

# Plants of the FREE STATE

## inventory and identification guide

E. Retief and N.L. Meyer

STRELITZIA 38



*Olea europaea* (Photographer: Pieter Zietsman)



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E. Retief and N.L. Meyer

SANBI
Biodiversity for Life
South African National Biodiversity Institute

Pretoria
2017

# STRELITZIA

This series has replaced *Memoirs of the Botanical Survey of South Africa* and *Annals of the Kirstenbosch Botanic Gardens* which SANBI inherited from its predecessor organisations.

The plant genus *Strelitzia* occurs naturally in the eastern parts of southern Africa. It comprises three arborescent species, known as wild bananas, and two acaulescent species, known as crane flowers or bird-of-paradise flowers. Part of the logo of the South African National Biodiversity Institute is based on the striking inflorescence of *Strelitzia reginae*, a native of the Eastern Cape and KwaZulu-Natal that has become a garden favourite worldwide. It symbolises the commitment of the Institute to champion the exploration, conservation, sustainable use, appreciation and enjoyment of South Africa's exceptionally rich biodiversity for all people.

**E. Retief & N.L. Meyer**
National Herbarium, South African National Biodiversity Institute, Pretoria, South Africa

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# DEDICATION

*Plants of the Free State: inventory and identification guide* is dedicated to all plant collectors and researchers, who gathered material and information contributing to our present knowledge of the flora of the Free State.




**Figure 1.** *Crinum macowanii* (Amaryllidaceae). Artist: G. Condy.

# FOREWORD

## A Flora for the Free State of South Africa

There exists a popular, but completely erroneous, belief that the floristic riches of South Africa are more-or-less restricted to the western and southern areas of the country that experience a Mediterranean climate, as well as the subtropics of the eastern seaboard, from the Drakensberg to the coast. The present work, *Plants of the Free State: inventory and identification guide*, has now confirmed what plant taxonomists, ecologists and vegetation scientists in general always knew: the central province of South Africa, the Free State, also has a remarkably rich flora. The plants of the region total almost 3 000 taxa, split among over 900 genera and over 200 families, a rich diversity in any terms, especially for a comparatively small region often widely viewed as consisting of only rolling grasslands. This is another fallacy as the province harbours a wide range of habitats that support several vegetation types, ranging from pockets of dense savanna to almost desert-like karoo.

With the exception of some formally conserved areas such as the magnificent sandstone cliffs and formations of the Golden Gate Highlands National Park in the east, much of the Free State landscape has been transformed, particularly for agricultural and mining purposes. In fact, about 119 000 km$^2$ of the 130 000 km$^2$ covered by the Free State are linked to agricultural activity through crop cultivation or by providing grazing for domestic stock. Not surprisingly, the Free State is widely regarded as one of the 'bread baskets' of South Africa. Herein lies one of the main values of the book in that it will assist with informing society at large about what is at stake if the remaining natural resources of the province are not wisely managed.

As a basic botanical reference work there is to this day no replacement for having a Flora available for a region. (Note the capitalisation of the 'F' in Flora, indicating that it is a *treatise* on the plants of a region.) Regardless of how technological advances, particularly the almost instant connection to the global electronic ether through the worldwide web, have simplified our lives, it has thus far proven to be impossible to find alternatives for a Flora, which can be defined as a taxonomic treatment of the plants of a defined geographical area.

Taxonomists are increasingly, and with good reason, embracing modern technologies to simplify, indeed to liberate, information previously inaccessible through conventional search and dissemination mechanisms. But prior to embarking on any such dissemination exercises, the critically important step of unravelling taxonomic intricacies, requires attention. Without critical investigation and taxonomic resolution of our exceptionally rich flora (note lower case 'f' denoting the actual plants of the region), the contents of our databases and published volumes will remain stagnant and sadly lack improvement. Once we are more confident of the classification of the constituents of the flora, the information thus generated should be captured and structured into a reliable, interrogatable database and other products.



**Figure 2.** *Aloe hereroensis*

As with all the regions of South Africa, the Free State also had its fair share of pioneering botanists who compiled and disseminated information on its plants (Moffett 2014). In this regard the seminal works of Van Zinderen Bakker (no date), Roberts (1973), Venter (1976), Moffett (1997), Venter & Joubert (1984) and Kok (1999), particularly on the grass and arborescent floras of the Free State, come to mind. These works still have their place of course, but the present tome is commendably the first comprehensive treatment of all the plants of the province.

In several respects the first decade of the 21st century has been a proverbial Golden Age for biological taxonomy and systematics as far as the realisation of the primary value of this field of scientific endeavour is concerned. However, no longer does 'Golden Age' simply refer to organism collectors gaining increasingly easy physical access to previously inaccessible localities where loads of species new to science will be discovered. Explicit in this statement is the much wider and stronger understanding of, and appreciation for, the value and services that can be derived from collections of preserved biological material and their associated data. This statement of course also refers to monographic and revisionary studies. One of the first steps in initiating a taxonomic revision of any group of plants is to establish the current knowledge in an inventory of accepted and alternative names. Such an inventory can serve as the base-line hypothesis to be tested in a herbarium or using laboratory and other techniques. The critical first step of compiling a checklist of a group or region therefore remains of paramount importance in initiating a floristic or taxonomic investigation.

Elizabeth Retief, Nicole Meyer and their collaborators went beyond this first step and populated the plants dataset for the Free State with enhanced descriptive information. In some respects it is surprising that a *Flora* had not been produced for the Free State

before, given that the earlier successive and complementary works of Retief & Herman (1997), Goldblatt & Manning (2000), Manning & Goldblatt (2012) and Snijman (2013) set the scene for a comprehensive regional approach to covering the country floristically. In this regard, too, the authors are to be congratulated for having taken the initiative to produce this treatise, which will undoubtedly prove useful to a wide range of end users.

Finally, let me confirm that this book deals informatively with the Free State plants, and as such will undoubtedly prove to be an indispensable resource for anyone interested in the rich and unique flora of South, and southern, Africa.

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October 2014

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# CONTRIBUTORS



**Figure 3.** *Arctotis arctotoides*

| | | |
|---|---|---|
| Bester | S.P. | Apocynaceae, Ericaceae, Linderniaceae, Scrophulariaceae |
| Cupido | C.N. | Campanulaceae |
| Du Preez | P.J. | Vegetation of the Free State |
| Figueiredo | E. | Rubiaceae |
| Grobler | A. | Fabaceae |
| Herman | P.P.J. | Asteraceae |
| Klopper | R.R. | Agavaceae, Asphodelaceae, Lycopodiophyta, Pteridophyta |
| Masupa | T.T. | Geraniaceae |
| Meyer | J.J. | Lamiaceae |
| Moffett | R.O. | Anacardiaceae |
| Nkonki | T. | Fabaceae (*Lessertia*) |
| Singh | Y. | Hypoxidaceae |
| Smith | G.F. | Agavaceae, Asphodelaceae |
| Van Rooy | J. | Bryophyta, Marchantiophyta, Anthocerotophyta |
| Venter | H.J.T. | Convolvulaceae |
| Venter | A.M. | Solanaceae (*Lycium*) |
| Winter | P.J.D. | Cactaceae |
| Zietsman | P.C. | Oleaceae, Pedaliaceae, Rhamnaceae |

**Figure 4.** *Freesia andersoniae* (Iridaceae).

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Our contributors as listed on p. ix.

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A special word of thanks to the following photographers: Pieter Bester (various families), Lesley Henderson (aliens and invaders), Marinda Koekemoer (various families), Arrie Klopper (ferns), Štěpán Koval (mosses), Jean Meyer (various families), Latso Mucina (Aasvoëlberg), Madeleen Struwig (*Commicarpus*), Ena van der Walt (*Massonia*) and Pieter Zietsman (various families).

**Elizabeth Retief & Nicole Meyer**
PRETORIA, 2017




**Figure 5.** *Themeda triandra* (Poaceae). Artist: Jill Kimpton.

# INTRODUCTION

## Background

Early in the 19th century grassy plains, alive with game, characterised the region now known as the Free State. However, settlers entered the area and the rolling grasslands were fenced in and changed into agricultural land and mining areas, with the game population diminishing. In 1854 the Free State was proclaimed as an independent republic, the Orange Free State. Today it is the third largest province in the Republic of South Africa, situated in the centre of the country.

The Free State is high-lying with almost all land being 1 000 metres above sea level. It covers an area of approximately 130 000 km$^2$ (± 50 000 mi$^2$). Two main rivers form part of its boundaries: the Vaal River in the northwest and the Orange (Gariep) River in the south. In the southeast the Free State borders several districts of Lesotho. Domestically, it borders six provinces: North West (northwest), Gauteng (north), Mpumalanga (northeast), KwaZulu-Natal (east), Northern Cape (west) and Eastern Cape (south). Not only are ridges, koppies and grassy plains characteristic of the Free State, but spectacular sandstone cliffs and basalt formations are to be found in the northeastern part of the province. The surface area of the Free State is covered with rocks characteristic of the Karoo Supergroup.

The Free State lies in the summer rainfall region of South Africa. The rainy season usually reaches its maximum in December and January in the northern parts, and February to March in the western and southern part. The winter months can be extremely cold, with temperatures well below the freezing point, and snow is not unusual over higher-lying areas. Maximum temperatures in the summer months regularly exceed 35°C. Plants in the area are also subjected to winter drought and fire. With sturdy, often very old, fire-resistant rootstocks and mass seed production by fire-stimulated flowering, species are well adapted to survive unfavourable conditions.

## Aim

***Plants of the Free State: inventory and identification guide*** is aimed at professional botanists, nature conservationists, students, amateur botanists and informed laymen. It seeks to assist in the identification of plants, to provide essential information as well as pleasure, and to stimulate and promote an interest in the plants of the Free State.

In compiling the publication, specimens and information at the following institutions were studied: the National Herbarium (PRE) at the South African National Biodiversity Institute; the University of the Free State Geo-Potts Herbarium (BLFU), as well as the Herbarium at the National Museum (NMB) in Bloemfontein. Through many years, plants were collected and documented by various people.

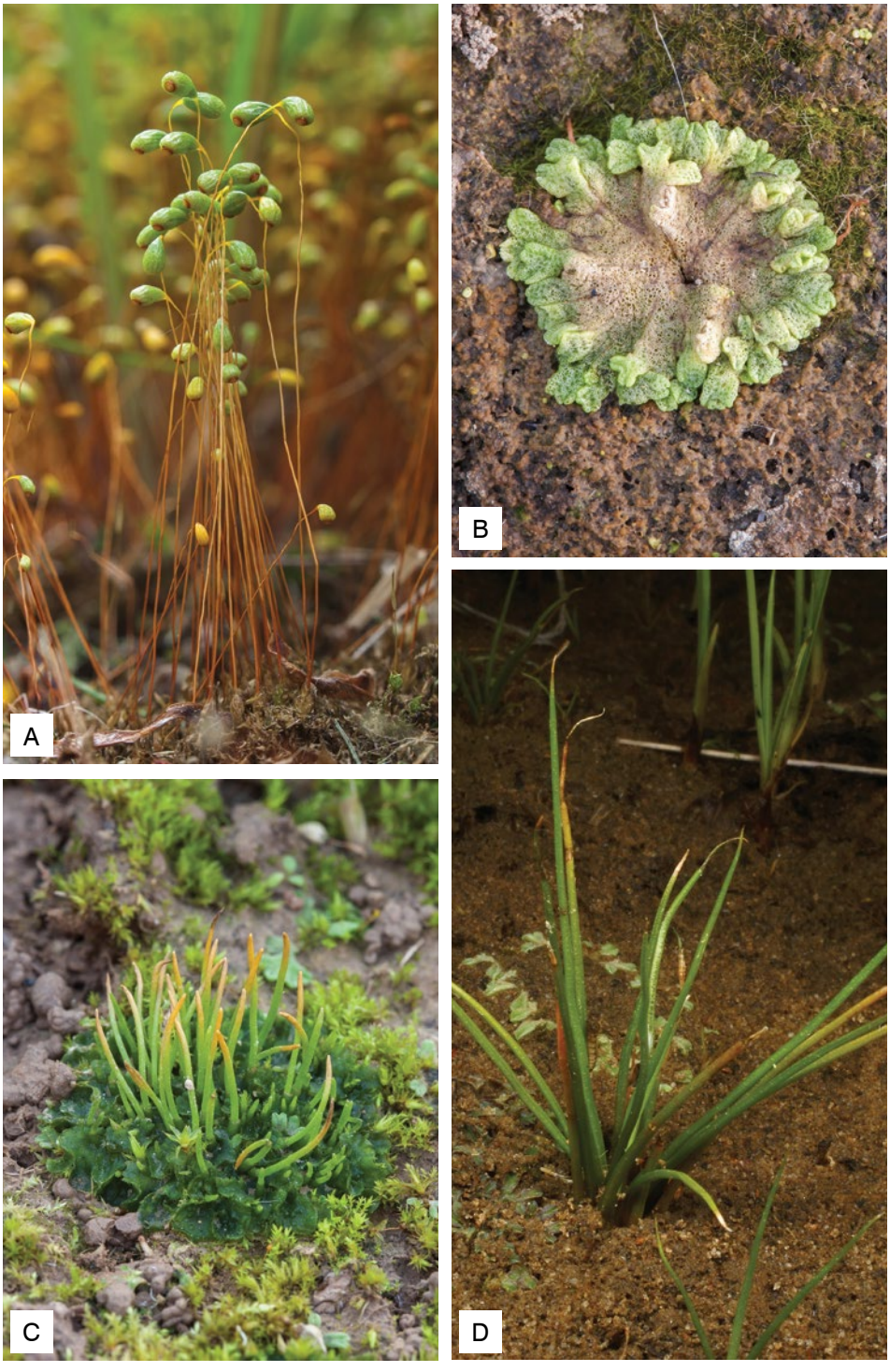



**Figure 6.** A, *Funaria hygrometrica* (Bryophyta, Funariaceae); B, *Riccia cavernosa* (Marchantiophyta, Ricciaceae); C, *Phaeoceros carolinianus* (Anthocerophyta, Notothyladaceae); D, *Isoetes transvaalensis* (Lycopodiophyta, Isoetaceae).

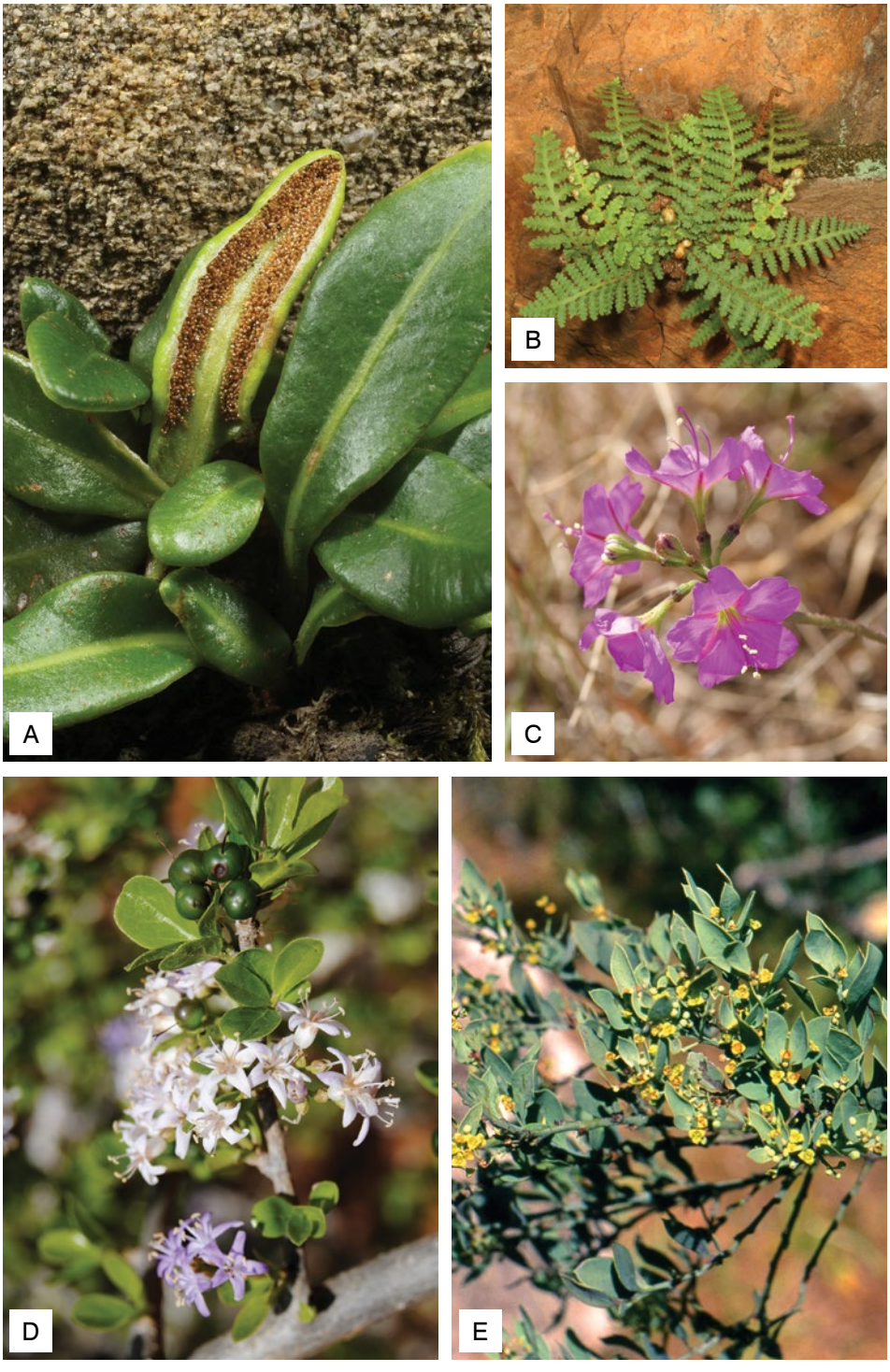



**Figure 7.** A, B: Pteridophyta; C–E: Dicotyledonae. A, *Elaphoglossum acrostichoides* (Dryopteridaceae); B, *Asplenium cordatum* (Aspleniaceae); C, *Commicarpus pentandrus* (Nyctaginaceae); D, *Ehretia rigida* subsp. *nervifolia* (Boraginaceae); E, *Osyris lanceolata* (Santalaceae).

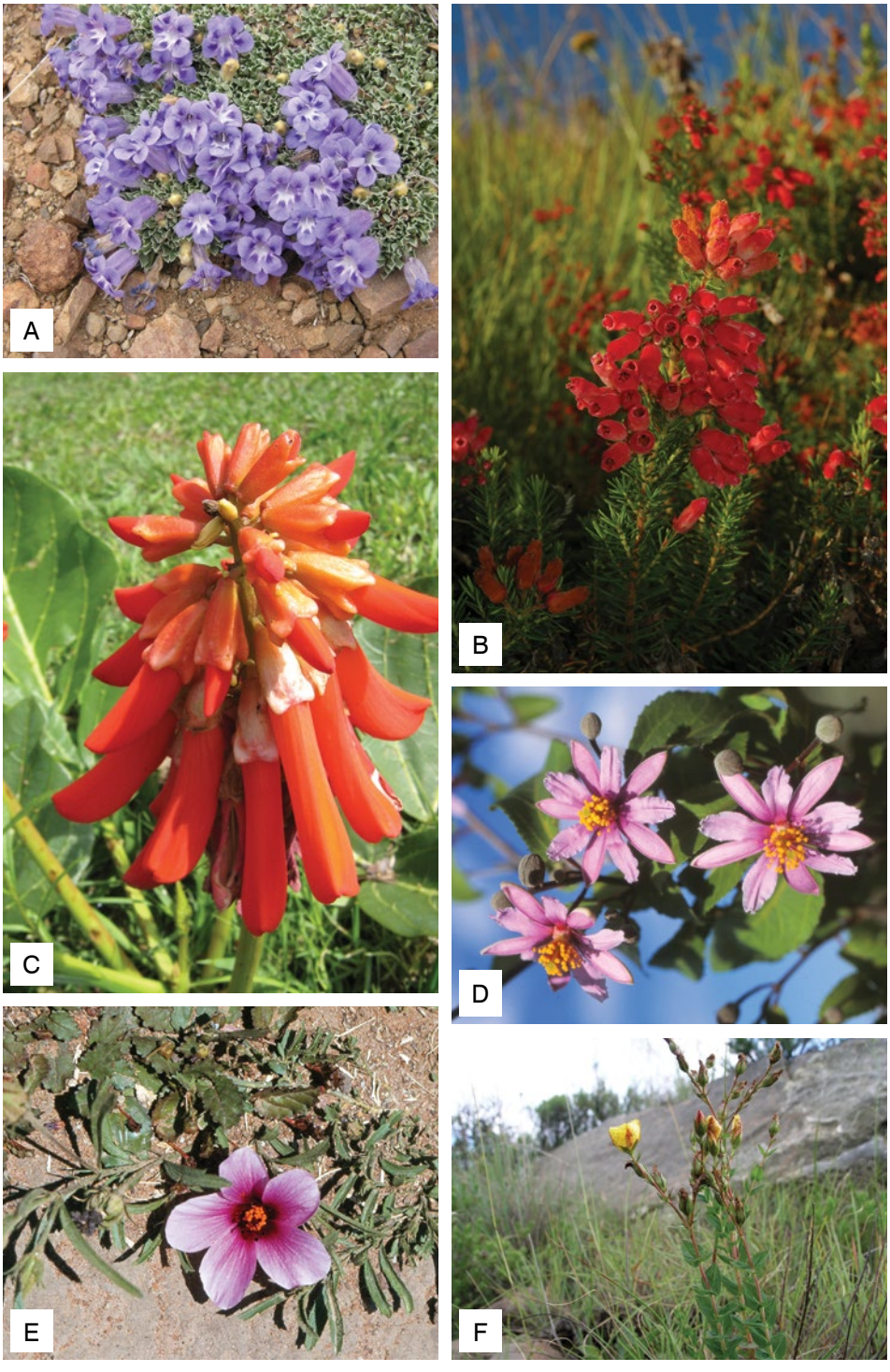



**Figure 8.** Dicotyledonae. A, *Aptosimum procumbens* (Scrophulariaceae); B, *Erica oatesii* (Ericaceae); C, *Erythrina zeyheri* (Fabaceae); D, *Grewia occidentalis* (Malvaceae); E, *Hibiscus microcarpus* (Malvaceae); F, *Hypericum aethiopicum* subsp. *sonderi* (Hypericaceae).




**Figure 9.** Dicotyledonae. A, *Pachycarpus schinzianus* (Apocynaceae); B, *Searsia pyroides* var. *gracilis* (Anacardiaceae); C, *Lessertia frutescens* subsp. *microphylla* (Fabaceae); D, *Berkheya onopordifolia* (Asteraceae); E, *Dicoma anomala* subsp. *anomola* (Asteraceae); F, **Cosmos bipinnatus* (Asteraceae).

> The urge to collect is inherent in human nature and in some individuals it is more marked than in others. The early collectors were inspired as much by a love of adventure as by an instinct for collecting and acquiring strange plants, animals and minerals. They were prepared to face incredible hazards, and many died prematurely from diseases or by violence.*
>
> *excerpt from *Botanical exploration of southern Africa* (Glen & Germishuizen 2010)]

A few examples of collectors that explored the plants of the Free State are: Henry George Flanagan, in 1894, accompanied by his wife and Harry Bolus, made a journey by ox-wagon to the Free State, collecting in the Bester's Vlei and Bethlehem areas and on the Mont-aux-Sources Mountains; George Potts, Professor of Botany, University College of the Free State, from 1905 until his retirement in December 1937, collected mainly in the Free State and his specimens formed the basis of the University Herbarium; Marguerite Henrici was a plant physiologist stationed at Fauresmith from 1929, for the study of problems connected with Karoo vegetation and, to some extent, pasture problems in other parts of the country. Specimens Henrici collected are mainly from the western Free State; Inez Verdoorn, well-known botanist of her time, also collected extensively in this region. Recent collectors to mention are: Noeline Kroon, Johann du Preez, Johan Venter, Pieter Zietsmann, Pieter Bester, Jean Meyer and Lyn Fish (née Smook). For more information consult *A Biographical Dictionary of contributors to the Natural History of the Free State and Lesotho*, compiled by Moffett (2014).

# Floristic composition

The flora of the Free State is represented by 218 families, 947 genera, 2 954 species (including 344 alien species), comprising 3 092 taxa (including 353 alien taxa). The three largest families in the region are the Asteraceae, Poaceae and Fabaceae. Figures 6–12 display the variety of plants occurring in the vegetation of the region.

Naturalised aliens are included in this treatise because invasions by non-native species are often to the detriment of native plants. These species can alter the ecological nature of their new-found regions significantly. An important reason for this is that they become naturalised without the natural enemies that restrict them in their countries of origin. Examples of some naturalised aliens in the vegetation of the Free State are illustrated in Figures 9F, 10A, 13 & 14.

# Structure of entries

**Order** – The families, genera, species and subspecific taxa in each section are arranged in alphabetical order.

**Plant families** – The family descriptions were compiled from various sources (for example, Heywood *et al*. 2007 and Leistner 2005). Delimitation of the families is mainly based on APG II. They are primarily grouped in eight more-or-less natural assemblages, namely: Bryophyta, Marchantiophyta, Anthocerotophyta, Lycopodiophyta, Pteridophyta, Gymnospermae, Dicotyledonae and Monocotyledonae.

**Keys** – A family description is followed by a key to the relevant genera. Keys to the genera are from published information with references given, or compiled by the authors.

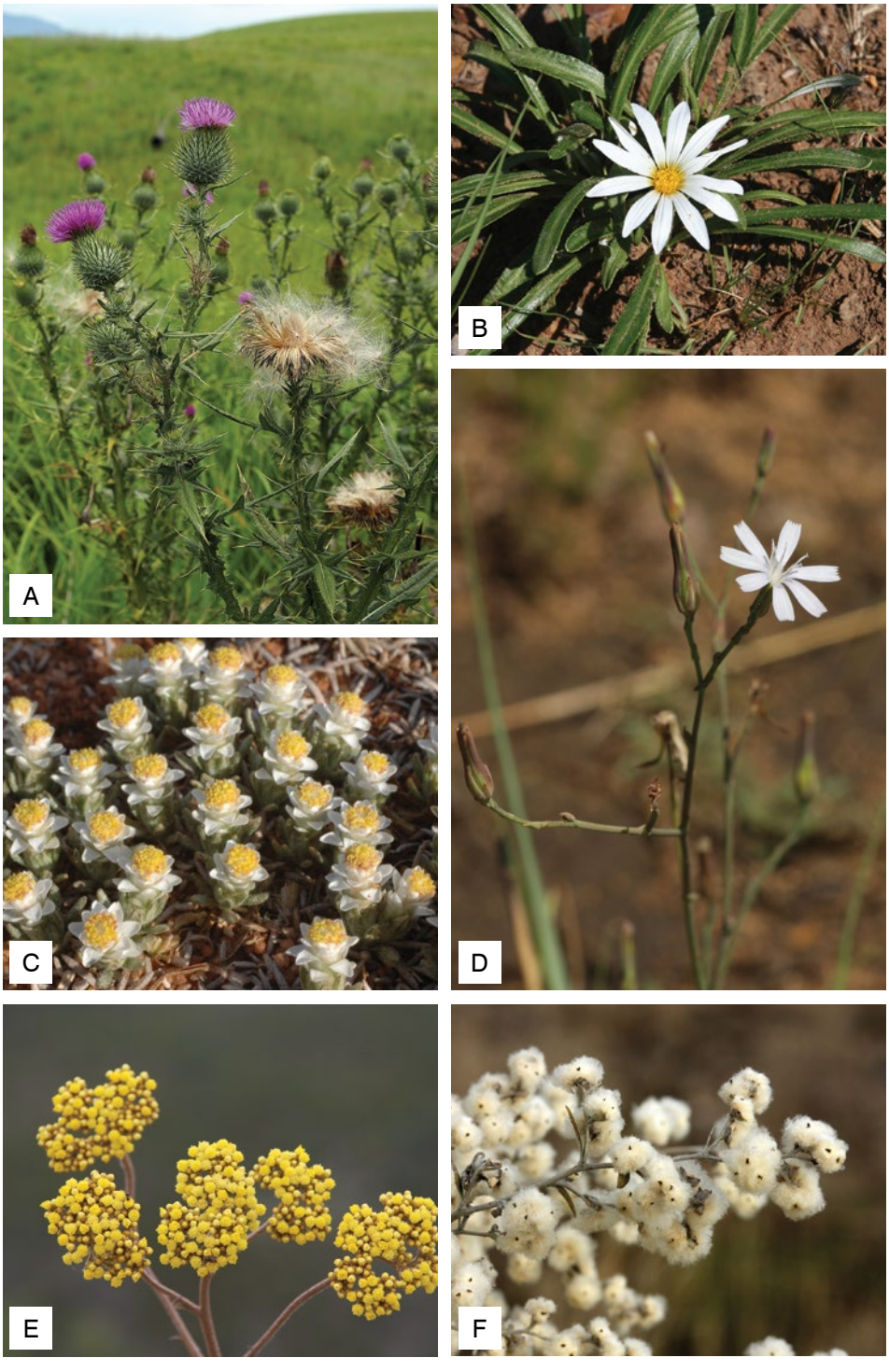



**Figure 10.** Dicotyledonae. A, **Cirsium vulgare* (Asteraceae); B, *Gazania krebsiana* subsp. *serrulata* (Asteraceae); C, *Helichrysum caespititium* (Asteraceae); D, *Lactuca inermis* (Asteraceae); E, *Helichrysum nudifolium* var. *nudifolium* (Asteraceae); F, *Tarchonanthus camphoratus* (Asteraceae).

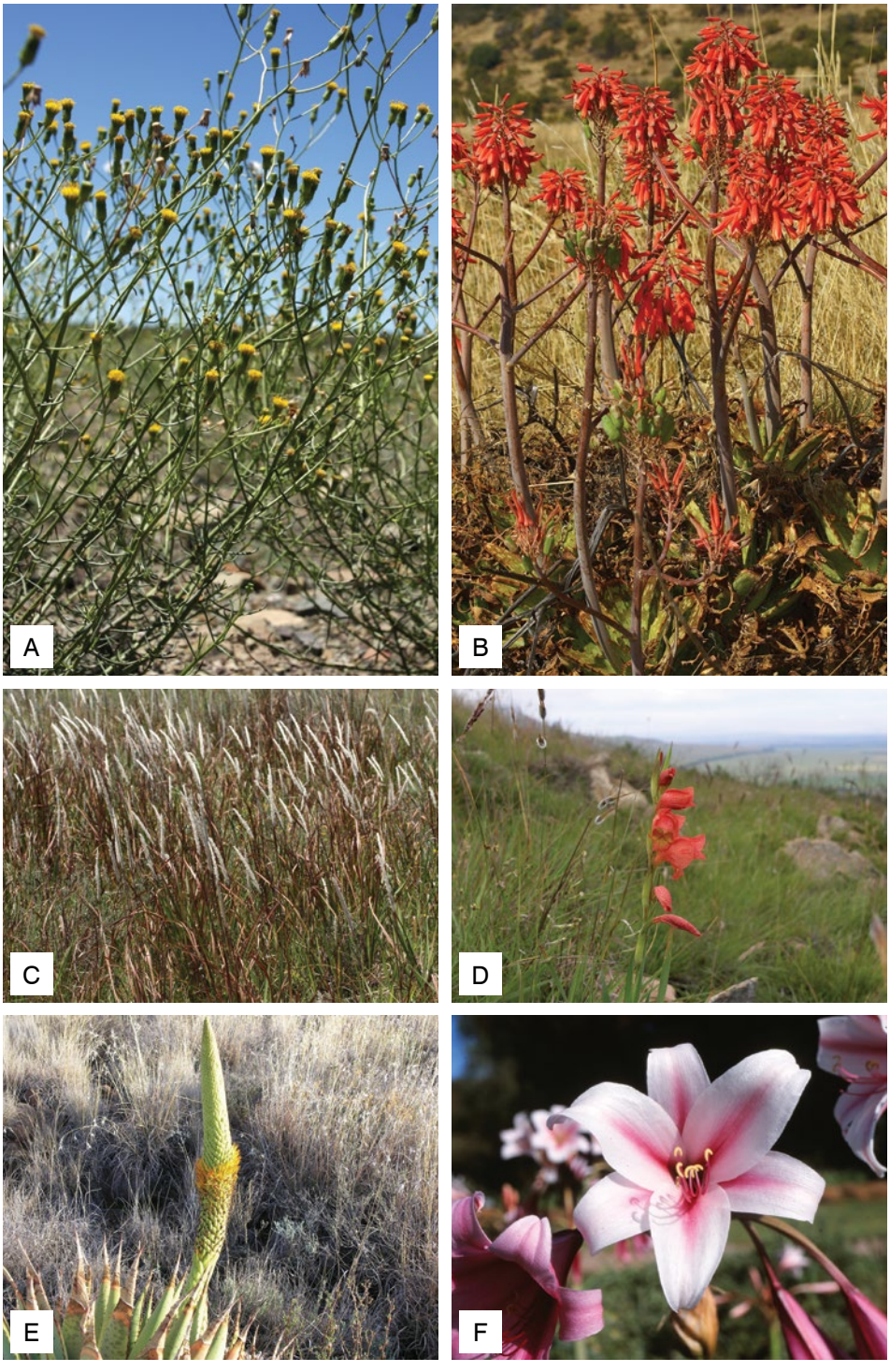



**Figure 11.** A: Dicotyledonae; B–F: Monocotyledonae. A, *Senecio inaequidens* (Asteraceae); B, *Aloe grandidentata* (Asphodelaceae); C, *Imperata cylindrica* (Poaceae); D, *Gladiolus dalenii* (Iridaceae); E, *Aloe broomii* var. *broomii* (Asphodelaceae); F, *Crinum bulbispermum* (Amaryllidaceae).

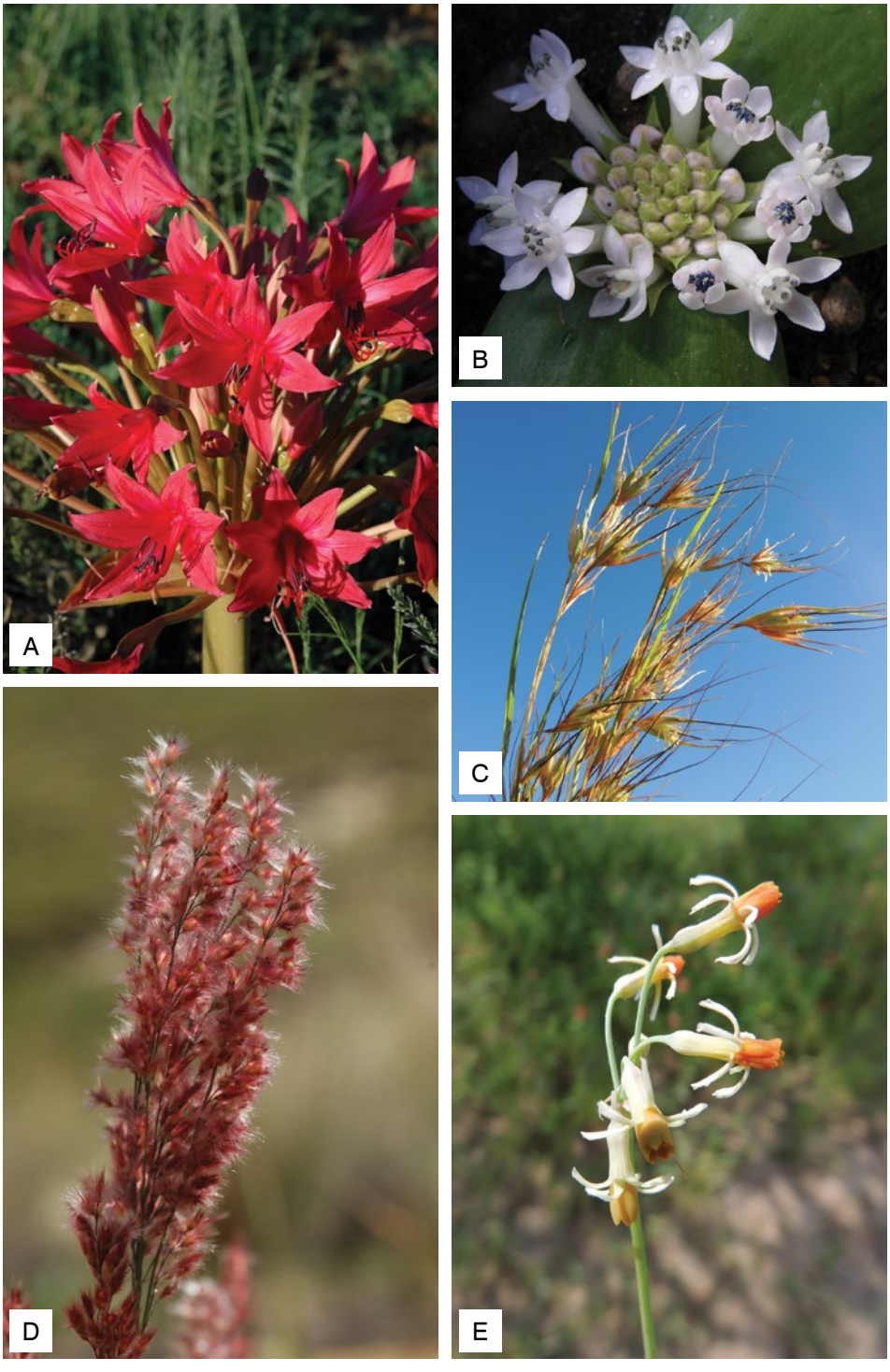



**Figure 12.** Monocotyledonae. A, *Brunsvigia radulosa* (Amaryllidaceae); B, *Massonia jasminiflora* (Hyacinthaceae); C, *Themeda triandra* (Poaceae); D, *Melinis repens* subsp. *melinis* (Poaceae); E, *Tulbaghia acutiloba* (Alliaceae).

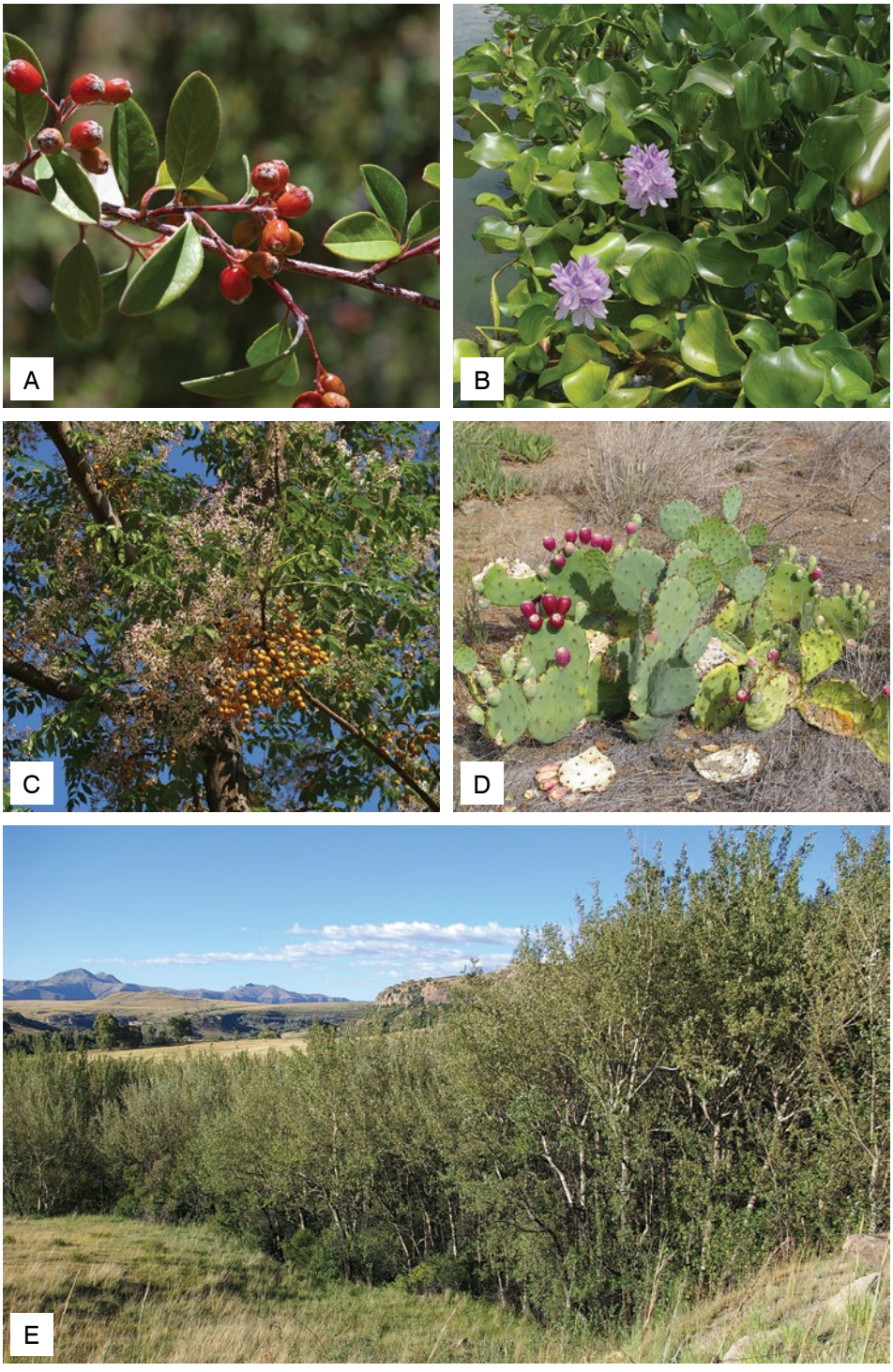



**Figure 13.** Naturalised aliens. A, C–E: Dicotyledonae; B: Monocotyledonae. A, **Cotoneaster pannosus* (Rosaceae), B, **Eichhornia crassipes* (Pontederiaceae); C, **Melia azedarach* (Meliaceae); D, **Opuntia engelmannii* (Cactaceae); E, **Populus × canescens* (Salicaceae).

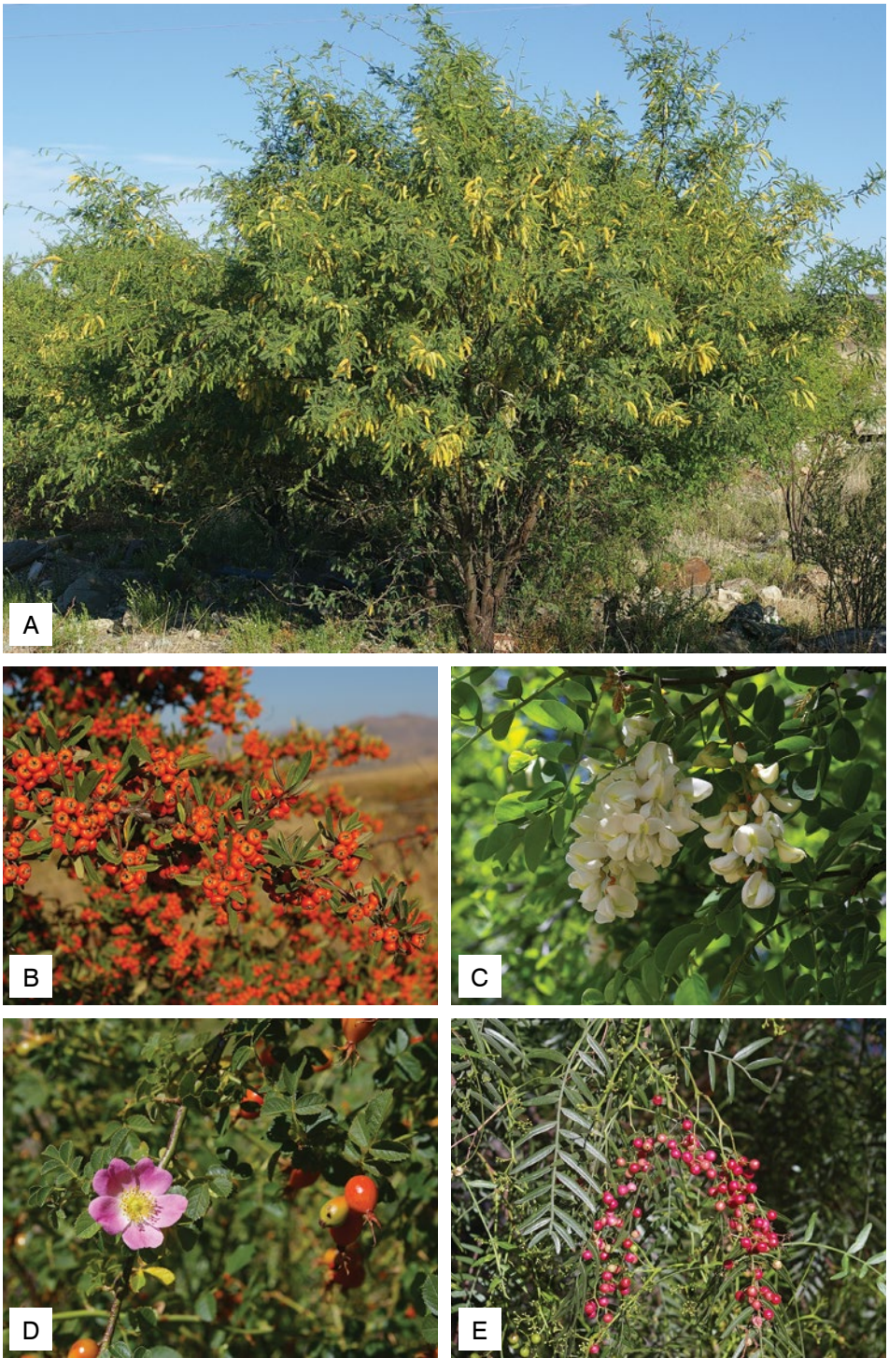



**Figure 14.** Naturalised aliens. Dicotyledonae. A, **Prosopis glandulosa* var. *torreyana* (Fabaceae); B, **Pyracantha angustifolia* (Rosaceae); C, **Robinia pseudoacacia* (Fabaceae); D, **Rosa rubiginosa* (Rosaceae); E, **Schinus molle* (Anacardiaceae).

Characters of the *habit*, *stems*, *leaves*, *flowers* and *fruit* are used in distinguishing the different taxa. Each genus then has a key to the taxa occurring in the Free State, where applicable. Keys to the species and subspecific taxa are from published information with references given, or compiled by the authors.

**Descriptions** – Each species and subspecific taxa entry comprises the following:

- Genus name with author citation; number of species in each genus for southern Africa (sthn Afr.) – here defined as South Africa, Namibia, Botswana, Swaziland and Lesotho.
- A specific epithet with author citation.
- Taxa non-native to southern Africa are marked with the symbol * before a specific epithet.
- Synonyms: the most important two, or sometimes more, are given.
- A brief description comprising distinguishing characters about a taxon's habit, height, stem, leaves, flowers, flowering time, fruit and habitat follows – information about the habitat was taken from specimen data, no attempt was made to classify it; the descriptions were compiled from various sources, literature, as well as websites (for example, www.sanbi.org.za, www.wikipedia.com, www.theplantlist.org).
- In the case of naturalised aliens, the country of origin is given.
- Common names in English, Afrikaans (**A**), SeSotho (**SS**), seTswana (**T**), isiXhosa (**X**) or isiZulu (**Z**). The use of common names, valuable as they often may be, is difficult because the same plant may have a different name in one part of the area from what it bears in another, or plants botanically distinct, may bear the same name in different regions.
- The distribution of a taxon in the Free State is indicated according to six vegetation units: Vredefort Dome Savanna (**VreDm**), Kalahari Deciduous Acacia-wooded Grassland (**AcGr**), Dry Grassland (**DrGr**), Mesic Grassland (**MsGr**), Dwarf Karroid Shrubland (**KarSh**) and Zastron Moist Grassland (**Zastr**) – see section on the various vegetation types occurring in the Free State (p. 14), with maps (Figures 16 & 19). A species might not have been recorded in a specific unit in this publication, but as collections grow, more precise distribution may become available.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

## Literature frequently consulted

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**Figure 15.** *Eriocephalus ericoides* (Asteraceae).



# VEGETATION OF THE FREE STATE

Compiled by P.J. du Preez

## Introduction

The Grassland Biome covers large areas of the Free State province. The overwhelming impression of the Free State's vegetation is grass-covered plains and slopes. This is due to the dominance of grasses. However, the species richness of grasslands can be ascribed to the occurrence of a rich diversity of forbs, which form an important component of grassland, especially in the mesic grassland. Woody species also dominate various plant communities that occur in grasslands. They can vary from dwarf karroid shrubs to shrubs and trees. Most of these shrub and tree communities are limited to special habitat conditions, showing higher moisture retention abilities. Woody species are situated in protected sites such as valleys, boulder-strewn slopes and along water courses. Some of these woody communities may be relicts of paleo-climates and past vegetation patterns which still have links with the Savanna and Forest biomes. Forest patches are restricted to sheltered ravines and protected slopes (Mucina & Rutherford 2006).

The distribution of the broad vegetation patterns is shown in Figure 16. Studies by vegetation scientists have shown that these major habitats are driven by environmental factors such as precipitation, temperature, frost, altitude and soil type. Within these generalised vegetation types is a diverse variety of plant associations. These associations are influenced by environmental factors such as aspect, drainage, slope, percentage surface rock, fires, grazing pressures and others.

## Vegetation units

The vegetation of the Free State in this account on the plants of the region, is treated under six major vegetation units (Figure 19). The units relevant for each taxon described, are indicated in a row of blocks below the description.

### Vredefort Dome Savanna

VreDm

This semi-circular structure is part of the largest and oldest impact crater on Earth. A collision between the Earth and a celestial object (comet or meteorite) occurred about 2 023 million years ago. Today the topography reflects the intensity of the impact and it is characterised by the sequence of concentric ridges (resistant quartzites) and broad valleys

(weathered shales). These quartzite outcrops of the Vredefort Dome and associated hills and ridges form an archipelago of savanna dominated islands, surrounded by Grassland Biome. These islands are the southernmost outliers of the Central Bushveld Bioregion.

The typical vegetation is open woodland, dominated by acacia trees and several shrub species. The grass cover is relatively low due to the high percentage surface covered by rock. Sloped areas with deeper soils support a proteoid savanna. The shale-dominated valleys are dominated by acacia and karree trees. In relation to the rest of the vegetation of the Free State, the vegetation of the Vredefort Dome is unique and contains numerous typical savanna trees, shrubs, forbs and grasses, which occur nowhere else in the Free State. About 2.5% of the plant species of the Free State is restricted to this region. Figure 17A & B; Figure 19, 1.

## Kalahari Deciduous Acacia-wooded Grassland

AcGr

The northwestern part of the Free State is covered by the most eastern parts of the Kalahari Deciduous Acacia-wooded Grassland. Although relatively high above sea level, this region still supports savanna vegetation because of the presence of deep

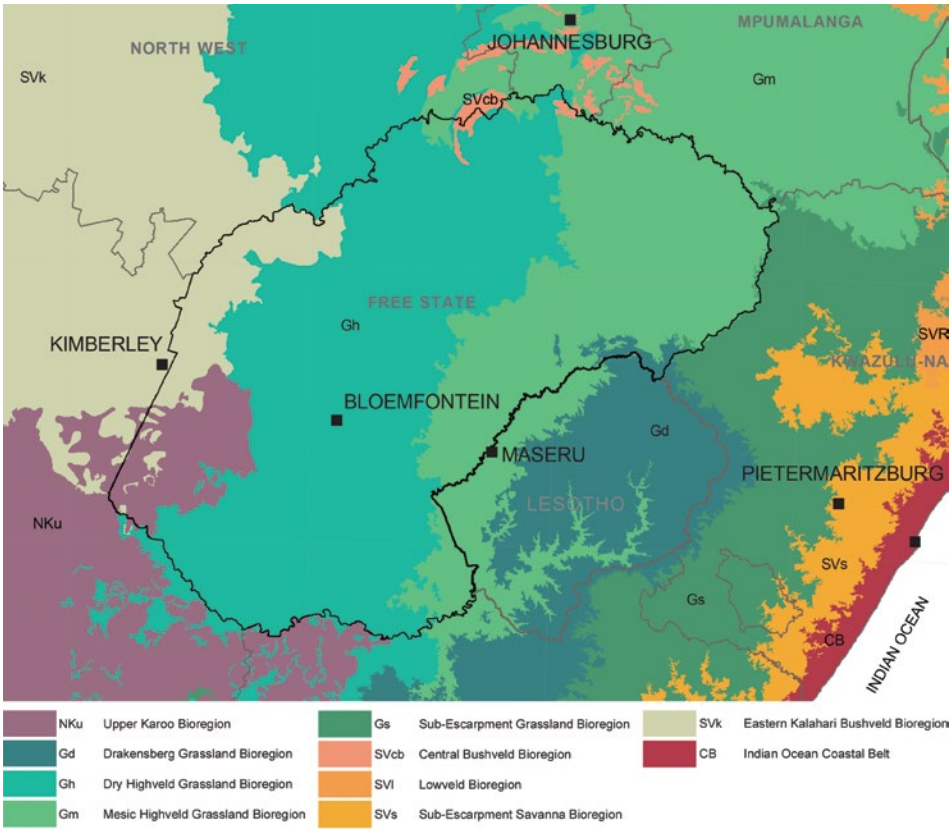



**Figure 16.** Bioregions of the Free State, South Africa (part of Mucina & Rutherford: 45, 2006).

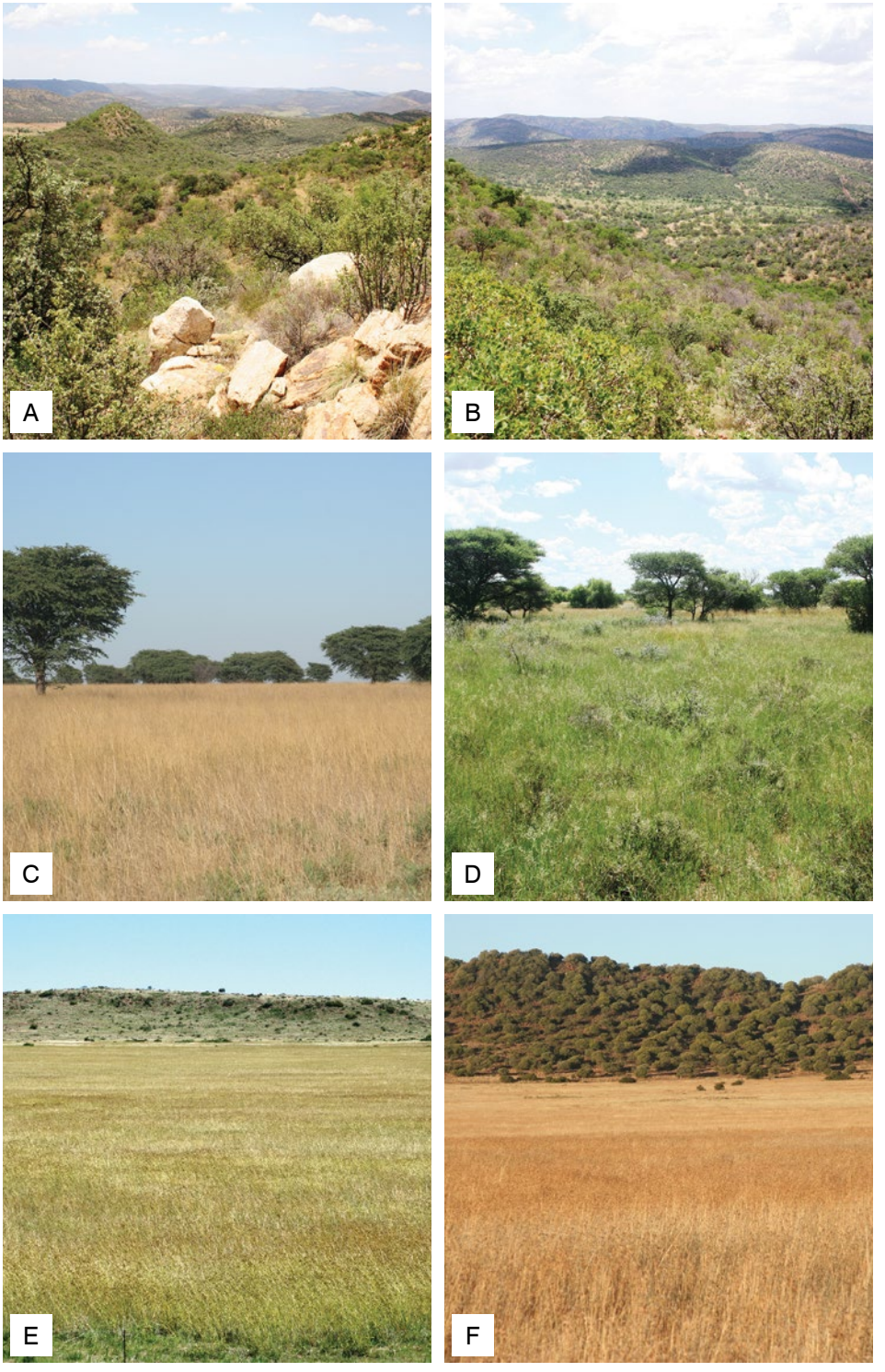



**Figure 17.** Vegetation Units. A & B, Vredefort Dome Savanna (VreDm); C & D, Kalahari Deciduous Acacia-wooded Grassland (AcGr); E & F, Dry Grassland (DrGr).

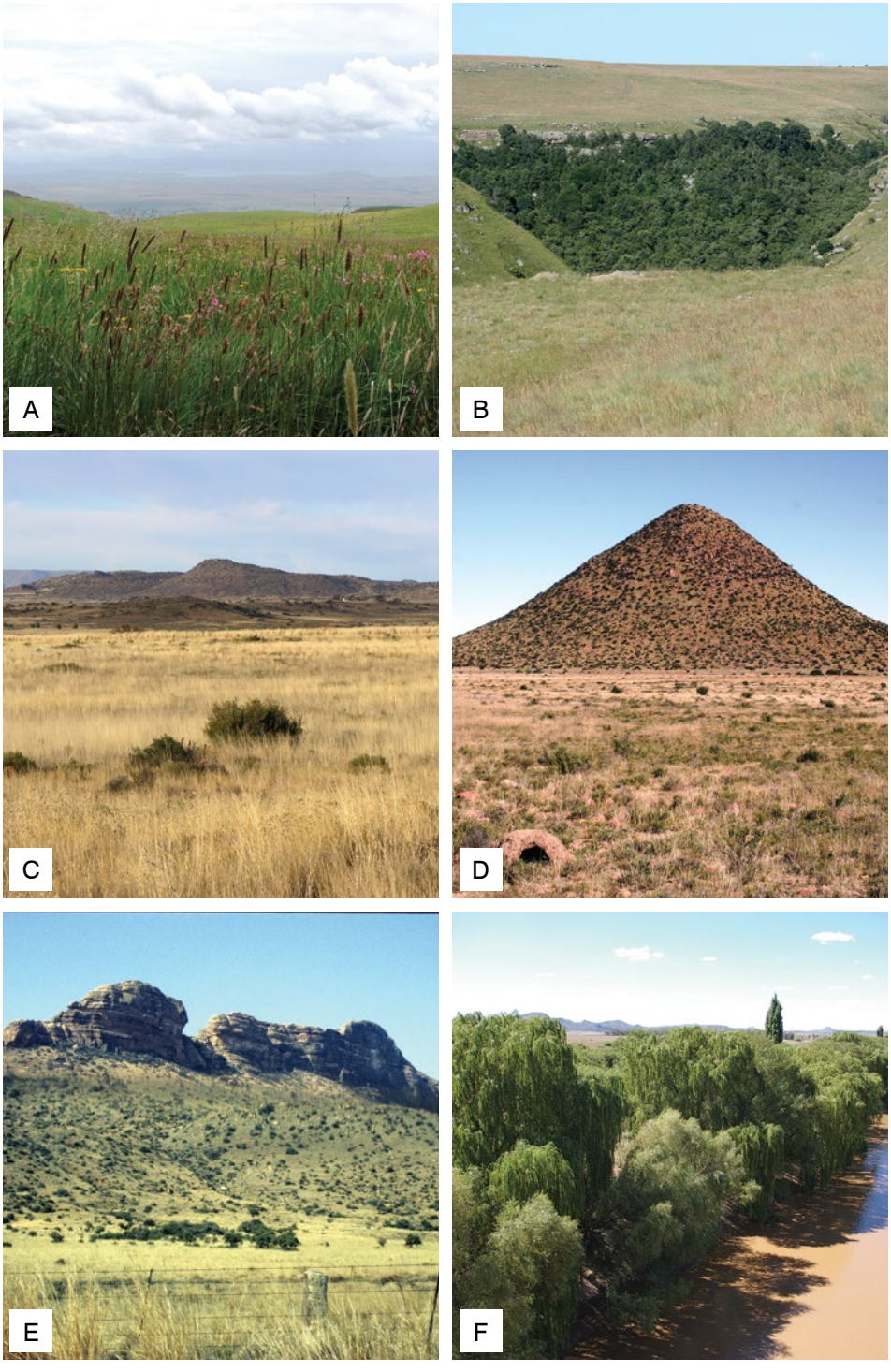



**Figure 18.** Vegetation Units. A & B, Mesic Grassland (MsGr); C & D, Dwarf Karroid Shrubland (KarSh); E, Zastron Moist Grassland (Zastr) [Aasvoëlberg]; F, Riverine vegetation, an azonale type (Caledon River).

deposits of Kalahari sand that occur east of the Vaal River. Savanna trees and shrubs obtain their water from these deep sand deposits. This allows them to survive the low rainfall, high summer temperatures and high evapotranspiration rates. Towards the southeast the sandy soils become shallower, but then the rainfall increases and the evapotranspiration decreases. Dolerite hills and ridges in this region support a different variation of savanna vegetation (Low & Rebelo 1996; Mucina & Rutherford 2006).

Three types of woodland occur in this vegetation region. All three types are associated with different soil types and geology in the area. On the deep sandy plains, the vegetation is characterised by wooded grassland. It is open grassland covered by scattered thorn- and karee trees. In areas with sufficient ground water, bush clumps of *Vachellia erioloba* (camel thorn) occur. Shallower sandy plains are dominated by mainly *Vachellia tortilis* (umbrella thorn). Areas with surface limestone also occur. On dolerite hills, shrub communities dominate. Here the grass cover is sparse due to the high percentage of surface rock (Low & Rebelo 1996; Mucina & Rutherford 2006).

About 1.1% of the Free State's species are restricted to this vegetation unit. Large parts of this vegetation region, especially those areas on deep sand are under threat due to crop production. Extensive areas of camel thorn veld have been destroyed to make way for crop fields. Only small remnants of the natural vegetation remain undamaged. Figure 17C & D; Figure 19, 2.

## Dry Grassland




Annual rainfall is a major environmental factor that can be used to distinguish Dry Grassland vegetation unit from moist grassland. The central part of the Free State can be classified as Dry Grassland. This sweet grassland occurs, unlike sour moist grassland, in areas with a relatively low rainfall, low altitude and on soils that are nutrient-rich. These soils are thus less leached and have on average a higher pH (base status). The grasses are sweet, palatable and the canopy cover, biomass production and fire frequency are relatively low (Low & Rebelo 1996; Mucina & Rutherford 2006).

The topography is flat to undulating; occasional dolerite ridges and hills break the extensiveness of the plains. Streams and rivers drain most of these plains, while numerous pans occur in those very flat, poorly drained areas. The variation in the arid grassland is mostly based on soil type characteristics such as soil texture, soil depth, slope and percentage surface rock (Mucina & Rutherford 2006). About 11.1% of the plant species of the Free State are restricted to this vegetation unit.

Most of this open grassland is, due to the palatability of its species, in a degraded state. Severe overgrazing occurs in places. In the southern Free State, encroachment of dwarf karroid shrubs is notable. Figure 17E & F; Figure 19, 3.

## Mesic Grassland




Unlike Dry Grassland, Mesic Grassland occurs in higher rainfall areas. Here the soils are leached and poor in nutrients. These soils have a relatively low pH (base status) and the

grasses are mainly sour and unpalatable. The canopy cover, biomass production and fire frequency are higher than those of sweet grasses. Sour grasslands are generally found in the eastern parts of the Free State, where an average rainfall of more than 600 mm per annum occurs. These grasslands are also associated with higher altitudes, where the winters are characterised by severe frost (Low & Rebelo 1996; Mucina & Rutherford 2006).

As in the case of the Dry Grassland, the topography of the Mesic Grassland region is flat to undulating, while occasional dolerite ridges and sandstone-capped hills and mountains break the extensiveness of the plains. Streams and rivers drain most of these plains. In the mountainous areas the valley bottoms become narrower and valley slopes steeper. A few pans occur in those areas that are very flat and have poor drainage (Low & Rebelo 1996; Mucina & Rutherford 2006).

The moist grassland varies from open in the central Free State, to closed tall grassland on the escarpment and the very steep slopes and plateaus of the high basalt-capped mountains. The variation in the Mesic Grassland is also based on soil type characteristics, such as soil texture, soil depth, slope and percentage surface rock. Important climatic factors that characterise this region are high annual rainfall and extreme seasonal temperature fluctuations, from winters with severe frost and occasional snow, to hot days in summer (Mucina & Rutherford 2006).

The vegetation is closed, short grassland rich in forbs, which become dominant in places. Fire and extreme winter temperatures are important environmental factors that keep the

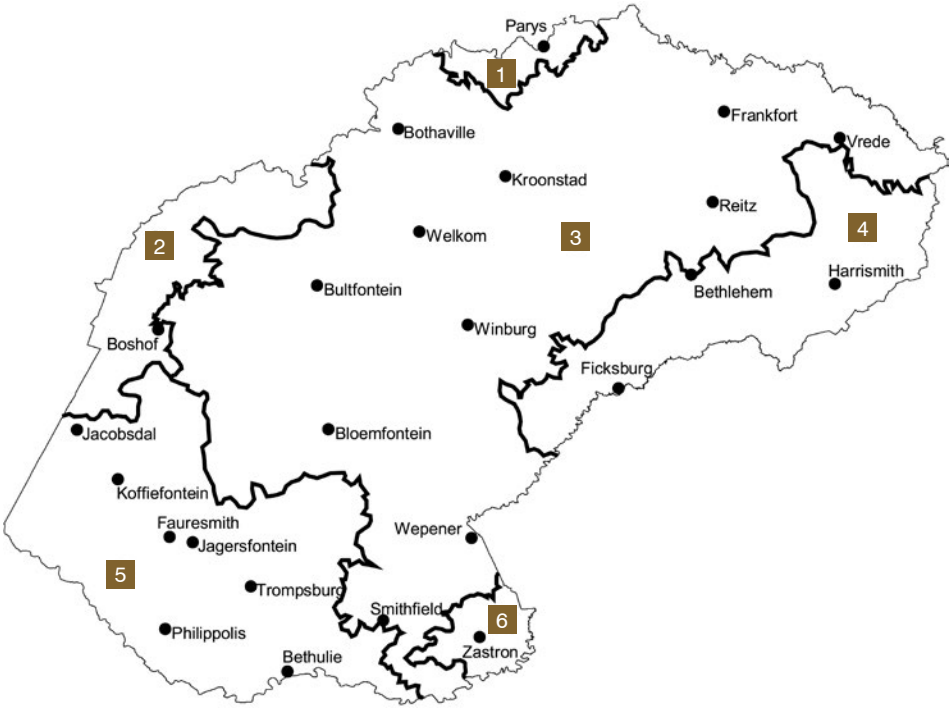



**Figure 19.** Map of vegetation units of the Free State: 1, Vredefort Dome Savanna; 2, Kalahari Deciduous Acacia-wooded Grassland; 3, Dry Grassland, 4, Mesic Grassland, 5, Dwarf Karroid Shrubland; 6, Zastron Moist Grassland.

grassland short (Mucina & Rutherford 2006). Certain areas of this grassland have been invaded by *Stoebe vulgaris* (bankrupt bush) and *Aristida junciformis* (ngongoni bristle grass). Both these species are indicators of degradation, especially overgrazing.

Woody plant communities dominate the slopes of mountains in the eastern Free State. The woody species are situated in protected sites such as valleys, boulder-strewn slopes and along water courses. Yellowwood-dominated forest patches are restricted to deep, sheltered ravines and protected slopes (Mucina & Rutherford 2006). A special vegetation type, which is also restricted to the sandstone outcrops on the mountains in the eastern Free State, is the Afromontane fynbos communities. These fynbos communities occur on leached, nutrient-poor sandy soils in fire-protected sites. About 27.8% of the Free State's species are restricted to this vegetation unit. Figure 18A & B; Figure 19, 4.

## Dwarf Karroid Shrubland




This is the most arid region in the Free State. The sparse vegetation cover does not effectively protect the poorly developed soils and in places, soil degradation is enhanced by sheet and gully erosion. The soils are lime-rich and have a relatively high pH. This region has a low and unpredictable rainfall and the winter temperatures are too low to support tree communities. It is also too dry for perennial grasses to dominate. Due to these relatively hostile environmental factors, the species richness is relatively low.

The vegetation is dominated by dwarf karroo shrubs and annual grasses on the plains. Small trees, of which *Vachellia karroo* (sweet thorn) dominate, occur along drainage lines. On dolerite hills and ridges shrub communities dominate. Here the grass cover is low due the high percentage of surface rock on the plateaus and slopes. In the Free State, this floristic region can be regarded a floristic transition between the Nama-Karoo, Kalahari savanna and Dry Highveld Grassland due to the presence of environmental gradients (Low & Rebelo 1996; Mucina & Rutherford 2006). About 6% of the Free State's species are restricted to this vegetation unit. Figure 18C & D; Figure 19, 5.

## Zastron Moist Grassland




This is a vegetation unit that forms part of the Mesic Grassland, but floristic elements from the Eastern Cape make this unit unique enough to be listed separately. The topography varies from undulating plains to steep mountain slopes. The soils have a relatively low pH (base status) and the grasses are mainly sour and unpalatable. An average rainfall of more than 600 mm per annum occurs. These grasslands are also associated with higher altitudes where cold winters with severe frost influence the plant species composition. In the mountainous areas the valley bottoms are narrow and valley slopes steeper (Low & Rebelo 1996; Mucina & Rutherford 2006).

The grass-dominated vegetation is also rich in forbs. Fire and extreme winter temperatures are important environmental factors that keep the grassland short and also prevent

the development of shrub communities (Mucina & Rutherford 2006). In degraded and overgrazed areas *Stoebe vulgaris* (bankrupt bush) is a serious invader.

Like in other parts of the eastern Free State, woody plant communities dominate mountain slopes in the Zastron area. The woody species are situated in protected sites such as valleys, boulder-strewn slopes and along water courses to escape the severe winter frost and occasional fires. *Aloe ferox*, a prominent Eastern Cape succulent, dominate a number of north-facing slopes in the Zastron area. The Afromontane fynbos is also present in this floristic unit and it is also restricted to the sandstone outcrops on the mountains. About 0.6% of the Free State's species are restricted to this vegetation unit. Figure 18E; Figure 19, 6.

# Azonal vegetation types

The size of these plant associations are relatively small and fall within the boundaries of the above mentioned major units. In the Free State these vegetation types are usually associated with rivers (Figure 18F) or streams (banks are usually fringed with a variety of plants), wetlands and saline depressions in low-lying areas. The main environmental factors that support azonal communities are moisture availability and the presence of high concentrations of lime and salt in the soil.

Unlike habitats that support zonal vegetation, habitats with water-logged conditions or high levels of salt concentration form a highly stressed environment for most plants. Only plants with special adaptations can survive in these extreme conditions. The azonal vegetation in the Free State deviates strongly from the zonal vegetation and is considered to fall within four major groups namely: freshwater wetlands, alluvial wetlands, salt pans and intermittent water courses (Mucina & Rutherford 2006).

**Freshwater wetlands** fall within the boundaries of the Mesic Grassland. Typical freshwater wetlands are vleis, freshwater pans and high-altitude fens. Vleis form in the catchment areas of streams and are dominated by aquatic grasses, sedges, reeds and bulrushes. Some of these vleis are peat forming. Another freshwater wetland type is freshwater pans. These pans can be subdivided into open, reed, sedge and grass pans. High-altitude wetlands (fens) are limited to very few places in the high basalt-capped mountains of the Free State. The formation of deep organic deposits (peat) in the hill-slope seeps and valley bottoms is the result of the extreme climatic conditions. In these fens, the acidic, slowly decomposing humus of decaying plant roots, result in a high water-retention capacity. The species composition of these wetlands is completely different from those of the surrounding grassland (Mucina & Rutherford 2006).

The second azonal wetland type is **alluvial (riparian) wetlands**. Most of these wetlands are linear and limited to water courses whether it is perennial, seasonal or episodic. These alluvial wetlands are usually subjected to frequent flooding and associated disturbance. On these floodplains, different types of waterbodies such as backwater lakes, oxbow lakes, as well as slow-flowing river channels can form, which will support aquatic vegetation (Mucina & Rutherford 2006).

**Salt pans** are the third azonal wetland type. These pans are mainly restricted to the western half of the Free State and fall within the following zonal vegetation units: Kalahari Deciduous Acacia-wooded Grassland, Dwarf Karroid Shrubland and Dry Grassland. Salt pans are closed systems with no outlet (endorheic) and contain fine clayey sediments

with high salt content. Most of these pans are seasonally inundated and carry water for only a few months. Most of these pan floors are devoid of any vegetation and the typical vegetation is limited to the pan edge (Mucina & Rutherford 2006). Under special conditions a karroid shrub community, mainly dominated by *Salsola* species, occur on the floors of some of these salt pans.

**Seasonal water courses** fringed with *Vachellia karroo* is the last azonal wetland. These watercourses drain the most arid part of the Free State and fall within the Dwarf Karroid Shrubland of the southwest Free State. They are dry for most of the year, are very seldom in flood and then only for a short time after heavy rains. Water disappears into the sandy streambeds where it can persist in small streambed and riparian aquifers (Mucina & Rutherford 2006).

# Threats

A large percentage of the vegetation of the Free State has been permanently transformed due to crop production, urbanisation, mining, forestry plantations, dams and erosion. Many vegetation types are classified as threatened and endangered due to these impacts. Of the remaining natural vegetation, large areas have also been significantly degraded due to overgrazing and encroachment of woody species (indigenous and alien). Another concern is the high level of fragmentation of the remaining untransformed grasslands.

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**Figure 20.** *Vachellia karroo* (Fabaceae).



# GUIDE TO FAMILY GROUPS
## in the Dicotyledonae and Monocotyledonae (flowering plants)

[after Manning: 26 (2007), Koekemoer, Steyn & Bester: 4 (2013)]

## MONOCOTYLEDONAE

Herbs, rarely tree-like. **Leaves** with parallel venation; blade often strap-shaped. **Flowers** with sepals/petals and stamens in multiples of three, usually with undifferentiated sepals and petals (= tepals or named perianth segments)

| **Grasses & grass-like plants** | **Aquatic herbs** |
|---|---|
| Cyperaceae<br>Juncaceae<br>Poaceae<br>Restionaceae<br>Typhaceae<br>Xyridaceae | Alismataceae<br>Aponogetonaceae<br>Hydrocharitaceae<br>Lemnaceae<br>Pontederiaceae<br>Potamogetonaceae<br>Ruppiaceae<br>Zannichelliaceae |

| **Terrestrial or marsh plants** | | | |
|---|---|---|---|
| Ovary inferior | Ovary superior | | |
| Agavaceae<br>Amaryllidaceae<br>Dioscoreaceae<br>Hypoxidaceae<br>Iridaceae<br>Orchidaceae<br>Velloziaceae | Inflorescence with a spathe | Fruit a berry | Fruit a capsule |
| | Acoraceae<br>Araceae | Asparagaceae<br>Dracaenaceae | Agapanthaceae<br>Agavaceae<br>Alliaceae<br>Asphodelaceae<br>Colchicaceae<br>Commelinaceae<br>Eriocaulaceae<br>Hyacinthaceae<br>Ruscaceae |

**Figure 21.** *Pterodiscus speciosus* (Pedaliaceae).



# DICOTYLEDONAE

Herbs, shrubs or trees. **Leaves** with netted or herringbone venation; blade variable in outline, margins often toothed or lobed. **Flowers** with sepals/petals and stamens in multiples of four or five, usually with differentiated sepals and petals.

| **Ovary inferior** | | |
|---|---|---|
| Petals or perianth segments free | | Petals fused |
| Aizoaceae | Menispermaceae | Campanulaceae |
| Apiaceae | Myrtaceae | Dipsacaceae |
| Araliaceae | Oliniaceae | Valerianaceae |
| Begoniaceae | Onagraceae | |
| Cactaceae | Rhamnaceae | |
| Combretaceae | Rosaceae | |
| Curtisiaceae | Santalaceae | |
| Haloragaceae | Vahliaceae | |
| Lythraceae | | |

**Figure 22.** *Cyrtanthus contractus* (Amaryllidaceae) at Golden Gate.



**Ovary superior**

Petals and perianth absent

Betulaceae
Fagaceae
Myricaceae
Myrothamnaceae
Piperaceae
Salicaceae

Petals or perianth segments free

Corolla regular

Amaranthaceae
Anacampserotaceae
Anacardiaceae
Brassicaceae
Capparaceae
Caryophyllaceae
Celastraceae
Cleomaceae
Crassulaceae
Droseraceae
Elatinaceae
Fabaceae
Flacourtiaceae
Frankeniaceae
Geraniaceae
Gisekiaceae
Hypericaceae
Icacinaceae
Limeaceae
Linaceae
Lophiocarpaceae
Loranthaceae
Malpighiaceae
Malvaceae
Meliaceae
Molluginaceae
Moraceae
Myrtaceae
Nymphaeaceae
Ochnaceae
Oxalidaceae
Papaveraceae
Phyllanthaceae
Phytolaccaceae
Pittosporaceae
Portulacaceae
Proteaceae
Putranjivaceae
Ranunculaceae
Rhamnaceae
Rutaceae
Sapindaceae
Simaroubaceae
Tamaricaceae
Thymelaeaceae
Urticaceae
Vitaceae
Zygophyllaceae

Corolla irregular

Euphorbiaceae
Fabaceae
Geraniaceae
Gunneraceae
Loranthaceae
Melianthaceae
Polygalaceae
Resedaceae
Tropaeolaceae

Petals fused

Corolla regular

Acanthaceae
Achariaceae
Apocynaceae
Aquifoliaceae
Asteraceae
Boraginaceae
Cannabaceae
Ceratophyllaceae
Convolvulaceae
Crassulaceae
Cucurbitaceae
Ebenaceae
Ericaceae
Gentianaceae
Myrsinaceae
Nyctaginaceae
Oleaceae
Plantaginaceae
Plumbaginaceae
Polygonaceae
Primulaceae
Rubiaceae
Scrophulariaceae
Solanaceae
Stilbaceae
Ulmaceae

Corolla irregular

Acanthaceae
Balsaminaceae
Bignoniaceae
Gesneriaceae
Lamiaceae
Lentibulariaceae
Linderniaceae
Lobeliaceae
Orobanchaceae
Pedaliaceae
Scrophulariaceae
Verbenaceae



**Figure 23.** *Gnidia polycephala* (Thymelaeaceae).

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**Figure 24.** *Moraea pallida* (Iridaceae).



# PLANTS OF THE FREE STATE

## Bryophytes

Compiled by J. van Rooy, E. Retief & N.L. Meyer

Mosses (Bryophyta), liverworts (Marchantiophyta) and hornworts (Anthocerotophyta), collectively known as bryophytes (Bryobiotina), are generally identified by microscopic characters. For general introductions to southern African bryophytes, and how to study and identify plants in this group, see Magill (1981), Van Rooy (1997a–2001b) and Perold (1999). Taxonomy and nomenclature of the mosses mostly after Van Rooy (2006) and English names after Edwards (1997).

### Key to the main groups of Bryophytes

[after Damsholt: 17 (2002); Gradstein & da Costa: 2 (2003)]

1a Plants without leaves (thallose); each cell with 1–4 large chloroplasts, each with or without a pyrenoid; sporophyte with a basal meristem; capsule cylindrical to long filiform. . . . . **Anthocerotophyta** (p. 108)

1b Plants with or without leaves; each cell usually with many chloroplasts, without pyrenoids; sporophyte without a basal meristem, growing by an apical cell; capsule rounded to cylindrical . . . . . 2

2a Plants with leaves spirally arranged, rarely in 2 or 3 rows; rhizoids multicellular; oil bodies absent; capsule usually with columella, stomata and peristome; elaters absent. . . . . **Bryophyta**

2b Plants with leaves in 2 or 3 rows or thallose; rhizoids unicellular; oil bodies usually present; capsule without columella, stomata and peristome; elaters present . . . . . **Marchantiophyta** (p. 89)

## Bryophyta

### Key to families of Bryophyta

A key to the families of mosses (Bryophyta) in sub-Saharan Africa is available on the Guide to bryophytes of sub-Saharan Africa (*GBA online*); website http://www.dulwichrunners.org.uk/gba/ (O'Shea *et al*., no date).

# AMBLYSTEGIACEAE

Plants forming loose to dense mats or ascending tufts, semi-aquatic or aquatic. **Stems** creeping, decumbent or ascending, irregular to subpinnately branched; central strand usually present; pseudoparaphyllia filamentous or foliose. **Leaves** imbricate to somewhat distant, often subjulaceous or falcate-secund; lanceolate, ovate or oblong, rarely plicate; apex short to long acuminate, base often decurrent; margins mostly plane, entire to weakly serrulate, usually elimbate; costa single and percurrent, or short and forked, or absent; cells rhombic to fusiform, or linear, mostly thin-walled, smooth; alar region often differentiated, cells either inflated and oblong with thin walls or cells few, quadrate and thick-walled. **Autoicous** or **dioicous**. **Capsules** long exserted, mostly horizontal, urn cylindrical, strongly curved; annulus differentiated; operculum conic; peristome double, exostome teeth 16; endostome basal membrane high, segments 16, cilia present; calyptra cucullate, naked and smooth. **Spores** round, smooth to finely papillose.

[after Sharp *et al*.: 886 (1994); Gradstein *et al*.: 250 (2001); Chuah-Petiot: 129 (2003)]

## Key to genera

Leaves strongly falcate-secund to circinate, strongly plicate . . . . . .**Sanionia**
Leaves straight to slightly falcate, smooth to weakly plicate . . . . . **Leptodictyum**

## **Leptodictyum** (Schimp.) Warnst. (sthn Afr.: 1 sp.)

**riparium** (Hedw.) Warnst.
*Hypnum riparium* Hedw.

Plants small to large, soft to flaccid, in dull or lustrous, yellow-green mats. **Stems** creeping or floating, up to 100 mm long. **Leaves** soft, wide spreading and distantly spaced; ovate to narrowly oblong-ovate, up to 5 mm long; apex long-acuminate; costa single, slender, extending ± ⅔ of leaf. **Upper laminal cells** long-hexagonal to linear, smooth; basal cells broadly rectangular, lax, larger at insertion. **Perichaetia** conspicuous, leaves oblong-ovate. **Capsule** suberect to horizontal, arcuate, cylindric. Typically semi-aquatic with flaccid plants and wide-spreading, distantly spaced, straight leaves with costae extending ± ⅔ of leaf, long upper laminal cells, and broad, lax basal cells. On soil, rock or decaying bark. *Drepanocladus sparsus* Müll.Hal. is probably synonymous with this species (O'Shea 2006) and included here. *Kneiff's feather-moss*.

MsGr

## **Sanionia** Loeske (sthn Afr.: 1 sp.)

**uncinata** (Hedw.) Loeske
*Drepanocladus uncinatus* (Hedw.) Warnst.
*Hypnum uncinatum* Hedw.

Plants medium-sized to large, yellowish green. **Stems** creeping or erect-ascending, up to 200 mm long; pseudoparaphyllia broad; axillary hairs 1–7-celled. **Leaves** falcate-secund to circinate, plicate; long subulate from narrowly ovate base, up to 3 mm long; apex long-acuminate; margins finely denticulate above; costa ending in acumen. **Upper laminal cells** linear; alar cells inflated, hyaline, thin-walled. **Perichaetial leaves** narrowing gradually to very

long-acuminate apex. **Capsule** inclined, curved. Easily recognised by its plicate, strongly falcate-secund to circinate leaves that taper to a long and narrow acumen. On wet soil, soil over rock or logs at high altitudes. *Sickle-leaved hook-moss*.

MsGr

# ANDREAEACEAE

Plants small to large, forming patches or cushions, red-brown to green-black; saxicolous, rarely semi-aquatic. **Stems** slender, generally erect; central strand absent, cortical cells weakly incrassate. **Leaves** appressed when dry, spreading to squarrose when wet; ovate to elliptical, occasionally constricted above base; apex obtuse to subulate; costa present or absent; in section, cells not strongly differentiated; lamina cells small, quadrate to rectangular, incrassate, dorsal surface occasionally papillose. **Monoicous** or **dioicous**. **Perigonia** on short lateral branches, gemmate. **Perichaetia** terminal; leaves larger, convolute; seta absent, sporophyte elevated at maturity by pseudopodia. **Capsules** elliptical to ovate-oblong, lacking peristome and operculum, dehiscing through 4–8 longitudinal valves. **Spores** round, yellowish. *Rock-mosses*.

[after Magill: 33 (1981)]

## **Andreaea** Hedw. (sthn Afr.: 6 spp.)

### **rupestris** Hedw.

Plants small, red-brown, forming cushions. **Stems** 5–20 mm long, irregularly branched. **Leaves** ovate to oblong-lanceolate; apex acute to obtuse; margins entire, incurved; costa absent. **Upper laminal cells** quadrate, incrassate, smooth to strongly papillose; basal cells linear to rectangular. **Capsule** just exserted, pseudopodia 1–2 mm long. **Spores** weakly papillose. Growing on bare rock at high altitude. *A. rupestris* is most easily identified by its red-brown colour, ecostate leaves and frequently papillose leaf cells. *Black rock-moss*.

MsGr

# ARCHIDIACEAE

Plants small, yellow to yellow-green; terricolous. **Stems** mostly erect, often stoloniferous, central strand present. **Leaves** frequently reduced to bracts below, innovation leaves smaller. **Autoicous**. **Perigonia** gemmate, terminal on short lateral branches or axillary on stem. **Perichaetia** gemmate, usually terminal; leaves frequently concave, elliptic or oblong to ovate or lanceolate, apex apiculate, acute, acuminate or subulate; margins plane to recurved, entire, serrulate, irregularly crenulate or papillose-denticulate; costa in section circular or crescent-shaped; laminal cells uniform or irregular in shape; basal cells rectangular, thin-walled, larger, hyaline. **Capsules** subsessile, cleistocarpic, globose; wall single-layered, undifferentiated, semi-transparent, yellowish, with brownish spots when mature; calyptra inconspicuous. **Spores** large, > 50 µm, rounded

to polyhedral, thick-walled, smooth to densely papillose, pale yellow to brown. Plants colonise soil of open sites and are recognised by the globose, cleistocarpic, subsessile capsules with massive spores, surrounded by large perichaetial leaves.

[after Magill: 71 (1981)]

## **Archidium** Brid. (sthn Afr.: 11 spp.)

### Key to species:

Costa in section semi-circular or crescent-shaped; perichaetial leaf margins irregularly crenulate, cells 20–45 µm long . . . . . **A. capense**
Costa in section circular; perichaetial leaf margins entire to serrulate above, cells 37–95 µm long . . . . . **A. ohioense**

### **capense** Hornsch.

Plants loosely caespitose, yellow-green. **Stems** 1–4 mm long. **Perichaetial leaves** erect to erect-spreading; ovate to oblong-ovate, 0.8–1.7 mm long; margins irregularly crenulate; costa excurrent as hair-point. **Laminal cells** irregular, rhomboidal to fusiform, 20–45 µm long; basal cells irregularly rectangular. **Spores** 8–40 per capsule, smooth, pale yellow to yellow-orange. On soil. *Cape clay-moss*.




### **ohioense** Schimp. ex Müll.Hal.

Plants forming loose turfs, yellow-green. **Stems** 2–15 mm long. **Perichaetial leaves** erect; ovate, oblong-ovate or lanceolate, 0.7–1.8 mm long; margins entire to serrulate above; costa percurrent to excurrent as hair-point. **Laminal cells** rhomboidal to fusiform, 37–95 µm long; basal cells rhomboidal to rectangular. **Spores** 8–60 per capsule, smooth to granulose, yellow. On soil. *Ohio clay-moss*.




# BARTRAMIACEAE

Plants small to large, occasionally robust, caespitose; terricolous or saxicolous. **Stem** erect, central strand present. **Leaves** lanceolate to ovate, lamina infrequently bistratose; apex acuminate to subulate, or acute to rounded; base scarcely or strongly differentiated with lamina reflexed above; margins plane to recurved, entire to crenulate or serrate, frequently doubly so; costa mostly percurrent to short-excurrent; laminal cells isodiametric, quadrate to linear, incrassate, papillose or prorate; basal cells rectangular or quadrate, thin-walled, generally smooth. **Autoicous** or **dioicous**. **Perichaetia** terminal, frequently overgrown by subperichaetial branches. **Capsules** erect to inclined or horizontal, subglobose, smooth or rarely with wart-like projections, rugulose to furrowed or sulcate when dry; peristome absent, single or double, endostome with segments and cilia or frequently rudimentary; operculum convex to conic or rostrate; calyptra cucullate, quickly lost. **Spores** reniform or rounded, papillose or warty. *Apple-mosses*.

[after Magill: 407 (1987)]

## Key to genera

1a Leaves bistratose above . . . . . 2
1b Leaves unistratose . . . . . 3
2a Leaf base highly differentiated; margins serrate to denticulate . . . **Bartramia**
2b Leaf base not differentiated; margins denticulate to doubly denticulate in subula . . . . . **Anacolia**
3a Leaves generally < 2 mm long, frequently with distinct border of elongated cells, not plicate . . . . . **Philonotis**
3b Leaves generally > 2 mm long, without distinct border, frequently plicate . . . . . **Breutelia**

## **Anacolia** Schimp. (sthn Afr.: 1 sp.)

### **breutelii** (Schimp. ex Müll.Hal.) Magill var. **breutelii**

*Bartramia breutelii* Schimp. ex Müll.Hal.

Plants medium-sized, loosely caespitose. **Stems** 10–30 mm long. **Leaves** closely set, erect to appressed when dry, linear-lanceolate, 2–4 mm long, bistratose above; apex subulate; margins reflexed to recurved, doubly denticulate in subula; costa short-excurrent as denticulate awn. **Upper laminal cells** rectangular, prorate; basal cells long-rectangular; alar cells weakly differentiated. **Capsule** inclined, subglobose; peristome double, exostome teeth 16, endostome rudimentary. **Spores** warty. On rock or soil over rock at higher elevations. *Breutel's apple-moss*.




## **Bartramia** Hedw. (sthn Afr.: 5 spp.)

### **hampeana** Müll.Hal.

Plants loosely caespitose, yellow-green to glaucous green. **Stems** 3–60 mm long, weakly fluted. **Leaves** compact and appressed when dry, linear above oblong to obovate base, up to 5 mm long, bistratose above; apex subulate, frequently fragile; margins serrate to denticulate, unistratose; costa percurrent to short excurrent as serrate awn. **Upper laminal cells** rectangular, sharply prorate; basal cells highly differentiated, long-rectangular. **Capsule** suberect to inclined, subglobose, sulcate when dry; peristome absent. **Spores** subround, warty. On soil or rock. *Hampe's apple-moss*.




## **Breutelia** (Bruch & Schimp.) Schimp. (sthn Afr.: 5 spp.)

### Key to species:

Leaves rigidly erect-appressed when dry; alar cells many, quadrate to short-rectangular . . . . . **B. substricta**
Leaves patent to recurved when dry; alar cells weakly differentiated . . . . . **B. microdonta**

### **microdonta** (Mitt.) Broth.

*B. angustifolia* Rehmann ex Sim

Plants medium-sized, loosely caespitose. **Stems** 10–50 mm long, fluted. **Leaves** patent to recurved, long-acuminate to subulate above oval base, 2–3 mm long, weakly plicate; margins

serrate above; costa excurrent as denticulate awn. **Upper laminal cells** long-rectangular, smooth to prorate or papillose at proximal end; basal and alar cells weakly differentiated. **Capsule** globose, rugose when dry; peristome double, fragile, endostome rudimentary. **Spores** warty. On soil.

MsGr

**substricta** (Schimp.) Magill
*Bartramia substricta* Schimp.

Plants medium-sized to large, loosely caespitose. **Stems** 20–50 mm long, occasionally with reddish tomentum below, fluted. **Leaves** rigidly erect-appressed when dry, ovate to oval-lanceolate, 2–3 mm long, plicate below; apex acuminate; margins recurved to revolute, serrulate to serrate above; costa short-excurrent as denticulate awn. **Upper laminal cells** long-rectangular, prorate or papillose; alar cells in large, distinct group, thickened. **Capsule** ellipsoidal, striate; peristome double, exostome teeth 16, endostome rudimentary. **Spores** with large wart-like plates. On soil in rock crevices and ledges of seepage areas.

MsGr

## **Philonotis** Brid. (sthn Afr.: 9 spp.)

### Key to species:

1a Capsules erect, little altered when dry, gymnostomous, mouth small; costa percurrent to short-excurrent . . . . . **P. globosa**
1b Capsules horizontal to suberect, striate to sulcate when dry, peristome present, mouth wide; costa ending below apex to percurrent or short-excurrent . . . . . 2
2a Leaves keeled, cells distinctly prorate . . . . . **P. falcata**
2b Leaves not keeled, cells smooth or weakly prorate . . . . . 3
3a Costa short-excurrent as serrate awn; leaf apex acuminate; margins serrate to doubly serrate . . . . . **P. dregeana**
3b Costa ending below apex to percurrent; leaf apex acute to acuminate; margins coarsely crenulate by projecting cell ends . . . . . **P. hastata**

**dregeana** (Müll.Hal.) A.Jaeger
*Bartramia dregeana* Müll.Hal.

Plants caespitose. **Stems** 5–50 mm long, central strand small. **Leaves** appressed or reflexed when dry, ovate-lanceolate, 0.5–1.5 mm long; apex acuminate; margins serrate to doubly serrate; costa short excurrent as serrate awn. **Upper laminal cells** narrowly rectangular, incrassate, smooth to weakly prorate; basal cells quadrate to short-rectangular, forming distinct group. **Capsule** inclined, globose to ovoid, sulcate when dry; peristome double, exostome teeth 16, endostome variable and fragile, segments alternating with teeth, cilia single. **Spores** subround, strongly papillose. On soil or rock. *Drege's apple-moss*.

DrGr MsGr Zastr

**falcata** (Hook.) Mitt.
*Bartramia falcata* Hook.

Plants caespitose. **Stems** 20–80 mm long, tomentose below, in section with large central strand. **Leaves** contorted when dry, keeled, ovate-acuminate, 1.0–1.5 mm long; margins plane, serrate above; costa short-excurrent. **Upper laminal cells** rectangular, prorate at proximal

ends; basal cells rectangular, prorate. **Capsule** inclined to suberect, globose to ovoid, weakly striate; peristome double, exostome teeth 16, fragile, endostome segments perforated, cilia 2 or 3. **Spores** subround, papillose. On soil or rock.

DrGr MsGr

**globosa** (Müll.Hal.) D.G.Griffin & W.R.Buck
*Bartramia globosa* Müll.Hal.
*Bartramidula globosa* (Müll.Hal.) Broth.

Plants small, caespitose or forming turfs. **Stems** 2–10 mm long, fluted. **Leaves** tall, appressed to erect when dry, narrowly lanceolate, 0.8–1.4 mm long; apex acuminate; margins plane to weakly reflexed, sharply serrate above; costa percurrent or shortly excurrent as serrate awn. **Upper laminal cells** linear-rectangular, incrassate, distinctly prorate; basal cells rectangular, in distinct group. **Capsule** erect, globose; peristome absent, with fringe at mouth. **Spores** subround to reniform, weakly papillose. On soil or rock.

MsGr

**hastata** (Duby) Wijk & Margad.
*Hypnum hastatum* Duby

Plants small, loosely caespitose. **Stems** 10–30 mm long. **Leaves** appressed when dry, ovate-lanceolate to ovate-acute, 0.4–1.2 mm long; apex mostly acute; margins coarsely crenulate by projecting cells ends; costa ending below to percurrent. **Upper laminal cells** ± rectangular, smooth or weakly prorate-papillose; basal cells short-rectangular. **Capsules** rare, horizontal, globose. On wet soil or rock. *Spear-leaved apple-moss*.

MsGr Zastr

# BRACHYTHECIACEAE

Plants medium-sized to large, forming shiny mats or wefts. **Stems** creeping, irregularly pinnately branched; central strand often present; pseudoparaphyllia foliose. **Leaves** ovate, ovate- to oblong-lanceolate, often plicate; apex acute to acuminate; base often decurrent; margins plane or reflexed, serrulate or denticulate; costa single, to midleaf or above; upper cells smooth, mostly fusiform to linear or vermicular; alar region weakly differentiated. **Dioicous**, autoicous or rarely synoicous. **Perichaetia** lateral, leaves differentiated. **Seta** smooth or papillose. **Capsules** exserted, inclined to horizontal, occasionally erect, short, ovoid-cylindrical, curved; operculum conic to conic-rostrate; peristome double, exostome teeth 16; endostome basal membrane high, segments usually 16, keeled and perforate, cilia 1–4; calyptra cucullate, naked and smooth, rarely roughened. **Spores** round, usually papillose.

[after Buck: 240 (1998) and Gradstein *et al*.: 272 (2001)]

## **Brachythecium** Schimp. (sthn Afr.: 8 spp.)

**ruderale** (Brid.) W.R.Buck
*B. implicatum* (Hornsch. ex Müll.Hal.) A.Jaeger
*Hypnum ruderale* Brid.

Plants ± lustrous, soft, slender, in dense mats. **Stems** irregularly to subpinnately branched, 25–75 mm long; pseudoparaphyllia foliose. **Leaves** crowded, erect to erect-spreading when dry, concave, plicate; narrowly ovate-lanceolate, gradually narrowed into long acumen; margins entire to denticulate; costa ending at or above mid-leaf. **Upper laminal cells** linear; alar cells quadrate to short-rectangular. **Capsule** inclined to horizontal, curved, cylindric; peristome double. Recognised by the slender, shiny, yellowish green plants and leaves with long slender acumina and a median fold often obscuring the costa. On soil. *B. subrutabulum* (Müll.Hal.) A.Jaeger, also reported from the Free State, is probably synonymous with this species and treated here.

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|

# BRUCHIACEAE

Plants minute to medium, gregarious or in loose tufts; terricolous. **Stems** erect; central strand present. **Leaves** patent, ovate to oblong, acuminate to subulate or appressed, oval with broadly rounded apices; margins entire to serrate above; costa strong or weak, narrow, flattened; in section with or without stereid or substereid bands; laminal cells quadrate to rectangular, smooth or prorate; basal cells rectangular; alar cells not differentiated. **Perichaetia** terminal; leaves erect, occasionally distinct from vegetative leaves. **Capsule** stegocarpic or cleistocarpic, immersed to exserted, with well-developed neck; peristome absent, rudimentary or well developed; teeth with vertical bars below, perforated or cleft to below middle; operculum rostrate; calyptra cucullate or mitriform. **Spores** large, papillose to spinose.

[after Magill: 106 (1981)]

### Key to genera

Stem julaceous; leaves imbricate; oval; perichaetia lateral; capsule immersed; calyptra mitriform . . . . . **Cladophascum**
Stem not julaceous; leaves spreading, erect, flexuose or contorted; subulate above oblong to oval base; perichaetia terminal; capsule long exserted; calyptra cucullate . . . . . **Trematodon**

## **Cladophascum** Dixon (sthn Afr.: 1 sp.)

**gymnomitrioides** (Dixon) Dixon
*Aongstroemia gymnomitrioides* Dixon

Plants small, in loose tufts. **Stems** julaceous, up to 10 mm long. **Leaves** imbricate, concave, semi-circular to oval, 0.2–0.4 mm long; apex broadly obtuse to rounded; base clasping; costa weak to above midleaf. **Upper laminal cells** smooth, quadrate to angular, strongly incrassate;

border 2 or 3 cells wide around apex; basal cells larger. **Perichaetia** lateral through innovation. **Capsule** stegocarpous, immersed; peristome absent; calyptra mitriform. **Spores** subreniform, lightly papillose. On soil.

DrGr MsGr Zastr

## **Trematodon** Michx. (sthn Afr.: 6 spp.)

### Key to species:

1a Peristome absent or rudimentary . . . . . 2
1b Peristome well developed . . . . . 3
2a Upper leaves subulate; apex acute; marginal cells narrowly rectangular, 7–10 µm wide; peristome rudimentary . . . . . **T. intermedius**
2b Upper leaves lingulate; apex obtuse; marginal cells bulging rectangular, 15–18 µm wide; peristome absent. . . . . **T. paradoxus**
3a Leaves lanceolate to ligulate, obtuse; capsule neck shorter than urn . . . . . **T. mayottensis**
3b Leaves oblong to oval, abruptly subulate; capsule neck twice as long as urn . . . . . **T. longicollis**

### **intermedius** Welw. & Duby

Plants small, gregarious. **Stems** 1–2 mm long. **Leaves** flexuose to erect, oval to oblong, subulate, 1.5–3.0 mm long; apex acute, bluntly toothed; margins bistratose above; costa percurrent to short-excurrent. **Laminal cells** rectangular; basal cells lax. **Capsule** erect, urn short-cylindrical, neck strumose; peristome consisting of a short basal membrane. **Spores** papillose. On soil.

DrGr MsGr

### **longicollis** Michx.

Plants small to medium-sized, gregarious or in loose tufts. **Stems** 1–7 mm long. **Leaves** contorted above erect base when dry, oval to oblong, abruptly subulate, 2–4 mm long; apex bluntly acute; base sheathing; margins bistratose in subula; costa subpercurrent. **Laminal cells** short-rectangular to quadrate; basal cells large, lax. **Capsule** erect, urn cylindrical, neck twice as long, strumose; peristome reddish, teeth lanceolate, fringe present between teeth. **Spores** papillose. On soil. *Long-necked moss*.

MsGr

### **mayottensis** Besch.

Plants small, gregarious or in loose tufts. **Stems** 1–3 mm long. **Leaves** contorted when dry, erect-spreading when wet, narrowly ovate to ovate-ligulate, 1.0–1.6 mm long; apex obtuse to rounded; margins entire to crenulate above, bistratose; costa subpercurrent. **Laminal cells** short-rectangular to quadrate; basal cells larger, lax. **Capsule** erect, urn short-cylindrical, neck strumose at base; peristome reddish yellow, teeth triangular, apical segments free. **Spores** subreniform, papillose. On soil. *Mayotte long-necked moss*.

MsGr

**paradoxus** Hornsch.

Plants very small, in scattered groups. **Stems** 1–2 mm long. **Leaves** erect to erect-spreading, oval to oblong, abruptly linear, 1.5–2.0 mm long; apex obtuse to acute; margins entire, unistratose; costa subpercurrent. **Laminal cells** bulging, rectangular; basal cells lax. **Capsule** erect, neck strumose; peristome absent. **Spores** round, coarsely papillose. On soil.

MsGr

# BRYACEAE

Plants small to robust, generally yellow to dark green or reddish; terricolous, saxicolous, corticolous or humicolous. **Stems** erect, connected by stolons in some species; in section with central strand. **Leaves** variable in size and shape, spirally arranged, equidistant to rosulate above, mostly smaller below, straight or variously twisted when dry; margins plane to recurved, entire to dentate above, limbate or not; costa ending below apex to excurrent as awn; laminal cells mostly rhomboidal, smooth; basal cells quadrate to rectangular. **Propagules** produced in some. **Autoicous, dioicous** or **synoicous**. **Perichaetia** terminal or lateral through innovations. **Capsules** inclined to pendulous, generally pyriform, neck differentiated; peristome double or rarely single, exostome teeth 16, endostome segments alternating with teeth, cilia present or absent; operculum conic-apiculate or rostellate; calyptra cucullate, smooth. **Spores** round, smooth to papillose. *Thread-mosses*.

[after Magill: 335 (1987)]

## Key to genera

1a Plants large to robust, solitary to gregarious; stems erect from subterranean stolons; leaves rosulate, reduced below; frequently polysetous; on forest floor . . . . . **Rhodobryum**

1b Plants small to large, loosely caespitose to caespitose; stems erect, stolons absent; leaves equidistant to larger above, frequently comose or rosulate; in grassland or forest . . . . . 2

2a Leaf cells abruptly shorter and wider in base; capsule inclined to horizontal, mouth small; endostome incomplete . . . . . **Brachymenium**

2b Leaf cells gradually differentiated towards base; capsule inclined to pendulous, mouth wide; endostome rarely incomplete . . . . . 3

3a Stems julaceous; leaves imbricate, equidistant; upper laminal cells frequently linear-rhomboidal to vermicular . . . . . **Anomobryum**

3b Stems rarely julaceous; leaves imbricate or appressed but mostly erect to variously twisted when dry and erect-spreading to squarrose when wet; equidistant to comose or rosulate; upper laminal cells rhomboidal. . .**Bryum**

## **Anomobryum** Schimp. (sthn Afr.: 2 spp.)

### Key to species:

Costa ending below apex; margins denticulate above; upper laminal cells linear-rhomboidal to vermicular, 50–140 $\mu$m long; endostome cilia 2 or 3 . . . . . .**A. julaceum**

Costa percurrent; margins entire; upper laminal cells rhomboidal, occasionally vermicular, 35–63(–85) µm long; endostome cilia rudimentary. . . . . .
. . . . . **A. drakensbergense**

### **drakensbergense** Van Rooy

Plants small to medium-sized, caespitose. **Stems** up to 20 mm long. **Leaves** imbricate, frequently concave, shortly oblong-acute or ovate to narrowly ovate, 0.5–1.5 mm long; apex acute; margins, entire; border absent; costa percurrent to mucronate. **Upper laminal cells** rhomboidal, incrassate. **Capsule** inclined to horizontal, pyriform; peristome teeth irregular in outline, endostome segments broadly perforated, cilia rudimentary. On soil in rock crevices at high altitudes. *Drakensberg silver-moss*.




### **julaceum** (Schrad. ex P.Gaertn., B.Mey. & Scherb.) Schimp.

*Bryum julaceum* Schrad. ex P.Gaertn., B.Mey. & Scherb.

Plants small to medium-sized, shiny, caespitose. **Stems** up to 37 mm long, julaceous. **Leaves** imbricate, concave, ovate or oblong-acute, 0.5–1.6 mm long; apex acute to obtuse; margins denticulate above; costa ending below apex. **Upper laminal cells** linear-rhomboidal or vermicular, incrassate. **Capsule** inclined to pendulous, pyriform, neck wrinkled when dry; peristome teeth trabeculate, endostome segments broadly perforated, cilia 2 or 3. On soil, sand or rock at high altitudes. *Slender silver-moss*.




## **Brachymenium** Schwägr. (sthn Afr.: 7 spp.)

### **acuminatum** Harv.

Plants in loose turfs, yellowish green, glossy. **Stems** 2–10 mm long. **Leaves** erect-appressed, concave, ovate to ovate-acuminate, 0.5–0.8 mm long; margins entire; costa short-excurrent. **Upper laminal cells** fusiform to linear-rhomboidal; basal cells distinct, quadrate to short-rectangular. **Capsule** inclined to horizontal, clavate to cylindrical-pyriform; endostome segments rudimentary. Recognised by the light green, glossy plants with concave leaves, lax, elongate upper laminal cells and strongly differentiated basal cells. On soil or rock.




## **Bryum** Hedw. (sthn Afr.: 22 spp.)

### Key to species:

1a Leaf border absent or laminal cells gradually narrowed towards margins. . 2
1b Leaf border 1–6 cells wide, occasionally weak . . . . . 7
2a Plants whitish or silvery green; upper laminal cells hyaline . . . **B. argenteum**
2b Plants variously green; upper laminal cells chlorophyllose . . . . . 3
3a Costa aristate, awn smooth to denticulate above . . . . . 4
3b Costa ending below apex, percurrent, mucronate or short excurrent . . . . . 5
4a Leaves small, 0.3–1.2 mm long, ovate to narrowly ovate; capsule ovoid, short and thick with rounded neck . . . . . **B. dichotomum**

4b Leaves large, 1.7–6.0 mm long, broadly ovate to oblong or obovate; capsule oblong-cylindrical or narrowly pyriform . . . . . **B. canariense**
5a Leaf cells incrassate; margins plane to revolute; costa strong . . . .**B alpinum**
5b Leaf cells lax or thin-walled; margins plane; costa weak. . . . . 6
6a Leaves crowded above to comose, narrowly oblong-ovate; axillary tubers present . . . . . **B. apiculatum**
6b Leaves equidistant, orbicular or ovate to oblong; axillary tubers absent. . . . . **B. cellulare**
7a Leaves frequently decurrent . . . . . **B. pseudotriquetrum**
7b Leaves not or weakly decurrent . . . . . 8
8a Leaves spirally twisted around stem when dry; tubers frequently present . 9
8b Leaves erect or variously twisted (not spirally around stem) when dry; tubers occasionally present . . . . . 10
9a Leaf border inconspicuous, 1 or 2(3) cells wide; tubers brown **B. capillare**
9b Leaf border conspicuous, 2 or 3 cells wide; tubers brown . . **B. torquescens**
10a Leaf margins strongly dentate to spinose above; border inconspicuous; filamentous gemmae present on leaf lamina . . . . . **B. aubertii**
10b Leaf margins denticulate to dentate above; border inconspicuous or conspicuous; filamentous gemmae absent or present in leaf axils . . . . . .11
11a Leaf border indistinct; margins plane or narrowly recurved below; capsule shortly pyriform, contracted below mouth when dry. . . . . **B turbinatum**
11b Leaf border distinct; margins recurved to revolute below; capsule pyriform, not or slightly contracted below mouth when dry . . . . . 12
12a Filamentous gemmae frequently present in leaf axils; costa in section subround to round, dorsal stereid band well defined . . . . . **B. andicola**
12b Filamentous gemmae absent; costa in section subrectangular, dorsal substereids present . . . . . .**B. pycnophyllum**

## **alpinum** Huds. ex With.

Plants medium-sized to large, frequently reddish green, shiny. **Stems** 5–55 mm long. **Leaves** crowded, appressed to erect when dry, generally narrowly ovate, frequently concave, 1–3 mm long; apex mostly acuminate; margins plane to revolute, crenulate to denticulate above; border absent; costa ending below to short-excurrent. **Upper laminal cells** generally linear-rhomboidal, incrassate. **Capsule** pendulous, red to reddish brown. On soil or rock of seepage areas at high altitude. *Alpine thread-moss*.




## **andicola** Hook.

Plants medium-sized to large. **Stems** 3–30 mm long. **Leaves** frequently in successive comal tufts, larger above, twisted when dry, rosulate when wet; elliptical, oblong or spathulate, up to 4 mm long; apex acute to obtuse; margins serrate above; border 2–6 cells wide; costa mucronate to short-excurrent. **Upper laminal cells** short-rhomboidal, frequently pitted; basal cells frequently reddish. **Gemmae** filamentous; tubers rhizoidal. **Capsule** rare, horizontal. On soil or bark in wooded areas.




## **apiculatum** Schwägr.

*B. nitens* Hook.

Plants medium-sized, caespitose. **Stems** 5–35 mm long. **Leaves** crowded above to comose, concave, erect to erect-spreading when dry; narrowly oblong-ovate, 1.2–2.2 mm long; apex acuminate; margins entire to denticulate at apex; border absent; costa weak, mucronate.

**Upper laminal cells** rhomboidal, thin-walled; basal cells abruptly broader below. **Tubers** axillary and rhizoidal, with protuberant cells, reddish brown. **Sporophytes** not known in area. On wet streambanks and concrete dam walls.

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## **argenteum** Hedw.

Plants small to medium-sized, forming turfs or cushions, whitish or silvery green. **Stems** julaceous, 1–25 mm long. **Leaves** crowded, imbricate, concave; broadly ovate to oblong, 0.5–1.5 mm long; apex hyaline, apiculate; margins entire; border absent; costa ending below to aristate, weak. **Upper laminal cells** hyaline, rhomboidal, basal cells frequently reddish, quadrate to rectangular, extending up margins. **Capsule** pendulous, ovoid or pyriform, neck short, wrinkled when dry. On soil, rock or artificial substrates in exposed and disturbed areas. *Silver-moss*.

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## **aubertii** (Schwägr.) Brid.

*Mnium aubertii* Schwägr.

Plants large to robust, loosely caespitose. **Stems** 5–60 mm long. **Leaves** frequently in successive comal tufts, twisted when dry; elliptical or oblong-spathulate, 3–6 mm long; apex acute to acuminate; margins denticulate to spinose above; border 1–4 cells wide, inconspicuous; costa short-excurrent. **Upper laminal cells** rhomboidal, frequently pitted. **Filamentous gemmae** frequently produced on leaf laminae. **Sporophytes** not known in area. On soil, soil over rock, or humus in wooded areas. *Aubert's thread-moss*.

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## **canariense** Brid.

Plants medium-sized to large, caespitose. **Stems** 3–22 mm long. **Leaves** frequently in successive comal tufts, distant and reduced below, appressed to erect or twisted when dry; broadly ovate to oblong or obovate, up to 6 mm long; apex acute to obtuse; margins entire to crenulate or denticulate above; border absent or indistinct; costa aristate. **Upper laminal cells** rhomboidal, incrassate, gradually narrowed towards margins. **Capsule** pendulous. On soil or rock. *Canary thread-moss*.

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## **capillare** Hedw.

Plants small to medium-sized. **Stems** 1–15 mm long. **Leaves** larger above, spirally twisted around stem when dry; ovate to oblong, 0.8–1.6 mm long; apex acute to obtuse; margins entire to denticulate above; border inconspicuous, cells in 1–3 rows; costa cuspidate to aristate. **Upper laminal cells** rhomboidal, thin-walled. **Tubers** rhizoidal, yellowish brown. **Capsule** pendulous, contracted below mouth when dry. On soil or rock in drier areas. *Capillary thread-moss*.

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## **cellulare** Hook.

Plants small, reddish green, shiny. **Stems** 3–20 mm long. **Leaves** erect when dry, concave; orbicular or ovate to oblong, 0.2–1.0 mm long; apex acute to rounded; border generally absent; costa weak, ending well below to percurrent. **Upper laminal cells** lax, rhomboidal to

subrectangular. **Tubers** rhizoidal, reddish brown. **Capsule** inclined to horizontal; endostome with cilia absent and basal membrane low. On wet rock or soil.

MsGr | Zastr

**dichotomum** Hedw.

*B. bicolor* Dicks.

Plants small, caespitose, yellowish green. **Stems** 3–15 mm long. **Leaves** comose, erect to erect spreading when dry; ovate to narrowly ovate, 0.3–1.2 mm long; apex acuminate; margins entire to denticulate above; border absent; costa strongly aristate, awn smooth to denticulate. **Upper laminal cells** thin-walled to incrassate. **Propagules** bud-like, axillary. **Capsule** horizontal to pendulous, ovoid or shortly oblong-cylindrical, neck short, wrinkled when dry. On soil, often in exposed, disturbed places. *Bicoloured bryum*.

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**pseudotriquetrum** (Hedw.) P.Gaertn., B.Mey. & Scherb.

*Mnium pseudotriquetrum* Hedw.

Plants medium-sized to large, caespitose. **Stems** 3–42 mm long, densely tomentose below. **Leaves** crowded above, twisted to spirally twisted around stem when dry; narrowly ovate, up to 4.2 mm long; apex acuminate; margins decurrent, frequently red, denticulate at apex; border strong, cells in 2–8 rows; costa percurrent to short-excurrent. **Upper laminal cells** short-rhomboidal, pitted. **Capsule** pendulous. On soil or rock at higher altitudes. *Marsh bryum*.

MsGr

**pycnophyllum** (Dixon) Mohamed

*B. truncorum* var. *pycnophyllum* Dixon

Plants medium-sized to robust, caespitose. **Stems** 5–45 mm long, densely tomentose below. **Leaves** in successive comal tufts or evenly spaced, larger above, twisted when dry; elliptical to obovate, up to 6 mm long; apex acute; margins denticulate to dentate above; border 2–5 cells wide; costa aristate, awn denticulate to dentate above. **Upper laminal cells** short-rhomboidal, narrower towards border, incrassate, pitted. **Capsule** horizontal, straight to curved. On soil, soil over rock or humus in partial shade.

DrGr | MsGr | KarSh | Zastr

**torquescens** Bruch ex De Not.

Plants medium-sized, caespitose. **Stems** 1–20 mm long, tomentose below. **Leaves** crowded above to comose, twisted to spirally twisted around stem when dry; elliptical to oblong-spathulate, 1.5–3.5 mm long; apex acute to acuminate; margins denticulate above; border 1–3 cells wide, incrassate; costa mucronate to aristate, awn denticulate above, reddish. **Upper laminal cells** rhomboidal. **Tubers** rhizoidal, red. **Capsule** cernuous to pendulous, red or reddish brown. On soil, rock, or rarely on bark. *Twisting thread-moss*.

MsGr | KarSh

**turbinatum** (Hedw.) Turner

*Mnium turbinatum* Hedw.

Plants medium-sized, caespitose. **Stems** 4–45 mm long, tomentose below. **Leaves** crowded above, erect and slightly twisted when dry; ovate to narrowly ovate, 0.8–2.5 mm long; apex

acuminate; margins entire or denticulate above; border indistinct above, 1–4 cells wide, occasionally bistratose; costa mucronate to short-excurrent. **Upper laminal cells** rhomboidal, generally thin-walled; basal cells frequently bulging. **Capsule** pendulous, shortly pyriform. On soil of streambanks. *Topshape thread-moss*.

DrGr MsGr KarSh

## **Rhodobryum** (Schimp.) Limpr. (sthn Afr.: 4 spp.)

### **umbraculum** (Bruch ex Hook.) Schimp. ex Paris

Plants large to robust, solitary or gregarious, dark green. **Stems** up to 40 mm long. **Leaves** reduced below, rosulate above, undulate; broadly obovate-spathulate, 7–15 mm long; apex obtuse; margins recurved below, denticulate above; border 2–4 cells wide; costa ending below to apiculate. **Upper laminal cells** rhomboidal, pitted. **Seta** long, frequently polysetous. **Capsule** horizontal to pendulous, oblong-cylindrical. Easily recognised by its habit and darkish green, undulate, broadly obovate-spathulate leaves. On soil or humus of forest floor.

MsGr

# CALYMPERACEAE

Plants small to medium-sized, in loose tufts or cushions; terricolous, saxicolous or corticolous. **Stems** erect; central strand present or absent. **Leaves** elongate above broad, sheathing, ± hyaline base; margins frequently thickened, toothed, or with hyaline border of elongated cells, occasionally with intermarginal bands (teniolae) of elongated cells; costa strong, percurrent or excurrent, occasionally gemmiferous apically; upper laminal cells small, papillose; frequently inner basal cells (cancellinae) enlarged, hyaline; sometimes leaves modified, having chlorocysts surrounded by several layers of leucocysts. **Gemmae** multicellular, cylindrical, frequently produced at leaf apices. **Capsules** erect, urn ± cylindrical; peristome teeth 8, 16 or absent; calyptra large, cucullate or campanulate, sometimes persistent.

[after Magill: 161 (1981)]

## **Syrrhopodon** Schwägr. (sthn Afr.: 2 spp.)

### **gaudichaudii** Mont.

*S. obliquirostris* Müll.Hal.
*S. uncinifolius* Müll.Hal.

Plants small to medium-sized, dark green with hyaline leaf bases. **Stems** 5–10 mm long. **Leaves** spirally twisted or inrolled above when dry; ligulate above obovate base, 2.5–4.0 mm long; apex acute; margins serrate to toothed at apex; border cells linear, hyaline; costa percurrent to mucronate. **Upper laminal cells** quadrate, papillose; cancellinae rectangular to quadrate. **Gemmae** clavate. **Capsule** short-cylindrical, peristome teeth linear. Recognised by the spirally twisted, dark green, upper leaf lamina and conspicuous, sheathing, hyaline bases. On soil, rock or bark. *Gaudichaud's netted-leaf-moss*.

MsGr

# DICRANACEAE

Plants minute to large, gregarious or in dense cushions; terricolous or saxicolous. **Stems** erect, central strand present or absent, often tomentose. **Leaves** generally narrow, occasionally falcate or falcate-secund; costa single, frequently broad below, ending below apex to filling subula, or excurrent as long, denticulate awn; dorsal surface smooth to rough, mammillose or with lamellae. **Upper laminal cells mostly** elongate, incrassate, smooth or papillose, rarely mammillose or prorate, infrequently pitted; basal cells large, rectangular; alar cells often differentiated, enlarged, reddish. **Perichaetia** terminal or lateral through innovation. **Seta** mostly elongate, straight or rarely flexuose or cygneous. **Capsules** frequently ribbed; peristome when present single, rudimentary to well developed; teeth 16, generally cleft to middle; operculum short- or long-rostrate; calyptra cucullate, base entire or rarely fringed. **Spores** small, infrequently highly ornate. *Fork-mosses*.

[after Magill: 105 (1981)]

## Key to genera

1a Costa broad, occupying at least 1/3 of leaf base, in section flattened; alar cells conspicuous, enlarged, or scarcely differentiated . . . . . **Campylopus**
1b Costa narrower, occupying < 1/3 of leaf base, in section rounded or somewhat flattened; alar cells not differentiated . . . . . 2
2a Stems julaceous; leaves appressed when wet or dry . . . . . **Aongstroemia**
2b Stems not julaceous; leaves crisped or flexuose when dry, erect-spreading to squarrose when wet. . . . . 3
3a Leaves ligulate; margins irregularly serrate or erose; upper laminal cells sharply mammillose on dorsal and ventral surfaces . . . . . **Oreoweisia**
3b Leaves subulate above a broad base; margins entire; laminal cells smooth . . . . . **Dicranella**

## **Aongstroemia** Bruch & Schimp. (sthn Afr.: 2 spp.)

### **julacea** (Hook.) Mitt.

*Gymnostomum julaceum* Hook.

Plants caespitose. **Stems** slender, julaceous, 5–10 mm long. **Leaves** appressed; short-oval, 0.4–0.8 mm long; apex rounded-apiculate to acute; margins erose-denticulate by projecting cell ends; costa ending below. **Upper laminal cells** rectangular to rhombic, incrassate; basal cells quadrate. **Sporophytes** not known in area. Recognised by its julaceous stems and appressed, oval leaves with erose-denticulate margins. On soil at high altitudes.




## **Campylopus** Brid. (sthn Afr.: 22 spp.)

### Key to species:

1a Leaves small, 2–3 mm long; apex blunt, subcucullate in lower leaves, short-acuminate and occasionally hyaline in comal leaves; costa percurrent in lower leaves, ending in a smooth, hyaline awn in comal leaves, in proximal section with ventral stereid or substereid band . . . . . **C. pilifer** var. **simii**

1b Leaves larger, 2.5–7.0 mm long; apex acute to subulate, occasionally channelled; costa percurrent, short-excurrent or ending in a toothed, hyaline awn, in proximal section with enlarged ventral cells . . . . . 2
2a Costa excurrent as a hyaline awn . . . . . 3
2b Costa percurrent or short-excurrent, not ending in a hyaline awn . . . . . 5
3a Awn straight . . . . . **C. pilifer** var. **pilifer**
3b Awn recurved or reflexed . . . . . 4
4a Awn recurved . . . . . **C. aureonitens**
4b Awn reflexed . . . . . **C. introflexus**
5a Basal laminal cells extending further up margins to form V-shaped junction; upper laminal cells rectangular to oval or elongate; leaf margins entire . . . . . **C. bartramiaceus**
5b Basal laminal cells not extending further up margins; upper laminal cells rectangular to rhomboidal; leaf margins entire to serrulate . . . **C. pyriformis**

## **aureonitens** (Müll.Hal.) A.Jaeger

*Dicranum aureonitens* Müll.Hal.

Plants blackish, brownish or yellowish green. **Stems** up to 70 mm long. **Leaves** appressed with recurved apices, comose in fertile plants; narrowly ovate, acuminate, 5–7 mm long; costa ending in long-excurrent, recurved, dentate, hyaline awn; in section with ventral cells large, narrow, dorsal lamellae 2 or 3 cells long. **Upper laminal cells** oval to elongate, thick-walled; basal cells rectangular, thin-walled; alar cells absent or weakly developed. **Capsule** erect, ovoid. On soil or rock in wet habitats such as vleis.




## **bartramiaceus** (Müll.Hal.) Paris

*Dicranum bartramiaceum* Müll.Hal.

Plants loosely caespitose. **Stems** 10–20 mm long. **Leaves** weakly contorted to erect-spreading; ovate, narrowly ovate to elliptical, subulate, 4–6 mm long, occasionally with hyaline tips; margins entire; costa percurrent or short-excurrent; in section with ventral cells large, dorsal stereids or substereids present, dorsal surface rough or with single cell projections. **Upper laminal cells** rectangular to oval or elongate, incrassate; basal cells rectangular, hyaline, thin-walled, forming V-shaped area; alar cells scarcely differentiated. **Sporophytes** not known in area. On sandy soil or rock. Treated as *C. atroluteus* (Müll.Hal.) Paris in Magill (1981).




## **introflexus** (Hedw.) Brid.

*Dicranum introflexum* Hedw.

Plants in cushions. **Stems** up to 30 mm long. **Leaves** frequently comose, appressed when dry, erect-spreading when wet; oblong to elliptical, acuminate, 3–7 mm long; margins entire; costa long-excurrent as dentate, hyaline awn, frequently reflexed; in section with ventral cells large, dorsal surface with single cells or lamellae 1 or 2 cells long. **Upper laminal cells** short-rectangular to rhomboidal; basal cells rectangular, hyaline, thin-walled, forming weak V-shaped area; alar cells short-rectangular, thin-walled, reddish. **Sporophytes** not known in area. On soil. *Heath star moss*.




## **pilifer** Brid. var. **pilifer**

Plants large, in turfs or cushions. **Stems** 5–40 mm long. **Leaves** crowded, loosely appressed when dry, erect-spreading when wet; narrowly ovate, acuminate to subulate, 3–7 mm long;

margins entire; costa short-excurrent as denticulate, hyaline awn; in section ventral cells large, dorsal lamellae 2–4 cells long. **Upper laminal cells** quadrate to rhomboidal, incrassate; basal cells rectangular, thin-walled, hyaline, forming weak V-shaped area; alar cells quadrate, thin-walled, reddish or hyaline. **Sporophytes** not known in area. Frequently collected on soil or rock. *Stiff swan-neck moss*.

DrGr MsGr Zastr

**pilifer** var. **simii** (Schelpe) J.-P.Frahm & Hedd.
*C. simii* Schelpe

Plants yellow-green. **Stems** up to 50 mm long. **Leaves** appressed when dry, erect when wet, occasionally comose; oblong to elliptical, or ovate to ligulate, 2–3 mm long; apex blunt, subcucullate in lower leaves, short-acuminate and occasionally hyaline in comal leaves; margins entire; costa filling acumen or short-excurrent as hyaline awn; in section with ventral stereid band, dorsal lamellae 2–4 cells long. **Upper laminal cells** fusiform, thickened; basal cells rectangular to linear, thin-walled, hyaline, forming V-shaped area; alar cells weakly differentiated, quadrate, hyaline, reddish. **Sporophytes** not known. On rock at high altitude. *Sim's stiff swan-neck moss*.

MsGr

**pyriformis** (Schultz) Brid.
*C. pallidus* Hook. & Wilson
*Dicranum pyriforme* Schultz

Plants forming cushions, yellow-green. **Stems** 2–15 mm long. **Leaves** weakly contorted when dry, erect-spreading when wet; narrowly linear-ovate to ovate-subulate, 2.5–6.0 mm long, broadly channelled ventrally; margins entire to serrulate; costa percurrent or excurrent as short, denticulate tip; in section ventral cells large, dorsal cells incrassate or in stereid groups, dorsal surface rough or with projecting cells. **Upper laminal cells** quadrate or rectangular to rhomboidal, incrassate; basal cells rectangular, thin-walled, hyaline; alar cells weakly differentiated. **Capsule** erect, cylindrical. On soil or rock. *Dwarf swan-neck moss*.

MsGr

## **Dicranella** Schimp. (sthn Afr.: 4 spp.)

[after Ochyra *et al*.: 170 (2013)]

**hookeri** (Müll.Hal.) Cardot
*Aongstroemia hookeri* Müll.Hal.

Plants medium-sized, slender, in dense tufts. **Stems** erect, up to 60 mm long. **Leaves** flexuose when dry, erect-spreading when wet, smaller below; subulate above oblong, loosely clasping base; 1.4–2.3 mm long; apex obtuse to subacute; margins plane, entire; costa subpercurrent. **Upper laminal cells** short-rectangular, smooth, uni- to bistratose; basal cells rectangular, incrassate. **Sporophytes** not known in South Africa. Recognised by the oblong, loosely clasping leaf base, contracting into a channelled subula with smooth, uni- to bistratose laminal cells. On soil. *Hooker's forklet-moss*.

MsGr

## **Oreoweisia** (Bruch & Schimp.) De Not (sthn Afr.: 1 sp.)

**erosa** (Hampe ex Müll.Hal.) Kindb.
*Weissia erosa* Hampe ex Müll.Hal.

Plants small, in loose tufts. **Stems** erect, up to 10 mm long, radiculose below. **Leaves** crisped when dry, patent when wet; ligulate, 1.2–2.0 mm long; apex obtuse, weakly cucullate; margins erose to bluntly serrate above; costa prominent, ending just below or percurrent. **Upper laminal cells** irregular, quadrate to angular, sharply mammillose on both surfaces; basal cells oblong, smooth, hyaline. **Capsule** short-cylindrical; peristome teeth fragile. **Spores** papillose. Recognised by the erose leaf margins, obtuse apices and strongly mammillose leaf cells. On soil or rock.




# DITRICHACEAE

Plants minute to medium-sized, in dense tufts or gregarious; terrestrial. **Stems** simple or branched, central strand present or absent. **Leaves** ovate, oval or oblong, acute to subulate; costa strong, narrow or broad; in section round or flattened, generally with stereid bands; laminal cells generally rectangular, smooth or occasionally papillose above; basal cells generally larger, rectangular; alar cells not distinct. **Seta** straight or cygneous. **Capsule** cleistocarpic or stegocarpic, long-exserted or immersed; peristome single or absent, teeth 16, fragile, cleft or irregularly perforated, papillose or striate, reddish; operculum rostrate; calyptra cucullate or mitriform. **Spores** round, smooth, papillose, spinose or punctate.

[after Magill: 83 (1981)]

### Key to genera

1a Stems julaceous; leaves imbricate; capsule immersed or exserted laterally . . . . . **Pleuridium**
1b Stems not julaceous; leaves patent or erect-flexuose; capsule long-exserted . . . . . 2
2a Plants with a bluish bloom, branched above; gregarious in caves and deep crevices. . . . . **Saelania**
2b Plants yellowish green, infrequently branched; forming dense tufts or patches in open sites. . . . . **Ditrichum**

## **Ditrichum** Hampe (sthn Afr.: 4 spp.)

**brachypodum** (Müll.Hal.) Broth.
*Leptotrichum brachypodum* Müll.Hal.

Plants small. **Stems** 2–5 mm long, simple. **Leaves** patent, bistratose above; oval to ovate, 1.0–1.2 mm long; apex acuminate; margins entire to serrulate; costa broad, ending in acumen. **Upper laminal cells** mostly rectangular, incrassate, basal cells larger. **Capsule** erect, short-cylindrical; seta short, 5–7 mm long; peristome fragile, teeth papillose. Recognised by the long,

narrow leaves with rectangular cells and broad costa, as well as the cylindrical, non-furrowed capsule with papillose, fragile peristome. On soil of streambanks and road cuttings.

MsGr

## **Pleuridium** Rabenh. (sthn Afr.: 5 spp.)

### **nervosum** (Hook.) Mitt.

*Phascum nervosum* Hook.

Plants small, in scattered groups. **Stems** 0.4–1.0 mm long, julaceous. **Leaves** imbricate, lower leaves ovate to oval, upper leaves oblong, up to 1.2 mm long; apex obtuse to acuminate in upper leaves; margins irregularly serrate by projecting cell ends; costa percurrent or filling acumen. **Upper laminal cells** short-rectangular, becoming rhombic in subperichaetial leaves. **Perichaetial leaves** 2.2–2.5 mm long. **Capsule** immersed, oval to elliptical. Recognised by its julaceous stems, changing leaf apices up the stem and the immersed, oval capsule. On soil or soil over rock.

MsGr

## **Saelania** Lindb. (sthn Afr.: 1 sp.)

### **glaucescens** (Hedw.) Broth.

*Trichostomum glaucescens* Hedw.

Plants small, gregarious, blue-green, glaucous. **Stems** 5–10 mm long, branched above. **Leaves** erect, flexuose when dry, patent when wet; narrowly ovate, subulate, 2.5–3.5 mm long; apex acute; margins irregularly serrate; costa excurrent. **Upper laminal cells** rectangular to quadrate. **Capsule** exserted, erect, elliptical; peristome teeth divided to base. Recognised by its bluish 'bloom' and erect, branching stems. On shallow soils in small caves or recesses at high altitudes. *Blue dew moss*.

MsGr

# ENCALYPTACEAE

Plants medium to large, forming large tufts; terricolous or saxicolous. **Stems** radiculose below; central strand present or absent. **Leaves** larger above; oblong, elliptical or spathulate; apex broadly rounded to short-acuminate; margins plane or weakly revolute; costa ending below apex to excurrent; upper laminal cells isodiametric above, thickened, with large C- or 0-shaped papillae; basal cells fragile, rectangular, longitudinal walls thin, end wall thickened, marginal cells forming distinct border. **Autoicous** or **dioicous**. **Perichaetia** terminal, leaves frequently smaller. **Capsules** cylindrical, smooth or furrowed when dry; stomata scattered on lower urn; peristome single, double or absent, teeth 16, narrowly ovate to linear, prostome occasionally present; operculum deciduous with calyptra, long-rostrate; calyptra large, cylindrical-rostrate, smooth or

scabrous, completely covering erect capsule, base entire, erose, lacerate or fringed. **Spores** large, frequently ornate. *Extinguisher-mosses*.

[after Magill: 173 (1981)]

### **Encalypta** Hedw. (sthn Afr.: 2 spp.)

**ciliata** Hedw.

Plants medium to large, forming cushions. **Stems** 5–20 mm long. **Leaves** weakly contorted when dry, lingulate to oblong or elliptical; apex short-acuminate, base oblong; margins papillose; costa short-excurrent. **Upper laminal cells** hexagonal, papillae large; basal cells highly differentiated, fragile, rectangular, marginal cells linear, forming distinct borders. **Capsule** cylindrical, peristome absent; calyptra cylindrical-rostrate, entire to erose at base. **Spores** discoid, with tetrad scar, distal face warty. Easily recognised by the large, fringed calyptra, covering the erect capsule, and the discoid spores with tetrad scar. On soil in rock crevices at high altitudes. *Fringed extinguisher-moss*.

MsGr

## ENTODONTACEAE

Plants large, yellowish green, glossy, forming flat mats. **Stems** creeping to subascending distally, pinnately branched, central strand present. **Leaves** complanate, ovate to oblong to narrowly ovate, smooth or plicate; apex acute to short-acuminate; margins entire to denticulate above; costa short and double to absent; upper laminal cells linear to rhomboidal, smooth; alar cells many, subquadrate. **Autoicous** or less often **dioicous**. **Perichaetia** lateral, leaves elongate. **Capsules** erect, long-exserted, ovoid-cylindrical, with protruding columella; peristome double, inserted below mouth, exostome teeth 16, endostome basal membrane absent or low, segments usually narrow, cilia absent; calyptra cucullate, smooth and naked. **Spores** round, finely to coarsely papillose.

[after Gradstein *et al*.: 343 (2001) and Chuah-Petiot: 139 (2003)]

### **Entodon** Müll.Hal. (sthn Afr.: 4 spp.)

**dregeanus** (Hornsch.) Müll.Hal.
*Neckera dregeana* Hornsch.

Plants large, yellowish green, glossy, forming flat mats. **Stems** creeping, up to 76 mm long. **Leaves** complanate, narrowly oblong-ovate, up to 2 mm long, narrowed at insertion; apex acute; margins entire to denticulate above; costa short and double to absent. **Upper laminal cells** linear; alar cells rounded-quadrate. **Capsule** erect, long-cylindrical, with protruding columella; exostome teeth striate, horizontal striations up to capsule mouth, endostome segments striate to papillose-striate. Recognised by the large, yellowish green, glossy plants with complanate leaves, frequently forming extensive, flat mats. On decaying wood and sandstone boulders in Afromontane forest. No longer regarded as a synonym of *E. macropodus* (Hedw.) Müll.Hal. (O'Shea 2006). *Drege's entodon*.

MsGr

# EPHEMERACEAE

Plants minute, ephemeral, gregarious or scattered, frequently on persistent protonemal mat. **Stems** very short. **Leaves** few, larger above, spreading; narrowly linear-ovate to oblong-subulate; margins entire or serrate; costa present or absent, sometimes weak below and strong above, percurrent to excurrent; in section cells not differentiated; laminal cells rectangular to rhomboidal or fusiform, smooth or prorate. **Dioicous**. **Seta** very short. **Capsules** cleistocarpic, globose to ellipsoidal, short apiculate; calyptra cucullate, smooth or rough. **Spores** large.

[after Magill: 305 (1981)]

## **Ephemerum** Hampe (sthn Afr.: 4 spp.)

**rehmannii** (Müll.Hal.) Broth.
*Ephemerella rehmannii* Müll.Hal.

Plants minute, scattered or in small groups, annual. **Stems** up to 1 mm long. **Leaves** larger above; narrowly ovate, 1.0–2.5 mm long; apex acuminate to subulate; margins entire to serrulate; costa long- to short-excurrent, awn flexuose. **Upper laminal cells** rectangular to oblong-rhomboidal, basal cells rectangular. **Capsule** stegocarpic, immersed, ellipsoidal, seta very short. **Spores** papillose to sharply papillose. Recognised by the very small plants with cleistocarpic, immersed capsules and well-defined costa excurrent as a flexuose, smooth awn. On soil. *Rehmann's earth-moss*.

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| | | DrGr | | | |

# ERPODIACEAE

Plants small, stringy, in loose wefts; corticolous or saxicolous. **Stems** branched; central strand weak or absent; paraphyllia and pseudoparaphyllia absent. **Leaves** crowded or somewhat distant, concave, clasping the stem or erect, ovate to elliptical, apex acute to rounded, muticous or with long hyaline awn; laminal cells uniform, quadrate to rectangular, smooth or papillose, weakly thickened, alar cells not differentiated. **Autoicous**. **Perichaetia** on short branches. **Seta** short or absent. **Capsules** immersed or just emergent, cylindrical; peristome absent or rudimentary; operculum convex, beaked; calyptra campanulate, sometimes twisted and clasping the seta, ribbed, naked. **Spores** large, granulate.

[after Magill & Van Rooy: 451 (1998)]

## **Erpodium** (Brid.) Brid. (sthn Afr.: 4 spp.)

**beccarii** Müll.Hal.

Plants small and slender, creeping or in wefts, dark green to grey-green. **Stems** up to 20 mm long. **Leaves** evenly spaced, appressed when dry, erect-spreading when wet; broadly ovate

to elliptical; apex obtuse; awns hyaline, papillose; ecostate. **Upper laminal cells** hexagonal, papillose on both surfaces. **Perichaetia** strongly differentiated, hyaline. **Capsule** immersed, erect, gymnostomous, annulus persistent. Recognised by its long, hyaline awns that strongly contrast with the dark green colour of the leaf lamina. On trees in open areas. *Beccari's erpodium*.

DrGr

# EUSTICHIACEAE

Plants slender, forming dense tufts, light green; terricolous or saxicolous. **Stems** frequently elongate; central strand present. **Leaves** distichous, keeled, ovate-cuspidate; margins erose-denticulate; costa short excurrent; in section cells weakly differentiated, mostly stereids; laminal cells small, papillose; seta elongate. **Dioicous**. **Capsules** suberect; exostome absent, endostome of 16 segments, weakly perforated, vertically striolate; operculum rostrate; calyptra cucullate, naked and smooth. **Spores** finely papillose.

[after Magill: 399 (1987)]

## **Eustichia** (Brid.) Brid. (sthn Afr.: 1 sp.)

### **longirostris** (Brid.) Brid.

*Pterigynandrum longirostre* Brid.

Plants small, light green. **Stems** up to 50 mm long, mostly buried. **Leaves** complanate and distichous, conduplicate to carinate-concave, appressed when dry; ovate-cuspidate; margins erose-denticulate by projecting cell ends; costa short excurrent, reflexed. **Upper laminal cells** subquadrate to short-rectangular, papillose dorsally; basal cells rectangular. **Sporophytes** not known in area. Recognised by the slender, light green plants, buried below, with distichous, keeled leaves. On soil at high altitudes.

MsGr

# FABRONIACEAE

Plants mostly small, forming silky mats, epiphytic. **Stems** creeping, subascending distally; pseudoparaphyllia foliose. **Leaves** erect to imbricate when dry, spreading to erect-spreading when wet, homomallous or not; orbicular, ovate or narrowly ovate-oblong, weakly to strongly concave; apex mostly acuminate; margins plane, entire to serrate or ciliate distally; costa single, ending below to percurrent; laminal cells mostly short, smooth; alar cells weakly differentiated, often oblate. **Autoicous**. **Perichaetia** lateral, leaves usually differentiated. **Capsules** exserted, erect, ovoid to cylindrical; operculum short rostrate or conic-mammillate; peristome set below mouth, single or double, exostome teeth 16, often paired; endostome, absent or rudimentary and adhering to exostome or with segments 8 or 16, shorter than exostome teeth; calyptra cucullate, smooth or roughened distally, naked. **Spores** round to ovoid, finely to coarsely papillose.

[after Gradstein *et al*.: 350 (2001)]

## ERPODIACEAE

## **Fabronia** Raddi (sthn Afr.: 10 spp.)

[after Chuah-Petiot: 123 (2003)]

### **pilifera** Hornsch.

Plants deep green, caespitose or in silky mats. **Stems** 25–50 mm long, creeping. **Leaves** closely imbricate, often julaceous when dry, spreading when wet; ovate to ovate-acuminate, with long, hyaline hair points formed by narrow apices; margins toothed by single projecting cells above; costa weak, ending above mid-leaf. **Upper laminal cells** oblong-rhomboid, up to 50 µm long; alar cells quadrate. **Perichaetial leaves** erect, pellucid, long-sheathing. **Capsule** cupulate; peristome teeth broad, short. Forms silky mats on bark.

DrGr

# FISSIDENTACEAE

Plants minute to large, generally forming dense mats; terricolous, saxicolous, corticolous or rarely aquatic. **Stems** erect or prostrate, generally simple; central strand present or absent. **Leaves** distichous and complanate, larger above, equitant, generally long and narrow, occasionally asymmetrical; apices acute to rounded; margins elimbate or completely to partly limbate, smooth, crenulate or serrate; costae short-excurrent or ending below apex, rarely absent; with 2 equal or unequal vaginant laminae; dorsal lamina tapering to insertion, rarely decurrent; laminal cells mostly small, quadrate to hexagonal, occasionally oblong-hexagonal or rhombic, flat to mammillose, smooth or papillose. **Perichaetia** terminal or lateral. **Seta** elongate, erect or flexuose. **Capsules** erect to inclined, urn short-cylindrical, symmetric or curved; peristome single, teeth 16, generally deeply cleft; operculum rostrate; calyptra cucullate. **Spores** small, generally round. *Pocket-mosses*.

[after Magill: 39 (1981)]

## **Fissidens** Hedw. (sthn Afr.: 28 spp.)

### Key to species:

1a Leaves variable limbate or lower leaves occasionally elimbate . . . . . 2
1b Leaves without limbidia . . . . . 10
2a Leaves strongly limbate, limbidia present on all laminae, occasionally weak . . . . . 3
2b Leaves weakly limbate, limbidia present on part of dorsal lamina, but frequently restricted to vaginant laminae of perichaetial leaves, occasionally elimbate . . . . . 7
3a Upper laminal cells regularly isodiametric, hexagonal, rounded-hexagonal or quadrate . . . . . 4
3b Upper laminal cells generally longer than broad, or heterogeneous, rectangular or hexagonal to elongate-hexagona . . . . . 9
4a Vaginant laminae equal . . . . . 5
4b Vaginant laminae unequal . . . . . 6
5a Limbidia broader on proximal vaginant laminae, 4–6 cells wide; leaf cells bulging . . . . . **F. hoeegii**

5b Limbidia not much broader on proximal vaginant laminae; leaf cells flat or occasionally bulging . . . . . **F. bryoides**
6a Limbidium marginal; vaginant laminae generally closed, minor blade ending on costa; leaf cells flat . . . . . **F. beckettii**
6b Limbidium intermarginal on proximal vaginant laminae; vaginant laminae open or closed, minor blade ending on lamina; leaf cells bulging to mammillose . . . . . **F. rufescens**
7a Leaf cells smooth . . . . . **F. bogosicus**
7b Leaf cells papillose. . . . . 8
8a Costa frequently ending up to 8 cells below apex; apex broadly acute, obtuse or rounded, abruptly apiculate by a smooth, clear cell . . . . . **F. sciophyllus**
8b Costa percurrent to subpercurrent; apex acute . . . . . **F. borgenii**
9a Leaves 1–2 mm long; laminal cells lax . . . . . **F. aciphyllus**
9b Leaves 0.7–0.8 mm long; laminal cells small . . . . . **F. curvatus** var. **curvatus**
10a Plants terrestrial; leaves crowded; with large, axillary, hyaline nodules; dorsal lamina crumpled against stem; costa short-excurrent . . . . . **F. ovatus**
10b Plants aquatic; leaves distant; axillary hyaline nodules absent or small; dorsal lamina not reaching stem; costa ending well below apex . . . . . **F. palmifolius**

## **aciphyllus** Dixon

Plants small, light green. **Stems** 3–4 mm long. **Leaves** larger above, asymmetrical, ovate to lanceolate or narrowly elliptical, 1–2 mm long; apex short-acuminate; margins entire, limbate, broader on vaginant lamina; costa percurrent to short-excurrent. **Vaginant laminae** with one blade ending on lamina. **Upper laminal cells** large, lax, hexagonal to elongate-hexagonal, flat, smooth. **Capsule** erect, short-cylindrical. On soil.




## **beckettii** Mitt.

*F. simii* Schelpe

Plants small, light green. **Stems** 3–5 mm long. **Leaves** distant, elliptical to lanceolate, 0.8–1.1 mm long; apex short-acuminate; margins entire, strongly limbate; costa percurrent to short-excurrent. **Vaginant laminae** unequal, minor blade ending on costa. **Upper laminal cells** quadrate to rhombic, smooth, flat. **Sporophytes** not known in area. On soil. *Beckett's pocket-moss*.




## **bogosicus** Müll.Hal.

*F. microandrogynus* Dixon
*F. parvilimbatus* Sim

Plants small to medium, yellowish green. **Stems** 1–5 mm long. **Leaves** ± distant, lanceolate to elliptical, 0.6–1.2 mm long; apex rounded to acute, cuspidate; margins entire to serrulate, weakly limbate or elimbate, limbidium occasionally restricted to a few cells on vaginant laminae; costa subpercurrent to percurrent. **Vaginant laminae** slightly unequal. **Upper laminal cells** hexagonal, smooth. **Capsule** erect to inclined, short-cylindrical. On rock or soil.




## **borgenii** Hampe

Plants small, yellow-green to green. **Stem** 2–3 mm long. **Leaves** larger above, ligulate to asymmetrically oval-lingulate, 0.9–1.4 mm long; apex acute; margins minutely crenulate by marginal cell papillae, elimbate or perichaetial leaves limbate on vaginant lamellae; costa

percurrent or ending just below. **Vaginant laminae** slightly unequal or one blade ending on lamina; dorsal lamina abruptly rounded at insertion. **Upper laminal cells** hexagonal to quadrate, obscured by low, dense papillae. **Capsule** erect to inclined, strongly restricted below mouth when dry. Frequently on bark. *Borgen's pocket-moss*.

MsGr

**bryoides** Hedw.

Plants medium-sized, dark green. **Stems** up to 10 mm long. **Leaves** contorted when dry, ovate or ligulate to elliptical, 1–2 mm long; apex broadly acute to cuspidate; margins entire to serrulate at apex, strongly limbate; costa percurrent to short-excurrent. **Vaginant laminae** equal, dorsal lamina rounded to insertion. **Upper laminal cells** quadrate to hexagonal, flat to bulging, smooth. **Capsule** erect to inclined, straight to curved. On wet soil or rock. *Lesser pocket-moss*.

DrGr MsGr Zastr

**curvatus** Hornsch. var. **curvatus**

*F. macleanus* Shaw

Plants small, yellow-green, glossy. **Stems** 1–3 mm long. **Leaves** linear-lanceolate to lanceolate, small, 0.7–0.8 mm long; apex acute to cuspidate; margins entire, strongly limbate, yellowish; costa percurrent. **Vaginant laminae** narrow, equal or unequal, minor blade ending on margin or lamina. **Upper laminal cells** irregularly shaped, elongate-hexagonal or rectangular, smooth, flat. **Capsule** inclined, short-cylindrical, seta length variable. On soil. *Portuguese pocket-moss*.

DrGr MsGr Zastr

**hoeegii** P.de la Varde

Plants small, yellow-green to dark green. **Stems** 3–6 mm long. **Leaves** contorted when dry, ligulate to oblong-elliptical, 1.2–1.3 mm long; apex acute; margins entire, limbate, limbidia broader on proximal vaginant laminae; costa percurrent. **Vaginant laminae** equal. **Upper laminal cells** small, hexagonal, superficially bulging, smooth. **Capsule** erect, cylindrical. On soil. *Høeg's pocket-moss*.

MsGr

**ovatus** Brid.

*F. glaucescens* Hornsch.

Plants large, light green. **Stems** 5–10 mm long, with large, axillary, hyaline nodules. **Leaves** erect with circinate tips when dry, oblong to oblong-lanceolate, 2.0–3.2 mm long; apex obtuse to broadly acute, cuspidate; margins elimbate, entire to serrate above; costa strong, short-excurrent, flexuose above. **Vaginant laminae** unequal, minor blade terminating submarginal or laminal; dorsal lamina undulate below, crumpled against stem. **Upper laminal cells** rounded-hexagonal, incrassate, mammillose. **Capsule** horizontal, curved. On wet soil or rock.

MsGr KarSh

**palmifolius** (P.Beauv.) Broth.

*F. capensis* (Müll.Hal.) Broth.

*Mnium palmifolium* P.Beauv.

Plants large, flaccid, yellow-green to blackish. **Stems** 50–100 mm long. **Leaves** distant, narrowly linear-lanceolate, 3–7 mm long; apex acute to obtuse; margins elimbate, plane, entire; costa

ending well below apex. **Vaginant laminae** equal or minor blade terminating submarginal; dorsal lamina not reaching stem. **Upper laminal cells** irregular, rectangular to hexagonal, thin-walled, flat. **Capsule** erect, elliptical, seta very short. On rock or roots in streams and rivers. Treated as *F. fontanus* (Bach.Pyl.) Steud. by Magill (1981). *Palm-leaved pocket-moss*.

DrGr MsGr

**rufescens** Hornsch.

*F. marginatus* Schimp. ex Müll.Hal.

Plants small to medium, green, glossy. **Stems** 4–8 mm long. **Leaves** weakly contorted when dry, ligulate to elliptical, frequently asymmetrical, 0.5–2.0 mm long; apex acute, cuspidate; margins entire to serrulate above, limbate, limbidia confluent with costa or ending just below, frequently intermarginal; costa short-excurrent. **Vaginant laminae** open to closed, termination variable, frequently on lamina. **Upper laminal cells** quadrate to subhexagonal, bulging to mammillose. **Capsule** inclined to horizontal, asymmetrical, curved. On soil or rock.

DrGr MsGr Zastr

**sciophyllus** Mitt.

*F. subobtusatus* Müll.Hal.

Plants small, light green. **Stems** 2–3 mm long. **Leaves** larger above, contorted when dry, ligulate to lingulate, 0.4–0.7 mm long; apex broadly acute, obtuse or rounded, abruptly apiculate by a smooth, clear cell; margins elimbate or limbidia restricted to vaginant laminae of perichaetial leaves, crenulate; costa frequently ending below apex. **Vaginant laminae** unequal, minor blade terminating on lamina. **Upper laminal cells** quadrate to hexagonal, pleuripapillose. **Capsule** inclined, short-cylindrical. On soil or rock.

MsGr

# FUNARIACEAE

Plants annual or biennial, small to medium-sized, generally light green; terricolous. **Stems** erect, simple; central strand generally present. **Leaves** ± lax, mostly crowded above, erect, broad and concave; margins plane to broadly incurved, entire or often serrate, rarely bordered; costa strong, percurrent to excurrent; laminal cells large, wide, smooth, thin-walled; marginal cells generally narrower; basal cells generally larger, rectangular. **Monoicous** or rarely **dioicous**. **Capsules** immersed or long exserted, stegocarpic or occasionally cleistocarpic, erect to cernuous or pendent; globose to pyriform, symmetric or curved, frequently with well-defined neck; annulus usually well developed; stomata with single guard cell; peristome absent, single or double, teeth 16, strongly trabeculate, segments opposite teeth, cilia absent; operculum plano-convex to conic, often apiculate; calyptra smooth, generally cucullate-inflated and rostrate or smaller, mitrate. **Spores** small, smooth or granulate. *Cord-mosses*.

[after Magill: 311 (1987)]

## Key to genera

Plants small, stems very short; capsule emergent to exserted on short seta; calyptra large, 8-plicate . . . . . **Goniomitrium**
Plants larger, stems elongated; capsule exserted on long seta; calyptra not 8-plicate . . . . . **Funaria**

## **Funaria** Hedw. (sthn Afr.: 10 spp.)

### Key to species:

1a Costa percurrent to excurrent in upper leaves . . . . . 2
1b Costa ending below apex in upper leaves . . . . . 4
2a Leaves acute to apiculate; capsules erect to inclined . . . . . **F. rottleri**
2b Leaves short-acuminate; capsules inclined to horizontal or pendent . . . . . 3
3a Leaves narrowly obovate; capsules inclined, symmetrical; peristome absent . . . . . **F. urceolata**
3b Leaves broadly elliptical to obovate; capsules inclined to pendent, asymmetrical; peristome double. . . . . **F. hygrometrica**
4a Leaf margins crenulate . . . . . **F. rhomboidea**
4b Leaf margins entire . . . . . 5
5a Leaf apices acute to obtuse; leaves broadly elliptical to obovate or ovate . . . . . **F. succuleata**
5b Leaf apices mucronate to apiculate; leaves elliptical to obovate . . . . . **F. bergiana**

### **bergiana** (Hornsch.) Broth.

*Entosthodon bergianus* (Hornsch.) Müll.Hal.
*Weissia bergiana* Hornsch.

Plants small, gregarious, annual, occasionally perennial. **Stems** 2–3 mm long. **Leaves** elliptical to obovate, 2.0–2.5 mm long; mucronate to apiculate; margins plane, entire; costa ending below. **Upper laminal cells** rectangular or rhomboidal. **Capsule** erect, pyriform, neck differentiated; peristome single, fragile, teeth narrowly triangular; operculum plano-convex. On soil. *Bergius' cord-moss*.




### **hygrometrica** Hedw.

Plants medium-sized, gregarious, annual, occasionally perennial. **Stems** 3–8 mm long. **Leaves** imbricate, in bulb-like cluster, weakly contorted when dry; broadly elliptical to obovate, 2–4 mm long, concave; apex acute to short acuminate; margins plane to broadly inrolled above, entire to weakly serrate; costa ending below to short excurrent. **Upper laminal cells** inflated, subhexagonal to short rectangular. **Capsule** horizontal to pendent, asymmetrical, arcuate, subpyriform, sulcate; peristome double, exostome teeth sigmoid, triangular-twisted, joined at apex; operculum convex, cells twisted counter-clockwise. Found in a variety of disturbed habitats such as wet crevices of cribs. *Common cord-moss*. Figure 6A, p. 2.




### **rhomboidea** J.Shaw

*F. schinzii* (Geh.) Broth.
*Physcomitrium rivale* (Geh.) Broth.

Plants small, scattered, annual, occasionally perennial. **Stems** 2–3 mm long. **Leaves** rosulate, weakly contorted when dry; elliptical to obovate, 2.5–4.5 mm long; apex acute to

obtuse-apiculate; margins crenulate to bluntly toothed above base; costa ending below. **Upper laminal cells** rectangular to rhomboidal. **Capsule** erect, pyriform, neck strongly sulcate; peristome double, endostome rudimentary; operculum short conic, twisted counter-clockwise. On soil.

DrGr

**rottleri** (Schwägr.) Broth.
*Entosthodon rottleri* (Schwägr.) Müll.Hal.
*Gymnostomum rottleri* Schwägr.

Plants small, scattered, annual, occasionally perennial. **Stems** 2–5 mm long. **Leaves** rosulate, weakly contorted when dry; elliptical to obovate, 2–4 mm long; apex acute to apiculate; margins entire or cells bulging; costa short-excurrent. **Upper laminal cells** short-rectangular, thin-walled. **Capsule** erect to inclined, cylindrical to obconical, mouth very broad; peristome very rudimentary or absent; operculum plano-convex, cells not twisted. On soil. *Rottler's cord-moss*.

DrGr MsGr

**succuleata** (Wager & C.H.Wright) Broth. ex Magill
*Physcomitrium succuleatum* Wager & C.H.Wright

Plants small, gregarious, annual, occasionally perennial. **Stems** 2–4 mm long. **Leaves** appressed or slightly contorted when dry; broadly elliptical to obovate or ovate, 1.5–2.0 mm long, concave; apex acute to obtuse; margins plane to broadly incurved above, entire; costa ending below apex. **Upper laminal cells** rectangular, narrower and bulging towards margins. **Capsule** erect, pyriform, neck very short; peristome single, rudimentary and often missing; operculum plano-convex, cells not twisted. On soil.

DrGr

**urceolata** (Mitt.) Magill
*Entosthodon urceolatus* Mitt.

Plants small, scattered, annual, occasionally perennial. **Stems** 2–4 mm long. **Leaves** weakly contorted when dry, lingulate to narrowly obovate, 3.0–3.5 mm long; apex short-acuminate; margins entire; costa short-excurrent. **Upper laminal cells** irregularly short-rectangular. **Capsule** inclined, narrow-pyriform, mouth wide, neck sulcate; peristome absent. On soil.

DrGr

## **Goniomitrium** Hook.f. & Wilson (sthn Afr.: 1 sp.)

**africanum** (Müll.Hal.) Broth.
*Rehmanniella africana* Müll.Hal.

Plants small, scattered or gregarious, annual, occasionally perennial. **Stems** 1–2 mm long. **Leaves** larger above, infolded and appressed when dry; broadly elliptical to obovate or subspathulate, 1.2–2.5 mm long; apex apiculate to cuspidate; margins plane, entire; costa short-excurrent. **Upper laminal cells** rhomboidal. **Capsule** emergent to exserted, erect, stegocarpic, cupulate with broad mouth, sulcate when dry; peristome absent; calyptra mitrate,

8-sided, plicate. Recognised by the large, 8-sided, plicate calyptra, large-mouthed capsule, and spreading, dark green, cuspidate leaves. On soil. *African goniomitrium*.

DrGr

# GIGASPERMACEAE

Plants small, scattered or loosely caespitose, terricolous. **Stems** erect, arising from a long, highly branched, aphyllous rhizome; in section central strand weak or absent. **Leaves** appressed to erect spreading, generally concave, larger above, orbicular to broadly elliptical or obovate; margins plane, entire; costa absent or excurrent; laminal cells small, angular or quadrate to hexagonal, thin-walled, smooth; basal cells slightly larger, rectangular. **Gemmae** occasionally present. **Autoicous** or **dioicous** with androgametophytes smaller. **Perichaetia** terminal, leaves generally distinct, larger. **Capsules** immersed or exserted, cleistocarpic and subspherical or stegocarpic, gymnostomous and cupulate to short-cylindrical; exothecial cells lax, smaller and transversely rectangular at mouth; annulus often well developed; peristome absent; operculum plano-convex, apiculate; calyptra very small. **Spores** large, granulate.

[after Magill: 299 (1987)]

## **Gigaspermum** Lindb. (sthn Afr.: 1 sp.)

**repens** (Hook.) Lindb.
*Anictangium repens* Hook.

Plants small, scattered or loosely caespitose, annual, occasionally perennial. **Stems** erect from a long-creeping, aphyllous rhizome, 2–5 mm long. **Leaves** distant, orbicular-apiculate; costa absent. **Laminal cells** angular, quadrate to subhexagonal, smooth. **Perichaetia** terminal; leaves highly differentiated, elliptical, long-acuminate, up to 2.5 mm long. **Capsule** immersed, gymnostomous, cupulate, mouth very broad; peristome absent. The conspicuous perichaetial leaves and short, immersed, broad-mouthed capsules are distinctive. On dry, rocky soil.

DrGr

# GRIMMIACEAE

Plants small to large, forming dense turfs or cushions, blackish green to yellow-green; mostly saxicolous. **Stems** erect; central strand present or absent. **Leaves** little differentiated when wet or dry, ovate to lanceolate; apex acute to acuminate, often with hyaline tips or hair points; lamina frequently bistratose or only margins thickened; costa percurrent to excurrent; in section cells frequently undifferentiated; laminal cells quadrate to rectangular, incrassate, smooth, lateral walls frequently sinuate to nodose; basal cells elongate, walls sinuate to straight. **Perichaetia** terminal. **Seta** short, erect

or cygneous. **Capsules** immersed or exserted, ovoid to cylindrical; peristome single, teeth 16, cleft or perforated, reddish; operculum rostrate; calyptra mitriform. **Spores** small.

[after Magill: 271 (1981)]

## Key to genera

Capsules immersed; leaves generally muticous or apex hyaline . . . . **Schistidium**
Capsules exserted; leaves with short or long hyaline awn, sometimes absent . . . . . **Grimmia**

## **Grimmia** Hedw. (sthn Afr.: 9 spp.)

### Key to species:

1a Leaf lamina unistratose, margins thickened; seta frequently curved . . . . . 2
1b Leaf lamina bistratose; seta straight . . . . . 3
2a Leaf apices long acuminate. . . . . **G. fuscolutea**
2b Leaf apices acute to obtuse . . . . . **G. pulvinata**
3a Leaves lanceolate to ovate-acuminate; basal cells short-rectangular . . . . . **G. longirostris**
3b Leaves oval to ovate-lanceolate; basal cells quadrate, lower juxtacostal cells frequently linear . . . . . **G. laevigata**

### **fuscolutea** Hook.

*G. sanii* Greven

Plants in dense, yellowish green tufts, somewhat hoary. **Stems** up to 20 mm long. **Leaves** curved when dry, unistratose to partly bistratose above; ovate-lanceolate, sharply keeled above; apex long-acuminate; margins unequally recurved on both sides; costa weak at base, projecting on dorsal side, awn short, slightly denticulate. **Upper laminal cells** short-rectangular, conspicuously sinuose, incrassate; basal marginal cells rectangular, hyaline, thin-walled; basal juxtacostal cells yellowish, elongate, incrassate. **Capsules** exserted, globose to ovoid, smooth, seta acuate; operculum conical with short obtuse beak. On soil or rock.




### **laevigata** (Brid.) Brid.

*Campylopus laevigatus* Brid.

Plants medium-sized, in loose tufts, hoary. **Stems** up to 20 mm long. **Leaves** appressed when dry, concave, lamina bistratose above; ovate to narrowly ovate; apex broadly acute, frequently hyaline, extending into long, spinose, hyaline awn; margins entire or serrate at apex; costa broad below, weak to apex. **Upper laminal cells** quadrate to short-rectangular, lower juxtacostal cells elongate, merging with costa. **Capsule** emergent, elliptical, smooth, seta straight; peristome teeth cleft above; operculum short-rostrate. On rock or shallow soil. *Hoary grimmia*.




### **longirostris** Hook.

Plants small to medium-sized, olive to blackish green, in dense cushions. **Stems** 5–20 mm long. **Leaves** appressed when dry; ovate-acuminate, bistratose above; apex acute, with short, smooth, hyaline awn; margins recurved on one side; costa percurrent to short-excurrent.

**Upper laminal cells** quadrate, walls smooth. **Capsule** exserted, ovoid to short-oblong, seta straight; peristome teeth perforated; operculum short-rostrate. Previously known as *G. ovalis* (Hedw.) Lindb. On rock. *North grimmia*.

MsGr

**pulvinata** (Hedw.) Sm.
*Fissidens pulvinatus* Hedw.

Plants small, forming dense cushions, blackish to yellow-green. **Stems** 5–15 mm long. **Leaves** appressed, weakly spiralled when dry, unistratose; lanceolate to ovate-lanceolate; apex acute to obtuse; margins bistratose to multistratose above; costa excurrent as smooth, hyaline awn. **Upper laminal** cells short-rectangular, sinuate. **Capsule** exserted, inclined to pendulous, ovoid, seta frequently curved; peristome teeth triangular; operculum short-rostrate. On soil or rock. *Grey-cushioned grimmia*.

DrGr MsGr KarSh Zastr

## **Schistidium** Bruch & Schimp. (sthn Afr.: 1 sp.)

**apocarpum** (Hedw.) Bruch & Schimp.
*Grimmia apocarpa* Hedw.

Plants medium-sized, in tufts, dark green or blackish, occasionally reddish. **Stems** 10–30 mm long. **Leaves** erect to spreading, frequently bistratose above; ovate-acuminate; apex acute, infrequently with hyaline, toothed awn; costa percurrent or extending into awn. **Upper laminal cells** quadrate to short-rectangular, incrassate, frequently sinuate. **Capsule** immersed, ovoid; peristome teeth triangular; operculum rostrate. Easily recognised by its immersed capsules. On rock. *Sessile grimmia*.

DrGr MsGr Zastr

# HEDWIGIACEAE

Plants medium to large, erect to creeping, grey-green or yellow-green to green, occasionally with reddish tint; saxicolous, corticolous or terricolous. **Stems** ± julaceous, freely branched; in section central strand absent or weak; pseudoparaphyllia absent or filamentous. **Leaves** appressed when dry, wide spreading when wet, frequently with hyaline or reddish apex, ecostate; broadly ovate to elliptical; acute to acuminate or sometimes piliferous; margins recurved below, entire to serrulate, frequently decurrent at base; laminal cells quadrate to rectangular or sometimes fusiform, generally incrassate and pitted, pluripapillose or granulose; basal cells longer; alar cells quadrate, sometimes strongly differentiated. **Autoicous** or **dioicous**. **Perigonia** terminal or axillary, gemmate. **Perichaetia** terminal; leaves imbricate, oblong, margins entire, serrulate or ciliate. **Capsules** immersed or exserted, cupulate to cylindrical, occasionally weakly ribbed, gymnostomous; operculum rostrate, beak curved; calyptra cucullate, smooth, naked. **Spores** small to medium-sized, brown or greenish.

[after Magill & Van Rooy: 541 (1998)]

## Key to genera

Leaf apex hyaline or green; leaves somewhat plicate when dry; capsules exserted
. . . . . **Braunia**
Leaf apex green or yellow-green; leaves not plicate when dry; capsule immersed
. . . . . **Hedwigidium**

### **Braunia** Bruch & Schimp. (sthn Afr.: 1 sp.)

**secunda** (Hook.) Bruch & Schimp.
*Hedwigia secunda* Hook.

Plants in extensive tufts, yellow-green. **Stems** suberect, 20–70 mm long. **Leaves** evenly spaced, weakly appressed when dry, plicate; broadly elliptical to ovate-lanceolate; apex acute to acuminate, frequently hyaline and papillose; margins narrowly recurved, entire to toothed at apex; ecostate. **Upper laminal cells** irregularly quadrate to rectangular, incrassate, papillose to smooth above; basal cells linear and forming distinct group internally, papillae seriate. **Perichaetial leaves** oblong-acuminate. **Capsule** exserted, erect, gymnostomous, cylindrical. **Spores** angular, papillose. Recognised by the ecostate, plicate leaves. Forms large yellow-green carpets over boulders and tree bases in forest openings. *Red-branch moss*.




### **Hedwigidium** Bruch & Schimp. (sthn Afr.: 1 sp.)

**integrifolium** (P.Beauv.) Dixon
*Hedwigia integrifolia* P.Beauv

Plants in medium to large tufts. **Stems** suberect to creeping, up to 50 mm long. **Leaves** appressed dry; elliptical to lanceolate; apex acuminate, base decurrent; margins plane to recurved below, entire; ecostate. **Upper laminal cells** rectangular or quadrate, incrassate, wavy, weakly papillose; basal cells strongly differentiated internally, linear, incrassate, smooth. **Perichaetial leaves** oblong. **Capsule** immersed, erect, gymnostomous, weakly ribbed. **Spores** rounded angular, granulate. On exposed rock or humus over rock. *Green hoar-moss*.




## HYPNACEAE

Plants small to medium-sized, forming mats. **Stems** creeping and spreading to ascending, pinnate or bipinnately branched; pseudoparaphyllia usually foliose. **Leaves** often falcate or homomallous, ovate to lanceolate; apex acute to long acuminate; margins plane to recurved below, entire to serrate; costae short and double or absent; laminal cells rhomboidal to linear, smooth, papillose or prorate; alar region frequently differentiated. **Gemmae** infrequent. **Autoicous** or **dioicous**. **Perichaetia** lateral, leaves mostly differentiated. **Capsules** exserted, mostly inclined or pendulous, obloid-cylindrical, often curved; operculum conic-rostrate, oblique; peristome perfect, exostome teeth 16, frequently cross-striolate; endostome basal membrane mostly high,

segments 16, cilia mostly 1–3, nodose; calyptra cucullate, usually smooth and naked. **Spores** round, mostly finely papillose. *Feather-mosses*.

[after Gradstein *et al*.: 375 (2001)]

### **Hypnum** Hedw. (sthn Afr.: 2 spp.)

#### **cupressiforme** Hedw. var. **cupressiforme**

Plants medium-sized, shiny. **Stems** creeping, up to 100 mm long, branches complanate; pseudoparaphyllia narrow. **Leaves** ± falcate-secund, oblong to ovate-lanceolate, short or long-acuminate, concave; margins serrulate above; costa short and double or absent. **Upper laminal cells** long-hexagonal to linear; alar cells at basal angles, subquadrate, thick-walled. **Capsule** suberect, oblong-cylindric, weakly curved. Recognised by the ± falcate-secund, concave, acuminate leaves with well-defined groups of alar cells. On sandy soil or sandstone outcrops. *Cypress-leaved plait-moss*.

DrGr MsGr

## LEPTODONTACEAE

Plants medium-sized, forming loose tufts, dark green to yellow-green; corticolous or saxicolous. **Secondary stems** erect, sometimes incurved when dry, generally pinnately branched; branches in single plane; in section central strand absent; paraphyllia and pseudoparaphyllia present or absent. **Leaves** appressed when dry, wide spreading when wet; broadly ovate; apex rounded or acute to acuminate; margins plane, entire; costa strong, single, extending to midleaf or above; upper laminal cells short, rhombic; alar cells quadrate to transversely rectangular, frequently in large groups. **Autoicous** or **dioicous**. **Perigonia** and **perichaetia** along erect stems and branches; seta short. **Capsules** exserted, short-cylindrical; peristome double; exostome teeth somewhat irregular, smooth, whitish; endostomes rudimentary; operculum rostrate; calyptra cucullate, somewhat hairy. **Spores** small, granulate.

[after Magill & Van Rooy: 585 (1998)]

### **Leptodon** D.Mohr (sthn Afr.: 1 sp.)

#### **smithii** (Hedw.) F.Weber & D.Mohr

*Hypnum smithii* Hedw.

Plants medium-sized, gregarious or in tufts. **Primary stem** creeping, secondary stem erect, 20–50 mm long; axillary hairs and paraphyllia many. **Leaves** weakly crisped when dry; lanceolate-subulate; apex obtuse to acute; margins entire; costa ending well below. **Upper laminal cells** quadrate to rectangular or rhombic, smooth; basal cells wavy; alar cells quadrate. **Perichaetia** strongly differentiated, leaves narrowly ovate-subulate. **Capsule** exserted, erect, ellipsoid; peristome double granulate. Recognised by the pronounced curving of the stems and branches when dry. On bark and rock. *Prince-of-Wales feather-moss*.

Zastr

# LESKEACEAE

Plants small, forming loose to dense mats, dark green to yellowish or golden-brown, terrestrial or epiphytic. **Stems** terete-foliate, pinnately branched; central strand weak; paraphyllia absent or present and simple, not papillose. **Leaves** mostly ovate-lanceolate, often plicate, apex mostly short-acuminate; margins often reflexed below, serrulate or dentate above base; costa mostly single; laminal cells short, usually unipapillose or prorate; alar cells weakly differentiated, usually many. **Autoicous**. **Perichaetia** lateral, leaves long-lanceolate. **Seta** elongate, smooth, often twisted. **Capsules** erect or inclined to horizontal, urn cylindrical and ± symmetric or ovoid-short cylindrical and asymmetric; operculum conic or conic-short rostrate; peristome double, exostome teeth 16, cross-striate below or pale, endostome variously reduced; calyptra cucullate, naked and smooth. **Spores** round, papillose.

[after Gradstein *et al*.: 394 (2001)]

## Key to genera

Capsules erect, symmetrical; peristome reduced, endostome without segments and cilia . . . . . **Lindbergia**
Capsules inclined to horizontal, curved, asymmetrical; peristome complete, endostome segments and cilia present. . . . . **Pseudoleskeopsis**

## **Lindbergia** Kindb. (sthn Afr.: 4 spp.)

[after Sim: 379 (1926) and Chuah-Petiot: 125 (2003)]

### Key to species:

1a Stems not julaceous; leaves erect when dry, not rounded . . . . . **L. haplocladioides**
1b Stems julaceous; leaves appressed when dry, rounded. . . . . 2
2a Leaves rounded-ovate; apex short, wide; branches few . . . . . **L. pseudoleskeoides**
2b Leaves ovate; apex longer, narrow; pinnately branched . . . . . 3
3a Leaves wide-spreading to squarrose when wet; apex incurved; base cordate . . . . . **L. patentifolia**
3b Leaves erect-spreading when wet; apex straight; base not or weakly cordate . . . . . **L. viridis**

### **haplocladioides** Dixon

Plants slender, dark green. **Stems** prostrate, 6–12 mm long. **Leaves** erect when dry, broadly ovate or oblong, long-acuminate, 0.30–1.25 mm long; margins entire to crenulate; costa extending into acumen. **Upper laminal cells** oval or rhomboid, smooth; alar cells transversely elongated. **Perichaetial leaves** convolute, short pointed, costa absent. **Capsule** erect, cylindrical; endostome membrane low. On bark.

MsGr

### **patentifolia** Dixon

Plants in mats. **Stems** prostrate, up to 50 mm long, branches ascending. **Leaves** imbricate when dry, wide-spreading to squarrose when wet, ovate, acuminate, up to 1 mm long; apex curved;

margins entire to crenulate; base cordate; costa strong, extending into acumen. **Upper laminal cells** oval or rhomboid; basal cell elliptical to transversely quadrate towards margins. **Perichaetial leaves** clasping, short pointed, denticulate, costa absent. **Capsule** erect, cylindrical; endostome membrane ½ as high as exostome teeth, without processes or cilia. On bark.

DrGr

### **pseudoleskeoides** Dixon

Plants in mats. **Stems** up to 30 mm long. **Leaves** erect to erect-spreading when dry, erect-spreading to wide-spreading when wet, ovate, long acuminate, 0.5–1.0 mm long; margins entire; costa extending into acumen. **Upper laminal cells** oval, incrassate, transversely elongated towards basal margins. **Perichaetial leaves** convolute, sharply pointed, margins entire, costa absent. **Capsule** erect, cylindrical, endostome membrane ⅓ as high as exostome teeth, without processes or cilia. On bark.

DrGr

### **viridis** Dixon

Plants slender, dark green. **Stems** 5–15 mm long; branches ascending, julaceous. **Leaves** erect-spreading, imbricate, ovate to lanceolate, 0.75 mm long; costa extending into acumen. **Upper laminal cells** roundly quadrate, transversely elongated towards margins and base. **Perichaetial leaves** sheathing, shortly pointed, costa absent. **Capsule** cylindrical, endostome membrane ⅓ as high as exostome teeth. On bark.

DrGr

## **Pseudoleskeopsis** Broth. (sthn Afr.: 3 spp.)

[after Sim: 382 (1926) and Buck: 200 (1993)]

### **claviramea** (Müll.Hal.) Thér.

*Hypnum clavirameum* Müll.Hal.
*Pseudoleskea claviramea* (Müll.Hal.) A.Jaeger

Plants small, in mats. **Stems** up to 50 mm long; branches curved and julaceous when dry. **Leaves** imbricate when dry, spreading when wet, ovate, up to 1 mm long, falcate above, stem leaves longer; apex acute; margins entire to denticulate above; costa extending into acumen. **Upper laminal cells** short, oval or elliptical, quadrate and transversely elongated towards basal margins, smooth. **Perichaetial leaves** sheathing, oblong, long-acuminate, costa weak. **Capsule** inclined to horizontal, curved, contracted below mouth when dry; peristome double, endostome membrane high, with processes and cilia. On soil, rock, bark or humus-rich soil.

DrGr MsGr KarSh

# LEUCODONTACEAE

Plants small to large, forming loose tufts, green to yellow-green or brownish; saxicolous or corticolous. **Secondary stems** erect, julaceous when dry, variably branched; central

strand present or absent; pseudoparaphyllia present or absent. **Leaves** appressed when dry, wide-spreading when wet; broadly ovate to elliptical; acute to acuminate; margins plain, entire or serrate; costa absent, short and double, or single extending to above midleaf; upper laminal cells short, rhombic to fusiform, smooth or prorate; basal cells elongate; alar cells in large groups, quadrate to transversely rectangular. **Dioicous**. **Perichaetia** along stem, obvious. **Capsules** generally exserted, short-cylindrical; peristome double; exostome teeth somewhat irregular, linear, whitish, papillose or smooth; endostome rudimentary, frequently only basal membrane present; operculum rostrate; calyptra cucullate, smooth or with a few hairs. **Spores** granulate.

[after Magill & Van Rooy: 553 (1998)]

### **Pterogoniadelphus** M.Fleisch. (sthn Afr.: 1 sp.)

**assimilis** (Müll.Hal.) Ochyra & Zijlstra
*Felipponea assimilis* (Müll.Hal.) O'Shea
*Leucodon assimilis* (Müll.Hal.) A.Jaeger
*Neckera assimilis* Müll.Hal.

Plants medium to large, in loose tufts. **Secondary stems** ± erect, julaceous and curved when dry, 40–100 mm long. **Leaves** crowded, ecostate, stem leaves ovate to elliptical, short-acuminate or acute; margins entire. **Upper laminal cells** rhombic, thickened, smooth; basal cells in distinct centre group, linear; alar cells distinct, quadrate. **Perichaetia** obvious; leaves imbricate, oblong to lanceolate. **Capsule** exserted, erect, short-cylindrical; peristome double. Recognised by the julaceous, ± erect stems and ecostate leaves with a pronounced group of basal cells. On rocks and trees in forests.




## MNIACEAE

Plants small to large, caespitose or forming loose mats, dark green to yellow-green. **Stems** erect or fertile stems erect and sterile stems procumbent or arcuate; central strand present. **Leaves** frequently pellucid, ovate to linear-lanceolate or oblong to elliptical or spathulate; apex acuminate or rounded; margins bordered or not, entire or dentate, sometimes doubly dentate; costa ending below to short-excurrent, guide cells present, with 1 or 2 stereid bands; laminal cells isodiametric or elongate-rhomboidal to linear-rhomboidal, smooth. **Perichaetia** terminal or quickly lateral through innovation. **Seta** elongate; occasionally polysetaceous. **Capsules** erect to pendulous; peristome double or appearing single, complete or variously reduced; operculum convex or rostrate; calyptra small, cucullate, generally naked. **Spores** round, smooth or finely papillose. *Thyme-mosses*.

[after Magill: 338, 349 & 395 (1987)]

### Key to genera

1a Plants in dark green mats formed by creeping, sterile stems with distant, rounded leaves, fertile stems erect with leaves crowded above; leaf apex rounded to truncate or emarginate . . . . . **Plagiomnium**

1b Plants caespitose, stems erect; leaves evenly spaced or in comal tuft, ovate to ovate-lanceolate; leaf apex subacute to acuminate . . . . . 2
2a Perichaetia on short basal bud or quickly lateral through elongation of subperichaetial innovation; peristome double but appearing single as a result of rudimentary exostome teeth, fragile. . . . . **Mielichhoferia**
2b Perichaetia terminal on elongated shoot; peristome double, complete, persistent . . . . . **Pohlia**

## **Mielichhoferia** Nees & Hornsch. (sthn Afr.: 2 spp.)

### Key to species:

Leaves lanceolate to oval-acuminate, 1–2 mm long; propagules absent; endostome segments 16, linear. . . . . **M. bryoides**
Leaves broadly elliptical or ovate, 0.4–1.0 mm long; propagules bud-like, axillary; endostome rudimentary, segments absent. . . . . **M. subnuda**

### **bryoides** (Harv.) Wijk & Margad.

*Schizymenium bryoides* Harv.

Plants loosely caespitose, somewhat glossy. **Stems** 2–10 mm long. **Leaves** appressed to erect when dry, lanceolate to ovate-acuminate, mostly 1.0–1.8 mm long; margins entire to weakly serrate above; costa ending below to percurrent. **Upper laminal cells** elongate-rhomboidal to linear-rhomboidal. **Capsule** erect to pendent, subpyriform; peristome with rudimentary exostome teeth, endostome with 16 linear segments on low basal membrane, cilia absent. On soil or rock.




### **subnuda** Sim

Plants loosely caespitose. **Stems** 2–5 mm long. **Leaves** appressed when dry, weakly concave; broadly elliptical, ovate or shortly oblong-acute, mostly 0.6–1.0 mm long; margins entire; costa ending below to mucronate. **Upper laminal cells** rhomboidal to elongate-rhomboidal. **Propagules** bud-like, axillary. **Capsule** erect to inclined, subglobose; peristome double, rudimentary. On soil.




## **Plagiomnium** T.J.Kop. (sthn Afr.: 1 sp.)

### **rhynchophorum** (Harv.) T.J.Kop. var. **reidii** (Dixon) T.J.Kop.

*Mnium rhynchophorum* Harv.
*Mnium rostratum* var. *reidii* Dixon

Plants in loose mats, dark green. **Fertile stems** erect, up to 40 mm long, sterile stems long-creeping. **Fertile stem leaves** somewhat contorted when dry, oblong to oblong-spathulate, 5–6 mm long; apex rounded to truncate or emarginate; margins dentate to denticulate; costa mucronate; sterile stem leaves distant, scattered, orbicular to broadly elliptical, strongly bordered. **Laminal cells** rounded, collenchymatous, smooth; marginal cells elongate, in 3 rows. **Capsule** horizontal to pendulous; peristome double, complete. Recognised by the dark green mats formed by creeping sterile stems with distant, rounded leaves. On wet soil or rock.



## **Pohlia** Hedw. (sthn Afr.: 4 spp.)

### **elongata** Hedw.

Plants loosely caespitose. **Stems** 5–20 mm long. **Leaves** longer and narrower above, appressed when dry, ovate-lanceolate, 1–2 mm long, becoming linear-lanceolate, 1.7–3.5 mm long at apex, forming distinct tuft; apex acuminate; margins entire to denticulate at apex; costa subpercurrent. **Upper laminal cells** oblong-rhomboidal to linear. **Capsule** curved, asymmetrical, inclined to horizontal, cylindrical-pyriform, neck as long as urn; peristome with exostome teeth and endostome segments, cilia present, rudimentary or absent. On soil at high altitude. *Long-fruited thread-moss*.




# NECKERACEAE

Plants small to large or occasionally robust, dark green to yellow green or golden; occasionally dendroid; corticolous or saxicolous. **Primary stems** creeping; secondary stems erect and perpendicular to substrate or appressed; stipe sometimes differentiated; central strand small or absent; paraphyllia filamentous or absent, pseudoparaphyllia filamentous or narrowly foliose. **Leaves** frequently complanate and undulate, ovate to oblong; apex acute; margins plane, entire or toothed above; costa strong and single or short and double. **Laminal cells** mostly fusiform to linear, mostly smooth, sometimes pitted; alar cells few or weakly differentiated. **Dioicous** or **autoicous**. **Perigonia** and **perichaetia** along stems or branches. **Capsules** immersed or long-exserted, erect; peristome double, incomplete; exostome teeth narrow, striate below, endostome often reduced, cilia absent. **Operculum** rostrate. **Calyptrae** cucullate, smooth or with a few hairs. **Spores** small, round.

[after Magill & Van Rooy: 590, 592 (1998)]

## **Porotrichum** (Brid.) Hampe (sthn Afr.: 3 spp.)

### **madagassum** Kiaer ex Besch.

Plants yellow-green, in loose colonies. **Primary stems** long-creeping, secondary stems erect, 60–100 mm long, ± dendroid. **Leaves** somewhat crowded, flattened, erect-appressed, ovate to elliptical, 1.5–2.5 mm long, branch leaves smaller; apex acute to short-acuminate; margins serrate above; costa single, ± to midleaf. **Upper laminal cells** rhomboidal, smooth. **Capsule** exserted, erect, ovoid; peristome double, endostome cilia absent. Recognised by its habit, ± flaccid appearance, rhomboidal to fusiform laminal cells and acute, serrate leaf apices. On rock or bark in moist forests.



# ORTHOTRICHACEAE

Plants acrocarpous or cladocarpous, forming mats or caespitose; saxicolous, corticolous or terricolous. **Stems** prostrate or erect; central strand absent or weak. **Leaves** ovate, lanceolate or oblong; unistratose, bistratose or irregularly multistratose; margins plane, recurved or rarely incurved, entire or toothed above, rarely tuberculate below; costa single; upper laminal cells generally small, isodiametric, incrassate, smooth, mammillose or papillose; basal cells generally rectangular to quadrate. **Gemmae** present or absent. **Autoicous**, **dioicous** or **synoicous**, occasionally **pseudautoicous**. **Perichaetia** terminal on stems or branches. **Capsules** immersed to exserted, erect, frequently ribbed; peristome double or reduced; exostome teeth recurved when dry; endostome segments 8 or 16, alternating with teeth, basal membrane low or absent, cilia absent; operculum mostly conic-rostrate; calyptra cucullate, mitrate or campanulate, typically plicate and hairy, occasionally lobed or lacerate below. **Spores** round, isosporous or anisosporous. *Bristle-mosses*.

[after Magill & Van Rooy: 476 (1998)]

## Key to genera

Primary stem erect, simple or sparsely branched; sporophytes produced on primary stem or branches; capsule immersed, emergent or exserted . . . . . **Orthotrichum**
Primary stem prostrate, with many erect to ascending branches; sporophytes produced on secondary stem and branches; capsule exserted . . . . . **Macrocoma**

## **Macrocoma** (Hornsch. ex Müll.Hal.) Grout (sthn Afr.: 3 spp.)

### Key to species:

Branch leaf apex fragile; laminal cells generally rounded-quadrate, frequently obscure . . . . . **M. lycopodioides**
Branch leaf apex intact; laminal cells oval, clear. . . . . **M. tenuis** subsp. **tenuis**

### **lycopodioides** (Schwägr.) Vitt

*Macromitrium lycopodioides* Schwägr.

Plants yellowish green or olive-green above. **Stems** up to 90 mm long. **Branch leaves** crowded, appressed to spirally appressed when dry, lanceolate, 0.5–1.0 mm long, keeled, unistratose to bistratose; apex fragile; margins plane to recurved below; costa ending below to percurrent. **Upper laminal cells** rounded-quadrate, frequently obscure, mammillose to papillose below, intercellular spaces many. **Capsule** ribbed; peristome double, reduced; calyptra densely hairy. On bark of trees and rock.




### **tenuis** (Hook. & Grev.) Vitt subsp. **tenuis**

*Macromitrium confusum* Mitt.

Plants yellowish green to dark green or olive-green above. **Stems** up to 150 mm long. **Branch leaves** crowded, appressed to spirally appressed when dry, lanceolate, 0.5–1.6 mm long, keeled, unistratose with bistratose patches above; apex intact; margins plane to recurved below; costa ending below to mucronate. **Upper laminal cells** oval to rounded; mammillose to

papillose below, with intercellular spaces below. **Capsule** smooth to ribbed; peristome double, reduced; calyptra densely hairy. On bark of trees and occasionally on rock.

MsGr

## **Orthotrichum** Hedw. (sthn Afr.: 8 spp.)

### Key to species:

Leaf apex aristate, cells elongate; costa frequently merging with apical cells . . . . . **O. diaphanum**

Leaf apex apiculate, cells scarcely differentiated, rounded; costa ending below apex . . . . . **O. transvaaliense**

### **diaphanum** Schrad. ex Brid.

Plants caespitose. **Stems** up to 13 mm long. **Leaves** erect and flexuose when dry, lanceolate, mostly 1.8–2.8 mm long, ventral surface keeled; apex aristate, cells elongate, incrassate; margins entire to denticulate at apex; costa merging with apical cells. **Upper laminal cells** rounded-hexagonal, smooth or weakly papillose. **Gemmae** fusiform, on lamina. **Capsule** emergent, weakly 8-ribbed; exostome teeth and endostome processes 16. On bark of indigenous and exotic trees. *White-tipped bristle-moss*.

DrGr MsGr

### **transvaaliense** Rehmann ex Sim

Plants caespitose. **Stems** 3–13 mm long. **Leaves** erect to appressed when dry, concave, lanceolate, mostly 1.7–2.8 mm long, ventral surface keeled; apex acute or apiculate, cells weakly differentiated, rounded; margins entire to denticulate at apex; costa ending below. **Upper laminal cells** rounded-hexagonal, incrassate, smooth or weakly papillose. **Gemmae** fusiform, on lamina. **Capsule** emergent, 8-ribbed; exostome teeth in 8 pairs, endostome processes 8 or 16. On bark of indigenous and exotic trees. *Transvaal bristle-moss*.

DrGr

# POLYTRICHACEAE

Plants small to robust. Stems erect, typically rhizomatous, sparsely branched, central strand and well-developed internal conducting systems present. Leaves scale-like below, stiff above, frequently differentiated into narrow limb and broad, sheathing base; upper surface of the limb with longitudinal chlorophyllose lamellae; margins plane to infolded, sometimes limbate, often serrate to spinose; costa usually broad, often with teeth on abaxial side; sheathing base cells mostly elongate-rectangular to linear; limb cells isodiametric, incrassate. Dioicous, rarely **autoicous**. Perigonia often conspicuous as apical, flower-like rosettes. Perichaetia terminal; leaves differentiated; seta elongate, stout and wiry. Capsules large, suberect to inclined, urn angled or cylindric; apophysis indistinct or distinct; operculum usually long rostrate, oblique; peristome nematodontous, teeth (16)32–64; calyptra cucullate, usually densely hairy. Spores minute to small. *Hairy-caps*.

[after Müller (2000)]

## ORTHOTRICHACEAE

## Key to genera

1a Leaves bordered by linear, thick-walled cells, marginal teeth often paired . . . . . **Atrichum**
1b Leaves not bordered, margins entire or teeth single . . . . . 2
2a Lamellae restricted to upper costal surface, not covering upper part of leaf, sinuose; calyptra sparsely hairy or smooth . . . . . **Oligotrichum**
2b Lamellae almost filling upper part of leaf, ± straight; calyptra hairy. . . . . 3
3a Terminal cells of lamellae bilobed or pyriform in cross section . . . . . **Polytrichum**
3b Terminal cells of lamellae globose, subglobose or quadrate with incrassate walls . . . . . **Pogonatum**

## **Atrichum** P.Beauv. (sthn Afr.: 1 sp.)

**androgynum** (Müll.Hal.) A.Jaeger
*Catharinea androgyna* Müll.Hal.

Plants in loose tufts. **Stems** up to 53 mm long. **Leaves** strongly crisped when dry, ligulate to linear-obovate, 5–10 mm long, often undulate, usually toothed dorsally; apex acute to short-acuminate; margins limbate, double-toothed; costa narrow, percurrent; lamellae 4–6, confined to upper surface of costa, 2–6 cells high. **Upper laminal cells** short rectangular to subquadrate. **Capsule** suberect to inclined, long and narrow; peristome teeth 32. Recognised by the undulate leaves, crisped and contorted when dry, and the narrow costa with 4–6 rows of lamellae. On soil banks, road cuts and sides of paths. *Smoothcap*.

MsGr

## **Oligotrichum** DC. (sthn Afr.: 4 spp.)

[after Fanshawe: 64 (1980)]

**wageri** (Broth.) G.L.Sm.
*Psilopilum wageri* Broth.

Plants small, deep green. **Stems** 3–5 mm long. **Leaves** incurled when wet, lanceolate above ovate, clasping base, 3–4 mm long; margins inflexed; costa percurrent; lamellae 6–12, confined to upper costal surface, sinuose, 5(2–10) cells high, terminal cell in section rounded, not much differentiated from subterminal cells; blade margins up to 21 cells wide. **Capsule** subglobose, asymmetrical, laterally compressed; peristome teeth 32. On soil at high altitudes. *Wager's haircap*.

MsGr

## **Pogonatum** P.Beauv. (sthn Afr.: 4 spp.)

[after Sharp *et al*.: 1083 (1994) and Chuah-Petiot: 39 (2003)]

**perichaetiale** (Mont.) A.Jaeger subsp. **oligodus** (Kunze ex Müll.Hal.) Hyvönen
*Pogonatum oligodus* (Kunze ex Müll.Hal.) Mitt.
*Polytrichum perichaetiale* Mont.

Plants loosely tufted to gregarious, rigid. **Stems** up to 12 mm long. **Leaves** erect-spreading, involute when dry, lanceolate from an ovate, sheathing, pellucid base, 6–7 mm long; apex

acute; margins erect, serrate; costa ending in a toothed awn; lamellae 5–7 cells high, terminal cell in section quadrate, incrassate; cells of sheath rectangular. **Capsule** erect to inclined, ovoid-cylindrical; peristome teeth 16. **Calyptra** hairy. On soil banks or soil over rock.




## **Polytrichum** Hedw. (sthn Afr.: 4 spp.)

[after Fanshawe: 45 (1980) and Sharp *et al*.: 1074 (1994)]

### Key to species:

Leaf margins toothed, narrow; terminal cells of lamellae bilobed . . . . **P. commune**
Leaf margins entire, broadly involute and covering the upper leaf surface; terminal cells of lamellae pyriform . . . . . **P. juniperinum**

### **commune** Hedw.

Plants large, in tufts. **Stems** stiff, 25–233 mm long. **Leaves** rigid, scale-like below, loosely appressed when dry, erect-spreading and recurved when wet, 8–12 mm long, linear-lanceolate; apex acuminate; base oblong, sheathing, shiny; margins narrow, erect, coarsely dentate; costa excurrent as long, dentate awn; lamellae 5–8 cells high, terminal cell bilobed. **Upper laminal cells** subquadrate, hexagonal or rectangular. **Capsule** 4-angled, box-like, with distinct apophysis. **Calyptra** hairy. On soil banks and road cuts. *Common haircap*.




### **juniperinum** Hedw.

Plants medium-sized to large, in tufts. **Stems** up to 30 mm long. **Leaves** scale-like below, imbricate and erect when dry, wide-spreading to squarrose when wet, 6–8 mm long; apex subulate; base oblong, sheathing, shiny; margins entire, broadly involute, covering the upper leaf surface; costa excurrent as rough, reddish awn; lamellae 6–8 cells high, terminal cell pyriform, incrassate. **Upper laminal cells** at margins transversely elongate. **Capsule** 4-angled, rectangular. **Calyptra** hairy. On soil over rock. *Juniper haircap*.




# POTTIACEAE

Plants minute to robust, usually in dense tufts; terricolous, saxicolous or corticolous. **Stems** erect, central strand often present. **Leaves** appressed or contorted when dry, spreading to squarrose when wet; frequently narrowly lanceolate to ligulate; lamina usually unistratose; apex acute to broadly rounded; margins usually entire, plane to revolute or involute; costa single, percurrent to excurrent as long or short awn, smooth or denticulate, rarely ending below apex; upper laminal cells small, isodiametric, mostly papillose, generally incrassate; basal cells generally larger, oblong, smooth; gemmae or propagules occasionally produced. **Perichaetia** terminal or rarely lateral; seta elongate, rarely shorter than urn. **Capsules** erect, symmetrical, mostly stegocarpic, cylindrical or

globose to oval; peristome of 16 or 32 segments; operculum conical to rostrate; calyptra cucullate, naked, smooth. **Spores** mostly round, smooth to strongly papillose.

[after Magill: 177 (1981]

## Key to genera

1a Costa without a ventral stereid band, ventral cells occasionally incrassate . . . . . 2
1b Costa with a ventral stereid band, strong or weak. . . . . 9
2a Leaves mostly broadest at middle or above, oval to oblong or lingulate to spathulate; leaf cells generally large with several C-shaped, or rarely spinose, papillae . . . . . 3
2b Leaves broadest below middle, ovate to lanceolate; leaf cell papillae rarely C-shaped . . . . . 4
3a Costa with a pad of enlarged upper ventral cells, mucronate; transition from medial to basal laminal cells gradual . . . . . **Tortula**
3b Costa without a pad of enlarged ventral cells, mucronate, apiculate or aristate; basal laminal cells abruptly differentiated . . . . . **Syntrichia**
4a Leaves in 3 ranks, cells spinose-papillose . . . . . **Triquetrella**
4b Leaves not 3-ranked, cells with low, blunt papillae, smooth or mammillose . . . . . 5
5a Leaf margins plane. . . . . 6
5b Leaf margins recurved to revolute below, if margins plane, then bistratose . . . . . 8
6a Archegonia on short lateral branches; perichaetial leaves strongly differentiated . . . . . **Anoectangium**
6b Archegonia terminal on main stem; perichaetial leaves weakly differentiated . . . . . 7
7a Plants dull; stem with central strand small or absent; leaf lamina uni- or bi-stratose above; operculum deciduous . . . . . **Gymnostomum**
7b Plants often glossy; stem with central strand absent; leaf lamina unistratose; capsule systylious . . . . . **Hymenostylium**
8a Plants reddish green; leaf apices with a clear, smooth apiculus and occasionally one to several smooth, clear marginal teeth; basal cells well defined, enlarged . . . . . **Bryoerythrophyllum**
8b Plants green or yellowish; leaf apices without clear, smooth apiculus or marginal teeth; basal cells little differentiated . . . . . **Didymodon**
9a Stems without central strand. . . . . 10
9b Stems with central strand present but occasionally weak . . . . . 13
10a Leaves in 3 ranks; margins recurved below; cells spinose-papillose. . . . . **Triquetrella**
10b Leaves not 3-ranked; margins plane; cells with low, blunt papillae . . . . . 11
11a Plants larger; peristome present. . . . . **Trichostomum**
11b Plants small; peristome absent . . . . . 12
12a Plants dull; leaf lamina bistratose above; operculum deciduous . . . . . **Gymnostomum**
12b Plants often glossy; leaf lamina unistratose; capsule systylious . . . . . **Hymenostylium**
13a Leaf margins recurved to revolute . . . . . **Pseudocrossidium**
13b Leaf margins plane or involute . . . . . 14
14a Leaf margins involute. . . . . 15
14b Leaf margins plane. . . . . 16
15a Leaf with narrow border of elongate, hyaline cells up to mid-leaf; upper laminal cells with massive, bifid papillae ventrally. . . . . **Hypodontium**
15b Leaf border absent; upper laminal cells with low, simple papillae . . . **Weissia**

16a Leaves bistratose juxtacostally . . . . . **Timmiella**
16b Leaves unistratose . . . . . 17
17a Leaves widely spreading to squarrose above sheathing bases when wet; broadly lanceolate to ligulate above obovate bases . . . . . **Barbula**
17b Leaves erect-spreading to widely spreading when wet; linear to lanceolate or narrowly spathulate to elliptical or oblong, base not strongly differentiated . . . . . 18
18a Leaves linear to lanceolate, up to 5 mm long; basal hyaline cells extending up margins forming distinct V-shaped area in leaf base. . . . . **Tortella**
18b Leaves narrowly spathulate to elliptical or oblong, up to 3.5 mm long; basal hyaline cells not or weakly extending up margins . . . . . **Trichostomum**

## **Anoectangium** Schwägr. (sthn Afr.: 1 sp.)

### **wilmsianum** (Müll.Hal.) Paris

*Zygydon wilmsianus* Müll.Hal.

Plants slender. **Stems** 5–20 mm long, central strand absent. **Leaves** incurved and twisted when dry, ligulate to lanceolate or ovate-lanceolate, 0.8–1.2 mm long, ventral surface grooved along costa; apex acute, mucronate; costa percurrent, with dorsal stereid band. **Upper laminal cells** rounded, incrassate, papillae low, basal cells quadrate. **Perichaetia** on short lateral branches, leaves distinct, ovate. **Capsule** oval, peristome absent. In dense cushions on soil or soil over rock at high altitudes. *Wilms' beardless-moss*.

MsGr

## **Barbula** Hedw. (sthn Afr.: 7 spp.)

### **microcalycina** Magill

Plants glaucous-green when dry. **Stems** 8–20 mm long, central strand present. **Leaves** incurved when dry, squarrose when wet, ligulate above obovate, sheathing bases, 1.5–2.5 mm long; apex acute to obtuse; margins plane; costa mucronate, with ventral and dorsal stereid bands. **Upper laminal cells** rounded, incrassate, papillae low, basal cells highly differentiated, rectangular, hyaline. **Perichaetia** terminal. **Capsule** cylindrical; peristome teeth short. Recognised by the ligulate leaves with obovate, sheathing bases and highly differentiated basal cells. On soil or rock at high altitudes.

MsGr

## **Bryoerythrophyllum** P.C.Chen (sthn Afr.: 2 spp.)

### **campylocarpum** (Müll.Hal.) H.A.Crum

*B. jamesonii* fide Magill (1981)
*Trichostomum campylocarpum* Müll.Hal.

Plants with reddish tint. **Stems** 2–15 mm long, central strand present. **Leaves** incurved, contorted when dry, ligulate to oblong-lanceolate, 1.0–1.5 mm long; apex acute, mucronate; margins plane above, entire or irregularly dentate by smooth marginal cells; costa short-excurrent, ventral stereid band weak or absent. **Upper laminal cells** rounded-quadrate,

papillose; basal cells enlarged, rectangular, smooth. **Perichaetia** terminal. **Capsule** cylindrical; peristome teeth erect, fragile. On soil or rock.

DrGr MsGr

## **Didymodon** Hedw. (sthn Afr.: 6 spp.)

### Key to species:

1a Leaf margins plane, bistratose above . . . . . 2
1b Leaf margins reflexed or recurved to revolute, unistratose . . . . . 3
2a Leaf cells papillose. . . . . **D. australasii**
2b Leaf cells smooth . . . . . **D. umbrosus**
3a Leaf apex rounded to obtuse; leaf cells smooth; axillary gemmae infrequently produced; peristome absent . . . . . **D. tophaceopsis**
3b Leaf apex acute to broadly rounded; leaf cells smooth to weakly papillose; axillary gemmae absent; peristome present . . . . . **D. tophaceus**

### **australasii** (Hook. & Grev.) R.H.Zander

*Tortula australasii* Hook. & Grev.
*Trichostomopsis australasiae* (Hook. & Grev.) H.Rob.

Plants caespitose. **Stems** up to 10 mm long, central strand and hyalodermis present. **Leaves** incurved to contorted when dry, lanceolate, 1–2 mm long; apex acute; margins bistratose above; costa percurrent, ventral surface cells papillose, ventral stereid band absent. **Upper laminal cells** rounded, subquadrate, papillose, basal cells rectangular, thin-walled. **Capsule** short-cylindrical, peristome teeth divided. On soil over rock. *Australasian beard-moss*.

MsGr

### **tophaceopsis** R.H.Zander

*Gyroweisia amplexicaulis* Sim
*Husnotiella latifolia* (Dixon) R.H.Zander & Magill

Plants very small. **Stems** 3–4 mm long, central strand present. **Leaves** appressed when dry, ligulate to ovate-lanceolate, 0.5–1.0 mm long; apex rounded to obtuse; recurved or reflexed to plane; costa ending well below apex, ventral stereid band absent. **Upper laminal cells** rounded-quadrate, incrassate, smooth. **Gemmae** axillary, obovoid. **Capsule** short-cylindrical, peristome absent. On soil.

DrGr MsGr

### **tophaceus** (Brid.) Lisa

*D. ceratodonteus* (Müll.Hal.) Dixon
*Trichostomum tophaceum* Brid.

Plants in dense cushions. **Stems** 10–50 mm long, central strand small. **Leaves** ovate-acuminate to lanceolate or ligulate, 1.0–1.8 mm long; apex acute to rounded; margins reflexed to recurved below; costa percurrent to ending below, ventral stereid band absent. **Upper laminal cells** rounded-quadrate, incrassate, some cells with low papillae. **Capsule** short-cylindrical, peristome absent. On wet soil, rock or concrete banks of water courses. *Olive beard-moss*.

DrGr MsGr KarSh Zastr

**umbrosus** (Müll.Hal.) R.H.Zander
*D. trivialis* (Müll.Hal.) J.Guerra
*Trichostomopsis trivialis* (Müll.Hal.) H.Rob.

Plants caespitose. **Stems** up to 10 mm long, central strand very small. **Leaves** incurled when dry, lanceolate to ovate-lanceolate, 1.5–2.0 mm long; apex broadly acute; margins bistratose; costa percurrent, ventral stereid band absent. **Upper laminal cells** irregularly quadrate to short-rectangular, ± smooth, basal cells rectangular, thin-walled. **Capsule** short-cylindrical, peristome teeth divided. On soil.




## **Gymnostomum** Nees & Hornsch. (sthn Afr.: 3 spp.)

### Key to species:

Leaf lamina unistratose; apex obtuse to rounded or broadly acute; costa with ventral stereid band absent or small . . . . . **G. aeruginosum**
Leaf lamina bistratose above base; apex acute; costa with ventral stereid band present . . . . . **G. bewsii**

**aeruginosum** Sm.

Plants small. **Stems** up to 3 mm long, central strand small. **Leaves** ligulate to linear-lanceolate above oblong base, 0.4–1.5 mm long; apex obtuse to broadly acute and apiculate; margins plane; costa ending below to percurrent; in section dorsal stereid band absent or small. **Upper laminal cells** quadrate, sparsely papillose; basal cell rectangular, hyaline. **Capsule** elliptical, peristome absent. On soil or sandstone. *Verdigris tufa-moss*.




**bewsii** Sim

Plants in tufts or dense cushions. **Stems** 5–20 mm long, central strand absent. **Leaves** linear to linear-lanceolate, 1–2 mm long, broadly concave ventrally, bistratose above; apex acute; margins entire or denticulate at shoulders; costa percurrent to just excurrent, in section with dorsal and ventral stereid bands. **Upper laminal cells** quadrate, incrassate, with low papillae; basal cells short-rectangular, hyaline. **Capsule** short cylindrical, peristome absent. On soil over rock. *Bews' tufa-moss*.




## **Hymenostylium** Brid. (sthn Afr.: 1 sp.)

**recurvirostrum** (Hedw.) Dixon
*Gymnostomum recurvirostrum* Hedw.

Plants frequently glossy. **Stems** 10–20 mm long, central strand absent. **Leaves** keeled, ligulate to oblong-lanceolate, 0.5–2.0 mm long; apex acute; margins plane to recurved on one side below; costa percurrent to just excurrent; in section ventral stereid band weak. **Upper laminal cells** quadrate to short-rectangular, papillae scattered. **Capsule** systylious, peristome absent.

Recognised by the glossy appearance, keeled leaves, lower margins recurved on one side and the systylious capsule. On wet rock or soil over rock at high altitudes. *Hook-beak tufa-moss*.

MsGr

## **Hypodontium** Müll.Hal. (sthn Afr.: 2 spp.)

### **dregei** (Hornsch.) Müll.Hal.

*Syrrhopodon dregei* Hornsch.

Plants in dense cushions. **Stems** 10–30 mm long, central strand small. **Leaves** contorted when dry, narrowly lingulate above oval, sheathing base, 4–5 mm long; apex acute; margins involute above mid-leaf, border reaching mid-leaf; costa mucronate, with stereid bands. **Upper laminal cells** quadrate, ventral surface with massive papillae; basal cells rectangular, hyaline. **Perichaetial leaves** highly differentiated. **Capsule** short-cylindrical, peristome teeth 16. Recognised by the contorted upper leaves when dry and conspicuous sheathing, hyaline bases. On rock or bark. *Drege's netted-leaf-moss*.

DrGr MsGr Zastr

## **Pseudocrossidium** R.S.Williams (sthn Afr.: 4 spp.)

### Key to species:

Costa long-excurrent as a smooth, yellow awn; margins recurved, cells not differentiated; common. . . . . **P. crinitum**
Costa percurrent to mucronate; margins spirally revolute, cells enlarged, thin-walled, smooth; rare . . . . . **P. replicatum**

### **crinitum** (Schultz) R.H.Zander

*Barbula crinita* Schultz

Plants yellow-green. **Stems** up to 35 mm long, central strand small. **Leaves** contorted to spirally twisted when dry, lanceolate to linear above ovate base, 2.0–4.5 mm long; acute to obtuse, frequently asymmetrical; margins recurved; costa aristate, with stereid bands. **Upper laminal cells** hexagonal to quadrate, papillose. **Capsule** cylindrical, peristome teeth spirally twisted. On soil or soil over rock, frequently collected. *Wispy beard-moss*.

DrGr MsGr KarSh Zastr

### **replicatum** (Taylor) R.H.Zander

*Barbula acutata* Müll.Hal.
*B. replicata* Taylor

Plants in loose cushions. **Stems** 8–15 mm long, central strand large. **Leaves** spirally twisted around stem when dry, lanceolate to ligulate, 1.0–1.5 mm long; apex obtuse to broadly acute; margins spirally revolute; costa percurrent to mucronate, with stereid bands. **Upper laminal cells** quadrate to short-rectangular, papillose; marginal cells enlarged, thin-walled, smooth. **Sporophytes** not known in area. On soil, rarely collected.

MsGr

## **Syntrichia** Brid. (sthn Afr.: 13 spp.)

[after Magill: 212 (1981), Kramer: 81 (1988) and Mishler: 618 (2007)]

### Key to species:

| | | |
|---|---|---|
| 1a | Costa mucronate | 2 |
| 1b | Costa excurrent as a short or long awn | 3 |
| 2a | Leaves fragile, especially below; propagules absent | **S. fragilis** |
| 2b | Leaves not fragile; propagules leaf-like, papillose, axillary | **S. ammonsiana** |
| 3a | Upper laminal cells with a single papilla on dorsal surface | **S. papillosa** |
| 3b | Upper laminal cells with multiple papillae on both surfaces | 4 |
| 4a | Leaves erect to spreading when wet, not recurved; gemmae in chains on ventral surface of costa, globular, multicellular | **S. leucostega** |
| 4b | Leaves squarrose-recurved when wet; gemmae absent | 5 |
| 5a | Leaf apex acute to acuminate; margins plane above, revolute below; awn frequently red-brown | **S. norvegica** |
| 5b | Leaf apex rounded, emarginate or truncate; margins revolute to apex; awn frequently hyaline | **S. ruralis** |

### **ammonsiana** (H.A.Crum & L.E.Anderson) Ochyra

*Tortula ammonsiana* H.A.Crum & L.E.Anderson

Plants in loose tufts. **Stems** 10–15 mm long, central strand large. **Leaves** infolded and twisted when dry, subspathulate, 2.5–4.5 mm long; apex rounded; margins plane, entire; costa mucronate, smooth. **Upper laminal cells** quadrate to hexagonal, 4–6 C-shaped papillae per cell; basal cells abruptly differentiated, narrower toward the margins. **Propagula** on stalks in axils of distal leaves, leaf-like. **Capsule** cylindrical, peristome teeth weakly twisted, fragile. On sandstone or sandy soil. *Ammons' screw-moss*.

DrGr MsGr

### **fragilis** (Taylor) Ochyra

*Tortula fragilis* Taylor
*Tortula schmidii* (Müll.Hal.) Broth.

Plants in dense tufts. **Stems** 10–15 mm long, central strand small. **Leaves** fragile, lingulate to spathulate, 2.5–3.0 mm long; apex obtuse; margins recurved below; costa mucronate to apiculate, denticulate dorsally. **Upper laminal cells** quadrate to hexagonal, 4–6 C-shaped papillae per cell; basal cells abruptly differentiated, rectangular to quadrate at margins. **Sporophytes** not known in area. On cliffs or bark in wooded areas. *Fragile-leaved screw-moss*.

DrGr MsGr Zastr

### **leucostega** (Müll.Hal.) R.H.Zander

*Barbula leucostega* Müll.Hal.
*Tortula leucostega* (Müll.Hal.) Broth.

Plants large. **Stems** 10–30 mm long. **Leaves** erect to spreading, spathulate, 3–4 mm long; apex rounded, emarginate; margins recurved to revolute below, border absent or indistinct; costa excurrent as long, hyaline, dentate awn, denticulate dorsally. **Upper laminal cells** papillose; basal cells hyaline, thin-walled. **Gemmae** in chains on ventral side of costa, globular, multicellular. **Capsule** straight or slightly curved, peristome teeth twisted. On sandstone or soil. Two varieties, var. *leucostega* and var. *trachyneura* (Dixon) R.H.Zander, have been reported from the area.

DrGr MsGr KarSh

**norvegica** F.Weber
*Tortula norvegica* (F.Weber) Lindb.

Plants large. **Stems** 8–25 mm long, central strand absent. **Leaves** squarrose-recurved when moist, lingulate-ovate, 2.5–3.5 mm long, channelled; apex acute to acuminate; margins revolute below; costa excurrent as serrulate to serrate, red-brown awn, papillose dorsally. **Upper laminal cells** papillose; basal cells abruptly differentiated, rectangular to quadrate. **Sporophytes** not known. On rock at high altitude. *Norway screw-moss*.

MsGr

**papillosa** (Wilson) Jur.
*Tortula papillosa* Wilson

Plants small. **Stems** 2–8 mm long, with central strand. **Leaves** broadly spathulate, 2.0–2.5 mm long; apex obtusely acute to rounded; margins plane; costa excurrent as short, yellowish, weakly toothed awn, spinose dorsally. **Upper laminal cells** hexagonal to polygonal, 1(2) spinose papillae dorsally; basal cells rectangular. **Gemmae** on dorsal surface of costa, round, multicellular. **Sporophytes** not known in area. On bark of trees in dry woodland. *Marble screw-moss*.

DrGr

**ruralis** (Hedw.) F.Weber & D.Mohr
*Barbula ruralis* Hedw.
*Tortula ruralis* (Hedw.) P.Gaertn., B.Mey. & Scherb.

Plants large. **Stems** 5–15 mm long, central strand absent. **Leaves** wide-spreading to squarrose-recurved when wet, oblong-spathulate, 1.5–3.0 mm long; apex emarginate or truncate; margins revolute to upper leaf; costa long-excurrent as hyaline dentate awn; papillose to spinose on dorsal surface. **Upper laminal cells** hexagonal, papillose; basal cells abruptly differentiated, narrowly rectangular, hyaline. **Capsule** straight, peristome teeth twisted. On rock or soil over rock. *Great hairy screw-moss*.

Zastr

## **Timmiella** (De Not.) Limpr. (sthn Afr.: 1 sp.)

**pelindaba** Magill

Plants small. **Stems** up to 5 mm long, central strand small. **Leaves** crisped with involute margins when dry, bistratose juxtacostally, constricted above base, ligulate, 3.5–4.5 mm long; apex acute; base oval; margins irregularly serrate above; costa percurrent, wide below, with stereid bands. **Upper laminal cells** quadrate, mammillose ventrally, in section dorsal cells larger than ventral cells, basal cells lax. **Capsule** with persistent annulus, peristome teeth straight. On soil or rock. *Pelindaba timmiella*.

DrGr MsGr Zastr

## **Tortella** (Lindb.) Limpr. (sthn Afr.: 3 spp.)

**xanthocarpa** (Schimp. ex Müll.Hal.) Broth.
*Trichostomum xanthocarpum* Schimp. ex Müll.Hal.

Plants caespitose. **Stems** 1–5 mm long, central strand small. **Leaves** contorted to incurved when dry, lanceolate or linear, 2.5–5.0 mm long; apex acute, mucronate; base oval to oblong;

margins entire; costa short-excurrent, with stereid bands. **Upper laminal cells** quadrate to short-rectangular, papillose; basal cells rectangular. **Capsule** cylindrical, peristome teeth twisted counter-clockwise. Recognised by the narrow leaves with plane margins, basal cells extending up margins, and costa with dorsal and ventral stereid bands. On soil, rock or bark of trees.

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|

## **Tortula** Hedw. (sthn Afr.: 4 spp.)

### **atrovirens** (Sm.) Lindb.

*Desmatodon convolutus* (Brid.) Grout
*Grimmia atrovirens* Sm.

Plants gregarious or in loose patches. **Stems** 2–5 mm long, central strand present. **Leaves** incurled, spirally twisted or contorted when dry, oval to oblong or lingulate; apex acute to obtuse; margins narrowly revolute; costa percurrent, convex ventrally, ventral stereid band absent. **Upper laminal cells** quadrate to hexagonal, with 4–6 C-shaped papillae; basal cells lax, smooth. **Capsule** cylindrical, peristome teeth divided into filaments. Recognised by the enlarged ventral cells of the upper costa. On soil in semi-arid areas. *Rib-leaf-moss*.

| | | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

## **Trichostomum** Bruch (sthn Afr.: 3 spp.)

### Key to species:

Stem with a central strand; peristome absent or rudimentary . . . . **T. brachydontium**
Stem without a central strand; peristome teeth filiform . . . . . **T. tenuirostre**

### **brachydontium** Bruch

Plants caespitose. **Stems** 4–26 mm long, central strand present. **Leaves** incurved, crisped when dry, widely spreading when wet, narrowly spathulate to elliptical or oblong, 2.5–3.5 mm long; apex acute to obtuse, cuspidate; margins plane; costa short-excurrent, with stereid bands. **Upper laminal cells** subquadrate, incrassate, papillose, basal cells rectangular, hyaline, smooth. **Capsule** short-cylindrical, peristome absent or rudimentary. On soil in a variety of habitats, common. *Variable crisp-moss*. Figure 25 (11–19).

| | AcGr | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

### **tenuirostre** (Hook. & Taylor) Lindb.

*Oxystegus cylindricus* (Bruch ex Brid.) Hilp.
*Weissia tenuirostris* Hook. & Taylor

Plants loosely caespitose. **Stems** 5–10 mm long, central strand absent. **Leaves** incurved, spirally twisted when dry, erect-spreading when wet, frequently broken, linear-lanceolate, 2.5–4.5 mm long; apex acute to acuminate; margins plane; costa percurrent to short-excurrent, with stereid bands. **Upper laminal cells** quadrate to short-rectangular, incrassate, papillose; basal cells hyaline, smooth. **Capsule** cylindrical; peristome teeth erect or weakly twisted, filiform. On soil or rock. *Narrow-fruited crisp-moss*. Figure 25 (1–10).

| | | | MsGr | | |
|---|---|---|---|---|---|

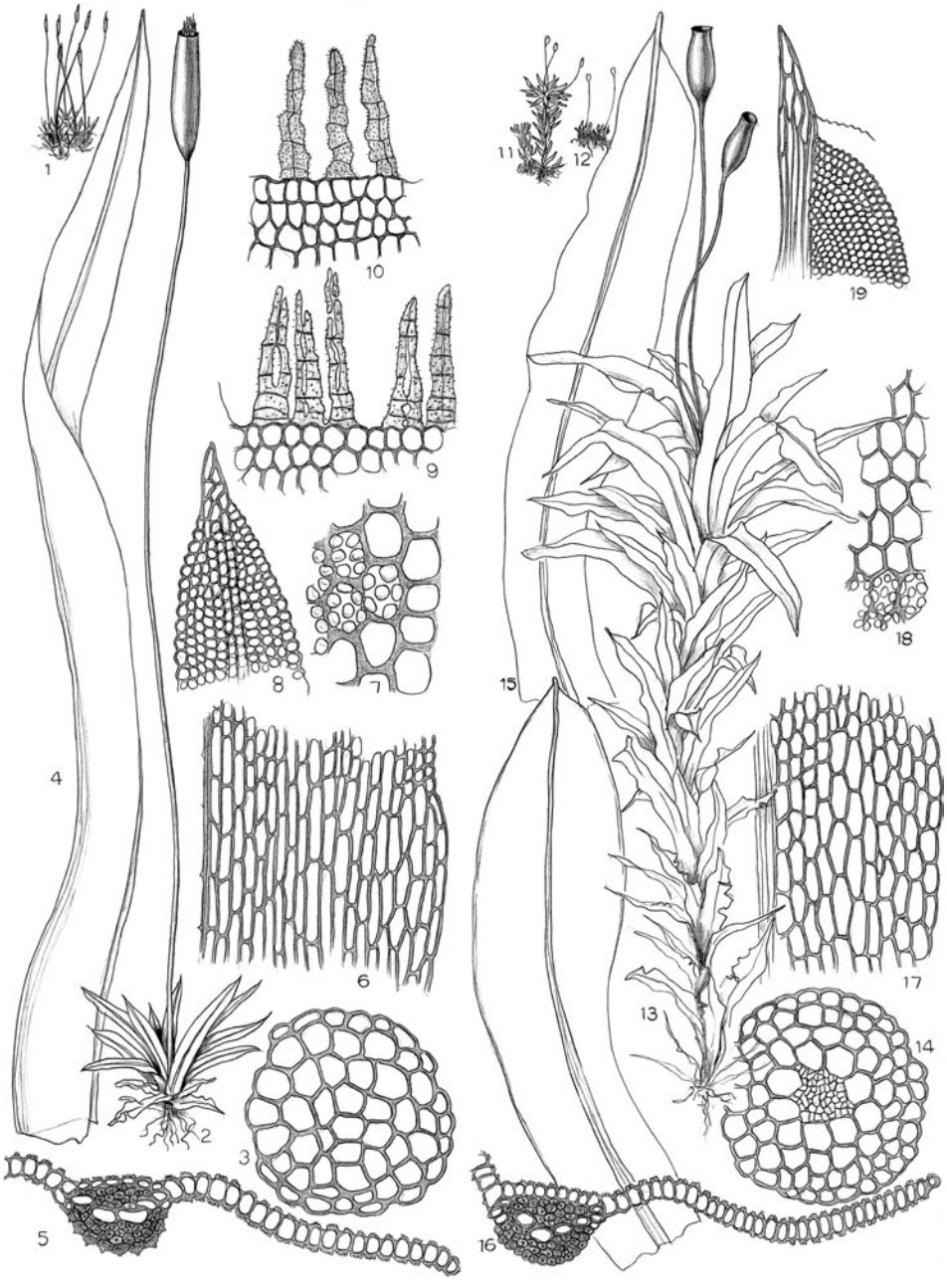



**Figure 25.** *Trichostomum tenuirostre* (1–10). 1, habit, ×0.9; 2, habit, ×7.2; 3, stem in cross section, ×153; 4, leaf, ×36; 5, leaf in cross section, ×117; 6, cells at leaf base (right side), ×153; 7, upper laminal cells (papillae partly shown), ×575; 8, leaf apex, ×153; 9–10, parts of capsule mouth with peristome teeth, ×153. *T. brachydontium* (11–19). 11–12, habit, ×0.9; 13, habit, ×7.2; 14, stem in cross section, ×153; 15, leaves, ×36; 16, leaf in cross section, ×117; 17, cells at leaf base (right side), ×153; 18, upper laminal cells (papillae partly shown), ×575; 19, leaf apex (dorsal surface), ×153. (1–10, *Magill* 3980; 11 & 13–19, *Sim* 8579; 12. *Smook* 944). Artist: Rita Weber.

## **Triquetrella** Müll.Hal. (sthn Afr.: 1 sp.)

### **tristicha** (Müll.Hal.) Müll.Hal.

*Zygodon tristichus* Müll.Hal.

Plants in loose cushions or mats. **Stems** up to 25 mm long, central strand absent. **Leaves** 3-ranked, ovate or oval, 1.2–2.0 mm long; apex acuminate; base decurrent; margins recurved below; costa subpercurrent; in section cells frequently undifferentiated. **Upper laminal cells** quadrate, spinose-papillose. **Sporophytes** not known in area. Recognised by the 3-ranked, ovate leaves with decurrent bases and spinose-papillose cells. On soil or rock.




## **Weissia** Hedw. (sthn Afr.: 5 spp.)

Key to species:

Leaves up to 2 mm long; apex mucronate; paroicous; peristome teeth linear . . . . . **W. dieterlenii**

Leaves up to 4 mm long; apex apiculate; autoicous; peristome teeth lanceolate . . . . . **W. controversa**

### **controversa** Hedw.

Plants small. **Stems** 2–4 mm long, with central strand. **Leaves** twisted to spirally involute when dry, lanceolate to linear-lanceolate, 2–5 mm long; apex acute, apiculate, base ovate to oblong; margins narrowly involute; costa short-excurrent, ventral stereid band small. **Upper laminal cells** rounded, thickened, papillose; basal cells hyaline, smooth. **Autoicous**. **Capsule** with peristome teeth short or rudimentary, lanceolate. On soil. *Green-tufted stubble-moss*.




### **dieterlenii** Thér.

Plants small. **Stems** 2–4 mm long, central strand large. **Leaves** spirally twisted when dry, lanceolate, 1.5–2.0 mm long; apex acute, mucronate, base oval to oblong; margins narrowly involute; costa percurrent to short-excurrent, ventral stereid band small. **Upper laminal cells** subquadrate, papillose; basal cells hyaline, smooth. **Paroicous**. **Capsule** with peristome teeth linear, distant. On sandy soil or sandstone. *Dieterlen's stubble-moss*.




# PTYCHOMITRIACEAE

Plants small to medium-sized, caespitose, dark green to blackish green, glossy above, brownish and dull below; mostly saxicolous. **Stems** erect, branching irregular; in section with small central strand. **Leaves** incurled with involute margins when dry, erect-spreading when wet; margins and/or lamina frequently bistratose; costa in section with guide cells and stereid bands; laminal cells rounded-quadrate to short-rectangular or

transversely rectangular near margins, smooth, ± thickened. **Autoicous**. **Perichaetia** terminal becoming lateral through innovation; perichaetial leaves undifferentiated or somewhat narrower; seta erect, occasionally polysetaceous. **Capsules** erect, ovoid to short-cylindrical; annulus present; peristome single, teeth 16, cleft or perforated, ± fragile; operculum long-beaked; calyptra mitrate, deeply lobed, ± plicate, naked. **Spores** small.

[after Magill & Van Rooy: 462 (1998)]

## Key to genera

Leaves oblong to lingulate; margins broadly involute when wet; cells mostly larger than 10 µm . . . . . **Ptychomitriopsis**
Leaves mostly linear-lanceolate to ovate- or oblong-lanceolate; margins plane to erect when wet; cells mostly smaller than 10 µm . . . . . **Ptychomitrium**

## **Ptychomitriopsis** Dixon (sthn Afr.: 2 spp.)

### **aloinoides** Magill

Plants small. **Stems** 2–4 mm long. **Leaves** incurved and appressed when dry, bistratose above base, oblong to lingulate, 1.0–1.5 mm long; apex obtuse to rounded; margins broadly involute above; costa ending below to subpercurrent. **Upper laminal cells** rounded-quadrate to transversely rectangular, basal cells hyaline. **Capsule** ellipsoid, peristome teeth cleft and perforated. Recognised by the broadly involute upper leaf margins and bistratose lamina with large cells. On sandstone in drier areas.

MsGr

## **Ptychomitrium** Fürnr. (sthn Afr.: 8 spp.)

### Key to species:

1a Leaf lamina unistratose with bistratose patches, margins bistratose . . . . . **P. subcrispatum**
1b Leaf lamina bistratose . . . . . 2
2a Leaf margins revolute in base . . . . . **P. sellowianum**
2b Leaf margins plane to ± reflexed in base . . . . . 3
3a Leaf apex distinctly cucullate; leaves up to 3 mm long . . . **P. cucullatifolium**
3b Leaf apex acute or subcucullate; leaves up to 5 mm long. . . . . **P. crispatum**

### **crispatum** (Hedw.) A.Jaeger

*Encalypta crispata* Hedw.

Plants dark green. **Stems** 10–20 mm long. **Leaves** incurved when dry, linear-lanceolate above oblong to elliptical base, up to 5 mm long, bistratose; apex acute to subcucullate; costa percurrent. **Upper laminal cells** rounded-quadrate, thickened, basal cells rectangular to rhomboidal. **Capsule** short-cylindrical, peristome teeth narrowly triangular. On rock.

MsGr Zastr

**cucullatifolium** (Müll.Hal.) A.Jaeger
*Brachystelium cucullatifolium* Müll.Hal.

Plants dark green. **Stems** 5–20 mm long. **Leaves** weakly appressed and curved when dry, linear- to ovate-lanceolate, 2–3 mm long, bistratose; apex cucullate; costa percurrent. **Upper laminal cells** rounded-quadrate or transversely rectangular, thickened, basal cells distinct, rectangular. **Capsule** short-cylindrical, peristome teeth narrowly triangular. On rock or rock crevices, frequently collected.

DrGr | MsGr | KarSh | Zastr

**sellowianum** (Müll.Hal.) A.Jaeger
*Brachystelium sellowianum* Müll.Hal.
*Ptychomitrium depressum* (Müll.Hal.) Paris

Plants green. **Stems** 5–25 mm long. **Leaves** incurved and crisped when dry, narrowly acuminate above oblong base, 4–5 mm long, bistratose to tristratose at margins; apex acute; margins revolute in base; costa percurrent. **Upper laminal cells** small, rounded to transversely rectangular, incrassate, basal cells rectangular. **Capsule** elliptical, peristome teeth narrowly triangular. On rock.

MsGr

**subcrispatum** Thér. & P.de la Varde

Plants dark green. **Stems** 10–40 mm long. **Leaves** incurved or appressed with crisped apex when dry, linear-lanceolate to ovate- or oblong-lanceolate, up to 5 mm long, unistratose with bistratose patches; apex acute to subcucullate; margins bistratose; costa percurrent. **Upper laminal cells** rounded-quadrate to transversely rectangular towards margins, basal cells rectangular. **Capsule** short-cylindrical, peristome teeth cleft and perforated. On rock.

DrGr | MsGr | Zastr

# RACOPILACEAE

Plants small to large, in loose mats, dark green; mostly terricolous. **Stems** creeping, heterophyllous; central strand small. **Leaves** 4-ranked, incurved when dry, widely spreading when wet, leaves in lateral ranks larger than dorsal ranks; strongly cuspidate; margins weakly serrate above; leaf cells rectangular to quadrate, minutely mammillose, rectangular below; alar cells not differentiated. **Dioicous** or **autoicous**. **Perigonia** and **perichaetia** along stem; seta long, smooth. **Capsules** horizontal, ribbed; peristome double, complete; operculum rostrate; calyptra cucullate, somewhat hairy. **Spores** small, green. *Selaginella-mosses*.

[after Magill & Van Rooy: 531 (1998)]

## **Racopilum** P.Beauv. (sthn Afr.: 1 sp.)

**capense** Müll.Hal. ex Broth.

Plants dark green. **Stems** creeping, up to 60 mm long, pinnately branched. **Leaves** 4-ranked, dimorphic; lateral leaves broadly ovate to elliptical, 1–2 mm long; acute, cuspidate or short-

awned; margins serrate above; dorsal leaves ovate, shorter. **Upper laminal cells** of lateral leaves hexagonal to rhomboidal, minutely mammillose; basal cells quadrate to short-rectangular, hyaline. **Perichaetia** strongly differentiated, leaves oblong to ovate. **Capsule** horizontal to nodding, ribbed, peristome complete. Recognised by its dark green, creeping stems with 4-ranked, dimorphic leaves. On soil, rock or bark in wooded areas. *Cape selaginella-moss*.

MsGr

# SEMATOPHYLLACEAE

Plants small to large, forming loose to dense mats or ascending tufts, often glossy and yellowish tinged. **Stems** creeping or spreading to ascending, irregularly or pinnately branched, central strand present; paraphyllia absent. **Leaves** frequently crowded, often complanate, secund and homomallous, ovate to lanceolate, often concave; apex acute to acuminate; costa absent or short and double; laminal cells linear-rhomboidal, alar cells differentiated, enlarged, bubble-like. **Dioicous** or **autoicous**. **Perichaetia** lateral, leaves often differentiated, elongate. **Capsules** exerted, usually inclined or pendulous, ovoid or short-cylindrical, often slightly curved, asymmetrical, constricted below mouth when dry; stomata on base of urn; peristome usually perfect; operculum mostly conic-long rostrate; calyptra usually cucullate, smooth and naked. **Spores** round, smooth or finely papillose.

[after Gradstein *et al*.: 532 (2001) and Smith: 885 (2004)]

## **Sematophyllum** Mitt. (sthn Afr.: 7 spp.)

[after Sim: 434 (1926), Sharp *et al*.: 993 (1994) and Chuah-Petiot: 141 (2003)]

### Key to species:

1a Alar cells bordered by elongated leaf cells above; leaf apex long-acuminate . . . . . **S. gueinzii**

1b Alar cells bordered by 2 or 3 rows of quadrate cells above; leaf apex acute to acuminate . . . . . 2

2a Leaves ovate; apex acute; cells oblong-rhomboidal to vermicular, apical cells shorter and wider . . . . . **S. subpinnatum**

2b Leaves ovate-lanceolate; apex acuminate; cells linear-rhomboidal to vermicular, apical cells not distinctly shorter and wider . . . . . **S. brachycarpum**

### **brachycarpum** (Hampe) Broth.

*Hypnum brachycarpum* Hampe

Plants dark green to yellowish. **Stems** creeping, 10–40 mm long, branches ascending. **Leaves** homomallous at stem tips, concave, ovate-lanceolate; apex acuminate; costa absent or short and double. **Upper laminal cells** linear-rhomboidal or fusiform, smooth; alar cells usually 3, bordered by quadrate cells above. **Capsule** horizontal to pendulous, oval, constricted below mouth when dry; peristome double; endostome with high basal membrane, keeled processes and single cilia. On rock, soil or decaying wood in forests.

MsGr

**gueinzii** (Hampe) Magill
*Hypnum gueinzii* Hampe
*Rhaphidorrhynchium gueinzii* (Hampe) Broth.

Plants dark green with yellow tips. **Stems** creeping, up to 50 mm long, branches ascending. **Leaves** homomallous, lanceolate; apex acuminate to abruptly acuminate; margins entire to serrulate above; costa absent. **Upper laminal cells** linear-vermicular; alar cells 2–6, swollen, bordered by elongated leaf cells above. **Capsule** horizontal, oval, wide-mouthed when dry; peristome double. On rock or decaying logs in wooded areas. *Gueinzi's signal-moss*.




**subpinnatum** (Brid.) E.Britton
*Leskea subpinnata* Brid.
*Sematophyllum caespitosum* (Hedw.) Mitt.

Plants yellow- to golden-green. **Stems** creeping, 25–75 mm long, irregularly branched, branches ascending, short, curved. **Leaves** crowded, homomallous, concave, ovate, 0.7–1.4 mm long; apex acute; margins entire; costa weak. **Upper laminal cells** oblong-rhomboidal; alar cells 3–6, swollen, bordered by quadrate cells above. **Capsule** inclined to horizontal, short-cylindric; endostome cilia rudimentary or absent. On rock or occasionally bark in wooded areas.




# THUIDIACEAE

Plants small to large and rather robust, forming loose to dense mats or wefts, flattened, dull light to dark green, yellow to brown with age. **Stems** 1–3 pinnately branched, often frondose; central strand present; with axillary hairs and paraphyllia. **Leaves** usually dimorphic; stem leaves mostly triangular or ovate to ovate-lanceolate; apex acute, acuminate or subulate; base frequently cordate, decurrent; margins plane to recurved below, entire to serrulate-papillose; costa single, ending below to excurrent; laminal cells short, smooth or papillose; terminal cell differentiated; alar cells not or weakly differentiated; branch leaves smaller and narrower. **Autoicous** or **dioicous**. **Perigonia** and **perichaetia** lateral, perichaetial leaves usually differentiated, margins ciliate or not; seta elongate, often roughened. **Capsules** suberect to pendulous, urn cylindrical, usually curved and asymmetric; operculum rostrate, oblique; peristome perfect, exostome teeth densely cross-striolate; calyptra cucullate, naked and smooth. **Spores** round, papillose.

[after Martin (2003)]

## Key to genera

Plants small to medium-sized, monoicous; paraphyllia simple or weakly branched; stem leaf apex acuminate . . . . . **Pelekium**
Plants large to robust, dioicous; paraphyllia strongly branched; stem leaf apex mostly ending in a long filiform awn. . . . . **Thuidium**

## SEMATOPHYLLACEAE

## **Pelekium** Mitt. (sthn Afr.: 3 spp.)

**ramusculosum** (Mitt.) Touw
*Leskea ramusculosa* Mitt.
*Thuidium ramusculosum* (Mitt.) A.Jaeger

Plants medium-sized, slender, in loose mats. **Stems** (1)2-pinnately branched, branches remote; paraphyllia simple to weakly branched; axillary hairs present. **Leaves** dimorphic, stem leaves broadly ovate or cordate-triangular, weakly plicate; base short-decurrent; apex acuminate, terminal cell mostly acute; margins entire to prominently papillose-crenulate; costa percurrent. **Upper laminal cells** rhomboidal, papillose, basal cells rectangular. **Perichaetial leaf** margins denticulate or spinose to short-ciliate at shoulders. **Capsule** inclined to horizontal, curved; peristome perfect. On rock at high altitude.

MsGr

## **Thuidium** Bruch & Schimp. (sthn Afr.: 1 sp.)

**assimile** (Mitt.) A.Jaeger
*Leskea assimilis* Mitt.
*Thuidium matarumense* Besch.

Plants large to robust, in mats. **Stems** 2(3)-pinnately branched; paraphyllia dense; strongly short branched; axillary hairs present. **Leaves** dimorphic, stem leaves broadly lanceolate or cordate-ovate, plicate; apex acuminate to piliferous, terminal cell acute; costa percurrent, disappearing in apex; margins entire to papillose-serrate. **Upper laminal cells** hexagonal, smooth to strongly papillose, basal cells rectangular to linear. **Perichaetial leaf** margins coarsely serrate to ciliate at shoulders. **Capsule** inclined to horizontal, curved; peristome perfect. On rock and litter in forest. *Philibert's tamarisk-moss*.

MsGr

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# Marchantiophyta

Compiled by J. van Rooy, E. Retief & N.L. Meyer

Taxonomy and nomenclature mostly after Perold (2006). Liverworts not yet recorded from the Free State may be identified using Arnell (1963), Perold (1999), Chuah-Petiot (2003) and Wigginton (2004).

## Key to the families of Marchantiophyta

[after Wigginton: 69 (2004) and Bischler-Causse *et al*.: 18 (2005)]

1a Plants aquatic, growing in alkaline pans or ponds, erect, consisting of a narrow axis and a broad, undulate wing. . . . . **Riellaceae**

1b Plants terrestrial or epiphytic, prostrate, not consisting of a narrow axis and a broad, undulate wing . . . . . 2

2a Thallus with air chambers and many small pores on the dorsal surface; ventrally with scales, at least near the apex; antheridia and archegonia usually in receptacles . . . . . 3

2b Thallus without air chambers and pores; ventrally with or without scales; receptacles absent or stalked . . . . . 7

3a Archegonia and sporophytes in an involucre below and beyond thallus apex . . . . . **Targioniaceae**

3b Archegonia in well-delimited cushions with several cavities, the cushions developing after fertilisation into stalked archegoniophores, or archegonia initiated on ventral side of stalked archegoniophores. . . . . 4

4a Epidermal pores compound; both archegoniophores and antheridiophores produced . . . . . **Marchantiaceae**

4b Epidermal pores simple, with 1 or several concentric rings of cells; only archegoniophores produced . . . . . 5

5a Epidermal pores with 1 ring of differentiated cells; pores of female receptacle simple or absent; capsule wall with annular thickenings; spores with rounded protuberances on distal face. . . . . **Exormothecaceae**

5b Epidermal pores with several concentric rings of cells (with a single ring of hardly differentiated cells in *Plagiochasma rupestre*); epidermal pores of female receptacle compound (absent in *Lunularia*); capsule wall without annular thickenings; spores without rounded protuberances on distal face 6

6a Air chambers in several layers, without chlorophyllous filaments; gemma cups not produced; receptacle with compound epidermal pores; capsule opening by a lid; spores 20–106 µm in diameter . . . . . **Aytoniaceae**

6b Air chambers in a single layer, with chlorophyllous filaments; gemmae in crescent-shaped gemma cups; receptacle without epidermal pores; capsule splitting to base into 4 valves; spores 12–23 µm in diameter **Lunulariaceae**

7a Plants growing in complete or incomplete rosettes; upper surface of thallus with median groove . . . . . 8

7b Plants not growing in rosettes; upper surface of thallus without median groove. . . . . 9

8a Epidermal pores often with thickened radial walls; antheridia in a dorsal groove bordered by cilia; archegonia and sporophytes in dorsal thallus depression, in pyriform involucres; proximal and distal faces with strikingly different ornamentation . . . . . **Oxymitraceae**

8b Epidermal pores (if differentiated) with thin radial walls; antheridia scattered or in dorsal groove, without scales or cilia; archegonia and sporophytes

scattered or in 2 or 3 rows in dorsal groove, involucres lacking; proximal and distal faces of spores with similar or nearly similar ornamentation, or spores remaining in tetrads . . . . . **Ricciaceae**

9a Thallus forked, with a ventral midrib of rhizoids; rhizoids pegged (papillose); antheridia and archegonia on stalked receptacles . . . . . **Dumortieraceae**

9b Thallus simple, forked or pinnately branched, without ventral midrib of rhizoids; rhizoids smooth; stalked receptacles lacking . . . . . 10

10a Thallus margins and ventral side of midrib with bristle-like hairs; gametoecia ventral on midrib . . . . . **Metzgeriaceae**

10b Thallus margins and midrib lacking bristle-like hairs; gametoecia dorsal on thallus . . . . . **Aneuraceae**

# ANEURACEAE

Plants thalloid, pale to dark green. **Thalli** simple, or irregularly or pinnately branched, midrib poorly defined or indistinguishable, lacking a differentiated conducting strand, lacking ventral scales; apex with 1-celled slime-papillae; oil bodies small, Massula-type, many (*Aneura*), or large, finely granular, few per cell (*Riccardia*), sometimes lacking. **Dioicous** or **monoicous**. **Gametoecia** on short lateral branches, or on thallus margin: the antheridia sunk in pits in the upper surface of the branch, in 2 or more rows; archegonia on the upper surface of a branch associated with paraphyses, or in *Aneura*, on margins of thallus. **Sporophyte** surrounded by a thick-walled, fleshy calyptra, lacking any other involucres (pseudoperianths lacking). **Capsule** ellipsoid, the wall bistratose, at maturity opening by 4 valves. **Spores** small; elaters with 1(2) spirals, usually attached to the tips of the capsule valves.

[after Wigginton: 79 (2004)]

## **Aneura** Dumort. (sthn Afr.: 1 sp.)

[after Perold: 167 (2001)]

### **pinguis** (L.) Dumort.

*Jungermannia pinguis* L.

Plants prostrate, in patches, bright green to yellow. **Thalli** 15–35 mm long; margins bistratose, 3 cells wide; mucilage papillae clustered at ventral apices; rhizoids restricted to ventral median area. **Dioicous**. **Antheridia** subglobular. **Archegonia** in rows, hidden by paraphyses. **Calyptra** clavate, large. **Capsules** oblong-ovoid. **Spores** 20–28 µm in diameter, papillose; elaters with 1 spiral. Recognised by the large, bright green, greasy, fleshy and opaque thalli, in cross section up to 15 cells thick, each cell with many minute, colourless oil bodies, 2–4 rows of antheridial chambers, and spore size. Closely adhering to wet soil or decaying wood.

MsGr

# AYTONIACEAE

Plants thalloid, in dense or loose patches. **Thalli** with simple pores, rarely star-shaped, surrounded by 1 to several rings of differentiated cells; air chambers in 2 or more layers, walls green, forming a network, filaments lacking; ventral scales large, in 2 rows. **Antheridia** in irregular groups embedded in the dorsal surface of the thallus or in discrete, sessile receptacles; archegonia in receptacles, epidermal pores compound. **Archegoniophore** stalk developing after fertilization; with or without furrow; receptacle ± lobed, each segment with 1 (to several) archegonia in a cavity surrounded by a 2-lipped or entire involucre; fertilized archegonium and sporophyte sometimes surrounded by a pseudoperianth (*Asterella*). **Sporophyte** with a very short seta; capsule opening by an operculum. **Spores** usually large, triangular-globular, winged.

[after Perold: 25 (1999) and Gradstein *et al*.: 218 (2001)]

## Key to genera

1a Thalli often large, firm and leathery; carpocephala dorsal on thallus, away from apex; stalk sometimes very short, lacking a rhizoid furrow . . . . . **Plagiochasma**

1b Thalli smaller, often thin and somewhat delicate; carpocephala on stalk arising from apex or bifurcation, rarely ventrolaterally, with 1 rhizoid furrow . . . . . 2

2a Air chambers of thallus subdivided by supplementary chlorophyllose partitions; sporophyte surrounded only by an involucre, pseudoperianth lacking. . . . . **Mannia**

2b Air chambers of thallus empty, not subdivided, lacking chlorophyllose filaments, cells in bounding walls with chloroplasts; sporophyte surrounded by pseudoperianth. . . . . **Asterella**

## **Asterella** P.Beauv. (sthn Afr.: 5 spp.)

[after Perold: 43 (1999)]

### Key to species:

1a Thalli spongy, with tall air chambers mostly in one storey; carpocephalum lacking paleae at summit of stalk . . . . . **A. muscicola**

1b Thalli compact, firm, with small, low air chambers in several storeys; carpocephalum with paleae at summit of stalk . . . . . 2

2a Thalli small to large; ventral scales with lanceolate appendage; carpocephalum distinctly papillose . . . . . **A. bachmannii**

2b Thalli large to robust; ventral scales with ovate appendage; carpocephalum ± smooth or with low papillae. . . . . **A. wilmsii**

### **bachmannii** (Steph.) S.W.Arnell

*Fimbriaria bachmannii* Steph.

Plants smallish to large. **Thalli** 18–25 mm long, ventral scales with lanceolate appendage. **Carpocephalum** covered with distinct papillae, projecting ± 200 µm; paleae at summit of stalk shaggy, dense, pale mauve or colourless, up to 3 000 µm long and 4 or 5 cells wide at base. **Spores** 102–105 µm in diameter, elaborately ornamented with 6–8 alveoli across distal face,

ridges extending across wing, with many subsidiary alveoli. Common, on damp soil banks and cliffs. *Bachmann's star liverwort*.

DrGr MsGr

**muscicola** (Steph.) S.W.Arnell
*Fimbriaria muscicola* Steph.

Plants spongy. **Thalli** up to 18 mm long, with tall air chambers mostly in one storey, not subdivided by supplementary partitions dorsally opening by a stellate pore; ventral scales occasionally fimbriate at single lanceolate appendage. **Carpocephalum** round or umbonate and lacking paleae at summit of stalk; pseudoperianth extending ± 300 µm beyond involucres and subdivided into 12 or 13 segments. **Spores** 75–95 µm in diameter, dark brown, irregular zigzag ridges. On soil over rock at high altitudes.

DrGr MsGr

**wilmsii** (Steph.) S.W.Arnell
*Fimbriaria wilmsii* Steph.

Plants large, green above, purple ventrally. **Thalli** up to 12 mm long; ventral scales with single, large-celled, ovate appendage, constricted at base. **Carpocephalum** with rounded head distinctly lobed below; paleae at summit of stalk almost colourless to purple, 2 000–3 000 µm long, up to 7 cells wide at base. **Spores** 115–152 µm in diameter; with 5–8 alveoli across, extending to wing margins, small subsidiary alveoli sometimes present. On damp soil of streambanks and cliffs. *Wilms' star liverwort*.

MsGr

## **Mannia** Opiz (sthn Afr.: 1 sp.)

[after Perold: 64 (1999)]

**capensis** (Steph.) S.W.Arnell
*Grimaldia capensis* Steph.

Plants small to medium-sized, in patches, bright green. **Thalli** up to 12 mm long; air pores many, small, with narrow black borders distally; air chambers in several storeys; scales in two ventral rows. **Carpocephalum** papillose centrally, not or scarcely lobed below; stalk with single rhizoid furrow; paleae dark purple, lanceolate, up to 1 150 µm long, 4–6 cells wide; pseudoperianth absent. **Spores** 75–80 µm in diameter; roughly triangular-globular, distal face with conspicuous bubbles. On soil over rock in drier areas. *Cape mushroom-headed liverwort*.

DrGr MsGr KarSh

## **Plagiochasma** Lehm. & Lindenb. (sthn Afr.: 5 spp.)

[after Perold: 27 (1999) and Bischler-Causse *et al*.: 186 (2005)]

### Key to varieties:

Epidermal pores bounded by 4 or 5 cells with thin radial walls; appendages pink, purple or hyaline, up to 900 µm long, uniseriate apex of 1–3 thin-walled, short cells; spores < 93 µm in diameter . . . . . **P. rupestre** var. **rupestre**

Epidermal pores bounded by 5 or 6 cells with thickened radial walls; appendages hyaline, up to 1 500 µm long, uniseriate apex of 3–5 thick-walled, elongate cells; spores > 93 µm in diameter . . . . . **P. rupestre** var. **volkii**

**rupestre** (G.Forst.) Steph. var. **rupestre**

*Aytonia rupestris* G.Forst.

Plants leathery, glaucous to greyish green above, purple below. **Thalli** 8–25 mm long; epidermal pores bounded by 4 or 5 cells, walls thin; ventral scales reddish pink to purple, rarely > 2 000 µm long; appendages pink, purple or hyaline, 1 or 2, narrowly to broadly triangular, up to 900 µm long, apically short-pointed, cells 1–3, thin-walled and quadrate or rectangular. **Archegoniophores** dorsal, medially; stalk very short. **Spores** up to 93 µm in diameter. On soil over rock, common.

DrGr MsGr KarSh Zastr

**rupestre** (G.Forst.) Steph. var. **volkii** Bischl.

Plants leathery, glaucous to greyish green above, purple below. **Thalli** 8–25 mm long; epidermal pores bounded by 5 or 6 cells, walls thickened; ventral scales dark red or purple, large, up to 3 000 µm long; appendages hyaline, 1–3, narrowly triangular, up to 1 500 µm long, apically long-pointed, cells 3–5, thick-walled. **Archegoniophores** dorsal, medianly; carpocephala with 1–5 lobes; stalk very short. **Spores** > 93 µm in diameter. On soil over rock.

MsGr

# DUMORTIERACEAE

Plants thalloid, large, in extensive mats or sheets, dark green, thin, translucent. **Thalli** up to 22 mm long, undifferentiated but with few vestigial air chambers; air pores mostly absent or few, simple, at thallus apex; ventral scales rudimentary, in 2 rows, without appendages; rhizoids dimorphic, smooth and pegged, also with unicellular bristles (modified rhizoids) present on ventral surface; oil cells few, with single large oil body; specialised asexual structures absent. **Monoecious**. **Antheridia** in terminal, short-stalked, disciform receptacle; stalk ± 4 mm long, with 2 rhizoid furrows. **Pseudoperianth** absent. **Sporophytes** on stalked receptacle; involucres tubular, bristly, opening by slit; seta present, shortly exserted; capsule dehiscence by irregular valves. **Spores** 25–30 µm in diameter, irregularly tuberculate, elaters bispiral. Monogeneric.

[after Perold: 101 (1999) and Long: 260 (2006)]

## **Dumortiera** Mitt. (sthn Afr.: 3 spp.)

Monospecific.

**hirsuta** (Sw.) Nees

*Marchantia hirsuta* Sw.

With characters of the family. Easily recognised by the large, thin and translucent, dark green thalli lacking a dorsal epidermis, air pores and air chambers, as well as the sparsely hirsute margins. On soil in sheltered areas like rock overhangs. *Dumortier's liverwort*.

MsGr

# EXORMOTHECACEAE

Plants in crowded patches; silvery glaucous-green, dorsally completely covered with many conical evaginations of epidermis. **Thalli** ligulate or narrowly to broadly linear or ovate, apex entire to shallowly notched. **Scales** ventrolateral, in 2 rows. **Dorsal epidermis** unistratose, without trigones; air pores simple, with single ring of 4–10 cells; air chambers elevated, low or tall, basally with densely crowded, chlorophyllose filaments in one storey; with scattered oil cells. **Asexual** reproduction rare. **Monoicous or dioicous**. **Antheridia** in dorsal groove or in irregular groups behind gynoecia. **Gynoecial receptacle** raised on stalk or sessile; carpocephalum with simple pores on dorsal side, capsules usually laterally; stalk, when present, with single rhizoid furrow, lacking paleae; involucre tubular or not, bilabiate. **Sporophyte** mostly 1 or 2 per involucre, capsule wall with semi-annular thickenings; capsules dehiscing by 4 or 5 irregular valves. **Spores** triangular-globular; granulose; elaters with helical bands.

[after Perold: 72 (1999) and Bischler-Causse *et al*.: 152 (2005)]

## **Exormotheca** Mitt. (sthn Afr.: 3 spp.)

### Key to species:

Thalli medium-sized to large; air chambers tall; ventral scales large, hyaline, apex with up to 5 appendages; gynoecial receptacle sessile; tubers absent . . . .**E. holstii**

Thalli smallish; air chambers low; ventral scales small, often purple, with 1 or 2 appendages; gynoecial receptacle mostly on longish stalk; tubers produced . . . . . **E. pustulosa**

### **holstii** Steph.

Plants medium-sized to large, silvery green. **Thalli** up to 22 mm long; assimilation tissue with air chambers inflated into tall, conical protuberances, basal third occupied by chlorophyllose filaments; ventral scales large, ± obliquely triangular, hyaline, apex with up to 5 filiform appendages. **Androecia** in 2–4 irregular rows along middle of thallus. **Gynoecial receptacle** sessile; involucres continuous with outer layer of dome. **Spores** 117–143 µm in diameter, dark red; elaters short, unispiral or ringed. On sandy soil in dry areas.

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### **pustulosa** Mitt.

Plants smallish, glaucous-green. **Thalli** up to 9 mm long; assimilation tissue with air chambers inflated into low, conical protuberances, basal ⅔ occupied by chlorophyllose filaments; ventral scales small, oblong to rounded, often purple, with 1 or 2 filiform appendages. **Asexual** tubers present, spherical. **Androecia** in 1–3 rows along middle of thallus. **Gynoecial receptacle** mostly on longish stalk; involucres bilabiate. **Spores** 70–75 µm in diameter, honey-brown; elaters long, trispiral. On soil around rock outcrops.

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# LUNULARIACEAE

Plants thalloid, in crowded patches, bright green to yellowish green, glossy. **Thalli** 40–55 mm long; ventral scales in 2 rows, hyaline; dorsal epidermis hyaline; air pores conspicuous, slightly raised, surrounded by 3 or 4 concentric rings of differentiated cells; air chambers in 1 low storey, with erect, chlorophyllose, branched filaments; oil cells scattered. **Asexual** reproduction by gemmae in crescent-shaped gemma cups. **Dioicous**. **Androecia** with antheridia sunken in thickened, sessile discs. **Gynoecial receptacles** terminal, eventually lateral; when young sessile, sheathed in layers of white scales, without epidermal pores; stalk up to 34 mm long, lacking rhizoid furrow. **Involucres** tubular, initially drooping, later spreading outwards, cross-like. **Pseudoperianth** absent. **Sporophytes** 1 or 2(3) per involucre; capsules obovoid, splitting to base into 4 valves. **Spores** small, 12–23 µm in diameter, apolar, spherical or ovoid, densely granulate; elaters long, tapering, bispiral. A monogeneric family.

[after Perold: 21 (1999)]

## **Lunularia** Adans. (sthn Afr.: 1 spp.)

Monospecific.

**cruciata** (L.) Dumort. ex Lindb.
*Marchantia cruciata* L.

With characters of the family. Easily recognised by the discoid gemmae in crescent-shaped gemma cups with entire margins. On soil of pot plants or on paving in nurseries or city gardens. *Crescent-cup liverwort*.

DrGr

# MARCHANTIACEAE

Plants thalloid, medium-sized to large, in crowded mats, green, sometimes leathery. **Thalli** pseudodichotomously furcate, band- or ribbon-shaped, apex notched; ventral scales in 4 rows; dorsal air pores compound, surrounded by superimposed concentric cell rings; air chambers shallow, densely packed with chlorophyllose filaments; oil cells scattered throughout. **Gemmae** discoid. **Dioicous**. **Antheridiophore** with receptacle lobed or divided into rays; stalk with 2 rhizoid furrows and 0–2 bands of air chambers. **Archegoniophore** with carpocephalum lobed or divided into rays; stalk with 2–4 rhizoid furrows and 0–2 bands of air chambers, basally sometimes surrounded by large scales; involucres bivalved, membranous. **Pseudoperianth** membranous, bell-shaped. **Spores** ± triangular-globular, with ridges and granules; elaters bi- or trispiral.

[after Perold: 82 (1999)]

## **Marchantia** L. (sthn Afr.: 5 spp.)

### Key to species:

Thalli up to 7.5 mm wide, with distinct dark median band dorsally; cupule margins crenulated or with short cilia up to 3 cells long; involucre margins entire or crenulate . . . . . **M. debilis**
Thalli up to 10 mm wide, without dark median band; cupule margins with cilia up to 6 cells long; involucre margins ciliate . . . . . **M. pappeana**

### **debilis** K.I.Goebel

Plants green, occasionally purplish, mostly with distinct dark median band dorsally. **Thalli** 5–12 mm long, 3.0–7.5 mm wide; median scale appendages small. **Cupule** margins crenulated or with short cilia up to 3 cells long. **Female receptacle** rather small, deeply dissected into narrow lobes; involucre margins entire or crenulated. **Spores** 25–33 µm in diameter, with irregular ridges and granules; elaters brown, bispiral. On wet soil or mud of streambanks, waterfalls, weirs and dam walls.

MsGr

### **pappeana** Lehm.

Plants light green to yellowish green, without dark median band. **Thalli** 10–15 mm long, 6–10 mm wide, median scale appendages large, inner cells large and loose. **Cupule** margins with cilia up to 6 cells long. **Female receptacle** large, shallowly dissected into broad lobes, sometimes bearing a male ray; involucres margins ciliate. **Spores** 22–30 µm in diameter, with irregular, smooth ridges; elaters yellow-brown, bispiral. On wet streambanks, at waterfalls or irrigation furrows.

MsGr

# METZGERIACEAE

Plants thalloid. **Thalli** narrow, with a narrow, well-defined midrib and a unistratose lamina, furcate, sometimes with ventral branches; prostrate or erect or pendent; margins and ventral surface of costa (and sometimes also the lamina) bearing bristle-like hairs; apex with slime-papillae; midrib with large epidermal cells, without central strand; oil bodies absent or very small, homogeneous; ventral scales lacking. **Vegetative reproduction** by gemmae or caducous branches. **Dioicous** or **monoicous**. **Gametoecia** on very short branchlets scattered along ventral side of midrib, antheridia inside a globose sac (inrolled branchlet), archegonia hidden under a thallus flap (female branchlet or involucre). **Sporophyte** surrounded by a fleshy calyptra; pseudoperianth lacking; capsule spherical to ovoid, opening by 4 valves, wall uni- or bistratose. **Spores** small; elaters with 0 or 1 spiral, attached to elaterophore at valve apices.

[after Wigginton: 86 (2004)]

## **Metzgeria** Raddi (sthn Afr.: 14 spp.)

[after So (2004)]

### **consanguinea** Schiffn.

Plants yellowish to grey, occasionally light blue at tapering apex. **Thalli** up to 30 mm long; margins slightly recurved; wing mostly 18–20 cells wide from midrib to margin; costa with 2 epidermal cells both dorsally and ventrally. **Laminal cells** 25–30 × 35–40 µm; marginal hairs usually single, rarely paired, mostly 80–120 µm long. **Gemmae** small, plane to slightly concave, rounded, aggregated around apex and margins, sometimes blue. Sex organs not seen. Recognised by the thallus with both tapered and obtuse apices and the plane to concave gemmae on thallus margin and apex. On bark in forest.

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# OXYMITRACEAE

Plants thallose, gregarious or in rosette-like patches. **Thalli** simple or once/twice furcate, apex emarginate; groove medianly sharp and deep; margins acute; scales lateral, projecting far above thallus margins, obliquely triangular, dark red to almost black; air pores tiny, simple, stellate, radial walls of surrounding cells thickened; air chambers in 1 storey, empty, tall, narrow, bounded by unistratose walls of chlorophyllose cells; storage tissue ventral, compact. **Asexual reproduction** reputed to be by tuber formation. **Monoicous** or **dioicous**. **Antheridia** in median groups, proximal to archegonia, immersed in thallus. **Archegonia** in median groups enclosed in flask-shaped cavities, partly sunken into thallus; involucre covering archegonia, fleshy, continuous, crest-like. **Sporophyte** without stalk or foot; capsule globose, wall hyaline, unistratose or locally bistratose, lacking thickening bands. **Spores** triangular-globular, distal face with large alveoli, proximal face irregularly reticulate; elaters absent.

[after Perold: 108 (1999)]

## **Oxymitra** Bisch. (sthn Afr.: 1 sp.)

### **cristata** Garside ex Perold

Plants bright to deep green. **Thalli** up to 12 mm long; scales 1 250–1 375 µm long; air pores small, radial walls slightly thickened, margins dark red; air chambers empty, in one storey, bounding tissue chlorophyllose. **Monoicous**. **Gametangia** on dorsal surface of thallus; involucre ridged, enclosing archegonial groups. **Spores** black, mostly 110–115 µm in diameter. Recognised by its large, obliquely triangular, shiny, dark red, lateral scales and the row of archegonia enclosed in a crest-like, fleshy ridge of tissue. On soil over rock in drier areas.

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# RICCIACEAE

Plants thallose, in gregarious patches or rosettes; green, often tinged with colour; terricolous, rarely aquatic. **Thalli** 2 or 3 × furcate, linear to obovate; apex truncate to rounded, emarginate; median groove often present; margins acute to obtuse, glabrous or occasionally ciliate; flanks sloping obliquely or steep; scales lateral or ventral, generally imbricate, hyaline or coloured; dorsal covering either a chlorophyllose, unistratose epidermis or an echlorophyllose epithelium in 1 to several rows; assimilation tissue spongy with wide air chambers, or compact with narrow air canals; air pores (if differentiated) with thin radial walls; rhizoids from ventral epidermis. **Asexual** reproduction rare. **Monoicous** or **dioicous**. **Gametangia** acropetally arranged, embedded, only necks projecting, medianly along groove or scattered; sporophyte without stalk or foot, capsule globose. **Spores** generally large, separating at maturity, rarely in tetrads, mostly reticulate; elaters absent. *Crystalworts*.

[after Perold: 111 (1999)]

## **Riccia** L. (sthn Afr.: 54 spp.)

### Key to species:

1a Thalli covered by dorsal epidermis with thin-walled, generally chlorophyllous and unistratose cells; air pores well-spaced; assimilation tissue loosely arranged, spongy, with large polyhedral air chambers; habitat mostly mesic, rarely xeric or aquatic. . . . . 2

1b Thalli covered by dorsal epithelium with echlorophyllous cells in 1 to several rows; air pores many; assimilation tissue compact, with narrow interstitial air canals; habitat sometimes mesic, often xeric . . . . . 7

2a Plants generally annual, not in rosettes; branches linear or strap-shaped; not lacunose dorsally; sporangia protruding conspicuously ventrally **R. stricta**

2b Plants annual or perennial, sometimes in rosettes; branches not strap-shaped; lacunose dorsally; sporangia deeply imbedded or somewhat bulging . . . . . 3

3a Plants finely to coarsely spongiose, not deeply grooved, often in rosettes, glaucous-green to yellow-green, sometimes tinged with red . . . . . 4

3b Plants swollen to rather flat, usually markedly lacunose, deeply grooved dorsally along entire length or only at apex, rarely in rosettes, green to straw-coloured or whitish, rarely tinged with purple . . . . . 6

4a Dioicous; plants markedly heterothallic with small male gametophytes, bright green to yellowish green; air chamber walls visible from above or dorsal epidermis lacunose; spores foveolate, triradiate mark pronounced. . . . . **R. cupulifera**

4b Monoicous; green to yellow-green or blue-green; air chamber walls visible or not; spores completely or incompletely reticulate . . . . . 5

5a Plants green to yellow-green, faintly red at margins; spores 85–115 µm in diameter, red-brown to black . . . . . **R. cavernosa**

5b Plants blue-green, crystalline and glistening; spores 65–85 µm in diameter, pale yellow to light brown . . . . . **R. crystallina**

6a Plants straw-coloured or yellow-green; thalli bloated, large and very wide, 5–15 × 3.5–5.5 mm; spores mostly 130–150 µm in diameter, with 10–12 rounded alveoli across distal face . . . . . **R. bullosa**

6b Plants lime-green to yellowish; thalli narrower and more delicate, 2–6 × 2.5–3.5 mm; spores mostly 90–100 µm in diameter, with 7 or 8 deep, round or oval alveoli across distal face . . . . . **R. volkii**

7a Epithelial cells closely associated, in 1 or 2 layers, top cells globose, mammillose or pyriform, outer cells often collapsing, generally regularly orientated and in parallel rows running from median groove across to margin; scales small to large, rounded . . . . . 8
7b Epithelian cells in free-standing, 2–6-celled, uniseriate pillars not regularly orientated, top cells variously shaped, soon collapsing; scales small to large, mostly rounded and smooth-margined, rarely triangular and dentate or apically filiform . . . . . 19
8a Thallus ciliate along margins, occasionally also over sporangia; ventral scales not conspicuous; sometimes flanks dark purple . . . . . 9
8b Thallus margins not ciliate, marginal cells enlarged or not; ventral scales small to large . . . . . 10
9a Plants medium-sized to large, thalli up to 12 × 4 mm; cilia white when dry, finely granulate, 300–400 µm long; spores straw-coloured, wing present . . . . . **R. natalensis**
9b Plants smaller; thalli up to 6 × 1.5 mm; cilia hyaline, smooth, up to 950 µm long; spores dark brown to black, wing absent . . . . . **R. crinita**
10a Scales inconspicuous, hyaline or partly hyaline; thallus margins hyaline; groove narrow and deep along entire length of thallus; dorsal epithelium walls sometimes thickened . . . . . **R. atropurpurea**
10b Scales large and conspicuous, pigmented, with or without hyaline border or entirely hyaline or white; groove various; dorsal epithelial cells walls not thickened . . . . . .11
11a Scales dark, black or reddish black to deep violet, shiny; plants glaucous-green to green or purplish, rarely brown . . . . . 12
11b Scales not black, variously coloured or white; plants green to yellow-green, white or brownish . . . . . 14
12a Plants medium-sized to large; thallus in section 2.5–5.0 × wider than thick; flanks sloping obliquely . . . . . **R. angolensis**
12b Plants smallish to medium-sized; thallus in section 1–2 × wider than thick; flanks steeply rising . . . . . 13
13a Plants medium-sized, glaucous-green; scales with crenate edges, projecting above thallus margins, rather dull black when dry; spores golden-brown, wingless, densely papillate . . . . . **R. okahandjana**
13b Plants smallish, glaucous-green, rust-brown along margins and proximally; scales with entire edges appressed, not projecting above thallus margins, shiny when wet or dry; spores light to dark brown, winged, incompletely reticulate . . . . . **R. nigrella**
14a Scales brown or various shades of pink to red . . . . . 15
14b Scales predominantly white or hyaline, often encrusted with calcium deposits . . . . . 18
15a Thallus margins and scales brownish yellow; in section idioblasts present throughout; spores vermiculate . . . . . **R. macrocarpa**
15b Thallus margins not brown; scales pink to dark red; in section idioblasts absent; spores reticulate . . . . . 16
16a Thalli very small, 1.5–3.0 × 0.7–1.0 mm; bottle-green, tumid; scales regular, appressed, dark red, white-bordered; spores 60–78 µm in diameter, triangular-globular, polar; distribution restricted . . . . . **R. pottsiana**
16b Thalli medium-sized, 7–12 × 1.0–2.5 mm; bright green or light green to whitish; scales wine-red or rose-pink; spores 80–105 µm in diameter, globular to subglobose, apolar; distribution widespread . . . . . 17
17a Thalli 7–9 × 1.2–1.6 mm; bright green turning grey-green; scales dark red, shiny, with narrow hyaline border; monoicous; spores red to black, subglobular, periphery with prominent projections, cogwheel-like in profile . . . . . **R. runssorensis**
17b Thalli up to 12 × 2.5 mm; pale green, white along margins; scales wavy, rose-pink with wide hyaline border; dioicous; spores light brown, periphery with low projections . . . . . **R. rosea**

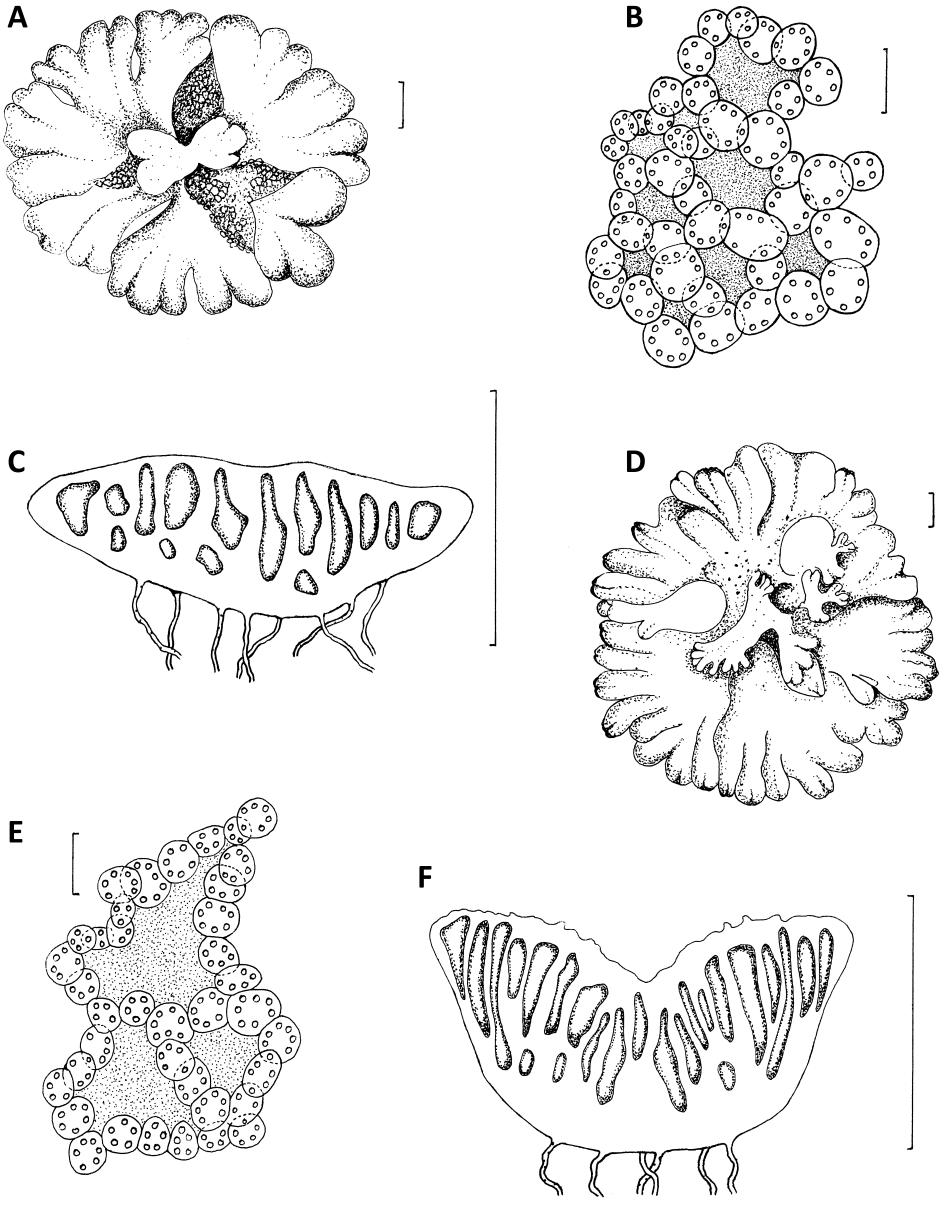



**Figure 26.** A–C, *Riccia crystallina*: A, complete rosette; B, h/s assimilation tissue, air canals (stippled); C, c/s branch. D–F, *R. cavernosa*: D, complete rosette; E, h/s through air chambers (stippled); F, c/s thallus. A–C, *Koekemoer* 103; D, E, *Arnold 4323*; F, *S.M. Perold* 453. Scale bars: A, C, D, F, 1 mm; B, E, 50 µm. Artist: Jill Kimpton. h/s: histological section; c/s: cross section.

18a Plants green to bluish green, shiny, turning chalk-white and spongy over sporangia; thalli up to 8 × 3 mm; scales large, 800–1 200 × 600 µm, undulating, imbricate, hyaline to white; monoicous; spores polar . . . . . **R. albolimbata**
18b Plants greenish grey, matt; thalli up to 7 × 2 mm; scales smaller, 600–800 × 500 µm, stiff, regular, closely imbricate, white to silvery mauve; dioicous; spores apolar . . . . . **R. argenteolimbata**
19a Dorsal pillars short, often < 200 µm long, 2 or 3(4) cells high, cells mostly wider than long. . . . . 20
19b Dorsal pillars tall, > 200 µm long, (3)4–6 cells high, cells narrow, elongated . . . . . 21
20a Thalli up to 10 × 3 mm; dorsal pillars tapering, 3 or 4 cells high; air canals widening upwards, 4–8-sided; distal face of spore with 4–7 large, central alveoli . . . . . **R. albovestita**
20b Thalli up to 6 × 1.5 mm; dorsal pillars not tapering, generally 2 cells high; air canals narrow, 4-sided; distal face of spore with 12–14 rather irregularly shaped alveoli across . . . . . **R. pulveracea**
21a Plants emerald-green; dorsal pillars 4 or 5 cells high, basal cells in a conspicuous row; antheridia with necks nearly 500 µm long . . . . . **R. simii**
21b Plants bright green to bluish green; dorsal pillars 3 or 4 cells high, basal cells not in a conspicuous row; antheridia with necks up to 180 µm long . . . . . **R. ampullacea**

## **albolimbata** S.W.Arnell

Plants crowded or in rosettes, green to bluish green, shiny, turning chalk-white and spongy over sporangia. **Thalli** up to 8 × 2.2 mm; margins inflexed dry with wavy, white scales covering dorsal face; scales large, mostly 800–900 × 600 µm, undulating, imbricate, hyaline to white, surface often encrusted with calcium carbonate deposits. **Monoicous**. **Spores** 82–105 µm in diameter, triangular-globular, polar, yellow-brown to dark brown, incompletely reticulate. On calcrete, loam or soil over rock.

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## **albovestita** O.H.Volk

Plants medium-sized, in patches or incomplete rosettes, creamy green, glistening, turning white along margins, almost papillose. **Thalli** up to 10 × 3 mm; scales large, conspicuous at apex, imbricate, hyaline, base often wine-red to reddish purple; dorsal pillars tapering, 3 or 4 cells high; air canals widening upwards, 4–8-sided. **Dioicous**. **Spores** mostly 60–80 µm in diameter, light brown, polar, reticulate; distal face of spore with 4–7 large, central alveoli. On soil over rock outcrops.

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## **ampullacea** Perold

Plants medium-sized, in patches, bright green to bluish green. **Thalli** up to 8 × 2.5 mm; margins incurved to inflexed when dry, revealing flanks covered with imbricate, slightly wavy, hyaline scales; dorsal pillars 3 or 4 cells high, fragile, hyaline, basal cells not in a conspicuous row; scales projecting above margins. **Monoicous**. **Spores** 90–95 µm in diameter, triangular-globular, chestnut-brown, finely reticulate and radiately ridged. On soil over rock at higher altitudes.

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## **angolensis** Steph.

Plants medium-sized to large, in gregarious patches, green. **Thalli** up to 10 × 4 mm, often irregularly shaped, in section 4 or 5 times wider than thick; flanks sloping obliquely; scales

usually violet to black, projecting above thallus margins, imbricate to more distantly spaced proximally. **Monoicous**. **Spores** mostly 72–82 µm in diameter, triangular-globular, winged, distal face with areolae ± concentric; proximal face roughened. On soil in damp places. *Angolan crystalwort*.

DrGr MsGr Zastr

### **argenteolimbata** O.H.Volk & Perold

Plants scattered, rarely in rosettes, compact, greenish grey, matt. **Thalli** up to 7 × 1.2 mm; margins tightly inflexed when dry with flanks covered by white to silvery mauve scales; scales 600–800 × 500 µm, stiff, regular, closely imbricate. **Asexual propagation** by bulbils. **Dioicous**. **Spores** mostly 80–129 µm in diameter, subglobular, apolar, reddish brown to almost black, wing and triradiate mark absent, reticulate with 10–16 alveoli across. On soil over calcrete, limestone or dolomite.

DrGr

### **atropurpurea** Sim

Plants medium-sized, crowded or in incomplete rosettes, glaucous-green to silvery grey-green, flanks dark red-brown or violet. **Thalli** up to 10 × 2 mm; margins hyaline; groove narrow and deep; dorsal epithelium walls sometimes thickened; scales inconspicuous, hyaline or with hyaline borders and reddish bases. **Monoicous**. **Spores** mostly 75–105 µm in diameter, subglobular, dull dark brown to nearly black, reticulate, wing and triradiate mark absent. On soil over rock outcrops.

VreDm DrGr MsGr

### **bullosa** Link ex Lindenb.

Plants straw-coloured or yellow-green. **Thalli** bloated, large and very wide, 5–15 × 3.5–5.5 mm; air pores surrounded by 6 or 7 smaller cells; air chambers tall, in 1 storey; scales in pairs toward apex, vestigial. **Dioicous**. **Spores** mostly 130–150 µm in diameter, yellow-brown, reticulate, wing undulating, with 10–12 rounded alveoli across distal face; proximal face with triradiate mark. On soil over rock at high altitudes.

MsGr

### **cavernosa** Hoffm.

Plants medium-sized to large, in rosettes, green to yellowish green, often tinged with red, becoming spongy with age. **Thalli** mostly 4–8 × 1.5–2.5 mm; air pores with surrounding cells lacunose; air chambers in single storey; scales absent or evanescent. **Monoicous**. **Spores** 85–115 µm in diameter, triangular-globular, winged; distal face with 2- or 3-branched ridge in centre; proximal face with triradiate mark. On sandy soil. *Cavernous crystalwort*. Figure 6B, p. 2; Figure 26D–F.

AcGr DrGr KarSh

### **crinita** Taylor

*R. trichocarpa* M.Howe

Plants small to medium-sized, in crowded patches or incomplete rosettes, glaucous green. **Thalli** up to 6 × 1.5 mm; margins with many slender cilia; cilia hyaline, smooth, up to 950 µm long, also over sporangia; scales adherent, purple to nearly black. **Monoicous**. **Spores** 100–120 µm in diameter, triangular-globular, dark brown to black, wingless, reticulate on both

surfaces; areolae extending to margins, 12–14 across; proximal face with indistinct triradiate mark. On sandy soil over rock.

DrGr

### **crystallina** L.

Plants medium-sized, in rosettes, dorsally glistening, grey-green, becoming pitted with age. **Thalli** 5–7 × 2–4 mm; scales small and inconspicuous, evanescent; air pores small; air chambers narrow. **Monoicous**. **Spores** 65–85 µm in diameter, triangular-globular, pale yellow to light brown, semi-transparent; wing notched or with a round pore, margins crenulate to erose, reticulate on both faces; distal face highly convex, with 8–10 alveoli across. On damp soil over rock. *Blue crystalwort*. Figure 26 A–C.

DrGr KarSh

### **cupulifera** A.V.Duthie

Plants crowded or in rosettes or scattered in butterfly shapes when young, bright green to yellowish green; heterothallic with male thalli very small. **Thalli** spongy, oblong to obcuneate, up to 7 × 3.5 mm; scales ventral toward apex, minute. **Dioicous**. **Spores** mostly 90–115 µm in diameter, triangular-globular, foveolate, with deep-set, rounded alveoli on both spore faces, wing thick; distal face convex; proximal face with prominent triradiate mark. On soil over rock outcrops.

DrGr MsGr

### **macrocarpa** Levier

Plants medium-sized, scattered or in incomplete rosettes, pale green apically and yellow to rust-brown along margins, margins inflexed when dry. **Thallus** up to 8 × 2 mm; scales inconspicuous, partly hyaline, partly flecked with brown and violet; in section with idioblasts. **Monoicous**. **Spores** mostly 85–110 µm in diameter, triangular-globular, pale straw-coloured to brown, vermiculate; distal face with 10–15 incomplete alveoli across; proximal face with triradiate mark. On soil over rock outcrops.

MsGr

### **natalensis** Sim

Plants medium-sized to large, scattered or in rosettes up to 25 mm in diameter, bright green, sometimes with violet streaks. **Thalli** lax, up to 12 × 4 mm; margins conspicuously ciliate, tumid; cilia white when dry, finely granulate, 300–400 µm long; scales small, inconspicuous. **Monoicous**. **Spores** 95–125 µm in diameter, straw-coloured, reticulate; wing wide, undulating; distal face with 8 or 9 alveoli across, walls low; proximal face with triradiate mark not clearly defined. On loam-rich soil or clay. *KwaZulu-Natal crystalwort*.

DrGr MsGr

### **nigrella** DC.

Plants smallish to medium-sized, in rosettes, glaucous-green, rust-brown along margins and proximally. **Thalli** mostly up to 5 × 1 mm, when dry with margins tightly inflexed and shiny black scales covering dorsal surface; scales with entire edges, appressed, not projecting above thallus margins, shiny wet or dry. **Monoicous**. **Spores** 62–87 µm in diameter, light to dark

brown, wing narrow, incompletely reticulate; distal face with 10–12 alveoli across; proximal face with triradiate mark. On soil over rock. *Black crystalwort*.

AcGr DrGr MsGr

### **okahandjana** S.W.Arnell

Plants medium-sized, crowded or in rosettes, glaucous-green, sometimes blotched with violet. **Thalli** up to 10 × 1.8 mm; scales large, conspicuous, with crenate edges, shiny black, dull when dry; in cross section flanks steep, scales projecting vertically above thallus margins. **Monoicous**. **Spores** mostly 92–110 µm in diameter, triangular-globular, light brown, wingless, densely papillose; proximal face without apex or distinct triradiate mark. On soil over rock, frequently collected in northern parts. *Okahandja crystalwort*.

AcGr DrGr MsGr

### **pottsiana** Sim

Plants very small, usually in rosettes, bottle-green to dark green, tumid. **Thalli** 1.5–3.0 × 0.7–1.0 mm; margins inflexed when dry with regular, appressed, dark red, white-bordered scales covering most of dorsal surface. ?**Monoicous**. **Spores** small, 60–78 µm in diameter, triangular-globular, polar, brownish, reticulate; distal face convex, 14–16 small, deep alveoli across, walls papillose at nodes; proximal face with triradiate mark not prominent. On soil over rock outcrops. *Potts' crystalwort*.

AcGr DrGr MsGr KarSh

### **pulveracea** Perold

Plants smallish to medium-sized, in patches; green to yellowish green. **Thalli** up to 6 × 1.5 mm; scales conspicuous towards apex, wavy, imbricate, hyaline, sometimes reddish purple; dorsal pillars not tapering, generally 2 cells high, top cell mammillose, collapsing when dry to form powdery covering; air canals narrow, 4-sided. ?**Dioicous**. **Spores** 75–92 µm in diameter, polar, light brown; distal face of spore with 12–14 rather irregularly shaped alveoli across. On soil.

DrGr Zastr

### **rosea** O.H.Volk & Perold

Plants medium-sized, scattered or in patches, light green with white along margins and proximally. **Thalli** up to 12 × 2.5 mm; in section as wide as thick; apex and sides inflexed when dry and covered by prominent, wavy, pink scales with wide hyaline border. **Antheridia** with prominent hyaline necks. **Dioicous**. **Spores** 92–105 µm in diameter, subglobular, apolar, light brown, without wing and triradiate mark, reticulate with 9–11 alveoli across. On soil over rock. *Rose crystalwort*.

VreDm DrGr

### **runssorensis** Steph.

Plants smallish to medium-sized, crowded or in rosettes, bright green turning grey-green. **Thalli** 7–9 × 1.2–1.6 mm, in section twice wider than thick; margins tightly inflexed when dry with shiny, dark red to purple scales; scales with narrow hyaline border. **Monoicous**. **Spores** 80–105 µm in diameter, apolar, red to black, subglobular, wing and triradiate mark absent, periphery with prominent projections, cogwheel-like in profile, reticulate, 6–10 alveoli across. On soil over rock.

DrGr

### **simii** Perold

Plants medium-sized to large, in patches or scattered, bright green or emerald-green. **Thalli** up to 12 × 2.5 mm; margins tightly inflexed when dry, with large, imbricate, wavy, white scales covering the flanks; dorsal pillars 4 or 5 cells high, basal cells in a conspicuous row; scales projecting up to 500 µm above and beyond margins. **Monoicous**. **Spores** mostly 70–105 µm in diameter, polar, yellow or light brown, finely or coarsely reticulate. On soil over rock. *Sim's crystalwort*.

DrGr MsGr Zastr

### **stricta** (Gottsche, Lindenb. & Nees) Perold

Plants forming dense, tangled masses, green, sometimes with purple margins or streaks. **Thalli** in long, branched, flat, narrow ribbons, 15–20 mm long; scales few near apex, small, hyaline. **Monoicous**. **Spores** mostly 62–70 µm in diameter, triangular-globular, polar, winged, reticulate; distal face with 5 or 6 large, deep set areolae across, each with a central boss; proximal face with triradiate ridge very prominent, each facet with 6–10 areolae, some incomplete. Floating on or submerged in water, or on damp soil.

DrGr MsGr

### **volkii** S.W.Arnell

Plants medium-sized, occasionally in rosettes, lime-green to yellowish. **Thalli** 2–6 × 2.5–3.5 mm, lingulate; air pores small, surrounded by 6–8 smaller cells; air chambers in 1 storey; scales vestigial or absent. **Dioicous**. **Spores** mostly 90–100 µm in diameter, yellow-brown to tan, reticulate, wing thin and narrow, with 7 or 8 deep, round or oval alveoli across distal face; proximal face with weak triradiate mark. On soil over rock. *Volk's crystalwort*.

DrGr MsGr

## RIELLACEAE

Plants aquatic, usually submerged. **Stem** (or axis) slender, erect, elongate, simple or furcate, with unistratose wing along dorsal side. **Wing** undulate or ruffled, unistratose, overarching stem at coiled apex, tapering towards base, oil cells scattered. **Scales** unistratose, leaf-like, mostly dimorphic; lateral scales on both sides of wing; ventral scales smaller and often constricted in middle, attached by single or row of cells. **Rhizoids** basally on stem. **Asexual reproduction** by caducous ventral scales. **Dioicous** or **monoicous**. **Antheridia** along free margins of wing, sunken in pockets, ovoid. **Archegonia** single, enclosed in flask-shaped involucres in acropetal sequence along stem, to right and left of wing. **Sporophyte** with globose capsule, cleistocarpous. **Spores** large, single, not in tetrads, brown or purple to red, spinose; nutritive cells 4-nucleate; elaters absent. Monogeneric.

[after Perold: 127 (2000)]

### **Riella** Mont. (sthn Afr.: 5 spp.)

### **echinospora** Wigglesw.

Plants erect. **Stem** up to 35 mm long; wing unistratose, undulate; lateral leaf scales crowded in pairs along stem, attached by row of cells; ventral scales attached by single cell. **Dioicous**.

**Antheridia** along wing margins. **Involucres** 4 or 5 in acropetal sequence along stem, ovoid, short-acuminate; capsules occupying its lower ± ¾. **Spores** 87–98 µm in diameter including spines, light brown, subglobose. Submerged aquatic, recognised by the erect, narrow axis and broad, undulating wing. Only known from a salt pan near Brandfort.

DrGr

# TARGIONIACEAE

Plants thalloid, medium-sized, in crowded patches; dark green. **Thalli** simple or repeatedly furcate, sometimes with ventrolateral innovations. **Scales** ventral in 2 rows, one on either side of keel, large, deep purple, oil cells few. **Dorsal epidermis** hyaline and firm, cells with distinct trigones; air pores conspicuous, surrounded by 3 concentric rings of differentiated cells. **Assimilation tissue** a low storey of air chambers, with chlorophyllose filaments. **Autoicous** or **dioicous**. **Androecia** in groups at apex of ventrolateral branches; antheridia embedded, each with a conical protuberance. **Gynoecial** receptacles displaced below apex of thallus. **Involucres** large, mussel-like, bivalved, thick-walled and black, opening along lips of valves. **Sporophyte** single in each involucre, subsessile, with short seta, foot distinct, capsule wall with thickening bands. **Spores** alveolate with larger network of raised ridges enclosing polygonal areas, all covered by fine reticulum; elaters up to ± 300 µm long, bi- or trispiral.

[Perold: 14 (1999)]

## **Targionia** L. (sthn Afr.: 1 sp.)

### **hypophylla** L.

Plants in crowded patches, dark green, leathery. **Thalli** up to 30 mm high; scales obliquely triangular, reddish to purple-black, with one apical appendage; epidermal cells with conspicuous trigones; air pores large, white-encircled, simple. **Autoicous** or **dioicous**. **Gynoecia** ventrally displaced below apex of thallus, involucres shiny black, mussel-like, enclosing single capsule. **Spores** mostly 62–77 µm in diameter, elaters bispiral. Frequently on soil in rock crevices and overhangs in drier areas. *Orobus-seed liverwort*.

DrGr MsGr

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# Anthocerotophyta

Compiled by J. van Rooy, E. Retief & N.L. Meyer

Five families are now recognised and *Phaeoceros* was moved from the Anthocerotaceae to a broader Notothyladaceae (Renzaglia *et al*. 2009).

## NOTOTHYLADACEAE

Plants thalloid, deep to dark green, forming rosettes or small patches. **Thalli** solid, with large mucilage-containing cells or scattered *Nostoc* colonies; margins entire or crenate, flat or crispate; chloroplasts 1–3 per cell, pyrenoid present or absent. **Tubers** present or absent. **Monoicous** or occasionally **dioicous**. **Antheridia** usually 2–6 per chamber, with non-tiered jacket-cell arrangement. **Sporophytes** long, projecting from thallus surface, or short, horizontal, almost completely enclosed within involucres. **Capsule** erect, 10–90 mm long, linear, or short, up to 3 mm long, clavate; stomata and columella present or absent. **Spores** yellow to brownish or blackish when mature, with equatorial girdle; spinose, finely vermiculate, or granulose to tuberculate. **Pseudoelaters** absent or 1–4-celled, with irregular thickenings.

[after Wigginton: 418 (2004) and Renzaglia *et al*.: 142 (2009)]

### **Phaeoceros** Prosk. (sthn Afr.: 4 spp.)

**carolinianus** (Michx.) Prosk.
*Anthoceros carolinianus* Michx.

Plants in rosettes or irregular patches, 20–40 mm in diameter, dark green. **Thalli** 3–5 mm wide, smooth, repeatedly branched; margins ± lobed; in cross-section 4–7 cells thick, epidermal cells 10–20 µm deep, medullary cells 30–50 µm deep, 50–100 µm long, thin-walled. **Monoicous**. **Female involucres** mostly solitary, occasionally paired; capsules 30–40(–60) mm long. **Spores** mostly 35–45 µm in diameter, rounded-tetrahedral; proximal face finely granulose to smooth; distal face densely papillose to spinulose. Recognised by the solid thallus, monoicous sexual condition and spore ornamentation. On damp soil banks and cliffs. *Carolina hornwort*. Figure 6C, p. 2.

DrGr

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# Lycopodiophyta

Compiled by R.R. Klopper

## Key to families

1a Leaves grass-like, erect, arranged in rosette on small, corm-like rhizome; sporangia borne adaxially in depressions on expanded leaf base . . . . . **Isoetaceae**

1b Leaves short, sessile, arranged spirally or in two ranks on long branched stems; sporangia borne in axils of leaves at branch tips. . . . . 2

2a Leaves without ligules; homosporous . . . . . **Lycopodiaceae**

2b Leaves with ligules; heterosporous. . . . . **Selaginellaceae**

## ISOETACEAE

Submerged or emergent aquatic in permanently or seasonally wet, terrestrial habitats. **Stem** short, corm-like, with many black dichotomously branched rootlets, occasionally with persistent dark scales. **Leaves** produced annually, tufted, grass-like, terete to slightly flattened, with 4 longitudinal air-canals, with a small triangular ligule on adaxial surface. **Sporangia** large, borne adaxially in depressions at leaf base below ligule, partially or completely protected on adaxial side by a membranous outgrowth (velum), heterosporous. *Quillwort family*.

### **Isoetes** L. (sthn Afr.: 12 spp.)

Key to species:

Velum covering half or less of the sporangia; megaspores variously verrucate. . . . . **I. aequinoctialis**

Velum completely covering the sporangia; megaspores smooth to shallowly tuberculate. . . . . **I. transvaalensis**

#### **aequinoctialis** Welw. ex A.Braun

**Pseudo-corm** 3-lobed, 4–10 mm in diameter. **Leaves** erect, ± trigonous, apex abruptly pointed, 40–350 mm long, base broadly deltate, ± 3 mm wide, ligule often trilobed, deltate-attenuate. **Sporangium** only covered in lower half by velum, or velum reduced to a marginal ring. **Megaspores** greyish when dry, granulate to verrucate. In shallow depressions with seasonally water-logged, sandy soils overlaying sheet rock, submerged during summer, dry during winter.




#### **transvaalensis** Jermy & Schelpe

**Pseudo-corm** 3-lobed, < 10 mm in diameter. **Leaves** erect, terete to semi-terete, tapered to acute apex, 30–160 mm long, base broadly deltate, ± 3 mm wide, ligule somewhat fan-

shaped. **Sporangium** completely covered by velum. **Megaspores** blackish when wet, smooth to shallowly tuberculate. In rock pools on sandstone in montane grassland or mountain peaks, submerged during summer, dry during winter. *Transvaal quillwort*. Figure 6D, p. 2.

MsGr

# LYCOPODIACEAE

Terrestrial, epilithic or epiphytic. **Stems** erect, pendulous or creeping, unbranched or dichotomously branched. **Leaves** small, many, sessile, simple with central vein, without ligules, spirally arranged or more rarely in 2 planes. **Sporangia** solitary in axils of leaves or usually arranged in terminal strobili. *Clubmoss family*.

## Key to genera

[after Roux: 18 (2001)]

Stems isotomously branched; sporophylls persistent, ± similar to foliage leaves . . . . . **Huperzia**
Stems anisotomously branched; sporophylls ephemeral, different from foliage leaves . . . . . **Lycopodium**

## **Huperzia** Bernh. (sthn Afr.: 5 spp.)

### Key to species:

Stems stiffly erect, unbranched; sporangia inconspicuous . . . . . **H. saururus**
Stems pendulous, repeatedly branched; sporangia conspicuous . . . **H. verticillata**

### **saururus** (Lam.) Trevis.

*Lycopodium saururus* Lam.

Terrestrial or epilithic. **Stem** stiffly erect, unbranched, 90–230 mm long. **Leaves** narrowly lanceolate, up to 12 × 2 mm, closely overlapping; sporophylls not distinct from sterile leaves. **Sporangia** inconspicuous in sporophyll axils of distal stem portion. Rock ledges and cliffs in seasonally moist montane grassland. *Boriba-boboholo*, *moriri-oa-lilomo*, *moriri-oa-mafika* (SS).

MsGr

### **verticillata** (L.f.) Trevis.

*Lycopodium verticillatum* L.f.

Epilithic or epiphytic. **Stems** pendulous, repeatedly branched, up to 500 mm long. **Leaves** suberect, acicular, up to 8 mm long; sporophylls not distinct from sterile leaves. **Sporangia** single, conspicuous in sporophyll axils of distal stem portion. Moist montane evergreen forests. *Weeping clubmoss*; *treur wolfsklou* (A).

MsGr

# ISOETACEAE

## **Lycopodium** L. (sthn Afr.: 2 spp.)

### **clavatum** L.

Terrestrial. **Stems** erect, branching from a prostrate, branched main stem, 80–300 mm long. **Leaves** erect from branches at right angles, with aristate tips bent forward, 3–5 mm long, up to 0.6 mm wide; sporophylls ephemeral, distinct from sterile leaves. **Sporangia** short-stalked, borne in sporophyll axils in a terminal strobilus. Moist or seasonally moist habitats, especially road cuttings and sheltered mountain slopes amongst rocks. *Running clubmoss*, *common clubmoss*; *algemene wolfsklou* (A); *boriba-boboholo*, *moriri-oa-lilomo*, *moriri-oa-mafika* (SS); *inwele* (Z).

| | | | MsGr | | |
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# SELAGINELLACEAE

Terrestrial or epilithic, moss-like plants. **Stems** long, erect or creeping, bearing aerial roots. **Leaves** small, many, sessile, simple with single central vein, uniform and spirally arranged or dimorphous and in 2 ranks, with inconspicuous basal adaxial ligules. **Sporangia** solitary, borne in axils of leaves, concentrated in compact terminal strobili. *Spikemoss family*.

## **Selaginella** P.Beauv. (sthn Afr.: 9 spp.)

Key to species:

| | | |
|---|---|---|
| 1a | Leaves similar throughout, spirally arranged | 2 |
| 1b | Leaves dimorphic, arranged in 4 distinct rows | 3 |
| 2a | Leaves deep olive-green when living, pale copper-brown when dry; branch tips bending inwards when dry | **S. caffrorum** var. **caffrorum** |
| 2b | Leaves grey-green when living, silver-grey when dry | **S. dregei** |
| 3a | Leaves discolorous; plants erect, rooting near base of stem | **S. imbricata** |
| 3b | Leaves concolorous, curling beneath stem when dry; plants creeping, rooting along stem for most of length | **S. mittenii** |

### **caffrorum** (Milde) Hieron. var. **caffrorum**

Terrestrial or epilithic, mat-forming perennial. **Stems** widely creeping, branched, primary branches prostrate or ascending, branch tips bending inwards when dry. **Leaves** spirally arranged, deep olive-green when living or wet, pale copper-brown when dry, up to 3 × 0.4 mm; sporophylls distinct from sterile leaves, in 4 ranks. Seasonally moist soil pockets on rock surfaces, in rock crevices and at boulder bases. *Resurrection plant*, *staghorn clubmoss*; *boribo*, *morir-oa-matlapa*, *phate-ea-balimo* (SS).

| | | DrGr | MsGr | | Zastr |
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### **dregei** (C.Presl) Hieron.

Terrestrial or epilithic, mat-forming perennial. **Stems** widely creeping, branched, primary branches prostrate or ascending. **Leaves** spirally arranged, grey-green when living or wet,

turning silver-grey when dry, up to 2 × 0.25 mm; sporophylls distinct from sterile leaves, in 2 ranks adjacent to 2 rows of sterile leaves. Shallow, seasonally moist soil pockets on exposed sheet rock. *Drege's resurrection fern*; *grys-opstandingsvaring* (A). Figure 27.

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| VreDm | AcGr | | MsGr | | |

### **imbricata** (Forssk.) Spring ex Decne.

Epilithic perennial. **Stems** repeatedly branched in upper half, primary branches erect, branchlets curling when dry. **Leaves** in 4 distinct rows, discolorous, dark green adaxially, beige abaxially, median and lateral leaves dimorphic, median leaves narrowly ovate-oblong, ± 1.25 mm long, margins widely serrate, lateral leaves oblong-elliptic, ± 1.5 mm long, margins entire; sporophylls hardly distinct from sterile leaves. Seasonally moist, exposed or partially shaded, shallow soil pockets or rock crevices. *Scaled resurrection fern*, *fish-scale clubmoss*; *skubblaar-opstandingsvaring* (A).

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### **mittenii** Baker

Terrestrial or epilithic, loosely mat-forming perennial. **Stems** repeatedly branched, prostrate. **Leaves** in 4 distinct rows, concolorous, curling beneath stem when dry, ciliate at base, median and lateral leaves dimorphic; median leaves elliptic, up to 1.2 mm long, closely clasping stem; lateral leaves elliptic, up to 2 mm long, spreading; sporophylls not distinct from median sterile leaves. Permanently or seasonally moist, exposed or sheltered areas in forests, along streams or rocky places in montane grassland. *Mitten's spike moss*; *dwerg-aarmos* (A).

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| | | DrGr | MsGr | | |



**Figure 27.** *Selaginella dregei* (Selaginellaceae).

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# Pteridophyta

Compiled by R.R. Klopper

## Key to families

[partially adapted from Schelpe & Anthony: 1, 39 (1986) and Roux: 15 (2001)]

1a Leaves much-reduced or absent, with unbranched veins . . . . . 2
1b Leaves broad, simple or dissected, with a branched vascular system . . . . 3
2a Sporangia in globular, thick-walled synangia composed of 3 fused sporangia borne in axils of much-reduced leaves; stems leafless except for minute much-reduced sporophylls . . . . . **Psilotaceae**
2b Sporangia borne on stalked, peltate, sporangiophores arranged in compact, terminal strobili; leaves reduced to a short, toothed sheath at each node . . . . . **Equisetaceae**
3a Fronds hemidimorphic; sporangia borne on highly reduced fertile segments of lamina; sterile lamina segments broad. . . . . 4
3b Fronds monomorphic or dimorphic; sporangia borne on unreduced fertile segments or highly reduced fertile fronds; sterile segments or sterile fronds broad. . . . . 5
4a Sporangia fused to form a synangium, thick-walled, without an annulus, borne in 2 rows on a distinct, slender, fertile segment; sterile lamina segment entire . . . . . **Ophioglossaceae**
4b Sporangia not fused, thin-walled, with an annulus, borne on reduced, apical pinnae; sterile lamina divided . . . . . **Osmundaceae**
5a Plants aquatic. . . . . 6
5b Plants terrestrial, epiphytic or lithophytic . . . . . 7
6a Free-floating aquatics; sporangia in thin-walled sporocarps on submerged leaves or in axils of submerged lobes. . . . . **Salviniaceae**
6b Rooted aquatics; sporangia in thick-walled sporocarps on pedicels at stipe base . . . . . **Marsileaceae**
7a Plants small, moss-like, mat-forming; fronds semi-transparent, one cell thick; sporangia borne on slender receptacle within tubular, cup-shaped or bivalved indusium . . . . . **Hymenophyllaceae**
7b Plants small to large, not moss-like or mat-forming; fronds opaque, > 1 cell thick; sporangia not as above . . . . . 8
8a Fronds repeatedly pseudo-dichotomously branched, indeterminate growth . . . . . **Gleicheniaceae**
8b Fronds not repeatedly pseudo-dichotomously branched, not of indeterminate growth. . . . . 9
9a Fronds dimorphic. . . . . 10
9b Fronds monomorphic . . . . . 11
10a Fronds simple, fertile fronds usually smaller than sterile fronds; sporangia acrostichoid, exindusiate. . . . . **Dryopteridaceae** (*Elaphoglossum*)
10b Fronds pinnatifid to pinnate, fertile fronds highly contracted; sporangia in linear sori borne in almost uninterrupted line along each side of pinnule midrib, indusium linear . . . . . **Blechnaceae**
11a Sporangia on receptacle in circular sori, indusium cyathiform, attached basally to receptacle . . . . . **Cyatheaceae**
11b Sporangia not on receptacle, indusium (if present) not cyathiform . . . . . 12
12a Sporangia borne marginal or submarginal on lamina . . . . . 13
12b Sporangia borne on lamina, along veins, costae or midrib. . . . . 15
13a Sporangia solitary, conspicuous, exindusiate . . . . . **Anemiaceae**

13b Sporangia in continuous or discrete sori, individual sporangia not conspicuous, covered with marginal pseudo-indusium . . . . . 14
14a Lamina thickly coriaceous; rhizome set with hairs . . . . . **Dennstaedtiaceae**
14b Lamina herbaceous to thinly coriaceous; rhizome set with scales. . . . . **Pteridaceae**
15a All or at least the fertile fronds articulated at the stipe base . . . . . 16
15b Fronds not articulated at stipe base . . . . . 17
16a Sori indusiate; veins free . . . . . **Oleandraceae**
16b Sori exindusiate; veins anastomosing . . . . . **Polypodiaceae**
17a Undersurface of fronds with white or yellow powder. . . . . **Pteridaceae** (*Pityrogramma*)
17b Undersurface of fronds without powder . . . . . 18
18a Sporangia borne on all parts of ultimate segments. . . . . **Pteridaceae** (*Anogramma*)
18b Sporangia borne in linear, circular, or elongated to J-shaped sori along veins . . . . . 19
19a Sori linear along veins . . . . . **Aspleniaceae**
19b Sori circular or elongate to J-shaped . . . . . 20
20a Stipe base with 2 or more near circular vascular bundles. . . **Dryopteridaceae**
20b Stipe base with 2 strap-shaped vascular bundles. . . . . 21
21a Sori linear . . . . . **Athyriaceae**
21b Sori circular . . . . . 22
22a Indusium elliptic, attached to posterior of receptacle . . . . **Cystopteridaceae**
22b Indusium cup-shaped, surrounding receptacle. . . . . **Woodsiaceae**

# ANEMIACEAE

Terrestrial or epilithic perennials. **Rhizome** short, decumbent or suberect, irregularly laterally branched. **Fronds** many, erect, monomorphic or hemidimorphic, pinnate to 3-pinnatifid, veins free. **Sporangia** flask-shaped, borne singly (not in sori) at or near vein endings, on almost unmodified distal pinnae or on 2 erect skeletonised basal pinnae, exindusiate, homosporous. *Flowering fern and scented fern family*.

## **Mohria** Sw. (sthn Afr.: 6 spp.)

### Key to species:

[after Roux: 2 (1995)]

1a Adaxially sparsely to densely hirsute . . . . . **M. marginalis**
1b Adaxially glabrous, or with sparse hairs, mainly confined to secondary rachises . . . . . 2
2a Lamina usually < 200 mm long, erect or spreading; scales on abaxial surface lanceolate to ovate appressed . . . . . **M. rigida**
2b Lamina usually > 200 mm long, erect; scales on abaxial surface narrowly linear to narrowly lanceolate, twisted . . . . . 3
3a Lamina herbaceous; adaxially sparsely hairy; pinnule margins strongly dentate . . . . . **M. vestita**
3b Lamina coriaceous; adaxially almost glabrous; pinnule margins shallowly crenate to obtusely toothed. . . . . **M. nudiuscula**

**marginalis** (Savigny) J.P.Roux

*M. hirsuta* J.P.Roux

Terrestrial or epilithic. **Rhizome** shortly creeping. **Fronds** erect, vernation non-circinnate, lamina oblanceolate to linear-attenuate, 33–131 mm long, pinnate to 2-pinnatifid, herbaceous texture; adaxially sparsely to densely hirsute with eglandular, straight-walled hairs; abaxial surface, rachis and stipe with filiform scales and sinuous-walled hairs; pinna margins shallowly crenulate to bluntly dentate. Seasonally moist soil pockets on sheet rock and in montane grassland.

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**nudiuscula** J.P.Roux

*M. caffrorum* (L.) Desv. var. *ferruginea* J.E.Burrows & S.M.Burrows

Terrestrial. **Rhizome** shortly creeping. **Fronds** erect or spreading, vernation non-circinnate, fertile slightly longer than sterile, lamina narrowly elliptic, 53–635 mm long, pinnate to 2-pinnate, thick coriaceous texture; adaxially almost glabrous with few hairs or scales along secondary rachis; abaxial surface, rachis and stipe with long filiform scales, pinnule margins shallowly crenulate to obtusely toothed. Exposed or lightly shaded areas in montane grassland.

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**rigida** J.P.Roux

Epilithic or terrestrial. **Rhizome** shortly creeping. **Fronds** erect or spreading, vernation non-circinnate, fertile slightly longer than sterile, lamina elliptic to narrowly elliptic, 43–197 mm long, 2-pinnate, herbaceous texture, adaxially almost glabrous with few hairs or small scales, abaxially with sparse or dense naviculate hairs and broadly ovate, appressed scales, pinnule margins shallowly crenulate to bluntly dentate. Rocky, often exposed places in montane grassland.

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**vestita** Baker

Epilithic or terrestrial. **Rhizome** shortly creeping. **Fronds** erect, vernation non-circinnate, fertile longer than sterile; sterile lamina narrowly elliptic, 53–380 mm long; fertile lamina narrowly oblanceolate, 79–464 mm long, 2-pinnatifid to 2-pinnate, herbaceous texture; adaxially almost glabrous with ossiform-celled hairs on secondary rachis and veins; abaxially with hastate, sparse, twisted scales on secondary rachis and veins, strongly dentate. Rocky places in grassland. *Scented fern*; *brandbossie* (A); *lehorometso*, *mahorometso* (SS).

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# ASPLENIACEAE

Small to moderate or large terrestrial, often epiphytic or epilithic perennials. **Rhizomes** creeping or erect. **Fronds** many, monomorphic, simple or variously pinnately dissected, often proliferous, veins free, ending near margins, rarely anastomosing near margins; stipe with 2 vascular strands at base, uniting upwards to form a 4-armed single strand, not articulated to rhizome. **Sporangia** in usually linear sori borne elongated along veins,

in some species sporangia marginal in ± rectangular sori, indusium narrow or obsolete, opens inwards, homosporous. *Spleenwort family*.

## **Asplenium** L. (sthn Afr.: 35 spp.)

### Key to species:

1a Pinnae set with dense, imbricate scales abaxially . . . . . 2
1b Pinnae glabrous or set with scattered, small scales abaxially . . . . . 3
2a Fronds pinnatifid to pinnate; pinnae adnate to rachis and decurrent, ovate-oblong . . . . . **A. capense**
2b Fronds pinnate throughout; pinnae free from rachis, elongate . . . **A. cordatum**
3a Fronds usually gemmiferous . . . . . 4
3b Fronds never gemmiferous . . . . . 5
4a Gemmae borne at end of specialised proliferating, stoloniferous frond without pinnae . . . . . **A. stoloniferum**
4b Gemmae borne on upper half of stipe of normal fronds . . . . . **A. monanthes**
5a Fronds pinnate to 2-pinnatifid throughout . . . . . 6
5b Fronds 2- or 3-pinnate . . . . . 7
6a Pinnae with large acroscopic lobe; 7–18 pairs of sori per pinna . . . . . **A. platyneuron**
6b Pinnae only slightly acroscopically developed; 3–6 pairs of sori per pinna . . . . . **A. trichomanes** subsp. **quadrivalens**
7a Sori borne singly on terminal margins of pinnae lobes . . . . . **A. theciferum**
7b Sori not marginal . . . . . 8
8a Venation pinnate; stipe glabrous to subglabrous . . . . . 9
8b Venation flabellate; stipe densely set with scales when young, may become subglabrous with age . . . . . 10
9a Stipe black, glabrous, base prominently swollen . . . . . **A. adiantum-nigrum** var. **adiantum-nigrum**
9b Stipe matt brown, subglabrous, base not swollen . . . . . **A. varians** subsp. **fimbriatum**
10a Fronds tufted; basal pinnae usually reduced; pinnae ovate to narrowly lanceolate; stipe dark brown . . . . . **A. aethiopicum**
10b Fronds closely spaced; basal pinnae not or only slightly reduced; pinnae broadly obcuneate to subrhombic; stipe dark brown basally, becoming green apically . . . . . **A. splendens** subsp. **drakensbergense**

### **adiantum-nigrum** L. var. **adiantum-nigrum**

Terrestrial or epilithic. **Rhizome** shortly creeping. **Fronds** tufted, erect to arching, 2- or 3-pinnate, lamina ovate to lanceolate, 60–150 × 35–140 mm, glabrous adaxially, subglabrous abaxially; pinnae triangular to broadly ovate, angled forward, becoming more dissected basally, margins sharply dentate; rachis black near base, becoming pale towards tip; stipe black, shiny glabrous, subterranean base prominently swollen. **Sporangia** in oval sori borne tightly clustered along costae and costules, up to 3 mm long, with entire indusium. Rock crevices, along streambanks, boulder bases in montane grassland and forest floors. *Black spleenwort*, *black maidenhair*.

DrGr MsGr Zastr

### **aethiopicum** (Burm.f.) Bech.

Terrestrial, epilithic or low-level epiphyte. **Rhizome** creeping, prostrate to suberect, with light brown to dark brown or blackish scales. **Fronds** tufted, arching, variable, deeply 2-pinnatifid to 3-pinnate, lamina ovate to very narrowly lanceolate, 60–250 × 35–140 mm, basal pinnae usually reduced,

subglabrous adaxially, abaxial surface sparsely set with small twisted scales; pinnae ovate to narrowly lanceolate, apex sharply acute to acuminate, margins irregularly serrate; rachis and stipe dark brown, densely covered with hair-like scales, becoming subglabrous with age. **Sporangia** in linear, indusiate sori borne closely packed along veins. Variety of habitats, from shaded moist ravines in dry woodland to high-altitude mist forest. *African spleenwort*; *Afrika tralievaring* (A).

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**capense** (Kunze) Bir, Fraser-Jenk. & Lovis

*Ceterach capense* Kunze

Terrestrial or epilithic. **Rhizome** short, erect or procumbent, with shining lanceolate scales. **Fronds** tufted, suberect to spreading, pinnatifid to pinnate, lamina oblong, 65–90 × 20–40 mm, basal pinnae reduced, glabrous adaxially, covered with pale brown, overlapping scales abaxially, texture thinly coriaceous, involute when dry; pinnae ovate-oblong, adnate to rachis, decurrent, margins wavy to crenate-incised; rachis and stipe blackish, with shining, reddish, lanceolate scales. **Sporangia** in linear sori, becoming confluent, sometimes obscured by scales. Rock crevices and boulder bases. *Resurrection fern*, *scaly fern*; *lehorometso* (SS).

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**cordatum** (Thunb.) Sw.

*Ceterach cordatum* (Thunb.) Desv.

Terrestrial or epilithic. **Rhizome** short, erect or procumbent, with shining lanceolate scales. **Fronds** tufted, suberect, pinnate, lamina oblanceolate, 25–240 × 9–85 mm, basal pinnae reduced, glabrous adaxially, densely covered with pale brown, overlapping scales abaxially, texture thinly coriaceous, involute when dry; pinnae oblong-lanceolate, free from rachis, margins sinuate to crenate; rachis and stipe blackish, with shining, lanceolate scales. **Sporangia** in linear sori, obscured by scales. Rock crevices and boulder bases. *Resurrection fern*, *scaly fern*; *lehorometso* (SS). Figure 7B, p. 3.

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**monanthes** L.

Terrestrial or epilithic. **Rhizome** erect to suberect, with black scales with reddish margins. **Fronds** tufted, suberect, pinnate, often gemmiferous in upper half of stipe, lamina linear-oblong, 150–450 × 18–27 mm, basal pinnae somewhat reduced, glabrous adaxially, with occasional small scales abaxially; pinnae roughly rectangular, acroscopically developed, margins crenate-serrate acroscopically, entire basiscopically; rachis almost black, glabrous; stipe dark brown to almost black, with scattered scales when young, glabrous at maturity. **Sporangia** in elongate-linear to oval sori borne singly (rarely 2) per pinna near costa along lower margins, with subentire indusium. Shaded, moist forest floors, often near streams. *Single sorus spleenwort*; *lehorometso* (SS).

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**platyneuron** (L.) Britton, Sterns & Poggenb.

Terrestrial. **Rhizome** shortly creeping to suberect, with blackish brown scales. **Fronds** tufted, strongly erect, pinnate, lamina linear-elliptic to linear-oblanceolate, ± 240 × 26 mm, glabrous adaxially, subglabrous with minute, scattered scales abaxially; pinnae roughly rectangular, somewhat falcate and angled downwards, sessile, with enlarged acroscopic lobe, margins crenate to subentire; rachis black, glossy; stipe blackish brown, glabrous at maturity. **Sporangia**

in linear, indusiate sori borne in 7–18 pairs set at 45° angle to midrib. Forest margins, among rocks and boulder bases in scrub and open grassland.

MsGr

**splendens** Kunze subsp. **drakensbergense** A.F.Braithw.

Terrestrial or epilithic. **Rhizome** creeping, with mid-brown scales. **Fronds** closely spaced, erect to arching, 2-pinnate, lamina oblong-lanceolate, narrowly ovate to narrowly triangular, 50–160 × 20–50 mm, basal pinnae not or only slightly reduced, glabrous or with few, minute, twisted hairs abaxially; pinnae broadly obcuneate to subrhombic, margins irregularly serrate; rachis sparsely set with twisted, hair-like scales; stipe dark brown basally, becoming green apically, densely covered with scales when young, becoming subglabrous with age. **Sporangia** in many, linear sori borne along veins, with entire, linear indusium. Boulder bases and rock crevices in montane regions. *Drakensberg splendid spleenwort*; *Drakensberg blinkblaar tralievaring* (A).

MsGr

**stoloniferum** Bory

Terrestrial, epilithic or low-level epiphyte. **Rhizome** erect, with dark brown scales. **Fronds** laxly tufted, dimorphic, proliferating fronds without pinnae, elongate, filiform, horizontal, bearing plantlets at tips; normal fronds pinnate, lamina lanceolate, ± 40–100 × 10 mm, glabrous; pinnae widely spaced, unequally obtriangular or cuneiform, distal margins serrate to cuneate; rachis straw-coloured, glabrous; stipe greenish, glabrous. **Sporangia** in elongate, indusiate sori borne along veins. Deeply shaded forest floors.

MsGr

**theciferum** (Humb., Bonpl. & Kunth) Mett.

Epilithic or epiphytic. **Rhizome** erect, with dark brown scales. **Fronds** tufted, suberect to arching, 2-pinnate to 3-pinnatifid, lamina narrowly oblong to lanceolate, 90–260 × 25–60 mm, glabrous; pinnae with linear lobes, costae winged, margins entire; rachis pale straw-coloured, narrowly winged, subglabrous; stipe green when fresh, pale straw-coloured when dry, narrowly winged, with few scales, becoming subglabrous with age. **Sporangia** in oblong to circular, indusiate sori borne singly on terminal margins of pinnae lobes. Moss-covered branches and rocks in deeply shaded, moist evergreen forests. *Frog's foot fern*; *geitjietoon varing* (A).

MsGr

**trichomanes** L. subsp. **quadrivalens** D.E.Mey. emend. Lovis

Terrestrial or epilithic. **Rhizome** erect, with dark brown scales. **Fronds** tufted, pinnate, lamina oblong-linear, 60–230 × 10–15 mm, glabrous adaxially, subglabrous with few minute scales adaxially; pinnae widely spaced, obovate to shortly rectangular, slightly acroscopically developed, margins entire to sharply crenate; rachis and stipe brown or blackish, glabrous. **Sporangia** in linear or elongate, indusiate sori borne in 3–6 pairs per pinna at almost 45° angle to costa. Rock crevices and overhangs in montane grassland. *Maidenhair spleenwort*; *lehorometso* (SS).

DrGr MsGr

**varians** Wall. ex Hook. & Grev. subsp. **fimbriatum** (Kunze) Schelpe

Terrestrial, epilithic or low-level epiphyte. **Rhizome** erect, with dark brown scales. **Fronds** tufted, 2-pinnatifid to 2-pinnate, lamina ovate-lanceolate, rarely oblanceolate, 50–230 ×

15–50 mm, with basal pinnae slightly reduced, glabrous adaxially, subglabrous abaxially; pinnae with obovate to spathulate lobes, basal acroscopic lobe usually free, distal margins sharply toothed, to shallowly incised; rachis glabrous, narrowly winged; stipe matt brown, subglabrous with few hair-like scales. **Sporangia** in linear to oval sori borne along veins, 2–5 per lobe, with linear, erose indusium. Usually on moss-covered boulders in forests, or on shaded earth banks or boulder bases.

MsGr

# ATHYRIACEAE

Terrestrial or epilithic plants. **Rhizome** erect or sometimes shortly creeping. **Fronds** many, monomorphic, pinnate to 3-pinnate, stipe and rachis adaxially grooved, venation free or anastomosing, stipe with 2 strap-shaped vascular bundles that merge upward into single U-shaped bundle. **Sporangia** in elongate, curved or J-shaped, indusiate sori borne on veins, homosporous. *Lady fern family*.

## **Athyrium** Roth (sthn Afr.: 3 spp.)

### Key to species:

[after Roux: 349 (2008)]

Leaves 2-pinnate-pinnatifid; pinnules firmly herbaceous; proximal pinnules on basal 3 or 4 pairs of pinnae smaller than the following pair . . . . . **A. crassicaule**
Leaves up to 3-pinnate; pinnules thinly herbaceous; proximal pinnules on basal pair of pinnae not reduced in size . . . . . **A. newtonii**

### **crassicaule** J.P.Roux

Terrestrial. **Rhizome** erect, up to 90 mm long, robust. **Fronds** up to 8, tufted, erect to arching, lamina narrowly ovate, up to 590 × 260 mm, 2-pinnate-pinnatifid, glabrous, basal pair of pinnae reduced, proximal pinnules on basal 3 or 4 pairs of pinnae smaller than the following pair. **Sporangia** in elongate, curved or J-shaped sori born on vein branches, with subentire indusium. Shaded or partially shaded streambanks and boulder bases.

MsGr

### **newtonii** Baker

*A. scandicinum* auct., non C.Presl

Terrestrial or epilithic. **Rhizome** erect, sometimes forming small caudex up to 120 mm long. **Fronds** up to 6, tufted, suberect to arching, lamina narrowly ovate, 220–600 × 160–350 mm, 3-pinnate to 3-pinnatifid, glabrous, basal pair of pinnae slightly reduced, proximal pinnules on basal pair of pinnae not reduced in size. **Sporangia** in elongate, curved or J-shaped sori born on vein branches, with subentire indusium. Deeply shaded streambanks in evergreen forest. *Shady lady fern*; *sagte damesvaring* (A).

MsGr

# BLECHNACEAE

Terrestrial, epilithic or climbing epiphytes. **Rhizome** widely creeping or suberect to erect, sometimes trunk-like. **Fronds** many, dimorphic, pinnatifid to pinnate, rarely bipinnatifid, fertile pinnae strongly contracted, new fronds often red or pink, veins free or anastomosing, always ending near margins. **Sporangia** in linear sori borne in almost uninterrupted line along each side of pinnule midrib, with linear indusium, opening towards costae, rarely exindusiate, homosporous. *Hard fern family*.

## **Blechnum** L. (sthn Afr.: 6 spp.)

### Key to species:

[after Burrows: 326 (1990)]

1a Pinnae completely adnate to rachis . . . . . 2
1b Pinnae sessile or partially adnate to rachis, bases lobed . . . . . 3
2a Fertile and sterile fronds similar size; pinnae apices acute to attenuate . . . . . **B. attenuatum**
2b Fertile frond half to one third length of sterile frond; pinnae apices obtuse; fertile pinnae crowded . . . . . **B. inflexum**
3a Sterile pinnae apices attenuate; basal acroscopic lobes of fertile pinnae rounded . . . . . **B. punctulatum** var. **punctulatum**
3b Sterile pinnae apices and basal acroscopic lobes of fertile pinnae mucronate . . . . . **B. australe**

### **attenuatum** (Sw.) Mett.

Terrestrial, epilithic or epiphytic. **Rhizome** creeping to suberect. **Fronds** tufted, arching, pinnate with pinna bases adnate to rachis, sterile lamina narrowly elliptic to narrowly oblanceolate, 0.3–1.8 m × 45–360 mm, basal pinnae reduced, glabrous adaxially, subglabrous abaxially, pinnae oblong-acute to linear attenuate, margins entire; fertile lamina similar in size to sterile lamina, pinnae linear, ± 3 mm wide, bases widened and adnate to rachis. **Sporangia** in linear sori borne on whole length of pinna, with linear, entire indusium. Moist to wet, shaded forests and ravines, often near water. *Giant hard fern*; *waterval varing* (A).




### **australe** L.

Terrestrial or epilithic. **Rhizome** thin, widely creeping, terminating in thickened, erect portion. **Fronds** tufted, erect to arching, pinnate, sterile lamina very narrowly elliptic, 280–560 × 35–130 mm, basal pinnae much reduced, glabrous to minutely glandular, pinnae lanceolate, acuminate, somewhat falcate with distinctive mucronate tip, base partially adnate distally, becoming sessile basally, margins entire; fertile lamina somewhat longer than sterile lamina, pinnae contracted laterally, bases remain lobed, basal pinnae not fertile, basal acroscopic lobes of fertile pinnae mucronate. **Sporangia** in linear sori borne on central portion of pinnae, with linear, continuous, minutely lacerate indusium. Shaded streambanks, near waterfalls and shelter of rock overhangs and crevices. *Southern hard fern*; *bostapyt* (A); *metsi-a-oang* (SS). Figure 28.





**Figure 28.** *Blechnum australe* (Blechnaceae).

## BLECHNACEAE

### **inflexum** (Kunze) Kuhn

Terrestrial. **Rhizome** thin, creeping, terminating in thickened, erect portion. **Fronds** in dense whorl, erect to suberect, pinnate, sterile lamina narrowly oblong-elliptic, 280–450 × 50–100 mm, basal pinnae reduced, glabrous, pinnae oblong, acute and rounded, bases adnate to rachis, overlapping distally, spaced apart basally, margins entire; fertile lamina 80–220 × 14–30 mm, pinnae linear, densely crowded. **Sporangia** in linear sori, apparently covering abaxial surface, with continuous, lacerate indusium. Boulder bases, streambanks and forest margins in montane grassland. *Folded hard fern*; *klein-stamvaring* (A).

MsGr

### **punctulatum** Sw. var. **punctulatum**

Terrestrial or epilithic. **Rhizome** prostrate to suberect. **Fronds** tufted, erect to arching, pinnate, sterile lamina lanceolate to linear-elliptic, 33–800 × 12–120 mm, basal pinnae gradually reduced, glabrous, pinnae narrowly oblong, obtuse, sessile, lobes of bases overlapping rachis, margins entire; fertile frond similar to sterile frond, pinnae contracted laterally, bases remain lobed, basal acroscopic lobes of fertile pinnae rounded. **Sporangia** in linear sori covering most of abaxial surface, with linear, continuous indusium. Moist forest margins, boulder bases along streams or lightly shaded forest floors. *Glossy hard fern*; *blinkblaar-bosvaring* (A).

MsGr

## CYATHEACEAE

Large, terrestrial or epilithic perennials. **Stem** large, erect, forming a blackish trunk, unbranched, rarely with short branches, densely covered in adventitious roots and leaf base scars. **Fronds** many, large, with long stipes, borne at apex of stem, deeply 2-pinnatifid to 3-pinnate or rarely 4-pinnatifid, veins free. **Sporangia** borne on receptacle in circular sori on either side of costules of ultimate lobes, indusium attached basally to receptacle, cyathiform when open, homosporous. *Scaly tree fern family*.

### **Cyathea** (sthn Afr.: 2 spp.)

### **dregei** Kunze

*Alsophila dregei* (Kunze) R.M.Tryon

Shrub or tree. **Stem** massive, up to 5 m high, crown without aphlebia. **Fronds** arching, lamina up to 2 m long, 3-pinnatifid to 3-pinnate, glabrous, abaxially with light brown hair-like scales on costules and veins; pinnule lobes narrowly oblong, margins entire to minutely crenate. **Sporangia** in circular, cyathiform sori borne in 2 rows along each side of costule. Open streambanks in grassland. *Common tree fern*; *boomvaring* (A); *isi-hihi* (X); *inkomankoma*, *isikhomankhoma*, *isikhomane*, *umphanga* (Z).

MsGr

# CYSTOPTERIDACEAE

Terrestrial or epilithic plants. **Rhizome** creeping to erect or ascending. **Fronds** many, monomorphic, pinnate to 3-pinnate, sometimes basiscopically developed, stipe and rachis adaxially grooved, venation free, stipe with 2 strap-shaped vascular bundles that merge upward into single U-shaped bundle. **Sporangia** in circular indusiate sori borne on veins, homosporous. *Brittle fern or bladder fern family*.

## **Cystopteris** Bernh. (sthn Afr.: 1 sp.)

### **fragilis** (L.) Bernh. subsp. **fragilis**

Terrestrial. **Rhizome** shortly creeping to suberect. **Fronds** erect, closely spaced, lamina narrowly elliptic to rarely linear-elliptic, 130–290 × 45–80 mm, 3-pinnatifid, glabrous, margins crenate to bluntly serrate, texture very thin and membranous. **Sporangia** in round sori borne on veins, with cup-shaped indusium obscured at dehiscence. Moist rock crevices and boulder bases in montane grassland. *Brittle fern*.

MsGr

# DENNSTAEDTIACEAE

Moderate to large-sized, terrestrial plants. **Rhizome** subterranean, short and erect or short to widely creeping, branched, with reddish hairs. **Fronds** many, large, with long stipes, 3- or 4-pinnate, monomorphic, venation free or anastomosing. **Sporangia** in circular or elongate, small sori borne marginally, submarginally or superficially near margins, exindusiate or indusium cup-shaped, consisting of modified lobe margins, reflexed margins or well-developed outer marginal and partially developed inner indusium, homosporous. *Bracken and ground fern family*.

## **Pteridium** Gled. ex Scop. (sthn Afr.: 1 sp.)

### **aquilinum** (L.) Kuhn subsp. **capense** (Thunb.) C.Chr.

Terrestrial perennial. **Rhizome** creeping subterranean. **Fronds** erect, up to 1.75 m long, lamina ovate to deltate, 3-pinnatifid to 4-pinnate, with sparse, fine, pale hairs, denser abaxially and along costae and costules; pinnules deeply incised, basal pinnae basiscopically developed, ± half as long as frond. **Sporangia** in linear, continuous sori borne submarginally inside inrolled margins, pseudo-indusium ciliate. Exposed grassland and forest margins. *Bracken fern*; *adelaarsvaring* (A); *umbewe*, *umhlashoshana* (Z).

MsGr

# DRYOPTERIDACEAE

Moderate to large, terrestrial or epilithic plants. **Rhizome** creeping, ascending or erect, with non-clathrate scales. **Fronds** many, usually monomorphic or less often dimorphic with contracted fertile fronds, simple to pinnate or up to 4-pinnatifid, veins free or anastomosing. **Sporangia** in round or elongated sori borne on veins, never on margins, or acrostichoid, exindusiate or with reniform or peltate indusium, homosporous. *Wood fern and deer tongue fern family*.

## Key to genera

[after Schelpe & Anthony: 240 (1986)]

1a Fronds simple, dimorphic; sporangia acrostichoid . . . . . **Elaphoglossum**
1b Fronds 2- or 3-pinnate, seldom dimorphic; sporangia in circular sori . . . . . 2
2a Indusium reniform, marginally attached; basal pinnae often developed basiscopically. . . . . **Dryopteris**
2b Indusium circular, conspicuously peltate; basal pinnae not developed basiscopically. . . . . **Polystichum**

## **Dryopteris** Adans. (sthn Afr.: 6 spp.)

### Key to species:

[after Roux: 124 (2001)]:

1a Basal pinnae not conspicuously basiscopically developed. . . . . **D. athamantica**
1b Basal pinnae conspicuously basiscopically developed . . . . . 2
2a Fronds dimorphic, fertile frond longer than sterile frond . . . . **D. dracomontana**
2b Fronds monomorphic, fertile and sterile fronds of equal length. . . . . 3
3a Lamina abaxially with or without oblong unicellular glandular hairs, 2-celled hairs absent . . . . . **D. lewalleana**[#]
3b Lamina abaxially with oblong unicellular glandular hairs, 2-celled hairs present . . . . . **D. pentheri**[#]

[#]*D. lewalleana* and *D. pentheri* are sometimes included in the extremely variable species complex *D. inaequalis* (Schltdl.) Kuntze *s.l.*

### **athamantica** (Kunze) Kuntze

Terrestrial or epilithic. **Rhizome** prostrate. **Fronds** tufted, erect, mostly 3-pinnatifid to 3-pinnate on basal pinnae, lamina narrowly ovate-oblong to lanceolate, 250–680 × 180–260 mm, subglabrous; pinnules deeply pinnatifid, narrowly oblong-lanceolate, margins shallowly crenate to subentire. **Sporangia** in circular sori with circular to slightly reniform, erose indusium. Among rock in montane grassland and forest margins. *Grassland fern*; *grasveld-varing* (A); *koma-koma*, *lehorometso* (SS); *inkomkomo*, *inkomankomane* (Z).




### **dracomontana** Schelpe & N.C.Anthony

Terrestrial or epilithic. **Rhizome** prostrate. **Fronds** tufted, strongly dimorphic, sterile fronds semi-prostrate, 2-pinnate to 3-pinnatifid, conspicuously basiscopically developed, lamina

narrowly deltate to ovate, 110–250 × 60–100 mm, glabrous, pinnules incised or pinnatifid; fertile fronds erect, 3-pinnatifid, lamina narrowly lanceolate, 150–250 mm long, pinnules narrowly oblong. **Sporangia** in circular sori with membranous, slightly erose indusium. Moist rock crevices and boulder bases in montane regions. *Drakensberg wood fern*.

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### **lewalleana** Pic.Serm.

Terrestrial or epilithic. **Rhizome** prostrate. **Fronds** suberect to arching, 2- or 3-pinnate, conspicuously basiscopically developed, lamina ovate to deltate, up to 730 mm long, glabrous or with few filiform scales along costae adaxially, abaxial surface with glandular or eglandular hairs; pinnules ovate-obtuse or oblong-obtuse. **Sporangia** in circular sori with reniform indusium. Moist rocky areas along streams and in forests. *Broadleaved forest fern*; *breëblaar-woudvaring* (A).

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### **pentheri** (Krasser) C.Chr.

Terrestrial or epilithic. **Rhizome** prostrate. **Fronds** erect to arching, 2- or 3-pinnate, conspicuously basiscopically developed, lamina ovate to ovate-triangular, up to 780 mm long, glabrous or with few hairs along costules adaxially, abaxial surface with sparse unicellular glands, 2-celled hairs and scales mostly along costules and veins; pinnules lanceolate to oblong-acuminate. **Sporangia** in circular sori with reniform indusium. Moist rocky areas, streambanks, forests and forest margins. *Penther's wood fern*; *breëblaar-bergvaring* (A); *koma-koma*, *mong a lebitso* (SS).

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## **Elaphoglossum** Schott ex J.Sm. (sthn Afr.: 8 spp.)

### Key to species:

1a Lamina apex sharply acute to acuminate; glabrous adaxially, with minute dot-like scales abaxially; stipe with few scales . . . . . **E. acrostichoides**
1b Lamina apex rounded; with scales adaxially; stipe densely set with scales . . . . . 2
2a Lamina set with scales adaxially, glabrous abaxially with scales on midrib only . . . . . **E. drakensbergense**
2b Lamina covered with scales on both surfaces, especially along margins and midrib, often subglabrous with age adaxially; young fertile fronds folded in half . . . . . **E. spathulatum**

### **acrostichoides** (Hook. & Grev.) Schelpe

Terrestrial, epilithic or epiphytic. **Rhizome** creeping, scales dark brown to pale brown. **Fronds** simple, erect or arching, texture thickly herbaceous to coriaceous, sterile lamina linear-elliptic to very narrowly lanceolate, 30–350 × 10–36 mm, apex acuminate, base tapering, adaxially dark green, glabrous, abaxially paler green, subglabrous with minute stellate scales; fertile frond similar in shape and length as sterile frond, stipe longer, lamina smaller; margins entire, somewhat wavy; stipe articulated near base, with few papery scales. **Sporangia** acrostichoid except for midrib. Moist, exposed or shaded rocks, boulder bases or forests. *Narrow-leaved deer tongue fern*; *smalblaar-tongvaring* (A); *lehorometso*, *tsebe-tsa-'mutla* (SS). Figure 7A, p. 3.

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### **drakensbergense** Schelpe

Terrestrial or epilithic. **Rhizome** widely creeping, scales dark brown. **Fronds** simple, erect, sterile lamina elliptic to slightly oblong or narrowly ovate, 15–60 × 7–12 mm, apex rounded, base tapering, adaxially set with pale brown, peltate scales, abaxially glabrous, with scales on midrib only; fertile frond similar to sterile frond, stipe longer, lamina oblong-elliptic to narrowly ovate, 17–32 × 7–10 mm; margins entire, ciliate; stipe densely set with pale brown scales. **Sporangia** acrostichoid except for midrib. Rock crevices and boulder bases in montane grassland. *Drakensberg tongvaring* (A).

MsGr

### **spathulatum** (Bory) T.Moore

Epilithic. **Rhizome** shortly creeping to suberect, scales pale brown. **Fronds** simple, erect, sterile lamina narrowly obovate to elliptic, 11–22 × 6–8 mm, apex rounded, base tapering, both surfaces covered with pale brown entire scales, especially along margins and midrib, adaxially often subglabrous with age; fertile fronds longer than sterile fronds, lamina ovate, elliptic or orbicular, 6–23 × 6–9 mm, characteristically folded in half before maturity; margins entire to irregular, ciliate; stipe densely set with reddish brown scales. **Sporangia** acrostichoid. Moist, shaded, moss-covered rocks along streams in evergreen forest.

MsGr

## **Polystichum** Roth (sthn Afr.: 9 spp.)

### Key to species:

[after Burrows: 309 (1990)]

| | | |
|---|---|---|
| 1a | Rachis scales almost black | **P. luctuosum** |
| 1b | Rachis scales reddish brown to pale brown | 2 |
| 2a | Basal basiscopic arista of each pinnule folded over adaxial surface | 3 |
| 2b | All aristae pointing outward from pinnules | 4 |
| 3a | Basal pinnae reduced; stipe with many scales | **P. wilsonii** |
| 3b | Basal pinnae not reduced; stipe with few scales, denser basally | **P. transvaalense** |
| 4a | Lamina thickly coriaceous; indusium up to 2 mm in diameter | **P. dracomontana** |
| 4b | Lamina thinly herbaceous; indusium at most 1 mm in diameter | **P. monticola** |

### **dracomontana** Schelpe & N.C.Anthony

Terrestrial. **Rhizome** ascending to procumbent, with brown scales. **Fronds** erect to slightly arching, 2-pinnate to sometimes 3-pinnatifid, lamina lanceolate to narrowly ovate, ± 340 × 140 mm, glabrous, glossy, very dark green adaxially, matt, light green abaxially; pinnules thickly coriaceous, margins crenate, sharply serrate or aristate; rachis with red-brown, sparse, hair-like and larger scales; stipe pale green also with both hair-like and larger scales, becoming denser basally. **Sporangia** in circular sori with peltate, membranous indusium, 1–2 mm in diameter. Forest margins and montane grassland. *Drakensberg shield fern*.

MsGr

## **luctuosum** (Kunze) T.Moore

Terrestrial or epilithic. **Rhizome** erect to suberect, with dark brown scales. **Fronds** tufted, suberect to arching, 2-pinnate to 2-pinnatifid, basal pinnae not or only slightly reduced, lamina lanceolate to narrowly ovate, 220–450 × 90–190 mm, subglabrous adaxially, scattered hair-like scales abaxially; pinnules coriaceous, ovate, basal acroscopic pinnule enlarged, bases strongly unequally cuneate, margins serrate-aristate; rachis densely covered with dark brown, hair-like scales; stipe mid-brown, with both hair-like and larger, almost black scales. **Sporangia** in circular sori with circular, entire indusium, ± 1 mm in diameter. Shady forests and kloofs, often along streams. *Mourning shield fern*; *treurskildvaring* (A).




## **monticola** N.C.Anthony & Schelpe

Terrestrial. **Rhizome** creeping, with rusty coloured scales. **Fronds** tufted, arching, 2-pinnate to 3-pinnatifid, basal pinnae only slightly reduced, lamina ovate-truncate, ± 350 × 140 mm, glabrous adaxially, with occasional hair-like scales abaxially; pinnules lunate, margins aristate, aristae not prominent; rachis set with many reddish scales; stipe pale brown, thickly set with scales, becoming subglabrous with age. **Sporangia** in circular sori with membranous, erose indusium, ± 1 mm in diameter. At base of cliffs and in rocky outcrops in montane grassland. *Mountain shield fern*; *lehorometso* (SS).




## **transvaalense** N.C.Anthony

Terrestrial or epilithic. **Rhizome** erect, rarely procumbent, with brown scales. **Fronds** tufted, erect to arching, 2-pinnate, basal pinnae not or only slightly reduced, lamina narrowly ovate, attenuate, 300–650 × 160–300 mm, subglabrous adaxially, with sparse hair-like scales abaxially; pinnules elliptic to obovate, auriculate, margins aristate, basal basiscopic arista folded over adaxial surface; rachis with brown, hair-like scales; stipe pale brown, with few, both fine, hair-like and large scales, denser basally. **Sporangia** in circular sori with peltate, erose indusium, ± 1 mm in diameter. Along streams on shaded forest floors. *Transvaal shield fern*.




## **wilsonii** H.Christ

*P. alticola* Schelpe & N.C.Anthony

Terrestrial or epilithic. **Rhizome** erect to suberect, with reddish brown scales. **Fronds** tufted, arching, 2-pinnate, basal pinnae slightly reduced, lamina lanceolate-linear, 160–520 × 40–150 mm, subglabrous adaxially, with twisted, hair-like scales abaxially; pinnule margins aristate, basal basiscopic arista folded over adaxial surface; rachis and straw-coloured stipe with dense hair-like scales and pale, ovate scales at almost right angles. **Sporangia** in circular sori with membranous, erose indusium, up to 1 mm in diameter. Vertical rock crevices, rock overhangs and boulder bases in high altitude montane grassland or scrub. *Lehorometso*, *mokubetso* (SS).



# EQUISETACEAE

Terrestrial plants. **Stems**: aerial ones erect, hollow, ribbed; whorls of branches at nodes; subterranean, rhizomatous stems creeping. **Leaves** reduced to short, toothed sheaths at each node. **Sporangia** borne on adaxial surface of peltate heads of sporangiophores. *Horsetail family*.

## **Equisetum** L. (sthn Afr.: 1 sp.)

### **ramosissimum** Desf. subsp. **ramosissimum**

Perennial with underground rhizome. **Stems** erect, up to 2 m high, branching in whorls at nodes, conspicuously longitudinally ribbed. **Leaves** reduced, whorled, fused into a sheath at each node. **Sporangia** borne on stalked, peltate sporangiophores in a terminal strobilus. Permanently moist areas along streams and riverine vegetation. *Scouring rush*, *African horsetail*; *bewerasiegras*, *dronkgras*, *drilgras*, *lidjiesgras*, *perdestert* (A); *mohlaka-photsoane* (SS).

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# GLEICHENIACEAE

Terrestrial or epilithic perennials. **Rhizome** thin, widely creeping, branched, apex bearing fringed scales or branched multicellular hairs. **Fronds** repeatedly pseudo-dichotomously branched, with dormant bud between pairs of lateral branches or pinnae, indeterminate growth, veins free. **Sporangia** grouped into small circular sori, borne on surface of vein, exindusiate, homosporous. *Coral fern family*.

## **Gleichenia** Sm. (sthn Afr.: 1 sp.)

### **polypodioides** (L.) Sm.

Terrestrial or epilithic. **Rhizome** widely creeping. **Fronds** widely spaced, pseudo-dichotomously branched, ultimate branches 2-pinnate; pinnules widely spaced, lobed, linear, ± 70 × 7.5 mm, present on all branches. **Sporangia** in small round sori, partially immersed in lamina surface. Moist disturbed areas such as earth banks and road embankments. *Coral fern*, *creeping coral fern*; *keistervaring* (A); *phalatsane* (SS).

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# HYMENOPHYLLACEAE

Minute and moss-like or small, terrestrial, low-level epiphytic or epilithic, matforming perennials. **Rhizomes** slender, mostly creeping or rarely suberect, irregularly branched. **Fronds** many, small, delicate, semi-transparent and membranous, often one cell thick,

simple to variously divided, monomorphic, veins free. **Sporangia** borne on slender receptacle within tubular, cup-shaped or bivalved indusium, homosporous. *Filmy fern family*.

## Key to genera

Indusium cup-shaped, with bilabiate mouth, receptacle long, protruding . . . . . **Crepidomanes**
Indusium bivalved, receptacle not protruding. . . . . **Hymenophyllum**

### **Crepidomanes** (C.Presl) C.Presl (sthn Afr.: 2 spp.)

**melanotrichum** (Schltdl.) J.P.Roux
*Trichomanes melanotrichum* Schltdl.

Epilithic or low-level epiphytic. **Rhizome** widely creeping, branched, with black hairs. **Fronds** spaced, erect or pendent, lamina ovate to lanceolate, elliptic or oblong, up to 75 mm long, 2- or 3-pinnatifid, dark green when fresh; pinna lobes folded longitudinally when dry; stipe narrowly winged in upper half or ridged throughout. **Sporangia** in obconical sori, almost as deep as broad, narrowly winged by lamina for part of its length. Shaded, mossy boulders or tree trunks in evergreen forest. *Black-haired filmy fern*; *wimper-vliesvaring* (A).

MsGr

### **Hymenophyllum** Sm. (sthn Afr.: 6 spp.)

**tunbridgense** (L.) Sm.

Terrestrial, epilithic or epiphytic. **Rhizome** widely creeping, branched, at first sparsely set with hairs, glabrous at maturity. **Fronds** widely spaced, erect to arching, lamina variously shaped, 40–140 × 16–35 mm, commonly 2-pinnatifid, glabrous, margins serrate; stipe partially narrowly winged. **Sporangia** in sori on proximal acroscopic pinna lobes, enclosed by 2 serrate indusial valves. Wet, deeply shaded, vertical rock faces or tree trunks in forest. *Tunbridge filmy fern*; *Tunbridge-vliesvaring* (A).

MsGr

## MARSILEACEAE

Small, aquatic or semi-aquatic plants, rooting in mud. **Rhizomes** long, widely creeping, dichotomously branched, of indefinite growth. **Fronds** many, 1-pinnate with 2 pinnae pairs in symmetrically cross-wise (clover-shaped), terminal cluster at apex of long petiole, circinnate when young, venation reticulate. **Sporangia** borne in thick-walled sporocarps on short or long stalks, inserted at base of petioles, heterosporous. *Water-clover family*.

## **Marsilea** L. (sthn Afr.: 16 spp.)

Key to species:

1a Sporocarp with distinct lateral ribs; superior tooth insignificant. . . . . **M. macrocarpa**
1b Sporocarp without lateral ribs; superior tooth distinct. . . . . 2
2a Sporocarps with flanks inflated; distal portion rounded; very small. . . . . **M. burchellii**
2b Sporocarps with flanks compressed or only slightly inflated; distal portion squarish . . . . . **M. capensis**

### **burchellii** (Kunze) A.Braun

Aquatic perennial. **Fronds** with slender, glabrous stipes, up to 60 mm long; pinnae obovate or narrowly obovate to suborbicular, up to 8 × 6 mm, distal margins entire, adaxially glabrous, abaxially glabrous or variously pilose. **Sporocarps** 1 or 2 per leaf axil, very small, subcircular to squarish in lateral view, broadly ovate in dorsiventral cross-section, pilose, inferior tooth absent, superior tooth narrow and sharp or short and obtuse, lateral ribs not distinct. Seasonal vleis and seepage areas. *Burchell's water clover*; *Burchell-se-waterklawer* (A). Figure 29.

AcGr DrGr KarSh

### **capensis** A.Braun

Aquatic perennial. **Fronds** with slender, usually crowded, glabrous stipes, 70–200 mm long; pinnae narrowly obdeltoid to obdeltate-obovate, distal margins crenate to undulate, glabrous to thinly pilose. **Sporocarps** obliquely broad-oblong or irregularly rhombic in lateral view, narrowly elliptic in dorsiventral cross-section, laterally compressed or only slightly inflated,



**Figure 29.** *Marsilea burchelli* (Marsileaceae).

thinly pilose, inferior tooth usually absent, superior tooth distinct, short, conical, acute, straight or recurved, lateral ribs absent. Seasonal vleis and pans. *Cape water clover*; *Kaapse-waterklawer* (A).

VreDm | AcGr | DrGr

### **macrocarpa** C.Presl

Aquatic perennial. **Fronds** with slender, usually glabrous stipes, 150–300 mm long; pinnae broadly obdeltoid, 15–23 × 15–23 mm, distal margins entire or shallowly crenate to irregularly incised, glabrous or pilose at first, becoming glabrous with age. **Sporocarps** broadly elliptic to elliptic-oblong or obtusely rectangular to subcircular in lateral view, rectangular in dorsiventral cross-section, tomentose to appressed-pilose, rarely becoming glabrous, inferior tooth usually absent, superior tooth short, obtuse, insignificant, rarely acute, lateral ribs distinct. Dams, seasonal ponds and pans.

VreDm | AcGr | DrGr | MsGr

## OLEANDRACEAE

Terrestrial, epilithic or epiphytic plants. **Rhizome** long, creeping, laterally branched, with phyllopodia. **Leaves** many, deciduous, simple, articulated to phyllopodia, veins free. **Sporangia** in circular sori borne in single row on each side of midrib, with round-reniform indusium opening outwards, homosporous. *Crevice creeper family*.

### **Oleandra** Cav. (sthn Afr.: 1 sp.)

### **distenta** Kunze

Epilithic or occasionally epiphytic. **Rhizome** very widely creeping, branched. **Leaves** many, tufted or widely spaced, arching to rarely erect, deciduous, articulated, simple, narrowly linear-ovate to oblong-elliptic, 140–300 × 15–53 mm. **Sporangia** in circular sori borne in irregular row on each side of midrib, with round, entire indusium. On cliff faces, near waterfalls, in rock overhangs and in crevices of boulders in montane grassland. *Tangled crevice creeper*; *kranstou* (A).

DrGr

## OPHIOGLOSSACEAE

Terrestrial or epiphytic, small to very small, deciduous plants. **Rhizome** globose, subglobose or elongate, erect or creeping, subterranean. **Leaves** few or solitary, petiolate, simple or divided, vernation not circinnate, lamina with separate sterile, foliaceous and fertile, spike-like segments, both arising from same stipe. **Sporangia** large, thick-walled, without an annulus, superficial or imbedded in double row within terminal spikes of fertile segments, dehiscing by slit into 2 valves, homosporous. *Adder's tongue family*.

## MARSILEACEAE

## **Ophioglossum** L. (sthn Afr.: 14 spp.)

Key to species:

1a Old stipe bases persistent . . . . . **O. polyphyllum**
1b Old stipe bases not persistent. . . . . 2
2a Sterile lamina narrowly elliptic to elliptic. . . . . **O. lusoafricanum**
2b Sterile lamina ovate, only occasionally lanceolate . . . . . **O. vulgatum** subsp. **africanum** var. **africanum**

### **lusoafricanum** Welw. ex Prantl

Terrestrial. **Rhizome** linear, erect, lacking persistent old stipe bases. **Leaf** single, rarely 2, erect, sterile lamina narrowly elliptic to elliptic, up to 35 × 5 mm; fertile spike with up to 16 sporangium pairs; stipe up to 80 mm long, subterranean for up to half of its length. Moist submontane grassland.

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### **polyphyllum** A.Braun

Terrestrial. **Rhizome** cylindrical, with persistent old stipe bases. **Leaves** 1 or 2, erect, sterile lamina narrowly elliptic to lanceolate or sometimes narrowly ovate, 20–110 × 6.5–29.0 mm; fertile spike with 12–46 sporangium pairs; stipe 25–130 mm long, subterranean for one third to half of its length. Wide variety of habitats.

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### **vulgatum** L. subsp. **africanum** Pocock ex J.E.Burrows var. **africanum**

Terrestrial. **Rhizome** oval to cylindrical, lacking persistent old stipe bases. **Leaf** single, erect, sterile lamina ovate or sometimes lanceolate, 25–90 × 9–44 mm; fertile spike with 15–32 sporangium pairs; stipe 30–220 mm long, subterranean for one third of its length. Seasonally moist areas in woodland and montane grassland. *Common adder's tongue*.

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# OSMUNDACEAE

Moderate to large terrestrial perennials. **Rhizome** massive, erect, sometimes forming short trunk, covered in persistent dried leaf bases. **Fronds** large, many, pinnate to 2-pinnate, veins free, whole fronds or only pinnae dimorphic. **Sporangia** large, not grouped into sori, borne along veins on both surfaces of fertile pinnules or on abaxial surface of undifferentiated pinnae, exindusiate, homosporous, with green spores.

## **Osmunda** L. (sthn Afr.: 1 sp.)

### **regalis** L.

Terrestrial. **Rhizome** erect, up to 3 m long. **Fronds** erect, 2-pinnate, up to 1 m long, outline narrowly ovate, with dimorphic sterile and fertile pinnules; sterile pinnules narrowly ovate-

oblong, glabrous at maturity; fertile pinnules much reduced, borne on terminal portion of lamina, covered in sporangia. Banks of fast-flowing streams and rivers. *Royal fern*, *flowering fern*; *adelvaring* (A).

DrGr MsGr

# POLYPODIACEAE

Epiphytic or epilithic, rarely terrestrial plants. **Rhizomes** erect to creeping or climbing, laterally branched, with peltate, often clathrate scales. **Fronds** many, simple to 2-pinnatifid, produced in 2 ranks on upper side of rhizome, often articulated to rhizome, monomorphic or dimorphic, veins free or anastomosing. **Sporangia** in round or elliptic, linear or acrostichoid, exindusiate sori borne submarginally or superficially and terminally on veins or at junction of 2 veins, homosporous. *Polypody family*.

## Key to genera

1a Abaxial lamina surface with circular to ovate scales . . . . . **Pleopeltis**
1b Abaxial lamina surface glabrous at maturity . . . . . 2
2a Fronds simple. . . . . **Lepisorus**
2b Fronds pinnate . . . . . **Polypodium**

## **Lepisorus** (J.Sm.) Ching (sthn Afr.: 2 spp.)

### **schraderi** (Mett.) Ching

*Pleopeltis schraderi* (Mett.) Tardieu

Epilithic or epiphytic. **Rhizome** creeping, scales black. **Fronds** erect to arching, simple, lamina narrowly lanceolate, 130–340 × 12–29 mm, texture firmly herbaceous, glabrous at maturity, margins entire. **Sporangia** in round, exindusiate sori born in 2 rows, one on either side of midrib, in upper half of lamina. Evergreen forest or scrub. *Smooth lance-fern*; *naakte lansvaring* (A).

MsGr

## **Pleopeltis** Humb. & Bonpl. ex Willd. (sthn Afr.: 2 spp.)

### Key to species

Fronds simple . . . . . **P. macrocarpa** var. **macrocarpa**
Fronds deeply pinnatifid . . . . . **P. polypodioides** subsp. **ecklonii**

### **macrocarpa** (Bory ex Willd.) Kaulf. var. **macrocarpa**

Epilithic or epiphytic. **Rhizome** widely creeping, scales with dark brown central part and pale, jagged margins. **Fronds** erect to arching, simple, lamina narrowly elliptic, 60–200 × 7–17 mm, texture coriaceous, adaxially subglabrous, abaxially with scattered, pale, circular to ovate

scales, margins entire, slightly wavy. **Sporangia** in circular to broadly oval, exindusiate sori born in 2 rows, one on either side of midrib, in upper half of lamina. Evergreen and riverine forest, moist woodland and scrub. *Scaly lance-fern*; *lansvaring* (A); *lehorometso*, *tsee-tsa-'muthla* (SS).

MsGr

**polypodioides** (L.) E.G.Andrews & Windham subsp. **ecklonii** (Kunze) J.P.Roux
*Polypodium polypodioides* (L.) Hitch. subsp. *ecklonii* (Kunze) Schelpe

Epilithic or epiphytic. **Rhizome** widely creeping, scales dark brown with pale margins. **Fronds** erect to arching, deeply pinnatifid towards apex, pinnate in lower half, lamina narrowly deltate, 25–205 × 15–65 mm, texture firmly herbaceous to coriaceous, adaxially glabrous, abaxial surface and stipe with circular to broadly ovate, peltate, dark brown scales with pale margins, lamina margins entire to somewhat irregular. **Sporangia** in round to oval, exindusiate sori born near noticeably inrolled margins of pinnae. Mist-belt forest, semi-deciduous forest and woodland. *Ecklon's polypody*.

MsGr

## **Polypodium** L. (sthn Afr.: 2 spp.)

**vulgare** L.

Epilithic or rarely epiphytic. **Rhizome** creeping, scales pale brown. **Fronds** erect, pinnate, lamina narrowly ovate to oblong, 80–200 × 35–75 mm, texture thickly coriaceous, lamina and stipe glabrous, margins entire to slightly wavy or irregular. **Sporangia** in round, exindusiate sori born in single row on each side of pinna midrib. Damp, shaded rocks and cliffs. *Common polypody*.

MsGr

# PSILOTACEAE

Terrestrial plants, confined to proximity of water. **Stems**: aerial ones chlorophyllous, rigid, twisted, dichotomously branched from above middle; subterranean, rhizomatous stems brown. **Leaves** few, greatly reduced. **Sporangia** borne on upper parts of aerial stems, supported by a very small, bifurcate bract, in 3-lobed synangia. *Whisk fern family*.

## **Psilotum** Sw. (sthn Afr.: 1 sp.)

**nudum** (L.) P.Beauv.
*Lycopodium nudum* L.
*P. triquetrum* Sw.

Epilithic or occasionally epiphytic. **Rhizome** short, rootless. **Stems** triangular in cross-section, glabrous, up to 240 mm high. **Leaves** rudimentary, simple, widely spaced, up to 1.5 mm long. **Sporangia** fused to form sessile synangium, each subtended by a bifurcate bract. Sheltered,

moist rock crevices in forest and montane environments, often associated with streams or riverine habitat. *Whisk fern*; *stoffervaring* (A).

DrGr MsGr

# PTERIDACEAE

Terrestrial, epilithic, epiphytic, ephemeral or perennial plants. **Rhizomes** erect, ascending, suberect or creeping, often laterally branched, with scales. **Fronds** many, monomorphic or dimorphic, simple and entire, pinnate to quadripinnatifid, or branching dichotomously, often proliferous, veins free or reticulate. **Sporangia** solitary or in sori borne marginally or more commonly elongated along veins, rarely acrostichoid, exindusiate or covered by a strongly modified marginal indusium, sometimes in grooves, homosporous. *Brake fern*, *maidenhair fern*, *cliff brake and lip fern family*.

## Key to genera

[after Schelpe & Anthony: 91 (1986)]

| | | |
|---|---|---|
| 1a | Sori marginal or submarginal | 2 |
| 1b | Sori borne along veins | 5 |
| 2a | Sori born on reflexed marginal flaps | **Adiantum** |
| 2b | Sori born on under surface of lamina near margins and usually covered by it | 3 |
| 3a | Ultimate fertile segment with a distinct sterile apex | **Pteris** |
| 3b | Ultimate fertile segment without a distinct sterile apex | 4 |
| 4a | Ultimate segments of frond articulated | **Pellaea** |
| 4b | Ultimate segments of frond not articulated | **Cheilanthes** |
| 5a | Lamina with yellow or white powder on undersurface | **Pityrogramma** |
| 5b | Lamina without powder on undersurface | **Anogramma** |

## **Adiantum** L. (sthn Afr.: 6 spp.)

### Key to species:

Margins serrate; veins ending in tip of marginal serration . . . . **A. capillus-veneris**
Margins crenulate; veins ending in sinuses between crenations. . . . . **A. poiretii**

### **capillus-veneris** L.

Terrestrial or epilithic. **Rhizome** creeping. **Fronds** closely spaced, erect to arching or pendent, 2- or 3-pinnate, lamina broadly triangular to narrowly ovate, up to 200 × 180 mm, glabrous; pinnules obtriangular, persistent, deeply incised, margins shallowly serrate, veins ending in marginal serrations. **Sporangia** in oblong, lunulate or reniform sori borne on lobe apices, with pale brown, glabrous indusial flap. Shaded moist rock faces and crevices. *Maidenhair fern*, *black maidenhair*; *vrouehaarvaring*, *swart-vrouehaar* (A).

MsGr Zastr

### **poiretii** Wikstr.

Terrestrial or epilithic. **Rhizome** widely creeping. **Fronds** crowded, erect to arching, 2–4-pinnate, lamina ovate, up to 300 × 250 mm, glabrous; pinnules ovate to elliptic, deciduous, shallowly

incised, margins crenulate, veins ending in sinuses between crenations of teeth. **Sporangia** in oblong to reniform sori borne along acroscopic margins, with green, glabrous indusial flap. Shaded, moist floors of montane forest. *Maidenhair fern*; *vrouehaarvaring* (A); *lehorometso*, *lepata-maoa*, *pata-leoana* (SS).

DrGr MsGr Zastr

## **Anogramma** Link (sthn Afr.: 1 sp.)

### **leptophylla** (L.) Link

Terrestrial annual. **Rhizome** minute. **Fronds** few, tufted, erect to slightly arching, 2- or 3-pinnatifid, lamina ovate to oblong, up to 50 × 30 mm, fertile fronds slightly longer and more erect than sterile fronds, glabrous. **Sporangia** in exindusiate sori borne clustered along veins in lobes of pinnae. Damp, shady, moist earth slopes. *Annual fern*.

MsGr

## **Cheilanthes** Sw. (sthn Afr.: 25 spp.)

### Key to species:

1a Fronds with hairs and/or scales . . . . . 2
1b Fronds glabrous, subglabrous or sticky. . . . . 3
2a Lamina with hair-like scales adaxially; abaxial surface with thick covering of hairs, as well as shiny, cream-coloured scales on costae and costules . . . . . **C. eckloniana**
2b Lamina with scattered, long, multicellular, gland-tipped hairs on both surfaces . . . . . **C. hirta**
3a Lamina viscid or sticky . . . . . **C. parviloba**
3b Lamina glabrous to subglabrous, not sticky . . . . . 4
4a Venation apparent adaxially . . . . . 5
4b Venation obscure adaxially . . . . . 6
5a Sori with continuous indusium . . . . . **C. viridis** var. **viridis**
5b Sori discrete, with discontinuous indusium . . . . . **C. capensis**
6a Sori discrete, with discontinuous indusium . . . . . **C. multifida**
6b Sori with continuous indusium . . . . . 7
7a Stipe with brown or blackish scales . . . . . **C. involuta** var. **obscura**
7b Stipe mostly glabrous at maturity, with reddish brown, hair-like scales towards base . . . . . **C. quadripinnata**

### **capensis** (Thunb.) Sw.

Terrestrial or epilithic. **Rhizome** creeping. **Fronds** closely spaced, erect to arching, 2- to deeply 3-pinnatifid, basal pinnae largest and distinctly basiscopically developed, lamina ovate to triangular, 50–130 × 33–100 mm, glabrous, venation apparent adaxially, margins bluntly serrate to crenate; stipe glabrous. **Sporangia** in discrete, marginal sori with discontinuous, lacerate indusium. Boulder bases or among grasses and scrub. *Cape lip fern*; *Kaapse lipvaring* (A).

MsGr

### **eckloniana** (Kunze) Mett.

Terrestrial or epilithic. **Rhizome** creeping or ascending. **Fronds** tufted, erect, 2- to almost 3-pinnatifid with basal pinnae developed basiscopically, lamina narrowly ovate, up to 450 mm



**Figure 30.** *Cheilanthes eckloniana* (Pteridaceae).

PTERIDACEAE

long, dark green with sparse, white, hair-like scales adaxially, abaxial surface densely covered with hairs and with overlapping, shiny, golden-brown scales on costae and costules; stipe shiny or with covering of pale brown scales. **Sporangia** in marginal, interrupted sori that are frequently obscured by scales, with small or no indusium. Rocky outcrops. *Ecklon's lip fern*, *resurrection fern*; *Ecklon-se-lipvaring* (A); *lehorometso*, *mathomeng* (SS). Figure 30.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

**hirta** Sw.

Terrestrial or epilithic. **Rhizome** prostrate to erect. **Fronds** tufted, erect, 2-pinnate to 4-pinnatifid, lamina linear-elliptic to narrowly obovate, 80–600 × 20–150 mm, both surfaces with scattered, long, multicellular, gland-tipped hairs; stipe with reddish brown, multicellular, non-glandular, hair-like scale standing out stiffly from stipe. **Sporangia** in discrete, marginal sori borne below inrolled lobe margins with minute or no indusium. Boulder bases and rock crevices. *Parsley fern*; *pietersielievaring* (A); *mamaoaneng*, *lethotho* (SS); *inkomakoma*, *inkomankoma* (Z).

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

**involuta** (Sw.) Schelpe & N.C.Anthony var. **obscura** (N.C.Anthony) N.C.Anthony

*C. viridis* (Forssk.) Sw. var. *obscura* N.C.Anthony

Terrestrial or epilithic. **Rhizome** shortly creeping to ascending. **Fronds** tufted, erect, 2-pinnate to 3-pinnatifid, lamina ovate to subdeltate, 30–240 × 22–130 mm, glabrous adaxially, with few scales along costules abaxially, venation obscure adaxially; stipe with brown or blackish scales. **Sporangia** in linear, marginal sori with continuous, suberose indusium. Rocky outcrops and boulder bases.

| VreDm | | DrGr | MsGr | KarSh | |
|---|---|---|---|---|---|

**multifida** (Sw.) Sw.

*C. multifida* (Sw.) Sw. subsp. *lacerata* N.C.Anthony & Schelpe

Terrestrial or epilithic. **Rhizome** creeping. **Fronds** tufted, erect, 3–5-pinnatifid, basal pinnae basiscopically developed, lamina broadly ovate to deltate, 50–320 × 35–280 mm, subglabrous, venation obscure adaxially; stipe glabrous. **Sporangia** in discrete, marginal sori with pale, semi-circular, entire, erose to lacerate indusium. Boulder bases and rock crevices. *Cluster fern*; *kolonie-lipvaring* (A).

| | | | MsGr | | |
|---|---|---|---|---|---|

**parviloba** (Sw.) Sw.

Terrestrial or epilithic. **Rhizome** shortly creeping. **Fronds** tufted, erect, 2-pinnate to 4-pinnatifid, lamina elliptic to narrowly obovate, 100–320 × 10–70 mm, viscid adaxially, subglabrous abaxially; stipe with pale brown hairs. **Sporangia** in discrete, marginal, exindusiate sori borne along apices of ultimate lobes. Dry rocky slopes.

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|

**quadripinnata** (Forssk.) Kuhn

Terrestrial or epilithic. **Rhizome** shortly creeping. **Fronds** tufted, erect, 4-pinnatifid to 5-pinnate, basal pinnae conspicuously basiscopically developed, lamina pentagonal, 200–600 × 200–

400 mm, glabrous, venation obscure adaxially; stipe mostly glabrous at maturity, with reddish brown, hair-like scales towards base. **Sporangia** in continuous, marginal sori with continuous, membranous, entire to erose indusium. Forest margins and boulder bases in grassland or scrub. *Four-pinnate lip fern*; *vierveerlipvaring* (A); *lehorometso* (SS).

| | | DrGr | MsGr | | Zastr |
|---|---|---|---|---|---|

### **viridis** (Forssk.) Sw. var. **viridis**

Terrestrial. **Rhizome** shortly creeping. **Fronds** tufted, erect to arching, 2-pinnatifid to 3-pinnate, basal pinnae slightly basiscopically developed, lamina narrowly ovate to ovate or broadly ovate-triangular, glabrous, venation apparent adaxially; pinnae up to 20 × 7 mm; stipe glabrous to subglabrous with hair-like scales becoming denser towards base. **Sporangia** in marginal sori with subentire, continuous indusium. Shaded forest floors, forest margins and scrub. *Common lip fern*; *raamvaring* (A); *ikhambi lesilonda* (Z).

| VreDm | | DrGr | MsGr | | |
|---|---|---|---|---|---|

## **Pellaea** Link (sthn Afr.: 7 spp.)

### **calomelanos** (Sw.) Link var. **calomelanos**

Terrestrial or epilithic. **Rhizome** erect to suberect. **Fronds** tufted, erect to arching, 2- or 3-pinnate, lamina ovate, 100–250 × 25–150 mm, glabrous, texture coriaceous, grey-green adaxially, pale abaxially; pinnules hastate to ovate, petiolate, venation obscure; stipe and rachis black. **Sporangia** in continuous marginal sori with continuous, entire indusium. Rock crevices and boulder bases. *Hard fern*; *blou-groen bergvaring* (A); *lehorometso*, *pata-leoana*, *lapata-maoa*, *phatsoa-kommoho* (SS); *phaladza* (Z). Figure 31.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

## **Pityrogramma** Link (sthn Afr.: 2 spp.)

### **argentea** (Willd.) Domin

Terrestrial or epilithic. **Rhizome** erect. **Fronds** densely tufted, erect to arching, 3- or 4-pinnatifid, lamina broadly ovate to triangular, 15–290 × 12–250 mm, basal pinnae slightly basiscopically developed, glabrous, green adaxially, abaxial surface covered with white or yellow powder. **Sori** in linear, exindusiate sori borne along veins. Rock crevices and boulder bases.

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|

## **Pteris** L. (sthn Afr.: 7 spp.)

Key to species:

Basal pinnae with basiscopic subpinnae . . . . . **P. cretica**
Basal pinnae all simple, gradually reduced. . . . . **P. vittata**

**cretica** L.

Terrestrial or epilithic. **Rhizome** shortly creeping. **Fronds** tufted, erect to arching, pinnate with basal pinnae bearing basiscopic subpinna, lamina ovate, 130–550 × 130–380 mm, dimorphous, sterile fronds half as long as fertile fronds, glabrous; sterile pinnae narrowly lanceolate, acuminate, margins serrulate-aristate; fertile pinnae linear, attenuate, margins entire. **Sporangia** in linear, marginal, continuous sori with entire, continuous indusium. Undergrowth and margins of moist evergreen and riverine forest. *Cretan brake*, *avery fern*; *Kreta-ruigtevaring* (A); *lehorometso*, *lesira* (SS).

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|



**Figure 31.** *Pellaea calomelanos* var. *calomelanos* (Pteridaceae).

**vittata** L.

Terrestrial or epilithic. **Rhizome** short, prostrate to semi-erect. **Fronds** tufted, erect to arching, uniformly pinnate, basal pinnae gradually reduced, lamina narrowly elliptic to oblanceolate, 200–1 150 × 80–400 mm, monomorphic, glabrous; pinnae linear-oblanceolate, narrowly attenuate, margins serrulate. **Sporangia** in linear, marginal, continuous sori with entire indusium. Shaded rock crevices, forest floors and forest margins. *Chinese ladder brake*; *leervaring* (A).

DrGr MsGr

## SALVINIACEAE

Small, aquatic, free-floating plants. **Rhizome** slender, branched, with simple roots borne singly or in fascicles, or roots absent. **Leaves** sessile, either dimorphous, borne in whorls of 3, each group consisting of 2 simple floating leaves and a strongly branched submerged leaf, or alternate in 2 rows, equally lobed with a submerged lobe containing cavities housing blue-green algae and a chlorophyllous floating lobe; veins free or anastomosing. **Sporangia** borne in thin-walled mega- and microsporocarps on submerged leaves or in axils of submerged lobes, heterosporous. *Floating fern and mosquito fern family*.



**Figure 32.** **Azolla filiculoides* (Salviniaceae).

## PTERIDACEAE

### **Azolla** Lam. (sthn Afr.: 2 spp.)

#### ***filiculoides** Lam.

Free-floating aquatic plant; branching irregular, not noticeable pinnate. **Roots** borne singly. **Leaves** silvery green, with wine-red tinge in winter, broadly ovate to almost circular, up to 1.1 mm long. **Megasporocarps** with prominent dark apex; megaspores with 3 massulae. **Microsporocarps** borne singly or subtended by a megasporocarp. Rivers, dams, reservoirs and seasonal pans. Native to South America. *Mosquito fern*. Figure 32.

| VreDm | | DrGr | MsGr | KarSh | |
|---|---|---|---|---|---|

## WOODSIACEAE

Terrestrial or epilithic plants. **Rhizome** creeping to erect. **Fronds** many, monomorphic, pinnate to 2-pinnate, stipe and rachis adaxially grooved, venation free or anastomosing, stipe with 2 strap-shaped vascular bundles that merge upward into single U- or V-shaped bundle. **Sporangia** in circular indusiate sori borne on veins, homosporous. *Cliff fern family*.

### **Woodsia** R.Br. (sthn Afr.: 2 spp.)

#### **burgessiana** Gerr. ex Hook. & Baker

*W. montevidensis* (Spreng.) Hieron. var. *burgessiana* (Gerr. ex Hook. & Baker) Schelpe

Terrestrial. **Rhizome** short, creeping. **Fronds** closely packed, lamina very narrowly elliptic-oblong, 65–300 × 20–60 mm, deeply 2-pinnatifid to 2-pinnate, with sparse, minute, round, golden glands on both surfaces, margins deeply crenate on sterile lobes or irregularly crenate to serrate on fertile lobes. **Sporangia** in subcircular sori borne on veins, with cup-shaped indusium. Boulder bases, rock crevices or ledges of cliff faces in montane grassland.

| | | | MsGr | | |
|---|---|---|---|---|---|

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# Spermatophyta

## Gymnospermae

### Key to families

1a Seeds not winged; leaves petiolate, blade narrowly elliptic . . . . . **Podocarpaceae**
1b Seeds winged; leaves sessile, blade needle- and/or scale-like or awl-shaped . . . . . 2
2a Leaves awl-shaped (when juvenile) or scale-like; cones fleshy, dry or woody, < 20 mm long. . . . . **Cupressaceae**
2b Leaves linear, needle-like; cones woody, > 20 mm long . . . . . **Pinaceae**

## CUPRESSACEAE

Evergreen trees or shrubs; monoecious or occasionally dioecious. **Leaves** usually of two types, in juvenile form often needle-like, spirally or subspirally arranged and spreading, in adult form usually small, squamiform, whorled or decussate and ± appressed. **Male cones** small, mostly terminal and solitary. **Female cones** developing into typical cone, with enlarged leathery or woody scales; scales few to many, all or most fertile, bearing erect ovules at base on adaxial surface. **Seeds** free, mostly winged. *Cypress family*.

### Key to genera

1a Cones fleshy. . . . . **Juniperus**
1b Cones dry and woody . . . . . 2
2a Cones ovoid to oblong, with 4 (rarely 6) ± oblong scales . . . **Widdringtonia**
2b Cones subspherical to globose, usually with 8 peltate scales . . . **Cupressus**

### **Cupressus** L. (sthn Afr.: 1 sp.)

#### ***arizonica** Greene

Evergreen tree, up to 30 m high, with a narrow, pyramidal crown on young trees becoming broader and open when older. **Leaves** greyish when young, becoming glaucous; resinous-glandular, emitting a disagreeable odour when crushed. **Cones** up to 30 mm in diameter. Invader. Native to America. *Arizona pine*; *Arizona-den* (A).

| | | | | | |
|---|---|---|---|---|---|
| | | | MsGr | | |

## **Juniperus** L. (sthn Afr.: 1 sp.)

### ***virginiana** L.

Evergreen tree, up to 18 m high, initially conical, later with horizontal spreading branches; dioecious. **Leaves** of two types with adult ones scale-like, overlapping, acute, ± 1.5 mm long and juvenile leaves needle-like, up to 10 mm long. **Cones** indehiscent, globose, ± 6 mm in diameter, berry-like, dark blue with a bluish grey bloom. Grassland, riverbanks, rocky outcrops. Native to North America. *Red or pencil cedar*; *rooi-potloodseder* (A).

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## **Widdringtonia** Endl. (sthn Afr.: 3 spp.)

### **nodiflora** (L.) Powrie

*W. cupressoides* (L.) Endl.
*W. dracomontana* Stapf

Shrub or small tree, up to 9 m high, crown pyramidal when young, spreading with age. **Bark** reddish grey, thin, flaking off annually. **Leaves** of two types with young ones needle-like, spreading, 10–20 × 2 mm, adult leaves scale-like, appressed, narrowly oblong. **Cones**: male cones small, 2–4 mm long, on short lateral branches, scales broadly ovate with 4 pollen sacs at base of each scale; female cones of 4 woody valves, valves smooth to wrinkled, maturing ± Mar., but cones of varying stages of development may be found throughout the year. Forest, mountainous areas. *Mountain cypress*, *mountain cedar*; *bergsipres* (A).

MsGr

# PINACEAE

Trees or rarely shrubs; monoecious, evergreen or rarely deciduous, with monopodial growth; wood containing resin. **Leaves** linear, spirally arranged. **Cones**: male cones small, with many spirally arranged scales each bearing 2 pollen sacs on abaxial surface; pollen grains usually with a pair of wings; female cones usually subterminal and woody; scales arising in axils of many spirally arranged bracts and attached to them only at base, bearing 2 inverted ovules on adaxial surface. **Seeds** usually winged. *Pine family*.

## **Pinus** L. (sthn Afr.: 9 spp.)

Key to species:

| | | |
|---|---|---|
| 1a | Leaves slender, drooping | **P. patula** |
| 1b | Leaves stiff | 2 |
| 2a | Scales end in a blunt, grey prickle, 1–2 mm long | **P. elliottii** |
| 2b | Scales flat or slightly raised along a transverse ridge | **P. halepensis** |

***elliottii** Engelm.

Coniferous tree, up to 30 m high, with an open crown of modest spread, free of branches to a considerable height. **Leaves** needle-like, in bundles of two or three, coarse and stiff, crowded at ends of branchlets. **Cones**: conic-ovoid, 60–140 mm long; scales end in a blunt, grey prickle, 1–2 mm long. Grassland, forest margins. Invader. Native to North America. *Slash pine*; *bas-den* (A).

MsGr Zastr

***halepensis** Mill.

Coniferous tree, up to 20 m high, conical with an open crown. **Trunk** short when young, crooked when older. **Bark** silvery grey becoming darker. **Leaves** needle-like, in bundles of two, blade 40–80 mm long, slender and stiff, grey-green to yellowish green. **Cones**: conic-ovoid, 80–100 mm long, clustered on stout, reflexed stalks; scales flat or slightly raised along a transverse ridge. Grassland. Invader. Native to the Mediterranean region. *Aleppo pine*; *Aleppo-den* (A).

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***patula** Schltdl. & Cham.

Coniferous tree, up to 40 m high with a dense rounded canopy at maturity. **Leaves** needle-like, in bundles of three, 120–300 mm long, slender and drooping. **Cones**: conic-ovoid, 70–100 mm long, strongly reflexed on very short stalks; scales with sunken centres and minute deciduous prickles. Moist grassland, forest margins, road cuttings. Invader. Native to Central America. *Patula pine*; *treur-den* (A).

MsGr

# PODOCARPACEAE

Trees or shrubs, evergreen, dioecious. **Leaves** spirally arranged, subopposite or whorled, rarely opposite; blade linear to ovate or scale-like. **Cones**: male cones axillary or terminal, usually consisting of many fertile scales each bearing 2 pollen sacs; pollen grains with air-bladders or wings; female cones reduced, with 1–several fertile scales; ovule solitary, erect or inverted, usually enclosed in a false aril (epimatium). **Seeds** ellipsoid to globose. *Yellowwood family*.

## **Podocarpus** L'Hér. ex Pers. (sthn Afr.: 4 spp.)

**latifolius** (Thunb.) R.Br. ex Mirb.
*P. thunbergii* Hook.

Evergreen tree, up to 30 m high. **Branchlets** usually > 1.5 mm in diameter. **Bark** longitudinally fissured and peeling in strips. **Leaves** with blades orientated in a horizontal plane, blades narrowly elliptic, 60–80 × 5–10 mm, apex acute, margins entire, dark green or blue-green. **Cones**: male cones axillary, ± 50 × 5 mm; female cones borne on succulent, bright red, pink or reddish purple receptacles; Jul.–Sep. Forests or on exposed rocky slopes as a low spreading, stunted tree or shrub. *Broad-leaved yellowwood*; *opregte geelhout* (A). Figure 33.

MsGr




**Figure 33.** *Podocarpus latifolius* (Podocarpaceae). Artist: G. Condy.

# Dicotyledonae

See ‘Guide to family groups in the dicotyledonae’ p. 26, 27 for key to families.

## ACANTHACEAE

Herbs, dwarf shrubs, shrubs, occasionally scramblers or climbers; sometimes spiny. **Leaves** opposite from swollen nodes; blade simple, usually entire, often with cystoliths; without stipules. **Flowers**: in cymes; bracteate, often large and leafy, subtending individual flowers; bisexual; irregular; calyx 4- or 5-partite (10–18-partite in *Thunbergia*); 1- or 2-lipped, or (3–)5-lobed, tube cylindric, funnel-shaped or campanulate; stamens usually 4, arising on corolla, included or exserted; anthers muticous or variously elaborated at base, sometimes ciliate; disc nectariferous, annular to deeply cupuliform; ovary superior; style included or exserted; stigma simple or lobed. **Fruit** a 2-locular, often explosively, dehiscent capsule, ± club-shaped or ellipsoid. **Seeds** usually borne on a retinaculum or jaculator (persistent, hook-like funicle); surface smooth or variously ornamented, sometimes with hygroscopic hairs. *Acanthus family*.

The view to regard *Adhatoda* as a synonym of *Justicia*, and *Chaetacanthus* as a synonym of *Dyschoriste* is not followed here.

### Key to genera

| | | |
|---|---|---|
| 1a | Corolla tube longer than lobes | 2 |
| 1b | Corolla tube shorter than lobes | 7 |
| 2a | Calyx with 10–18 teeth | **Thunbergia** |
| 2b | Calyx 2-lipped or 4- or 5-lobed | 3 |
| 3a | Calyx 2-lipped | 4 |
| 3b | Calyx 4- or 5-lobed | 5 |
| 4a | Fertile stamens 2 | **Chaetacanthus** |
| 4b | Fertile stamens 4 | **Ruellia** |
| 5a | Calyx 4-lobed, irregular | **Barleria** |
| 5b | Calyx 5-lobed | 6 |
| 6a | Corolla contorted in bud; congested inflorescence surrounded by bracts | **Crabbea** |
| 6b | Corolla quincuncial in bud; inflorescence not as above | **Ruelliopsis** |
| 7a | Corolla 1-lipped | **Blepharis** |
| 7b | Corolla 2-lipped | 8 |
| 8a | Corolla with or without an indistinct rugula in upper lip | 9 |
| 8b | Corolla with a distinct rugula in upper lip | 10 |
| 9a | Anthers 1-chambered | **Hypoestes** |
| 9b | Anthers 2-chambered | **Dicliptera** |
| 10a | Seeds smooth and shiny | **Monechma** |
| 10b | Seeds rough, often tuberculate | 11 |
| 11a | Anthers attached at right angles to filaments | **Isoglossa** |
| 11b | Anthers attached parallel to filaments | 12 |
| 12a | Lips of corolla nearly equally long, upper lip deeply hooded | **Adhatoda** |
| 12b | Upper lip of corolla shorter than lower ones, shallowly hooded | **Justicia** |

## **Adhatoda** Mill. (sthn Afr.: 2 spp.)

### **andromeda** (Lindau) C.B.Clarke

Perennial herb. **Stems** 0.2–0.3 m high. **Leaves** opposite, often ternate; sessile; blade narrowly elliptic to narrowly ovate, 7–40 × 2.5–15.0 mm, glabrous or shortly strigose. **Flowers**: subsessile in subcapitate inflorescences, composed of reduced 1- or 2-flowered cymes clustered at tip of main axis; calyx 5-partite, lobes narrowly ovate; corolla 2-lipped with lips nearly equally long, upper lip deeply hooded, white; Oct.–Jan. **Fruit** 10–12 mm long, finely pubescent. Rocky grassland. *Adhatoda*; *valsmoeraskruid* (A); *umusa omncane* (Z).

MsGr

## **Barleria** L. (sthn Afr.: 57 spp.)

### Key to species:

| | | |
|---|---|---|
| 1a | Margins of leaf blade undulate | **B. rigida** |
| 1b | Margins of leaf blade flat | 2 |
| 2a | Leaf blade linear | **B. bechuanensis** |
| 2b | Leaf blade elliptic, ovate or broadly ovate | 3 |
| 3a | Stems erect; leaves densely tawny hairy | **B. monticola** |
| 3b | Stems pro- or decumbent; leaves sparsely hairy | 4 |
| 4a | Leaves erect, blade elliptic | **B. macrostegia** |
| 4b | Leaves drooping, blade ovate to broadly ovate | **B. obtusa** |

### **bechuanensis** C.B.Clarke

Perennial herb, up to 2 m high; hispid. **Stems** erect or decumbent. **Leaves** sessile; blade linear, up to 25 × 2.0 mm, margins flat, cartilaginous, white, spine-toothed. **Flowers**: solitary, axillary; corolla deep blue, tube linear-cylindric, lobes orbicular; Feb., Mar. Thornveld, sandy soil.

AcGr

### **macrostegia** Nees

Perennial herb; sparsely hairy. **Stems** procumbent, up to 0.5 m long. **Leaves** erect, petiolate; blade elliptic, up to 25 × 5 mm, margins flat, thickened, white, spinose-dentate or ciliate. **Flowers**: in many-flowered cymes; bracts ovate, spine-tipped, margins as in leaves; corolla blue; Jan.–Apr. **Fruit** ± 15 mm long. Grassland.

VreDm AcGr DrGr KarSh

### **monticola** Oberm.

Perennial herb, up to 0.45 m high; densely hairy with tawny hairs. **Stems** annual from a woody rootstock; erect. **Leaves** subsessile; blade narrowly ovate to ovate, up to 65 × 25 mm, margins entire, flat. **Flowers**: solitary in terminal spikes; bracts linear; corolla ± 15 mm long, lilac; Aug.–Dec. **Fruit** 25 mm long. *Berg-barleria*.

MsGr

### **obtusa** Nees

Shrub, up to 1 m high; sparsely hairy. **Stems** scandent with prominent internodes. **Leaves** drooping, petiolate; blade ovate to broadly ovate, up to 70 × 35 mm, base rounded, apex rounded or broadly acuminate, margins entire, flat, pubescent on both surfaces. **Flowers**: in 1–4-flowered cymes, crowding towards tops of branchlets; bracts linear, often curved; corolla circumscissile at base, falling as a whole, ± 30 mm long, bluish purple; Feb.–Sep. In shady places. *Bush violet*; *bosviooltjie* (A); *idololenkonyane* (Z).

| VreDm | | | | | |
|---|---|---|---|---|---|

### **rigida** Nees

*B. irritans* Nees var. *rigida* (Nees) C.B.Clarke
*B. rigida* Nees var. *ilicina* (E.Mey. ex Anderson) Oberm.

Shrub, ± 150 mm high; glabrous. **Leaves** petiolate; blade linear-oblong, up to 30 × 6 mm, margins undulate, whitish, with a few small teeth. **Flowers**: in 1–3-flowered cymes; bracts usually with well-developed, white, thickened marginal spines; corolla with tube > 20 mm long, pink, blue, white or purple; Feb.–May. **Fruit** globose, ± 10 mm long. Grassland.

| | | DrGr | | KarSh | |
|---|---|---|---|---|---|

## **Blepharis** Juss. (sthn Afr.: 46 spp.)

### Key to species:

1a Leaf blades folded and bent, white veining on lower surface prominent . . . . . **B. squarrosa**
1b Leaf blades flat . . . . . 2
2a Leaf blade linear . . . . . **B. integrifolia** var. **integrifolia**
2b Leaf blade elliptic, ovate or obovate . . . . . 3
3a Plant with procumbent stems; internodes prominent . . . . . **B. mitrata**
3b Plants appearing clustered with many shortened internodes . . . **B. espinosa**

### **espinosa** E.Phillips

Perennial herb, appearing clustered with many shortened internodes. **Stems** procumbent, up to 0.3 m long. **Leaves** with blade elliptic or narrowly elliptic, flat, up to 50 × 14 mm, margins entire or with 1–8 small to large teeth. **Flowers**: in 2–8-flowered spikes; peduncle 3–10 mm long; corolla bright purple to bright indigo blue; Dec.–Apr. Montane grassland.

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|

### **integrifolia** (L.f.) E.Mey. ex Schinz var. **integrifolia**

*Acanthus integrifolius* L.f.
*B. molluginifolia* Pers.

Perennial herb; appearing clustered with many shortened internodes. **Stems** procumbent. **Leaves** sessile; blade linear, flat, 10–25 × 3–5 mm, margins entire. **Flowers**: in 1-flowered spikes, enclosed by ± 8 pairs of bracts; bracts without markings, margins spinose-toothed and apical spines sharply recurved; bracteoles present, different from bracts; corolla blue; Sep.–May. Grassland. *Rankklits* (A).

| | | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

**mitrata** C.B.Clarke
*B. villosa* C.B.Clarke

Perennial herb; with prominent internodes. **Stems** procumbent. **Leaves** sessile; blade ovate to narrowly obovate, flat, ± 50 × 10 mm, decurrent, margins with a few irregular, short, spiny teeth. **Flowers**: in elongate, pubescent spikes; bracts obovate, white hairy; corolla white or blue; May–Jan. Roadsides, hill slopes, dry riverbeds, rocky or stony outcrops.

KarSh

**squarrosa** (Nees) T.Anderson
*Acanthodium squarrosum* Nees

Dwarf shrub. **Stems** up to 0.3 m high. **Leaves** on side shoots, not below spikes; blade ovate to elliptic or narrowly so, variable in size, folded and bent, margins spinose-dentate, white veining on lower surface prominent, glabrous. **Flowers**: in elongate, many-flowered, terminal spikes; lowest sterile bracts similar to upper ones but reduced in size, narrowly ovate, spinose-dentate, glabrous; corolla mauve or light blue; Oct.–Apr. Grassland, disturbed places.

DrGr KarSh

## **Chaetacanthus** Nees (sthn Afr.: 3 spp.)

### Key to species:

[after Compton: 548 (1976)]

Calyx lobes with curled, white hairs and scattered, stalked glands . . . **C. burchellii**
Calyx lobes with straight, white hairs and many stalked glands . . . . . **C. setiger**

**burchellii** Nees

Perennial herb, up to 0.3 m high. **Leaves** shortly petiolate; blade elliptic, ovate to broadly ovate, up to 25 mm long, sparsely hairy, lower blades with subacute, triangular tips. **Flowers**: calyx lobes with curled, white hairs and scattered, stalked glands; corolla with tube up to 25 mm long, white with mauve spots; Sep.–Jan. Grassland.

DrGr

**setiger** (Pers.) Lindl.
*C. glandulosus* Nees
*C. persoonii* C.B.Clarke

Perennial herb, 0.3–0.5 m high. **Leaves** subsessile; blade obovate to narrowly obovate, 6–12 mm long, hairy. **Flowers**: calyx lobes with straight, white hairs and many stalked glands; corolla with tube 8–10 mm long, white; Sep.–Feb. Grassland, sandy soil.

VreDm DrGr MsGr

## **Crabbea** Harv. (sthn Afr.: 6 spp.)

### Key to species:

[after Buys: 7 (1982)]

1a Plant acaulescent; leaves in a rosette, flat on ground . . . . . **C. acaulis**
1b Plant with stems procumbent, decumbent or erect; leaves not in a rosette, not flat on ground . . . . . 2

2a Leaves with blade linear . . . . . .**C. angustifolia**
2b Leaves with blade narrowly ovate . . . . . .**C. hirsuta**

### **acaulis** N.E.Br.

Acaulescent, herb. **Leaves** rosulate, flat on ground; blade narrowly elliptic-ovate to elliptic-ovate, up to 50 × 35 mm, margins entire. **Flowers**: in a sessile head; corolla with tube and limb 15–18 mm long, white or white with pink nerves; Oct.–Apr. Grassland

VreDm | | DrGr | MsGr | | |

### **angustifolia** Nees

Perennial herb. **Stems** pro- or decumbent, 110–300 mm long. **Leaves** with blade linear, up to 110 × 7 mm, margins undulate, crenulate. **Flowers**: in a sessile head; corolla white; Oct.–Jun. Grassland, stony soil.

| | | DrGr | | | |

### **hirsuta** Harv.

Perennial herb. **Stems** decumbent, trailing, 80–300 mm long. **Leaves** with blade ovate, up to 90 × 30 mm, margins entire, spiny. **Flowers**: in a sessile head; corolla white to very pale pink; Oct.–Mar. Grassland, disturbed places. *Prickle head*; *letsoeyana*, *mereko* (SS); *manxasana* (X); *ihlasi*, *umusa* (Z).

| | | DrGr | MsGr | | |

## **Dicliptera** Juss. (sthn Afr.: 15 spp.)

### **leistneri** K.Balkwill

Perennial herb, up to 0.9 m high; stems, leaves and tertiary bracts with smooth green appearance. **Leaves** petiolate; blade ovate, 50 × 20 mm, apex acute to caudate, margins entire. **Flowers**: inflorescence axis < 5 mm long, appearing contracted; tertiary bracts 2.7–3.7 mm broad; corolla with tube 6.5–9.0 mm long, light purple, bright pinkish purple; Oct.–Jun. **Fruit** 6–7 mm long. In shade along streambanks.

| | | DrGr | | | |

## **Hypoestes** Sol. ex R.Br. (sthn Afr.: 3 spp.)

### **forskaolii** (Vahl) R.Br.

Perennial herb, up to 1 m high. **Leaves** with blade narrowly ovate, 24–36 × 4.5–13.0 mm, apex acute to acuminate, short cystoliths frequent. **Flowers**: in spikes; bracts with apex obtuse, strigose; calyx 5-lobed; corolla with lip in lower position trullate, white, pink or light lilac with dark purple honey guides; Feb.–Jun. In moist places, disturbed areas.

VreDm | | | | KarSh | |

## **Isoglossa** Oerst. (sthn Afr.: 15 spp.)

### **grantii** C.B.Clarke

Subshrub, up to 1 m high. **Leaves** petiolate; blade ovate, up to 40 × 20 mm, apex acuminate. **Flowers**: in spikes; viscid-hairy; bracts spathulate to broadly obovate; calyx with gland-headed hairs; corolla up to 15 mm long, white; Jan.–May. Bush groups, in shade of other trees or bushes, moist places, disturbed places.

DrGr

## **Justicia** L. (sthn Afr.: 23 spp.)

Key to species:

Inflorescence with cyme reduced to a single, pedunculate, axillary flower . . . . . **J. orchioides** subsp. **glabrata**
Inflorescence an elongated, spike-like cyme, single at a node. . . . **J. anagalloides**

### **anagalloides** (Nees) T.Anderson

Perennial herb. **Stems** annual; erect becoming procumbent, up to 0.5 m long; rooting at nodes. **Leaves** petiolate; blade narrowly to broadly ovate to obovate, up to 20 × 10 mm, base cuneate, apex acute to obtuse, glabrous to densely pilose; petioles up to 4 mm long. **Flowers**: 2–4, sessile in an elongated, spike-like cyme, single at a node; calyx glabrous on inside; corolla 5–8 mm long, white with or without maroon lines; Aug.–May. **Fruit** 1-seeded, hard, up to 17 mm long. Grassland, disturbed places, roadsides.

DrGr

### **orchioides** L.f. subsp. **glabrata** Immelman

Woody shrub. **Stems** up to 0.6 m high. **Leaves** sessile; blade ovate to narrowly ovate, 3.5–13.0 × 1.5–7.0 mm, base cuneate, apex acute to obtuse, glabrous. **Flowers**: cyme reduced to a single, pedunculate, axillary flower; calyx glabrous or with short, stout, pyramidal papillae; corolla 7–10 mm long, white with maroon markings; Feb., Mar. **Fruit** 4-seeded, delicate, up to 8 mm long. Open areas, often in calcareous soils.

DrGr

## **Monechma** Hochst. (sthn Afr.: 19 spp.)

Key to species:

Calyx lobes 4; capsule 6–8 mm long . . . . . **M. divaricatum**
Calyx lobes 5; capsule 13–18 mm long . . . . . **M. incanum**

### **divaricatum** (Nees) C.B.Clarke

Shrub or suffrutex, up to 1 m high. **Branches** hairy and/or glandular. **Leaves** pseudopetiolate; blade narrowly linear-obovate, base cuneate, apex usually acute, variously hairy to

subglabrous. **Flowers**: solitary; calyx lobes 4; corolla 10–13 mm long, purple mauve or white, often bicoloured, with dark veining on lower lip; Nov.–Apr. **Fruit** 6–8 mm long. Stony hillsides, along watercourses, sandy places. *Wild lucerne*; *wildelusern* (A).

KarSh

### **incanum** (Nees) C.B.Clarke

Much-branched, woody shrub, up to 1 m high. **Branches** often arched, densely white-tomentose. **Leaves** subsessile; blade narrowly obovate or elliptic or occasionally obovate, up to 22 × 2–4 mm, thin, densely silvery grey or whitish pubescent. **Flowers**: solitary, occasionally in pairs; calyx lobes 5; corolla 10–13 mm long, white, often with purple veining; Nov., Dec., Apr. **Fruit** 13–18 mm long, glabrous or puberulous. Dry, rocky slopes, outcrops, sandy plains. *Skaapbloubossie*, *netvetbossie*, *boegoe-ankerkaroo*, *blouganna* (A).

KarSh

## **Ruellia** L. (sthn Afr.: 13 spp.)

### **cordata** Thunb.

Perennial herb, up to 500 mm high. **Stems** decumbent to erect. **Leaves** petiolate; blade ovate, up to 40 × 30 mm, base truncate or cordate, apex acute, margins entire, thinly hairy; petioles up to 10 mm long. **Flowers**: calyx obscurely 2-lipped, 2 nearly free to base, 3 connate for < $^1/_2$ their length; corolla pale mauve or white; May–Feb. **Fruit** 10–13 mm long. Grassland, open woodland.

DrGr

## **Ruelliopsis** C.B.Clarke (sthn Afr.: 2 spp.)

### **setosa** (Nees) C.B.Clarke

Perennial herb; hispid with long, scattered, white hairs. **Stems** trailing. **Leaves** sessile, clustered at nodes; blade linear to narrowly ovate, up to 45 × 2 mm, apex obtuse. **Flowers**: corolla ± 30 mm long, bright or pale blue, purple; Oct.–May. **Seeds** silky white. Grassland, edges of pans, on termitaria, roadsides, sandy or clay soil.

DrGr

## **Thunbergia** Retz. (sthn Afr.: 11 spp.)

### **neglecta** Sond.

Perennial herb; pubescent. **Stems** scrambling. **Leaves** petiolate; blade ovate, 29–47 × 20–47 mm, base cordate, apex acute, obtuse or emarginated, margins entire, lobed or toothed. **Flowers**: bracts persistent; corolla dull white, only inner surface of tube dull yellow; Sep.–Apr. **Fruit** 13–20 mm long, globose base 6–10 mm in diameter. Grassland, thornveld, woodland.

DrGr

## References

BUYS, S. 1982. *'n Taksonomiese ondersoek van die Suid-Afrikaanse verteenwoordigers van* Crabbea *Harv. (Acanthaceae)*. Unpublished M.Sc. thesis. University of North West, Potchefstroom.

COMPTON, R.H. 1976. Acanthaceae. The flora of Swaziland. *Journal of South African Botany*, suppl. vol. 11: 544–566.

# ACHARIACEAE

Acaulescent herbs, herbaceous dwarf shrubs or climbers. **Leaves** alternate, petiolate, simple; blade with margins entire or toothed; without stipules. **Flowers**: in racemes or cymes or solitary; bisexual or unisexual with male and female on separate plants or on the same plant; regular; sepals 3–5, sometimes not clearly distinguishable from petals, free; petals (4)5–14, free, sometimes whorled, when in whorls and clearly distinct from sepals, then usually larger and more numerous than sepals, often with an adnate adaxial scale or gland; stamens (5–)8–10 or more numerous, free; ovary superior, style 1. **Fruit** a capsule. *Acharia family*.

The family is endemic to South Africa, comprising the genera *Acharia*, *Ceratosicyos* and *Guthriea*. Molecular studies have found them nested within the traditional Flacourtiaceae. The delimitation of the family as viewed by Brummitt (2007) is followed here. The author explains it as follows: 'The close affinity of the genera to Flacourtiaceae, particularly the genus *Kiggelaria* is not questioned. However these genera differ markedly in their general appearance, herbaceous habit, exstipulate leaves and strongly gamopetalous flowers from members of the Flacourtiaceae. The genera have apparently evolved sufficiently far from their Flacourtiaceous ancestors for family status to be well justified, and it seems unnecessary to sink them together taxonomically, if the taxonomy is to reflect evolution of morphological characters and not conceal them.'

## **Guthriea** Bolus (sthn Afr.: 1 sp.)

### **capensis** Bolus

Acaulescent, perennial herb with a subhorizontal rhizome; roots fleshy. **Leaves** rosulate; simple; petiolate; blade ovate, 40–70 × 35–65 mm, base cordate, apex obtuse to rounded, margins crenate, discolorous, glossy dark green on upper surface, veins deeply indented; petioles 30–120 mm long. **Flowers**: male and female separate on same plant, hidden under leaves, solitary, stalk 30–120 mm long; sepals linear, adnate to corolla; corolla ± 15 mm long; tube campanulate, lobes much shorter than tube, creamy green; Oct.–Jan. **Fruit** enclosed in persistent corolla; seeds several, ellipsoid, arillate. Grassland, steep slopes below cliffs, damp places. *Hidden flower*.



## Reference

BRUMMITT, R.K. 2007. Achariaceae. In V.H. Heywood, R.K. Brummitt, A. Culham & O. Seberg, *Flowering plant families of the world*. Royal Botanic Gardens, Kew.

# AIZOACEAE

Herbs, dwarf shrubs, shrubs, herbaceous or succulent. **Leaves** alternate, opposite or whorled, with or without stipules. **Flowers**: bisexual, regular; in cymose inflorescences or solitary; calyx tube with 4–6 lobes, attached to ovary, ± persistent; petals many, free or absent; stamens 4–15 or many, usually free; nectary present or absent; ovary inferior or superior, 3–25-locular; styles often 2 or more, free or absent, stigmas ± the same number as locules. **Fruit** a loculicidal capsule or a nut. **Seeds** with or without an aril. *Brakbos and vygie family*.

## Key to subfamilies:

[after Hartmann: 11 (2002)]

1a Petals of staminodial origin present . . . . . 2
1b Petals absent, perianth lobes petaloid inside, sepaloid outside. . . . . 3
2a Petals and stamens mostly united into a tube; nectaries shell-shaped to tubular. . . . . **Mesembryanthemoideae** (p. 160)
2b Petals mostly free; nectaries crest-shaped . . . . . **Ruschioideae** (p. 162)
3a Fruit indehiscent, a winged or horned nut . . . . . **Tetragonioideae** (p. 176)
3b Fruit a capsule . . . . . 4
4a Capsule circumscissile; aril present, covering seed completely . . . . . **Sesuvioideae** (p. 176)
4b Capsule loculicidal or septicidal; seeds never arillate. . . . . **Aizooideae** (see below)

# Subfamily Aizooideae

## Key to genera

1a Capsules 5–10-locular; with 2–many ovules in each locule; distinct expanding keels present . . . . . **Aizoon**
1b Capsules 2–5-locular; 1 pendulous ovule in each locule; expanding tissue rudimentary to absent . . . . . 2
2a Stamens as many as perianth lobes. . . . . **Plinthus**
2b Stamens twice the number of the perianth lobes, in pairs alternating with the perianth lobes. . . . . **Galenia**

## **Aizoon** L. (sthn Afr.: 11 spp.)

### **canariense** L.

Perennial herb, up to 0.4 m high; many stemmed. **Stems** decumbent. **Leaves** alternate; papulose; blade suborbicular to narrowly obovate to obovate, 8–70 × 4–45 mm, apex obtuse, at base narrowed to a petiole as long as blade or longer. **Flowers**: solitary in leaf axils; perianth with outer surface pilose, yellowish inside, greenish or reddish outside; Sep.–Jun. **Fruit** 5–9 mm in diameter, persistent on dead plants for a long time. Roadsides, cultivated ground, rocky soils. *Galsiekslaai* (A).




## **Galenia** L. (sthn Afr.: 29 spp.)

### Key to species:

[after Adamson: 89 (1956)]

| | | |
|---|---|---|
| 1a | Perianth segments 4, in two dissimilar pairs | 2 |
| 1b | Perianth segments 4 or 5, all alike | 4 |
| 2a | Stem with internodes as long as leaves | **G. africana** |
| 2b | Stem with internodes not longer than leaves | 3 |
| 3a | Leaf blade up to 20 mm long, widened towards apex; inflorescence many-flowered, exposed | **G. namaensis** |
| 3b | Leaf blade rarely up to 10 mm long, not widened towards apex; inflorescence few-flowered, surrounded by leafy branches | **G. procumbens** |
| 4a | Perianth segments produced into a cylindrical point | 5 |
| 4b | Perianth segments not produced into a cylindrical point | 6 |
| 5a | Stems procumbent; leaf blade rhombic | **G. prostrata** |
| 5b | Stems decumbent-ascending; leaf blade obovate | **G. acutifolia** |
| 6a | Plants with procumbent stems | 7 |
| 6b | Plants with diffuse or ascending stems | **G. sarcophylla** |
| 7a | Plants glabrous, except for a few hairs on young parts. | **G. exigua** |
| 7b | Plants pubescent | 8 |
| 8a | Plants grey, white or yellow, hairy | **G. secunda** |
| 8b | Plants green, glabrescent | **G. pubescens** |

### **acutifolia** Adamson

Perennial herb, ± 0.18 m high; appressed hairy. **Stems** decumbent-ascending. **Leaves** opposite, petiolate; blade obovate or rhombic-ovate, 8–12 × 4–5 mm, apex acute, base cuneate. **Flowers**: sessile, on short branches; bracts sessile, bracteoles longer than perianth; anthers yellow; perianth segments 2.0–2.5 mm long, outer surface hairy, inner surface pale cream-coloured; Oct.–Jan. Grassland.




### **africana** L.

*G. africana* L. var. *secundata* Adamson

Shrub, up to 1.5 m high, 2 m in diameter; pale ochre; glabrous. **Stems** erect, with internodes as long as leaves. **Leaves** opposite; sticky; blade 15–20 × 2–5 mm, glandular-hairy, yellowish

green, turning bright yellow. **Flowers**: in cymes; bracteoles not longer than flower; anthers yellow or orange; perianth segments 4, in two dissimilar pairs, outer 2 cucullate, inner flat with a cylindrical, mucronate apex, yellowish green; Dec.–Mar. Flats, along watercourses. *Yellow bush*; *waterpensbos*, *muisgeelbos*, *kraalbos* (A); *iqina* (X).

KarSh

### **exigua** Adamson

Dwarf shrub, up to 0.2 m high; glabrous, except for few hairs on young parts. **Stems** procumbent; branches alternate, ascending. **Leaves** alternate; blade linear to narrowly obovate, 8–15 × 1–3 mm, apex subobtuse, finely papillate. **Flowers**: solitary, axillary, much shorter than leaf-like bracts; anthers yellow or pink; perianth much shorter than leaf-like bracts, segments 1.5–2.0 mm long, inner ones curved at apex, outer segments cucullate; Nov.–Feb. Open places in karroid veld.

KarSh

### **namaensis** Schinz

Dwarf shrub, up to 0.6 m high. **Stems** erect, diffuse or spreading; branches white, young parts covered with short, closely appressed hairs. **Leaves** crowded; blade linear, widened towards apex, 3–20 × 2 mm, folded upwards, dull green or glaucous. **Flowers**: many, terminal in laxly cymose to compact umbel-like inflorescences, 20–30 mm in diameter; bracts leaf-like, bracteoles thick, ± as long as flowers; anthers yellow or orange; perianth segments ± 2 mm long, inner ones white or greenish with a mucro, outer ones cucullate; Oct.–Feb. Rocky places, along watercourses.

DrGr KarSh

### **procumbens** L.f.

Dwarf shrub, up to 1 m high. **Stems** erect, much branched, opposite, ascending or divaricate; branches orange or yellow. **Leaves** opposite or crowded; blade linear, 3–6 mm long, apex hooked, squarrose or falcate. **Flowers**: few, in lax cymes on branches shorter than surrounding leafy shoots; bracts as long as flowers; bracteoles short; anthers orange, occasionally red; perianth segments 1.5–2.0 mm long, inner ones white or tinged pink, with a mucro, outer segments cucullate; Oct.–Mar. Rocky or stony places.

DrGr KarSh

### **prostrata** G.Schellenb.

Perennial herb; greyish green; in circular patches 0.5–0.8 m in diameter. **Stems** procumbent, slender; branches opposite, appressed pubescent. **Leaves** opposite; blade rhombic-spathulate, 6–10 × 3–5 mm, apex acute or obtuse-mucronate, thinly covered with appressed hairs. **Flowers**: crowded on lateral branches; anthers pink; perianth segments 2–3 mm long, pink or mauve, outer surface thinly hairy, a cylindrical, acuminate projection present behind incurved apex; Oct.–Mar. Old cultivated lands.

AcGr DrGr KarSh

### **pubescens** (Eckl. & Zeyh.) Druce

*G. pubescens* (Eckl. & Zeyh.) Druce var. *fourcadei* Adamson

Perennial herb, in patches 1 m or more in diameter; green or greyish green, glabrescent. **Stems** procumbent. **Leaves** alternate; subsessile, blade obovate-spathulate, 6–22 × 3–17 mm,

papillate, hairy. **Flowers**: on secund branches; anthers pink; perianth segments 5, 2.0–2.5 mm long, outer surface appressed pubescent, inner surface pinkish; Feb.–Apr. Disturbed places.

AcGr DrGr KarSh

### **sarcophylla** Fenzl

Perennial herb; sprawling; in clumps up to 0.5 m in diameter, glistening, greyish green, older parts red or yellow. **Stems** decumbent with ascending branches, the oldest slightly woody, the younger coarsely papulose, covered with loosely appressed hair-like scales. **Leaves** succulent; alternate or opposite; lower leaves narrowed to a petiole, upper ones smaller, sessile; blade obovate-spathulate, 6–16 × 3–8 mm, apex papulose, scaly. **Flowers**: many, on lateral branches; bracts thick, obtuse, longer than flowers; bracteoles about as thick as long; anthers yellow, occasionally pink; perianth segments ± 2 mm long, scales on outer surface; Sep.–Apr. Along watercourses, in sand or on gravel.

DrGr

### **secunda** (L.f.) Sond.

Dwarf shrub, 0.1–0.5 m high. **Stems** many, procumbent, woody at base, branched from base, distal part with many, short, flowering branches, standing out at right angles; villous, covered with coarse, loosely appressed hairs; white, grey or yellow. **Leaves** alternate; coarsely papulose; blade obovate, 7–20 × 4–12 mm on main shoots, on lateral branches smaller, apex obtuse, base cuneate. **Flowers**: solitary or in groups of 2–5; bracts leaf-like; bracteoles very short; anthers yellow, less often red; perianth segments 5, 2–3 mm long, outer surface villous, inner surface yellow or white; Sep.–Apr. Disturbed places, roadsides. *Vanwyksopslag* (A).

DrGr

## **Plinthus** Fenzl (sthn Afr.: 4 spp.)

### Key to species:

[after Adamson: 148 (1961)]

Leaves opposite; margins of blade rolled in . . . . . .**P. karooicus**
Leaves alternate; margins of blade flat or folded upwards. . . . . .**P. sericeus**

### **karooicus** I.Verd.

*P. karooicus* I.Verd. var. *alternifolia* Adamson

Dwarf shrub, up to 0.3 m high; many stemmed; young parts grey or silvery, not white. **Stems** woody at base, usually much branched, branches erect or sprawling. **Leaves** opposite; ericoid; blade linear or narrowly linear-ovate, 3–6 mm long, margins rolled in. **Flowers**: 4-merous, in many adjacent groups of 2 or 3; perianth segments cucullate, 2.0–2.5 mm long, outer surface hairy, yellow; Sep.–Apr. Rocky places, sandy soil.

DrGr

### **sericeus** Pax

*P. laxifolius* I.Verd.

Shrub, up to 1 m high; white or silvery grey. **Stems** erect or sprawling; internodes either short or up to 20 mm long. **Leaves** alternate; usually longer than internodes; blade elliptic on main

shoots, elliptic, 4–30 × 1–4 mm, narrowed at both ends, margins flat, smaller, thicker, folded upwards when fascicled. **Flowers**: 5-merous; solitary; perianth segments 2–3 mm long, outer surface hairy, inner surface white or yellow; Sep.–May. Grassland, sandy soil.

AcGr DrGr KarSh

# Subfamily Mesembryanthemoideae

[Notes on species compiled from Smith *et al*. (1998), Chesselet *et al*. (2000), Hartmann (2001)]

## Key to genera

[after Hartmann: 14 (2001)]

1a Plants perennial; stems constricted at nodes, green, with persistent succulent primary cortex . . . . . **Psilocaulon**
1b Plants annual, biennial or perennial; stems continuous, only young stages green, primary cortex not visible. . . . . 2
2a Plants annual or biennial; epidermal bladder cells small, distinct . . . . . **Mesembryanthemum**
2b Plants perennial, sometimes short-lived; epidermal bladder cells usually much flattened . . . . . 3
3a Epidermis with a thick wax layer . . . . . **Prenia**
3b Epidermis with wax layer less conspicuous. . . . . **Phyllobolus**

## **Mesembryanthemum** L. (sthn Afr.: ± 15 spp.)

### **stenandrum** (L.Bolus) L.Bolus

Perennial herb, succulent, up to 0.2 m high **Stems** procumbent to decumbent; terete; continuous, only young stages green, primary cortex not visible. **Leaves** linear, cylindric, 15–20 × 2–5 mm, bladder cells small, distinct. **Flowers**: corolla 15–30 mm in diameter; petals connate into a short tube, white or pale pink or white with pale pink tips; Dec.–Mar. **Fruit** 5-locular. Disturbed places, roadsides.

DrGr KarSh

## **Phyllobolus** N.E.Br. (sthn Afr.: 31 spp.)

### Key to species:

Plants low, up to 50 mm high; bladder cells conspicuous . . . . . **P. rabiei**
Plants > 100 mm high; bladder cells inconspicuous . . . . . **P. splendens**

### **rabiei** (L.Bolus) Gerbaulet

*Nycteranthus rabiei* (L.Bolus) Schwantes, illegitimate name
*Sphalmanthus rabiei* (L.Bolus) N.E.Br.

Perennial herb, succulent, up to 0.05 m high. **Stems** decumbent, internodes short with a thick, cork layer; continuous, only young stages green, primary cortex not visible. **Leaves** cylindrical,

narrowly ovate, decussate, persistent with small, conspicuous, bladder cells. **Flowers**: corolla 20–30 mm in diameter; petals pale salmon-coloured; Dec.–Feb. **Fruit** 5-locular.

KarSh

**splendens** (L.) Gerbaulet subsp. **pentagonus** (L.Bolus) Gerbaulet

Dwarf shrub, 0.1–0.3 high. **Stems** erect; continuous, only young stages green, primary cortex not visible; internodes lignified. **Leaves** cylindrical, narrowly ovate, decussate, bladder cells inconspicuous. **Flowers**: corolla 30–40 mm in diameter; petals white, cream-coloured or pink; Dec.–Feb. Karroid veld. *Bosvygie*, *donkievygie* (A).

KarSh

## **Prenia** N.E.Br. (sthn Afr.: 6 spp.)

**tetragona** (Thunb.) Gerbaulet
*Aridaria tetragona* (Thunb.) L.Bolus
*Mesembryanthemum tetragonum* Thunb.
*Psilocaulon pfeilii* (Engl.) Schwantes

Dwarf shrub or shrub, up to 0.7 m high. **Stems** erect; continuous, only young stages green, primary cortex not visible. **Leaves** linear, cylindrical, obtusely trigonous; epidermis with a thick wax layer. **Flowers**: 20–40 in a cyme; sepals and petals connate into a short tube; petals whitish to yellow; staminodes yellow; Sep.–Apr. **Fruit** 4-locular. Plains, roadsides.

KarSh

## **Psilocaulon** N.E.Br. (sthn Afr.: 11 spp.)

Key to species:

| | | |
|---|---|---|
| 1a | Stems with hair-like papillae | **P. articulatum** |
| 1b | Stems without hair-like papillae | 2 |
| 2a | Flowers solitary | **P. granulicaule** |
| 2b | Flowers in a cyme | **P. coriarium** |

**articulatum** (Thunb.) N.E.Br.
*Mesembryanthemum articulatum* Thunb.

Dwarf shrub, succulent, 0.1–0.3 m high. **Stems** erect, decumbent or procumbent; with hair-like papillae; constricted at nodes, green, with persistent, succulent, primary cortex. **Leaves** almost cylindrical. **Flowers**: 1–many in a cyme; corolla ± 10 mm in diameter; petals dark or pale pink or white; Oct.–Jan. **Fruit** 5-locular. Karroid veld. *Seepbos*, *asbosvygie* (A).

KarSh

**coriarium** (Burch. ex N.E.Br.) N.E.Br.
*Mesembryanthemum coriarium* Burch. ex N.E.Br.

Dwarf shrub, succulent, 1.5–3.0 m high. **Stems** decumbent or erect; constricted at nodes, green, with persistent, succulent, primary cortex. **Leaves** ± 5 mm long. **Flowers**: many in a

cyme; corolla 10–13 mm in diameter, petals white or pale pink. **Fruit** 4- or 5-locular. Gravel plains, pans, roadsides.

AcGr DrGr KarSh

**granulicaule** (Haw.) Schwantes
*Mesembryanthemum granicaule* Haw.

Dwarf shrub, sometimes short-lived, succulent, up to 0.25 m high. **Stems** decumbent or erect; constricted at nodes, green, with persistent, succulent, primary cortex. **Leaves** linear, up to 20 mm long. **Flowers**: solitary or a few per cyme; corolla 5–8 mm in diameter, petals pale yellow. **Fruit** 5-locular. Grassland, plains. *Loogbos*, *brakbos* (A).

KarSh

# Subfamily Ruschioideae

[Notes on species compiled from Smith *et al*. (1998), Chesselet *et al*. (2000), Hartmann (2001)]

## Key to genera

[after Chesselet *et al*.: 369 (2000)]

| | | |
|---|---|---|
| 1a | Leaves wider than thick | **Deilanthe** |
| 1b | Leaves usually not wider than thick | 2 |
| 2a | Plants creeping | 3 |
| 2b | Plants compact, caespitose or shrubby | 9 |
| 3a | Internodes on main stem long; adventitious roots fibrous | 4 |
| 3b | Internodes on main stem short; adventitious roots thickened, fleshy | 8 |
| 4a | Leaf surface mesomorphic; leaves soft | 5 |
| 4b | Leaf surface xeromorphic; leaves firm | 6 |
| 5a | Capsule multilocular | **Malephora** |
| 5b | Capsule 5- or 6-locular | **Delosperma** |
| 6a | Leaves with teeth along margins and keel | **Chasmatophyllum** |
| 6b | Leaves without teeth along margins and keel | 7 |
| 7a | Leaves small, < 15 mm long | **Mossia** |
| 7b | Leaves larger, > 20 mm long | **Ruschia** |
| 8a | Leaves ± sharply triquetrous | **Khadia** |
| 8b | Leaves ± club-shaped | **Neohenricia** |
| 9a | Plants compact, tufted, all internodes completely concealed by leaves | 10 |
| 9b | Plants caespitose, shrubby, if basally compact, then with additional long shoots | 16 |
| 10a | Leaves of a pair highly connate, > 50 % | **Lithops** |
| 10b | Leaves of a pair less connate, < 30% | 11 |
| 11a | Leaf surface mesomorphic | **Delosperma** |
| 11b | Leaf surface xeromorphic | 12 |
| 12a | Leaves triquetrous-acuminate | 13 |
| 12b | Leaves never triquetrous-acuminate | 15 |
| 13a | Plants growing sunken into ground | **Nananthus** |
| 13b | Plants with leaves completely above ground | 14 |
| 14a | Capsule with a flat or centrally raised top and funnel-shaped base | **Ebracteola** |

14b Capsule with a rounded top and base . . . . . **Rabiea**
15a Plants sunken into ground. . . . . **Titanopsis**
15b Plants in clumps above ground. . . . . **Hereroa**
16a Plants caespitose. . . . . 17
16b Plants dwarf shrubs or shrubs. . . . . 18
17a Leaves mesomorphic. . . . . **Delosperma**
17b Leaves xeromorphic. . . . . **Stomatium**
18a Dwarf shrubs or shrubs spinescent . . . . . **Ruschia**
18b Dwarf shrubs or shrubs not spinescent . . . . . 19
19a Leaves soft . . . . . 20
19b Leaves firm . . . . . 23
20a Leaf apex with a diadem . . . . . **Trichodiadema**
20b Leaf apex without a diadem. . . . . 21
21a Capsule with covering membranes absent . . . . . **Delosperma**
21b Capsule with covering membranes present. . . . . 22
22a Capsules with > 10 locules. . . . . **Malephora**
22b Capsules with 5–8 locules. . . . . **Mestoklema**
23a Capsules with valve wings absent . . . . . **Ruschia**
23b Capsules with valve wings present. . . . . **Antimima**

## **Antimima** N.E.Br. emend. Dehn (sthn Afr.: 103 spp.)

### **saxicola** (L.Bolus) H.E.K.Hartmann

Shrub, succulent, up to 0.7 m high when climbing in bushes. **Stems** much branched; internodes blackish brown with age. **Leaves** with blade triquetrous, 15–25 mm long, keel and margins cartilaginous, minutely crenulate, smooth. **Flowers**: solitary; bracteoles with apices acuminate; petals unknown; May–Aug. **Fruit** 5-locular. Habitat unknown.

DrGr | KarSh

## **Chasmatophyllum** Dinter & Schwantes (sthn Afr.: 8 spp.)

### Key to species:

Leaves sessile; petals bright egg-yolk-yellow . . . . . **C. musculinum**
Leaves subsessile; petals golden-yellow. . . . . **C. verdoorniae**

### **musculinum** (Haw.) Dinter & Schwantes

Perennial herb, succulent, up to 0.03 m high; compact to caespitose. **Leaves** sessile; blade trigonous to triquetrous, keel and margins with 0–4 teeth, warted, idioblasts white to green. **Flowers**: corolla 7–15 mm in diameter, petals bright egg-yolk-yellow, often purplish suffused on outer surface; Dec.–Feb. **Fruit** 5-locular. Flats, pans on rocks, sand, gravel. *Geelswaelstertvygie*, *geelbergvygie* (A).

VreDm | DrGr | KarSh | Zastr

### **verdoorniae** (N.E.Br.) L.Bolus

Perennial herb, succulent, up to 0.02 m high. **Leaves** subsessile, blade ovate or semiterete, 5.7–9.0 × 2.75–4.50 mm, margins with 0 or 1 small tooth along margins, dotted. **Flowers**:

corolla 11.3–13.7 mm in diameter; petals bright golden-yellow; Dec.–Feb. **Fruit** 5-locular. Karroid veld.

KarSh

## **Deilanthe** N.E.Br. (sthn Afr.: 3 spp.)

### **peersii** (L.Bolus) N.E.Br.

Perennial herb, succulent, 0.020–0.035 m high; compact. **Leaves** spreading, blade ovate or elliptic, 20–35 × 8.5–13.0 mm. **Flowers**: petals yellow, apically copper or reddish, also reddish yellow; Jun.–Sep. **Fruit** (10–)12–14-locular. Flats, shale.

KarSh

## **Delosperma** N.E.Br. emend. (sthn Afr.: 161 spp.)

### Guide to species:

I. Plants with a creeping growth form: *D. ficksburgense*, *D. nubigenum*, *D. obtusum*, *D. pottsii*
II. Plants with a compact growth form: *D. ashtonii*, *D. congestum*, *D. deleeuwiae*, *D. galpinii*, *D. kofleri*, *D. wiumii*
III. Plants with caespitose growth form: *D. clavipes*, *D. lavisiae*
IV. Dwarf shrubs: *D. carolinense*, *D. cooperi*, *D. floribundum*, *D. herbeum*, *D. lineare*, *D. mahonii*, *D. ornatulum*, *D. reynoldsii*, *D. roseopurpureum*, *D. wethamae*

### **ashtonii** L.Bolus

Perennial herb, succulent; flowering branches up to 0.08 m high, sterile branches very short; internodes not visible, all herbaceous parts green, papillate, papillae ending in soft hairs. **Leaves** ovate, oblong or linear, up to 45 × 12 mm, hairs often longer than margins. **Flowers**: 1–3 together; corolla up to 45 mm in diameter; petals purplish pink, white at base; staminodes paler; Dec.–Mar. Rocky places, wet crevices.

MsGr

### **carolinense** N.E.Br.

*D. carolinense* N.E.Br. var. *compacta* L.Bolus

Perennial herb, succulent, 0.06–0.14 m high. **Stems** erect, annual flowering branches up to 0.2 m high, internodes smooth. **Leaves** ovate to narrowly ovate, up to 30 × 8 mm. **Flowers** 1–3 in a cyme; corolla ± 30 mm or more in diameter; petals purplish pink, base white; staminodes and filaments white; Oct.–Feb. In fissures of rocks. *Rotsvygie*, *klipvygie* (A).

DrGr MsGr KarSh

### **clavipes** Lavis

Perennial succulent, up to 0.05 m high; caespitose. **Leaves** spreading to recurved, 23 × 3–4 mm, canaliculate, dorsally rounded. **Flowers**: 1–7; corolla 20–50 mm in diameter; petals purplish pink; staminodes pink, filaments pale pink; anthers yellow; Oct.–Feb. Mountain grassland.

MsGr

**congestum** L.Bolus

Dwarf shrub, succulent, up to 0.13 m high. **Stems** erect. **Leaves** dense, ascending; blade 12–18 × 3 mm, dorsally rounded, apex acute. **Flowers**: 3–7 in a cyme; petals white, withering lemon; staminodes white; anthers dark yellow; Oct.–Feb. Mountain grassland.

MsGr

**cooperi** (Hook.f.) L.Bolus

*D. cooperi* (Hook.f.) L.Bolus forma *bicolor* (L.Bolus) G.D.Rowley

Dwarf shrub, 0.2–0.4 m high. **Stems** much branched, glabrous, greyish green, smooth. **Leaves** semiterete to trigonous, tapering to a sharp point, 37–50 mm long, papillate. **Flowers**: in cymes; corolla 30–60 mm in diameter; petals bright pinkish purple, base often white; staminodes pinkish purple or white; anthers yellow; Oct.–Feb. Grassland, disturbed places. *Skaapvygie* (A). Figure 34.

DrGr MsGr KarSh

**deleeuwiae** Lavis

Perennial herb, succulent, up to 0.03 m high. **Stems** erect, flowering branches up to 8 mm long, 3 leaf pairs below elongate inflorescence. **Leaves** flat, 12–40 × 11 mm, papillae along margins elongating into hairs, blade covered with round papillae. **Flowers** 1–3; corolla ± 40 mm in diameter; petals purplish pink; staminodes pale pink; anthers yellow; Oct.–Feb. Basalt outcrops, shallow soil, rock surfaces.

MsGr

**ficksburgense** Lavis

Perennial herb, succulent, up to 0.15 m high. **Stems** decumbent. **Leaves** spreading, 22 × 5 mm. **Flowers**: 1–3; corolla 15–17 mm in diameter; petals white, some purple; staminodes white; anthers yellow; Oct.–Feb. Amongst rocks.

MsGr

**floribundum** L.Bolus

*Delosperma pontii* L.Bolus

Dwarf shrub, succulent, up to 0.25 m high. **Stems** densely branched, internodes light ochre, bladder cells elongate, distant. **Leaves** semiterete, apex acute, bright green. **Flowers**: in loose cymes; corolla up to 30 mm in diameter; petals rose-purple; staminodes pink; filaments pale pink; Oct.–Feb. Shady places, damp black soil. *Skaapvygie* (A).

VreDm DrGr MsGr Zastr

**galpinii** L.Bolus

Perennial herb, succulent, 0.05–0.12 m high. **Leaves** spreading, narrowly ovate to ovate, basally narrower, 40–50 × 21 mm. **Flowers**: 1–3; petals bright pink; Oct.–Feb. Mountain grassland.

MsGr



**Figure 34.** *Delosperma cooperi* (Aizoaceae). Artist: G. Condy.

AIZOACEAE

### **herbeum** (N.E.Br.) N.E.Br.

Perennial herb, succulent, 0.09–0.15 m high. **Stems** erect, annual shoots papillate. **Leaves** spreading; blade linear to semiterete, 20–40 × 2.5–4.0 mm, minutely papillate. **Flowers**: cymes in upper parts of branches; corolla 10–18 mm in diameter; petals white, sometimes purplish suffused; staminodes and filaments white. Grassland, disturbed places. *Highveld white vygie*; *witbergvygie* (A); *motabo* (SS).

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| VreDm | AcGr | DrGr | MsGr | | |

### **kofleri** Lavis

Perennial herb, succulent, up to 0.13 m high. **Stems** erect. **Leaves** erect to ascending, 4–15 × 2–3 mm. **Flowers**: in loose cymes; corolla ± 10 mm in diameter; petals, filaments and anthers white; Oct.–Feb. Mountain grassland.

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### **lavisiae** L.Bolus

Perennial herb, succulent, up to 0.09 m high; caespitose. **Stems** decumbent to procumbent, internodes light ochre when older, young parts olive-green to purplish suffused, papillae distant. **Leaves** erect; semiterete, corolla 15–20 × 2 mm. **Flowers**: solitary; corolla 14–20 mm in diameter; petals pinkish purple; staminodes pale pink; Oct.–Feb. Growing over rocks.

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| | | DrGr | MsGr | KarSh | |

### **lineare** L.Bolus

Perennial herb, succulent, up to 0.18 m high. **Stems** erect to decumbent, much branched; old branches whitish with minute papillae hardening. **Leaves** linear to elongate, spindle-shaped, 20–48 × 3–4 mm, surfaces with dense semi-orbicular bladder cells. **Flowers**: petals white; staminodes pink, recurved; filaments pink; Oct.–Feb. Mountain grassland.

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### **mahonii** (N.E.Br.) N.E.Br.

Dwarf shrub, succulent, 0.15–0.20 m high. **Stems** erect, internodes light ochre with translucent, round bladder cells. **Leaves** 25–43 × 3–6 mm, surfaces with dense, globose bladder cells. **Flowers**: petals deep purple; staminodes and filaments white; Oct.–Feb. Grassland, open shrub places, loamy soil.

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| | | DrGr | | | |

### **nubigenum** (Schltr.) L.Bolus

Perennial herb, succulent, up to 0.15 m high. **Stems** decumbent to procumbent, forming mats, all herbaceous parts minutely papillate. **Leaves** erect; ovate, yellowish green. **Flowers**: solitary; petals bright yellow; staminodes deep yellow, thread-like; Oct.–Feb. Mountain grassland, in crevices.

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|---|---|---|---|---|---|
| | | | MsGr | | |

**obtusum** L.Bolus

Perennial herb, succulent, up to 0.05 m high. **Stems** decumbent, elongate; internodes light ochre, ± smooth. **Leaves** spreading; blade widening from a narrow base, semiterete, 14–17 × 3 mm, greyish green, bladder cells semiglobose. **Flowers**: petals pinkish purple; staminodes pink; anthers white; Oct.–Feb. Mountain grassland. *Mountain vygie*; *bergvygie*, *kransvygie* (A).




**ornatulum** N.E.Br.

Dwarf shrub, succulent, up to 0.4 m high. **Stems** with many, erect branches, internodes deep maroon when old. **Leaves** spreading and recurved; blade linear, 12–25 × 2–3 mm. **Flowers**: corolla 16–20 mm in diameter; petals bright coppery to magenta-purple; staminodes white; anthers pale yellow; Oct.–Feb. Karroid veld. *Skaapvygie* (A).




**pottsii** (L.Bolus) L.Bolus

Perennial herb, up to 0.1 m high; all parts covered in minute papillae ending in hairs. **Stems** with branches decumbent. **Leaves** almost erect; blade semiterete to terete, 10–25 × 3–5 mm. **Flowers**: 1–3; corolla ± 15 mm in diameter; petals, staminodes and filaments white; anthers yellow; Oct.–Feb. Hills. *Motabo* (SS).




**reynoldsii** Lavis

Dwarf shrub, succulent, 0.10–0.17 m high. **Stems** densely branched, glaucous with a pinkish tinge. **Leaves** ascending; blade subfalcate, 20–40 × 6 mm. **Flowers**: 1–3; petals and staminodes pinkish purple; filaments pink; anthers paler pink; Oct.–Dec. Grassland, sandy soil.




**roseopurpureum** Lavis

Dwarf shrub, succulent, up to 0.2 m high. **Leaves** erect to ascending, semiterete or canaliculate, 25–50 × 4 mm. **Flowers**: 2–6 in a cyme; petals and staminodes purplish pink; Oct.–Feb. Habitat unknown.




**wethamae** L.Bolus

Dwarf shrub, succulent, up to 0.1 m high. **Stems** spreading, with prickles from dead remains of short shoots; internodes minutely rough from small bladder cells. **Leaves** spreading; blade semiterete, 20–25 × 3.0–4.5 mm, apex acute, bladder cells semiglobose. **Flowers**: petals, staminodes and filaments white; Oct.–Feb. Mountain grassland.



**wiumii** Lavis

Perennial herb, succulent, up to 0.08 m high. **Stems** erect to decumbent. **Leaves** spreading; blade linear, 14–30 × 2–3 mm. **Flowers** 1–3 in a cyme; petals pink, base paler pink, apices deeper pink; Oct.–Feb. Sandy soil between rocks.

MsGr

## **Ebracteola** Dinter & Schwantes (sthn Afr.: 4 spp.)

**wilmaniae** (L.Bolus) Glen

Perennial herb, succulent, up to 0.1 m high; in tufts. **Leaves** trigonous, keel somewhat oblique. **Flowers**: corolla 20–30 mm in diameter; petals white to dark purple, more intense towards apices; staminodes and filaments white; anthers yellow; Oct.–Mar. **Fruit** 5-locular. Grassland, open patches, in pans, amongst rocks, in gravel.

KarSh

## **Hereroa** (Schwantes) Dinter & Schwantes (sthn Afr.: 28 spp.)

**glenensis** (N.E.Br.) L.Bolus

Perennial herb, succulent, up to 0.05 m high; compact. **Leaves** finger-like, apex blunt, with dark markings, 25–40 × 5–8 × 4–6 mm. **Flowers**: corolla up to 30 mm in diameter; petals bright yellow, staminodes and filaments yellow; Dec.–Mar. **Fruit** 5-locular. Grassland, rock crevices, pans.

DrGr KarSh

## **Khadia** N.E.Br. (sthn Afr.: 6 spp.)

Key to species:

Petals magenta or pink over entire length; 8- or 9-locular . . . . . **K. acutipetala**
Petals pink, paler at base; 6- or 7-locular . . . . . .**K. alticola**

**acutipetala** (N.E.Br.) N.E.Br.

Perennial herb, succulent, up to 0.05 m high; compact. **Leaves** semicylindrical, apices 3-edged, 15–35 × 4–6 mm, dark green to glaucous. **Flowers**: corolla 25–35 mm in diameter; petals deep purple to pink; staminodes and filaments purple; Oct.–Dec. **Fruit** 8- or 9-locular. Grassland, humic pockets between rock plates.

VreDm DrGr KarSh

**alticola** Chesselet & H.E.K.Hartmann

Perennial herb, succulent, up to 0.1 m high; mat-forming. **Leaves** triquetrous, 11–15 × 5–7 mm, dark to bright green with translucent dots. **Flowers**: petals, staminodes and filaments pink; Oct.–Dec. **Fruit** 6- or 7-locular. Grassland.

DrGr

## **Lithops** N.E.Br. (sthn Afr.: 36 spp.)

Key to species:

Petals white . . . . . **L. salicola**
Petals yellow . . . . . **L. lesliei**

### **lesliei** (N.E.Br.) N.E.Br.

*L. lesliei* (N.E.Br.) N.E.Br. subsp. *lesliei* var. *mariae* D.T.Cole

Perennial herb, succulent, up to 0.01 m high. **Leaves** truncate in profile, 25–49 × 20–30 mm, fissure shallow, faces various shades of brown or grey with translucent greenish or brownish windows and channels, smooth to very slightly rugose. **Flowers**: corolla 25–50 mm in diameter; petals yellow; Apr.–Jul. **Fruit** 5- or 6-locular. Stony grassland.




### **salicola** L.Bolus

Perennial herb, up to 0.02 m high. **Leaves** truncate in profile, 17–35 × 11–26 mm, fissure shallow, faces flush, elliptic-reniform, smooth, margins distinctly regular, dentate or sinuate. **Flowers**: corolla 20–50 mm in diameter; petals white; Apr.–Jul. **Fruit** 5- or 6-locular. Stony grassland.




## **Malephora** N.E.Br. (sthn Afr.: 16 spp.)

### **smithii** (L.Bolus) H.E.K.Hartmann

*Hymenocyclus smithii* L.Bolus

Perennial herb, succulent, 0.035–0.040 m high; dense, compact mats. **Leaves** trigonous, obtuse, subclavate, 20–30 × 6 mm. **Flowers**: solitary; pedicels 15 mm long; corolla ± 40 mm in diameter; petals ochre, light at base; filaments saffron, white at base; Dec.–Mar. Karroid veld, in full sun, well-drained soils.




## **Mestoklema** N.E.Br. ex Glen (sthn Afr.: 6 spp.)

### **arboriforme** (Burch.) N.E.Br. ex Glen

Dwarf shrub, succulent, 0.25–0.50 m high. **Stems** intricately branched; old stems purplish brown or blackish brown. **Leaves** 5–15 × 1.0–1.5 mm. **Flowers**: in cymes; corolla 7–10 mm in diameter; petals yellow to yellowish white; Sep.–Dec. Grassland, loamy or stony soil. *Donkey mesemb*; *donkievy* (A).



## **Mossia** N.E.Br. (sthn Afr.: 1 sp.)

### **intervallaris** (L.Bolus) N.E.Br.

Perennial herb, succulent, up to 0.02 m high; creeper. **Stems** reddish brown, thin, wiry. **Leaves** clustered; erect; < 10 mm long, light green to dull blue-green, black-spotted. **Flowers**: solitary on short shoots; petals white with apices slightly incurved; Oct.–Dec. **Fruit** 5- or 6-locular. Shallow pans on rocks.

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## **Nananthus** N.E.Br. (sthn Afr.: 6 spp.)

### Key to species:

1a Leaves erect, apparently almost as thick as broad . . . . . **N. pole-evansii**
1b Leaves spreading, apparently flatter. . . . . 2
2a Valve wings 2–3 × as broad as expanding keels. . . . . **N. vittatus**
2b Valve wings 4 × as broad as expanding keels. . . . . **N. gerstneri**

### **gerstneri** (L.Bolus) L.Bolus

Perennial herb, succulent, up to 0.02 m high. **Leaves** spreading, blade broadest at middle, ± 35 × 5–6 mm. **Flowers**: petals yellow with red longitudinal lines; Dec.–Feb. **Fruit** 6–10-locular. Dolerite slopes, fine soil in washes.

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### **pole-evansii** N.E.Br.

Perennial herb, succulent, up to 0.03 m high. **Leaves** erect with an apical hump, 14–30 × 5–8 mm, apex incurved with an awn pointing inwards, warted. **Flowers**: solitary; petals yellow with a deep red line or purplish red and darker vittae, rarely purely yellow; Aug.–May. **Fruit** 6–10-locular. Grassland, open patches, pans.

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### **vittatus** (N.E.Br.) Schwantes

*N. transvaalensis* (Rolfe) L.Bolus var. *latus* L.Bolus

Perennial herb, succulent, up to 0.01 m high. **Leaves** spreading; blade ovate, apex acuminate, often with a central channel, 25–30 × 6–9 mm. **Flowers**: petals yellow with a distinct red stripe; Oct.–Feb. **Fruit** 6–10-locular. Grassland, bush clumps, disturbed places. *Clock plants*; *brakveldvygie*, *stryvygie* (A).

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## **Neohenricia** L.Bolus (sthn Afr.: 2 spp.)

### **sibbettii** (L.Bolus) L.Bolus

Perennial herb, succulent, up to 0.01 m high. **Stems** short, creeping with adventitious roots. **Leaves** ± 4 mm in diameter, club-shaped with a flat top, warts arranged in spirals or meanders

on top. **Flowers**: solitary; petals white or purple or white and apically purple; Dec.–May. **Fruit** 4–6-locular. Pans.

KarSh

## **Rabiea** N.E.Br. (sthn Afr.: 6 spp.)

### Key to species:

Due to lack of information, key is omitted.

### **albipuncta** (Haw.) N.E.Br.

Perennial herb, succulent, up to 0.03 m high. **Leaves** of a pair often differing in size, semiterete at base, changing to trigonous, surfaces white-dotted. **Flowers**: solitary; petals yellow; Oct.–Feb. **Fruit** 7–10-locular. Rock and stone crevices. Figure 35.

KarSh

### **comptonii** (L.Bolus) L.Bolus

Perennial herb, succulent, up to 0.04 m high. **Leaves** spreading widely, base broad, tapering to apex, up to 55 × 10 mm, white-dotted. **Flowers**: corolla 29–34 mm in diameter; petals golden, filaments white, apically pale yellow; Oct.–Feb. **Fruit** 7–10-locular. Pans or crevices in rocks.

KarSh

### **lesliei** N.E.Br.

Perennial herb, succulent, up to 0.05 m high. **Leaves** erect, one leaf tapering to a pointed tip from a broad base, the other dilated at keel near apex, 20–22 × 6.7–9.0 mm. **Flowers**: corolla 25–30 mm in diameter; petals yellowish orange; anthers bright yellow; Oct.–Feb. **Fruit** 7–10-locular. Grassland, stony slopes.

MsGr KarSh

## **Ruschia** Schwantes (sthn Afr.: ± 348 spp.)

### Key to species:

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| 1a | Shrubs spinescent | 2 |
| 1b | Shrubs not spinescent | 3 |
| 2a | Spines and younger stems whitish grey to beige | **R. divaricata** |
| 2b | Spines and younger stems reddish to dark brown | **R. intricata** |
| 3a | Petals pink to bright pink; staminodes pink and white | **R. canonotata** |
| 3b | Petals rose-purple or pink to purple | 4 |
| 4a | Staminodes all purple | **R. putterillii** |
| 4b | Staminodes purple with white tips or pink | 5 |
| 5a | Stems decumbent or procumbent | **R. rigens** |
| 5b | Stems erect | 6 |
| 6a | Leaf blade keel with 1–5 teeth | **R. griquensis** |
| 6b | Leaf blade keel smooth | **R. hamata** |




**Figure 35.** *Rabiea albipuncta* (Aizoaceae). Artist: G. Condy.

### **canonotata** (L.Bolus) Schwantes

Dwarf shrub, up to 0.2 m high; not spinescent. **Leaves** triquetrous, 12–22 × 2–3 mm, leaves of a pair separated by a sharp, white triangle. **Flowers**: solitary; bracteoles in middle of stalk; petals pink to bright pink; staminodes pink and white; Dec.–Feb. **Fruit** 5-locular. Along pans, open, shrubby vegetation. *Cattle vygie*; *beesvygie* (A).

DrGr KarSh

### **divaricata** L.Bolus

Dwarf shrub, up to 0.35 m high; spinescent. **Stems** with spines and younger stems whitish grey to beige. **Leaves** 10–15 mm long, epidermis cells convex to papillate. **Flowers**: terminal; corolla 9–18 mm in diameter; petals bright pinkish purple; Jan.–Dec. **Fruit** 5-locular. Grassland.

DrGr KarSh

### **griquensis** (L.Bolus) Schwantes

Dwarf shrub, up to 0.4 m high; not spinescent. **Stems** erect, internodes grey, later brown. **Leaves** triquetrous, 1–30 × 2–3 mm, 1–5 teeth along keel, margins and keel whitish, smooth, papillae distant. **Flowers**: solitary, bracteoles near middle; petals pink to purple; staminodes purple with white tips; Dec.–Feb. **Fruit** 5-locular. Grassland, rocky soil.

AcGr KarSh

### **hamata** (L.Bolus) Schwantes

Dwarf shrub, up to 0.45 m high; not spinescent. **Stems** erect, branches rigid. **Leaves** tapering to a prominent, markedly recurved apex, epidermis raised above idioblasts, often in rows along keel and margins. **Flowers**: solitary but several on a season's growth, looking like a panicle; corolla ± 16 mm in diameter; petals pink to purple; staminodes purple with white tips; Dec.–Feb. **Fruit** 5-locular. Grassland. *Beesvygie* (A).

VreDm AcGr DrGr MsGr KarSh

### **intricata** (N.E.Br.) H.E.K.Hartmann & Stueber

Dwarf shrub, succulent, up to 0.7 m high; spinescent. **Stems** with spines and younger stems reddish to dark brown. **Leaves** 12–30 mm long, surface even, epidermis cells convex. **Flowers**: petal colour unknown; Dec.–Feb. **Fruit** 5-locular. Grassland. *Steekvy*, *doringvygie* (A).

DrGr KarSh

### **putterillii** (L.Bolus) L.Bolus

Dwarf shrub, succulent, up to 0.3 m; not spinescent. **Stems** erect in other bushes or decumbent with a dense centre and long shoots. **Leaves** lunate in side view; blade triquetrous, 8–10 × 3–4 mm, apex white, bending back. **Flowers**: solitary, distant; petals rose-purple; staminodes and filaments purple. **Fruit** 5-locular. Under trees, in bush clumps, deep cervices on exposed rock plates.

AcGr DrGr MsGr KarSh Zastr

### **rigens** L.Bolus

Perennial herb, succulent, up to 0.15 m high; not spinescent. **Stems** decumbent and procumbent. **Leaves** persisting for several years, embracing internodes; blade triquetrous, 25–30 × 4 mm, keel with 1 tooth, prickly to touch, papillate. **Flowers**: petals and staminodes pink; filaments paler pink. **Fruit** 5-locular. Grassland, pans on rocks, open spaces.

DrGr KarSh

## **Stomatium** Schwantes (sthn Afr.: 39 spp.)

### **bolusiae** Schwantes

Perennial herb, succulent, up to 0.02 m high. **Leaves** with margins toothed, teeth with broad bases and an elevation at end, keel smooth or with 1 or 2 smaller teeth, lower leaf surface protruding forming a chin. **Flowers**: petals yellow; Sep.–Nov. **Fruit** 5-locular. Edges of huge rock plates in shallow ground.

DrGr KarSh

## **Titanopsis** Schwantes (sthn Afr.: 2 spp.)

### **calcarea** (Marloth) Schwantes

*Mesembryanthemum calcareum* Marloth

Perennial herb, succulent, up to 0.04 m high; clumps of closely, clustered rosettes; compact, sunken in soil. **Leaves** flattened, ± half as thick as wide, apex with big, separate warts small or large, covered by short papillae, pearly. **Flowers**: 1–3; petals amber or amber and white; Oct.–Feb. **Fruit** with base bell-shaped, (5)6(–10)-locular. Limestone flats. *Sheep's tongue*; *kalkvygie* (A).

DrGr KarSh

## **Trichodiadema** Schwantes (sthn Afr.: 32 spp.)

### **pomeridianum** L.Bolus

Dwarf shrub, up to 0.3 m high. **Stems** erect; internodes with white, rounded papillae enlarging towards nodes. **Leaves** 15 × 2 mm in diameter; bladder cells dense without papillae. **Flowers**: pedicels 10–13 mm long; petals purplish pink; filamentous staminodes white, > 4 mm long; stamens with filaments white, papillate; anthers pale yellow; Aug.–Jan. **Fruit** 5–8-locular. Grassland. *Clock plant*; *perde-vygie*, *soetaartappel* (A).

DrGr KarSh

# Subfamily Tetragonioideae

## **Tetragonia** (sthn Afr.: 32 spp.)

Key to species:

Annual herb with procumbent stems; fruit spinescent . . . . . **T. acanthocarpa**
Dwarf shrub; fruit winged . . . . . .**T. arbuscula**

### **acanthocarpa** Adamson

Annual herb, up to 0.5 m high. **Stems** procumbent, up to 250 mm long. **Leaves** petiolate; papulose; blade elliptic or rhombic, 5–10 × 4–7 mm, thick; petioles 4–7 mm long. **Flowers**: axillary; solitary; pedicels 1–3 mm long; perianth segments 4, broadly triangular, apices obtuse, connate at bases, thin, yellowish green; Oct.–Mar. **Fruit** papulose, 4–5 × 3 mm, base truncate, covered with spines, 1.0–1.5 mm long, fruiting pedicel up to 6 mm long. Disturbed places.

| | | DrGr | | | |
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### **arbuscula** Fenzl

Dwarf shrub, up to 0.6 m high. **Stems** erect, ascending, smooth with raised, decurrent lines from leaf bases. **Leaves** petiolate; blade narrowly or narrowly linear-ovate, 5–12 × 1–3 mm or ovate, oblong, almost rotund, 5–15 × 3–7 mm, apex obtuse, base rounded, abruptly narrowed to petiole; petioles 2–3 mm long. **Flowers**: axillary; solitary or in groups of 2 or 3; pedicels slender, as long as or longer than subtending leaves; perianth segments broadly ovate, apices acute, inner surfaces bright yellow; Dec.–Feb. **Fruit**: pendulous, 6–15 × 6–15 mm, apex cordate-indented, wings thin, smooth. Grassland.

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# Subfamily Sesuvioideae

## **Trianthema** L. (sthn Afr.: 4 spp.)

### **salsoloides** Fenzl ex Oliv. var. **stenophylla** Adamson

Annual herb, up to 0.5 m high. **Stems** procumbent or erect, slender; smooth. **Leaves** with blade linear to narrowly ovate-obovate, 5–20 mm long. **Flowers**: glomerulate (in compact cymes); perianth lobes shorter than tube with broad membranous margins, obtuse or subobtuse, purple, pink to white; Dec.–May. Edge of pans, brackish soil.

| VreDm | | DrGr | | | |
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# AMARANTHACEAE (incl. Chenopodiaceae)

Annual or perennial herbs, dwarf shrubs or shrubs; often halophytic; monoecious or dioecious; lepidote, glabrous, with a mealy bloom of vesicular hairs (farinose) or an indumentum of simple to branched hairs, sometimes fleshy. **Stems** continuous or with distinct segments, if segmented then apparently leafless and fleshy. **Leaves** simple; alternate, opposite or ternate; usually petiolate; without stipules. **Flowers**: bisexual or unisexual, usually regular; in spike- or head-like inflorescences, compact or open cymes or panicles, or reduced to solitary, axillary flowers; bracts and bracteoles present or 0; perianth segments 1–5, free, ± dry and membranous or absent from female flowers, free or often connate below, sometimes enlarged, developing lobes with a horn or spines at back, or winged or becoming succulent in fruit; stamens 1–5, opposite to, as many as, or fewer than perianth segments; filaments usually free, occasionally connate at base; anthers exserted, 2-thecous with connective sometimes produced, thecae with or without a terminal appendage, often inflated and coloured, dehiscing by longitudinal slits; ovary superior, 1-locular; stigmas usually 2 or 3(–6), sessile or on stylar arms. **Fruit** dehiscent or indehiscent, often opening by means of a lid; dry or with membranous, crustaceous, or succulent pericarp, usually enclosed in and falling off with a bladdery perianth, rarely a hard nut. *Cockscomb or goosefoot family*.

## Key to genera

[after Jordaan: 50 (2000)]

1a Perianth segments dry, ± scarious; leaf margins entire (subfam. Amaranthoideae) . . . . . 2

1b Perianth segments herbaceous; leaf margins entire, variously toothed or pinnatifid (subfam. Chenopodioideae) . . . . . 12

2a Leaves alternate, fasciculate, rarely opposite . . . . . 3

2b Leaves always opposite . . . . . 6

3a Stamens fused for at least half their length in a tube. . . . . **Hermbstaedtia**
3b Stamens not fused . . . . . 4
4a Inflorescence white woolly . . . . . **Aerva**
4b Inflorescence not white woolly . . . . . 5
5a Flowers bisexual, sterile flowers strap-shaped with long hairs forming a silky-haired ball in fruit . . . . . **Sericorema**
5b Flowers unisexual, sterile flowers absent . . . . . **Amaranthus**
6a Modified sterile flowers present . . . . . 7
6b Modified sterile flowers absent, all flowers fertile. . . . . 9
7a Stamens without intermediate pseudostaminodes . . . . . **Pupalia**
7b Stamens with intermediate pseudostaminodes. . . . . 8
8a Leaves narrowly linear; fruit with a horn-like process . . . . . **Kyphocarpa**
8b Leaves broadly linear; fruit without a horn-like process . . . . . **Cyathula**
9a Plants erect. . . . . **Achyranthus**
9b Plants procumbent, decumbent . . . . . 10
10a Perianth segments densely woolly lanuginose . . . . . **Guilleminea**
10b Perianth segments glabrous or pubescent, free . . . . . 11
11a Flower clusters sessile in axils of leaves. . . . . **Alternanthera**
11b Flower clusters in dense spikes or terminal sessile heads . . . . . **Gomphrena**
12a Plants with well-developed, ± flat leaves . . . . . 13
12b Plants apparently leafless, or leaves narrow, or scale-like . . . . . 14
13a Plants mealy when young; flowers unisexual, male flowers with a 5-lobed perianth and 5 stamens, female flowers without a perianth but surrounded by a pair of bracteoles . . . . . **Atriplex**
13b Plants variously hairy to glabrous; flowers bisexual or female, all with a perianth, not surrounded by bracteoles . . . . . **Chenopodium**
14a Fruiting perianth without obvious appendages . . . . . **Suaeda**
14b Fruiting perianth with 1 or more wings, spines or tubercles . . . . . 15
15a Annual or perennial herbs, or dwarf shrubs; flowers 1–3 in axils of bracts, bibracteolate; perianth horizontally winged at or above middle . . . . . **Salsola**
15b Annual herbs; flowers in axillary clusters; fruiting perianth accrescent with spine-like or tubercle-like appendages, or membranous, scarious wings at back; bracts and bracteoles absent . . . . . 16
16a Fruiting perianth segments with spines or spine-like tubercles . . . . . **Bassia**
16b Fruiting perianth segments with membranous, scarious wings . . . . . **Kochia**

## **Achyranthes** L. (sthn Afr.: 1 sp.)

### Key to varieties:

[after Townsend: 106 (1988)]

1a Leaves with blade broadly elliptic, obovate to almost circular, blunt or abruptly apiculate; perianth up to 4.5 mm long . . . . . **A. aspera** var. **aspera**
1b Leaves with blade oblong to elliptic, bluntly to long-acuminate; perianth 3–7 mm long, if not exceeding 5 mm, leaf blade distinctly acuminate . . . . . 2
2a Perianth 3–5 mm long; leaf blade with upper surface green, lower surface silvery canescent, at least when young . . . . . **A. aspera** var. **sicula**
2b Perianth 5–7 mm long; leaf blade not as above . . . . **A. aspera** var. **pubescens**

### ***aspera** L. var. **aspera**

*A. robusta* C.H.Wright

Perennial herb, up to 2 m high. **Stems** pubescent. **Leaves** with blade broadly elliptic, obovate to almost circular, 20–220 × 13–80 mm, blunt or abruptly apiculate, secondary veins on lower surface prominent. **Flowers**: in a spike, up to 445 mm long, lower flowers reclined; perianth up to 4.5 mm long, brownish green to dull yellow; Jan.–Jul. Grassland, bush clumps, riverbanks,

hillsides. Native to India. *Chaff flower*, *burrweed*; *langklits*, *haak-en-steek-klitsbossie*, *knapsekêrel* (A); *bohomane* (SS); *moxato* (T); *usibambangubo*, *ulimilwengwe*, *ibundlubundlu*, *isinama* (Z).

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### *aspera L. var. pubescens (Moq.) C.C.Towns.

Perennial herb, up to 2 m high. **Stems** pubescent**. Leaves** with blade oblong to elliptic, 20–220 × 13–80 mm, bluntly to distinctly acuminate, subglabrous to pilose or tomentose. **Flowers**: in a spike, up to 445 mm long; perianth 5–7 mm long, brownish green to dull yellow; Jan.–Jul. Grassland. Native to Mexico.

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### *aspera L. var. sicula L.

*A. argentea* Lam.
*A. sicula* (L.) All.

Slender herb, up to 0.5 m high. **Leaves** with blade elliptic, size variable, ± 60 × 35 mm, long-acuminate, margins entire, discolorous, upper surface green, lower surface silvery canescent, at least when young. **Flowers**: in a terminal spike, up to 240 mm long; lower flowers reclined; perianth 3–5 mm long, greenish white; Dec.–May. **Fruit** silvery green, bracteoles with stellate spines. Bush clumps, hillsides, waste places. Native to Mediterranean region.

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## **Aerva** Forssk. (sthn Afr.: 3 spp.)

### **leucura** Moq.

Perennial herb, up to ± 1 m high; hermaphrodite. **Stems** erect to procumbent, occasionally scrambling; whitish hairy. **Leaves** alternate; blade broadly elliptic to narrowly obovate, 10–100 × 5–30 mm. **Flowers**: in a spike running into a terminal leafless panicle, white-woolly; perianth white; Nov.–May. Grassland, bush clumps. *Aambeibossie* (A).

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## **Alternanthera** Forssk. (sthn Afr.: 4 spp.)

### Key to species:

[after Townsend: 124 (1988)]

1a Perianth segments very dissimilar in form . . . . . 2
1b Perianth segments all similar in form . . . . . 3
2a Abaxial segments very long-aristate, awn ± 1/3 of total segment length . . . . . **A. pungens**
2b Abaxial segments only shortly aristate, awn < 1/4 of total segment length . . . . . **A. caracasana**
3a Ripe fruit yellowish with tumid margins on each side of seed, only about half length of the 30–40 mm long perianth segments . . . . . **A. nodiflora**
3b Ripe fruit dark, thin-margined with only a narrow yellowish rim, almost as long to sometimes exceeding the 2.0–2.5 mm long perianth segments . . . . **A. sessilis**

### *caracasana Kunth

Perennial, mat-forming herb. **Stems** procumbent. **Leaves** with blade obovate to elliptic, 8–32 × 4–15 mm. **Flowers**: inflorescence a dense axillary spike; perianth segments very dissimilar in form, segments ± 3 mm long, abaxial segments only shortly aristate, awn < 1/4 of total segment length, ending in sharp point, not so pungent as in *A. pungens*, white; Jul.–Jun. **Fruit** orbicular, ± 2 mm long. On fully exposed ground and ruderal places. Native to tropical America.

DrGr

### *nodiflora R.Br.

*A. sessilis* L. var. *nodiflora* Kuntze

Perennial, hydrophytic herb, up to 150 mm high. **Stems** procumbent or erect. **Leaves** with blade narrowly ovate, 20–70 × 3–12 mm. **Flowers**: inflorescences globose, axillary solitary or in clusters; bracts 4 mm long, acuminate, longer than fruit; perianth segments all similar in form, white; Jul.–Jun. **Fruit** when ripe yellowish with tumid margins on each side of seed, only about half length of the 30–40 mm long perianth segments. Margins of pans and dams. Native to Australia.

DrGr

### *pungens Kunth

*Achyranthes repens* L.
*Alternanthera achyrantha* R.Br.

Perennial herb. **Stems** procumbent. **Leaves** with blade elliptic to obovate, 15–45 × 3–27 mm, base cuneate to oblique. **Flowers**: inflorescence a dense axillary spike; perianth segments very dissimilar in form, ± 5 mm long, abaxial segments very long-aristate, awn ± 1/3 of total segment length, pungent, white; Jul.–Jun. **Fruit** orbicular, ± 0.2 mm long. On fully exposed ground and ruderal places. Native to tropical America. *Burweed*, *khakiweed*; *kakiedubbeltjie* (A); *ikhungele* (Z).

VreDm AcGr DrGr MsGr KarSh

### sessilis (L.) DC.

*Gomphrena sessilis* (L.) DC.

Perennial, hydrophytic herb, up to 0.6 m high. **Stems** procumbent, erect or scandent. **Leaves** with blade extremely variable in shape and size, narrowly linear-ovate, oblong or obovate-spathulate, 10–90 × 2–20 mm. **Flowers**: inflorescences subglobose, axillary solitary or in clusters; perianth segments all similar in form, 2.0–2.5 mm long, acute, shorter than fruit, white; Jul.–Jun. **Fruit** when ripe dark, thin-margined with only a narrow yellowish rim, almost as long to sometimes exceeding the 2.0–2.5 mm long perianth segments. Vleis, margins of pans, dams, along rivers.

DrGr

## **Amaranthus** L. (sthn Afr.: 16 spp.)

### Key to species:

[after Brenan: 454 (1981)]

1a Flowers entirely in axillary, cymose clusters, stems appearing leafy to apices . . . . . 2
1b Flowers always prominently in a terminal, branched or spike-like panicle. . . .5
2a Leaf blade obovate, broadest above middle, narrowing to obtuse apex . . . . . **A. thunbergii**

2b Leaf blade obovate, broadest near rounded apex. . . . . 3
3a Female perianth segments in fruit narrowly ovate, attenuate to a long, narrow acumen markedly uncinate-hooked . . . . . **A. capensis** subsp. **uncinatus**
3b Female perianth segments in fruit ovate to oblong, not attenuate to a long, narrow acumen markedly uncinate-hooked. . . . . 4
4a Internodes on principal stems long, up to 17 mm long . . . . . **A. dinteri** subsp. **dinteri**
4b Internodes on principal stems short, up to 7 mm long . . . . . **A. dinteri** subsp. **brevipetiolatus**
5a Leaves with blade linear to narrowly linear-ovate . . . . . **A. muricatus**
5b Leaves with blade ovate to elliptic. . . . . 6
6a Female flowers with 2 or 3, linear to oblong, narrowly obovate perianth segments, acute or shortly acuminate at apex . . . . . **A. deflexus**
6b Female flowers with 5 ovate to oblong perianth segments, aristate-acuminate at apex . . . . . 7
7a Upper part of fruit ± inflated and wrinkled, forming a sort of beak. . . . . **A. hybridus** subsp. **hybridus**
7b Upper part of fruit short, firm, not inflated, wrinkled or beaked. . . . . **A. hybridus** subsp. **cruentus**

## **capensis** Thell. subsp. **uncinatus** (Thell.) Brenan

Annual herb. **Stems** procumbent, up to 250 mm long. **Leaves** with blade obovate, 3–20 × 2–10 mm, broadest near rounded apex. **Flowers**: entirely in axillary, cymose clusters, stems appearing leafy to apices; female perianth with segments in fruit narrowly ovate, attenuate to a long, narrow acumen markedly uncinate-hooked, green; Feb.–Apr. **Fruit** shorter than perianth, smooth to rugose above. Disturbed places.




## ***deflexus** L.

Perennial herb, up to 0.4 m high. **Stems** procumbent to ascending, many from rootstock. **Leaves** with blade ovate to elliptic, 10–45 × 5–25 mm. **Flowers**: inflorescence a terminal branched or spike-like panicle; female perianth with 2 or 3, linear to oblong, narrowly obovate segments, acute or shortly acuminate at apex, green; Oct.–Feb. **Fruit** clearly exceeding perianth, indehiscent, smooth, rounded or obtuse at apex. Disturbed places. Native to South America. *Perennial pigweed*; *meerjarige misbredie* (A).




## **dinteri** Schinz subsp. **brevipetiolatus** Brenan

Annual herb. **Stems** procumbent to decumbent; internodes on principal stems up to 7 mm long. **Leaves** with blade obovate, blade up to 8 × 4 mm, broadest near rounded apex. **Flowers**: entirely in axillary, cymose clusters, stems appearing leafy to apices; female perianth segments in fruit ovate to oblong, whitish; Mar. **Fruit** ovoid, shorter than perianth, coarsely rugose above. Disturbed places.




## **dinteri** Schinz subsp. **dinteri**

Annual herb. **Stems** procumbent to decumbent; internodes on principal stems up to 17 mm long. **Leaves** with blade obovate, broadest near rounded apex, 10–25 × 3–13 mm. **Flowers**:

entirely in axillary, cymose clusters, stems appearing leafy to apices; female perianth segments of female flowers subequal, perianth segments in fruit ovate to oblong, whitish; Mar. **Fruit** ovoid, shorter than perianth, coarsely rugose above. Disturbed places; along dry watercourses.

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***hybridus** L. subsp. **cruentus** (L.) Thell.

*A. cruentus* L.

Annual herb, up to 2 m high. **Stems** erect. **Leaves** with blade ovate to elliptic, 25–150 × 15–80 mm. **Flowers**: inflorescence a terminal branched or spike-like panicle; larger bracteoles of female flowers ± as long as to 1.5 × as long as perianth; female perianth with 5 ovate to oblong segments, aristate-acuminate at apex, green; Feb.–Apr. **Fruit** with upper part short, firm, not inflated, wrinkled or beaked. Disturbed places. Native to North America. *Cape pigweed*, *prince's feather*, *redshank*; *misbredie* (A).

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***hybridus** L. subsp. **hybridus**

Annual herb, up to 2 m high. **Stems** erect. **Leaves** with blade ovate to elliptic, 25–150 × 15–80 mm. **Flowers**: inflorescence a terminal branched or spike-like panicle; larger bracteoles of female flowers ± 1.5–2.0 × as long as perianth; female perianth with 5 ovate to oblong segments, aristate-acuminate at apex, green; Sep.–Mar. **Fruit** in upper part ± inflated and wrinkled, forming a sort of beak. Weed of disturbed or cultivated land. Native to Central America. *Pigweed*; *misbredie*, *sprinkaanbossie*, *rooibossie*, *wilde-aartappelbos* (A); *theepe-ea-bokoni* (SS); *thepe* (T); *umtyutyu*, *unomdlomboyi* (X); *isheke*, *imbuya* (Z).

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***muricatus** (Moq.) Hieron.

Annual herb, up to 1 m high. **Stems** decumbent or erect, pubescent at least when young. **Leaves** with blade linear to narrowly linear-ovate, broadest above middle and ± narrowed to an obtuse apex. **Flowers**: inflorescences always prominently a terminal, branched or spike-like panicle; female perianth segments narrowed to a fine, subulate acumen 0.75–2.00 mm long; perianth green; Jul.–Jun. Weed in cultivated land and disturbed places. Native to temperate South America. *Small pigweed*, *poor man's spinach*; *hanekam*, *kalkoenslurp*, *kraanvoëlbossie* (A); *uqupose* (X); *imbuyu* (Z).

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**thunbergii** Moq.

Annual herb, up to 1 m high. **Stems** decumbent or erect, pubescent at least when young. **Leaves** with blade obovate, broadest above middle, narrowing to obtuse apex, 10–16 × 5–30 mm. **Flowers**: entirely in axillary, cymose clusters, stems appearing leafy to apices; female perianth segments narrowed to a fine, subulate acumen 0.75–2.00 mm long, green; Jul.–Jun. **Fruit** ellipsoid-ovoid, shorter than perianth, smooth or slightly rugose above. Weed in cultivated land and disturbed places. *Small pigweed*, *poor man's spinach*; *hanekam*, *kalkoenslurp*, *kraanvoëlbossie* (A); *uqupose* (X); *imbuyu* (Z).

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## **Atriplex** L. (sthn Afr.: 19 spp.)

Key to species:

1a Perianth joined up to a small opening, strongly spongy . . . . . **A. lindleyi** var. **inflata**
1b Perianth at least half free, herbaceous or membranous . . . . . 2
2a Leaf blade surfaces mealy lepidote, margins involute and deeply incised. . . . . **A. erosa**
2b Leaf blade not characterised as above. . . . . 3
3a Leaves herbaceous, weakly scaly, green . . . . . 4
3b Leaves leathery, densely scaly, grey . . . . . 5
4a Fruiting bracteoles with a distinctive base . . . . . **A. suberecta**
4b Fruiting bracteoles without a distinctive base . . . . . **A. semibaccata**
5a Leaf blade broadly obovate to elliptic, decurrent. . . . . **A. nummularia** subsp. **nummularia**
5a Leaf blade elliptic to oblong-elliptic, not decurrent . . . . . **A. vestita**

### **erosa** G.Brückn. & I.Verd.

*A. rosea* C.H.Wright non L.

Annual herb, up to 0.8 m high. **Stems** erect or decumbent; yellowish. **Leaves** subsessile or shortly petiolate; blade ovate to narrowly ovate, 6–30 × 4–15 mm, base cuneate, apex acute, margins involute and deeply incised, both surfaces mealy lepidote. **Flowers**: male in axils of upper, much-reduced leaves; female in lower leaves; fruiting bracteoles sessile, blade broadly rhomboid or subrhomboid, free apices semi-orbicular to broadly triangular, base cuneate, margins irregularly toothed, outer surface slightly pilose-lepidote with conspicuous wart-like tubercles; Jan.–Mar. Disturbed places, pans, vleis, lime soil. *Breekbossie* (A).

DrGr KarSh

### *__lindleyi__ Moq. subsp. __inflata__ (F.Muell.) Paul G.Wilson

*Blackiella inflata* F.Muell.

Annual or biennial herb, up to 0.5 m high. **Stems** erect, whitish. **Leaves** petiolate or sessile; blade elliptic to narrowly elliptic, up to 30 mm long, decurrent, apex acute, margins entire or remotely sinuate-dentate, greyish. **Flowers**: in axillary clusters; fruiting bracteoles subglobose, joined up to a small opening, free apex narrowly triangular, strongly spongy; Oct.–Mar. Disturbed places, roadsides, margins of pans. Native to Australia. *Sponge-fruit saltbush*; *blasiesoutbos* (A).

KarSh

### *__nummularia__ Lindl. subsp. __nummularia__

Perennial herb or shrub, up to 3 m high; dioecious. **Stems** erect or ascending. **Leaves** leathery, densely scaly, grey, petiolate; blade decurrent, broadly obovate to elliptic, apex obtuse, margins sinuate-dentate, grey-green; petioles up to 10 mm long. **Flowers**: male in glomerules, arranged in panicles; female in compact clusters, arranged in panicles; fruiting bracteoles sessile, orbicular, margins appressed or slightly spreading, membranous all over, dull yellow or pinkish; Feb.–Apr. Grassland, vleis, along pans, deep sandy soil. Native to Australia. *Old man's saltbush*; *oumansoutbos* (A).

DrGr KarSh

### *semibaccata R.Br. *s.l.*

Annual, occasionally perennial, herb, up to 0.6 m high; dioecious. **Stems** procumbent or decumbent, with branches, long, loosely branched, matforming. **Leaves** herbaceous, weakly scaly, green, shortly petiolate; blade oblong-elliptic or narrowly ovate or obovate, margins irregularly sharply sinuately dentate or entire. **Flowers**: inflorescences terminal or in axils of leaves; fruiting bracts distinctly rhomboid in outline with deltoid apical lobes, without a distinctive base, yellowish, brown to black in fruit; Oct.–Mar. **Fruit** becoming semibaccate when ripe, turning red to orange. Grassland, woodland, along seasonal streams, sandy soil. Native to Australia. *Creeping saltbush*; *kruipsoutbos* (A).

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### **suberecta** I.Verd.

*A. muelleri* Benth. *sens. auct.*

Annual or perennial herb, up to 0.75 m high; monoecious. **Stems** decumbent-erect, subwoody, up to 1 m long. **Leaves** herbaceous, weakly scaly, green, shortly petiolate; blade narrow to broadly rhombic, 10–50 × 5–35 mm, apex rounded, base cuneate, margins coarsely, irregularly, sinuately dentate or lobed, upper surface mealy pubescent. **Flowers**: female flowers in axillary clusters; fruiting bracteoles weakly rhombic with broad, deltoid, apical lobes, with a distinctive base, toothed, green; Sep.–Mar. **Fruit** with a stipe-like solid base, first to swell and indurate. Disturbed places, in depressions, margins of mine dams, stony soil.

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### **vestita** (Thunb.) Aellen *s.l.*

*A. halimus* C.H.Wright

Perennial herb or shrub, up to 2 m high. **Stems** erect. **Leaves** leathery, densely scaly, grey, shortly petiolate; blade elliptic to oblong-elliptic, apex obtuse, margins entire, occasionally both sides in lower part with a simple blunt tooth. **Flowers**: in ± terminal, loose, pyramid-shaped pseudopanicles, female inflorescences often cluster-like; fruiting bracteoles leaf-like, membranous, rounded to triangular, divided to near base, glabrescent when old, shiny, light yellow; Jan.–Mar. *Cape saltbush*; *klappiesbrak*, *vaalbrak* (A).

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## Bassia

### Key to species:

Leaf blade narrowly ovate. . . . . **B. indica**
Leaf blade linear, subcylindric . . . . . **B. salsoloides**

### *indica (Wight) A.J.Scott

*Kochia indica* Wight

Annual herb, up to 0.25 m high. **Stems** branched. **Leaves** alternate; blade narrowly ovate. **Flowers**: sessile in axils of leaf-like bracts; inflorescences spike-like; perianth winged, wings membranous, green; Sep.–Nov. **Seeds** black. Disturbed places, along pans. Native to India. *Fivehorn smotherweed*.

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**salsoloides** (Fenzl) A.J.Scott
*Kochia pubescens* Moq.
*K. salsoloides* Fenzl

Annual herb, up to 1 m high; shrubby. **Stems** branched, sprawling; young parts pubescent. **Leaves** succulent; blade linear, subcylindric. **Flowers**: yellow; Feb.–Jun. **Seeds** brown. Sandy or poorly drained flats, along watercourses, silty soil. *Forage kochia*; *basterinkbos* (A).

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## **Chenopodium** L. (sthn Afr.: 22 spp.)

### Guide to species:

I. Plants with glandular hairs and aromatic scent: *C. ambrosioides*, *C. carinatum*, *C. multifidum*, *C. pumilio*, *C. schraderianum*,
II. Plant without glandular hairs and aromatic scent, glabrous or/and farinose (covered with white or violet vesicles): *C. album*, *C. giganteum*, *C. glaucum*, *C. mucronatum*, *C. murale*, *C. petiolariforme*, *C. phillipsianum*

### *__album__ L.

Annual herb, up to 1 m high. **Stems** erect or drooping, ribbed. **Leaves** petiolate; blade ovate, narrowly ovate to subtrilobed, variable in size, margins entire, toothed or lobed, upper surface dark green, lower surface with a thick whitish, mealy covering; petioles slender, up to 40 mm long. **Flowers**: in dense, leafless, terminal panicles, overtopping leaves; perianth green; Dec.–Apr. **Seeds** Disturbed places. Native to Europe and Asia. *Fat hen*, *goosefoot*; *misbredie* (A).

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### *__ambrosioides__ L.

Annual herb, up to 1 m high. **Stems** erect. **Leaves** with blade oblong, ovate-lanceolate, irregularly sinuately repand, up to 100 × 40 mm, margins entire, dentate or laciniate, upper surface glabrous, lower surface covered with sessile, yellow glands. **Flowers**: in many-clustered, false spikes or pseudopanicles; perianth segments ovate-triangular, remaining green for a long time; Oct.–Apr. Disturbed places. Native to Central America.

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### *__carinatum__ R.Br.

Annual or short-lived perennial herb, up to 0.8 m high. **Stems** erect to procumbent. **Leaves** petiolate; blade ovate to elliptic, up to 25 × 15 mm, margins sinuate-dentate, veins prominent on upper surface, both surfaces densely glandular-pubescent; petioles shorter than blade. **Flowers**: in dense, axillary clusters; perianth green; Jan.–May. Margins of cultivated lands or abandoned land. Native to Australia. *Green goosefoot*; *groenhondebossie* (A).

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### *__giganteum__ D.Don
*C. amaranticolor* Coste & Reyn.

Annual herb, up to 2 m high. **Stems** erect; young shoots and young leaves suffused purplish pink. **Leaves** petiolate; blade broadly ovate to rhomboid, up to 200 × 160 mm, usually > 45 mm

wide, with many, ± shallow teeth, surfaces with mealy, vesicular hairs. **Flowers**: in a terminal panicle of many, spicately arranged flower clusters; green or reddish; Jan.–Mar. **Seeds** bluntly keeled, surface black, shining. Disturbed places. Native to India. *Purple goosefoot*.

DrGr | MsGr

***glaucum** L.

*C. glaucum* L. subsp. *marlothianum* (Murr) Thell. & Aellen

Annual herb. **Stems** procumbent with branches up to 0.4 m long. **Leaves** petiolate; blade narrowly ovate, purplish red above with green veins, lower surface conspicuously whitish grey; petioles up to 10 mm long. **Flowers**: in axils of leaves; green; Nov.–Mar. Edges of dams, vleis and pans. Native to Europe. *Oak-leaved goosefoot*.

AcGr | DrGr

**mucronatum** Thunb.

*C. vulvaria* L.

Annual herb, up to 2 m high; greyish. **Stems** procumbent. **Leaves** petiolate; blade triangular, 10–20 × 6–15 mm, margins hastate with rounded angles, mucronate, glabrous to densely farinose, upper leaves close together; petioles as long as blade. **Flowers**: in dense, terminal panicles; perianth fleshy, green; Nov.–Sep. **Seeds** with radial furrows and irregular scarred pits. Disturbed places.

DrGr

***multifidum** L.

Annual herb, up to 1 m high. **Stems** erect to procumbent, branched. **Leaves** sessile; blade oblong, up to 20 mm long, margins deeply pinnately divided with irregular, sometimes dentate lobes, glandular-hairy. **Flowers**: sessile, fascicled in axils of leaves, many; green; Nov.–May. Disturbed places, roadsides. Native to South America.

DrGr | MsGr | KarSh | Zastr?

***murale** L. var. **murale**

*C. longidjawense* Peter.

*C. murale* L. var. *acutidentatum* Aellen

Annual herb, up to 0.75 m high. **Stems** erect, branched. **Leaves** petiolate; blade ovate to rhombic, densely and sharply dentate; petioles slender, up to 30 mm long. **Flowers**: in dense, axillary panicles, shorter than leaves; perianth segments with a distinct tubercle on front part, green; Oct.–Mar. **Seed** surface with small, sharp-edged pits. Old lands, waste places, gardens. Cosmopolitan. *Nettle-leaved goosefoot*.

DrGr | MsGr | KarSh | Zastr?

***petiolariforme** (Aellen) Aellen

*C. opulifolium* Schrad. ex Koch & Ziz subsp. *petiolariforme* Aellen

Annual herb, up to 0.6 m high. **Stems** procumbent. **Leaves** petiolate; blade deeply lobed, margins with a few coarse teeth, mostly strongly farinose; petioles up to 20 mm long. **Flowers**: in almost leafless, terminal pseudopanicles; perianth segments with broad membranous

margins, narrow herbaceous middle portion, yellow; Mar. **Seed** surface with weak, radial furrows and irregular pits. Grassland. Native to Europe and Asia.

DrGr

### **phillipsianum** Aellen

Annual herb, up to 2 m high. **Stems** erect; branched below. **Leaves** petiolate; blade ovate to narrowly ovate, up to 25 × 15 mm, apex obtuse to acute, base hastate, margins entire, upper surface pale green lower surface farinose; petioles up to 15 mm long. **Flowers**: in terminal panicles. green; Oct.–Apr. Disturbed places, bush groups.

VreDm AcGr DrGr KarSh

### ***pumilio** R.Br.

Annual herb, up to 0.35 m high. **Stems** procumbent to suberect with branches up to 0.5 m long, main shoot up to 0.8 m high. **Leaves** with blade narrowly ovate to oblong, up to 14 × 6 mm, symmetrically sinuately dentate or lobed. **Flowers**: in axillary clusters; free part of perianth segments linear, rib-shaped, colour soon changing to yellowish white; Feb.–Jun. Disturbed places. Native to Europe and Asia.

DrGr

### ***schraderianum** Roem. & Schult.

*C. foetidum* Schrad.

Annual herb, up to 1.3 m high. **Stems** erect, red with many yellow glands. **Leaves** with blade oblong, deeply sinuately lobed, sessile, yellow glands present. **Flowers**: in loose, distinctly dichasially branched, terminal panicles; perianth segments with a few blunt tubercles on dorsal keel, green; Nov.–Jun. Disturbed and waste places. Region of origin uncertain.

DrGr MsGr KarSh

## **Cyathula** Blume (sthn Afr.: 6 spp.)

### Key to species:

Inflorescence a spike of densely congested cymose clusters. . . . . .
. . . . . **C. cylindrica** var. **cylindrica**
Inflorescence a globose head of agglomerated compound cymes. . . .**C. uncinulata**

### **cylindrica** Moq. var. **cylindrica**

*Achyranthes cylindrica* Bojer
*Pupalia alopecurus* Fenzl ex Drège

Robust, erect herb or scrambler, up to 0.7 m high. **Leaves** petiolate; blade broadly ovate, 10–140 × 7–60 mm, apex acuminate, glabrous or appressed hairy; petioles up to 25 mm long. **Flowers**: in a spike of densely congested cymose clusters; outer 2 perianth segments of mature fertile flowers mucronate only; perianth white; Dec.–Jun. Grassland. *Burweed*; *sekelklits* (A); *bohome-bo-boholo* (SS).

DrGr MsGr

**uncinulata** (Schrad.) Schinz
*C. globulifera* Moq.
*Desmochaeta uncinulata* Hiern

Erect herb or scrambler, up to 1.5 m high. **Leaves** petiolate; blade ovate to broadly elliptic-oblong, 35–120 × 25–80 mm; petioles up to 30 mm long. **Flowers**: inflorescence a globose head; outer 2 perianth segments of mature fertile flowers with arista tipped with an uncinate hook; perianth greenish white; Feb.–Jul. A weed of disturbed land, tending to spread in shady places. *Globe cyathula*, *burweed*; *rondeklits*, *wolbossie* (A); *bohome* (SS).

DrGr | MsGr | Zastr

## **Gomphrena** L. (sthn Afr.: 2 spp.)

***celosioides** Mart.
*G. celosioides* Mart. forma *villosa* Suess.
*G. decumbens* Jacq.

Perennial herb, up to 0.35 m high. **Stems** procumbent, decumbent or erect; much branched; white silky hairy. **Leaves** opposite; blade elliptic to obovate, 15–45 × 5–13 mm, decurrent, apex acute, margins entire, upper surface glabrous to thinly pilose, lower surface thinly to densely hairy with long, whitish hairs. **Flowers**: inflorescence terminal, sessile above uppermost pair of leaves, globose to spicate as flowers mature; bracteoles membranous; perianth 5–6 mm long, white; Oct.–Jun. Grassland, vleis, disturbed places. Native to South America. *Bachelor's button*, *prostrate globe amaranth*; *mierbossie*, *kruip-knopamarant* (A); *intandangulube* (Z).

DrGr | MsGr

## **Guilleminea** Kunth (sthn Afr.: 1 sp.)

***densa** (Willd. ex Roem. & Schult.) Moq.
*Brayulinea densa* (Willd.) Small

Perennial herb; pubescent. **Stems** procumbent or decumbent; much branched; many. **Leaves** opposite; blade narrowly elliptic to broadly ovate, variable in size, 5–22 × 1.5–14.0 mm, decurrent, apex acute, margins entire, upper surface glabrous or subglabrous, lower surface densely hairy with long, matted white hairs. **Flowers**: inflorescences dense glomerules in leaf axils, up to 5 mm in diameter; perianth white; Nov.–May. Widespread weed of lawns, roadsides and disturbed veld. Native to America.

VreDm | DrGr | MsGr | KarSh

## **Hermbstaedtia** Rchb. (sthn Afr.: 12 spp.)

Key to species:

Perianth segments deep magenta to maroon . . . . . **H. odorata** var. **aurantiaca**
Perianth segments white to pale pink . . . . . **H. odorata** var. **odorata**

**odorata** (Burch.) T.Cooke var. **aurantiaca** Suess.) C.C.Towns.

Perennial herb, up to 0.6 m high. **Stems** several; simple to much branched; striate. **Leaves** sessile or petiolate; blade narrowly obovate, 50–300 × 6–12 mm, base cuneate, apex obtuse,

margins entire, often folded, abbreviated shoots sometimes present in axils. **Flowers**: inflorescence a terminal spike; axis of inflorescence pilose, right down to lowest flower; perianth with segments deep magenta to maroon; Aug.–Apr. Grassland, disturbed places, sandy soil.

DrGr

**odorata** (Burch.) T.Cooke var. **odorata**

*Celosia odorata* Burch.

Perennial herb, up to 0.75 m high. **Stems** several; simple to much branched; striate. **Leaves** sessile or petiolate; blade narrowly obovate, 50–300 × 6–12 mm, base cuneate, apex obtuse, margins entire, abbreviated shoots sometimes present in axils. **Flowers**: inflorescence a terminal spike; axis of inflorescence pilose, right down to lowest flower; perianth with segments white to pale pink; Aug.–Apr. Grassland, disturbed places, sandy soil. *Rooiaarbossie*, *rooiaarkatstert* (A); *ubuphuphu*, *uvelabahleke* (Z).

DrGr

## **Kochia** Roth (sthn Afr.: 1 sp.)

***tricophylla** Stapf

Perennial herb or shrub, up to 0.75 m high. **Stems** much branched, leafy. **Leaves** with blade linear, margins entire. **Flowers**: in leaf axils, reddish or yellow; Mar.–May. Disturbed places. Native to Eurasia. *Summer cypress*.

DrGr KarSh

## **Kyphocarpa** (Fenzl) Lopr. (sthn Afr.: 3 spp.)

**angustifolia** (Moq.) Lopr.

*Cyathula angustifolia* Moq.

*Sericocoma angustifolia* (Moq.) Hook.f.

Annual herb, up to 0.7 m high. **Stems** simple or several from base, erect; striate. **Leaves** linear, 15–75 × 0.5–4.5 mm, apex with a sharp, acute mucro, upper ones folded inwardly, lower blades frequently flat. **Flowers**: in a spike, glomerules of 2–4 fertile and 1 or 2 sterile flowers, the latter reduced to spines; perianth and spine-tipped bracteoles silky hairy; perianth white; Dec.–May. Grassland, roadsides. *Silky burweed*; *umahlabahlabane* (Z).

DrGr KarSh

## **Pupalia** Juss. (sthn Afr.: 2 spp.)

**lappacea** (L.) A.Juss. var. **lappacea**

*P. atropurpurea* (Lam.) Moq.

Annual or perennial herb, up to 1 m high. **Stems** erect, procumbent or scandent. **Leaves** petiolate; blade variable, narrowly ovate-elliptic to oblong or circular, 20–100 × 10–50 mm, upper surface thinly hairy, paler, lower surface more densely hairy; petioles up to 25 mm

long. **Flowers**: in a terminal spike of small clusters of flowers; sterile flowers with many, dull yellow hooked spines; perianth with outer segments 4–5 mm long, dull white; Oct.–Apr. Open woodland, shady places, sandy soil. *Forest burr*, *sweethearts*; *bosklits*, *beesklits* (A); *isinama esibomvu* (Z).

DrGr

## **Salsola** L. (sthn Afr.: 70 spp.)

### Key to species:

[after Botschantzev: 597 (1974)]

1a Leaves and bracteoles furnished with an aculeolate apex; leaves not swollen at base . . . . . **S. kali**
1b Leaves and bracteoles not furnished with an aculeolate apex; leaves swollen at base . . . . . 2
2a Branches, leaves and flowers alternate . . . . . 3
2b Branches, leaves and flowers opposite or obliquely opposite . . . . . 10
3a Leaves, bracteoles and perianth segments becoming black when dry . . . . . **S. calluna**
3b Leaves, bracteoles and perianth segments scarcely changing in colour when dry . . . . . 4
4a Leaves of buds always glabrous and chaffy-margined laterally and on upper part . . . . . 5
4b Leaves of buds or young leaves pubescent from apex to margin, leaves of buds occasionally glabrous, but then with upper margin herbaceous . . . . 6
5a Leaves glabrous . . . . . **S. gemmifera**
5b Leaves, at least youngest, pubescent . . . . . **S. tuberculata**
6a Floral leaves of lower flowers equal in length to bracteoles (very rarely longer), shorter indeed than those of upper flowers . . . . . 7
6b Floral leaves in same plant all equal in length to bracteoles or shorter than them . . . . . 8
7a Floral leaves of flowers somewhat longer than bracteoles; perianth (excluding wings) ± 1.2 mm wide; plant glabrous, more rarely pubescent . . . . . **S. glabrescens**
7b Floral leaves of lower flowers equal in length to bracteoles; perianth (excluding wings) ± 2 mm wide; plant pubescent, more rarely glabrous . . . . . **S. rabieana**
8a Cauline leaves and those of buds pubescent, soon glabrous, irregularly rugose in dried state . . . . . **S. aphylla**
8b Cauline leaves and those of buds persistently pubescent, not rugose in dried state . . . . . 9
9a Perianth segments wholly glabrous below wings, or only pubescent at edges or base of wings . . . . . **S. kalaharica**
9b Perianth segments pubescent below wings over whole upper surface . . . . . **S. patentipilosa**
10a Plants blackening when dried . . . . . **S. smithii**
10b Plants almost unchanged in colour when dried . . . . . 11
11a Fruiting perianth without wings; seeds vertical . . . . . 12
11b Fruiting perianth winged; seeds horizontal . . . . . 15
12a Floral leaves and bracteoles spongy-fleshy in fruiting stage . . . . . 13
12b Floral leaves and bracteoles unchanged in fruiting stage . . . . . 14
13a Bracteoles of lower flowers shorter than perianth . . . . . **S. aellenii**
13b Bracteoles of lower flowers equal in length to perianth . . . . . **S. adisca**

14a Stems erect; leaves, bracteoles and perianth covered with non-appressed, flexuous, very slender hairs . . . . . **S. exalata**
14b Stems procumbent; leaves, bracteoles and perianth covered with appressed, straight, rather thick hairs, often rubbed off later . . . . . **S. henriciae**
15a Stems procumbent; leaves, bracteoles and perianth glabrous; perianth wings short, thick . . . . . **S. humifusa**
15b Stems erect; leaves, bracteoles and perianth pubescent; perianth wings large, membranous . . . . . **S. geminiflora**

## **adisca** Botsch.

Dwarf shrub, 0.4–0.5 m high; not blackening when dried; branches, leaves and flowers opposite. **Stems** with young branches pubescent. **Leaves** swollen at base; blade elliptic, appressed pubescent. **Flowers**: bracteoles of lower flowers equal in length to perianth; floral leaves and bracteoles spongy-fleshy in fruiting stage; fruiting perianth without wings; May. **Seeds** vertical. Grassland, along pans.




## **aellenii** Botsch.

Dwarf shrub, up to 0.6 m high; not blackening when dried; branches, leaves and flowers opposite. **Stems** erect. **Leaves** scale-like, swollen at base; blade ovate, 2.0–2.2 × 1.2 mm; glabrescent to glabrous. **Flowers**: bracteoles of lower flowers shorter than perianth; floral leaves and bracteoles spongy-fleshy in fruiting stage; fruiting perianth without wings; May. **Seeds** vertical. Along saltpans.




## **aphylla** L.f.

*Caroxylon salsola* Thunb.
*S. caffra* Sparrm.

Shrub, up to 3 m high; not blackening when dried; branches, leaves and flowers alternate. **Stems** much branched, branches ash-grey or light brown; leafy. **Leaves** sessile, amplexicaul; blade broadly triangular, spurred, the upper ones rounded and thick, close to each other; cauline leaves and those of buds pubescent, soon glabrous, irregularly rugose in dried state. **Flowers**: solitary; bracteoles suborbicular, keeled on back, with membranous margins, mostly ± densely covered with appressed hairs; perianth hairy to glabrescent, the front part with a short triangular middle portion, wings delicate, many-nerved, sinuately lobed, light brown; Nov.–Mar. Along watercourses, margins of pans. *Langbeen*, *brakganna*, *slootganna* (A).




## **calluna** Fenzl ex C.H.Wright

*S. nigrescens* I.Verd.

Dwarf shrub, up to 0.6 m high; leaves, bracteoles and perianth segments black when dry; branches, leaves and flowers alternate. **Stems** erect, robust and woody at base; branches glabrous with young branches reddish. **Leaves** hard, fleshy; blade ovate to narrowly linear-ovate, 2–5 × 1 mm, canaliculate, dorsally rounded or inconspicuously keeled, base spur-like. **Flowers**: sessile, axillary; ovate to ovate-orbicular, 2 × 1.5 mm, margins broadly hyaline; perianth yellow; Jan.–Apr. Disturbed places, along watercourses, edges of pans, stony or saline soil. *Rooilootganna*, *swartganna* (A).



**exalata** Botsch.

Dwarf shrub, up to 0.6 m high; not blackening when dried; branches, leaves and flowers opposite; leaves, bracteoles and perianth covered with non-appressed, flexuous, very slender hairs. **Stems** erect; shoots rooting at nodes; young ones pubescent. **Leaves** scale-like, swollen at base; blade ± 1.5 × 1.5 mm. **Flowers**: bracteoles ovate; perianth pubescent, wingless: Oct.–Mar. **Seeds** vertical. Vleis, margins of pans, limestone. *Ankerganna* (A).




**geminiflora** Fenzl ex C.H.Wright

Dwarf shrub, up to 0.6 m high; not blackening when dried; branches, leaves and flowers opposite; leaves, bracteoles and perianth pubescent. **Stems** erect. **Leaves** bract-like, swollen at base. **Flowers**: in spike-like inflorescences; perianth with large, chaffy wings, yellow; Oct.–Mar. **Seeds** horizontal. Along pans. *Soutganna* (A).




**gemmifera** Botsch.

Dwarf shrub, up to 0.45 m high; yellowish green, not blackening when dried; branches, leaves and flowers alternate. **Stems** divaricately branched, branches densely covered with buds; young shoots densely pubescent. **Leaves** scale-like; blade orbicular, ± 1.6 × 1.6 mm, base gibbous, spur-like, glabrous, wrinkled when dry. **Flowers**: in dense, few-flowered, spicate inflorescences; bracteoles glabrous or loosely pubescent; flowering shoots elongated, densely covered with buds above flowers and imbricate leaves to apex; perianth winged, yellowish green; Dec.–Feb. Along dry watercourses.




**glabrescens** Burtt Davy

Dwarf shrub or shrub, up to 0.9 m high; plants glabrous, more rarely pubescent; not blackening when dried; branches, leaves and flowers alternate. **Stems** thick and woody below; branchlets slender, glabrous or slightly puberulent at base of leaves and flowers when young. **Leaves** sessile; succulent; blade linear, up to 5 × 1 mm; floral leaves somewhat longer than bracteoles. **Flowers**: solitary in axils of leaves; perianth (excluding wings) ± 1.2 mm in diameter, yellow; Jan.–Apr. Riverbanks, saltpans, gregarious, forming colonies in brackish soil. *Riviergana* (A).




**henriciae** I.Verd.

Shrub, up to 1 m high; not blackening when dried; branches, leaves and flowers opposite; leaves, bracteoles and perianth covered with appressed, straight, rather thick hairs, often rubbed off later. **Stems** procumbent, spreading and rooting under sand, ultimate branches erect. **Leaves** scale-like, fleshy, swollen at base; blade ovate, 1.5–3.0 × 1.75 mm, apex subacute, base spurred, margins hyaline, minutely ciliate, glabrescent. **Flowers**: solitary, sessile, axillary forming spike-like inflorescences at apices of branchlets; bracteoles leaf-like; perianth segments ovate-oblong to narrowly ovate-oblong, small tubercles at base and without wings in fruit; Oct.–Mar. **Seeds** vertical. Marginal zone of pans. *Kruipganna* (A).



**humifusa** A.Brückn.

Dwarf shrub; not blackening when dried; branches, leaves and flowers opposite; leaves, bracteoles and perianth glabrous. **Stems** procumbent, forming mats 0.15–0.40 m in diameter; lateral branches long, rooting at intervals along their length; older branches glabrous, young ones hoarily pubescent. **Leaves** sessile, amplexicaul, swollen at base; blade small, ovate, ± 1.5 mm long. **Flowers**: sessile, axillary; bracteoles broadly ovate, margins hyaline, ciliate; perianth wings short, thick, dark pink; Feb., Mar. **Seeds** vertical. Dry margins of pans, vleis, limestone. *Springbokganna*, *kruipganna* (A).




**kalaharica** Botsch.

Dwarf shrub, up to 0.2 m high; not blackening when dried; branches, leaves and flowers alternate. **Stems** many, young branches pubescent. **Leaves** scale-like; blade ovate, 1.8 × 1.5 mm, apex obtuse with a fleshy, apical tubercle, base gibbous, densely pubescent; subfloral leaves shorter than bracts, with an obtuse, fleshy, apical tubercle. **Flowers**: in scattered, spicate inflorescences, flowering shoot terminating in a bud above flowers, covered with buds below; perianth segments wholly glabrous below wings, or only pubescent at edges or base of wings, white to cream-coloured; Oct.–Jan. Rocky hillsides, roadsides, calcrete soils.




***kali** L.

*S. australis* R.Br.

*S. ruthenica* (Iljin) Soó

Annual, dwarf shrub, up to 0.3 m high; glabrous or with short bristles; not blackening when dried; leaves, bracts and prophylls linear-subulate, spiny at tip, pungent. **Stems** decumbent or ascending, becoming woody at base; hispid or glabrescent. **Leaves** sessile; lower ones opposite, upper ones alternate, herbaceous, succulent; blade decurrent, semiterete, linear-subulate, apex mucronate-spiny, base clasping. **Flowers**: 1–3 in an axil, forming loose and leafy spikes; bracteoles longer than perianth, oblong-ovate to triangular; perianth segments cartilaginous with scarious wings 2–5 mm wide; white; Oct.–May. Grassland, disturbed or waste places, roadsides, vleis, sandy soil. Native to Europe and Asia. *Russian tumble weed*; *Russiese rolbossie* (A).




**patentipilosa** Botsch.

Dwarf shrub, up to 0.2 m high; not blackening when dried; branches, leaves and flowers alternate. **Stems** divaricately branched; young shoots densely pubescent. **Leaves** scale-like; blade ovate, 1.5 × 1.3 mm, base slightly spur-like, densely pubescent; subfloral leaves scale-like, 1.2 × 1.4 mm, shorter than bracts. **Flowers**: in scattered, few-flowered, spicate inflorescences; flowering branch elongate above flowers, covered in imbricate leaves with buds below them; perianth winged, segments pubescent below wings over whole upper surface, yellow; Jan.–Mar. Stony soil.




**rabieana** I.Verd.

*S. aphylla* L.f. var. *virescens* Fenzl ex Drège

Dwarf shrub or shrub, up to 1.2 m high; pubescent, more rarely glabrous; not blackening when dried; branches, leaves and flowers alternate. **Stems** erect or sprawling, much branched; leafy; pubescent or glabrous. **Leaves** scale-like; blade up to 2 × 1.5 mm, apex with a fleshy apicule, margins hyaline, appressed pubescent; floral leaves of lower flowers equal in length to bracteoles.

**Flowers**: solitary, on short floriferous branches; bracteoles leaf-like, blade triangular, 1.5 × 1.0–1.2 mm, keeled, auriculate at base, with broad membranous margins; bracteoles similar, somewhat smaller than perianth; perianth segments ovate, 2 mm long, apices acute or rounded, thin-skinned in front of wings, with narrowly triangular, hairy and herbaceous middle portion and glabrous membranous margin, hairy below wings, yellowish green or pink; Feb.–Apr. Grassland, roadsides, margins of pans, tree clumps, limestone, clayey soil. *Bloupanganna*, *hardeganna* (A).

DrGr KarSh

### **smithii** Botsch.

Dwarf shrub, up to 0.3 m high; blackening when dried; branches, leaves and flowers opposite. **Stems** erect; glabrous except at bases of leaves. **Leaves** sessile, swollen at base; blade oblong-ovate, 1.5–2.5 × 1.3 mm. **Flowers**: bracteoles oblong-ovate, scarcely longer than leaves; perianth segments glabrous, margins membranous, ciliate; Dec. Grassland, open scrub, seasonal streams, flood plains, stony soil. *Inkbos* (A).

DrGr KarSh

### **tuberculata** (Moq.) Fenzl

Dwarf shrub, up to 0.2 m high; not blackening when dried; branches, leaves and flowers alternate. **Stems** strongly branched; branches with many globose to oblong, knob-shaped shoots; ash-grey. **Leaves** with blade broadly triangular, back convex, 1 mm long, margins indistinct light-coloured, thick, mostly glabrous or with dense, short, appressed silky hairs. **Flowers**: solitary, in scattered, spicate inflorescences; flowering shoots terminate in a bud above flowers; bracteoles scale-like, shorter than perianth, rounded, blunt, keeled, with membranous margin, glabrous or with appressed silky hairs, fleshy-cartilaginous; perianth segments narrowly oblong-ovate, middle portion narrow, triangular, margins broad, membranous, base area of flower a pentagon, with light-coloured, swollen margins; Mar., Apr. Rocky hillsides, margins of pans, limestone. *Blomkoolganna* (A).

AcGr KarSh

## **Sericorema** (Hook.f.) Lopr. (sthn Afr.: 2 spp.)

### **remotiflora** (Hook.f.) Lopr.

*Pupalia remotiflora* Moq.
*Sericocoma remotiflora* Hook.f.

Perennial herb, up to 1 m high. **Stems** erect, slender. **Leaves** sessile; sometimes fascicled; blade narrowly linear, 5–30 × 0.5–1.0 mm, straight or slightly recurved, apex acute, mucronate, margins entire, glabrous. **Flowers**: sterile flowers strap-shaped with long hairs forming a silky-haired ball in fruit; inflorescence with single fertile flowers; perianth closing after fertilisation, white; Sep.–Apr. **Fruit** oblong-ovoid, 3.0–3.5 mm long, densely woolly hairy in upper part. Grassland, roadsides, flats, bush groups, deep sand, clay.

AcGr DrGr KarSh

## **Suaeda** Forssk. (sthn Afr.: 6 spp.)

### **fruticosa** (L.) Forssk.

Perennial herb, dwarf shrub or shrub, up to 0.9 m high. **Stems** erect or spreading; glabrous. **Leaves** succulent, ternate; blade ± terete, ± 8–10 × 2 mm long, slightly convex above, much

so on lower surface, apex acute, slightly contracted above, base blackish when dry. **Flowers**: in axillary clusters of 3, central flower alone perfect; white bracts at base; perianth segments 5, oblong, ± 2 mm long, margins membranous, green; Nov.–Jan. Margins of pans.

DrGr KarSh

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# ANACAMPSEROTACEAE

Perennial herbs, dwarf or large shrubs; roots and stems fleshy, sometimes rootstock thick and woody. **Stems** occasionally reddish. **Leaves** alternate or rarely subopposite or rosulate, simple, succulent or minute; stipules, when present, modified into bristly hairs or setaceous. **Flowers**: inflorescences terminal, variously cymose; bisexual; regular; sepals 2; petals (4)5(–7), free; stamens 5 to many, attached to base of petals; ovary superior, 1-locular; style 3-fid, thread-like or cylindrical. **Fruit** a capsule, opening by means of valves or a lid.

## Key to genera

[after Jordaan: 453 (2000)]

1a Green leaves not or only slightly exposed, hidden beneath papery scales, shoots appear white. . . . . **Avonia**
1b Green leaves exposed . . . . . 2
2a Flowers on an elongated, 2–more-flowered scape . . . . . **Anacampseros**
2b Flowers in racemose or panicled cymes . . . . . **Talinum**

## **Anacampseros** L. (sthn Afr.: 44 spp.)

### Key to species:

[after Rowley: 108 (1994)]

1a Leaves grey or white felted, sparsely so in *A. subnuda*, subterete . . . . . 2
1b Leaves not felted, > 1½ × as wide as thick . . . . . 3
2a Old leaves becoming bald. . . . . **A. subnuda** subsp. **subnuda**

2b All leaves ± covered with hairs . . . . . **A. filamentosa** subsp. **filamentosa**
3a Leaf blade with apex obtuse . . . . . **A. subnuda** subsp. **subnuda**
3b Leaf blade with apex acute . . . . . 4
4a Leaf blade with lower surface reddish; axillary hairs many. . . . **A. rufescens**
4b Leaf blade with lower surface not reddish; axillary hairs few . . . . . **A. telephiastrum**

**filamentosa** (Haw.) Sims subsp. **filamentosa**

*Portulaca filamentosa* Haw.

Perennial herb, up to 0.05 m high; much branched, densely leaved. **Leaves** with blade ovate to spherical, thick, apex acute, surfaces coated with fine white threads, bristly hairs long, many, curled, lower not reddish; axillary hairs few. **Flowers**: inflorescence up to 80 mm long; corolla ± 30 mm in diameter, pink; Oct.–Jan. Granite outcrops. *Haaskos*, *boesmansuring* (A).

DrGr | KarSh

**rufescens** (Haw.) Sweet

Perennial herb, up to 0.08 m high; matforming. **Leaves** densely spiralled round short stems; blade ovate to broadly ovate, ± 20 × 10 mm, apex acute, glabrous, lower surface reddish, axillary hairs many. **Flowers**: inflorescence up to 100 mm long; corolla pink; Nov.–Apr. Grassland, rocky places.

DrGr | MsGr | KarSh

**subnuda** Poelln. subsp. **subnuda**

*A. lanigera* Burch.

Perennial herb with branches up to 0.2 m long. **Leaves** hairy when young, older leaves ± bare; basal; blade globose. **Flowers**: corolla white to rose; Jan.–Dec. Depressions and cracks in rocks. *Haastepeltjie*, *haassuring*, *muispeerkies* (A).

DrGr | KarSh

**telephiastrum** DC.

Perennial herb; tufted. **Leaves** with blade ± 18 mm long, brownish green, papillate, axillary hairs few. **Flowers**: inflorescence up to 150 mm high; corolla 30–35 mm in diameter, dark pink; Dec.–Mar. Grassland, hillsides, disturbed places, loamy, clayey soil. *Gemsboksuring* (A).

VreDm | DrGr | MsGr | KarSh | Zastr

## **Avonia** (E.Mey. ex Fenzl) G.D.Rowley (sthn Afr.: 12 spp.)

**ustulata** (E.Mey. ex Fenzl) G.D.Rowley

Perennial herb, up to 0.03 m high; many stemmed from a thick rootstock. **Leaves** concealed by minute, ovate, closely appressed, acute, apiculate scales with lacerate margins. **Flowers**: corolla dull yellow, dull pink or white; Nov.–Mar. Disturbed places, roadsides, rocky places. *Moerplantjie*, *kareemoer* (A).

DrGr | KarSh

## **Talinum** Adans. (sthn Afr.: 6 spp.)

### Key to species:

[after Toelken: 21 (1969)]

Leaf blade linear to oblong; inflorescence 1-flowered; seeds with concentric ridges perpendicular, elongate papillae between ridges. . . . . .**T. caffrum**
Leaf blade narrowly ovate to broadly elliptic; inflorescence 1–3-flowered; seeds with without ridges, papillose. . . . . .**T. arnotii**

**arnotii** Hook.f.

Dwarf shrub, up to 0.4 m high. **Stems** semi-erect, occasionally decumbent, puberulous. **Leaves** narrowly ovate to broadly elliptic, margins irregularly recurved. **Flowers**: inflorescence 1- 3-flowered; corolla yellow; Nov. **Seeds** without ridges, papillose. Grassland, sandy to clayey soil.

KarSh

**caffrum** (Thunb.) Eckl. & Zeyh.
*T. esculentum* Dinter & G.Schellenb.

Dwarf shrub, up to 0.4 m high, **Stems** semi-erect or decumbent. **Leaves** linear to oblong, margins irregularly recurved. **Flowers**: inflorescence 1-flowered; corolla yellow; Sep.–Feb. **Seeds** with concentric ridges perpendicular, elongate papillae between ridges. Grassland, on rocky outcrops.

DrGr KarSh

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# ANACARDIACEAE

Compiled by R.O. Moffett, E. Retief & N.L. Meyer

Shrubs, suffrutices or trees, often with resin ducts, particularly in bark; dioecious (although non-functional parts of the other sex usually present). **Leaves** usually

alternate, rarely opposite; blade pinnately compound, trifoliolate or simple, margins entire or toothed; without stipules. **Flowers**: small, in terminal or axillary panicles or racemes; regular, unisexual, very rarely bisexual; calyx 4–7-fid or -partite, petals 5 or 10, free; stamens as many as or twice as many as petals or many, free; ovary superior, styles 1–3, often widely separated. **Fruit** a fleshy or dry drupe or achene, sometimes winged. *Mango family*.

## Key to genera

| | | |
|---|---|---|
| 1a | Leaves simple | **Ozoroa** |
| 1b | Leaves compound | 2 |
| 2a | Leaves imparipinnate | **Schinus** |
| 2b | Leaves palmate, 3-foliolate (rarely > 3 leaflets) | 3 |
| 3a | Fruit a small, fleshy or dryish drupe | **Searsia** |
| 3b | Fruit winged | **Smodingium** |

## **Ozoroa** Delile (sthn Afr.: ± 20 spp.)

### **paniculosa** (Sond.) R.Fern. & A.Fern. var **paniculosa**

Shrub or tree, up to 6 m high. **Leaves** discolorous, alternate or in groups of 3; blade narrowly elliptic, 40–120 × 10–40 mm, margins entire and thickened, lower surface with midrib and lateral veins conspicuous, silvery to silky green with appressed hairs. **Flowers**: in loose terminal heads at ends of branches and in upper leaf axils; corolla white; Oct.–Mar. **Fruit** a drupe, purple to black when ripe, ± 10 mm in diameter. Woodland, hillsides, rare record. *Resin tree*; *harpuisboom* (A); *monokane* (T).

| | | | | | |
|---|---|---|---|---|---|
| | AcGr | | | | |

## **Schinus** L. (sthn Afr.: 2 spp.)

### ***molle** L.

Introduced, evergreen tree, up to 15 m high. **Branches** and foliage drooping. **Leaves** with leaflet blade narrowly ovate, margins entire or serrate, rhachis slightly winged. **Flowers**: in terminal and axillary clusters; corolla dull white; Sep.–Mar. **Fruit** a globose, pink to reddish, slightly fleshy drupe; 1-seeded. Grassland, roadsides, riverbanks. Native to South American deserts. *Pepper tree*; *peperboom* (A). Figure 14E, p. 11.

| | | | | | |
|---|---|---|---|---|---|
| | AcGr | DrGr | | KarSh | |

## **Searsia** F.A.Barkley (sthn Afr.: 90 spp.)

### Key to species:

| | | |
|---|---|---|
| 1a | Leaflets discolorous, whitish to rusty below | 2 |
| 1b | Leaflets ± concolorous, sometimes paler below | 4 |

2a Lower surface of leaflet blade rufescent; shrubs multi-stemmed . . . . . **S. divaricata**
2b Lower surface of leaflet blade canescent; shrubs not multi-stemmed . . . . . 3
3a Dwarf shrubs suffrutescent; drupe globose, glabrous . . . . . **S. discolor**
3b Shrubs arboreal; drupe ellipsoid, pubescent, tomentose . . . . . **S. tomentosa**
4a Terminal leaflets 4 × longer than broad . . . . . 5
4b Terminal leaflets < 4 × longer than broad . . . . . 11
5a Terminal leaflet > 20 × longer than broad . . . . . **S. dregeana**
5b Terminal leaflet < 20 × longer than broad . . . . . 6
6a Margins of leaflet blades entire . . . . . 7
6b Margins of leaflet blades toothed . . . . . 9
7a Small wiry spreading shrubs . . . . . **S. ciliata**
7b Large shrubs or small trees . . . . . 8
8a Terminal leaflets broadly linear, venation prominently penni-parallel; older stems not spinous . . . . . **S. lancea**
8b Terminal leaflets narrowly ovate, venation not penni-parallel; older stems spinous . . . . . **S. pendulina**
9a Terminal leaflet blade narrowly ovate; drupe rhombic, flattened . . . . . **S. leptodictya**
9b Terminal leaflet blade narrowly obovate or linear; drupes globose . . . . . 10
10a Terminal leaflet blade linear, < 10 mm wide, complete leaflet toothed; on rocky hillsides. . . . . **S. erosa**
10b Terminal leaflet blade narrowly obovate, > 10 mm wide, few teeth towards tip only; on streambanks . . . . . **S. gerrardii**
11a Margins of leaflet blades toothed or crenate or partly entire and toothed or crenate . . . . . 12
11b Margins of leaflet blades entire . . . . . 15
12a Drupes lenticular, compressed; bark dark and blocky . . . . . **S. pentheri** (rare record)
12b Drupes not compressed, globose to obloid; bark not blocky. . . . . 13
13a Terminal leaflet blades narrowly ovate to obovate, > $^1/_2$ of margins generally toothed . . . . . **S. bolusii** (rare, possibly hybrid)
13b Terminal leaflet blades broad, elliptical, < $^1/_2$ of margins toothed . . . . . 14
14a Much-branched shrubs with erect and spreading habit, usually away from water . . . . . **S. dentata**
14b Branched shrubs with arching habit, usually along streambanks . . . . . **S. montana**
15a Dwarf shrubs or shrubs < 2 m high . . . . . 16
15b Trees or shrubs > 2 m high . . . . . 18
16a Leaflets not conduplicate (flat), rough (sunken stomata) . . . . . **S. magalismontana** subsp. **magalismontana**
16b Leaflets conduplicate, glabrous . . . . . 17
17a Leaflets narrowly ovate to narrowly elliptic, ± 6 mm wide. . . . . **S. rigida** var. **rigida** (rare record)
17b Leaflets broadly elliptic, ± 10 mm wide . . . . . **S. rigida** var. **margaretae**
18a Leaflets glutinous (shiny and sticky), drying whitish when old; drupes ellipsoid. . . . . 19
18b Leaflets not glutinous; drupes globose . . . . . 20
19a Terminal leaflets < 15 mm long; much-branched shrubs, often spiny . . . . . **S. burchellii**
19b Terminal leaflets > 20 mm long; unarmed shrubs . . . . . **S. pallens**
20a Leaflet apices obtuse; non-spinous shrubs or small trees without galls; secondary veins not prominent; blades not tomentose . . . . . **S. pyroides** var. **gracilis**
20b Leaflet apices acute; spinous shrubs or small trees; secondary veins prominent; blades tomentose . . . . . **S. pyroides** var. **pyroides**

**bolusii** (Sond. ex Engl.) Moffett
*Rhus bolusii* Sond. ex Engl.

Much-branched, woody shrub, up to 2 m high. **Leaflets** sessile; blade narrowly ovate to obovate, margins > $^1/_2$ toothed, terminal leaflet (26–)41(–59) × (3–)10(–23) mm. **Flowers**: Nov.–Feb. **Fruit** a globose, glabrous drupe. Rocky hills. *Bolus's broom karee*; *basterbesemkaree* (A); *tshina* (SS). Possibly of hybrid origin with *R. erosa* as one parent.

DrGr

**burchellii** (Sond. ex Engl.) Moffett
*Rhus burchellii* Sond. ex Engl.

Much-branched shrub, up to 5 m high, shiny and sticky, often spiny. **Leaflets** sessile; blade obtriangular, apex emarginate, margins entire; terminal leaflet (7–)13(–23) × (3–)7(–13) mm. **Flowers**: Mar.–Jun. **Fruit** an ellipsoid, glabrous drupe. Arid rocky hills. *Burchell's kuni-bush*; *Burchell-se-koeniebos* (A); *mokata* (SS).

DrGr MsGr KarSh

**ciliata** (Licht. ex Schult.) A.J.Mill.
*Rhus ciliata* Licht. ex Schult.

Multistemmed, aromatic, wiry dwarf shrub, up to 2 m high. **Branches** ending in spines. **Leaflets** sessile; blade narrowly obovate to narrowly elliptic, margins entire, ciliolate; terminal leaflet (17–)26(–33) × (2–)4(–5) mm. **Flowers**: corolla yellow; Dec.–Mar. **Fruit** an obloid, glabrous drupe. Grassland. *Sourkaree*; *suurkaree* (A).

AcGr DrGr KarSh

**dentata** (Thunb.) F.A.Barkley
*Rhus dentata* Thunb.

Dwarf shrub, shrub or small tree, up to 5 m high, glabrous to pubescent. **Leaflets** sessile; blade obovate to broadly obovate, margins prominently dentate with 1–5 mucronulate teeth in upper half; (10–)26(–43) × (9–)17(–30) mm. **Flowers**: corolla yellow; Sep.–Jan. **Fruit** a globose, glabrous drupe. Riverbanks, rocky hills, verges, understorey of scrub forest. *Nana berry*; *nanabessie* (A); *lebelebele* (SS).

VreDm DrGr MsGr Zastr

**discolor** (E.Mey. ex Sond.) Moffett
*Rhus discolor* E.Mey. ex Sond.
*R. grandifolia* Engl.
*R. villosissima* Engl.

Suffrutex, up to 1 m high. **Leaflets** sessile; whitish tomentose below; blade broadly linear, oblanceolate, narrowly elliptic or obovate, margins entire, revolute; terminal leaflet (18–)82 (–131) × (4–)18(–35) mm. **Flowers**: corolla pale yellow to green; Sep.–Feb. **Fruit** a globose, glabrous drupe. Grassland. *Grassveld currant*; *grasveldtaaibos* (A); *kopshwane* (SS).

DrGr MsGr

**divaricata** (Eckl. & Zeyh.) Moffett

*Rhus dentata* Thunb. var. *fulvescens* (Engl.) Burtt Davy

*R. divaricata* Eckl. & Zeyh.

Erect, multistemmed to open-branched shrub, up to 3 m high, often forming colonies. **Leaflets** sessile; blade with shape variable from ovate to narrowly obovate, margins entire, rufescent below; terminal leaflets (10–)28(–51) × (5–)13(–26) mm. **Flowers**: corolla dull yellow; Oct., Nov. **Fruit** a globose, glabrous drupe. Higher altitude rocky hills. *Rusty-leaved currant*; *roesblaartaaibos* (A); *koditshane* (SS).

DrGr MsGr Zastr

**dregeana** (Sond.) Moffett

*Rhus dregeana* Sond.

Much-branched, wiry shrub, up to 2 m high. **Leaflets** sessile; blade linear, margins entire; terminal leaflet (19–)39(–66) × (1–)2(–3) mm. **Flowers**: Apr. **Fruit** an obloid to ellipsoid, glabrous drupe. Rocky hills. *Needle-leaved broom karee*; *naaldblaarbesemkaree* (A); *mosilabele* (SS).

DrGr KarSh Zastr

**erosa** (Thunb.) Moffett

*Rhus erosa* Thunb.

Much-branched, multistemmed, wiry shrub, up to 3 m high, often forming colonies; unarmed. **Branches** grey, prominently lenticellate. **Leaflets** sessile; blade linear, lateral leaflets often falcate, margins irregularly but prominently toothed (erose), surface sticky; terminal leaflet (25–)51(–90) × (3–)6(–12) mm. **Flowers**: Nov.–Mar. **Fruit** a globose, glabrous drupe. *Broom karee*; *besemkaree* (A); *tsilabele* (SS).

DrGr MsGr KarSh Zastr

**gerrardii** (Harv. ex Engl.) Moffett

*Rhus gerrardii* (Harv. ex Engl.) Diels

Multistemmed shrub, up to 2 m high. **Leaflets** sessile; blade olive-green, narrowly obovate, > 10 mm wide (terminal leaflet), margins irregularly, grossly serrate towards apex, apex acuminate; terminal leaflet (25–)73(–121) × (4–)22(–26) mm. **Flowers**: corolla green; Nov.–Mar. **Fruit** an obloid, glabrous drupe. Streambanks. *River currant*; *riviertaaibos* (A); *mosilabele* (SS).

MsGr

**lancea** (L.f.) F.A.Barkley

*Rhus lancea* L.f.

*R. viminalis* Aiton

Shrub or spreading tree, up to 12 m high. **Bark** very dark reddish brown when old, fissured. **Leaflets** sessile; blade linear to narrowly ovate, margins entire, venation prominently penni-parallel; terminal leaflet generally > 8 × longer than broad, (24–)70(–120) mm long. **Flowers**: corolla pale greenish yellow; May–Jul. **Fruit** an ellipsoid, glabrous drupe. Bushveld, watercourses, hillsides, plains. *Karree*; *karee* (A); *mosina* (SS).

AcGr DrGr MsGr KarSh

**leptodictya** (Diels) T.S.Yi, A.J.Mill. & J.Wen
*Rhus amerina* Meikle
*R. leptodictya* Diels
*R. rhombocarpa* R.Fern. & A.Fern.

Spreading shrub or small to medium-sized tree, up to 10 m high. **Leaflets** sessile; blade narrowly ovate, apex attenuate to acuminate, margins serrate; terminal leaflet 4 × longer than broad, (26–)63(–109) × (6–)13(–25) mm. **Flowers**: corolla pale yellow; Jan.–Apr. **Fruit** a rhombic, glabrous drupe. Bushveld, woodland, rocky hillsides. *Mountain karree*; *bergkaree* (A).

VreDm | | DrGr | | | |

**magalismontana** (Sond.) Moffett subsp. **magalismontana**
*Rhus magalismontana* Sond.

Dwarf, xerophytic dwarf shrub, up to 0.6 m high. **Leaflets** sessile; blade coriaceous, grey to greyish green, young growth golden or pink, narrowly elliptic, ovate or obovate, apex obtuse to acute, margins entire; terminal leaflet (11)49(–98) × (4–)12(–20) mm. **Fruit** an ellipsoid, glabrous drupe. Quartzitic mountain ridges. *Magaliesberg dwarf currant*; *Magaliesbergdwergtaaibos* (A).

VreDm | | | | | |

**montana** (Diels) Moffett
*Rhus gerrardii* (Harv. ex Engl.) Diels var. *montana* (Diels) Schönland
*R. montana* Diels

Single to multistemmed, deciduous shrub or small tree, up to 2 m high. **Leaves** rarely up to 7 leaflets. **Leaflets** sessile; blade glabrous, dark green above, pale olive below, elliptic to narrowly elliptic, margins entire or serrate in upper half; terminal leaflet (27–)44(–68) × (8–)12(–16) mm. **Flowers**: Oct.–Jan. **Fruit** an obloid, glabrous drupe. Streambanks, Drakensberg foothills. *Drakensberg karree*; *Drakensbergkaree* (A); *koditshana* (SS).

| | | | MsGr | | |

**pallens** (Eckl. & Zeyh.) Moffett
*Rhus pallens* Eckl. & Zeyh.

Much-branched, multistemmed shrub, up to 4 m high; unarmed. **Leaflets** dull, brownish olive-green, secondary venation dark and immersed; blade spathulate to narrowly obovate, base cuneate to attenuate, apex retuse to subacute; terminal leaflet (16–)40(–68) × (3–)8(–18) mm. **Flowers**: Apr.–Jun. **Fruit** an ellipsoid, glabrous drupe. Rocky foothills scrub. *Pale kuni-bush*; *bleekkoeniebos* (A).

| | | | MsGr | | |

**pendulina** (Jacq.) Moffett
*Rhus pendulina* Jacq.

Tree, up to 10 m high. **Bark** pale, flaky and trunk often spinous. **Leaflets** sessile; blade membranous, glabrous, concolorous, dull green above, slightly paler below, narrowly ovate, base cuneate, apex acute; terminal leaflet (21–)58(–95) × (6–)11(–15) mm. **Flowers**: Feb., Mar. **Fruit** a widely ellipsoid, glabrous drupe, reddish, drying black. Riverbanks. *White karree*; *witkaree* (A).

| | | | | KarSh | |

**pentheri** (Zahlbr.) Moffett
*Rhus pentheri* Zahlbr.

Shrub or small tree, up to 5 m high, multistemmed, unarmed. **Branchlets** villous, greyish pubescent. **Leaflets** sessile; blade with apex retuse, rounded, obtuse or subacute, sparsely pubescent, secondary veins impressed, dull yellow above, grey below; terminal leaflets < 35 mm long, (18–)28(–43) × (8–)12(–24) mm. **Flowers**: corolla greenish yellow; Feb.–Apr. **Fruit** an ellipsoid, glabrous drupe. Stony hillsides. *Common crow-berry*; *gewone kraaibessie* (A).

| | | | MsGr | | |
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**pyroides** (Burch.) Moffett var. **gracilis** (Engl.) Moffett
*Rhus flexuosa* Diels
*R. villosa* L.f. var. *gracilis* Engl.

Shrub or small tree, up to 4 m high, unarmed. **Leaflets** sessile; blade olive-green, glabrous or puberulous; veins generally slightly prominent below; terminal leaflet (33–)49(–67) × (10–)17(–32) mm. **Flowers**: corolla yellow; Nov.–Mar. **Fruit** a globose, glabrous drupe. Streambanks, scrub forest margins, rocky slopes below sandstone cliffs. *Mountain currant*; *bergtaaibos* (A); *koditshane* (SS). Figure 9B, p. 5.

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**pyroides** (Burch.) Moffett var. **pyroides**
*Rhus pyroides* Burch. var. *pyroides*

Spinescent shrub or tree, up to 6 m high. **Leaflets** sessile; blade generally revolute and puberulous to tomentose, elliptic to obovate; secondary venation prominent on lower surface; terminal leaflet (6–)40(–85) × (5–)18(–29) mm. **Flowers**: corolla white; Oct.–May. **Fruits** a globose, glabrous drupe. Grassland, bushveld, woodland. *Common wild currant*; *gewone taaibos* (A); *lerwana* (SS).

| | AcGr | DrGr | MsGr | KarSh | Zastr |
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**rigida** (Mill.) F.A.Barkley var. **margaretae** (Burtt Davy ex Moffett) Moffett
*Rhus rigida* Mill. var. *margaretae* Burtt Davy ex Moffett

Dwarf shrub with prostrate habit. **Leaflets** sessile; blade broadly elliptic, pubescent or ciliate with petioles and main veins pubescent; terminal leaflet (8–)19(–39) × (4–)10(–27) mm; petioles generally < 15 mm long; petioles and branches not yellowish. **Flowers**: corolla greenish; Sep.–Nov. **Fruit** an obloid, glabrous drupe. Mixed bushveld, rocky outcrops. *Margaret's rock currant*; *Margaret-se-kliptaaibos* (A).

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**rigida** (Mill.) F.A.Barkley var. **rigida**
*Rhus eckloniana* Sond.
*R. rigida* Mill.

Dwarf shrub to slender, much-branched, erect shrub. **Leaflets** sessile; blade glabrous, subcoriaceous, concolorous, dark green to blue green, conduplicate, recurved, narrowly elliptic to narrowly ovate; terminal leaflets (3–)20(–37) × (1–)6(–11) mm; petioles generally > 15 mm long. **Flowers**: corolla white; Jan.–Mar. **Fruits** an obloid, glabrous drupe. Grassland, rocky slopes. *Rock currant*; *kliptaaibos* (A).

| | | DrGr | | | |
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**tomentosa** (L.) F.A.Barkley

*Rhus tomentosa* L.

Much-branched shrub or small tree, up to 5 m high. **Leaflets** petiolulate; usually 1.5–3.0 × longer than broad, discolorous, dark grey-green and glabrous to thinly pubescent above, creamy canescent and villous tomentose to lanate below; terminal leaflet (29–)49(–79) × (8–)22(–45) mm; petiolules 3–5 mm long. **Flowers**: corolla dull yellow; Sep.–Jun. **Fruits** ellipsoid, pubescent. Moist forest edges. *Real wild currant*; *korentebos* (A).




## **Smodingium** E.Mey. ex Sond. (sthn Afr.: 1 sp)

**argutum** E.Mey. ex Sond.

Shrub or small tree, up to 8 m high, dioecious. **Leaves** digitately 3-foliolate; leaflet with a short petiole, blade narrowly ovate, 60–120 × 15–30 mm, veins prominent, margins deeply and sharply toothed. **Flowers**: small, in dense terminal clusters; corolla light yellow; Feb., Mar. **Fruit** a dry, winged, reddish achene. Kloofs, roadsides. *African poison oak*, *agony bush*, *rainbow leaf*; *pynbos* (A); *umthomvane* (X); *intovane* (Z).




# APIACEAE

Annual or perennial herbs, occasionally shrubs or trees, often aromatic. **Leaves** alternate, rarely opposite, mostly radical with a sheathing petiole; blade variously divided, sometimes simple; without stipules. **Flowers**: regular, bisexual, in simple or compound umbels, heads subtended by involucres, rarely without; calyx tube adnate to ovary; petals 5, free, inserted on margin of disc, usually with inflexed apices, keeled on inner face, soon falling; disc present; stamens 5, alternating with petals, anthers 2-thecous, opening laterally; ovary inferior, 1–3-locular, with a single, pendulous ovule in each locule; styles 2, short or long, free, sometimes with a thickened base (stylopodium). **Fruit** a dry schizocarp, usually crowned with calyx, disc and styles; fruit splitting down a septum (commissure) into 2 single-seeded, indehiscent mericarps, at first joined by their (commissural, inner) faces, and mostly suspended from a common, slender, divided or unbranched stalk (carpophore) derived from main vascular strand of fruit; mericarps typically with 5 primary ribs: 1 dorsal, 2 lateral, 2 commissural, and between them 4 secondary ridges, all running longitudinally from base to stylar end of fruit; mericarps either similar (homomorphic) or different (heteromorphic) in shape, sometimes winged, glabrous, villous, or spiny, usually with intervallecular vittae (oil ducts in furrows between ribs), or vittae sometimes intrajugal (within ribs). **Seeds** various. *Carrot family*.

## Key to genera

[after Van Wyk: 62 (2000)]

1a Stems procumbent. . . . . 2
1b Stems erect. . . . . 3

2a Fruit glabrous . . . . . **Centella**
2b Fruit hairy . . . . . **Choritaenia**
3a Plants woody . . . . . 4
3b Plants herbaceous . . . . . 7
4a Fruit hairy . . . . . **Deverra**
4b Fruit glabrous . . . . . 5
5a Mericarps heteromorphic, winged . . . . . **Heteromorpha**
5a Mericarps homomorphic . . . . . 6
6a Leaves simple or palmately lobed with a distinct intramarginal vein . . . . . **Polemannia**
6b Leaves compound, pinnate . . . . . **Notobubon**
7a Leaves slender, basally blade simple to ternate, upwards becoming pinnately divided, leaflets narrow or both basal and cauline leaves bipinnatisect with narrow leaflets . . . . . **Pimpinella**
7b Leaves not as above . . . . . 8
8a Leaves simple . . . . . 9
8b Leaves compound . . . . . 12
9a Umbels with involucral bracts united at base . . . . . **Alepidea**
9b Umbels with involucral bracts free . . . . . 10
10a Leaf blade much longer than broad (grass-like) . . . . . **Bupleurum**
10b Leaf blade not > 3 × as long as broad . . . . . 11
11a Umbels simple, or seemingly so by forming compact heads . . . . . **Sanicula**
11b Umbels manifestly compound . . . . . **Dracosciadium**
12a Foliage leaves all radical . . . . . **Afrosciadium**
12b Foliage leaves both radical and cauline . . . . . 13
13a Perennials or biennials . . . . . 14
13b Annuals or biennials . . . . . 18
14a Involucral bracts absent . . . . . 15
14b Involucral bracts present . . . . . 16
15a Plants glabrous; flowers white . . . . . **Apium**
15b Plants hairy; flowers yellow . . . . . **Pastinaca**
16a Leaves decompound . . . . . **Conium**
16b Leaves once-pinnate . . . . . 17
17a Teeth on leaflet margin spreading . . . . . **Berula**
17b Teeth on leaflet margin incurved, often slightly overlapping . . . . . **Sium**
18a Involucral bracts present . . . . . **Ammi**
18b Involucral bracts absent . . . . . 19
19a Outer flowers with outer petals enlarged . . . . . **Coriandrum**
19b Outer flowers with all petals equal . . . . . **Cyclospermum**

## **Afrosciadium** P.J.D.Winter (sthn Afr.: 4 spp.)

### Key to species:

Leaf blade pinnate or bipinnate; segments obovate, lobed or pinnatifid . . . . . **A. caffrum**
Leaf blade bipinnatisect; segments deeply pinnatifid, lobes linear . . . . . **A. magalismontanum**

### **caffrum** (Meisn.) P.J.D.Winter

*Peucedanum caffrum* (Meisn.) E.Phillips
*Seseli caffrum* Meisn.

Perennial herb. **Flowering stems** up to 0.8 m high; erect; in dense clumps. **Leaves** radical, compound; blade pinnate or bipinnate; segments obovate, lobed or pinnatifid, apices of

lobes mucronate. **Flowers**: involucral bracts present; white or yellow; Oct.–Jan. **Fruit** elliptic, 5-ribbed, winged. Grassland, rocky soil. *Wild parsley*; *pietersielietabak*, *tamboekietwak* (A); *tloro-ea-ngoale* (SS); *nhlashane*, *isingcina* (Z).




**magalismontanum** (Sond.) P.J.D.Winter

*Peucedanum magalismontanum* Sond.

*P. schlechterianum* H.Wolff

Perennial herb. **Flowering stems** up to 0.8 m high; erect from a rootstock covered with fibrous old leaf bases. **Leaves** radical, compound; blade bipinnatisect; segments deeply pinnatifid, lobes linear, apices acute. **Flowers**: involucral bracts present; yellow; Oct.–Feb. **Fruit** dorsally flattened, ribbed, wing narrow. Grassland, hill slopes. *Wild parsley*; *wildepietersielie* (A); *ibheka* (Z).




## **Alepidea** F.Delaroche (sthn Afr.: 29 spp.)

### Key to species:

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|---|---|---|
| 1a | Leaves not in a prominent basal rosette | **A. cordifolia** |
| 1b | Leaves in a prominent rosette | 2 |
| 2a | Stems densely leafy; involucral bracts greenish white | 3 |
| 2b | Stems sparsely leafy; involucral bracts white | 4 |
| 3a | Mericarp surface rugose | **A. setifera** |
| 3b | Mericarp surface tuberculate | **A. attenuata** |
| 4a | Involucral bracts ovate to triangular | **A. natalensis** |
| 4b | Involucral bracts narrowly ovate | **A. peduncularis** |

**attenuata** Weim.

Perennial herb. **Flowering stems** up to 1 m high; erect. **Leaves** radical and cauline, simple; blade narrowly ovate, margins serrate, cilia 2–3 mm long; cauline ones many, smaller. **Flowers**: involucral bracts equal or subequal; greenish white; Jan.–Mar. **Fruit** tuberculate. Grassland, wet areas.




**cordifolia** B.-E.van Wyk.

Perennial herb. **Flowering stems** up to 2 m high; erect; robust. **Leaves** radical, simple, in a loose rosette; blade oblong, base cordate, margins with evenly distributed teeth standing straight out, each tooth with a bristle. **Flowers**: involucre of 5 large segments with 5 smaller alternating teeth; white, cream-coloured or pale yellow; Jan.–Apr. **Fruit** glabrous, smooth. Grassland, near water. *Giant alepidea*, *larger tinsel flowers*; *kalmoes*, *slangwortel* (A); *lesoko*, *lesooku* (SS); *iqwili* (X); *ikhathazo* (X, Z).



**natalensis** J.M.Wood & M.S.Evans

Perennial herb. **Flowering stems** up to 0.2 m high; erect. **Leaves** radical with a few cauline leaves, simple; blade oblong, margins toothed, teeth with bristles, dark green, leathery. **Flowers**: involucral bracts ovate to triangular; white; Dec.–Apr. **Fruit** with scale-like protuberances. Grassland.

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**peduncularis** A.Rich.

*A. longifolia* E.Mey ex Dummer

Perennial herb. **Flowering stems** up to 0.7 m high; erect. **Leaves** radical with a few cauline, simple; blade linear-spathulate to narrowly linear-obovate, tapering gradually at base. **Flowers**: involucre with bracts narrowly ovate, apices acuminate; white; Nov.–Feb. **Fruit** rugose. Grassland, kloofs, hillsides.

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| | | DrGr | | | |

**setifera** N.E.Br.

*A. jacobsziae* Dummer

Perennial herb. **Flowering stems** up to 0.7 m high; erect. **Leaves** radical and cauline; radical ones with blade obovate to oblong-obovate, base rounded to cordate, apex rounded, margins dentate or serrate-setose; cauline ones covering stem, blade ovate to narrowly ovate. **Flowers**: involucre with bract apex acuminate; greenish white; Dec.–May. **Fruit** rugose. Grassland. *Kalmoes* (A).

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## **Ammi** L. (sthn Afr.: 1 sp.)

***majus** L. var. **glaucifolium** (L.) Godr.

*A. glaucifolium* L.

*A. diversifolium* Noulet var. *glaucifolium* (L.) Noulet

Annual herb. **Flowering stems** up to 1 m high; erect, wiry. **Leaves** radical and cauline, compound; blade pinnate or bipinnate with ultimate segments narrowly ovate, margins serrate. **Flowers**: in much-branched, showy umbels; involucral bracts pinnate; white; Nov.–Apr. **Fruit** narrowly oblong, narrowly ribbed, glabrous. Disturbed places, escaped from cultivation. Native to Europe and Asia. *Queen-Anne-lace flower.*

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## **Apium** L. (sthn Afr.: 4 spp.)

***graveolens** L.

Biennial or perennial herb. **Flowering stems** up to 1 m high; erect, glabrous, yellowish green. **Leaves** radical and cauline, compound; blade 1- or 2-pinnate; segments ± deltoid, margins

lobed, crenate-serrate, upper ones becoming sessile. **Flowers**: umbels shortly stalked or sessile; involucral bracts 0; white or greenish white; Oct.–Dec., May. **Fruit** with broad furrows between slender ribs. In wet ditches and along riverbanks. Native to Europe and Asia. *Wild celery*; *seldery* (A).

DrGr

## **Berula** W.D.J.Koch (sthn Afr.: 1 sp.)

**erecta** (Huds.) Coville subsp. **thunbergii** (DC.) B.L.Burtt
*B. thunbergii* (DC.) H.Wolff
*Sium thunbergii* DC.

Perennial herb. **Flowering stems** up to 2.5 m high; erect, glabrous. **Leaves** radical and cauline, compound; blade pinnate; leaflet margins coarsely, irregularly toothed, teeth spreading. **Flowers**: involucre with many bracts; white; Oct.–Apr. **Fruit** ovate or oblong, laterally flattened, indistinctly ribbed. Marshy areas, along watercourses.

DrGr MsGr

## **Bupleurum** L. (sthn Afr.: 2 spp.)

**mundii** Cham. & Schltdl.
*B. mundii* var. *mossii* Burtt Davy
*B. mundii* var. *latibracteolata* Burtt Davy

Perennial herb. **Flowering stems** up to 1 m high; erect, slender, glabrous. **Leaves** radical, grass-like; blade linear-subulate, 400 × 10 mm, parallel-veined. **Flowers**: inflorescence loosely branched, umbels few, delicate; involucral bracts narrowly ovate; yellow; Nov.–Jul. **Fruit** elliptic, not compressed, ribbed. Grassland, rocky areas. *Lekhasi* (SS).

DrGr MsGr

## **Centella** L. (sthn Afr.: 39 spp.)

***asiatica** (L.) Urb.
*Hydrocotyle asiatica* L.

Perennial herb; stems procumbent. **Flowering stems** up to 0.13 m high; erect. **Leaves** simple, long petiolate; blade reniform to orbicular, base deeply heart-shaped, margins with teeth thickened, glabrous below, occasionally thinly pilose. **Flowers**: in small umbels near surface of soil; partly enclosed in 2 green bracts; dark crimson to greenish white; Sep.–May. **Fruit** laterally compressed, densely reticulate. In damp grassy places, under bushes. Native to India. *Pennywort*; *varkoortjies*, *waternavel* (A); *bolila-balinku* (SS); *icudwane* (Z).

VreDm DrGr MsGr

## **Choritaenia** Benth. (sthn Afr.: 1 sp.)

### **capensis** Benth.

Annual herb. **Stems** procumbent, compact. **Leaves** simple; blade irregularly subternately cut; lobes capillary, obtuse. **Flowers**: umbels from base and apex of branches; involucral bracts foliaceous; pale pink to white; Sep.–Nov. **Fruit** circular, pubescent with long, stiff club-shaped hairs mixed with thin hairs. Grassland. *Luisboom*, *luisbos* (A).

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## **Conium** L. (sthn Afr.: 4 spp.)

### **chaerophylloides** (Thunb.) Sond.

*Seseli chaerophylloides* Thunb.

Biennial herb. **Flowering stems** up to 2 m high; erect. **Leaves** radical and cauline, compound; blade pinnately decompound, resembling carrot leaves. **Flowers**: involucral bracts many; greenish yellow; Nov.–Jan. **Fruit** broadly ovate or elliptic, slightly laterally compressed, smooth. Rough open grassland near rivers and streams, also in damp hollows and gullies. *Hemlock*.

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## **Coriandrum** L. (sthn Afr.: 1 sp.)

### ***sativum** L.

Annual herb. **Flowering stems** up to 0.7 m high; erect, glabrous. **Leaves** radical and cauline, compound; basal ones 1- or 2-pinnate, segments ovate in overall outline, apices acute, base cuneate; upper leaves finely divided into linear segments. **Flowers**: involucral bracts 0; outer petals of outer flowers in each umbel much enlarged, 5–6 mm long; white to pinkish; Oct. **Fruit** suborbicular, ribs filiform, zigzag markings between them. Escaped from cultivation. Native to southern Europe and Asia Minor. *Coriander*, *Chinese parsley*; *koljandersaad* (A).

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## **Cyclospermum** Lag. (sthn Afr.: 1 sp.)

### ***leptophyllum** (Pers.) Eichler

*Apium leptophyllum* (Pers.) F.Muell. ex Benth.

Annual herb. **Flowering stems** up to 0.6 m high; erect. **Leaves** radical and cauline, compound; blade 3- or 4-pinnate, divided into many linear-filiform segments. **Flowers**: involucral bracts 0; white; Jun.–Jan. Disturbed places, in lawns, cultivated lands, gardens, along riverbanks. Native of America. *Slender celery*, *lawn celery*; *wilde seldery* (A).

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## **Deverra** DC. (sthn Afr.: 2 spp.)

### Key to species:

Fruit with warty hairs (papillae) . . . . . **D. burchellii**
Fruit villous. . . . . **D. denudata** subsp. **aphylla**

**burchellii** (DC.) Eckl. & Zeyh.
*D. aphylla* (Cham. & Schltdl.) DC. var. *burchellii* DC.
*Pituranthos burchellii* (DC.) Benth. & Hook.f. ex Schinz

Perennial herb or shrub, up to 1 m high, almost leafless. **Leaves** aborted or, if present, radical, tripinnately decompound; cauline ones scale-like. **Flowers**: involucre a few bracts or absent; greenish yellow or yellowish white; Nov.–Apr. **Fruit** elliptic, slightly laterally compressed, with thickish, warty hairs (papillae). Grassland, near water.

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**denudata** (Viv.) Pfisterer & Podlech subsp. **aphylla** (Cham. & Schltdl.) Pfisterer & Podlech

Perennial herb or shrub, up to 1 m high, almost leafless. **Leaves** aborted or, if present, radical ones tripinnately decompound, segments linear-filiform; cauline ones scale-like. **Flowers**: involucre a few bracts or absent; greenish yellow or yellowish white; Nov.–Apr. **Fruit** elliptic, slightly laterally compressed, villous. Grassland, near water. *Wildevinkel*, *wildeseldery* (A).

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## **Dracosciadium** Hilliard & B.L.Burtt (sthn Afr.: 2 spp.)

**saniculifolium** Hilliard & B.L.Burtt

Perennial herb. **Flowering stems** up to 0.45 m high; erect, tufted. **Leaves** simple, radical, petiolate; blade palmate, 50–90 mm in diameter, margins 7-lobed, lobes sharply toothed; petioles ± 150 mm long. **Flowers**: involucre present; cream-coloured; Dec.–Feb. **Fruit** on erect or drooping peduncles, ovoid or shortly oblong, laterally flattened. Grassland, rocky soil.

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## **Heteromorpha** Cham. & Schltdl. (sthn Afr.: 6 spp.)

### Key to species:

[after Coates-Palgrave: 854 (2002)]

Mature leaves with a single leaflet; petioles up to 25 mm long . . . . . **H. arborescens** var. **arborescens**
Mature leaves with > 1 leaflet; petioles 25–70 mm long . . . . . **H. arborescens** var. **abyssinica**

**arborescens** (Spreng.) Cham. & Schltdl. var. **abyssinica** (A.Rich.) H.Wolff
*H. arborescens* (Spreng.) Cham. & Schltdl. var. *trifoliata* (H.L.Wendl.) Sond.
*H. trifoliata* (H.L.Wendl.) Eckl. & Zeyh.

Tree, up to 9 m high. **Branches** straggling; bark coppery brown, peels off horizontally in papery pieces. **Leaves** with > 1 leaflet; petioles 25–70 mm long. **Flowers**: involucral bracts and bracteoles ± membranous; pale yellow to yellowish green; Sep.–May. **Fruit** elliptic, winged. Montane and riverine woodland, forest margins, bush clumps. *Parsley tree*; *wildepietersieliebos*, *kraaihout* (A); *'makatlana*, *monkhoane* (SS); *umbangandlala* (X, Z).

VreDm | DrGr | MsGr

**arborescens** (Spreng.) Cham. & Schltdl. var. **arborescens**

Tree or shrub, up to 8 m high. **Branches** straggling; bark reddish brown to purplish brown. **Leaves** with a single leaflet; petioles up to 25 mm long. **Flowers**: involucral bracts present; greenish white; Sep.–May. **Fruit** elliptic, winged. Along watercourses, in kloofs. *Parsley tree*; *kraaihout* (A).

DrGr | KarSh

## **Notobubon** B.-E. van Wyk (sthn Afr.: 12 spp.)

**laevigatum** (Aiton) Magee
*Bubon laevigatum* Aiton
*Peucedanum capense* (Thunb.) Sond. var. *lanceolatum* Sond.

Shrub. **Flowering stems** up to 1.5 m high; branched at ground level, simple or sparsely branched, ribbed, leafy. **Leaves** radical, compound; blade pinnate; leaflets narrowly elliptic or narrowly ovate to ovate, 4–45 × 1–15 mm, apices acute to obtuse, margins entire or slightly crenate; petioles up to 35 mm long. **Flowers**: inflorescence a single umbel surrounded by reduced secondary umbels; yellow; Dec.–Mar. **Fruit** with flat mericarps. Rocky grassland. *Large wild carrot*; *lidbossie* (A); *tloro-ngoale* (SS).

DrGr | MsGr

## **Pastinaca** L. (sthn Afr.: 1 sp.)

***sativa** L.
*P. capensis* Sond.

Biennial herb. **Flowering stems** up to 2 m high; erect. **Leaves** radical and cauline, compound; blade pinnate with 7–9 ovate, toothed or lobed leaflets. **Flowers**: involucre 0; greenish yellow; Sep.–Mar. Disturbed places, along riverbanks, edges of dams, vleis. Native to Europe and Asia. *Parsnip*; *witwortel* (A).

MsGr

## **Pimpinella** L. (sthn Afr.: 7 spp.)

Key to species:

Fruit compressed, black with greenish ribs. . . . . **P. caffra**
Fruit not compressed, roundish, yellowish brown . . . . . .**P. transvaalensis**

**caffra** (Eckl. & Zeyh.) D.Dietr.

Perennial herb. **Flowering stems** up to 0.45 m high; erect, slender, softly hairy. **Leaves** often absent in flowering stage, basally blade simple, ovate-cordate, ternate, upwards becoming pinnately divided. **Flowers**: white; Feb., Mar. **Fruit** compressed, black with greenish ribs when ripe. *Mohopu*, *sehoetjana* (SS).

MsGr

**transvaalensis** H.Wolff

Perennial herb. **Flowering stems** up to 0.5 m high; erect, slender, little branched, glabrous or with few minute hairs. **Leaves** mainly basal; both basal and cauline leaves bipinnatisect with narrow leaflets. **Flowers**: white; Nov.–Apr. **Fruit** roundish, yellowish brown. Grassland, near water.

DrGr MsGr

## **Polemannia** Eckl. & Zeyh. (sthn Afr.: 3 spp.)

### Key to species:

[after Boon: 436 (2010)]

Leaflet blade with apex acute to long acuminate, margins coarsely toothed to deeply divided . . . . . **P. montana**
Leaflet blade with apex acute, margins entire . . . . . **P. simplicior**

**montana** Schltr. & H.Wolff

Shrub or small tree, up to 4 m high; slender. **Leaves** compound, trifoliolate; leaflets with apices acute to long acuminate, margins coarsely toothed to deeply divided. **Flowers**: yellow; Jan.–May. **Fruit** dorsally flattened, marginal ribs slightly winged. Along watercourses, in scrub. *Mountain polemannia*, *mountain false parsley-tree*.

DrGr MsGr

**simplicior** Hilliard & B.L.Burtt

Shrub, up to 3 m high; bushy. **Leaves** compound, trifoliolate; leaflets with apex acute, margins entire, seldom divided. **Flowers**: yellow; Jan.–May. **Fruit** dorsally flattened, marginal ribs slightly winged. Open mountain slopes, rocky streambanks.

VreDm AcGr DrGr MsGr KarSh Zastr

## **Sanicula** L. (sthn Afr.: 1 sp.)

**elata** Buch.-Ham. ex D.Don;
*S. capensis* (Cham. & Schltdl.) Eckl. & Zeyh.
*S. europaea* var. *elata* (D.Don) Boiss.

Perennial herb. **Flowering stems** up to 0.8 m high. **Leaves** mainly basal, simple; blade palmately to pinnately divided, margins serrate with teeth mucronate. **Flowers**: white to

yellowish green; Nov.–Aug. **Fruit** densely covered with strongly hooked spines. Mountainous grassland, in moist shady situations, often along small streams under forest cover. *Sanicle*.

MsGr

## **Sium** L. (sthn Afr.: 1 sp.)

### **repandum** Welw. ex Hiern

*S. repandum* Welw. ex Hiern var. *latifolium* Burtt Davy

Perennial herb. **Flowering stems** up to 1.5 m high; robust, ribbed, leafy, glabrous. **Leaves** compound; leaflets opposite, blade narrowly ovate, apex acute, margins with regular serrations, teeth curved inwards, often slightly overlapping. **Flowers**: involucral bracts present; yellowish to greenish white; Dec.–Mar. **Fruit** laterally flattened, ridged. Along streambanks, often in standing water. *Water parsnip*; *tandpynwortel* (A).

DrGr MsGr

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# APOCYNACEAE

Compiled by S.P. Bester, E. Retief & N.L. Meyer

Trees shrubs, dwarf shrubs, herbs, often twining or succulent, or woody climbers; milky or watery latex present. **Leaves** opposite or whorled, blade entire; without stipules. **Flowers**: regular, often large and fragrant; usually in umbels; sepals 5; petals 5, fused into a tube, twisted in bud; stamens 5, ± concealed, arising from corolla tube; filaments joined into a tube, anthers often arrow-shaped, free or united, attached to style, with pollen grains united into waxy masses (pollinia); corona (crown-like appendages) present on central column, which is made up of united stamens and carpels; ovary 1-locular or comprising 2 free carpels, often united with style; stigma sessile, disc-like. **Fruit** large and fleshy or dry and follicular, follicles often in divergent pairs. **Seeds** often plumed, with a coma of long silky hairs. *Dogbane family*; *selonsroosfamilie*.

The view to regard *Periglossum* as a synonym of *Cordylogyne* is not followed here.

# Artificial key to genera

1a Pollen not gathered in pollinia attached to a corpuscle . . . . . 2
1b Pollen gathered in pollinia attached to a corpuscle. . . . . 4
2a Flower tube 6–9 mm long . . . . . **Carissa**
2b Flower tube 1–4 mm long . . . . . 3
3a Shrub; corolla white, yellow, rarely pale yellowish green . . . . . **Cryptolepis**
3b Herb; corolla purple, pink or green, never as pale as above. . **Raphionacme**
4a Pollen gathered in 4 pollinia attached to a soft, pale corpuscle . . **Secamone**
4b Pollen gathered in 2 pollinia attached to a hard, dark corpuscle . . . . . 5
5a Pollinia directly attached to corpuscle . . . . . **Fockea**
5b Pollinia attached to a corpuscle with caudicle. . . . . 6
6a Plants stem succulents . . . . . 7
6b Plants herbaceous . . . . . 16
7a Plants protected with obvious dry, hard spines or bristles . . . . . 8
7b Plants without obvious bristles or spines, tubercles sometimes distinctly tooth-like, but soft and green . . . . . 10
8a Stems cylindrical in cross-section, never divided into ribs . . . **Pachypodium**
8b Stems with 7 or more ribs in cross-section . . . . . 9
9a Tubercles tipped with three bristles . . . . . **Tavaresia**
9b Tubercles with a single spine . . . . . **Hoodia**
10a Stems distinctly circular in cross-section. . . . . **Sarcostemma**
10b Stems always with angles in cross-section, occasionally obtuse . . . . . .11
11a Stems distinctly angled ± in middle length of stem . . . . . 12
11b Stems obtusely angled ± in middle length of stem. . . . . 14
12a Corolla tubular-campanulate. . . . . **Huernia**
12b Corolla rotate, flat. . . . . 13
13a Stems pubescent. . . . . **Stapelia**
13b Stems glabrous . . . . . **Orbea**
14a Outer corona a well-developed, flat disc . . . . . **Duvalia**
14b Outer corona reduced or tooth-like. . . . . 15
15a Outer corona much reduced. . . . . **Piaranthus**
15b Outer corona tooth-like . . . . . **Tridentea**
16a Pollinia develop above position of corpuscle (erect). . . . . 17
16b Pollinia develop below position of corpuscle (pendulent). . . . . 23
17a Stems climbing, creeping or procumbent . . . . . 18
17b Stems erect. . . . . 21
18a Stems climbing. . . . . 19
18b Stems creeping or procumbent . . . . . 20
19a Leaves with blade broadly heart-shaped . . . . . **Riocreuxia**
19b Leaves with blade linear to narrowly ovate. . . . . **Ceropegia**
20a Flowers usually quite small, corolla tube < 2 mm long, segments much longer than tube. . . . . **Anisotoma**
20b Flowers usually larger, corolla tube > 5 mm long, segments ± as long as tube. . . . . **Orthanthera**
21a Leaves with blade linear-oblong or lanceolate or oblong or ovate. . . . . **Brachystelma**
21b Leaves with blade filiform . . . . . 22
22a Plant with fusiform roots . . . . . **Sisyranthus**
22b Plant with a flattened discoid tuber. . . . . **Brachystelma** (*B. burchellii*)
23a Stems climbing or twining. . . . . 24
23b Stems erect or procumbent. . . . . 26
24a Leaves with blade broadly ovate, base truncate . . . . . **Araujia**
24b Leaves with blade broadly ovate, base cordate. . . . . 25
25a Corona fleshy, cucullate with broad flattened apical part and tooth-like projection towards gynostegial column; fruit with a rough warty surface . . . . . **Pentarrhinum**

25b Corona dorsiventrally flattened, tapering into a long fine needle-like apex; fruit distinctly winged . . . . . **Cynanchum**
26a Shrub with clear sap . . . . . **Microloma**
26b Herbs with milky latex . . . . . 27
27a Anther appendages ascending and covering style head; style head conical above . . . . . **Stenostelma**
27b Anther appendages adpressed to sides of style head but not covering it; style head conical or concave above with slight central depression . . . . . 28
28a Style head conical . . . . . **Cynanchum**
28b Style head concave above with slight central depression . . . . . 29
29a Corona fused to corolla tube for considerable distance towards sinuses of corolla lobes . . . . . **Parapodium**
29b Corona not fused to corolla tube . . . . . 30
30a Corona lobes fleshy and solid, without keel or process on ventral surface . . . . . **Xysmalobium**
30b Corona lobes dorsiventrally flattened or with margins folded inwards 31
31a Corona lobes dorsiventrally flattened, lateral margins not folded inwards to form cavity, sometimes keeled adaxially . . . . . 32
31b Corona lobes flat, with lateral margins folded forwards to form cavity, with or without processes within the cavity . . . . . 38
32a Corona lobes spreading horizontally or curving outwards from base, with keels on inner face . . . . . **Pachycarpus**
32b Corona lobes erect from base . . . . . 33
33a Petals white; corona lobes linear-oblong, purple . . . . . **Fanninia**
33b Petals rarely white; corona lobes not as above . . . . . 34
34a Flowers in dense, globose, pedunculate heads; corona lobes spathulate or hastately subspathulate, usually with 2 keels capped by a transverse ridge or tubercle on inner face . . . . . 35
34b Flowers in sessile or pedunculate umbels; corona lobes often produced into a subulate or filiform apex, usually with 2 keels and frequently with 1 or 2 appendages on inner face . . . . . 36
35a Corona lobes hastately subspathulate; marsh-loving . . . . . **Cordylogyne**
35b Corona lobes spathulate; slender grassland herbs . . . . . **Periglossum**
36a Inflorescence pedunculate; pollinia medially attached to caudicle with pellucid zone on outer side . . . . . **Schizoglossum**
36b Inflorescence sessile; pollinia subapically attached, usually without a germination zone, if present then at point of attachment of pollinia to caudicle . . . 37
37a Corona lobes fleshy; pollinia without pellucid zone . . . . . **Miraglossum**
37b Corona lobes thin; pollinia often with pellucid zone . . . . . **Aspidoglossum**
38a Robust shrubs with many erect perennial branches; rootstock with fibrous roots only, spreading just below surface . . . . . **Gomphocarpus**
38b Few- to single-stemmed herbs with branches dying back annually; rootstock thickened below soil surface (often well below) and often forming a tuber . . . . . 39
39a Plants a single slender, erect stem with linear to narrowly elliptic leaves 40
39b Plants with several stems, stout and erect or decumbent and then erect 41
40a Inflorescences 1–3 per plant, at apex of stem . . . . . **Aspidonepsis**
40b Inflorescences > 3 per stem, spread over upper half of stem . . . . . **Aspidoglossum**
41a Stems strictly erect; leaves glabrous and glaucous; inflorescence nodding . . . . . **Gomphocarpus**
41b Stems initially spreading horizontally, then ascending; leaves scabrid and not glaucous; inflorescences erect . . . . . **Asclepias**

## **Anisotoma** Fenzl (sthn Afr.: 2 spp.)

### **pedunculata** N.E.Br.

Perennial herb, up to 0.25 m high. **Stems** procumbent or twining. **Leaves** with blade cordate-ovate to cordate-orbicular, 8–38 × 6–34 mm. **Flowers**: corona lobes oblong or narrowly ovate, entire or denticulate, with puberulous, linear to narrowly ovate, acute or bifid appendages; corolla with tube < 2 mm long, lobes much longer than tube, cream-coloured to white, usually brown-tipped; Oct.–Jan. Grassland, usually among rocky boulders or shrubs. *Common spiderweb*; *morarana-oa-letlapa* (SS).

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## **Araujia** Brot. (sthn Afr.: 1 sp.)

### ***sericifera** Brot.

Subwoody climber. **Leaves** petiolate; blade ovate, up to 50 × 30 mm, base truncate, apex acuminate; upper surface dark green and glabrous above, lower surface paler with a short, dense, whitish pubescence. **Flowers**: in axillary cymes or solitary; corolla tubular with spreading segments, cream-coloured; Nov.–Apr. **Fruit** a large spongy capsule, up to 120 mm long; dehiscing down one side. Disturbed places. Native to South America. *Moth catcher*, *wax creeper*; *motvanger* (A).

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## **Asclepias** L. (sthn Afr.: 50 spp.)

### Key to species:

[after Nicholas: 215 (1999)]

1a Plants with stems decumbent or procumbent along ground level . . . . . 2
1b Plants with stems erect . . . . . 8
2a Leaves with blade ± ovate, often as wide as broad; corona lobes saccate or slipper-shaped, usually longer than high; anther wings without distinct notch along its length . . . . . 3
2b Leaves with blade ± linear, longer than broad; corona lobes turriform; anther wings with a distinct notch somewhere along its length . . . . . 6
3a Inflorescences usually with flowers < 20 . . . . . **A. multicaulis**
3b Inflorescences usually with flowers > 20 . . . . . 4
4a Inflorescences 35–67 mm wide . . . . . **A. albens**
4b Inflorescences 15–32 mm wide . . . . . 5
5a Leaves with blade 6–12 mm wide; corolla lobes 4.5–6.0 mm long . . . . . **A. adscendens**
5b Leaves with blade 20–35 mm wide; corolla lobes 7–8 mm long . . . . . **A. macropus**
6a Upper proximal margin of corona lobes level with or overtopping style apex by < 1 mm . . . . . **A. gibba** var. **gibba**
6b Upper proximal margin of corona lobes overtopping style apex by > 2 mm . . . . . 7
7a Corona lobes 10–15 mm high (rarely as short as 9 mm); gynostegial groove 2.8–3.6 mm long . . . . . **A. eminens**

7b Corona lobes 5.8–9.6 mm high; gynostegial groove 2.2–2.8 mm long . . . . . **A. gibba** var. **media**
8a Corolla lobes 8–12 mm long; if corolla purple, then leaf blade 19–75 mm wide; if corolla ivory, whitish pink and mottled with irregular purple blotches, then leaf blade 1.2–7.0 mm wide . . . . . **A. humilis**
8b Corolla lobes 1.2–7.0 mm long; corolla purple, purple-green, purple-brown, purple-white or yellow, never mottled; leaf blade < 4 mm long . . . . . 9
9a Plants usually high, 145–600 mm high and graminaceous; peduncles 50–148 mm long; corolla white, yellow or orange; pollinia hemispherical . . . . . **A. aurea**
9b Plants usually short, 30–295 mm high and graminaceous; peduncles seldom > 45 mm long; corolla purple-green, purple-brown or purple-white; pollinia lacrimiform or teardrop-shaped . . . . . 10
10a Corona lobes helmet-shaped, as long as high . . . . . **A. cucullata** subsp. **cucullata**
10b Corona lobes slipper-shaped, longer than high . . . . . 11
11a Mature plants with 10–50 stems . . . . . **A. meyeriana**
11b Mature plants with 1–9 stems . . . . . 12
12a Corolla lobes spreading . . . . . **A. brevipes**
12b Corolla lobes reflexed . . . . . **A. stellifera**

## **adscendens** (Schltr.) Schltr.

Perennial herb, 100–200 mm high. **Stems** decumbent. **Leaves** scabrid, with blade 6–12 mm wide, linear, narrowly ovate to ovate. **Flowers**: in terminal, solitary, usually > 20-flowered umbels, 15–32 mm wide; peduncles 15–65 mm long; corolla lobes 4.5–6.0 mm long, reflexed or reflexed-spreading, with upcurved tips glabrous inside or minutely puberulous at base; corolla white to cream-coloured to purplish; Aug.–Dec. Grassland. *Cartwheels*.




## **albens** (E.Mey.) Schltr.

Perennial herb, 25–500 mm high. **Stems** decumbent. **Leaves** scabrid, with blade 6–7 × as long as broad, ovate to narrowly ovate, base subcordate to broadly rounded. **Flowers**: in terminal, solitary, usually > 20-flowered umbels, 35–67 mm wide; peduncles 40–100 mm long; corolla lobes reflexed, glabrous inside, white or light purple; Dec., Jan. Grassland. *Cartwheels*; *idoyi*, *ishongwe*, *umadoye* (Z). Figure 36, 1–3.




## **aurea** (Schltr.) Schltr.

Perennial herb, 140–600 mm high. **Stems** erect. **Leaves** scabrid, with blade linear, 9–10 × as long as broad, glabrous. **Flowers**: in axillary and terminal 4(5–8)-flowered umbels; peduncles 50–148 mm long; pollinia hemispherical; corona white, yellow or purple with white sides; corolla with lobes reflexed or spreading, canescent inside, white, yellow or orange; Aug.–May. Grassy slopes on stony hillsides. *Mohlatsisa* (SS).




## **brevipes** (Schltr.) Schltr.

Perennial herb, up to 300 mm high. **Stems** 1–9, initially decumbent, becoming erect. **Leaves** scabrid, with blade linear, 9–10 × as long as broad, scabrous. **Flowers**: in terminal and axillary 4-flowered umbels; peduncles 10–48 mm long; corona reddish brown, purple or white; corolla

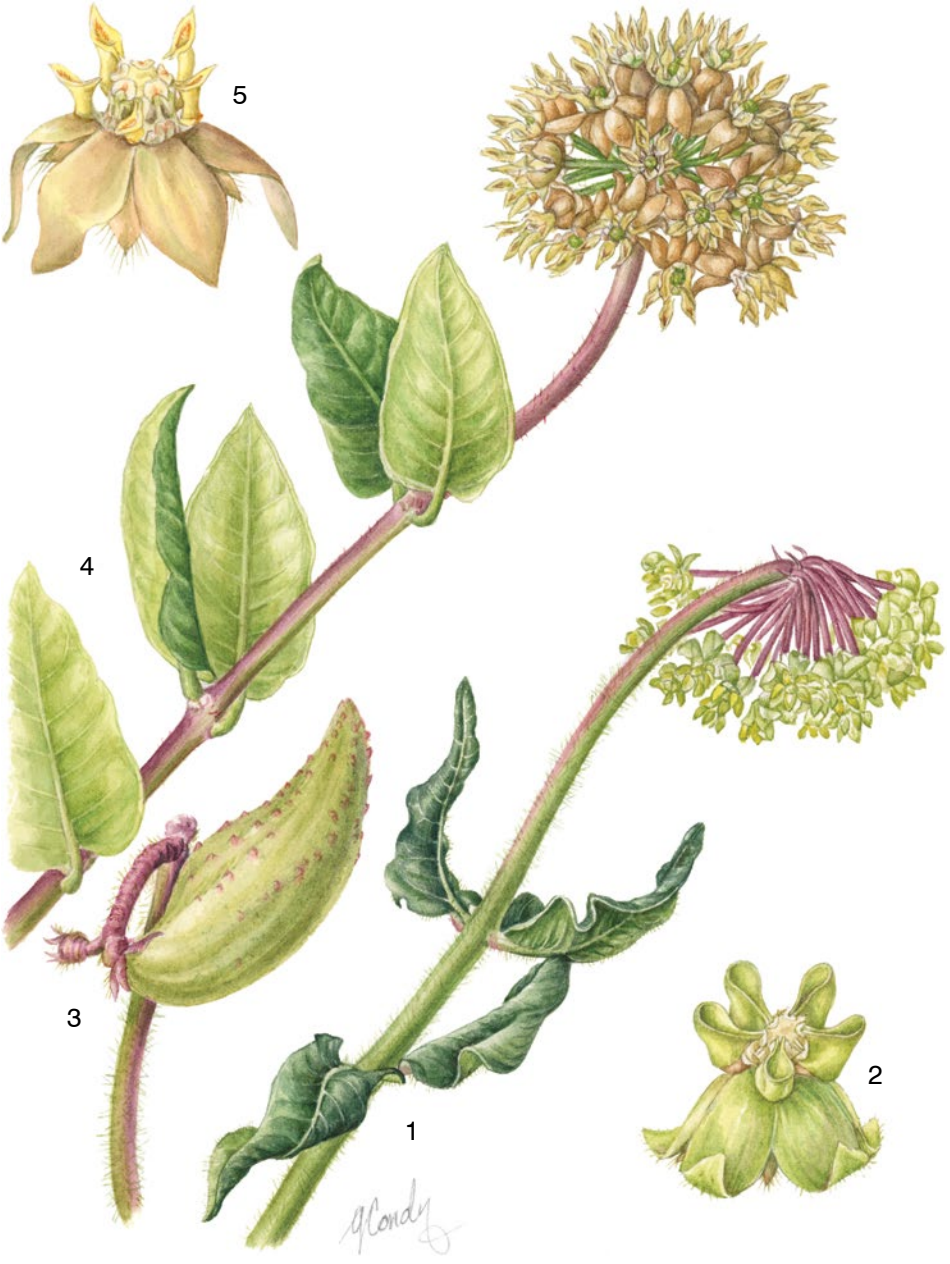



**Figure 36.** *Asclepias albens*, 1–3 and *A. macropus*, 4 & 5 (Aslepiadaceae). Artist: G. Condy.

with lobes spreading, canescent inside, pubescent outside, yellow-brown, tinted white or green; Sep.–Dec. Burnt veld on hillsides. *Northern meadowstar*; *bokhorinkie* (A).

DrGr

**cucullata** (Schltr.) Schltr. subsp. **cucullata**

Perennial herb, up to 350 mm high. **Stems** erect to decumbent. **Leaves** scabrid, with blade linear to narrowly ovate, 9–10 × as long as broad. **Flowers**: corona lobes erect, shorter to slightly longer than staminal column, helmet-shaped, cucullate part of corona lobes ± as long as broad; corolla lobes spreading, with tips curving up; scabrous to pubescent outside, canescent inside, purple, off-white, white or mauve to grey; Sep.–Jan. Stony to rocky, sandy to clay soils in open shrubland, grassland and seeps. *Hooded meadow-star*; *udambisa*, *uDelunina* (Z).

MsGr

**eminens** (Harv.) Schltr.

Perennial herb, 10–300 mm high. **Stems** decumbent with only terminal ends erect. **Leaves** scabrid, with blade narrowly ovate, 9–10 × as long as broad, base hastate to auriculate. **Flowers**: in solitary, terminal, 6- or 7-flowered umbels; gynostegial groove 2.8–3.6 mm long; corona lobes 10–15 mm high, 6–7 × as long as broad, when viewed from the side overtopping staminal column by half their length; corolla with lobes reflexed, glabrous outside, canescent to puberulent inside, green, greenish pink, greenish white to white; Jul., Oct.–Apr. Open grassland or on rocky hillsides. *Montsuku*, *motsoko* (SS).

DrGr MsGr

**gibba** (E.Mey.) Schltr. var. **gibba**

Perennial herb, 10–300 mm high. **Stems** decumbent with only terminal ends erect. **Leaves** scabrid, with blade linear, 9–10 × as long as broad, base auriculate or hastate. **Flowers**: in solitary, terminal 4–10-flowered umbels; corona lobes distinctly gibbous or curved on back, with an erect subulate point at their dorsal apex, overtopping style apex by ≤ 1 mm; corolla with lobes spreading to reflexed, glabrous outside, canescent inside; grey-mauve, green-mauve, silvery grey or greenish white tinted dull purple; Oct.–Feb. Grassland. *Humped turret flower*; *montsokoana* (SS); *umanqanda* (Z).

VreDm DrGr MsGr

**gibba** (E.Mey.) Schltr. var. **media** N.E.Br.

Perennial herb, 120–310 mm high. **Stems** decumbent with only terminal ends erect. **Leaves** scabrid, with blade linear, 9–10 × as long as broad, base auriculate or hastate. **Flowers**: in umbels; gynostegial groove 2.2–2.8 mm long; corona lobes 5.8–9.6 mm high, curved, but scarcely gibbous on back and without an oblique fold or keel upon sides; corolla as in var. *gibba*, white, grey or green; Sep.–Jan., Apr. Grassland.

DrGr

**humilis** (E.Mey.) Schltr.

Perennial, geophytic herb, 50–250 mm high. **Stems** 1 or 2, erect, unbranched, annual. **Leaves** scabrid, with blade oblong, crowded near base, if corolla purple, then blade 19–75 mm wide, if corolla ivory, whitish pink and mottled with irregular purple blotches, then blade 1.2–7.0 mm

wide, veins protruding below with long white hairs. **Flowers**: 4 per umbel, 1–4 inflorescences per stem, large, erect, ± at same level; corona slipper-shaped, white; corolla lobes 8–12 mm long, with tips upturned, white tinged brownish or reddish mauve; Nov.–Jan. Mountainous grassland. *Drakensberg meadow-star*; *sehoete* (SS).

MsGr

**macropus** (Schltr.) Schltr.

Perennial herb. **Stems** decumbent. **Leaves** scabrid, with blade 20–35 mm wide, rounded or cordate at base, scabrous or subhispid. **Flowers**: in solitary, terminal, usually > 20-flowered umbels, 15–32 mm wide; peduncles 80–150 mm long; corona lobes 45–50 mm long, corona yellow, with back and basal part brownish purple; corolla lobes 7–8 mm long, reflexed, with upcurved tips glabrous, yellowish green with purple-brown veins at tips; Oct.–Mar., mainly Jan., Feb. Grassland. *Tailed cartwheels*. Figure 36, 4–5.

MsGr

**meyeriana** (Schltr.) Schltr.

Perennial herb, 30–200 mm high. **Stems** erect, 10–50 branches from base. **Leaves** scabrid, with blade linear, 9–10 × as long as broad, scabrous. **Flowers**: in > two 4-flowered umbels; peduncles 7–38 mm long; corolla lobes reflexed, glabrous or canescent outside, pink and white, purple and white, greenish brown, pink, green or cream-coloured; Sep.–Jan. Open, sparsely covered, grassy areas.

DrGr

**multicaulis** (E.Mey.) Schltr.

Perennial herb, 100–150 mm high. **Stems** procumbent. **Leaves** scabrid, with blade linear, 6–7 × as long as broad, base truncate, subsagittate or subhastate, glabrous above. **Flowers**: in solitary, rarely 2 terminal, 6–9-flowered umbels; corona yellow; corolla lobes reflexed, glabrous outside, inside minutely papillose, grey-pink or mauve; Oct.–Dec. Grassland. *Melkbossie* (A); *lekhoaphela*, *lenkiling* (SS); *isikhonde*, *isiphofu* (Z).

VreDm DrGr MsGr

**stellifera** Schltr.

Perennial herb, 120–290 mm high. **Stems** 1–9, erect. **Leaves** scabrid, with blade linear, 9–10 × as long as broad, scaberulous. **Flowers**: in many 4-flowered umbels; corolla and corona lobes 5–6 mm long; corolla lobes reflexed, pubescent outside, canescent inside, yellow-red, mauve to pink or dirty pink; Jul.–Jan. Grassland. *Moholantja*, *mohlatsisa* (SS).

DrGr MsGr

## **Aspidoglossum** E.Mey. (sthn Afr.: 22 spp.)

### Key to species:

[after Kupicha: 635 (1984)]

1a Leaves whorled, at least in inflorescence . . . . . 2
1b Leaves opposite throughout . . . . . 3

2a Corolla lobes 7.5–9.0 mm long . . . . . **A. grandiflorum**
2b Corolla lobes < 7 mm long . . . . . **A. ovalifolium**
3a Stems unbranched; inflorescence ± sessile; pedicels > 0.5 mm long . . . . 4
3b Stems branched; inflorescence at least shortly pedunculate; pedicels > 1 mm long. . . . . 6
4a Corona with 2 or 3 white processes extending beyond corolla. . . **A. biflorum**
4b Corona contained within corolla . . . . . 5
5a Pedicels 5–8 mm long; corona lime-green. . . . . **A. glanduliferum**
5b Pedicels 2–4 mm long; corona white . . . . . **A. lamellatum**
6a Corolla reflexed at anthesis; inflorescences 1–5-flowered. . . . **A. araneiferum**
6a Corolla spreading at anthesis; inflorescences 6–12-flowered. . . . . **A. interruptum**

## **araneiferum** (Schltr.) Kupicha

*Schizoglossum araneiferum* Schltr.

Perennial, geophytic herb, 300–600 mm high. **Stems** simple or sparsely branched. **Leaves** opposite, shorter or longer than internodes; blade 15–35 × 0.5–1.5 mm, glandular-hairy. **Flowers**: inflorescences 1–5-flowered; corona with each lobe divided at apex into 3 slender, tortuous laciniae, the outer 2 curving into centre of flower and middle one curving outwards; corolla glabrous inside, glabrous outside or sparsely pilose with glandular hairs, lobes reflexed at anthesis, green, yellow or white; Jan.–Mar. Grassland.




## **biflorum** E.Mey.

*Schizoglossum biflorum* (E.Mey.) Schltr. var. *biflorum*
*S. conrathii* Schltr.

Perennial, geophytic herb, 200–700 mm high. **Stems** simple or rarely branched. **Leaves** opposite, longer or shorter than internodes, blade 25–75 × 1–4 mm. **Flowers**: pedicels up to 3 mm long; corona white, yellowish or purplish, with 2 or 3 white processes extending beyond corolla; corpusculum linear, not flanged; corolla lobes 3.5–5.0 × 1.5–2.0 mm, united for a quarter of their length, cup-shaped to spreading at anthesis, pilose inside and outside, green or purplish; Sep.–Feb. **Fruit** 60–70 mm long, densely pubescent, without bristles. Grassland or open woodland.




## **glanduliferum** (Schltr.) Kupicha

*Schizoglossum glanduliferum* Schltr.

Perennial, geophytic herb, 260–500 mm high. **Stems** erect and unbranched. **Leaves** opposite, all or most shorter than internodes, held vertically, glandular hairs present, blade 25–35 × 1–2 mm. **Flowers**: pedicels 5–8 mm long; corona of 5 segments, lime-green, lobes always with a ventral appendage; corpusculum inconspicuous; corolla lobes spreading and slightly cucullate, inside glabrous, outside pilose, pale green, striped maroon; Oct.–Jan. Grassland in xeric or mesic habitats.




## **grandiflorum** (Schltr.) Kupicha

*Schizoglossum grandiflorum* Schltr.
*S. macowanii* N.E.Br. var. *macowanii*
*S. macowanii* N.E.Br. var. *tugelense* N.E.Br.

Perennial, geophytic herb, up to 60–140 mm high. **Stems** usually unbranched or occasionally two. **Leaves** mostly opposite, but also in whorls of 3–5; blade 18–45 × 4–14 mm with upper

surface scabrid-pubescent, lower surface pilose with midrib and veins pubescent. **Flowers**: pedicels 8–15 mm long with 4–7 flowers per node; corona with basal lobe with peaked shoulders and erect or slightly inflexed apical process; translator arms flat and robust; corolla spreading and replicate, lobes 7.5–9.0 mm long, glabrous inside, adpressed hairs in centre of upper half on outside of lobes, jade-green, inner surface white with outer surface flushed or spotted in maroon; Sep.–Nov. Grassland.

| | | | MsGr | | |
|---|---|---|---|---|---|

**interruptum** (E.Mey.) Bullock
*Schizoglossum altissimum* Schltr.
*S. interruptum* (E.Mey.) Schltr.

Perennial, geophytic herb, 0.5–1.4 m high. **Stems** almost always branched in inflorescence. **Leaves** opposite, longer or shorter than internodes; blade 20–75 × 0.5–2.0 mm, upper leaf surface appressed-pubescent or glabrous. **Flowers**: inflorescences 6–12-flowered; corona whitish, with purple streaks; corolla spreading at anthesis, lobes 2–3 mm long, pubescent inside and long-pilose around periphery and especially at tip, dull purplish red outside, creamy or yellowish inside; Oct.–Feb. Grassland and open woodland.

| VreDm | | DrGr | MsGr | | |
|---|---|---|---|---|---|

**lamellatum** (Schltr.) Kupicha
*Schizoglossum bilamellatum* Schltr.
*S. lamellatum* Schltr.

Perennial, geophytic herb, 150–550 mm high. **Stems** unbranched. **Leaves** opposite, usually shorter than internodes, blade 15–45 × 0.5–8.0 mm, glandular-hairy. **Flowers**: pedicels 2–4 mm long; corona 5 segments, white; lobes simple, flat scales; corpusculum inconspicuous; corolla glabrous inside, erect and sometimes slightly replicate, greenish, marked with purple inside, buff-coloured outside; Sep.–Jan. Open grassland.

| | | DrGr | MsGr | | |
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**ovalifolium** (Schltr.) Kupicha
*Schizoglossum ovalifolium* Schltr.
*S. pumilum* Schltr.

Perennial, geophytic herb, 70–330 mm high. **Stems** unbranched and erect. **Leaves** opposite or whorled, at least in inflorescence; blade 14–35 × 0.5–12.0 mm. **Flowers**: relatively large; corona 3–7 mm high, white, marked with pink; corolla lobes 4–7 mm long, green striped with brown or with purple; Sep.–Feb. Grassland, sometimes near water.

| | | DrGr | MsGr | | |
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## **Aspidonepsis** Nicholas & Goyder (sthn Afr.: 5 spp.)

### Key to species:

[after Nicholas & Goyder: 26 (1992)]

Corolla reflexed when mature, dark brown to maroon; corona lobe cavity without an appendage . . . . . **A. reenensis**
Corolla not fully reflexed when mature, yellow to greenish; corona lobe cavity with a tongue-like appendage . . . . . **A. diploglossa**

**diploglossa** (Turcz.) Nicholas & Goyder
*Asclepias diploglossa* (Turcz.) Druce

Perennial, geophytic herb, 170–500 mm high. **Stem** single, erect, pubescent. **Leaves** spreading; blade narrowly ovate, occasionally falcate but rarely linear or narrowly elliptic, 5–130 × 0.3–7.0 mm. **Flowers**: 1–3 inflorescences, with 4–16 flowers per plant; peduncles sessile or up to 10 mm; pedicels 6–16 mm; corona lobes cup-shaped with a broad central appendage in sinus, not exceeding gynostegial column; anther appendages deeply cleft; corolla lobes not fully reflexed, ovate to elliptic and free to base, yellow or yellow-brown, yellow with occasionally purple or lilac on inside, outside yellow, brown or purple; Oct.–Jan. Annually burnt montane grassland, usually on S- or E-facing hill slopes or mountain plateaux.

MsGr

**reenensis** (N.E.Br.) Nicholas & Goyder
*Asclepias reenensis* N.E.Br.

Perennial herb, 240–625 mm high. **Stem** single, scabrous. **Leaves** with blade linear, 10–56 × 0.7–4.0 mm; petioles up to 1 mm long. **Flowers**: inflorescences 1–3 per plant, at apex of stems with up to 8 flowers; corona lobes claw-like with a tailed and keeled apex, without an appendage, whitish, keel purple below, bright yellow above, central cavity without an appendage; corolla lobes reflexed and narrowly elliptic to ovate, dark reddish brown, dark brown, brown, dull reddish purple or purple with light yellow or purple to white margins; Nov.–Jan. Dry mountain grassland, often in sandy situations on top of Cave Sandstone.

MsGr

## **Brachystelma** R.Br. (sthn Afr.: 80 spp.)

### Key to species:

[after Dyer: 274 ( 1983)]

| | | |
|---|---|---|
| 1a | Rootstock producing a cluster of cylindrical or fusiform roots | 2 |
| 1b | Rootstock producing a tuber | 3 |
| 2a | Leaves shortly petiolate; blade oblong-elliptic to orbicular ovate; corolla maroon | **B. comptum** |
| 2b | Leaves sessile; blade linear-oblong to narrowly ovate; corolla white, pale yellow or green | **B. ramosissimum** |
| 3a | Corolla lobes united at tips at full anthesis | 4 |
| 3b | Corolla lobes free | 6 |
| 4a | Leaves with blade ovate-elliptic | **B. dimorphum** subsp. **dimorphum** |
| 4b | Leaves with blade linear | 5 |
| 5a | Leaf blade > 20 mm long | **B. burchellii** var. **burchellii** |
| 5b | Leaf blade < 20 mm long | **B. circinatum** |
| 6a | Corolla > 20 mm in diameter | **B. foetidum** |
| 6b | Corolla < 10 mm in diameter | 7 |
| 7a | Corolla rotate | 8 |
| 7b | Corolla cup- or bell-shaped | 9 |
| 8a | Corolla pale yellow | **B. dimorphum** subsp. **gratum** |
| 8b | Corolla violet-black | **B. incanum** |
| 9a | Corolla 35–40 mm long | **B. glenense** |
| 9b | Corolla 22–24 mm long | **B. duplicatum** |

**burchellii** (Decne.) Peckover var. **burchellii**

Perennial, geophytic herb, up to 1 m high, with tuber disc-shaped. **Stems** slender and erect. **Leaves** pendulous; blade linear, 20–100 × 1–3 mm, with a prominent midrib. **Flowers**: inflorescences sessile or shortly pedunculate with 2–7 flowers; pedicels 5–8 mm, glabrous; corona sessile or shortly stalked, staminal corona linear and erect from broadly fleshy base over gynostegial column; corolla white to green with short tube and lobe linear to filiform, reflexed, united at tips, 20–30 mm; Nov.–Feb. **Fruit** a follicle. Grassland, stony to rocky, sandy or loam soils.

AcGr DrGr

**circinatum** E.Mey.

*B. galpinii* (Schltr.) N.E.Br.
*B. pallidum* (Schltr.) N.E.Br.

Perennial herb, 70–300 mm high, with tuber disc-shaped. **Stems** one to few, shortly pubescent. **Leaves** with blade linear, 5–20 mm long, folded upwards. **Flowers**: corolla with a cylindrical beak in bud, tube < 3 mm long, lobes united at tips, glabrous inside, pubescent outside, cage-like open part becoming broader than base, white to maroon; Jul.–Jun. **Fruit** a follicle. Grassland on rocky outcrops/slopes. *Wilde-aartappel* (A).

KarSh

**comptum** N.E.Br.

Perennial herb, 70–150 mm high, producing a cluster of fleshy roots. **Stem** single or sparsely branched, produced annually, slightly ribbed or winged, reddish, shortly hairy. **Leaves** shortly petiolate, spreading; blade oblong-elliptic to orbicular-ovate, 10–16 × 6–10 mm, short hairs present on either surfaces or only on lower surface. **Flowers**: solitary; corolla maroon with flat base, inverted at pedicel attachment with lobes spreading from constriction; vibratile hairs in throat at point of constriction; Oct.–Mar. **Fruit** a follicle. Grassland.

DrGr

**dimorphum** R.A.Dyer subsp. **dimorphum**

Perennial, geophytic herb, 100–200 mm high, with tuber cylindric to globose, somewhat depressed. **Stem** 1 or rarely 2, sparsely branched, mostly pubescent. **Leaves** shortly petiolate; blade ovate-elliptic, folded upward, 5–20 × 4–14 mm, upper surface glabrous; lower surface pilose. **Flowers**: outer corona lobes almost obsolete, or outer margins very shortly bidentate, inner lobes subquadrate; corolla with cylindrical beak in bud, tube < 3 mm long or absent, lobes united, open part becoming broader than base; inner face of lobes puberulous in lower half, outer mainly glabrous, dirty cream-coloured, with purplish touches or pale green; Oct.–Jan. **Fruit** a follicle. Alluvial soil in expansive shallow pans.

AcGr DrGr

**dimorphum** R.A.Dyer subsp. **gratum** R.A.Dyer

Perennial geophyte, up to 50 mm high. **Flowers**: differs from typical species in inner corona lobes just longer than broad; corolla free at tips, spreading, star-shaped and recurved, pale yellow; Dec., Jan. **Fruit** a follicle. Alluvial soil.

DrGr

### **duplicatum** R.A.Dyer

Perennial geophyte, up to 150 mm high; tuber globose to cylindrical. **Stem** single, produced annually, stiff and moderately branched, puberulous. **Leaves** blue-green; blade oblong to narrowly ovate, ± 10 × 3 mm, margins undulate, minutely papillose. **Flowers**: many; corolla < 5 mm in diameter, bell-shaped and with a short tube, 22–24 mm long; lobes free at tips, bright green with mauve veins near base; Apr. **Fruit** a follicle. Karroid veld and grassland, only known from vicinity of Fauresmith. Closely related to *B. circinatum*, but in this species the lobes are always united at tips.

DrGr

### **foetidum** Schltr.

*B. rehmannii* Schltr.

Perennial herb, 70–150 mm high, with tuber depressed from above. **Stems** 1–few, spreading or erect, branching higher up, coarsely hairy. **Leaves** with blade linear, narrowly ovate to ovate or elliptic, 5–30 × 3–10 mm. **Flowers**: corolla > 20 mm in diameter, with inner surface glabrous, tube campanulate, divided to ± $^{2}/_{3}$ of its length, white to yellowish within, with purple-brown warty spots, becoming dark purple-brown to nearly black on lobes; Oct.–Jan. **Fruit** a follicle. Grassland.

DrGr MsGr KarSh

### **glenense** R.A.Dyer

Perennial, dwarf, geophytic herb, up to 100 mm high; tuber depressed-globose. **Stems** 1 or 2 annually, branching from base; glabrous or with minute hairs. **Leaves** shortly petiolate; blade linear-oblong, up to 15–30 × 7–10 mm, upper surface glabrous, lower surface glabrescent. **Flowers**: 2–10 at nodes opening almost simultaneously; corolla 35–40 mm long, < 5 mm in diameter, glabrous on outer surface, tube 4–5 mm, cup-shaped, lobes 30–35 mm long, margins recurved, yellowish; Mar. **Fruit** a follicle. Grassland.

DrGr

### **incanum** R.A.Dyer

Perennial, geophytic herb, 50–100 mm high; tuber depressed-globose. **Stems** 1 or 2, spreading to decumbent; shortly hairy. **Leaves** petiolate; blade ovate to ovate-elliptic, 15–20 × 10–15 mm, hairy on both surfaces or only on lower surface, sometimes appearing silvery. **Flowers**: corolla < 5 mm in diameter, with short broad tube, rotate, with ring of long hairs around corona; corona producing a campanulate tube, tube with light violet hairs, lobes dark violet-black and with greenish yellow tips; Dec.–Feb. **Fruit** a follicle. Grassland.

DrGr

### **ramosissimum** (Schltr.) N.E.Br.

Perennial herb, up to 150 mm high, with fusiform roots. **Stems** 1 or 2, well branched throughout; angular or ribbed; glabrous or sometimes sparsely hairy. **Leaves** subsessile; blade linear-oblong to narrowly ovate, 15–30 mm long, few hairs mainly on margins and midrib below. **Flowers**: corolla with no tube, lobes 3–4 mm long, free at tips, white, pale yellow or greenish; Oct.–Dec. **Fruit** a follicle. Grassland.

VreDm DrGr

## **Carissa** L. (sthn Afr.: 5 spp.)

### **bispinosa** (L.) Desf. ex Brenan

Shrub, up to 5 m high. **Spines** slender to robust, up to 50 mm long, bifurcate, twice bifurcate or simple. **Leaves** with blade coriaceous, broadly ovate, ovate or narrowly ovate. **Flowers**: 5-merous; corolla tube 6–9 mm long, corolla lobes 3.5–5.0 mm long, longer than broad, overlapping to the left, white; Sep.–Mar. **Fruit** a red berry. Hot dry situations in bushveld and dense woodland, forest margins and scrub forest. *Red num-num*, *small amatungulu*; *rooi noem-noem* (A); *simboka* (T).




## **Ceropegia** L. (sthn Afr.: 52 spp.)

### Key to species:

Leaves with blade filiform, linear to narrowly ovate. . . . . **C. filiformis**
Leaves with blade broadly ovate to sublinear . . . . .**C. multiflora** subsp. **multiflora**

### **filiformis** (Burch.) Schltr.

Perennial herb, 150–800 mm long, cluster of fibrous succulent roots. **Stem** annual, twining, sparsely branched; glabrous. **Leaves** with blade filiform, linear to narrowly ovate, ± 70 × 10 mm, herbaceous. **Flowers**: pedunculate, develop successively from same node; corona united at base, outer lobes forming 5 pockets within, upright and divided for $^{2}/_{3}$ into linear lobules slightly thickened at purplish apex, with few long hairs round base; inner lobes incumbent erect, ± 2 mm long; corolla up to 60 mm long, tube up to 40 mm, straight or slightly curved with oblong-elliptic basal inflation up to 12 mm wide, narrowed to ± 3 mm above and expanding to 8–10 mm at throat, pale green with purple longitudinal venation; lobes twisted at first, up to 20 mm long, spreading-erect with apical 2 mm connate, narrowly linear from deltoid base, replicate, with white keel down inner face of lower half, otherwise dark purple; Oct.–Apr. **Fruit** a follicle. Nama Karoo in low scrub and closed woodland in rocky, stony and sandy soils. *Soetwortel*, *rankkambroo* (A).




### **multiflora** Baker subsp. **multiflora**

Perennial herb, tuber slightly flattened. **Stems** 1 or 2, annual, twining, 0.5–2.0 m long. **Leaves** with blade broadly ovate to sublinear, 10–70 × 3–12 mm, apex obtuse, slightly fleshy. **Flowers**: corolla lobes 5–7 mm long, basal portion spreading horizontally and upper half thread-like and meeting above corolla throat, greenish, longitudinally purple-papillate within basal inflation; Dec.–Feb. **Fruit** a follicle. Climber in bushes or grassland. *Heikwa-doras* (A).




## **Cordylogyne** E.Mey. (sthn Afr.: 1 sp.)

### **globosa** E.Mey.

Perennial herb, 150–750 mm high, marsh-loving. **Stems** 1–few, erect or lax-ascending from a rootstock. **Leaves** with blade linear erect or ascending, margins revolute, glabrous. **Flowers**: in

globose, terminal, long-peduncled umbels, solitary or 2(–4) to a stem; corona lobes hastately subspathulate; corolla green and white, brownish white and pink; Nov.–Apr. **Fruit** a follicle. Marshy grassland.

VreDm | DrGr | MsGr

## **Cryptolepis** R.Br. (sthn Afr.: 6 sp.)

### **oblongifolia** (Meisn.) Schltr.

Shrub, up to 2 m high. **Stems** much branched, long and slender, reddish brown. **Leaves** petiolate; blade elliptic to oblong, 25–50 × 6–18 mm, apex acuminate; petioles 1–2 mm long. **Flowers**: few in clustered inflorescences; corona lobes subterete or clavate; corolla tube 1–4 mm long, lobes oblong or linear-oblong, < 4 mm long, yellow, white or pale greenish yellow; Sep.–Apr. **Fruit** a follicle. Rocky hillsides, open woodland and grassland. *Bokhoring*, *melkbos* (A); *mukangaza* (SS).

VreDm

## **Cynanchum** L. (sthn Afr.: 12 spp.)

Key to species:

Twiner with heart-shaped leaves . . . . . .**C. virens**
Erect herb with linear leaves. . . . . .**C. orangeanum**

### **orangeanum** (Schltr.) N.E.Br.

Erect, perennial herb, 100–200 mm high. **Stems** not twining. **Leaves** with blade linear, 30–50 × 0.7–1.5 mm. **Flowers**: in almost sessile, 1–5-flowered, subumbellate inflorescences; corona dorsiventrally flattened, tapering into a long fine needle-like apex; style head conical; corolla lobes basally united, 4–6 mm, brown; Oct.–Mar. **Fruit** a winged follicle. Nama Karoo. *Wilde-piesang* (A).

KarSh

### **virens** (E.Mey.) D.Dietr.

Perennial herb. **Stems** twining. **Leaves** with blade heart-shaped, 25–80 mm long. **Flowers**: style head conical; corona dorsiventrally flattened, tapering into a long fine needle-like apex, lobes 2–4 mm long; staminal column not stipitate; corolla lobes 4–6 mm long, twisted, puberulous inside; corolla white; Nov.–Feb. **Fruit** a winged follicle. Thickets near rivers, forest margins.

VreDm | AcGr | DrGr | MsGr

## **Duvalia** Haw. (sthn Afr.: 13 spp.)

Key to species:

[after Bruyns: 70 (2005)]

1a Annulus ± glabrous, papillae < 0.5 mm long . . . . . 2
1b Annulus with hair-like papillae > 1 mm long . . . . . 4

2a Outer corona enclosed by tube formed by annulus . . . . . **D. maculata**
2b Outer corona ± level or slightly above top of annulus. . . . . 3
3a Annulus 1.0–1.5 mm high. . . . . **D. modesta**
3b Annulus > 1.5 mm high . . . . . **D. caespitosa** var. **caespitosa**
4a Corolla (25–)30–45 mm wide, annulus with papillae 2–4 mm long . . . . . **D. corderoyi**
4b Corolla 18–30(–35) mm wide, annulus with papillae ± 1.5 mm long . . . . . **D. caespitosa** var. **caespitosa**

## **caespitosa** (Masson) Haw. var. **caespitosa**

Perennial herb, 15–130 × 10–22 mm. **Stems** succulent; clustered; cylindrical, 4- or 5-angled; dark green. **Leaves** rudimentary, ± 2 mm long. **Flowers**: inflorescence with 1–few flowers near stem base; 20–35 mm wide, with strong foetid odour; corona yellow to reddish brown, maroon, dark brown to purple-brown; outer corona ± level or slightly above top of annulus; annulus circular to pentagonal, > 1.5 mm high, with papillae ± 1.5 mm long; corolla 0.2–0.4 × 18–30(–35) mm long, lobes almost entirely reflexed, with hairs basally or all over; Aug.–Jun. **Fruit** a follicle. Karroid shrubland in sandy and loamy, rocky, stony or gravelly soil.




## **corderoyi** (Hook.f.) N.E.Br.

Perennial herb, 12–45 × 12–25 mm. **Stems** succulent, clustered; globular, 6-angled; dark green. **Leaves** rudimentary, ± 1 × 1 mm. **Flowers**: inflorescence with 1–several flowers near base of stem; 30–45 mm wide, with strong foetid odour; corona reddish brown, pale maroon, dark purple; annulus fleshy, spotted and densely pubescent, hairs white to purple and 2–4 mm long; corolla (25–)30–45 mm wide, lobes with longitudinal furrows, widely but not fully reflexed, margins with purple hairs 2–4 mm long; Feb.–May. **Fruit** a follicle. Karroid shrubland in rocky and stony, sandy soils.




## **maculata** N.E.Br.

Perennial herb, 10–60 × 8–18 mm. **Stems** succulent, clustered, ovoid to cylindrical, 4-angled; dark green to greyish green. **Leaves** rudimentary, 1–3 mm long. **Flowers**: inflorescence on bottom half of stem with 1–several procumbent flowers, 15–20 mm wide, scentless; outer corona enclosed by tube formed by annulus; annulus pentagonal, white to cream-coloured, spotted and dotted maroon, papillose; corolla lobes almost entirely reflexed, basally with hairs, 0.2–2.5 mm long, canary yellow and maroon; Jan.–Apr. **Fruit** a follicle. Karroid shrubland in rocky and stony, sandy soils.




## **modesta** N.E.Br.

Perennial succulent. **Stems** in a cluster, 10–40 × 8–20 mm, ovoid to cylindrical, 4- or 5-angled, dark green. **Leaves** rudimentary, ± 1.5 mm long. **Flowers**: inflorescence ± in middle of stem with many procumbent flowers; 15–25 mm wide, faint foetid odour; outer corona ± level or slightly above top of annulus; annulus 1.0–1.5 mm high, circular or pentagonal with papillose rim; corona ivory, maroon; corolla lobes basally spreading, apically almost completely reflexed, margins basally with curved and purple hairs, 1.5–2.5 mm long; Sep.?–Apr. **Fruit** a follicle. Karroid shrubland.



## **Fanninia** Harv. (sthn Afr.: 1 sp.)

### **caloglossa** Harv.

Perennial, geophytic herb, up to 250 mm high, with tuberously thickened roots. **Leaves** with blade narrowly ovate to elliptic, 25–60 × 4–25 mm. **Flowers**: in terminal, pedunculate, 4–8-flowered false umbels; corona lobes linear-oblong, purple; corolla basally fused, 10–12 mm long, with long white hairs on either side, white or purplish with greenish midrib; Nov.–Jan. **Fruit** a follicle. Grassland. *Fannin's beauty*.




## **Fockea** Endl. (sthn Afr.: 6 spp.)

### Key to species:

1a Leaves with margins of blade undulate . . . . . **F. sinuata**
1b Leaves with margins of blade entire or revolute. . . . . 2
2a Corolla lobes 12–16 mm long . . . . . **F. angustifolia**
2b Corolla lobes 5–10 mm long . . . . . **F. comaru**

### **angustifolia** K.Schum.

*F. lugardii* N.E.Br.
*F. sessiliflora* Schltr.

Perennial herb, tuber globose to turnip-shaped. **Stems** erect, decumbent or twining, 150–450 mm long. **Leaves** sessile; blade linear to elliptic, 10–100 × 4–12 mm, margins entire or weakly revolute, narrowed or rounded at base, pubescent. **Flowers**: corolla lobes 12–16 mm long; corona ± 4× as long as corolla tube, white or yellow; corolla yellow to green to brown; Oct.–Jun. **Fruit** a follicle. Rocky koppies or sandy flats. *Kombru*, *potatoes*; *kombroo*, *gameru* (A).




### **comaru** (E.Mey.) N.E.Br.

*F. gracilis* R.A.Dyer

Perennial herb, tuber irregular to turnip-shaped. **Stems** pubescent, becoming woody, 100–300 mm high. **Leaves** almost sessile; blade linear-subulate, 20–30 × 1–2 mm, margins revolute, pubescent. **Flowers**: inflorescence sessile, 2–6-flowered; corona white, tube 4–6 mm; corolla lobes 5–10 mm long, pubescent outside, mainly glabrous inside, yellow to green to brown; Aug.–Apr. **Fruit** a follicle. Karroid and Nama karroid shrubland in stony and rocky soil.




### **sinuata** (E.Mey.) Druce

Perennial herb, tuber turnip-shaped. **Stems** erect, not climbing, few branches, becoming woody; pubescent. **Leaves** sessile; blade linear, 20–35 × 2–3 mm, longitudinally regularly undulate, upper surface glabrous, on lower surface only midrib pubescent. **Flowers**: inflorescence sessile, 3–6-flowered; corona white, tube ± 3 mm high; corolla tube campanulate, 2.5 mm high, lobes linear to narrowly ovate, 4–6 mm long, green to brown; Jan.–Mar. **Fruit**

a follicle. Karroid shrubland in calcrete, sandy and rocky or stony soils. *Velberoe*, *kamoo*, *kambaroo* (A).

KarSh

## **Gomphocarpus** R.Br. (sthn Afr.: 10 spp.)

### Key to species:

[after Nicholas: 131, 141 (1999)]

1a Corona lobes D-shaped in side view, without a reflexed, tooth-like falcate-shaped upper proximal appendage . . . . . **G. tomentosus** subsp. **tomentosus**

1b Corona lobes square in side view, with a reflexed tooth-like falcate-shaped upper proximal appendage . . . . . 2

2a Young stems, peduncles and pedicels ± glabrous; follicles echinate, glabrous and without dark longitudinal stripes . . . . . **G. fruticosus** subsp. **fruticosus**

2b Young stems, peduncles and pedicels usually with a dense covering of white hairs; follicles echinate and with white hairs and dark longitudinal stripes . . . . . **G. fruticosus** subsp. **decipiens**

### **fruticosus** (L.) Aiton f. subsp. **decipiens** (N.E.Br.) Goyder & Nicholas

*Asclepias decipiens* N.E.Br.

Perennial herb or shrub, up to ± 1 m high, with fibrous roots and erect stems. Differs from the typical species in that young shoots have a white indumentum with fruit subtomentose and more attenuate, tapering abruptly into a long beak; Aug.–May. **Fruit** a follicle, echinate, with white hairs and dark longitudinal stripes. Dry sandy soils in open or disturbed places.

DrGr

### **fruticosus** (L.) Aiton.f. subsp. **fruticosus**

*Asclepias fruticosa* L.

Perennial shrub, 0.9–2.0 m high, with fibrous roots and erect, glabrous stems. **Leaves** with blade linear or narrowly linear-ovate, 9–10 × as long as broad. **Flowers**: in several, racemosely arranged, nodding, 6–10-flowered umbels; corolla lobes reflexed, glabrous; corona lobes square in side view, with long, backwardly directed, falcate teeth at inner apical angles; white, cream-coloured, light yellow or light greenish; Sep.–Apr. **Fruit** an ovoid, glabrous follicle, tapering gradually into a beak or shortly acute. Dry sandy soils in open or disturbed places often on river- or streambanks. *Wild cotton*, *milkweed*; *melkbos*, *tontelbos* (A); *lerete-la-ntja*, *lebejana*, *leyeyana*, *molimolo* (SS); *usinga-lwesalukazi* (Z).

VreDm AcGr DrGr MsGr KarSh Zastr

### **tomentosus** Burch. subsp. **tomentosus**

*Asclepias burchellii* Schltr.

Perennial herb or shrub, up to 2 m high, with fibrous roots and erect stems; young parts of stem, peduncles, pedicels and outside of corolla densely, white tomentose. **Leaves** with blade linear, 9–10 × as long as broad. **Flowers**: in several, racemosely arranged, nodding, 3–7-flowered

umbels; corona lobes D-shaped, without teeth; corolla lobes reflexed, glabrous inside, white-cream-coloured or light yellow; Oct.–Jun. **Fruit** a follicle tapering gradually to a slender beak. Disturbed and open sites mostly in sand. *Wild cotton*, *milk weed*; *bergtontelbos*, *bloumelkbos* (A); *lerete-la-ntje* (SS).




## **Hoodia** Sweet ex Decne. (sthn Afr.: 12 spp.)

### Key to species:

Stems with 11–17 distinct ribs; corolla 40–100 mm wide . . . . . .**H. gordonii**
Stems with 17–22 less-distinct ribs; corolla 10–14 mm wide . . . . . .
. . . . . **H. officinalis** subsp. **officinalis**

### **gordonii** (Masson) Sweet ex Decne.

*H. bainii* T.-Dyer

Perennial shrub, 0.5–1.0 m high. **Stems** succulent, cylindrical, 25–50 mm thick with 11–17 distinct ribs; greyish green to brown. **Leaves** rudimentary. **Flowers**: inflorescence shortly pedunculate, 1–4-flowered; corona ± one tenth of corolla diameter; corolla 40–100 mm wide, rotate, flat, clearly 5-lobed, flesh-coloured becoming deep purple to red towards centre; Jan.–Dec. **Fruit** a follicle. Karroid open shrubland in sandy soils. *Wilde-ghaap*, *bobbejaanghaap*, *bitterghaap*, *jakkalsghaap*, *wolweghaap* (A).




### **officinalis** (N.E.Br.) Plowes subsp. **officinalis**

Perennial shrub, up to 300 mm high. **Stems** succulent, cylindrical, 35–65 mm thick with 17–22 indistinct ribs; pale green. **Leaves** rudimentary. **Flowers**: inflorescence shortly pedunculate, 1–3-flowered; corona ± $^1/_3$ of corolla diameter; corolla 10–14 mm wide, rotate, campanulate, clearly 5-lobed, pale green to brown becoming red-brown to yellow-brown toward centre; Jan.–Dec. **Fruit** a follicle. Karroid open shrubland in sandy soils.




## **Huernia** R.Br. (sthn Afr.: 41 spp.)

### Key to species:

Inner corona lobes tapering to a fine point, without papillae . . . . . .
. . . . . **H. barbata** var. **barbata**
Inner corona lobes clavate ending abruptly in a rounded tuberculate apex . . . . . .
. . . . . .**H. longituba** subsp. **longituba**

### **barbata** (Masson) Haw. var. **barbata**

Perennial herb, up to 60 mm high. **Stems** succulent, 4- or 5-angled. **Leaves** rudimentary. **Flowers**: facing upward and outward; inner corona lobes tapering to a fine point, without papillae; corolla broadly tubular-campanulate, 25–65 mm long, 15–65 mm in diameter; tube 10–20 mm long; lobes 9–18 mm long, 15–17 mm broad at base, tapering, outside green

to cream-coloured to yellow to white, finely dotted in maroon, tube inside basally red with short prickles, maroon or cream-coloured concentric lines; Aug.–May. **Fruit** a follicle. Karroid shrubland on stony slopes under bushes.

DrGr KarSh

### **longituba** N.E.Br. subsp. **longituba**

Perennial herb, up to 120 mm high. **Stems** succulent, 4- or 5-angled. **Leaves** rudimentary. **Flowers**: inner corona lobes much exceeding anthers, regularly clavate, ending abruptly in a rounded tuberculate apex, at least 3 mm long, blackish maroon; corolla tubular-campanulate, 20–28 × 20–40 mm; tube up to 20 mm long; lobes 8–10 mm long, 8–10 mm broad at base, deltate; concentrically lined (broken lines) on cream-coloured background; papillae spotted and banded, cream-coloured inside marked with brown-red to maroon spots and broken lines; Mar., Apr. **Fruit** a follicle. Semidesert areas, often in semishade of thorn scrub. *Bittergwhapie* (A).

KarSh

## **Microloma** R.Br. (sthn Afr.: 11 spp.)

### **armatum** (Thunb.) Schltr. var. **armatum**

*M. hystricoides* Wanntorp

Shrub or dwarf shrub, 100–600 mm high, with clear sap. **Stems** whitish grey to green. **Leaves** slightly fleshy; blade cordate-deltoid to narrowly ovate-elliptic, 2–8 × 1–4 mm. **Flowers**: inflorescence 1–6-flowered; corolla urceolate, truncate, tube narrowing to mouth, 2–4 × 1.5–3.0 mm, lobes 0.6–1.0 mm long, spirally twisted, yellow to green-yellow, sometimes paler towards base; Aug.–May. **Fruit** a follicle. Karroid shrubland. *Ystervarkbossie* (A).

AcGr DrGr KarSh

## **Miraglossum** Kupicha (sthn Afr.: 7 spp.)

### **pulchellum** (Schltr.) Kupicha

*Schizoglossum pulchellum* Schltr.

Perennial herb, 200–550 mm high. **Leaves** with blade linear to narrowly ovate, 20–50 × 1.5 mm, pubescent to pilose. **Flowers**: corona lobes ± circular, fleshy; appendage stout, arising from ventral surface of lobe and curving back over its apex, green or white and green appendage purple or brown; corolla < 15 mm wide, brownish green; Nov.–Jan. **Fruit** a follicle with bristles. Grassland. *Horned miracle-tongue*; *mpulutsoane*, *sehoete-mpulutsoane* (SS).

DrGr MsGr

## **Orbea** Haw. (sthn Afr.: 29 spp.)

### Key to species:

Corolla sandy brown to reddish, 32–35 mm wide. . . . . **O. cooperi**
Corolla yellow, mustard, rarely darker or orange, 35–65 mm wide . . . . . .
. . . . . .**O. lutea** subsp. **lutea**

### **cooperi** (N.E.Br.) L.C.Leach

Perennial herb, with rhizomes forming an aerial stem. **Stems** succulent, glabrous; erect or ascending, up to 50 mm high, distinctly 4-angled. **Leaves** rudimentary. **Flowers**: inflorescence 1–3, sessile at base of stem; annulus verruculose-papillose, flattish, cream-coloured, centrally depressed; corolla 32–35 mm wide, a deep sandy brown to reddish, striped maroon and a lighter central annulus; Jan.–Jun. **Fruit** a follicle. Closed woodland, under bushes at foot of hills on rocky or gravelly patches with sandy soils.

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### **lutea** (N.E.Br.) Bruyns subsp. **lutea**

*Caralluma lutea* N.E.Br.
*Orbeopsis lutea* (N.E.Br.) L.C.Leach subsp. *lutea*

Perennial herb. **Stems** succulent, glabrous; distinctly 4-angled; sprawling; pale green with dull purple blotches. **Leaves** with leaf rudiments acute, minute. **Flowers**: inflorescence with 3–26 flowers; outer horn of inner corona lobe ± erect, inner horn laterally compressed, outer corona lobes ± subquadrate, sometimes wider than long; corolla without tube, 35–65 mm wide, strong foul-smelling odour, lobes with dark maroon, marginal vibratile hairs, mainly yellow or mustard-coloured, rarely darker or orange; Dec.–Feb. **Fruit** a follicle. Rocky outcrops often in shade. *Kopseerblom*, *slang-gwaap* (A).

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## **Orthanthera** Wight (sthn Afr.: 2 spp.)

### **jasminiflora** (Decne.) Schinz

Perennial herb. **Stems** annually resprouting; procumbent, sparsely branched, up to 10 m long. **Leaves** ovate, narrowly ovate to linear, hairy, rough-textured; blade 10–76 × 3–45 mm. **Flowers**: corolla tube 10–18 mm long, hairy in throat, lobes 6–12 mm long; green, white or cream-coloured; Sep.–?Apr. **Fruit** a follicle. Grassland. *Sandmelktou* (A).

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## **Pachycarpus** E.Mey. (sthn Afr.: 27 spp.)

### Key to species:

1a Corolla cup-shaped, lobes divided to base . . . . . 2
1b Corolla globose, lobes not divided to base . . . . . 4
2a Inflorescence pedunculate; corolla white to cream-coloured . . . . . **P. schinzianus**
2b Inflorescence sessile; corolla not white to cream-coloured . . . . . 3
3a Basal portion of corona lobe without wings, keels or teeth . . . . . **P. rigidus**
3b Basal portion of corona lobe with a pair of keels . . . . . **P. macrochilus**
4a Corona lobes 9–17 mm long; inflorescences 2–5-flowered . . . . . **P. campanulatus** var. **campanulatus**
4b Corona lobes 2–8 mm long; inflorescences (3–)8–14-flowered . . . . . **P. campanulatus** var. **sutherlandii**

**campanulatus** (Harv.) N.E.Br. var. **campanulatus**

Perennial herb, 150–600 mm high. **Stems** 1 or 2; if branched, then at base of stem. **Leaves** erect-spreading; blade 55–165 × 2.0–9.5 mm, margins revolute, lower surface along midrib pubescent otherwise glabrous. **Flowers**: mostly in solitary, terminal, 2–5-flowered umbels; corona lobes 9–17 mm long with keels 2.5–4.5 mm high and 2.5–6.5 mm long, always shorter than lobe; corolla globose or globose-campanulate, 24–50 mm long, lobes 10–24 × 16–27 mm, pale green, dull cream-green becoming cream-brown with age; Nov.–Feb. **Fruit** a follicle. Grassland. *Cluster bells*; *trosklokkies* (A); *ishongwe* (Z).

| | | | MsGr | | |
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**campanulatus** (Harv.) N.E.Br. var. **sutherlandii** N.E.Br.

*Asclepias gerrardii* (Harv.) Schltr.

*P. gerrardii* (Harv.) N.E.Br.

Perennial herb, 150–600 mm high. **Leaves** erect-spreading; blade 64–145 × 2.0–5.5 mm, margins revolute, lower surface along midrib pubescent otherwise glabrous. **Flowers**: inflorescence 8–14-flowered; corona lobes 2–8 mm long with keels 0.5–4.3 mm high and 1–4 mm long, ± 1/4 length of corona lobe; corolla globose, 10–30 mm long, with lobes 5–12 mm long, pale green or dull cream-green, becoming cream-brown in older flowers; corona dark purple, with pale yellow-cream-coloured keels; Oct.–Apr. **Fruit** a follicle. Grassland. *Toad plant*.

| | | | MsGr | | |
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**macrochilus** (Schltr.) N.E.Br.

*Asclepias macrochila* Schltr.

Perennial herb, 140–330 mm high. **Leaves** with margins of blade sometimes undulate. **Flowers**: inflorescence sessile; corona lobes erect, from short, spreading, claw-like base, with a pair of slight or ± inconspicuous keels, not nearly reaching base of anthers, lemon-yellow; corolla cup-shaped, greenish yellow and mottled with brown or purple spots; Nov., Dec. **Fruit** a follicle. Mountain grassland. *Large-lipped thick-fruit pachycarpus*; *leshokhoa* (SS).

| | | | MsGr | | |
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**rigidus** E.Mey.

*Asclepias rigidus* (E.Mey.) Schltr.

*Xysmalobium rigidum* (E.Mey.) D.Dietr.

Perennial herb, 220–500 mm high. **Leaves** with margins of blade undulate. **Flowers**: inflorescence sessile; corona ± erect or slightly incurved, from shortly spreading base, lobes without keels or appendages on inner surface, apex of lobes entire or 3-lobed, dark chocolate-coloured; corolla cup-shaped or subglobose, pale greenish, stained with purple down back; Nov.–Feb. **Fruit** a follicle. Grassland. *Phoma-metsu*, *leshokhoana* (SS); *iShongwe* (Z).

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**schinzianus** (Schltr.) N.E.Br.

*Asclepias schinzianus* (Schltr.) Schltr.

*Gomphocarpus schinzianus* Schltr.

Perennial herb, 200–400 mm high. **Leaves** with margins of blade undulate. **Flowers**: inflorescence pedunculate; corona lobes with a pair of prominent, short, erect keels on inner surface, without auricles, apical part orbicular or suborbicular, concave, hood-like and upcurved,

white or pale lemon-yellow with violet-purple stripe down inner face; corolla cup-shaped, white or cream-coloured and purple-tinted at tips on back; Sep.–Jan., Jun. **Fruit** a follicle. Grassland, sometimes grassy slopes. *Cream cups*; *bitterwortel* (A). Figure 9A, p. 5.

VreDm | | DrGr | | | |

## **Pachypodium** Lindl. (sthn Afr.: 5 spp.)

### **succulentum** (Jacq.) Sweet

Shrub, up to 0.6 m high with a partially underground tuberous stem. **Stems** succulent, cylindrical in cross-section. **Leaves** in tufts; blade narrow. **Flowers**: 1–few at tips of branches; corolla with a narrow tube, flat, expanded lobes, pink to crimson, usually with darker stripes, rarely white; Sep.–Dec. **Fruit** a follicle. Arid, stony places, in dry scrub. *Bergkambroo*, *bobbejaankos*, *dikvoet*, *ystervarkkambroo* (A).

| | | | | KarSh | |

## **Parapodium** E.Mey. (sthn Afr.: 3 spp.)

### **costatum** E.Mey.

Perennial herb, 80–300 mm high. **Leaves** with blade narrowly ovate or oblong, flat or margins very slightly undulate. **Flowers**: style apex exserted beyond anther appendages; corona white; corolla dull purple-brown or violaceous outside, dull green within; Oct.–Jan. **Fruit** a follicle. Grassland.

VreDm | | DrGr | MsGr | | |

## **Pentarrhinum** E.Mey. (sthn Afr.: 2 spp.)

### **insipidum** E.Mey.

Perennial, twining herb. **Leaves** petiolate; blade broadly ovate to heart-shaped, 200–650 × 15–50 mm, apex acute, base deeply cordate; petioles up to 50 mm long, usually drooping. **Flowers**: corona as high as staminal column, lobes thick and fleshy, tooth projected over staminal column; corolla reddish brown; Oct.–May. **Fruit** a follicle, surface warty. Mixed grassland. *African heartvine*; *opklimbossie*, *donkieperske*, *wildekomkommer* (A); *umulugwe* (Ndebele).

VreDm | AcGr | DrGr | | | |

## **Periglossum** Decne. (sthn Afr.: 4 spp.)

### Key to species:

[after Nicholas: 612 (1999)]

Outer corona lobes with long, narrow pedicel and sagittate-ovate blade of equal length; inner lobes filiform, 1.5–4.0 mm long . . . . . **P. angustifolium**

Outer corona lobes with short and broad basal pedicel and elliptic-oblong blade 2.0–2.5 × as long as pedicel; inner lobes rudimentary, up to 2 mm long. . . . . **P. mackenii**

### **angustifolium** Decne.

Perennial, grassland herb, 300–750 mm high. **Leaves** with blade linear to almost filiform. **Flowers**: blade of outer corona lobes sagittate-ovate, as long as pedicel, inner lobes filiform, 1.5–4.0 mm long; corona white and purple-tipped; alternating filaments filiform, 15–30 mm long; corolla green tinged with purple; Oct.–Dec., Mar. **Fruit** a follicle. Marshy grassland. *Round head*.




### **mackenii** Harv.

*P. kassnerianum* Schltr.

Perennial, grassland herb, 150–300 mm high. **Leaves** with blade linear to almost filiform. **Flowers**: blade of outer corona lobes oblong, or narrowly ovate-oblong to elliptic-oblong, 2–25 × as long as pedicel, inner lobes rudimentary, up to 2 mm long; corona green; filaments alternating with corona lobes minute; corolla pale green, tinged with purple; Nov.–Mar. Grassy vleis.




## **Piaranthus** R.Br. (sthn Afr.: 6 spp.)

### Key to species:

[after Bruyns: 347 (2005)]

Corolla with a distinct tube . . . . . **P. decipiens**
Corolla without a distinct tube . . . . . **P. cornutus** var. **cornutus**

### **cornutus** (Masson) N.E.Br. var. **cornutus**

*P. decorus* (Masson) N.E.Br. subsp. *cornutus* (N.E.Br.) Meve

Perennial herb, 10–50 mm high. **Stems** succulent; ovoid to cylindrical; pale to dark grey-green. **Leaves** rudimentary. **Flowers**: with or without sweet fruity scent; outer corona much reduced; corolla 15–28 mm wide, densely hairy, tube 0, lobes 8–12 × 3–5 mm, whitish to brownish yellow with reddish to brown dots. **Fruit** a follicle. Karroid shrubland.




### **decipiens** (N.E.Br.) Bruyns

Perennial herb, 20–150 mm high. **Stems** succulent; green to grey mottled purple. **Leaves** rudimentary. **Flowers**: outer corona much reduced; corolla 20–30 mm wide, campanulate, fleshy; tube cupular, 4–10 mm long, 7–10 mm broad at mouth; lobes 7–12 × 6–8 mm, deltate ovate, clavate hairs near base of sinus, surface papillate; maroon-red spotted on a yellow to cream-coloured background; Dec.–May. **Fruit** a follicle. Woodland in calcrete, sandy and rocky soil.



## **Raphionacme** (sthn Afr.: 18 spp.)

### Key to species:

1a Corolla uniformly purple to pink; corona lobes entire . . . . . **R. hirsuta**
1b Corolla green or green with brown, maroon or purple; corona lobes clearly trifid . . . . . 2
2a Corolla homogenously green . . . . . **R. velutina**
2b Corolla green with purple, brown or maroon . . . . . 3
3a Corolla green with bright violet to magenta inverted V-shaped marking; corona with lateral segments corniculate. . . . . .**R. dyeri**
3b Corolla green without bright violet to magenta inverted V-shaped marking; corona with lateral segments subulate. . . . . .**R. galpinii**

### **dyeri** Retief & Venter

Perennial, geophytic herb or dwarf shrub. **Stems** dichotomous branched, up to 250 mm high, reddish green, hirsute. **Leaves** with blade ovate, 20–65 × 5–15 mm, spreading, folded along midrib, dull green to blue-green; petioles 1–15 mm long. **Flowers**: corona lobes trifid, with central segment filiform, lateral segments corniculate, green to purplish; corolla lobes green with an inverted V-shaped band of bright purple or magenta; Oct.–Jan. **Fruit** a follicle. Grassland.

VreDm | | DrGr | | | |

### **galpinii** Schltr.

*R. elata* N.E.Br.
*R. macrorrhiza* Schltr.

Perennial herb, ± 600 mm in diameter, with large tuberous root. **Stems** single to few, erect, up to 1 m high; densely pubescent to sparsely puberulent, rarely glabrous. **Leaves** petiolate; blade broadly to narrowly ovate to obovate, elliptic to narrowly elliptic or linear, 25–160 × 5–30 mm, dark olive-green above, paler below, densely pubescent to sparsely puberulent, veins conspicuous; petioles 3–15 mm long. **Flowers**: corona lobes trifid, central segment 4–5 mm long, lateral segments subulate, 2–3 mm long, green, greenish maroon or greenish violet; sepals with lobes 3–5 mm long, subulate, acute, longer than corolla tube; corolla pubescent outside, on inside at base brownish green, maroon-green or violet-green fading to green towards tips; Aug.–Jan. **Fruit** a follicle. Grassland and rocky hillsides. *Mzizi* (X).

VreDm | | | | | |

### **hirsuta** (E.Mey.) R.A.Dyer ex E.Phillips

*R. divaricata* Harv.
*R. pubescens* (Hochst.) Hochst.

Perennial herb, up to 400 mm high, with large tuberous root, glabrous or pubescent with short spreading hairs. **Stems** dichotomously branched. **Leaves** with blade oblong-ovate, broadly elliptic, circular or obovate, 10–50 × 7–26 mm, dark green; petioles 1–6 mm long. **Flowers**: sepals 2–3 mm long, narrowly ovate, as long as or longer than corolla tube; corona lobes variable, entire or toothed; corolla purple to pink; Jul.–Jan. **Fruit** a follicle. Grassland. *False gentian*; *khadiwortel* (A); *intsema* (X); *umathangane*, *umathanjana* (Z).

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**velutina** Schltr.

*R. burkei* N.E.Br.

*R. dinteri* Schltr. ex Schinz

Perennial herb, 70–200 mm high, with large underground tuber. **Leaves** with blade linear, 20–45 × 5–9 mm, V-shaped in cross-section, puberulous below, glabrous or scabrous-hirsute on upper surface, green-grey, lower surface a darker green; petioles 2–6 mm long. **Flowers**: sepals twice or more longer than broad, narrow, very acute, shorter than corolla tube or rarely equalling it; corona lobes deeply trifid; corolla green; Sep.–Mar. **Fruit** a follicle. Grassland.

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## **Riocreuxia** Decne. (sthn Afr.: 8 spp.)

### Key to species:

[after Dyer: 227 (1983)]

1a Corolla with longitudinal purple, brown or purple-brown veins . . . . . **R. picta**

1b Corolla greenish yellow or pale yellow to white, tinged with red or purplish but without longitudinal veins . . . . . 2

2a Basal inflation of corolla tube restricted; staminal column 1.5–2.0 mm high; corona with 5 simple, filiform or linear, bifid or toothed, radiating outer corona lobes . . . . . **R. torulosa**

2b Basal inflation of corolla tube gradually narrowing into tube; staminal column 1 mm high; corona with 5 small pockets with slightly spreading outer margin, minutely notched with teeth face to face . . . . . **R. burchellii**

**burchellii** K.Schum.

*Ceropegia burchellii* (K.Schum.) H.Huber subsp. *burchellii*

*R. flanaganii* Schltr. subsp. *segregata* R.A.Dyer

Perennial herb. **Stems** twining. **Leaves** petiolate; blade heart-shaped, 30–120 × 20–80 mm; petioles 20–50 mm long. **Flowers**: staminal column ± 1 mm high; corona with 5 small pockets, with very slightly spreading outer margin, minutely notched with teeth face to face; inner corona lobes half to full height of anthers; corolla greenish yellow to white; Oct.–Mar. **Fruit** a follicle. Riverine bush or scrub.

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**picta** Schltr.

Perennial herb. **Stems** twining. **Leaves** petiolate, blade heart-shaped, up to 150 mm long; petioles up to 50 mm long. **Flowers**: buds abruptly acuminate-tailed; corona of 5 broad pockets confluent at base and with ovate outer margin; inner corona lobes obsolete; corolla green with purple, brown or purple-brown veins; Nov.–Apr. **Fruit** a follicle. Forest and forest margins.

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**torulosa** Decne.

*R. torulosa* Decne. var. *longidens* N.E.Br.

*R. torulosa* Decne. var. *obsoleta* N.E.Br.

Perennial herb. **Stems** twining. **Leaves** petiolate; blade heart-shaped, proportionally as long as broad, 20–120 mm long; petioles 15–65 mm long. **Flowers**: staminal column 1.5–2.0 mm

high; with 5 simple, filiform or linear, bifid or toothed, radiating outer corona lobes; inner corona lobes minute or obsolete; corolla pale yellow, tinged with red or purplish; Nov.–Mar. **Fruit** a follicle. Forest margins. *Candle-vine*; *kandelaarblom* (A); *morarana-oa-moru* (SS); *ugwapha* (Z).

MsGr KarSh

## **Sarcostemma** R.Br. (sthn Afr.: 2 spp.)

### **viminale** (L.) R.Br. subsp. **viminale**

Perennial shrub, with leafless stems. **Stems** succulent, trailing or twining, green to grey-green, strongly wax-covered, distinctly circular in cross-section, woody with age. **Leaves** rudimentary. **Flowers**: lateral and terminal, sessile, many-flowered umbels; corolla greenish white or sulphur-coloured; Jan.–Dec. **Fruit** a follicle. Bushveld woodland. *Caustic vine*; *melktou*, *spantoumelkbos* (A); *ntlalamela* (SS); *umbelebele* (X, Z).

DrGr KarSh

## **Schizoglossum** E.Mey. (sthn Afr.: 27 spp.)

### Key to species:

[after Kupicha: 602 (1984)]

1a Corolla lobes replicate (folded backward lengthwise) or with reflexed margins . . . . . 2
1b Corolla lobes flat to cucullate, not replicate . . . . . 4
2a Leaves invariably opposite and decussate; corolla 6–10 mm long; appendages of corona lobes several-toothed . . . . . **S. nitidum**
2b Leaves verticillate or irregularly inserted on at least part of stem, very rarely all opposite and decussate; corolla 3–5(–6) mm long; appendages of corona lobes simple or bifid. . . . . 3
3a Stems usually < 0.2 m high, usually with branches; inflorescences usually pedunculate . . . . . **S. bidens** subsp. **bidens**
3b Stems usually > 0.3 m high, rarely branched; inflorescences often sessile . . . . . .**S. bidens** subsp. **pachyglossum**
4a Corolla lobes usually concave or cucullate; corona with appendage greatly exceeding subtending lobe; corpusculum often flanged . . . . . .**S. atropurpureum** subsp. **atropurpureum**
4b Corolla lobes flat, not cucullate; corona without appendages or with appendages shorter to slightly longer than subtending lobe; corpusculum never flanged . . . . . 5
5a Leaves with blade ovate, < 2 × as long as broad . . . . . 6
5b Leaves linear. . . . . 9
6a Stems decumbent . . . . . .**S. montanum**
6b Stems erect. . . . . 7
7a Leaves up to 9 mm broad; corolla dark maroon or purplish brown . . . . . **S. stenoglossum** subsp. **stenoglossum**
7b Leaves up to 15 mm broad; corolla dark maroon or brown or greenish yellow . . . . . 8
8a Corona lobes erect or curved outwards; corolla lobes glabrous on ventral surface, almost always dark brown or maroon . . . . . .**S. stenoglossum** subsp. **latifolium**

8b Corona lobes curved forwards over gynostegium; corolla lobes usually pubescent on ventral surface, usually greenish yellow . . . . . **S. stenoglossum** subsp. **flavum**
9a Stems decumbent . . . . . **S. eustegioides**
9b Stems erect. . . . . 10
10a Peduncles ≥ 20 mm long; corona with needle-like projection extended over style head . . . . . **S. linifolium** var. **linifolium**
10b Inflorescences mostly sessile, if not, peduncles < 10 mm long; corona ovoid without any projection . . . . . **S. periglossoides**

### **atropurpureum** E.Mey. subsp. **atropurpureum**

Perennial, geophytic herb, 0.6–1.3 m high. **Stems** usually unbranched. **Leaves** decussate; blade oblong or oblong-triangular, 29–50 × 8–21 mm. **Flowers**: inflorescences 5–9 per stem, 8–15-flowered, umbel sometimes branched; corona green, with appendage greatly exceeding subtending lobe; corpusculum often flanged; gynostegium white tinged brownish purple; corolla lobes cucullate, 5.5–6.0 × 3.5–4.0 mm, outside dark brown-maroon, almost black, inside green striped brown; Jan.–Mar. **Fruit** a follicle. Grassland or scrub, usually at forest margins or beside streams. *Red milkwort*; *basoetoraap*, *melkwortel* (A); *sehoete-moro* (SS); *ishongwe* (Z).




### **bidens** E.Mey. subsp. **bidens**

Perennial, geophytic herb, 90–220 mm high. **Stems** usually branched. **Leaves** verticillate or irregularly arranged; blade linear, 34–60 × 2.5–7.0 mm. **Flowers**: inflorescences pedunculate, 3–7 per stem, 5–8-flowered; corona white; gynostegium white; corolla lobes 3.5–5.0 × 3–8 mm; green or brownish; Oct.–Jan. **Fruit** a follicle. Grassland.




### **bidens** E.Mey. subsp. **pachyglossum** (Schltr.) Kupicha

*S. pachyglossum* Schltr. var. *abbreviatum* N.E.Br.
*S. pachyglossum* Schltr. var. *pachyglossum*

Perennial, geophytic herb, 200–600 mm high. **Stems** rarely branched. **Leaves** verticillate or irregularly arranged, many and dense; blade linear, 27–45 × 1.5–9.0 mm. **Flowers**: inflorescences 9–13 per stem or more, sessile, 7–many-flowered; corona white; gynostegium white; corolla lobes replicate, 2.5–4.0 × 1.5–2.5 mm, yellowish green; Dec., Jan. **Fruit** a follicle. Grassland often in rocky areas.




### **eustegioides** (E.Mey.) Druce

Perennial, geophytic herb, 50–380 mm high. **Stems** procumbent to erect, well branched. **Leaves** narrowly ovate, 4–48 × 1–3 mm, base sometimes sagittate. **Flowers**: inflorescences pedunculate, 3–5-flowered; corolla campanulate, lobes flat, erect, margins revolute, tips recurved, outside green with brownish streak in middle, inside paler green to cream-coloured; Nov.–Feb. **Fruit** a follicle with echinate, 4 mm long processes. Karroid open shrubland.



**linifolium** Schltr. var. **linifolium**

Perennial, geophytic herb, 150–380 mm high. **Leaves** with blade filiform, 0.5–20.0 mm broad, glabrous. **Flowers**: peduncles ≥ 20 mm long; corona with needle-like projection extended over style head, lobes 15 mm long, thick and fleshy; corolla lobes flat, spreading, with recurved margins or replicate, 2–4 mm long; glabrous outside, minutely puberulous inside, greenish; mainly Oct.–Mar., Jun., Aug. **Fruit** a follicle. Grassland, open woodland and closed shrubland.




**montanum** R.A.Dyer

Perennial, geophytic herb, up to 50–120 mm high. **Stems** 1–several, branching from base, decumbent. **Leaves** with blade broadly ovate, ovate or ovate-elliptic, 7–14 × 5–9 mm. **Flowers**: inflorescences 1 or 2 per stem, 3–5-flowered; corolla lobes flat, ± 5 × 2.5 mm, margins slightly recurved, dull yellow; Nov.–Feb. **Fruit** a follicle. Grassland in stony and rocky soil. *Lebatheke* (SS).




**nitidum** Schltr.

Perennial, geophytic herb, 70–300 mm high. **Stems** rarely branched. **Leaves** opposite, decussate; blade linear, elliptic, narrowly ovate or triangular, 23–85 × 4–31 mm. **Flowers**: inflorescences 2–5 per stem, 3–7-flowered; corona yellow or white, appendages of lobes several-toothed; gynostegium white or pink; corolla lobes 6–10 × 3.0–4.5 mm, strongly replicate, glabrous, yellow, green, greenish brown and white striped brown or pink; Oct.–Dec., Jun. **Fruit** a follicle. Moist grassland, marshes or close to streams. *Split-tongue*; *stinkmelkgras* (A).




**periglossoides** Schltr.

Perennial, geophytic herb, 230–600 mm high. **Stems** erect, usually unbranched. **Leaves** with blade linear to narrowly ovate, 25–120 × 1.5–6.0 mm. **Flowers**: inflorescences 4–12 per stem, sessile, in upper $^{1}/_{3}$ of stem, 6–16-flowered; corona ovoid without any projection; corolla lobes spreading or suberect, flat, 4 mm long, puberulous outside, glabrous or minutely puberulous inside, green with purple-brown outside and whitish to cream-coloured inside; Sep.–Jan. **Fruit** a follicle. Grassland near vleis.




**stenoglossum** Schltr. subsp. **flavum** (N.E.Br.) Kupicha

Perennial, geophytic herb, 180–480 mm high. **Stems** unbranched, erect. **Leaves** decussate; blade linear to narrowly ovate, 54–83 × 4–15 mm. **Flowers**: inflorescence ± 3 per stem, 2–5-flowered; corona greenish yellow, tips inflexed over gynostegium; corolla lobes flat, 7.5–10.0 × 3–5 mm, usually pubescent on ventral surface, greenish yellow, striped brown, rarely brown hairy; Oct.–Dec., Jan. **Fruit** a follicle. Grassland.




**stenoglossum** Schltr. subsp. **latifolium** Kupicha

Perennial, geophytic herb, 160–510 mm high. **Stems** unbranched, erect. **Leaves** decussate; blade linear to narrowly ovate, 45–58 × 3–15 mm. **Flowers**: inflorescences 3 or 4 per stem,

5–8-flowered; corona lobes flat, tips recurved, 8–9 × 3.0–3.5 mm, glabrous inside, dark brown or maroon striped, rarely yellow-green with brown stripes; Nov., Dec. **Fruit** a follicle. Mountain grassland.




### **stenoglossum** Schltr. subsp. **stenoglossum**

Perennial, geophytic herb, 250–450 mm high. **Stems** unbranched, erect. **Leaves** decussate; blade linear to narrowly ovate, 40–70 × 2–9 mm. **Flowers**: inflorescences 2–5 per stem, 3–6-flowered; corona lobes simple, erect, exceeding gynostegium tip, green or yellow with purple tips; corolla lobes flat, 6–9 × 2.5–3.5 mm, deep red, maroon or purplish brown; Oct.–Jan. **Fruit** a follicle. Mountain grassland. *Simple schizoglossum*.




## **Secamone** R.Br. (sthn Afr.: 5 spp.)

### **alpini** Schult.

Scrambling shrub. **Leaves** usually with a waxy epidermis and secondary veins parallel; 7–25 mm broad, oblong elliptic or narrowly ovate; blade 16–90 × 5–35 mm. **Flowers**: pollen gathered in 4 pollinia attached to a soft, pale corpuscle; style apex equalling or shortly exceeding anther tips, entire; corolla lobes white-pubescent inside, white yellow or greenish white; Sep.–Feb. **Fruit** a follicle. Forest, often riverine.




## **Sisyranthus** E.Mey. (sthn Afr.: 13 spp.)

### Key to species:

[after Brown: 788 (1908)]

Corolla tube with only 5 small tufts of deflexed hairs at throat. . . . . **S. imberbis**
Corolla tube entirely deprived of hairs within . . . . . **S. randii**

### **imberbis** Harv.

Perennial herb, 380–990 mm high, with fusiform roots. **Stems** usually unbranched, glabrous. **Leaves** with blade linear, 30–130 × 0.5–2.5 mm, folded lengthwise. **Flowers**: inflorescences 2–6 per stem, 2–7-flowered; corona lobes shorter than or not exceeding anthers; corolla broadly campanulate to cup-shaped, lobes glabrous inside, tube with 5 small tufts of deflexed hairs in throat, slightly contracted in throat, yellow or greenish; Oct.–Dec. **Fruit** a follicle. Wet grassland.




### **randii** S. Moore

Perennial herb, 450–750 mm high, with fusiform roots. **Leaves** with blade filiform or narrowly linear, 76–140 × 0.5–1.0 mm, channelled down face or longitudinally folded. **Flowers**: inflorescences

3–7-flowered; corolla depressed-globose, lobes and tube glabrous, cream-coloured, green, greenish brown, white to yellowish; Sep.–Mar. **Fruit** a follicle. Marshy areas in grassland.

DrGr MsGr

## **Stapelia** L. (sthn Afr.: 45 spp.)

### Key to species:

[after Bruyns: 422 (2005)]

Robust plants with square stems (in cross-section); corolla 80–220 mm wide . . . . . **S. grandiflora**
Neat plants with distinctly grooved purplish flanks on stems; corolla 20–40 mm wide . . . . . **S. olivacea**

### **grandiflora** Masson

Perennial herb, with clumps up to 1 m wide. **Stems** succulent, square in cross-section, 60–300 mm high, 20–40 mm wide, pubescent, green-grey. **Leaves** rudimentary. **Flowers**: bud typically rounded; corolla rotate, 80–220 mm wide, lobes with long, simple, white hairs on margins, with purple ridges and yellow depressions, becoming uniformly pink-purplish towards tips; Jan.–Dec. **Fruit** a follicle. Grassland, open woodland and closed shrubland. *Makghaap*, *slangghaap* (A).

DrGr KarSh

### **olivacea** N.E.Br.

Perennial herb, with compact clumps, 50–150 mm wide. **Stems** succulent, erect, pubescent, grey-green along flanks, grooves in between a darker green or purplish, 20–120 mm high, 6–10 mm wide. **Leaves** rudimentary. **Flowers**: corolla 20–40 mm wide, almost flat, white hairs along margins, dark maroon-red to greenish; Dec.–Aug. **Fruit** a follicle. Karroid shrubland. *Agurkie* (A).

KarSh

## **Stenostelma** Schltr. (sthn Afr.: 3 spp.)

### Key to species:

1a Corona lobes small without any extended sides at apical portion . . . . . **S. umbelluliferum**
1b Corona lobes dorsally somewhat flattened with apical horn exceeding the gynostegial column and sides somewhat extended horizontally . . . . . 2
2a Apical horn of corona bending inwards over gynostegial column, channelled on ventral surface, side flanks slightly extended . . . . . **S. corniculatum**
2b Apical horn of corona upright or bending outward, solid cylindrical throughout, side flanks markedly extended to form keels. . . . . **S. capense**

### **capense** Schltr.

*Krebsia stenoglossa* (Schltr.) Schltr.
*Schizoglossum capense* (Schltr.) H.Huber

Perennial, geophytic herb, 150–250 mm high. **Leaves** with blade narrowly ovate. **Flowers**: inflorescence pedunculate; pedicels 3–6 mm long; corona with apical horn upright or bending

outward, solid cylindrical throughout, side flanks markedly extended to form keels; corona lobes 5 mm long, dark purple with whitish margins; corolla cup-shaped, edge revolute, tips recurved, yellowish green outside, cream-coloured to pale pink inside; Sep.–Dec. **Fruit** a follicle. Grassland.

DrGr KarSh

**corniculatum** (E.Mey.) Bullock
*Schizoglossum corniculatum* (E.Mey.) R.A.Dyer
*Krebsia corniculata* (E.Mey.) Schltr.

Perennial, geophytic herb, 100–200 mm high. **Leaves** with blade narrowly ovate, base sagittate to truncate. **Flowers**: inflorescence subsessile; pedicels 2 mm long; corona with apical horn bending inwards over gynostegial column, channelled on ventral surface, side flanks slightly extended; corona lobes 6–8 mm long, purple-brown with paler margins; corolla cup-shaped, edge revolute, tips recurved; green with maroon outside, cream-coloured to white inside; Nov.–Mar., Jun. **Fruit** a follicle. Grassland.

DrGr

**umbelluliferum** (Schltr.) Bester & Nicholas
*Schizoglossum umbelluliferum* Schltr.

Perennial, geophytic herb, up to 200 mm high, with tuber carrot-shaped. **Leaves** narrowly ovate, margins revolute, hairy. **Flowers**: inflorescences on axillary or terminal nodes; corona lobes small without any extended sides at apical portion; corolla cup-shaped, edge revolute, tips recurved, green to cream-coloured outside, pink inside; Sep.–Mar. **Fruit** a follicle. Grassland and savanna on black turf.

DrGr

## **Tavaresia** Welw. (sthn Afr.: 3 spp.)

**barklyi** (T.-Dyer) N.E.Br.
*Decabelone barklyi* T.-Dyer
*D. grandiflora* (Dinter) A.Berger

Perennial herb, 75–100 mm high. **Stems** succulent, with 7–12 tuberculate ribs in cross-section; tubercles with 3 bristles. **Leaves** rudimentary. **Flowers**: corona purple-brown; corolla tubular, glabrous, papillate within segments of outer coronal lobes, long attenuate, terminated by subglobose knobs, outside pale greenish or greenish, white spotted with purple-red; inside pale yellowish, with purple-red spots, base purple-red; Nov.–Mar. **Fruit** a follicle. Karroid shrubland, dry conditions, but often in shade of trees.

KarSh

## **Tridentea** Haw. (sthn Afr.: 17 spp.)

### Key to species:

[after Bruyns: 533 (2005)]

1a Outer corona lobes bifid or simple . . . . . **T. jucunda**
1b Outer corona lobes trifid . . . . . 2

2a Corolla inside uniformly bright yellow to greenish yellow, 20–35 mm wide . . . . . **T. virescens**

2b Corolla inside with dark brown to almost black or purple-black, with scattered, small, irregular, yellowish or buff markings, 45–100 mm wide . . . . . **T. gemmiflora**

### **gemmiflora** (Masson) Haw.

*Stapelia gemmiflora* Masson

Perennial herb, clumps up to 500 mm wide. **Stems** succulent, 50–150 × 10–15 mm. **Leaves**: rudiments 5–10 mm long. **Flowers**: pedicels short, 10–20(–40) mm long; corona lobes deeply 3-dentate, inner lobes 2-horned, yellow, marked with dark purple; corolla lobes prominently ciliate, 45–100 mm wide, rotate, green outside, purple-spotted brownish towards apex of lobes, inside dark brown to almost black or purple-black, with scattered, small, irregular, yellowish or buff markings; Oct.–May. **Fruit** a follicle. Karroid shrubland and closed woodland in red sandy soil.

KarSh

### **jucunda** (N.E.Br.) L.C.Leach

Perennial herb, clumps 60–150 mm wide. **Stems** succulent; 30–120 mm high, 8–15 mm in diameter. **Leaves**: rudiments 1.5–5.0 mm long. **Flowers**: pedicels 15–30 mm long; outer corona lobes shortly to deeply bifid, channelled on inner face, inner lobes tapering narrowly in a column above gynostegial column, cream-coloured marked purple; corolla lobes marginally ciliate, 20–35 mm wide, rotate, pale green outside marked with dark purple, inside cream-coloured with purple-brown to red-brown spots becoming larger and more crowded towards margins; Sep.–Apr. **Fruit** a follicle. Karroid shrubland.

KarSh

### **virescens** (N.E.Br.) L.C.Leach

Perennial herb, clumps up to 500 mm wide. **Stems** succulent, 30–150 mm high, 8–15 mm in diameter. **Leaves**: rudiments 5–10 mm long. **Flowers**: pedicels short, 15–80 mm long; outer corona lobes deeply 3-dentate, central lobe 2 mm, side lobes 1 mm; inner lobes 2-horned, 3–4 mm long, bright yellow, marked with dark purple; corolla deeply lobed, 20–35 mm wide, rotate, densely papillate-rugose, outside pale green to pink, inside bright yellow to green-yellow; Feb.–Jun., Nov. **Fruit** a follicle. Karroid shrubland and false grassland.

KarSh

## **Xysmalobium** R.Br. (sthn Afr.: 21 spp.)

### Key to species:

[after Langley: 41(1980)]

1a Stems procumbent or decumbent . . . . . **X. parviflorum**

1b Stems erect. . . . . 2

2a Corolla lobes densely hairy; hairs argyrocomous and clavate on upper half of inner surface. . . . . 3

2b Corolla lobes sparsely hairy or not; hairs if present, shortly recurved or multicellular, not clavate . . . . . 5

3a Plants a low-growing, erect, perennial herb, 0.1–0.8 m high; leaves broadly lanceolate, tapering distinctly from base to apex; pericarp smooth, glabrous with a few short upwardly recurving spines . . . . . .**X. stockenstromense**
3b Plants erect, up to 1.8 m high; leaves lanceolate, ovate, ovate-lanceolate, subligulate or linear; pericarp with dense filiform processes . . . . . 4
4a Leaves broadly linear, lanceolate, ovate-lanceolate to elliptic with margins undulate . . . . . **X. undulatum** var. **undulatum**
4b Leaves narrowly lanceolate to linear with margins not undulate . . . . . .**X. undulatum** var. **ensifolium**
5a Leaf margins smooth, entire; corona lobes oval, fleshy, tapering into bifid apices due to small central notch or deep cleft . . . . . .**X. involucratum**
5b Leaf margins crisped or undulate; corona lobes tapering from base upwards to produce a broadly obtuse apex which is either solid or with a small central notch . . . . . 6
6a Corolla lobes reflexed . . . . . .**X. gomphocarpoides** var. **gomphocarpoides**
6b Corolla lobes erect, ascending or spreading, not reflexed . . . **X. brownianum**

## **brownianum** S.Moore

Perennial herb, 150–300 mm high. **Stem** solitary or 1- or 2-branched from base, erect. **Leaves** with blade elongated, narrowly ovate-deltoid, broadly ovate, oblong or suborbiculate, 24–43 × 20–36 mm, subsessile, glabrous; crisped on margins. **Flowers**: 7–12-flowered, sessile or subsessile, up to 13 lateral umbels; corona lobes ± as long as broad, fleshy; corolla globose-campanulate, glabrous on inner face, lobes erect, ascending or spreading, 3.5–5.5 × 1–3 mm, brown-red, pale brown or cream-coloured; Nov., Dec. **Fruit** a follicle. Grassland.




## **gomphocarpoides** (E.Mey.) D.Dietr. var. **gomphocarpoides**

Perennial herb, 100–600 mm high. **Stems** erect. **Leaves** with blade narrowly linear-ovate, basal leaves elliptic-ovate, 50–162 × 3–31 mm, midvein prominent, margins scabrid and undulate. **Flowers**: 4–8-flowered, subspherical inflorescence, 4–12 per stem; corona truncate to linear-oblong flanked by two small auricles at base, cream-coloured; corolla 6–10 × 3–5 mm, reflexed with margins revolute, greenish mauve to yellowish green; Oct.–Apr. **Fruit** a follicle. Grassland.




## **involucratum** (E.Mey.) Decne.

Perennial herb, 100–360 mm high. **Stems** erect. **Leaves** with blade linear to narrowly lanceolate, 36–130 × 1–9 mm, margins smooth, entire. **Flowers**: 14–32-flowered, globose or semispherical, terminal inflorescences, 1–9 per stem; corona lobes shorter than staminal column, oval, fleshy, tapering into bifid apices due to small central notch or deep cleft; corolla reflexed, glabrous on inner face, sweetly scented, yellowish green or cream-coloured to white; Sep.–Feb. **Fruit** a follicle. Grassland. *Scented xysmalobium*; *hongersnoodbossie*, *hongernoodswortel* (A); *udambisa omkhulu* (Z).




## **parviflorum** Harv. ex Scott-Elliot

Perennial herb, 80–320 mm high. **Stems** decumbent or procumbent; many branched. **Leaves** with blade ovate or narrowly ovate, 21–46 × 6–23 mm, thinly and harshly pubescent. **Flowers**: in a 9–33-flowered, globose inflorescence, 14–27 mm wide, 1–4 per stem or solitary and terminal; corona light yellow to brown, lobes fleshy; corolla lobes suberect, without gibbosity

on inner face, greenish white, sometimes purplish dorsally; Oct.–Apr. **Fruit** a follicle. Grassland. *Octopus cartwheel*; *leoto-la-khoho*, *ntsime*, *tsoetla* (SS).

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### **stockenstromense** Scott-Elliot

Perennial herb, 100–800 mm high. **Stem** solitary, many branched from base, erect. **Leaves** with blade narrowly ovate, 73–200 × 15–45 mm, apex attenuate, base obtuse, margins undulate, slightly thickened and revolute, glabrous. **Flowers**: pedunculate, 15–21-flowered, lateral and terminal, globose inflorescences, 1–5 per stem; pericarp smooth, glabrous with a few short upwardly recurving spines; corona lobes fleshy; corolla lobes erect or suberect, glabrous outside, densely white-pubescent at recurved tips on inner face; corolla cream-coloured or yellow-green tipped with brown or maroon; Nov.–Jan. **Fruit** a follicle. Grassland. *Mountain uzura*.

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### **undulatum** (L.) Aiton f. var. **ensifolium** Burch. ex Scott-Elliot

*X. ensifolium* Burch. ex Scott-Elliot

Perennial herb, 0.5–1.8 m high. **Stems** 1–9, erect. **Leaves** with blade narrowly ovate to linear, margins not undulate. **Flowers**: in pedunculate, 8–35-flowered, lateral and terminal, globose inflorescences, up to 72 mm wide, 4–13 per stem; pericarp with dense filiform processes; corona dull white, tinged with purple, lobes fleshy; corolla lobes erect or suberect pubescent outside, densely white-pubescent at recurved tips on inner face, dull green; Oct.–Apr. **Fruit** a follicle. Grassland.

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### **undulatum** (L.) Aiton f. var. **undulatum**

Perennial herb, 0.5–1.8 m high. **Stems** 1–9, erect. **Leaves** with blade ovate or narrowly ovate, 82–270 × 15–70 mm, margins undulate, pubescent. **Flowers**: in pedunculate, 8–35-flowered, lateral and terminal, globose inflorescences, up to 72 mm wide, 4–13 per stem; pericarp with dense filiform processes; corona dull white, tinged with purple, lobes fleshy; corolla lobes erect or suberect pubescent outside, densely white-pubescent at recurved tips on inner face, dull green; Oct.–Apr. **Fruit** a follicle. Grassland. *Waved-leaved xysmalobium*, *milk bush*; *bitterhoutwortel*, *bitterwortel* (A); *pohotshehele*, *leshokhoa* (SS); *iyeza elimhlophe* (X); *iShongwe* (Z).

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# AQUIFOLIACEAE

Evergreen or deciduous trees or shrubs. **Leaves** simple, alternate, rarely opposite; stipules absent or minute. **Flowers**: solitary to a few in fascicles or axillary cymes; bisexual or unisexual, regular; sepals 3–6, ± basally connate; petals usually 4, only united at base; stamens 4 or 5; ovary superior, style terminal, stigma globose or ovoid. **Fruit** a berry, usually with 4 pyrenes. *Holly family*.

## **Ilex** L. (sthn Afr.: 1 sp.)

**mitis** (L.) Radlk. var. **mitis**
*I. capensis* Sond.

Tree or shrub, up to 16 m high. **Bark** whitish or grey, young stems reddish. **Leaves** petiolate; blade elliptic to narrowly ovate or obovate, 40–130 × 10–45 mm, base cuneate, apex acute, margins entire or with a few teeth towards apex, midrib sunken above; petioles usually reddish. **Flowers**: axillary, solitary or congested; pedicellate; petals white; Oct.–Dec. **Fruit** globose, ± 6–7 mm in diameter, slowly ripening from greenish pink to dark crimson. Riverbanks, streambeds, evergreen forests. *African holly*, *Cape holly*; *without*, *witwaterhout* (A); *phugile*, *phukgu*, *mollo-oa-phofu*, *motoo a phofu*, *mofusata* (SS).

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# ARALIACEAE

Trees or shrubs. **Stems** solid. **Leaves** alternate, rarely opposite; petiolate; simple, digitately lobed or once or twice digitately compound; stipules present, often fused to base of petiole. **Flowers**: in umbels or spikes; bisexual, regular, often greenish; petals 5, free; stamens 5–10; ovary inferior. **Fruit** a berry or drupe, or of 2 readily separable mericarps. *Cabbage tree family*.

## **Cussonia** Thunb. (sthn Afr.: 10 spp.)

Key to species:

Leaves digitately compound; leaflet blade with margins entire or slightly toothed in upper part of blade . . . . . **C. paniculata** subsp. **paniculata**

Leaves digitately compound; leaflet blade conspicuously shallowly to deeply lobed . . . . . .**C. paniculata** subsp. **sinuata**

**paniculata** Eckl. & Zeyh. subsp. **paniculata**

Tree, up to 5 m high. **Leaves** digitately compound, 7–11 leaflets per blade; greyish green; leaflet blade with margins entire or slightly toothed in upper part of blade, 195–260 × 38–54 mm. **Flowers**: in racemose spikes; corolla green or yellowish green; Nov.–Apr. Rocky places. *Small mountain cabbage tree*; *klein-bergkiepersol* (A).

Zastr

**paniculata** Eckl. & Zeyh. subsp. **sinuata** (Reyneke & Kok) De Winter

*C. paniculata* Eckl. & Zeyh. var. *sinuata* Reyneke & Kok

Tree, up to 5 m high. **Leaves** digitately compound, 9–13 leaflets per blade; pale bluish green; leaflet blade conspicuously shallowly to deeply lobed, sinuate (wavy), 170–280 × 46–62 mm. **Flowers**: in racemose spikes; corolla green or yellowish green; Jan.–Jul. Hillsides and grassland. *Highveld cabbage tree*, *mountain cabbage tree*; *hoëveld-kiepersol*, *bergkiepersol* (A); *mosêtsê* (T); *umsenge* (Z).

DrGr MsGr KarSh Zastr

# ASTERACEAE

Compiled by P.P.J. Herman, E. Retief & N.L. Meyer

Herbs, shrubs or rarely trees. **Leaves** usually alternate, rarely opposite, often in a basal rosette, without stipules. **Inflorescence** a head with 1–many individual florets, aggregated on a common receptacle and surrounded by an involucre of 1–many rows of bracts, often resembling a single flower. **Involucral bracts** in 2–many rows, free and imbricate or ± connate, or sometimes in 1 row and united or with cohering overlapping margins, thickened region in lower part of bracts referred to as stereome; sometimes additional outer row of smaller bracts (calyculus) present. **Receptacle** flat, hemispherical or conical, with scales or setae subtending florets (paleate), or epaleate and surface smooth, areolate or shallowly to deeply honeycombed (alveolate); alveoli often fimbriate or setose. **Florets** of 4 different kinds: **ray florets** have corollas with obvious, strap-shaped blades, apically 3- or 4-lobed, sometimes with 2 smaller inner lobes, arranged in 1 or 2 rows on periphery of head, usually female or neuter, rarely bisexual; **disc florets** have tubular corollas, apically 4- or 5-lobed, rarely only 3-lobed, centrally situated, bisexual, functionally male or unisexual; **outer tubular-filiform florets** have reduced corollas with short, slender tube, apically minutely (1)2- or 3-lobed, corolla sometimes absent, arranged in 1–many rows on periphery of head, female; **ligulate florets** have corollas with obvious, strap-shaped blades, apically 5-lobed, covering head, mostly bisexual. **Flower heads** with only 1 kind or different combinations of florets: **radiate heads** contain ray and disc florets; **disciform heads** contain outer tubular-filiform florets and central disc florets; **discoid heads** contain only disc florets; **ligulate heads** contain only ligulate florets. **Calyx** (referred to as the **pappus** in this family) modified into scales, bristles, hairs or absent. **Corolla** of (3–)5 ± united petals, rarely 0. **Stamens** (3–)5; filaments free, arising on corolla tube;

anthers usually apically appendaged, thecae rounded, sagittate (tailed/caudate) and/or calcarate at base. **Style** of bisexual or functionally male florets elongating within anther tube, shallowly to deeply bifid, style branches with stigmatic areas on inner sides, apex acute, rounded or truncate, sometimes produced beyond stigmatic surfaces as triangular, subulate or clavate appendages; style of female florets simpler, with acute to rounded style branches. **Ovary** inferior, of 2 united carpels, unilocular with 1 erect, basal ovule. **Fruit** with cypsela unilocular, 1-seeded, indehiscent, very rarely fleshy with single seed enclosed in hard endocarp (drupe), sometimes produced apically into a beak (rostrum), crowned by persistent or caducous pappus, or epappose. *Daisy family*; *madeliefiefamilie* (A).

## Key to tribes

[after Jeffrey & Pope in Pope: 2 (1992) and descriptions in Keeley & Jansen: 173 (1991)]

In the key to tribes, the Helenieae key out twice together with the Heliantheae. The main difference between these two tribes is the presence (Heliantheae) or absence (Helenieae) of receptacular paleae.

1a Corollas all ligulate, equally 5-toothed at apex; latex present in plant . . . . . **Cichorieae** (p. 255)

1b Corollas tubular, or if radiate, then these with 4 or fewer equal or unequal apical teeth; latex rarely present . . . . . 2

2a Style branches with conspicuous papillose appendages; flower heads discoid, with florets all bisexual, not yellow; corollas with (4)5 relatively short, broad apical lobes; mature cypselae black[1] . . . . . **Eupatorieae** (only one genus in FS: **Campuloclinium**) (p. 280)

2b Style branches, flower heads, corollas and mature cypselae not showing the above combination of character states . . . . . 3

3a Involucral bracts uniseriate, cohering by their overlapping margins, or partly or wholly connate, with or without a calyculus; pappus present . . . . . 4

3b Involucral bracts imbricate, bi- or multiseriate, free or connate; OR uniseriate but then bracts not cohering or pappus 0 or flower heads unisexual or cypselae densely villous with long hairs from base. . . . . 5

4a Involucral bracts with evident, elongated oil glands; cypselae black[1] when mature. . . . . .**Helenieae** (p. 257)

4b Involucral bracts without elongated oil glands; cypselae not black[1] when mature. . . . . **Senecioneae** (p. 258)

5a Style branches long, gradually attenuate-acute, shortly hairy on outside, style shaft similarly hairy on upper part; flower heads discoid, all florets bisexual. . . . . **Vernonieae** (p. 259)

5b Styles and flower heads not exhibiting above combination of character states, or heads unisexual. . . . . 6

6a Flower heads with all or only outer florets bilabiate; corollas of ray and/or disc florets with 3-toothed outer lips and 2-lobed inner lips . . . **Mutisieae** (p. 258)

6b Flower heads without any such bilabiate florets . . . . . 7

7a Flower heads discoid; involucral bracts without scarious unlobed appendages or apices, and without scarious margins; OR heads radiant (heads discoid but outer florets ± enlarged and sterile, not true ray florets); OR heads unisexual and plants dioecious; appendages of involucral bracts, if present, spiniform and/or pinnately divided . . . . . 8

[1]consider cypselae to be black if the body of the mature cypsela is shiny black, at least in part; paler striations, ribs or wings may be present.

7b Flower heads radiate or disciform but not radiant as above; OR heads discoid and involucral bracts with unlobed, scarious, often white or coloured appendages or apices or with scarious, usually brownish margins, but not with spiniform and/or pinnately divided appendages; OR heads unisexual and plants monoecious . . . . . 12
8a Leaves spiny or bristly spiny at least towards base . . . . . 9
8b Leaves neither spiny nor bristly spiny . . . . . 10
9a Anthers tailed (caudate); receptacle densely setose . . . . . **Cardueae** (p. 255)
9b Anthers not tailed (ecaudate); receptacle alveolate with fringed alveolae . . . . . **Arctotideae** (p. 253)
10a Corolla lobes of tubular florets much longer than broad; leaves alternate; flower heads of > 1 floret, not aggregated into glomerules . . . . . .11
10b Corolla lobes ± as long as broad, or if much longer than broad, then leaves opposite; flower heads sometimes of only 1 floret, or heads aggregated into glomerules . . . . . 12
11a Receptacle densely setose; inner florets bisexual, outer sterile . . . . . **Cardueae** (p. 255)
11b Receptacle naked, not setose; all florets unisexual; plants dioecious . . . . . **Tarchonantheae** (p. 259)
12a Style branches of disc florets connate in lower part, connate part thicker than style shaft and abruptly marked off from it by ring of short hairs at its base; flower heads always bisexual . . . . . **Arctotideae** (p. 253)
12b Style branches of disc florets long to short or absent but connate lower part of style branches, if present, not as above or flower heads unisexual and plants monoecious. . . . . 13
13a Receptacle paleate and leaves opposite, or leaves not opposite and mature cypselae black[1] and/or flower heads glomerulate; OR receptacle epaleate and pappus of scales and/or leaves opposite and/or mature cypselae black and/or heads unisexual and/or heads glomerulate; pappus not of slender bristles, or if of bristles then bristles plumose . . . . . .**Heliantheae** and **Helenieae** (p. 257)
13b Receptacle epaleate (although sometimes hairy or fimbrillate); OR receptacle paleate and leaves not opposite (although sometimes opposite on upper stem) and cypselae not black[1] when mature, or flower heads not unisexual; heads glomerulate or not; OR if lower leaves opposite then pappus of slender barbellate bristles, at least in disc florets, or pappus 0, receptacle naked and heads not glomerulate . . . . . 14
14a Style branches of bisexual or functionally male florets each with a subulate to triangular papillose appendage . . . . . 15
14b Style branches of bisexual or functionally male florets acute to rounded, or truncate and fringed with short hairs or papillae, or shortly conical at apex with subdistal fringe of hairs, not appendaged; or style undivided . . . . . 16
15a Receptacle alveolate; pappus a deeply and unequally laciniate corona; flower heads disciform. . . . . .**Heliantheae** and **Helenieae** (p. 257)
15b Receptacle, pappus and flower heads not showing the above combination of character states . . . . . .**Astereae** (p. 254)
16a Involucral bracts with scarious, usually brown, often erose margins, not appendaged; leaves often pinnatipartite; style branches apically truncate and fringed, or style undivided and truncate; pappus 0, or if present, then a short lacerate crown or lobed auricle, or leaves pinnatipartite and outer pappus of 5 white petaloid scales. . . . . .**Anthemideae** (p. 252)
16b Involucral bracts green and herbaceous (though often with hyaline margins), or with scarious, membranous, often white or coloured appendages or apices, or rarely appendages foliose; leaves never pinnatipartite; a pappus

[1]consider cypselae to be black if the body of the mature cypsela is shiny black, at least in part; paler striations, ribs or wings may be present.

of hairs or scales present in at least some florets, or if 0 then style branches not truncate and fringed . . . . . 17
17a Pappus 0; fruit with large, curved, angular or winged cypselae, or smooth drupes; flower heads radiat . . . . . **Calenduleae** (p. 254)
17b Pappus present or 0; fruit with small cypselae and not as above; flower heads radiate, discoid or disciform . . . . . 18
18a Flower heads radiate; ray florets neuter, or if fertile, then style branches shortly conical at apex with subdistal fringe of hairs . . . . . **Mutisieae** (p. 258)
18b Flower heads radiate, disciform or discoid; ray florets, if present, female; style branches not as above . . . . . 19
19a Stems without resin ducts; leaves generally entire, with hairs of type B (hairs with 1 basal cell and a very long terminal cell); involucral bracts with entire or divided sclerenchymatous basal portion; pollen with 2-layered double sexine . . . . . **Gnaphalieae** (p. 256)
19b Stems with or without resin ducts; leaves dentate, denticulate, serrulate or pinnatifid, rarely entire, with hairs of type A (multiseptate hairs with short cells); involucral bracts with undivided sclerenchymatous portion; pollen with 1-layered sexine . . . . . **Inuleae** (p. 258)

# Tribe Anthemideae

## Key to genera

[after Bremer & Humphries: 84 (1993)]

1a Receptacle distinctly paleate with paleae subtending florets . . . . . 2
1b Receptacle completely epaleate (though sometimes pilose or hirsute) or flower heads few-flowered and presence of paleae unclear . . . . . 10
2a Flower heads radiate . . . . . 3
2b Flower heads discoid or disciform . . . . . 8
3a Ray florets yellow, rarely abaxially reddish. . . . . **Ursinia**
3b Ray florets white or rarely pink to reddish or purplish on both sides . . . . . 4
4a Cypselae copiously villous . . . . . 5
4b Cypselae glabrous, sometimes glandular or papillose . . . . . 6
5a Involucral bracts 2–4-seriate . . . . . **Lasiospermum**
5b Involucral bracts uniseriate . . . . . **Eriocephalus**
6a Shrubs with decussate leaves; cypselae with 10 or more ribs . . . **Eumorphia**
6b Herbs or rarely shrubs with alternate leaves (rarely with some leaves opposite basally on stem); cypselae various . . . . . 7
7a Cypselae dorsiventrally flattened and with 2 lateral ribs but no wings. . . . . **Achillea**
7b Cypselae various, sometimes dorsiventrally flattened but then rhombic in cross-section and without 2 lateral ribs and not or only narrowly winged . . . . . **Anthemis**
8a Pappus present, of scales, an auricle or a corona. . . . . **Inulanthera**
8b Pappus 0 but cypselae sometimes apically with obtuse rim. . . . . 9
9a Involucral bracts 2–4-seriate . . . . . **Lasiospermum**
9b Involucral bracts uniseriate . . . . . **Eriocephalus**
10a Flower heads radiate . . . . . **Phymaspermum**
10b Flower heads discoid or disciform . . . . . 11
11a Pappus present, of scales, an auricle or a corona. . . . . 12
11b Pappus 0 but cypselae sometimes apically with obtuse rim (mainly abaxial and somewhat toothed in *Oncosiphon*) . . . . . 13
12a Annual herbs . . . . . **Oncosiphon**
12b Subshrubs, dwarf shrubs or shrubs . . . . . **Pentzia**

13a Leaves opposite . . . . . 14
13b Leaves alternate, rarely opposite . . . . . 15
14a Flower heads corymbose . . . . . **Gymnopentzia**
14b Flower heads solitary or sometimes with 1 or 2 additional heads from leaf axils below . . . . . **Pentzia**
15a Flower heads in elongated and paniculate, rarely racemiform or spiciform synflorescences, often small and many . . . . . **Artemisia**
15b Flower heads solitary or in lax to dense corymbs or umbels, small to medium-sized . . . . . 16
16a Central floret corolla 4-lobed (rarely 3-lobed in *Cotula*) . . . . . 17
16b Central floret corolla 5-lobed. . . . . 20
17a Cypselae dorsiventrally flattened with 2 lateral ± distinct ribs or wings. . . . 18
17b Cypselae not or only slightly dorsiventrally flattened without or with 3–5 ribs and no wings . . . . . 19
18a Dwarf shrubs, subshrubs or perennial herbs with corymbose flower heads . . . . . **Schistostephium**
18b Annual or perennial herbs with solitary flower heads, rarely few together. . . . . **Cotula**
19a Disc corolla tube very much swollen and brittle . . . . . **Oncosiphon**
19b Disc corolla tube not or only slightly swollen; cypsela wall either white and spongy with 1 adaxial and 2 lateral weak ribs, abaxially thin or cypsela almost terete and thin-walled all around. . . . . **Foveolina**
20a Annual herbs . . . . . **Foveolina**
20b Perennial herbs or often subshrubs, dwarf shrubs or shrubs. . . . . 21
21a Cypselae 10–18-ribbed . . . . . **Phymaspermum**
21b Cypselae with 0 or fewer than 10 ribs. . . . . **Pentzia**

# Tribe Arctotideae (including tribe Platycarpheae)

## Key to genera

[after Dyer: 659 (1975) and Hilliard: 529 (1977)]

1a Flower heads discoid, massed in a cushion covering crown of root and surrounded by a rosette of leaves. . . . . **Platycarphella**
1b Flower heads radiate, if discoid, then not massed in a cushion surrounded by leaves . . . . . 2
2a Involucral bracts ± free, the inner ones at least obtuse, scarious at tips and on margins . . . . . 3
2b Involucral bracts connate at base or higher, acute or acuminate, often spine-tipped . . . . . 5
3a Ray florets sterile, not producing cypselae; pappus 0 or of small scales. . . . . **Arctotheca**
3b Ray florets female, producing cypselae . . . . . 4
4a Acaulescent herbs . . . . . **Haplocarpha**
4b Stems diffuse or matted . . . . . **Arctotis**
5a Involucral bracts slightly fused at base, pungent-toothed or -lobed . . . . . **Berkheya**
5b Involucral bracts fused in lower half, sometimes setose, not spinescent . . 6
6a Pappus scales of outer whorl not overlapping, the inner ones equal or somewhat longer; sap milky . . . . . **Gazania**
6b Pappus scales of outer whorl spirally overlapping, inner whorl small or obsolete . . . . . **Hirpicium**

# Tribe Astereae

## Key to genera

[after descriptions in Hilliard (1977) and Bremer (1994)]

1a Pappus uniseriate . . . . . 2
1b Pappus biseriate . . . . . 6
2a Flower heads distinctly radiate . . . . . **Felicia**
2b Flower heads disciform or shortly radiate . . . . . 3
3a Outer female florets uniseriate . . . . . **Nolletia**
3b Outer female florets biseriate to multiseriate . . . . . 4
4a Marginal florets (short ray florets) yellow . . . . . **Nidorella**
4b Marginal florets (short ray florets) white, pink or mauve, if yellow, then hidden by the pappus bristles . . . . . 5
5a Cypselae subcylindric, slightly compressed, appressed-hairy . . . . . **Symphyotrichum**
5b Cypselae narrowly elliptic or narrowly obovate, compressed, glabrous or pubescent. . . . . **Conyza**
6a Flower heads radiate . . . . . 7
6b Flower heads disciform or discoid . . . . . 10
7a Pappus of bristles only . . . . . 8
7b Pappus an outer row of scales and an inner row of bristles . . . . . 9
8a Cypselae obovate or elliptic, compressed, hairy and glandular-hairy . . . . . **Afroaster**
8b Cypselae cylindric, 9–11-ribbed, glandular . . . . . **Printzia**
9a Receptacle mostly paleate . . . . . **Amellus**
9b Receptacle epaleate . . . . . **Afroaster**
10a Flower heads disciform . . . . . 11
10b Flower heads discoid. . . . . 12
11a Cypselae narrowly elliptic or narrowly obovate, compressed. . . . . **Conyza**
11b Cypselae cylindric, 9–11-ribbed . . . . . **Printzia**
12a Pappus of bristles and scales . . . . . **Chrysocoma**
12b Pappus of bristles only . . . . . 13
13a Perennial herbs; leaves alternate, sometimes basal; cypselae oblong-obovoid, slightly compressed, usually 3-ribbed, glandular . . . . . **Heteromma**
13b Dwarf shrubs or shrubs; leaves mostly opposite, sometimes fascicled or alternate; cypselae obovoid or turbinate, sometimes compressed, sometimes narrowed into short, apical beak, glabrous to villous . . . . . **Pteronia**

# Tribe Calenduleae

## Key to genera

[after Nordenstam: 242 (2007)]

1a Style of disc florets deeply bifurcate and papillate-hairy outside . . **Garuleum**
1b Style of disc florets shallowly bifid with a subapical collar of sweeping hairs . . . . . 2
2a Cypselae drupaceous with a distinct black-blue or orange-red fleshy layer . . . . . **Chrysanthemoides**
2b Cypselae dry or rarely with a thin whitish or blue-blackish fleshy layer . . . . 3
3a Disc florets perfect, with flattened cypselae. . . . . **Dimorphotheca**

3b Disc florets functionally male, with cypselae undeveloped and not flattened . . . . . 4
4a Ray florets white, pink or purple . . . . . **Dimorphotheca**
4b Ray florets yellow-orange . . . . . 5
5a Cypselae 3-winged (rarely wings reduced) with apical cavity . . . . . **Tripteris**
5b Cypselae winged or not, without apical cavity. . . . . **Osteospermum**

# Tribe Cardueae

## Key to genera

[after Hilliard: 576 (1977) and Pope: 49 (1992)]

Pappus of plumose hairs connate at base . . . . . **Cirsium**
Pappus absent or several rows of simple, sometimes scale-like hairs free to base . . . . . **Centaurea**

# Tribe Cichorieae

## Key to genera

[after Hilliard: 596 (1977)]

1a Pappus of small scales up to 2 mm long . . . . . **Cichorium**
1b Pappus of hairs or bristles at least 4 mm long . . . . . 2
2a Hairs of pappus feathery (plumose) or at least inner ones so . . . . . 3
2b Hairs of pappus not feathery, at most somewhat barbellate. . . . . 5
3a Receptacular paleae present . . . . . **Hypochaeris**
3b Receptacular paleae absent . . . . . 4
4a Plants glabrous at maturity, sometimes floccose when young **Tragopogon**
4b Plants rough-hairy . . . . . **Picris**
5a Cypselae 2.0–3.5 mm long, obconic, truncate above, pappus of comparatively few coarse scabrid bristles . . . . . **Tolpis**
5b Cypselae and pappus not as above . . . . . 6
6a Cypselae tuberculate (muricate) in upper part with a long slender beak; scapes 1-headed, hollow. . . . . **Taraxacum**
6b Cypselae and scapes not as combined above, or plants not scapigerous. . . . . 7
7a Pappus dimorphic, of barbellate bristles intermixed with down-like hairs . . . . . **Sonchus**
7b Pappus of setae only, monomorphic, rarely with an outer ring of very short setae . . . . . 8
8a Cypselae ± compressed and equal-ribbed, with ascending evident or submicroscopic hairs on ribs or at least margins; involucres mostly cylindrical . . . . . **Lactuca**
8b Cypselae ± terete and equal-ribbed, rough with ascending projections on ribs; involucres usually obconic . . . . . **Crepis**

# Tribe Gnaphalieae

## Key to genera

[after Anderberg: 34 (1991a) and Anderberg & Bremer: 1068 (1991)]

1a Leaf margins denticulate, dentate, serrulate, serrate or lobed; involucral bracts cartilaginous or herbaceous, without papery blade. . . . . 2
1b Leaves entire or else involucral bracts have a papery blade . . . . . 4
2a Flower heads disciform . . . . . **Denekia**
2b Flower heads radiate . . . . . 3
3a Receptacle paleate . . . . . **Callilepis**
3b Receptacle epaleate . . . . . **Athrixia**
4a Involucral bracts cartilaginous or herbaceous; flower heads radiate . . . . . **Callilepis**
4b Involucral bracts with papery blade or else flower heads disciform or discoid . . . . . 5
5a Flower heads radiate . . . . . 6
5b Flower heads disciform or discoid . . . . . 7
6a Pappus bristles distinctly plumose . . . . . **Leysera**
6b Pappus bristles scabrid-barbellate . . . . . **Rosenia**
7a Involucral bracts entirely cartilaginous or herbaceous or sometimes with minute, papery, apical portion . . . . . 8
7b Involucral bracts conspicuously papery. . . . . 9
8a Flower heads 1-flowered . . . . . **Stoebe**
8b Flower heads with 2 or more florets . . . . . **Amphiglossa**
9a Florets purple or pink, at least apically or basally . . . . . 10
9b Florets mostly yellow, sometimes yellow tipped pink or reddish, or entirely pink or white . . . . . 15
10a Leaves adaxially concave, often tomentose adaxially only. . . . . 11
10b Leaves flat or revolute, not tomentose adaxially only . . . . . 12
11a Leaves twisted or straight; flower heads discoid; pappus barbellate. . . . . **Metalasia**
11b Leaves straight; flower heads disciform; pappus plumose . . . . . **Ifloga**
12a Flower heads discoid. . . . . **Troglophyton**
12b Flower heads disciform with female florets outnumbering disc florets . . . . . 13
13a Stereome divided . . . . . **Lasiopogon**
13b Stereome undivided. . . . . 14
14a Cypselae with globose hairs; pappus basally connate . . . . . **Gamochaeta**
14b Cypselae with clavate or elongated hairs; pappus free, connate or 0 . . . . . **Gnaphalium**
15a Outer involucral bracts subtending single female floret; pappus apically plumose . . . . . **Ifloga**
15b Outer involucral bracts not subtending single female floret; pappus various . . . . . 16
16a Flower heads discoid . . . . . **Helichrysum**
16b Flower heads disciform . . . . . 17
17a Female florets fewer than disc florets . . . . . **Helichrysum**
17b Female florets outnumbering disc florets . . . . . 18
18a Stereome undivided. . . . . **Pseudognaphalium**
18b Stereome divided . . . . . 19
19a Flower heads with < 20 florets . . . . . **Helichrysum**
19b Flower heads with > 20 florets . . . . . **Pseudognaphalium**

# Tribe Helenieae

## Key to genera

[after Hilliard: 324 (1977)]

1a Involucral bracts connate for most of their length, with embedded oil sacs . . . . . **Tagetes**
1b Involucral bracts free; without oil sacs . . . . . 2
2a Involucral bracts many, appressed-hairy, margins with long bristles. . . . . **Gaillardia**
2b Involucral bracts few (± 3–6), glabrous . . . . . 3
3a Leaves pinnate, alternate; individual heads solitary on long peduncles . . . . . **Schkuhria**
3b Leaves simple, opposite; many heads tightly clustered in shortly pedunculate terminal and axillary, secondary heads . . . . . **Flaveria**

# Tribe Heliantheae

## Key to genera

[after Wild: 1 (1967) and Hilliard: 290 (1977)]

1a Flower heads unisexual . . . . . 2
1b Flower heads bisexual . . . . . 3
2a Involucral bracts of male heads connate; female heads 1-flowered; cypselae clasped by female involucre which bears 4–6 spines . . . . . **Ambrosia**
2b Involucral bracts of male heads free; female heads 2-flowered; cypselae clasped by female involucre bearing hooked spines . . . . . **Xanthium**
3a Florets of disc sterile . . . . . **Acanthospermum**
3b Florets of disc fertile (or only innermost sterile) . . . . . 4
4a Receptacular paleae ± flat not clasping disc florets and cypselae . . . . . 5
4b Receptacular paleae ± conduplicate and clasping or enfolding disc florets and cypselae . . . . . 7
5a Involucral bracts quite free, the inner merging gradually into the receptacular paleae; leaves simple. . . . . **Galinsoga**
5b Involucral bracts of the inner row connate at base, outer row fewer and mostly smaller or narrower; leaves variously divided . . . . . 6
6a Ray florets yellow, golden, orange, creamy white or absent . . . . . **Bidens**
6b Ray florets white, pink, lilac or red . . . . . **Cosmos**
7a Ray florets persistent; leaves narrowly oblong-ovate, margins entire **Zinnia**
7b Ray florets not persistent; leaves broadly ovate, margins dentate or serrate . . . . . 8
8a Disc florets deep purple, at least above . . . . . **Helianthus**
8b Disc florets yellow . . . . . **Verbesina**

# Tribe Inuleae

## Key to genera

[after Anderberg: 85 (1991b)]

1a Pappus 0, or of wide scales, often with protruding bristle-like mid-portion . . . . . 2
1b Pappus an inner row or rows of well-developed capillary bristles and an outer row of scales. . . . . 3
2a Flower heads radiate; florets yellow; pappus of scales . . . . . **Geigeria**
2b Flower heads disciform; florets purple; pappus absent or rarely with 2 or 3 bristles in disc florets . . . . . **Litogyne**
3a Pappus scales forming short connate cup; capitula generally disciform. . . . . **Pulicaria**
3b Pappus scales ± free; capitula discoid . . . . . **Pegolettia**

# Tribe Mutisieae (Dicomeae)

## Key to genera

[after Dyer: 660 (1975)]

Branched perennials herbs; flower heads discoid or disciform, solitary or corymbosely arranged . . . . . **Dicoma**
Acaulescent, perennial herbs; flower heads usually radiate on upright, unbranched peduncles (scapes). . . . . **Gerbera**

# Tribe Senecioneae

## Key to genera

[after Jeffrey: 874 (1986) and descriptions by Bremer (1994), Nordenstam & Pelser (2005)]

1a Pappus 0 in all florets . . . . . **Euryops**
1b Pappus present, at least in ray florets. . . . . 2
2a Involucre usually calyculate . . . . . 3
2b Involucre ecalyculate . . . . . 7
3a Ovary wall crystals compound, drusiform . . . . . **Kleinia**
3b Ovary wall crystals simple, plate-like or needle-like or 0. . . . . 4
4a Outer (ray) cypselae dorsiventrally compressed . . . . . **Cineraria**
4b Outer (ray) cypselae not compressed, or radiate florets 0 . . . . . 5
5a Annual herbs; involucral bracts ± biseriate, inner bracts with 2 dark resin ducts; cypselae subtriquetrous, black, papillose-hairy apically and basally and along 3 longitudinal lines . . . . . **Mesogramma**
5b Annual or perennial herbs or dwarf shrubs; involucral bracts uniseriate, without dark stripes; cypselae terete . . . . . 6
6a Succulent, procumbent, mat-forming, perennial herb with sharply wing-angled stems . . . . . **Curio**
6b Plants not succulent, erect or decumbent, occasionally procumbent but never mat-forming, stems not wing-angled . . . . . **Senecio**

7a Flower heads discoid . . . . . **Euryops**
7b Flower heads radiate or disciform . . . . . 8
8a Flower heads disciform . . . . . **Hertia**
8b Flower heads radiate . . . . . 9
9a Disc florets bisexual, rarely functionally male; style bifid, sometimes undivided . . . . . **Euryops**
9b Disc florets functionally male . . . . . 10
10a Style undivided . . . . . **Othonna**
10b Style divided . . . . . **Hertia**

# Tribe Tarchonantheae

## Key to genera

[after Hilliard: 3 (1977)]

Pappus of scabrid bristles . . . . . **Brachylaena**
Pappus 0 . . . . . **Tarchonanthus**

# Tribe Vernonieae

## Key to genera and species

1a Annual herbs . . . . . 2
1b Perennial herbs, shrubs or subshrubs . . . . . 3
2a Outer pappus of many short scales, inner pappus of barbellate bristles . . . . . **Polydora poskeana**
2b Outer pappus of short barbellate bristles, inner pappus of subplumose bristles . . . . . **Vernonia fastigiata**
3a Shrubs or subshrubs . . . . . 4
3b Perennial herbs . . . . . 5
4a Leaves obovate, coarsely dentate in upper half . . . . . **Gymnanthemum corymbosum**
4b Leaves narrowly linear, entire . . . . . **Vernonia staehelinoides**
5a Leaves in basal rosette . . . . . **Vernonia thodei**
5b Leaves scattered along stems . . . . . 6
6a Flower heads solitary . . . . . 7
6b Flower heads many in corymbose panicles . . . . . 8
7a Involucral bracts imbricate, apices long-acuminate, bristle-tipped, ± squarrose, persistently woolly araneose . . . . . **Vernonia fastigiata**
7b Involucral bracts linear-subulate, attenuate, purple-tipped, subequal and uniform . . . . . **Vernonia galpinii**
8a Leaves silky silvery on both surfaces, concolorous . . . **Hilliardiella aristata**
8b Leaves discolorous . . . . . 9
9a Leaves linear . . . . . **Hilliardiella pinifolia**
9b Leaves elliptic, ovate to subrotund . . . . . 10
10a Leaf base cordate or subcordate . . . . . **Hilliardiella hirsuta**
10b Leaf base cuneate or rounded . . . . . 11
11a Leaves relatively small, ± 40 × 25 mm, elliptic, ovate or subrotund, margin entire . . . . . **Hilliardiella oligocephala**
11b Leaves large, ± 80 × 50 mm, ovate, elliptic or round, margin entire or faintly dentate . . . . . **Vernonia flanaganii**

## **Acanthospermum** Schrank (sthn Afr.: 3 spp.)

(Heliantheae)

### ***glabratum** (DC.) Wild

*A. xanthioides* (Kunth) DC. var. *glabratum* DC.

Annual, occasionally perennial herb. **Stems** procumbent, branches spreading widely and often rooting along their whole length, leafy. **Leaves** opposite; blade elliptic, broadly ovate to almost round, up to 30 × 25 mm, base cuneate, margins subentire to coarsely toothed, apex acute or obtuse, glabrous or glabrescent above and gland-dotted below; petiole up to 10 mm long. **Heads** shortly radiate, solitary, pedunculate, axillary, 5–7 mm in diameter in flower, up to 20 mm in fruit. **Involucral bracts** biseriate, outer row herbaceous, inner row enveloping cypselae of ray florets. **Receptacle** paleate. **Flowers**: ray florets female, fertile, yellowish; disc florets functionally male, yellowish; Jan., Feb. **Fruit** with cypsela, 4 or 5, radiating from disc, each enveloped in an enlarged involucral bract, fusiform-oblong, 8–10 mm long, covered in short hooked spines. **Pappus** absent. Weed in overgrazed and other disturbed areas. Native to South America. *Creeping starbur*, *prostrate starbur*, *five-seeded prostrate starbur*, *sheepbur*; *kruipsterklits*, *ankerbossie*, *vyfsadige kruipsterklits* (A).

DrGr | MsGr

## **Achillea** L. (sthn Afr.: 1 sp.)

(Anthemideae)

### ***millefolium** L. *s.l.*

Perennial herb, up to 500 mm high, strongly aromatic. **Leaves** alternate; sessile; blade linear or narrowly elliptic in outline, 2 × or 3 × pinnate, ultimate segments very narrow, sparsely hairy. **Heads** radiate, small, crowded in terminal corymbs. **Involucral bracts** in a few rows, imbricate. **Receptacle** paleate. **Flowers**: ray florets female, fertile, usually white, sometimes rosy; disc florets bisexual, fertile, white or creamy white; Nov.–Apr. **Fruit** with cypsela compressed, narrowly obovate, with 2 lateral ribs, glabrous. **Pappus** absent. Grassland, old fields and disturbed places. Native to Europe and North America. *Common yarrow*, *milfoil*, *yarrow*; *duisendblaarachillea* (A).

DrGr | MsGr?

## **Afroaster** J.C.Manning & Goldblatt (sthn Afr.: 15 spp.)

(Astereae)

[after Manning & Goldblatt: 792 (2012)]

### Key to species:

[adapted from Lippert: 175 (1973)]

1a Leaves pinnatifid . . . . . **A. erucifolius**
1b Leaf margins entire or toothed, but not pinnatifid . . . . . 2
2a Leaf margins cordate-amplexicaul, usually perfoliate, that is, clasping, with the basal lobes united so that the stem appears to pass through leaf . . . . . **A. perfoliatus**

2b Leaves not as above . . . . . 3
3a Involucral bracts glabrous or sparsely hairy on midline . . . . . 4
3b Involucral bracts pilose at least on midline . . . . . 5
4a Leaf margins entire; peduncle glabrous . . . . . **A. serrulatus**
4b Leaf margins remotely denticulate, especially in upper part; peduncle hairy and glandular-hairy . . . . . **A. pleiocephalus**
5a Peduncle and involucral bracts not glandular-hairy . . . . . **A. hispida**
5b Peduncle and involucral bracts glandular-hairy. . . . . **A. lydenburgensis**

## **erucifolius** (Thell.) J.C.Manning & Goldblatt

*Aster erucifolius* (Thell.) W.Lippert

Annual herb, up to 200 mm high. **Stems** branched from base, minutely glandular and hairy, beetroot-red. **Leaves** in a basal rosette or alternate upwards, petiolate, uppermost sessile; blade obovate in outline, pinnatifid, up to ± 30 × 10 mm, lobes oblong, smaller upwards and passing into uppermost linear leaves with entire or sometimes denticulate margins. **Heads** up to 20 mm in diameter, radiate, solitary on short leafy peduncles, axillary and terminal. **Involucral bracts** ± 3-seriate, equalling disc florets, narrowly ovate, coarse spreading hairs particularly on midline. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, mauve or white; disc florets bisexual, yellow; Oct., Feb. **Fruits** with cypsela straw-coloured, densely hairy and glandular-hairy, obovate, compressed. **Pappus** bristles barbellate, biseriate, outer row much shorter than inner. Marshy ground, damp scree, rocks, at high altitudes. *Mohantšoane-os-loti* (SS).




## **hispida** (Thunb.) J.C.Manning & Goldblatt

*Aster asper* (Less.) J.M.Wood & M.S.Evans
*A. bakerianus* Burtt Davy ex C.A.Sm.
*Calendula hispida* Thunb.

Perennial herb, up to 450 mm high. **Stems** single or several, scabrous. **Leaves** sessile, alternate; blade up to 80 × 20 mm, very narrowly ovate, narrowly elliptic, linear or ovate, apex acute to acuminate, base half-clasping, margins entire or remotely denticulate, 3–7-veined, sparsely to densely rough-hairy. **Heads** 15–25 mm in diameter, radiate, mostly solitary, rarely in few-headed corymbs; peduncle rough-hairy. **Involucral bracts** ± 3-seriate, imbricate, densely hairy. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, blue, mauve or less commonly white; disc florets bisexual, yellow; Nov.–Feb. **Fruit** with cypsela elliptic, compressed, hairy. **Pappus** biseriate, outer row of short narrow scales, inner row of long scabrid bristles. Open grassland, on hillsides. *Phoa* (SS); *noxgxekana*, *umthekisana* (X); *udlatshana*, *umaqhunsula*, *umhlungwana* (Z).




## **lydenburgensis** (W.Lippert) J.C.Manning & Goldblatt

*Aster lydenburgensis* W.Lippert

Perennial herb, up to 0.65 m high. **Stems** several, scabrid. **Leaves** alternate, sessile; blade very narrowly ovate, narrowly elliptic, linear or ovate, rigid, up to 100 × 20 mm, 3–5-veined, lowermost reduced, upper passing into inflorescence bracts, apex acute to acuminate, mucronate, base broad, half-clasping, margins entire, rarely distantly dentate, minutely scabridulous; both surfaces scabrid and minutely glandular. **Heads** 13–20 mm in diameter, radiate, usually corymbosely arranged, occasionally solitary; peduncle densely glandular. **Involucral bracts** densely hairy, at least the inner bracts, sometimes also outer bracts, densely glandular-hairy. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, white, rarely bluish; disc florets bisexual, yellow; Nov., Feb. **Fruit** with cypsela obovate or elliptic, compressed,

hairy and glandular-hairy. **Pappus** biseriate, outer row of short narrow scales, inner row of long scabrid bristles. Grassland on hills and among rock outcrops.

MsGr

**perfoliatus** (Oliv.) J.C.Manning & Goldblatt
*Aster perfoliatus* Oliv.

Perennial herb, up to 0.6 m high; stoloniferous, glabrous. **Stems** one or several, simple or sparsely branched, erect or ascending. **Leaves** alternate, sessile; ± confined to lower half of stem, blade broadly ovate to subrotund, up to 50 × 40 mm, apex acuminate or acute, mucronate, base cordate amplexicaul, usually clasping with basal lobes united, margins entire, leathery, prominently palmately veined, glabrous. **Heads** ± 40 mm in diameter, radiate, solitary, at tip of pedunculoid upper part of stem. **Involucral bracts** ± 3-seriate, equalling disc, narrowly ovate, dark-keeled, margins membranous, fimbriate, 3–5-veined, glabrous. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, blue, mauve or pink, rarely white; disc florets bisexual, yellow; Oct.–Jan. **Fruit** with cypsela obovate to elliptic, densely hairy. **Pappus** biseriate, outer row of short scales, inner row of long scabrid bristles. Stony grassland, rock outcrops and crevices. *Grysblaar-aster* (A); *khotolia-ea-thaba* (SS).

MsGr

**pleiocephalus** (Harv.) J.C.Manning & Goldblatt
*Aster pleiocephalus* (Harv.) Hutch.

Perennial herb, up to 0.7 m high. **Stems** one or several, erect, usually scabrid, rarely smooth, glandular-hairy, mostly simple below, rarely forking ± midway, then usually branching above into compound inflorescence, leafy. **Leaves** alternate, sessile; blade linear, narrowly ovate or narrowly oblong, up to 80 × 10 mm, reduced below, passing upwards into inflorescence bracts, apex acute to acuminate, base abruptly narrowed, margins scabrid, entire to remotely denticulate, especially in upper part, teeth sometimes very few or absent on some leaves, both surfaces glabrous to scabrid, glandular-hairy, prominently 3–5-veined. **Heads** 13–15 mm in diameter, radiate, usually few to many in rather open, corymbose panicles, very rarely solitary, terminal; peduncle hairy and glandular-hairy. **Involucral bracts** ± 3-seriate, inner a little shorter than pappus, narrowly ovate, midline dark, resinous, glabrous or very sparsely hairy on midline, inner bracts often glandular-hairy. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, white; disc florets bisexual, yellow; Nov.–Jan. **Fruit** with cypsela elliptic, compressed, hairy and glandular-hairy. **Pappus** biseriate, outer row of short, narrow scales, inner row of long, scabrid bristles. Mountainsides, rock outcrops, in grassland.

DrGr MsGr

**serrulatus** (Harv.) J.C.Manning & Goldblatt
*Aster harveyanus* Kuntze
*Diplopappus serrulatus* Harv.

Perennial herb, up to 1 m high. **Stems** single or several, erect, glabrous, leafy. **Leaves** alternate, sessile; blade very narrowly ovate, narrowly elliptic, linear or ovate, rigid, up to 100 × 20 mm, 3–5-veined, lowermost reduced, upper passing into inflorescence bracts, apex acute to acuminate, mucronate, base broad, half-clasping, margins entire, minutely scabridulous; both surfaces usually smooth, glabrous, lower occasionally scabridulous on nerves. **Heads** 13–20 mm in diameter, radiate, usually corymbosely arranged, occasionally solitary, terminal; peduncle glabrous. **Involucral bracts** ± 3-seriate, inner ± equalling pappus, narrowly ovate, keel dark, resinous, glabrous. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, mauve or white; disc florets bisexual, yellow; flowering time? **Fruit** with cypsela elliptic, compressed,

hairy and glandular. **Pappus** biseriate, outer row of short, narrow scales, inner row of long, scabrid bristles. Grassland, often among rock outcrops. *Bloublommetjie* (A). [Only 1 specimen in PRE with old inflorescences, identified as cf.]

VreDm

## **Ambrosia** L. (sthn Afr.: 2 or 3 spp.)

(Heliantheae)

### Key to species:

[after Hilliard: 296 (1977)]

Annual herb; ultimate leaf segments on average > 2 mm wide; female flower heads several, clustered in leaf axils below male heads. . . . . .**A. artemisiifolia**
Perennial herb with simple stems arising from underground runners; ultimate leaf segments on average < 2 mm wide; female flower heads solitary or 2 or 3 together in leaf axils below male heads . . . . . .**A. psilostachya**

### *__artemisiifolia__ L.

Annual herb, up to 2 m high; coarse, bushy. **Stems** pilose when young, later rough-pubescent. **Leaves** mostly alternate; blade ovate in outline, pinnatisect or bipinnatisect, the ultimate segments oblong, narrowly obovate or elliptic, on average > 2 mm wide, lobe apices obtuse, acute or acuminate, lobe margins sometimes with 1 or 2 coarse teeth, pubescent on both surfaces, more densely so below, often drying very discolorous, aromatic or not; petiole ± 20 mm long. **Heads** unisexual; male heads small, drooping, in slender, leafless, terminal spikes up to ± 100 mm long, arranged in panicles, involucral bracts connate, cup-shaped, containing several, functionally male florets; female heads sessile, several clustered in leaf axils below male heads, involucral bracts connate, turbinate, enveloping cypsela, containing single female floret, corolla absent. **Flowers**: disc florets only, whitish; Jan.–Apr. **Fruit** with cypsela ovoid, enveloped in turbinate, involucral bracts, with 4–6 spines on shoulders. **Pappus** absent. Weed of disturbed places. Native to Americas. *Ragweed*, *annual ragweed*.

AcGr DrGr

### *__psilostachya__ DC.

Possibly a synonym of *A. tenuifolia*.

Perennial herb, up to 1 m high. **Stems** simple, arising from underground runners. **Leaves** mostly opposite; blade ovate in outline, bipinnatisect, ultimate leaf segments narrowly oblong, on average < 2 mm wide, lobe apices acute to acuminate, lobe margins entire or minutely dentate, pubescent, light green, somewhat aromatic; petiole ± 10 mm long. **Heads** unisexual; male heads small, drooping, in slender, terminal racemes up to 120 mm long, arranged in panicles, involucral bracts connate, cup-shaped, containing several, functionally male florets; female heads solitary or 2 or 3 together in leaf axils below male heads, involucral bracts connate, turbinate, enveloping cypsela, containing single female floret, corolla absent. **Flowers**: disc florets only, whitish; Apr. **Fruit** with cypsela ovoid, enveloped in turbinate, involucral bracts, with 4–6 spines on shoulders. **Pappus** absent. Weed of disturbed places. Native to western North America. *Perennial ragweed*.

DrGr MsGr

## **Amellus** L. (sthn Afr.: 12 spp.)

(Astereae)

### **tridactylus** DC. subsp. **tridactylus**

*A. strigosus* (Thunb.) Less. var. *tridactylus* (DC.) Harv. *pro parte*

Annual herb, 20–150 mm high. **Stems** procumbent to erect, with spreading pubescence, not appressed pubescent, glandular. **Leaves** alternate; blade very narrowly obovate to narrowly elliptic, (6–)10–25(–35) × 1.0–2.5(–3.5) mm, apex acute, base narrowed, petiole-like, margins entire or 1- or 2-dentate, spreading pubescent, with few glandular hairs. **Heads** radiate, solitary, terminal; peduncle (0.5–)2.5–4.0(–8.0) mm long. **Involucre** hemispherical or cup-shaped; involucral bracts linear-lanceolate to lanceolate, 3- or 4-seriate, imbricate, hairy and glandular-hairy. **Receptacle** with paleae with orange-red main vein. **Flowers**: ray florets female, obvious, blue to blue-purple or sometimes white; disc florets bisexual, many, 5-lobed, yellow or white, white florets sometimes flushed reddish purple; Aug.–Nov. **Fruit** with cypsela obovate to cordate, brown to whitish, hairy; hairs with 2 acute apices. **Pappus** of scales and barbellate bristles. Grassland on flats, often on limestone soil. *Kalkbloublommetjie* (A).

DrGr | KarSh

## **Amphiglossa** DC. (sthn Afr.: 11 spp.)

(Gnaphalieae)

### **triflora** DC.

*Pterothrix spinescens* DC.

Shrub, up to 400 mm high, compact, greyish. **Stems** erect, densely entangled, rigid, terminal branches frequently spinescent; spines 8–25 mm long. **Leaves** alternate sessile; blade narrowly triangular, up to 8 mm long, margins entire, inrolled, upper surface woolly. **Heads** discoid, terminal, solitary or in groups of up to 8, sessile, 4- or 5-flowered. **Involucral bracts** 20–25, imbricate; outer broadly ovate; inner linear, hyaline in upper part, tips aristate. **Flowers**: ray florets absent; disc florets bisexual, 5.0–5.5 mm long; white, mainly Sep.–May. **Fruit** with cypsela subterete, ± 1 mm long, papillose. **Pappus** of 25–32 bristles, free, caducous, ± 5 mm long, plumose in upper part. Sandy soils, most often on limestone outcrops or sandstone koppies, frequently in disturbed or overgrazed veld. *Voëltjie-kan-nie-sit-nie* (A).

AcGr | DrGr | MsGr | KarSh

## **Anthemis** L. (sthn Afr.: 2 spp.)

(Anthemideae)

### ***cotula** L.

Annual herb, up to 0.6 m high, foetid. **Leaves** alternate, sessile; blade ovate to elliptic in outline, 1–3× pinnate, ultimate segments narrowly linear. **Heads** terminal, solitary on long peduncles, radiate. **Involucral bracts** in several rows, imbricate. **Receptacle** conical; paleae linear, acute. **Flowers**: ray florets usually without styles, white; disc florets bisexual, yellow; Feb. **Fruit** with cypsela oblong, ribbed and tubercled, glabrous. **Pappus** absent. Native to Europe and Asia, naturalised as a weed of cultivation in waste and disturbed places, localities around cities.

*Common dogfennel*, *foetid chamomile*, *poison daisy*, *stinking chamomile*, *stinking mayweed*; *stinkkamille* (A).

MsGr

## **Arctotheca** J.C.Wendl. (sthn Afr.: 5 spp.)

(Arctotideae)

### **calendula** (L.) Levyns

Perennial herb, up to 0.4 m high, creeping, erect or rosulate. **Leaves** basal or alternate; blade up to 150 × 50 mm, oblong in outline, lyrate-pinnatifid, rarely entire, upper surface glabrous or pubescent, lower surface thinly white-felted; petiole ± 50 mm long. **Heads** radiate, axillary, solitary, pedunculate. **Involucral bracts** in many rows, imbricate, inner ones with broad scarious tips. **Flowers**: ray florets neuter, yellow above, sometimes greenish grey below; disc florets bisexual, yellow; Oct., Apr. **Fruits** with cypsela small, enveloped in copious pinkish brown, silky wool. **Pappus** of minute delicate, pointed scales. Grassland, in sandy soils, often as weed of roadsides and waste places. *Cape dandelion*, *Cape weed*.

AcGr DrGr KarSh

## **Arctotis** L. (sthn Afr.: 50–60 spp.)

(Arctotideae)

### Key to species:

[compiled by P. Herman]

Perennial herb; ray florets yellow above, often washed purplish brown below; disc florets yellow; cypselae without pappus, with single linear furrow, basal ring of hairs absent . . . . . **A. arctotoides**
Annual herb; ray florets white above with yellow basal band, coppery or purplish below; disc florets mauve-purple; cypselae with pappus of obvious scales, with 2 linear-obovate cavities and basal ring of hairs . . . . . **A. venusta**

### **arctotoides** (L.f.) O.Hoffm.

*A. hispidula* (Less.) Beauverd
*A. microcephala* (DC.) Beauverd
*A. suffruticosa* K.Lewin
*Venidium arctotoides* (L.f.) Less.

Perennial herb, up to 400 mm high. **Stems** decumbent or procumbent, rarely semiscandent, mat-forming. **Leaves** basal and alternate; blade entire or lyrate-pinnatisect to pinnatisect, 100–200 × 20–80 mm, apex obtuse, base cuneately narrowed into petiole, margins entire, lobed or faintly dentate, upper surface ± glabrous, pilose-tomentose or glandular-pilose, lower surface white-tomentose or glandular-pilose. **Heads** radiate, solitary; peduncles ± 200 mm long. **Involucral bracts** white-tomentose or glandular-pilose, apex of outer bracts acuminate, of inner bracts pandurate, erect or reflexed. **Flowers**: ray florets female, fertile, yellow, often washed purplish brown below; disc florets many, bisexual, yellow; Aug.–Apr. **Fruit** with cypsela obovoid, ± glabrous, wrinkled, with a linear furrow, basal ring of hairs absent. **Pappus** absent. Widespread in grassy flats and slopes, open shrubland, disturbed

sites, marshy streambanks, in drainage ditches. *Botterblom*, *bittergousblom* (A); *putsoa-pululu*/*putswa-pududu* (SS); *ubushwa* (X). Figure 3, p. ix.

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**bolusii** (S.Moore) K.Lewin: uncertain taxonomic status.

**venusta** Norl.

*A. stoechadifolia auct. non* P.J.Bergius

Annual herb, 0.1–0.6 m high. **Stems** short, few to many branched from near base, sometimes apparently acaulescent with rosulate, basal leaves. **Leaves** basal, alternate upwards; blade elliptic-obovate in outline, margins lyrate-pinnatifid or deeply sinuate-dentate to pinnatilobate, apex obtuse, base tapering into petiole-like base, grey-tomentose on both sides; stem leaves sessile, smaller. **Heads** radiate, solitary, terminal, pedunculate. **Involucral bracts** in many rows, outer bracts white-tomentose, apex oblongly elongated, shortly reflexed. **Flowers**: ray florets female, fertile, limb white above with yellow basal band, coppery or purplish below; disc florets many, outer florets bisexual, inner florets male or sterile; corolla mauve-purple; Sep.–Mar. (May, Jun.). **Fruit** with cypsela obconical, white-woolly on adaxial side, with 2 linear-obovate cavities, basal ring of hairs longer than cypsela. **Pappus** scales in 2 unequal rows, inner scales much longer than outer scales, apex rounded-obtuse, longer than cypsela. Grassland flats, open shrubland, often spreading into disturbed places. *Free State daisy*, *blue-eyed African daisy*; *witgousblom*, *Karoo gousblom* (A); *lehaha-la-tsela* (SS).

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## **Artemisia** L. (sthn Afr.: 2 spp.)

(Anthemideae)

**afra** Jacq. ex Willd.

Shrub, up to 2 m high; very aromatic. **Leaves** alternate, petiolate; blade narrowly ovate in outline, bipinnatipartite, ultimate segments linear, entire or toothed, upper surface glabrous, lower surface canescent. **Heads** disciform, subglobose, ± 3 mm in diameter, many in terminal, racemose panicles. **Involucral bracts** in a few rows, imbricate, canescent. **Receptacle** epaleate. **Flowers**: outer female florets tubular, fertile; disc florets bisexual or functionally male, yellow; Feb.–May. **Fruit** with cypsela narrowly obovoid, smooth or ribbed. **Pappus** absent. Forest margins, grassland and often along streams, in sandy or rocky soil. *Wormwood*; *wilde-als*, *bitterals* (A); *lengana* (SS); *umhlonyane* (Z).

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## **Athrixia** Ker Gawl. (sthn Afr.: 9 spp.)

(Gnaphalieae)

Key to species:

[after Kroner: 49–51 (1980)]

1a Repeatedly branched shrubs or dwarf shrubs . . . . . 2
1b Perennial, rosulate herbs . . . . . 3

2a Plants with axillary tufts; flower heads sessile, spicate or racemose on side branches or in leaf axils . . . . . **A. elata**
2b Plants without axillary tufts; flower heads arranged in upper drawn-out panicle . . . . . **A. phylicoides**
3a Plants with dainty stem; middle stem leaves the longest; inner pappus consisting of 3(4) hairy bristles . . . . . **A. angustissima**
3b Plants with fairly robust stem; leaves towards base of stem the longest; inner pappus consisting of 5(–12) hairy bristles . . . . . **A. fontana**

## **angustissima** DC.

Perennial herb, up to 350 mm high; rosette plant. **Flowering stems** slender, wiry, often straggling, mostly simple, ± glandular-hairy and tomentose. **Leaves** of two kinds: basal leaves in a rosette, sessile, with blade elliptic to obovate, up to 200 × 100 mm, apex acute or broadly acute and mucronate, base broad, margins remotely denticulate, upper surface densely glandular-hairy, lower surface white-tomentose and glandular-hairy on veins, often 3-veined; stem leaves alternate, sessile, with blade linear, patent, up to 50 × 1.5(–3.0) mm, smooth above, white-tomentose below, margins strongly revolute, with single main vein. **Heads** radiate, terminal, solitary or few together on bracteate peduncles. **Involucre** turbinate; involucral bracts 7–9-seriate, ± 10 × 6–10 mm, bracts cobwebby, long-acuminate, tips somewhat recurved. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, white; disc florets bisexual, white or yellow; Jan., Feb. **Fruit** with cypsela narrowly oblong, 3-ribbed, glabrous, ± 1.75 mm long. **Pappus** biseriate, inner row of 3(4) delicate, subbarbellate bristles, soon caducous, outer row of delicate, narrow scales of different lengths, partly connate at base, so disposed that they appear to be only ± 5 in number and fimbriate. Steep grassy mountain slopes, in moist places. *Phefshoane-e-nyenyane* (SS).




## **elata** Sond.

Subshrub, up to 1 m high, with many axillary buds. **Stems** one or several, branched, white-tomentose. **Leaves** alternate, sessile; blade narrowly ovate or linear, to narrowly linear, up to 35 × 12 mm, apex acute, upper surface glabrous, lower surface white-felted, margins revolute; glandular hairs absent or on leaf margins only. **Heads** radiate, sessile, in a spike or racemose on side branches, or in leaf axils. **Involucre** turbinate; involucral bracts 9–12-seriate, apices acute, white-tomentose. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, pale to dark purple; disc florets bisexual, yellow; Sep., Oct. **Fruit** with cypsela narrowly oblong, 4–6-ribbed, glabrous, ± 1.7 × 0.45 mm. **Pappus** biseriate, an outer row of scales and an inner row of 9–12 subbarbellate bristles. Grassland and among rocks. *Daisy-tea bush*; *wildetee* (A).




## **fontana** MacOwan

*A. drakensbergensis* Thell.

Perennial herb, 200–500 mm high; rosette plant. **Flowering stems** erect, leafy, usually simple, or sometimes with several stems, sometimes forking once or twice above, thinly white-tomentose, thinly to thickly beset with long, purplish, gland-tipped hairs. **Leaves** of two kinds: basal leaves in a rosette, sessile, with blade ovate, narrowly obovate or oblong-linear, up to 77 × 23 mm, often 3-veined, apex acute, base broad, margins distantly denticulate; stem leaves decreasing in size upwards, sessile, apex long acuminate, margins entire or denticulate, with single main vein, upper surface glabrous to villous, with long, gland-tipped hairs, lower surface white-felted and glandular-hairy on veins. **Heads** radiate, mostly solitary, sometimes with several heads, terminal. **Involucre** turbinate; involucral bracts 7–9-seriate, very long-acuminate, tips recurved, cobwebby. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, white, mauve

or upper surface white, lower surface mauve; disc florets bisexual, white or yellow; Jan. **Fruit** with cypsela narrowly oblong, 3-ribbed, glabrous, ± 1.75 mm long. **Pappus** biseriate, inner row of 5–12 scabrid bristles, alternating with outer row of very short, ± lacerate scales. Marshes, along streambanks, on moist grassy slopes, more rarely on cliff faces. *Sepinare*, *shoeshoe-e-nyenyane* (SS).

MsGr

### **phylicoides** DC.

Shrub, up to 2 m high, repeatedly branched. **Stems** white-tomentose on upper parts, leafy throughout. **Leaves** alternate, sessile or subsessile; blade narrowly ovate, narrowly elliptic or narrowly oblong, up to 30 × 10 mm, apex acute, base cuneate or rounded, margins slightly revolute, entire, glandular-hairy, smooth above, white-tomentose below; often with 2–4 prominent veins parallel to main vein. **Heads** radiate, sessile or nearly so, terminal and axillary towards ends of branches, often then disposed in large, drawn-out panicles. **Involucre** turbinate-campanulate, ± 8 × 5 mm; involucral bracts 6–9-seriate, narrowly ovate, acuminate, mucronate, somewhat squarrose, loosely cobwebby. **Receptacle** epaleate. **Flowers**: ray florets female, fertile, reddish, blue or mauve; disc florets bisexual, yellow, reddish to mauve; Jan.–Apr. **Fruit** with cypsela narrowly cylindric, 4–6-ribbed, thinly pilose with a basal coma, ± 1.75 mm long. **Pappus** biseriate, inner row of 10–12 long, delicate, subbarbellate bristles, alternating with outer row of minute scales. Grassland or forest margin scrub. *Bushman's tea*; *boesmanstee* (A); *icholocholo* (X, Z); *ishayelo*, *ishanela*, *iphephetha* (Z).

MsGr

## **Berkheya** Ehrh. (sthn Afr.: 73 spp.)

(Arctotideae)

### Key to species:

[adapted from Hilliard: 547 (1977)]

1a Stems clearly winged, wings continuous or interrupted . . . . . 2
1b Stems not winged . . . . . 13
2a Upper leaf surface beset with straw-coloured bristles or spines . . . . . **B. echinacea** subsp. **echinacea**
2b Upper leaf surface smooth or harshly pubescent, but not bristly . . . . . 3
3a Cypselae with a sparse or dense, short, silky pubescence; if glabrous, ray florets pale to deep pink-violet . . . . . 4
3b Cypselae glabrous; ray florets white or yellow . . . . . 8
4a Ray florets pale to deep mauve, rarely white . . . . . **B. purpurea**
4b Ray florets yellow . . . . . 5
5a Leaves white-felted on lower surface . . . . **B. rhapontica** subsp. **rhapontica**
5b Leaves thinly pilose or cobwebby on lower surface, but not white-felted . . . 6
6a Stem not entirely winged . . . . . **B. rhapontica** subsp. **aristosa** var. **exalata**
6b Stem entirely winged . . . . . 7
7a Basal leaves broadly obovate to subrotund, apex rounded . . . . . **B. rhapontica** subsp. **aristosa** var. **aristosa**
7b Basal leaves oblong-elliptic to narrowly obovate, apex acute . . . . . **B. rhapontica** subsp. **platyptera**
8a Outer involucral bracts foliaceous, ± 5–10 mm wide . . . . . 9
8b Outer involucral bracts narrowly ovate or linear, up to 3 mm wide . . . . . 10
9a Spines tipping the involucral bracts ± 5–10 mm long, ± $^1/_3$–$^1/_2$ of overall length of bract . . . . . **B. cirsiifolia**

9b Spines tipping the involucral bracts 3–4 mm long, ± one eighth overall length of bract . . . . . **B. onopordifolia** var. **onopordifolia**
10a Leaves very shortly decurrent on stem. . . . . **B. latifolia**
10b At least the upper leaves decurrent on stem in long wings. . . . . .11
11a Blade of basal leaves broadly obovate-oblong to elliptic oblong, leaf margins sinuate or sinuate-lobate, not deeply toothed nor pinnately cut. . . **B. radula**
11b Blade of basal leaves elliptic or ovate in outline, leaf margins coarsely dentate . . . . . 12
12a Pappus scales 0.7–1.0 mm long; plant of grassy mountainsides . . . . . **B. discolor**
12b Pappus scales 0.2–0.5 mm long; weed of cultivation and waste places . . . . . **B. bergiana**
13a Flower heads discoid. . . . . 14
13b Flower heads radiate . . . . . 17
14a Upper leaf surfaces smooth, glabrous . . . . **B. carlinifolia** subsp. **carlinifolia**
14b Upper leaf surfaces beset with straw-coloured bristles. . . . . 15 **(B. pinnatifida)**
15a Leaf rachis 3–10(–15) mm wide, segments triangular, ± 5–10(–15) mm long, length ± equalling the width of the rachis; middle involucral bracts (2–) 3–5 mm wide . . . . . **B. pinnatifida** subsp. **pinnatifida**
15b Leaf rachis 2–4 mm wide, lobes 10–30 mm long, much longer than the width of the rachis; middle involucral bracts 1–2 mm wide . . . . . .16
16a Middle involucral bracts 10–15 mm long; pappus scales 1.5–2.0 mm long. . . . . **B. pinnatifida** subsp. **stobaeoides**
16b Middle involucral bracts 15–25 mm long; pappus scales 0.4–0.7 mm long . . . . . **B. pinnatifida** subsp. **ingrata**
17a Leaves mostly basal. . . . . 18
17b Leaves mostly situated along stem. . . . . 25
18a Upper leaf surface with straw-coloured bristles. . . . . **B. setifera**
18b Upper leaf surface smooth or harshly pubescent, not bristly . . . . . 19
19a Leaves up to 40 × 15 mm; shrubs . . . . . **B. rosulata**
19b Basal leaves usually much larger; perennial herbs . . . . . 20
20a Basal leaves pinnately divided . . . . . **B. multijuga**
20b Basal leaves entire, repand, sinuate or coarsely toothed, but not pinnately divided . . . . . 21
21a Basal leaves sessile or very nearly so . . . . . 22
21b Basal leaves distinctly petiolate . . . . . 23
22a Flower heads few, racemosely or subracemosely arranged; lower leaf surface cobwebby . . . . . .**B. rhapontica** subsp. **aristosa** var. **exalata**
22b Flower heads solitary; lower leaf surface white-felted. . . . . **B. speciosa** subsp. **ovata**
23a Basal leaves broadly elliptic, apex acute, base narrowed into petiole . . . . . **B. speciosa** subsp. **lanceolata**
23b Basal leaves broadly elliptic to broadly ovate, apex rounded or subacute to acute, base rounded, truncate or cordate or narrowed into petiole . . . . . 24
24a Leaves subsessile or shortly petiolate; petiole 20–30 mm long; flower heads solitary . . . . . **B. speciosa** subsp. **ovata**
24b Leaves distinctly petiolate; petiole 50–350 mm long; flower heads subcorymbosely arranged . . . . . **B. speciosa** subsp. **speciosa**
25a Flower heads solitary; leaves arranged rosulately at tips of flowering branches . . . . . **B. rosulata**
25b Flower heads few to several together; leaves scattered along stem . . . . . 26
26a Leaves pinnatifid, segments linear . . . . . **B. cardopatifolia**
26b Leaves elliptic, margins shallowly dentate or sinuate-dentate, spinose-ciliate in between . . . . . **B. montana**

**bergiana** Söderb.

Perennial herb, up to 1.5 m high. **Stems** winged, spinose. **Leaves** alternate; fairly densely set all along stem; sessile, base semi-amplexicaul, decurrent on stem; blade of basal and middle leaves elliptic to ovate in outline, up to ± 150 × 50 mm, pinnatilobate, lobes up to 6 on each side, margins coarsely dentate, teeth triangular, spine-tipped, spinose-ciliate in between, upper surface harshly glandular-pubescent, lower surface grey- or white-cobwebby; blade of upper leaves less deeply divided. **Heads** radiate, 40–60 mm in diameter, several, corymbose-paniculately arranged, pedunculate. **Involucral bracts** connate at base, narrowly ovate, up to 3 mm wide, apex and margins spiny, back very lightly cobwebby-glandular. **Flowers**: ray and disc florets yellow; Feb. **Fruit** with cypsela turbinate, glabrous, ± 2 mm long. **Pappus** of scales, uniseriate, 0.2–0.5 mm long, obtuse. Weedy, forming large stands in old fields and other waste places.




**cardopatifolia** (DC.) Roessler
*B. lignosa* Compton
*Stobaea cardopatifolia* DC.

Shrub up to 1.2 m high. **Stems** not winged, densely leafy. **Leaves** alternate, scattered along stem, sessile; blade up to 80 mm long, pinnatifid, leaf segments linear, 4–6 on each side, up to 3 mm wide, each lobe ending in a rigid spine, margins entire, revolute, upper surface sparsely hairy, glabrescent, lower surface white-felted. **Heads** radiate or sometimes apparently discoid, up to 40 mm in diameter, subpaniculately arranged terminally, shortly pedunculate. **Involucral bracts** connate at base, linear, 1.0–1.5 mm wide, apex with rigid spine, margins without or only few, small spines near base, white-felted on backs. **Flowers**: ray and disc florets yellow; flowering time? **Fruit** with cypsela turbinate, pilose or glabrous, 2–3 mm long. **Pappus** of scales, biseriate, 0.2–0.5 mm long, oblong or ovate. No specimens in PRE for FS but according to Roessler (1959), occurring in Zastron at foot of Witberg.




**carlinifolia** (DC.) Roessler subsp. **carlinifolia**
*B. excelsa* Hutch.
*Stobaea carlinaefolia* DC.

Perennial herb, up to 2 m high. **Stems** not winged. **Leaves** alternate, scattered along stem; basal leaves narrowed into petiole-like base; blade narrowly oblong in outline, up to 150 × 40 mm, pinnatilobate, lobes 4–8 on each side, margins coarsely dentate, teeth triangular, ending in apical spine, spinose-ciliate in between, upper surface smooth, lower surface glandular, not hairy; upper leaves somewhat smaller, sessile, semi-amplexicaul. **Heads** discoid, up to 50 mm in diameter, paniculately or racemosely arranged terminally, pedunculate. **Involucral bracts** connate at base, narrowly ovate, 2–3(–5) mm wide, apex and margins spiny, glandular on backs, not hairy. **Flowers**: ray florets absent; disc florets yellow; Nov. **Fruit** with cypsela turbinate, pilose or glabrescent, 2–3 mm long. **Pappus** of scales, biseriate, 0.7–1.5 mm long, oblong. Grassland, in kloofs and valleys.




**cirsiifolia** (DC.) Roessler
*B. alba* E.Phillips
*Stobaea cirsiifolia* DC.

Perennial herb, up to 1.5 m high. **Stems** stout, winged, spinose. **Leaves** alternate, densely set all along stem; basal leaves petiolate, upper leaves sessile; blade of basal leaves narrowly

obovate or oblong in outline, up to 300 × 80 mm, pinnatilobate to pinnatifid, lobes rounded, margins coarsely dentate, teeth triangular, spine-tipped, spines up to 10 mm long, spinose-ciliate in between, upper surface harshly glandular-pubescent, white-felted below; blade of upper leaves similar but smaller, base decurrent on stem; uppermost leaves elliptic, not lobed, coarsely spinose-dentate. **Heads** radiate, up to 80 mm in diameter, solitary or few together, pedunculate. **Involucral bracts** connate at base, broadly ovate, foliaceous, up to 10 mm wide, tips spiny, spine ± 5–10 mm long, ± $^1/_3$–$^1/_2$ length of bract, margins also with smaller spines. **Flowers**: ray florets white or yellow; disc florets yellow; Jan.–Mar. **Fruit** with cypsela glabrous, turbinate, 2.5–3.5 mm long. **Pappus** of scales, uniseriate, up to 0.5 mm long, obtuse. Grassy mountain slopes, alt ± 2 000–3 000 m. *Tšehlo-ea-thaba*, *ntšoantšane-e-kholo*, *mohata-o-mosoeu* (SS).

MsGr

**discolor** (DC.) O.Hoffm. & Muschl.
*Stobaea discolor* DC.

Perennial herb, up to 0.9 m high. **Stems** narrowly winged, spinose. **Leaves** alternate, densely set all along stem; blade oblong, narrowly ovate or narrowly elliptic, up to 200 × 50 mm, margins coarsely sinuate-dentate or pinnatisect, lobes rounded, spinose-ciliate in between, all decurrent in narrow, spiny, stem wings; upper surface rather harshly glandular-pubescent, lower surface white-felted; lower ones narrowed to a short petiole-like base, upper ones sessile. **Heads** radiate, up to 80 mm in diameter, few, corymbosely arranged, pedunculate. **Involucral bracts** connate at base, narrowly ovate, up to 3 mm wide, tip and margins spiny, minutely glandular on backs. **Flowers**: ray and disc florets yellow; Nov.–Mar. **Fruit** with cypsela turbinate, glabrous, ± 2 mm long. **Pappus** of scales, uniseriate, 0.7–1.0 mm long, irregularly denticulate. Damp mountain grassland.

DrGr MsGr KarSh

**echinacea** (Harv.) O.Hoffm. ex Burtt Davy subsp. **echinacea**
*Stobaea echinacea* Harv.
*S. gerrardii* Harv.

Perennial herb, up to 1 m high. **Stems** erect, winged, softly spinose and with straw-coloured bristles. **Leaves** densely set all along stem, alternate; large basal leaves (if present) petiolate, upper leaves sessile; blade of basal leaves elliptic or obovate, up to 80(–170) × 50 mm, margins entire, ciliate or spinose ciliate, upper surface with straw-coloured bristles, lower surface nearly glabrous; blade of upper leaves narrowly obovate to narrowly elliptic to almost linear, margins entire, ciliate or spinose dentate; bases decurrent on stem. **Heads** radiate, up to 60 mm in diameter, solitary or a few corymbosely arranged, pedunculate. **Involucral bracts** connate at base, linear, up to 2 mm wide, apex and margins spiny, minutely glandular. **Flowers**: ray and disc florets yellow; Feb. **Fruit** with cypsela up to 2 mm long, turbinate, villous. **Pappus** scales biseriate, ± 2 mm long, oblong, obtuse. Poor stony grassland. *Iphungula* (Z).

MsGr

**latifolia** J.M.Wood & M.S.Evans

Perennial herb, up to 0.6 m high. **Stems** only with short wings below leaves. **Leaves** alternate, regularly set along stem; blade of basal leaves broadly elliptic, up to 350 × 150 mm, apex obtuse, margins sinuate-lobate, lobes rounded, beset with short spines and spinose-ciliate, upper surface harshly pubescent, lower surface white-felted; blade of upper leaves smaller, linear or narrowly ovate, apex acute, bases shortly decurrent on stem; basal leaves very shortly petiolate, upper leaves sessile. **Heads** radiate, 50–80 mm in diameter, corymbosely

arranged, pedunculate. **Involucral bracts** connate at base, outer ones linear, up to 2 mm wide, apex spinose, margins minutely spinose or ciliate, glandular on back. **Flowers**: ray and disc florets yellow; Feb. **Fruit** with cypsela turbinate, glabrous, 1.5–3.5 mm long. **Pappus** of scales, uniseriate, < 1 mm long, obtuse. Grassland or shrubby woodland.

MsGr

**montana** J.M.Wood & M.S.Evans
*B. bilabiata* N.E.Br.

Perennial herb, up to 2 m high. **Stems** not winged, stout, with slender spines up to 7 mm long. **Leaves** alternate, scattered along stem; blade of lower leaves elliptic, up to ± 200 × 100 mm, apex obtuse or subacute, margins shallowly dentate or sinuate-dentate, teeth spinose, spinose-ciliate in between, upper surface harshly pubescent, lower surface white-cobwebby; upper leaves smaller, narrower, apex acute, base half-clasping, not decurrent on stem; basal leaves petiolate, upper leaves sessile. **Heads** radiate, 30–40 mm in diameter, many in a spreading, corymbose panicle, pedunculate. **Involucral bracts** connate at base, linear, up to 2.5 mm wide, apex and margins spiny, minutely glandular on backs. **Flowers**: ray and disc florets yellow; Mar. **Fruit** with cypsela turbinate, glabrous, ± 2.5 mm long. **Pappus** of scales, uniseriate, up to 1 mm long, obtuse. Forest margins. *Ntsoa-ntsane-ea-loti*, *mohatollo* (SS).

MsGr

**multijuga** (DC.) Roessler
*Stobaea multijuga* DC.

Perennial herb, up to 0.6 m high, stout. **Stems** not winged. **Leaves** mostly in basal rosettes, but also scattered to densely set along stem, spreading, alternate; blade of basal leaves oblong to narrowly obovate or elliptic in outline, up to 400 × 150 mm, pinnatisect, usually cut nearly to midrib, lobes up to ± 15 each side, oblong or narrowly ovate, ± imbricate, margins coarsely and irregularly dentate, teeth spine-tipped, upper surface thinly and softly hairy, lower surface usually white-cobwebby, occasionally only glandular-hairy; upper leaves smaller, ovate, base semi-amplexicaul, auriculate; basal leaves narrowed into an often broadened petiole, upper leaves sessile. **Heads** radiate, ± 60–100 mm in diameter, up to ± 8 subcorymbosely clustered at apex, rarely solitary, pedunculate. **Involucral bracts** connate at base, linear to very narrowly ovate, up to 5 mm wide, apex and margins spiny, glandular and white-cobwebby on backs. **Flowers**: ray and disc florets yellow; Dec.–Feb. **Fruit** with cypsela turbinate, glabrous or minutely pubescent, ± 2.5 mm long. **Pappus** of scales, ± biseriate, ± 1.2 mm long, ± oblong, obtuse. Steep, damp grass slopes below rocky cliffs. *Mohatollo*, *ntšoa-ntšane-ea-loti* (SS), *ukhakhasi*, *imboziso*, *emhlophe* (Z).

MsGr

**onopordifolia** (DC.) O.Hoffm. ex Burtt Davy var. **onopordifolia**
*Stobaea onopordifolia* DC.

Perennial herb, up to 1 m high. **Stems** winged only short distance below leaves, spinose. **Leaves** alternate, fairly densely set all along stem; sessile; blade oblong or narrowly obovate in outline, up to 300 × 80 mm, pinnatifid, lobes ± 6 each side, lobes of lower leaves semi-rounded or almost kidney-shaped, margins with coarse triangular, spine-tipped teeth, interspersed with shorter and more slender spines, upper surface glandular, lower surface white-felted; upper leaves smaller, not so deeply lobed. **Heads** radiate, up to 90 mm in diameter, solitary or few together, pedunculate. **Involucral bracts** connate at base, foliaceous, narrowly ovate, up to 10 mm wide, apex spiny, spine 3–4 mm long, 1/8 length of bract, margins also spiny. **Flowers**: ray florets white or yellow; disc florets yellow; Jan.–Apr. **Fruit** with cypsela turbinate, glabrous,

3–5 mm long. **Pappus** of scales, uniseriate, up to 1 mm long, obtuse. Grassland, on S-facing slopes. *Mohato*, *ntšoa ntšane* (SS). Figure 9D, p. 5.

VreDm | | DrGr | MsGr | KarSh |

**pinnatifida** (Thunb.) Thell. subsp. **ingrata** (Bolus) Roessler

*B. ingrata* Bolus

Perennial herb or subshrub, 0.3–0.5 m high. **Stems** not winged. **Leaves** alternate, scattered along stem, sessile; blade linear-oblong or narrowly obovate in outline, 30–80 mm long, pinnatifid, rachis 2–3 mm wide, segments linear-triangular, spicate, 10–30 × 2 mm, margins revolute, spinulose-ciliate, upper surface usually with straw-coloured bristles, lower surface tomentose, rarely glabrescent; upper leaves somewhat smaller, base semi-amplexicaul. **Heads** discoid, 30–50 mm in diameter, several together, terminal and axillary, pedunculate. **Involucral bracts** connate at base, linear-triangular, (10–)15–25 × 1–2 mm, apex and margins spiny. **Flowers**: ray florets absent; disc florets yellow; Dec.–Mar. **Fruit** with cypsela turbinate, glabrous or rarely minutely pubescent, 2–3 mm long. **Pappus** of scales, ± biseriate, 0.4–0.7 mm long, acute to subobtuse. Grassland, often vlei or marshy areas.

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**pinnatifida** (Thunb.) Thell. subsp. **pinnatifida**

*Stobaea epitrachys* DC.

*S. pinnatifida* Thunb.

Perennial herb or subshrub, up to 0.3 m high. **Stems** not winged. **Leaves** alternate, scattered along stem, lower leaves petiolate, upper sessile; blade linear-oblong or narrowly obovate in outline, 30–80 mm long, pinnatifid, rachis 3–10(–15) mm wide, segments triangular, spicate, 5–10(–15) mm long, margins revolute, spinulose-ciliate, upper surface usually with straw-coloured bristles, lower surface tomentose, rarely glabrescent; upper leaves somewhat smaller, base semi-amplexicaul. **Heads** discoid, up to 40 mm in diameter, several together, terminal and axillary, pedunculate. **Involucral bracts** connate at base, linear-triangular, 8–15(–20) × (2–)3–5 mm, apex and margins spiny. **Flowers**: ray florets absent; disc florets yellow; Oct.–Apr. **Fruit** with cypsela turbinate, glabrous or rarely minutely pubescent, 2–3 mm long. **Pappus** of scales, ± biseriate, 0.8–1.5 mm long, acute to subobtuse. Grassland in sandy soil. *Mofahla-toeba* (SS); *isihlungu* (Z).

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**pinnatifida** (Thunb.) Thell. subsp. **stobaeoides** (Harv.) Roessler

*B. stobaeoides* Harv.

Perennial herb or subshrub, 0.3–0.5 mm high. **Stems** not winged. **Leaves** alternate, scattered along stem, sessile; blade linear-oblong or narrowly obovate in outline, 30–80 mm long, pinnatifid, rachis 2–4 mm wide, base semi-amplexicaul; segments narrowly triangular, spicate, 10–30 mm long, margins revolute, spinulose-ciliate, upper surface usually with straw-coloured bristles, lower surface tomentose, rarely glabrescent. **Heads** discoid, up to 30 mm in diameter, several together, terminal and axillary, pedunculate. **Involucral bracts** connate at base, linear-triangular, 10–15 × 1–2 mm, apex and margins spiny. **Flowers**: ray florets absent; disc florets yellow; Oct.–May. **Fruit** with cypsela turbinate, glabrous or rarely minutely pubescent, 2–3 mm long. **Pappus** of scales, ± biseriate, 1.5–2.0 mm long, acute to subobtuse. Grassland, often vlei or marshy areas.

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**purpurea** (DC.) Mast.

*Stobaea purpurea* DC. including var. *albiflora* Harv.

Perennial herb, up to 0.9 m high. **Stems** stout, winged, spinose. **Leaves** crowded in basal rosette and densely set along stem; sessile or narrowed somewhat at base; blade of lower leaves oblong to broadly elliptic, 250–450 × 100 mm, margins sinuate-dentate or shallowly lobed, spiny, upper surface harshly pubescent and glandular, softly white-tomentose and glandular below; upper leaves smaller, alternate, sessile, bases decurrent on stem, blade narrowly elliptic to narrowly ovate, margins coarsely lobed, spiny. **Heads** radiate, 50–80 mm in diameter, racemosely arranged, pedunculate. **Involucral bracts** connate at base, narrowly ovate, up to 5 mm wide, apex and margins spiny, minutely glandular and cobwebby on backs. **Flowers**: ray and disc florets pale to deep mauve, rarely white; Jan. **Fruit** with cypsela turbinate, villous, 2–3 mm long. **Pappus** scales biseriate, up to 1.5 mm long, obovate-oblong, acute to obtuse. Steep grassy mountain slopes, rough herbage along streams, often in large colonies. *Purple berkheya*; *bloudisseldoring* (A); *sehlohlo* (SS).

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**radula** (Harv.) De Wild.

*Stobaea radula* Harv.

Perennial herb, (0.20–)0.25–0.90 m high. **Stems** winged, spinose. **Leaves** alternate; in a basal rosette and scattered along flowering stems; blade of lower leaves obovate-oblong to elliptic-oblong, up to 400 × 120 mm, apex subobtuse to rounded, base narrowed petiole-like, margins sinuate to sinuate-lobate, lobes denticulate-spinose and spinose-ciliate in between, upper surface scattered hairy, lower surface white-tomentose; upper leaves sessile, much smaller, narrowly oblong to linear, apex acute, base decurrent on stem. **Heads** radiate, 30–50 mm in diameter, a few laxly arranged terminally, pedunculate. **Involucral bracts** connate at base, linear to very narrowly ovate, up to 3 mm wide, apex and margins spiny, minutely glandular and cobwebby on backs, or glabrescent. **Flowers**: ray and disc florets yellow; Oct.–Mar. **Fruit** with cypsela turbinate, glabrous, 3.5–4.5 mm long. **Pappus** of scales, biseriate, up to 2 mm long, narrowly oblong. Grassland in marshy areas and riverbanks. *Boesmansrietjie* (A); *isihlungu* (Z). Figure 37.

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**rhapontica** (DC.) Hutch. & Burtt Davy subsp. **aristosa** (DC.) Roessler var. **aristosa**

*Stobaea aristosa* DC.

Perennial herb, up to 0.3 m high. **Stems** erect, entirely winged. **Leaves** alternate, sessile; crowded in a basal rosette and scattered to densely set along stem; blade of basal leaves broadly obovate to subrotund, rarely broadly elliptic, 60 × 50 mm, apex rounded, subobtuse or rarely acute, base narrowed, margins entire or very shallowly sinuate-lobate, softly spiny and ciliate, upper surface harshly pubescent, lower surface sparsely pilose, often cobwebby, not white-tomentose; upper leaves sessile, much smaller, blade oblong or linear-oblong, apex acute, base decurrent on stems, margins spinose-dentate and ciliate in between. **Heads** radiate, ± 40–50 mm in diameter, a few racemosely or subracemosely arranged; peduncles 10–60 mm long. **Involucral bracts** connate at base, linear, up to 2 mm wide, tips and margins of particularly the outer bracts spiny, cobwebby on the backs. **Flowers**: ray and disc florets bright yellow; Jan. **Fruit** with cypsela turbinate, villous, 1.5–2.0 mm long. **Pappus** of scales, biseriate, up to 1 mm long, ± oblong, obtuse or subacute. Grassland, sometimes rocky outcrops. *Pepetloane-e-meutla*, *ntšoa-ntšane* (SS); *ikhakhasi*, *iphungula* (Z). Often confused with var *exalata* and subsp. *platyptera*.

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**Figure 37.** *Berkeya radula* (Asteraceae). Artist: G. Condy.

**rhapontica** (DC.) Hutch. & Burtt Davy subsp. **aristosa** (DC.) Roessler var. **exalata** Roessler

*B. evansii* Schltr.

Perennial herb, up to 0.2 m high. **Stems** erect, not entirely winged or for the most part wingless. **Leaves** alternate, sessile; crowded in a basal rosette and scattered to densely set along stem; blade of lower leaves broadly elliptic to subrotund, 50 × 40 mm, apex acute, rounded or subobtuse, base narrowed, margins entire, softly spinose-ciliate, upper surface harshly pubescent, lower surface sparsely pilose, often cobwebby; upper leaves sessile, much smaller, blade oblong or linear-oblong, apex acute or obtuse, base semi-amplexicaul, not or very shortly decurrent on stems. **Heads** radiate, ± 40–60 mm in diameter, few racemosely or subracemosely arranged; peduncles 10–60 mm long. **Involucral bracts** connate at base, linear, up to 2 mm wide, tips and margins of particularly the outer bracts spiny, cobwebby on the backs. **Flowers**: ray and disc florets bright yellow; Jan. **Fruit** with cypsela turbinate, villous, 1.5–2.0 mm long. **Pappus** of scales, biseriate, up to 1 mm long, ± oblong, obtuse or subacute. Grassland, sometimes rocky outcrops. *Pepetloane-e-meutla*, *ntšoa-ntšane* (SS); *ikhakhasi*, *iphungula* (Z). Often confused with var. *aristosa* and subsp. *platyptera*.

MsGr

**rhapontica** (DC.) Hutch. & Burtt Davy subsp. **platyptera** (Harv.) Roessler

*B. platyptera* (Harv.) O.Hoffm.

*Stobaea platyptera* Harv.

Similar to subsp. **rhapontica** below, but basal leaves oblong-elliptic to narrowly obovate, 180 × 80 mm, apex acute, margins sinuate-lobate to coarsely dentate and spiny, ciliate in between; lower surfaces sparsely pilose, not white-tomentose. No specimens in PRE for FS. Often confused with the two varieties of subsp. *aristosa*.

**rhapontica** (DC.) Hutch. & Burtt Davy subsp. **rhapontica**

*Stobaea rhapontica* DC.

Perennial herb, up to 1.2 m high. **Stems** erect, winged entirely. **Leaves** alternate, crowded in a basal rosette and scattered along stem; blade of lower leaves elliptic, broadly obovate, obovate-oblong to subrotund, up to 180(–300) × 90–100 mm, apex acute to obtuse or rounded, base narrowed petiole-like, margins entire, very shallowly sinuate-lobate or dentate, softly spiny and ciliate, upper surface harshly pubescent, lower surface densely white-felted; upper leaves sessile, much smaller, oblong or linear-oblong, apex acute, base decurrent on stems. **Heads** radiate, ± 25–40 mm in diameter, 6–10 racemosely or subracemosely arranged, rarely solitary; peduncles 10–30(–100) mm long. **Involucral bracts** connate at base, linear, acute, up to 2 mm wide, tips and margins of particularly the outer bracts spiny, tomentose on the backs. **Flowers**: ray and disc florets bright yellow; Nov., Feb. **Fruit** with cypsela turbinate, villous, 1.5–2.0 mm long. **Pappus** of scales, biseriate, up to 1 mm long, ± oblong, obtuse or subacute. Grassland, sometimes rocky outcrops. *Pepetloane-e-meutla*, *ntšoa-ntšane* (SS); *ikhakhasi*, *iphungula* (Z).

MsGr

**rosulata** Roessler

Shrub, up to 1 m high, bushy. **Stems** not winged, leafless in lower part, young stems white-felted. **Leaves** almost in a rosette at branch tips, some scattered along stem below heads, sessile; blade narrowly obovate, up to 40 × 15 mm, apex acute, base cuneate, margins distantly spine-toothed in upper half, upper surface glabrous, lower surface white-felted; bract-like leaves on peduncles alternate, smaller. **Heads** radiate, 50–70 mm in diameter, solitary,

terminal, on white-felted shoots 150–300 mm long. **Involucral bracts** connate at base, linear or very narrowly ovate, up to 3 mm wide, tips and margins spiny, white-felted on backs. **Flowers**: ray and disc florets yellow; Jan.–Apr. **Fruit** with cypsela villous, turbinate, ± 2 mm long. **Pappus** of scales, biseriate, up to 1.5 mm long, narrowly ovate, acute. Crevices of basalt cliffs. *Rosette thistle*; *ntšoa-ntšane* (SS).

MsGr

**setifera** DC.

*Crocodilodes setiferum* (DC.) Kuntze

Perennial herb, up to 1.2 m high. **Stems** erect, single, not winged. **Leaves** alternate; mostly basal, occasionally 1 or 2 small leaves along stem; blade of basal leaves elliptic to broadly elliptic or obovate to narrowly obovate, up to 400 × 120 mm, apex rounded to subobtuse, base narrowed into petiole, not decurrent, margins entire to coarsely but shallowly dentate, upper surface and margins with harsh, straw-coloured bristles, lower surface softly hairy; stem leaves in lower half, much smaller, sessile. **Heads** few, radiate, ± 60 mm in diameter, clustered on long peduncles. **Involucral bracts** connate at base, linear, acuminate, ± 1 mm wide, apex and margins spiny, minutely glandular-pubescent and pilose-araneose on backs. **Flowers**: ray and disc florets bright golden-yellow; Nov.–Feb. **Fruit** with cypsela turbinate, pilose, ± 2.5 mm long. **Pappus** of scales, bi- or triseriate, up to 12 mm long, narrow, linear, acuminate. Open grassland. *Buffalo-tongue berkheya*; *rasperdisseldoring* (A); *lelelemla-khomo* (SS); *indlebe-lenkomo* (X); *ikhakhasi*, *ulimi-lwenkomo*, *ulimi-lwenyathi* (Z).

DrGr MsGr

**speciosa** (DC.) O.Hoffm. subsp. **lanceolata** Roessler

Perennial herb, up to 1 m high. **Stems** not winged. **Leaves** alternate, mostly basal and only a few along stem; blade broadly elliptic, up to 200 × 70 mm, apex acute, base narrowed into petiole, margins entire or finely denticulate, ciliate, cilia up to 2 mm long, upper surface harshly pubescent, lower surface white-felted; few upper leaves much smaller, sessile; basal leaves with petiole 10–200 mm long, spinose-ciliate. **Heads** radiate, up to ± 70 mm in diameter, usually in subcorymbs, pedunculate. **Involucral bracts** connate at base, linear, acuminate, up to 2 mm wide, apex and margins spiny, minutely glandular, sometimes cobwebby as well on backs. **Flowers**: ray and disc florets bright yellow; Jan. **Fruit** with cypsela glabrous or minutely pubescent, turbinate, 1.5–2.0 mm long. **Pappus** of scales, biseriate, up to 3 mm long, narrowly obovate, obtuse. Grassland.

MsGr

**speciosa** (DC.) O.Hoffm. subsp. **ovata** Roessler

Perennial herb, up to 0.35 m high. **Stems** not winged. **Leaves** alternate, mostly basal, only a few along stem; blade ovate or elliptic, 50–120 × 25–55 mm, apex rounded or subacute to acute, base narrowed into petiole or rounded, truncate or cordate, margins entire or finely denticulate, ciliate, cilia up to 2 mm long, upper surface harshly pubescent, lower surface white-felted; few upper leaves much smaller, sessile; basal leaves subsessile or petiole 20–30 mm long, spinose-ciliate. **Heads** radiate, up to ± 70 mm in diameter, solitary, pedunculate. **Involucral bracts** connate at base, linear, acuminate, up to 2 mm wide, apex and margins spiny, minutely glandular, sometimes cobwebby as well on backs. **Flowers**: ray and disc florets bright yellow; flowering time? **Fruit** with cypsela glabrous or minutely pubescent, turbinate, 1.5–2.0 mm long. **Pappus** of scales, biseriate, up to 3 mm long, narrowly obovate, obtuse. No records in PRE for FS, but occurs there according to Roessler (1959).

**speciosa** (DC.) O.Hoffm. subsp. **speciosa**

*Stobaea speciosa* DC. including var. *macroglossa* DC.

Perennial herb, up to 1 m high. **Stems** not winged. **Leaves** alternate, mostly basal and only a few along stem; blade broadly elliptic to broadly ovate, up to 300 × 250 mm, apex rounded or subacute to acute, base rounded, truncate or cordate, margins mostly entire, rarely shallowly sinuate or shallowly and broadly dentate, with cilia up to 2 mm long, upper surface harshly pubescent, lower surface white-felted; few upper leaves much smaller, sessile; basal leaves with petiole 50–350 mm long, spinose-ciliate. **Heads** radiate, up to ± 70 mm in diameter, usually in subcorymbs, pedunculate. **Involucral bracts** connate at base, linear, acuminate, up to 2 mm wide, apex and margins spiny, minutely glandular, sometimes cobwebby as well on backs. **Flowers**: ray and disc florets bright yellow; Dec. **Fruit** with cypsela glabrous or minutely pubescent, turbinate, ± 2 mm long. **Pappus** of scales, biseriate, up to 3 mm long, narrowly obovate, obtuse. Grassland. *Skraaldisseldoring* (A); *ntšoa-ntšane* (SS); *ikhakhasi elikhulu*, *uma-phola* (Z).

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## **Bidens** L. (sthn Afr.: 5 spp.)

(Heliantheae)

### Key to species:

[after Hilliard: 316 (1977)]

1a Ray florets creamy white or absent; pappus of 2 or 3 awns . . . . . **B. pilosa**
1b Ray florets yellow; pappus of (2)3 or 4 awns . . . . . 2
2a Leaves bipinnate, leaflets very narrowly ovate or linear; pappus of (2)3 or 4 awns . . . . . **B. bipinnata**
2b Leaves pinnately lobed or pinnatisect with 5–9 ovate leaflets, basal pair ± deeply divided into 2 asymmetric lobes; pappus of 3 or 4(5) awns . . . . . **B. biternata**

***bipinnata** L.

Annual herb, up to 1.5 m high. **Leaves** opposite, rarely alternate towards apex; blade ovate in outline, up to 200 mm long, bipinnate; leaflets very narrowly ovate or linear, margins serrate to almost entire, usually pubescent in lower parts; petiole 10–60 mm long. **Heads** radiate, up to 10 mm in diameter, in lax, paniculate cymes, pedunculate. **Involucral bracts** biseriate, imbricate. **Receptacle** paleate. **Flowers**: ray florets small, neuter, yellowish; disc florets bisexual, yellow; Jan.–May. **Fruit** with cypsela black, linear-fusiform, tetragonal, glabrous or sparsely hispid towards apex. **Pappus** of (2)3 or 4 awns. Weed of cultivation. Native to America. *Spanish black-jack*, *khakibush*; *basterkakiebos*, *Spaanse knapsekêrel* (A); *monyane* (North Sotho).

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***biternata** (Lour.) Merr. & Sherff

Annual herb, up to 2 m high. **Leaves** opposite, rarely alternate towards apex; blade broadly ovate in outline, up to 200 mm long, 5–9-pinnately lobed or pinnatisect, leaflets ovate, basal pair ± deeply divided into 2 asymmetric lobes, margins serrate, glabrous or pilose; petiole up to 60 mm long. **Heads** radiate, up to 10 mm in diameter, in lax, paniculate cymes, pedunculate. **Involucral bracts** biseriate, imbricate, pubescent. **Receptacle** paleate. **Flowers**: ray florets

small, neuter, yellow; disc florets bisexual, yellow; Jan. **Fruit** with cypsela black, linear-tetragonal, hispid towards apex. **Pappus** of 3 or 4(5) awns. Weed of cultivation. Native to China.

MsGr

***pilosa** L.
*B. leucantha* (L.) Willd.

Annual herb, up to 1.5 m high. **Leaves** opposite; blade ovate in outline, up to 200 mm long, trifoliolate or pinnately 5-foliolate, leaflets ovate, apical leaflet usually ± 2 × as long as laterals, margins serrate, glabrous or pilose; petiole up to 70 mm long. **Heads** radiate or discoid, up to 10 mm in diameter, solitary or a few together terminally, pedunculate. **Involucral bracts** biseriate, imbricate, glabrous. **Receptacle** paleate. **Flowers**: ray florets neuter, creamy white or absent; disc florets bisexual, yellow; Mar.–May. **Fruit** with cypsela black, linear-tetragonal, hispid. **Pappus** of 2 or 3(4) awns. Weed of cultivation. Native to America. *Black-jack*; *knapsekêrel* (A); *mokolonyane* (SS), *umhlabangubo* (X, Z); *ucucuza*, *umesisi*, *uqadolo* (Z).

DrGr MsGr

## **Brachylaena** R.Br. (sthn Afr.: 9 spp.)

(Tarchonantheae)

**rotundata** S.Moore
*B. rhodesiana* S.Moore

Tree or shrub, up to 10 m high; young branches white-tomentose. **Leaves** alternate; blade elliptic or oblong-elliptic, up to 100 × 60 mm, apex obtuse to rounded, rarely subacute, base cuneate to rounded, margins entire, sometimes dentate, especially in coppice shoots, lower surface white or greyish tomentose, side veins prominent; petiole 2–5(–7) mm long. **Heads** discoid, many in axillary or terminal spikes or racemes, very shortly pedunculate; male and female florets on different plants. **Involucral bracts** 6- or 7-seriate; extending down to base of peduncle. **Flowers**: disc florets only, dull yellow; flowering time? **Fruit** with cypsela subcylindric-fusiform or narrowly elliptic, dark brown, pubescent. **Pappus** of barbellate bristles, sparse in male florets, several rows in female florets. Open woodlands, especially on rocky slopes at base of hills, on sandy soil and sandy pits and edge of riverine strips. No specimens in PRE for FS, but according to the literature, occurring occasionally on the FS side of the Vaal River.

VreDm?

## **Callilepis** DC. (sthn Afr.: 4 spp.)

(Gnaphalieae)

**laureola** DC.
*C. glabra* DC.
*C. hispida* DC.

Perennial herb, up to 0.6 m high; with large woody tuber. **Leaves** alternate, lower opposite, sessile; blade mostly elliptic, sometimes ovate or very narrowly elliptic to almost linear, apex acute, base cuneate or rounded, margins entire or denticulate, 3-nerved, glabrous or hairy.

**Heads** radiate, ± 60 mm in diameter, solitary or occasionally 2–4 in open corymbs. **Involucral bracts** in few rows, imbricate. **Receptacle** paleate, enveloping disc florets. **Flowers**: ray florets creamy white; disc florets purplish black; Feb. **Fruit** with cypsela of ray florets 3-angled, of disc florets compressed. **Pappus** of scales. Grassland. *Star thistle*; *wilde-margriet* (A); *amafuthomhlaba*, *ihlamvu*, *impila* (Z).

MsGr

## **Campuloclinium** DC. (sthn Afr.: 1 spp.)

(Eupatorieae)

### ***macrocephalum** (Less.) DC.

*Eupatorium macrocephalum* Less.

Perennial herb, up to 0.6 m high, coarsely hispid. **Leaves** alternate, shortly petiolate; blade elliptic, up to 80 × 20 mm, apex subacute, base attenuate, margins serrate. **Heads** discoid, up to 25 mm in diameter, several in terminal, open, corymbose panicle, pedunculate. **Involucral bracts** 3-seriate, subequal, purplish. **Flowers**: disc florets only, pink, Dec.–Mar. **Fruit** with cypsela narrowly cylindric, 4-angled, black, gland-dotted, ± 4.5 mm long. **Pappus** of many barbellate bristles. Weed of disturbed places. Native to South America. *Pom-pom weed*.

VreDm DrGr

## **Centaurea** L. (sthn Afr.: 5 spp.)

(Cardueae)

### Key to species:

[partly after Moore & Frankton: 76 (1974)]

| | | |
|---|---|---|
| 1a | Involucral bracts without spines | 2 |
| 1b | Involucral bracts with spines | 3 |
| 2a | Heads radiate | **C. cyanus** |
| 2b | Heads discoid | **C. repens** |
| 3a | Florets purple | **C. calcitrapa** |
| 3b | Florets yellow | **C. melitensis** |

### ***calcitrapa** L.

Annual or biennial herb, up to 600 mm high. **Stems** thin, wiry, not winged, glabrous. **Leaves** alternate; blade elliptic or obovate in outline, deeply pinnatifid almost to midrib, segments linear to narrowly elliptic, margins denticulate, lightly pubescent; basal leaves petiolate, stem leaves sessile. **Heads** discoid, 15–20 mm long, solitary. **Involucral bracts** glabrous, in a few rows, imbricate, bracts tipped with rigid, yellow spines, 15–25 mm long, often with shorter spines at base of central spine. **Flowers**: disc florets only, bright purple; Apr. **Fruit** with cypsela oblong. **Pappus** absent. Native to Europe. *Star thistle*; *sterdissel* (A).

KarSh

***cyanus** L.

*Cyanus segetum* Hill

Annual herb, up to 600 mm high. **Stems** slender, sericeous, not winged. **Leaves** alternate, sessile; blade linear, apex acute, margins entire, lower leaves sometimes sparsely lobed, lower surface white-woolly. **Heads** radiate, solitary, terminal. **Involucral bracts** glabrous, in several rows, imbricate, without spines, apical margins lacerate, often purple-tinged. **Flowers**: ray and disc florets blue, purple or white; Nov. **Fruit** with cypsela narrowly obovoid, compressed, light and dark grey, slightly sericeous. **Pappus** of many unequal bristles, 3–4 mm long. Escaped from cultivation. Native to Mediterranean region. *Cornflower*; *koringblom* (A).

DrGr

***melitensis** L.

Annual herb, 200–500 mm high. **Stems** angular, narrowly winged, scabridulous. **Leaves** basally crowded and alternate along stem; basal leaves petiolate, blade narrowly obovate to lyrate-pinnatilobed, lobes few, narrow, margins entire or dentate; stem leaves sessile, blade oblong, mostly entire, sometimes weakly sinuate or dentate, bases decurrent, pubescent to scabridulous. **Heads** discoid, solitary or in small groups, terminal, on short branches. **Involucral bracts** glabrous, in many rows, imbricate, outer bracts tipped with deflexed spine up to 8 mm long and at its base 1 pair of lateral spines, additionally also 2 or 3 pairs of shorter spines on margin of bract, innermost bracts with reduced apical spine and lateral spines absent. **Flowers**: disc florets only, bright yellow; June and Nov. **Fruit** with cypsela pale brownish purple, oblong, laterally compressed. **Pappus** of paleaceous setae in many rows, 2–3 mm long. Weed of cultivation. Native to Mediterranean region. *Maltese thistle*; *koringdissel* (A).

DrGr MsGr

***repens** L.

*Centaurea picris* Pall.

Perennial herb, up to 1 m high. **Stems** thin, stiff, canescent, not winged. **Leaves** basally crowded and alternate along stem, sessile; blade of basal leaves obovate, irregularly pinnately lobed or almost entire; blade of lower stem leaves narrowly oblong, margins often distantly dentate or entire; blade of upper stem leaves linear, margins entire, initially lightly pilose, glabrate. **Heads** discoid, solitary, terminal. **Involucral bracts** in several rows, imbricate, not spiny, outer bracts glabrous with broad, whitish, chartaceous, finely ciliate margins, inner bracts densely silky pubescent. **Flowers**: disc florets only, pink or purple, Aug., Dec–Feb. **Fruit** with cypsela obovoid, compressed, whitish, glabrous. **Pappus** of many shortly plumose bristles, 8–10 mm long. Weed of cultivation. Native to southern Europe. *Russian centaurea*, *Russian knapweed*, *Russiese centaurea* (A).

DrGr KarSh

## **Chrysanthemoides** Fabr. (sthn Afr.: 2 spp.)

(Calenduleae)

**monilifera** (L.) Norl. subsp. **canescens** (DC.) Norl.

*Osteospermum pisiferum* L. var. *canescens* DC.

Shrub, up to 1.5 m high; branches, involucre and often leaves with persistent, greyish hairy indumentum. **Leaves** alternate, shortly petiolate; blade elliptic to obovate, apex acute, base cuneate, margins coarsely dentate, semisucculent. **Heads** radiate, solitary or few corymbosely arranged, terminal and axillary. **Involucral bracts** 2- or 3-seriate, imbricate, inner bracts narrowly

oblong or elliptic, acute or acuminate. **Flowers**: ray florets fertile; disc florets functionally male, all pale yellow; Sep.–Apr. **Fruit** a drupe, with ellipsoid or obovoid endocarp. **Pappus** absent. Mountainous areas. *Bush-tick berry*; *boetabessie*, *bietou* (A); *monokotsoai-oa-makhoaba*, *motlempe*, *ntlo-ea-lekhoaba* (SS); *ulwamfithi* (X); *inkhupuyana*, *itholonja*, *umtholombe* (Z).

DrGr MsGr

## **Chrysocoma** L. (sthn Afr.: 21 spp.)

(Astereae)

### Key to species:

[after Bayer: 271 (1981)]

Leaf blade linear, needle-like . . . . . **C. ciliata**
Leaf blade flat, very narrowly obovate, broadened to apex . . . . . **C. obtusata**

### **ciliata** L.

*Aster discoideus* Sond.
*C. tenuifolia* P.J.Bergius

Dwarf shrub, up to 1 m high, densely leafy. **Leaves** alternate, sessile; blade linear, up to 15 × 1 mm, needle-like, apex acute, margins entire, glabrous, gland-dotted and often sticky. **Heads** discoid, solitary, terminal. **Involucral bracts** ± 4-seriate, imbricate, glabrous, sticky. **Flowers**: disc florets only, yellow; Jun.–Apr. **Fruit** with cypsela obovate, flattened, hairy, with thickened margins. **Pappus** an outer row of small scales and inner row of barbellate bristles. Rocky places, also flat areas, can become invasive. *Bitter bush*; *beesbos*, *bitterbos*, *donkiebos*, *kaalsiektebos* (A); *sehalahala* (SS).

AcGr DrGr MsGr KarSh Zastr

### **obtusata** (Thunb.) Ehr.Bayer

*Aster obtusatus* Thunb.
*C. polygalifolia* S.Moore

Dwarf shrub, up to 0.6 m high. **Leaves** alternate, sessile; blade very narrowly obovate, up to 17 × 2.2 mm, flat, apex obtuse, rarely acute, margins entire, glabrous, glandular. **Heads** discoid, solitary or up to 3 together, terminal. **Involucral bracts** 4-seriate, imbricate, glabrous, often with glands. **Flowers**: disc florets only, yellow; Aug.–Mar. **Fruit** with cypsela obovate, flattened, hairy, with thickened margins. **Pappus** an outer crown of small scales and inner row of barbellate bristles. Flat grassveld.

AcGr DrGr KarSh

## **Cichorium** L. (sthn Afr.: 1 sp.)

(Cichorieae)

### ***intybus** L. subsp. **intybus**

Perennial herb, up to 1.2 m high, containing milky juice. **Leaves**: basal leaves crowded, petiolate, blade large, obovate in outline, irregularly pinnately lobed with acute apex and dentate margins or obovate with broadly acute apex and sparsely dentate margins, sometimes with few basal lobes, base narrowing to petiole; stem leaves alternate, sessile, blade smaller,

irregularly pinnately lobed with acute apex and dentate margins or oblong to ovate, apex obtuse to acute, margins sparsely dentate to entire, base amplexicaul, hispid or glabrescent. **Heads** ligulate, solitary and terminal on apically thickened stalks or in few-headed clusters, sessile in axils of upper leaves. **Involucral bracts** biseriate, imbricate, outer bracts glandular-ciliate on margins and midrib or glabrous, inner bracts apically pubescent. **Flowers**: sky-blue, rarely pink or white; Dec.–Feb. **Fruit** with cypsela obscurely 5-angled, obconic, truncate, rugose-scabridulous. **Pappus** of small scales in several rows. Escape from cultivation, occurring as a weed in disturbed areas. Native to Europe and Asia. *Chicory*; *sigorei* (A).

DrGr | KarSh | Zastr

## **Cineraria** L. (sthn Afr.: 28 or 29? spp.)

(Senecioneae)

### Key to species:

[partly after Cron *et al*.: 456 (2006)]

1a Leaf blade reniform, sometimes with 1 or 2(–4) pairs of lateral pinnae . . . . 2
1b Leaf blade pinnatisect or lyrate-pinnatifid . . . . . 3
2a Heads solitary, rarely up to 3. . . . . .**C. mollis**
2b Heads few to many in corymbose panicles. . . **C. erodioides** var. **erodioides**
3a Dwarf shrubs; leaf blade pinnatisect, segments usually pinnatilobed; cypselae ciliate on margins and hairy on faces . . . . . **C. aspera**
3b Annual or possibly short-lived perennial herbs; leaf blade lyrate-pinnatifid, usually with 2 or 3 pairs of lateral lobes, terminal lobe usually the largest: cypselae glabrous or with few minute hairs and/or sparsely ciliate on wings . . . . . **C. lyratiformis**

### **aspera** Thunb.

*C. burkei* Burtt Davy & Hutch.
*C. hamiltoni* S.Moore

Dwarf shrub, up to 1 m high. **Leaves** alternate; blade ovate to elliptic in outline, up to 84 × 77 mm, pinnatisect, segments usually pinnatilobed, margins dentate, both surfaces greyish green due to thick cobwebby indumentum, upper surface glabrescent; petiole 5–50 mm long, auriculate. **Heads** radiate, many in compact, corymbose panicles, pedunculate. **Involucral bracts** 8–10(–13), uniseriate, 4–5 mm long, with calyculus bracts below involucral bracts, glabrous, but cobwebby among calyculus bracts. **Flowers**: ray florets 5–8; ray and disc florets bright yellow; Jan.–Dec. **Fruit** with cypsela obovate, compressed, margined, dark brown, ciliate and hairy on faces and margins. **Pappus** of delicate, barbellate, caducous bristles. Among rocks on mountainsides, at foot of cliffs; becoming a weed along roadsides. *Grey cineraria*; *geelrankbossie* (A); *moholu-oapela*, *mohodu-we-pela* (SS).

AcGr | DrGr | MsGr | KarSh | Zastr

### **erodioides** DC. var. **erodioides**

*C. britteniae* Hutch. & R.A.Dyer
*C. dieterlenii* E.Phillips
*C. polycephala* DC.
*C. tussilaginea* Thunb. (1823: 671) *pro parte*

Perennial, dwarf shrub (suffrutex), up to 1 m high. **Leaves** alternate; blade reniform to deltoid-reniform in outline, 10 × 47–71 mm, shallowly or deeply lobed, apex rounded to obtuse, base truncate to subcordate, margins dentate; thinly cobwebby, sparsely hairy or glabrous above,

cobwebby or hairy below, glabrescent, auricles conspicuous, auriform and procurrent (running up petiole); petiole 5–65(–95) mm long. **Heads** radiate, few (4–12) to many (18–96) per stem branch arranged in fairly lax, corymbose panicles, pedunculate. **Involucral bracts** 8–13, uniseriate, up to 5 mm long, with calyculus bracts below involucral bracts, glabrous or cobwebby, glabrescent, remaining cobwebby among calyculus bracts. **Flowers**: ray florets 5–8(–13); ray and disc florets bright yellow; Feb.–Sep. **Fruit** with cypsela obovate, compressed, dark brown with a paler distinct, narrow wing (or broad wing in ray cypsela), ciliate with sparsely hairy or glabrous faces, or entirely glabrous. **Pappus** of delicate, barbellate, caducous bristles. Mountain slopes and plateaux, near rivers and along forest margins, on sandstone outcrops and basalt.

| | | DrGr | MsGr | KarSh | Zastr |
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### **lyratiformis** Cron

*C. lyrata* DC.

Annual or possibly short-lived perennial herb, up to 0.6 m high. **Leaves** alternate, auriculate; blade of young leaves reniform with pinnae, mature leaves oblong in outline, up to 80 × 30 mm, lyrate-pinnatifid, usually with 2 or 3 pairs of lateral lobes, terminal lobe usually the largest, apex of lobes acute, margins dentate, base cuneate to truncate to subcordate, glabrescent, but lower surface remaining sparsely cobwebby or hairy; upper leaves sometimes sessile and clasping; palmately veined; petiole 1–30 mm long. **Heads** radiate, few to many in corymbose panicles, pedunculate. **Involucral bracts** 12–14, uniseriate, 4–5 mm long, with calyculus bracts below involucral bracts, cobwebby when young, glabrescent, but cobwebby among calyculus bracts. **Flowers**: ray florets ± 8; ray and disc florets bright yellow; Oct.–Feb., May. **Fruit** with cypsela broadly obovate, compressed, broadly winged, black or dark brown with pale brown wings, glabrous or with few minute hairs and/or sparsely ciliate on wings. **Pappus** of delicate, barbellate, caducous bristles. Weed along roadsides and in old fields, often wet places. *Wild parsley*; *boerelusern* (A); *khotoliea*, *tlali-tlali* (SS).

| VreDm | | DrGr | MsGr | | Zastr |
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### **mollis** E.Mey. ex DC.

Tufted, perennial herb, 30–200(–300) mm high. **Leaves** alternate, basally crowded; blade reniform, sometimes with 1 or 2(–4) pairs of lateral pinnae, terminal lobe largest, up to 20(–50) × 30(–80) mm, usually shallowly 3-lobed, apex round, base cordate, margins coarsely dentate, upper surface cobwebby grey or glabrous, lower surface white- or grey-tomentose; palmately veined; petiole up to 150 mm long, auricles absent. **Heads** radiate, solitary or rarely 2 or 3, pedunculate. **Involucral bracts** 12–20, uniseriate, 5.5–7.0 mm long, with calyculus bracts below involucral bracts, cobwebby, glabrescent, remaining cobwebby among calyculus bracts. **Flowers**: ray florets up to 14; ray and disc florets bright yellow; Jan. **Fruit** with cypsela narrowly obovate, compressed, margined, dark brown, white-hairy. **Pappus** of delicate, barbellate, caducous bristles. Associated with sandstone, basalt or dolerite rock formations.

| | | DrGr | | | |
|---|---|---|---|---|---|

## **Cirsium** Mill. emend. Scop. (sthn Afr.: 2 spp.)

(Cardueae)

### ***vulgare** (Savi) Ten.

*Carduus vulgaris* Savi

Biennial herb, up to 1.5 m high. **Stems** lightly arachnoid, upper branches irregularly and spiny winged. **Leaves** alternate, sessile; blade oblong to obovate in outline, deeply pinnately parted,

segments triangular, ending in long, stout spine, margins also with shorter, finer spines, upper surface rough, scabrous, lower glabrate to grey-tomentose, base decurrent. **Heads** large, discoid, solitary or 2 or 3 clustered at tips of branches. **Involucral bracts** in many rows, linear, spine-tipped. **Flowers**: disc florets only, reddish purple, rarely white; Nov.–Apr. **Fruit** with cypsela obovate, obscurely 4-angled, pale with dark vertical streaks. **Pappus** of many plumose bristles connate at base. Weed of cultivation and waste places. Native to Europe, western Asia and North America. *Scottish thistle*; *skaapdissel*, *skotsedissel* (A); *hlaba* (SS). Figure 10A, p. 7.

VreDm | AcGr | DrGr | MsGr

## **Conyza** Less. (sthn Afr.: 14 spp.)

(Astereae)

### Key to species:

[after Hilliard: 86 (1977) and Pruski & Sancho: 97 (2006)]

1a Well-branched shrubs with leaf blade 3-nerved from base. . . . . **C. scabrida**
1b Herbs, sometimes bushy, but then leaf blade not 3-nerved from base . . . . 2
2a Most of the leaf blades pinnatifid or lyrate-pinnatifid . . . . . 3
2b Leaf blade entire or toothed (dentate), but not pinnatifid . . . . . 7
3a Leaves mostly crowded in a basal rosette; flower heads up to 20 mm in diameter [when pressed] . . . . . **C. chilensis**
3b Leaves mostly along the stem [cauline] (leafy runners with rosettes present in 2 species); flower heads not exceeding 15 mm in diameter [when pressed] . . . .4
4a Stem leaves distinctly petiolate, eared at base, generally lyrate-pinnatifid, upper part elliptic to ovate in outline, sometimes without lower lobes . . . . . **C. ulmifolia**
4b Stem leaves sessile, basal leaves (if present) petiolate . . . . . 5
5a Flower heads ± 15 mm in diameter [when pressed], solitary on long (up to 150 mm) nude or nearly nude peduncles, sometimes forming a very open, few-headed corymb . . . . . **C. podocephala**
5b Flower heads ± 10 mm in diameter [when pressed], in compound corymbs, the ultimate peduncles usually ± 10–30 mm long. . . . . 6
6a Plants with long leafy runners; stems and leaves weakly hairy; leaf lobes commonly 1- or 2-toothed (dentate) . . . . . **C. pinnata**
6b Plants without leafy runners; stems and leaves generally with a copious white pubescence; leaf lobes nearly always entire . . . . . **C. obscura**
7a Leaves mostly basal . . . . . **C. chilensis**
7b Leaves mostly along the stem [cauline]. . . . . 8
8a Flower heads large, ± 15 mm in diameter [when pressed], solitary on long (up to 150 mm) peduncles, sometimes grouped in loose, few-headed corymbs . . . . . **C. podocephala**
8b Flower heads < 15 mm in diameter, in compound corymbs or panicles. . . 9
9a Weak, straggling, branching herbs, often supported by other vegetation. . . . . **C. ulmifolia**
9b Erect herbs; weeds of cultivation and waste places . . . . . 10 (also see p. 286)
10a Lateral branches commonly overtopping or at least equalling the main axis; flower heads usually > 10 mm in diameter [when pressed]; pappus dirty white or pinkish . . . . . **C. bonariensis**
10b Lateral branches never overtopping the main axis, the whole forming a pyramidal compound inflorescence; flower heads usually < 10 mm in diameter; pappus straw-coloured . . . . . .11

11a Flower heads ± 5 mm in diameter, outer florets with minute, white or mauve-tinged rays . . . . . **C. canadensis**

11b Flower heads generally > 5 mm in diameter, outer florets filiform, greenish white, greenish yellow, yellowish or whitish . . . . . **C. sumatrensis** var. **sumatrensis**

## Alternative key to species:

10a Leaves entire, margins generally ciliate; heads minutely radiate; central coloured portion of middle rows of involucral bracts generally narrower than the light-coloured bract margin; disc corollas mostly 4-lobed . . . . . **C. canadensis**

10b Leaves entire to variously incised, margins generally strigulose; heads generally disciform; central green portion of middle rows of involucral bracts generally broader than the light-coloured bract margin; disc corollas 5-lobed . . . . . 11

11a Plants often grey-pubescent, lateral branches commonly overtopping or at least equalling the main axis; heads generally few, long pedunculate; involucre basally broadened; involucral bracts sometimes reddish purple tipped; outer female florets 4- or more seriate; pappus sometimes reddish brown . . . . . **C. bonariensis**

11b Plants not grey-pubescent, lateral branches never overtopping the main axis, the whole forming a pyramidal compound inflorescence; heads generally many, short or moderately pedunculate; involucre basally narrowed; involucral bracts not reddish purple tipped; outer female florets 3- or 4-seriate; pappus straw-coloured . . . . . **C. sumatrensis** var. **sumatrensis**

### *__bonariensis__ (L.) Cronquist

*Erigeron bonariensis* L.
*E. linifolius* Willd.

Annual herb, up to 1.2 m high; erect, often grey-pubescent. **Stems** with lateral branches commonly overtopping or at least equalling main axis. **Leaves** alternate, sessile; blade linear to narrowly elliptic, up to 100 × 10 mm, often twisted near base, apex acute, base cuneate, margins entire or dentate, often undulate, scabrid-pubescent on both surfaces. **Heads** disciform, > 10 mm in diameter, few, long-pedunculate, grouped in terminal, lax, leafy panicles. **Involucral bracts** 2- or 3-seriate, imbricate, linear, margins of middle bracts light-coloured and narrower than central dark portion, apices sometimes tipped reddish purple. **Flowers**: outer florets female, minutely radiate, 4- or more seriate; disc florets bisexual, with corolla 5-lobed, whitish or yellowish green; Oct.–Jun. **Fruit** with cypsela narrowly elliptic, compressed, thinly hairy. **Pappus** of many, dirty white, pinkish or reddish brown, barbellate bristles. Weed of wasteland or cultivated land. Native to South America. *Flax-leaf fleabane*; *kleinskraalhans* (A).

AcGr | DrGr | MsGr | KarSh

### *__canadensis__ (L.) Cronquist

*Erigeron canadensis* L.

Annual herb, up to 1.5 m high; erect. **Stems** with lateral branches never overtopping main axis, the whole forming a pyramidal, compound inflorescence. **Leaves** alternate; blade linear or very narrowly elliptic, up to 40 × 5 mm, apex acute, base narrowed, petiole-like, margins entire, ciliate, glabrous or sparsely hairy. **Heads** minutely radiate, ± 5 mm in diameter, grouped in terminal, lax, leafy panicles. **Involucral bracts** ± 4-seriate, imbricate, linear, margins of middle rows light-coloured and broader than central darker portion. **Flowers**: ray florets in several rows, tiny, white or mauve-tinged; disc florets with corollas mostly 4-lobed, whitish or pale yellow; Dec.–Feb. **Fruit** with cypsela narrowly elliptic, compressed, thinly hairy. **Pappus** of many,

uniseriate, whitish or straw-coloured, barbellate bristles. Weed of wasteland and cultivation. Native to North America. *Canadian fleabane*, *horseweed*; *armoedskruid*, *peperbossie* (A).

VreDm | | | MsGr | | |

## *chilensis Spreng.

Perennial herb, up to 1 m high. **Stems** simple, stiffly erect. **Leaves** mostly crowded in a basal rosette; blade elliptic, 200 × 50 mm, apex rounded, base narrowed, petiole-like, margins crenate, crenate-sinuate, sometimes pinnatifid, scabridulous; stem leaves distant, alternate, sessile, blade similar to basal leaves but smaller. **Heads** disciform, up to 20 mm in diameter, in few-headed corymb. **Involucral bracts** ± 4-seriate, imbricate, linear. **Flowers**: outer female florets several-seriate, outer female and central disc florets dull yellow or dirty white; Nov.–Feb. **Fruit** with cypsela narrowly elliptic, compressed, thinly hairy. **Pappus** of many, whitish or straw-coloured, barbellate bristles. Garden weed, along roadsides and in disturbed grassland. Native to South America. *Chilean fleabane*; *Chile-se-skraalhans* (A).

VreDm | | | MsGr | | |

## obscura DC.

*Webbia kraussii* Sch.Bip.

Perennial herb, up to 0.6 m high; without leafy runners. **Stems** simple below, branching above into compound inflorescence, with copious white pubescence. **Leaves** alternate, sessile, clasping; blade oblong or narrowly obovate in outline, up to 40(–70) × 15(–20) mm, pinnatifid or lower ones deeply crenate, lobes oblong, entire, white spreading hairy. **Heads** disciform, ± 10 mm in diameter, in compound, terminal corymbs. **Involucral bracts** ± 4-seriate, imbricate, linear. **Flowers**: outer female florets several seriate, outer female and central disc florets white to pale yellow; Aug. **Fruit** with cypsela narrowly obovate, compressed, glabrous or thinly hairy. **Pappus** of many, whitish, barbellate bristles. Forest margins, but tending to spread to disturbed areas.

| | | | MsGr | | |

## pinnata (L.f.) Kuntze

*C. pinnatilobata* DC.
*Erigeron pinnatus* L.f.

Perennial herb, up to 0.6 m high; weakly hairy, with long leafy runners. **Stems** simple, erect, branching above into compound inflorescence. **Leaves** crowded basally and along stems; blade of basal leaves oblong in outline, up to 150 × 30 mm, pinnatifid, lobes oblong, obtuse to broadly acute, margins commonly 1- or 2-dentate, petiole 40–50 mm long; stem leaves alternate, sessile, blade similar but smaller; weakly hairy. **Heads** disciform, ± 10 mm in diameter, few in terminal corymbs; peduncles ± 10–30 mm long. **Involucral bracts** ± 3-seriate, imbricate, linear. **Flowers**: outer female florets several-seriate, outer female and central disc florets yellow; Nov.–Feb. **Fruit** with cypsela narrowly obovate, compressed, glabrous or sparsely hairy. **Pappus** of many, whitish, barbellate bristles. Damp situations such as hollows in open grassland, streambanks and forest margins and glades. *Sekhatlana se seholo* (SS).

| | | | MsGr | | |

## podocephala DC.

Perennial herb, up to 500 mm high, with leafy runners. **Stems** erect or decumbent at base, simple or sparsely branched. **Leaves** in a basal rosette and along stem; blade of basal leaves oblong-obovate, up to 90 × 30 mm, margins coarsely crenate in upper half, entire in lower

half, petiolate; stem leaves alternate, sessile, blade similar but smaller; harshly hairy. **Heads** disciform, ± 15 mm in diameter, solitary on long nude or nearly nude peduncles, sometimes forming an open, few-headed corymb. **Involucral bracts** ± 4-seriate, imbricate, linear. **Flowers**: outer female florets several-seriate, outer female and central disc florets yellow; Nov.–Apr. **Fruit** with cypsela narrowly obovate, compressed, glabrous except for sparse hairs at base and apex. **Pappus** of many, whitish, barbellate bristles. Along roadsides and in disturbed grassland. *Bakbossie* (A); *manku-a-maholo* (SS); *isitshotshokazane* (Z).

| VreDm | | DrGr | MsGr | KarSh | Zastr |
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**scabrida** DC.

*Baccharis ivaefolia* L.
*C. ivifolia* (L.) Less.

Shrub, up to 1.2 m high. **Stems** pubescent, leafy. **Leaves** alternate; blade elliptic to narrowly ovate, 3-nerved from base, margins sharply serrate, pubescent to almost glabrous; petiole ± 10 mm long. **Heads** disciform, < 8 mm in diameter, in compact, terminal, compound corymbs. **Involucral bracts** ± 4-seriate, imbricate, linear. **Flowers**: outer female florets several seriate, outer female and central disc florets pale yellow; Nov.–Mar. **Fruit** with cypsela narrowly obovate, compressed, pubescent. **Pappus** of many, whitish, barbellate bristles. Damp situations, commonly found in sandy streambeds or along streams and forest margins. *Oven bush*; *oondbos* (A).

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***sumatrensis** (Retz.) E.Walker var. **sumatrensis**

*C. albida* Willd. ex Spreng.
*Erigeron sumatrensis* Retz.

Annual herb, up to 2 m high; erect. **Stems** with lateral branches never overtopping main axis, the whole forming a pyramidal compound inflorescence. **Leaves** alternate, sessile; blade narrowly ovate to elliptic, up to 100 × 15 mm, margins entire or toothed, roughly hairy. **Heads** disciform, 5–10 mm in diameter, many in terminal, lax, leafy panicles. **Involucral bracts** ± 3-seriate, imbricate, linear, margins of middle bracts light-coloured and narrower than central dark portion. **Flowers**: outer female florets filiform, 3- or 4-seriate, greenish white, greenish yellow, yellowish or whitish; disc florets many, yellowish; Nov., Mar. **Fruit** with cypsela narrowly elliptic, compressed, thinly hairy. **Pappus** of uniseriate, straw-coloured, barbellate bristles. Weed of waste places and cultivated ground. Native to South America.

| VreDm | | DrGr | | | |
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**ulmifolia** (Burm.f.) Kuntze

*Baccharis ulmifolia* Burm.f.
*C. incisa* Aiton

Annual, occasional perennial herb, up to 1.2 m high; straggling, often supported by other vegetation. **Leaves** alternate, mostly cauline, distinctly petiolate, eared at base; blade lyrate-pinnatifid, upper part elliptic to ovate in outline, lower lobes sometimes lacking, up to 70 × 20–30 mm, margins coarsely and irregularly crenate-serrate to lobulate, pubescent, glandular. **Heads** disciform, ± 10 mm in diameter, in loose, terminal corymbs. **Involucral bracts** ± 3-seriate, imbricate, linear. **Flowers**: outer female florets several-seriate, outer female and central disc florets yellow; Apr. **Fruit** with cypsela narrowly obovate, compressed, glabrous. **Pappus** of many, whitish, barbellate bristles. Damp forest margins and straggling through other vegetation along streams. *Umacakaza* (Z).

| VreDm | | | | | |
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## **Cosmos** Cav. (sthn Afr.: 2 spp.)

(Heliantheae)

***bipinnatus** Cav.
*Bidens formosa* (Bonato) Sch.Bip.
*Coreopsis formosa* Bonato

Annual herb, up to 2.5 m high. **Leaves** opposite, sessile or shortly petiolate; blade ovate in outline, finely dissected, segments linear, margins entire, glabrous or thinly hispid. **Heads** radiate, up to 100 mm in diameter, solitary on long nude peduncles. **Involucral bracts** biseriate, outer row ovate with long subulate appendage, green; inner row narrowly elliptic, brownish. **Receptacle** paleate. **Flowers**: ray florets neuter, white, pink or crimson; disc florets bisexual, yellow; Dec.–Apr. **Fruit** with cypsela very narrowly obovate, angled, black, smooth or hispid. **Pappus** of 1–3 awns or absent. Escaped from cultivation; in disturbed places, e.g. along roadsides. Native to Central America and the West Indies. *Cosmos*; *kosmos* (A); *moqhoboqhobo* (SS). Figure 9F, p. 5.

VreDm | DrGr | MsGr

## **Cotula** L. (sthn Afr.: 43 spp.)

(Anthemideae)

### Key to species:

[partly after Hilliard: 351 (1977)]

1a Flower heads large, [homogamous] discoid; all the florets bisexual, with normal corollas. . . . . **C. hispida**
1b Flower heads smaller, [heterogamous] disciform; corollas absent or much reduced in outer, female florets. . . . . 2
2a Peduncle below head broadened, hollow, especially conspicuous in fruiting heads . . . . . **C. microglossa**
2b Peduncle not broadened and hollow below head . . . . . 3
3a Hairs on the peduncle below head appressed-ascending; peduncle much exceeding the leaves; female florets 2- or 3-seriate. . . . . **C. australis**
3b Peduncle either glabrous below head or hairs woolly, spreading; peduncle not or scarcely exceeding the leaves; female florets 5- or 6-seriate. . . . . **C. anthemoides**

**anthemoides** L.
*C. microcephala* DC.

Annual herb, up to 200 mm high; erect or spreading. **Leaves** alternate, petiolate; blade oblong in outline, up to 60 × 20 mm, pinnatisect or bipinnatisect, segments acute, margins entire or few-toothed, thinly hairy, glabrescent. **Heads** disciform, solitary, terminal, pedunculate; peduncles not exceeding leaves, glabrous or with woolly, spreading hairs. **Involucral bracts** 1- or 2-seriate, obovate with scarious margins. **Receptacle** epaleate. **Flowers**: outer female florets stalked, 5- or 6-seriate, corolla absent or much reduced; disc florets sessile, 4-lobed; yellow; Sep.–Feb., Jun. **Fruit** with cypsela of outer female florets dorsiventrally flattened, winged; of disc florets dorsiventrally flattened, margined but not winged. **Pappus** absent. Damp situations, e.g. muddy streamsides and edges of pans. *Gansgras*, *tuingras* (A); *hlapi-e-nyenyane* (SS); *umHlonyane* (Z).

VreDm | DrGr | MsGr | KarSh

***australis** (Spreng.) Hook.f.
*Anacyclus australis* Spreng.

Annual herb, up to 200 mm high; erect or decumbent. **Leaves** alternate, petiolate; blade oblong in outline, bipinnatisect, segments linear, acute, margins entire or sometimes dentate, thinly pubescent. **Heads** disciform, solitary, terminal, pedunculate; peduncles much exceeding leaves, hairs below heads appressed-ascending. **Involucral bracts** 1- or 2-seriate, elliptic with scarious margins. **Receptacle** epaleate. **Flowers**: outer female florets stalked, 2- or 3-seriate, corolla absent or much reduced; disc florets stalked, 4-lobed; whitish; Oct. **Fruit** with cypsela of outer female florets dorsiventrally flattened, winged; of disc florets dorsiventrally flattened, margined but not winged. **Pappus** absent. Weed in damp and shaded places in gardens. Native to possibly Australia. *Carrot weed*.

DrGr

*burchellii* DC. see **Foveolina burchellii**

**hispida** (DC.) Harv.
*Tanacetum hispidum* DC.

Perennial herb, up to 400 mm high; erect or decumbent. **Leaves** alternate; blade narrowly ovate in outline, up to 30 × 15 mm, bipinnate, lobes linear, apiculate; upper leaves progressively smaller; thinly villous with spreading hairs; lower leaves distinctly petiolate, petiole up to 80 mm long, upper sessile. **Heads** discoid, large, solitary, pedunculate, upper part of peduncle swollen below head. **Involucral bracts** ± biseriate, glabrous with broad scarious margins. **Receptacle** epaleate. **Flowers**: disc florets only, bisexual; corolla 4-lobed, shortly stalked, bright yellow, reddening with age; Jan.–Apr. **Fruit** with cypsela ovate, slightly dorsiventrally flattened, narrowly winged. **Pappus** absent. Steep rough grass slopes, along bases of cliffs and around rock outcrops.

MsGr

**microglossa** (DC.) O.Hoffm. & Kuntze ex Kuntze
*Cenia microglossa* DC.

Annual herb, up to 300 mm high; softly and patently villous. **Leaves** alternate; petiolate?; blade bipinnatisect, lobes linear, apex callous-mucronate, softly villous with long, spreading, slender hairs. **Heads** disciform, terminal, solitary on long peduncles; peduncles below head broadened, hollow, especially conspicuous in fruiting heads; villous with spreading hairs. **Involucral bracts** biseriate, ovate to oblong, 1-nerved, margins membranous, glabrous. **Receptacle** epaleate. **Flowers**: outer female florets 1- or 2-seriate, with very short or no corolla; disc florets 4-lobed; yellow; Aug.–Jan. **Fruit** with cypsela oblong-obovate, compressed, wingless but margined. **Pappus** absent. Riverbanks, edges of vleis or in disturbed grassland. *Grootknoppiesopslag* (A).

VreDm DrGr KarSh

## **Crepis** L. (sthn Afr.: 2 spp.)

(Cichorieae)

**hypochaeridea** (DC.) Thell.
*C. hypochaeridea* (DC.) Thell. var. *genuina* Thell.
*C. polyodon* (Fr.) E.Phillips
*Hieracium polyodon* Fr.

Perennial herb, up to 500 mm high, with milky latex. **Leaves** mostly basal in a rosette, sessile; blade oblong to narrowly obovate, up to 144 × 25 mm, apex rounded to acute mucronate,

narrowed to base, margins remotely denticulate, irregularly and coarsely toothed or runcinate-pinnatifid, glabrous to ± densely hispid or glandular-setose. **Heads** ligulate, solitary at ends of branches or few in lax corymbs. **Involucral bracts** in a few rows, up to 15 mm long at fruiting, glabrous or white-woolly, densely glandular-setose. **Flowers**: pale yellow; Sep.–Nov. **Fruit** with cypsela cylindrical becoming fusiform, ribbed, with long beak, brown to orange red, 7–10 mm long, including 1.5–4.0 mm long beak. **Pappus** of many barbellate bristles. Grassland.

DrGr | MsGr

## **Curio** P.V.Heath (sthn Afr.: ± 17 spp.)

(Senecioneae)

### **radicans** (L.f.) P.V.Heath

*Cacalia radicans* L.f.
*Kleinia radicans* (L.f.) Haw.
*Senecio radicans* (L.f.) Sch.Bip.

Perennial herb; flowering stems up to 150 mm high; procumbent, mat-forming, succulent, leafy, sharply wing-angled from base of each leaf. **Leaves**: blade fusiform-terete, drying linear-falcate, up to 50 × 9 mm, apex acute, narrowed to short, petiole-like base, glabrous, sometimes with minute sessile glands. **Heads** discoid, solitary or paired, terminal. **Involucral bracts** 12–14, 9–14 mm long, shorter than disc florets; calyculus bracts several, short, glabrous but sometimes with sessile glands. **Flowers**: disc florets only, white; Sep.–Dec., Mar., May. **Fruit** with cypsela hairy, ± terete, ribbed. **Pappus** of barbellate bristles. Dry scrub country, forming mats on bare or stony ground. *Bokkos*, *boesmansvingertjies*, *bokhorinkie* (A).

VreDm | DrGr | KarSh

## **Denekia** Thunb. (sthn Afr.: 1 sp.)

(Gnaphalieae)

### **capensis** Thunb.

*Amphidoxa glandulosa* Klatt
*D. glabrata* DC.

Perennial herb, up to 0.7 m high. **Leaves** alternate; lower leaves petiolate; stem leaves sessile, often auriculate at base; blade oblong or linear-oblong, 10 × 2 mm or up to 200 × 50 mm, margins entire or toothed; lower surface usually white-felted. **Heads** disciform, small, ± 3 mm in diameter, in terminal, corymbose clusters. **Involucral bracts** ± biseriate, glandular. **Flowers**: outer female florets in many rows; disc florets functionally male; white or bluish; Aug.–Apr. **Fruit** with cypsela subterete, glandular. **Pappus** absent in female florets, in disc florets of 1 or 2 delicate bristles, plumose at tip. Damp places, often in shallow water, in marshes or marshy streamsides. *Toane-mohlaka* (SS).

VreDm | AcGr | DrGr | MsGr | KarSh

## **Dicoma** Cass. (sthn Afr.: 16 spp.)

(Mutisieae/Dicomeae)

### Key to species:

[after Netnou & Van Wyk: 55 (2007)]

1a Flower heads discoid, with disc florets only . . . . . 2
1b Flower heads disciform, with filiform, outer female florets and central disc florets . . . . . 3
2a Plants procumbent . . . . . **D. anomala** subsp. **anomala**
2b Plants erect . . . . . **D. anomala** subsp. **gerrardii**
3a Leaves ± conduplicate, margins undulate . . . . . **D. capensis**
3b Leaves not conduplicate, margins not undulate . . . . . 4
4a Leaves discolorous, sessile or subsessile . . . . . **D. macrocephala**
4b Leaves concolorous, distinctly petiolate . . . . . **D. schinzii**

### **anomala** Sond. subsp. **anomala**

*D. anomala* Sond. subsp. *cirsioides* (Harv.) Wild

Perennial herb, up to 600 mm long; procumbent. **Leaves** alternate, sessile; blade linear, up to 70 × 5 mm, apex acute, base cuneate, margins entire to serrulate, upper surface greenish black, gland-pitted, lower surface white-felted. **Heads** discoid, broadly campanulate, ± 15 mm long, up to 35 mm in diameter, broadly campanulate, solitary or subcorymbosely arranged at branch tips. **Involucral bracts** in many rows, imbricate, inner with subulate apices, exceeding pappus, erect or outer squarrose. **Flowers**: disc florets only, many, purple or whitish; Jan.–May. **Fruit** with cypsela turbinate, obscurely 10-ribbed, densely hairy. **Pappus** of isomorphic, barbellate bristles. Hillsides, flat grassland or savanna. *Maagbitterwortel*, *regop aambeibos* (A); *mohlasetse*, *hloenya* (SS); *inyongana* (X); *isihlabamakhondlwane*, *umuna* (Z). Figure 9E, p. 5.

Some specimens from the eastern FS have shortly petiolate, small, elliptic or narrowly ovate leaves, up to 15 × 10 mm, with 2 distinct lateral veins from base. **Flowering time**: Jan.–Apr.

VreDm | AcGr | DrGr | MsGr | | Zastr

### **anomala** Sond. subsp. **gerrardii** (Harv. ex F.C.Wilson) S.Ortíz & Rodr.Oubiña

*D. anomala* Sond. var. *microcephala* Harv.
*D. gerrardii* Harv. ex F.C.Wilson

Perennial herb, 100–300 mm high; erect. **Leaves** alternate, sessile; blade linear, up to 50 × 3 mm, subobtuse at apex, callose-tipped, serrulate on margins, upper surface glabrous, greenish black, gland-pitted, lower surface densely greyish lanate. **Heads** discoid, subcylindric to campanulate, solitary or 3–5 corymbosely arranged at end of branches, 10–15 mm long, < 30 mm in diameter, obconic. **Involucral bracts** in many rows, imbricate, inner with pungent apices, ± equalling pappus in length, all erect. **Flowers**: disc florets only, purplish, fading whitish; Feb., Mar. **Fruit** with cypsela turbinate, obscurely 10-ribbed, densely hairy. **Pappus** of isomorphic, barbellate bristles. Wooded grassland, woodland or scrubland, on sandy soils or stony hillsides.

VreDm | | | | | |

### **capensis** Less.

Perennial herb, up to 300 mm long; procumbent. **Leaves** alternate, sessile or subsessile; blade narrowly elliptic to narrowly obovate, up to 40 × 10 mm, conduplicate, apex mucronate, base narrowly cuneate or attenuate, margins finely serrate, undulate, upper surface thinly greyish

cobwebby, glabrescent, lower surface paler and woolly. **Heads** disciform, 13 mm long, 10 mm in diameter, solitary, subsessile, in upper leaf axils. **Involucral bracts** many, 3- or 4-seriate, linear, outer squarrose, inner erect, pungent. **Flowers**: outer female florets filiform, whitish; disc florets ± equal to pappus in length, pale mauve; Sep.–Dec., Apr. **Fruit** with cypsela turbinate, 10-ribbed, densely hairy. **Pappus** of 2 kinds, outer of barbellate bristles, inner with basal part scale-like, upper part plumose. Sandy soil in dry areas, grassland.

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### **macrocephala** DC.

Perennial herb, up to 150 mm long; procumbent. **Leaves** alternate, sessile or subsessile; blade elliptic or narrowly oblong-ovate, 65 × 15 mm, apex acute, base cuneate, margins subentire, upper surface thinly cobwebby at first, later glabrous, lower surface white-felted, discolorous. **Heads** disciform, 40 × 20 mm, solitary, in terminal leaf axils, sessile. **Involucral bracts** narrowly ovate; outer bracts with subulate tip, squarrose; inner bracts erect, pungent, purplish, shiny. **Flowers**: outer female florets filiform; disc florets distinctly shorter than pappus, whitish or purplish; Nov.–May. **Fruit** with cypsela narrowly turbinate, 10-ribbed, densely hairy. **Pappus** of 2 kinds, outer of barbellate bristles, inner scale-like, base broad, membranous with undulate margins, upper part ciliolate. Grassland and rocky outcrops.

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| VreDm | AcGr | DrGr | | KarSh | |

### **schinzii** O.Hoffm.

*D. arenicola* Muschl. ex Dinter
*D. lanata* Muschl. ex Dinter

Perennial herb, up to 200 mm high; semi-procumbent or suberect. **Leaves** alternate, distinctly petiolate; blade elliptic to ovate-elliptic, up to 80 × 24 mm, apex acute, base cuneate, margins serrulate, both surfaces greyish or suffused brownish lanate, concolorous; petiole up to 16 mm long. **Heads** disciform, solitary, axillary, sessile or subsessile. **Involucral bracts** many, imbricate; outer bracts with long, subulate tip, often squarrose; inner bracts with acute-pungent tip. **Flowers**: outer female florets filiform; disc florets distinctly shorter than pappus, whitish or reddish; Nov.–Apr., Jun. **Fruit** with cypsela narrowly turbinate, 10-ribbed, densely hairy. **Pappus** of 2 kinds, outer of barbellate bristles, inner scale-like, becoming undulate-winged towards base, upper part ciliolate. Grassland, sandy areas. *Vaalplatblaar* (A).

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| | AcGr | DrGr | | KarSh | |

## **Dimorphotheca** Vaill. ex Moench (sthn Afr.: 19 spp.)

(Calenduleae)

### Key to species:

1a Woody shrubs . . . . . **D. cuneata**
1b Herbaceous perennial herbs . . . . . 2
2a Ray florets pink or purple on upper surface . . . . . **D. jucunda**
2b Ray florets white on upper surface . . . . . 3
3a Fruit developing only from ray florets, obovoid, 3–6-angular . . . . . **D. caulescens**
3b Fruit developing from both ray and disc florets: those of ray florets obovoid-triangular, those of disc florets dorsiventrally flattened, obcordate . . . . . **D. zeyheri**

**caulescens** Harv.

*D. dekindtii* O.Hoffm.

*Osteospermum caulescens* (Harv.) Harv.

Perennial herb, 100–400 mm high. **Leaves** alternate; blade linear to narrowly obovate or oblong, 150 × 20 mm, decreasing in size upwards, apex acute to obtuse, base petiole-like narrowed, clasping, margins remotely denticulate, sinuate-dentate or entire; glandular-pubescent, glabrescent. **Heads** radiate, terminal, solitary, pedunculate. **Involucral bracts** ± biseriate, glandular pubescent. **Flowers**: ray florets female, fertile, upper surface white, lower surface purple to mauve or coppery; disc florets functionally male, yellow or whitish; Oct.–Jan., Apr. **Fruit** developing from ray florets, with cypsela obovoid, 3–6-angular, glabrous. **Pappus** absent. Grassland among rock outcrops. *Bietou* (A); *bohlahlo*, *mohlahlo*, *phela* (SS).

DrGr | MsGr | KarSh

**cuneata** (Thunb.) Less.

*Calendula cuneata* Thunb.

Shrub, up to 1 m high; young parts densely glandular. **Leaves** alternate, sessile; blade broadly obovate to sublinear, 10–20(–30) × 10 mm, base cuneate, margins dentate, pinnatifid-dentate to denticulate, glandular viscid. **Heads** radiate, solitary, terminal, on short, naked peduncles. **Involucral bracts** uniseriate, all the same length. **Flowers**: ray florets female, fertile, upper surface white, lower surface blue-violet with an interspersion of copper; disc florets bisexual, fertile, yellow; Jul.–Mar. **Fruit** with cypsela of ray florets obovate, triangular; of disc florets ± obcordate, dorsiventrally flattened, 10 mm long. **Pappus** absent. Sandveld. *Weather-prophet*, *white bietou*; *weerprofeet*, *witgousblom* (A).

DrGr | MsGr | KarSh

**jucunda** E.Phillips

*Osteospermum jucundum* (E.Phillips) Norl.

Perennial herb, 200–500 mm high. **Leaves** alternate; blade narrowly obovate to elliptic to oblong or linear, 150 × 20 mm, decreasing in size upwards, apex acute to subacute, base petiole-like narrowed, clasping, margins entire, dentate or denticulate, glandular-hispid. **Heads** radiate, solitary, terminal, on long peduncles. **Involucral bracts** ± biseriate, glandular. **Flowers**: ray florets female, fertile, upper surface deep pink, lower surface coppery buff-coloured; disc florets functionally male, yellow or purple; Sep.–May. **Fruit** with cypsela narrowly triangular-obovoid to ellipsoid. **Pappus** absent. Grassland on mountainsides. *Trailing pink daisy*; *bergbietou*, *bloutou* (A); *umasigcolo-nkonakazi* (Z).

MsGr

**zeyheri** Sond.

Perennial herb, 50–250 mm high. **Leaves** alternate; crowded basally; blade very narrowly elliptic or linear, up to 80 × 8 mm, apex acute, base cuneate, margins entire, dentate, pinnatifid or leaves pinnatipartite. **Heads** radiate, solitary, terminal, on long peduncles. **Involucral bracts** uniseriate, glandular. **Flowers**: ray florets female, fertile, upper surface white, lower surface bluish, purplish brown or goldish brown; disc florets bisexual, fertile, yellow; Sep.–May. **Fruit** with cypsela of ray florets obovoid-triangular; of disc florets dorsiventrally flattened, obcordate, ± 5 mm long. **Pappus** absent. Grassland. *White dimorphotheca*; *jakkalsblom* (A); *khotolia* (SS).

AcGr | DrGr | KarSh

## **Eriocephalus** L. (sthn Afr.: 32 spp.)

(Anthemideae)

### Key to species:

[after Müller *et al*.: 1 (2001)]

| | | |
|---|---|---|
| 1a | Flower heads radiate | 2 |
| 1b | Flower heads disciform | 4 |
| 2a | Paleae of ray florets free | **E. karooicus** |
| 2b | Paleae of ray florets partly or entirely connate | 3 |
| 3a | Flower heads sessile or subsessile | **E. eximius** |
| 3b | Flower heads shortly to distinctly pedunculate | **E. tenuifolius** |
| 4a | Paleae of marginal florets connate | **E. decussatus** |
| 4b | Paleae of marginal florets free | 5 |
| 5a | Leaves alternate or rosulate on short shoots | **E. ambiguus** |
| 5b | Leaves decussate, opposite, or opposite and alternate on flowering shoots | 6 |
| 6a | Leaves sericeous or felty-sericeous | 7 |
| 6b | Leaves felty, glabrescent | 8 |
| 7a | Plants spinescent | **E. spinescens** |
| 7b | Plants not spinescent | **E. merxmuelleri** |
| 8a | Disc florets 10–18 | **E. glandulosus** |
| 8b | Disc florets < 10 | **E. ericoides** subsp. **ericoides** |

### **ambiguus** (DC.) M.A.N.Müll.

*E. aspalathoides* DC. var. *ambiguus* DC.

Shrub, 0.3–0.6 m high; erect, much branched, spinescent. **Leaves** alternate on long shoots or rosulate on short shoots; blade linear, margins entire, densely silver-grey pilose. **Heads** disciform, solitary, rarely in terminal racemes, shortly to distinctly pedunculate. **Involucral bracts** 4 or 5, ovate, green with narrow membranous margins, hairy. **Receptacle** with paleae of marginal florets free, rarely connate. **Flowers**: marginal female florets filiform, 2–5, corolla rudimentary, yellow; disc florets 5–21, corolla tubular, widening upwards, yellow, sometimes tinged red-purple; May, Oct. **Fruit** with cypsela oblong-ovoid, compressed, long-hairy. **Pappus** absent. Low-lying areas in sandy and clayey soils. *Doringkapok*, *grootdoringkapokbos*, *steekmaryn* (A).




### **decussatus** Burch.

Shrub, 0.6–1.5 m high, sometimes spinescent, branches conspicuously opposite. **Leaves** decussate, imbricate, often alternate on flowering shoots; blade triangular, margins entire, densely silver-sericeous. **Heads** disciform, solitary, rarely in terminal racemes, shortly pedunculate. **Involucral bracts** 4, ovate, greenish purple to reddish purple, margins narrow, membranous, silvery white sericeous. **Receptacle** with paleae of marginal florets connate, forming cylindrical sheath. **Flowers**: marginal female florets filiform, 2–4, corolla extremely short, creamy white; disc florets (3–)5–8(–11), corolla trumpet-shaped, base cream-coloured, apex red-purple; Oct. **Fruit** with cypsela oblong, compressed, long-hairy. **Pappus** absent. Sandy soil.




### **ericoides** (L.f.) Druce subsp. **ericoides**

*E. glaber* Thunb.

Shrub, 0.3–1.0 m high. **Leaves** ericoid, opposite on long shoots, rarely alternate on flowering shoots, decussate on short shoots, imbricate; blade linear, margins entire, initially felty,

glabrescent, shiny, bright green. **Heads** disciform, solitary on short shoots or racemose on long shoots, shortly pedunculate. **Involucral bracts** 4, ovate to narrowly obovate, green, margins broad, membranous, purple, glabrous or with sparse pubescence. **Receptacle** with paleae of marginal florets free. **Flowers**: marginal female florets (1)2, corolla inconspicuous, yellow; disc florets (1–)3–5(–7), corolla trumpet-shaped, red-purple, yellow towards base; Feb.–May, Sep.–Nov. **Fruit** with cypsela oblong to narrowly obovate, compressed, long-hairy. **Pappus** absent. Gravel or sandy areas. *Rosemary*, *kapok bush*; *roosmaryn*, *sandveldkapokbos*, *renosterveldkapok*, *gewone kapok* (A). Figure 15, p. 13.

DrGr | KarSh

## **eximius** DC.

Shrub, 0.3–0.6 m high; much branched, rigid, sometimes spinescent. **Leaves** opposite, densely imbricate; blade linear to triangular, margins entire, permanently silvery sericeous. **Heads** radiate, solitary, terminal, rarely 2–4 in terminal racemes, sessile or subsessile. **Involucral bracts** 4, broadly ovate, margins purple. **Receptacle** with paleae of ray florets partly or entirely connate, forming a tube. **Flowers**: ray florets 3 or 4, white or pale to dark red-purple; disc florets 26–35, corolla tubular, widening in upper part, yellow, lobes sometimes purplish; May, Sep. **Fruit** with cypsela ovoid, flattened, densely hairy. **Pappus** absent. Mountain slopes and summits. *Grootbergkapok* (A).

DrGr | MsGr | KarSh | Zastr

## **glandulosus** M.A.N.Müll.

Shrub, 0.2–0.6 m high; many stemmed, spinescent. **Leaves** decussate, densely imbricate; blade obtuse triangular to linear, margins entire, initially sparsely felty, soon glabrous, shiny, bright green, often with red-purple tinge. **Heads** disciform, mostly solitary but sometimes racemose or umbellate-racemose, pedunculate. **Involucral bracts** 4, broadly ovate, with broad membranous margins, mostly red-purple, sometimes shiny green, glabrous. **Receptacle** with paleae of marginal florets free. **Flowers**: marginal female florets 2, white, with short strap-shaped blade; disc florets 10–18, corolla trumpet-shaped to infundibuliform, red-purple; Oct.? (summer). **Fruit** with cypsela oblong to ovoid, slightly flattened, long-lanate. **Pappus** absent. Plains. *Kapokbos* (A).

KarSh

## **karooicus** M.A.N.Müll.

Shrub, 0.15–0.45 m high; spinescent, much branched. **Leaves** decussate; blade obtuse-triangular to linear-obovate, margins entire, permanently silver- to green-grey sericeous. **Heads** small, radiate, sessile, terminal, solitary or spicate. **Involucral bracts** 4, with green to purple central part and transparent margins, hairy. **Receptacle** with paleae of ray florets free. **Flowers**: ray florets 2 or 3, white; disc florets 4–10, corolla trumpet-shaped, white to pale yellow to yellow with red-purple lobes; Sep.–May. **Fruit** with cypsela oblong, slightly flattened, densely lanate. **Pappus** absent. Rocky slopes and bases of hills. *Doringkapok*, *veerkapok*, *wilde dagga* (A).

AcGr | DrGr | MsGr | KarSh

## **merxmuelleri** M.A.N.Müll.

Shrub, 0.4–1.2 m high, much branched, branches opposite, not spinescent. **Leaves** decussate, sometimes alternate on flowering shoots; blade linear to very narrowly obovate, margins entire,

rarely pinnatisect, 3-lobed, young leaves felty sericeous, mature leaves appressed sericeous, glabrescent. **Heads** disciform, racemose or paniculate, rarely solitary, shortly pedunculate. **Involucral bracts** 4(5), ovate, green to red-purple, sparsely sericeous, glabrescent. **Receptacle** with paleae of marginal florets free. **Flowers**: marginal female florets (1)2–4, blade very short, cream-coloured; disc florets (1–)5 or 6(–9), corolla tubular, widening upwards, basally cream-coloured to yellow, upper part red-purple; Jul. **Fruit** with cypsela oblong, flattened, long hairy. **Pappus** absent. Mountain slopes and sandy flats.

KarSh

### **spinescens** Burch.

Shrub, 0.5–1.2 m high; spinescent, much branched. **Leaves** opposite on long shoots, decussate and imbricate on short shoots; blade linear, margins entire, permanently densely silver-sericeous. **Heads** disciform, sessile or very shortly pedunculate, solitary, terminal. **Involucral bracts** 4, oblong-ovate or ovate, green with purple margins, fringed. **Receptacle** with paleae of marginal florets free. **Flowers**: marginal female florets 2, cream-coloured to yellow; disc florets 6–8, trumpet-shaped, yellow with red-purple margins; Oct. **Fruit** with cypsela oblong, slightly flattened, long hairy. **Pappus** absent. In or along watercourses, seasonal rivulets, sandy, gravelly soil. *Kapokbos* (A).

KarSh

### **tenuifolius** DC.

Shrub, 0.3–1.3 m high; erect, many stemmed. **Leaves** opposite but sometimes alternate on flowering shoots; blade linear, margins entire, sparsely felty, glabrescent, pale green to yellow-green, greenish shiny white. **Heads** radiate, in umbellate racemes, terminal; peduncles as long as or shorter than subtending leaves. **Involucral bracts** (4)5, central part green with broad membranous margins, sparsely felty to glabrous. **Receptacle** with paleae of ray florets connate into cylindrical sheath. **Flowers**: ray florets 2 or 3, white, sometimes with red-purple tinge; disc florets 13–22, trumpet-shaped, red-purple; Sep.–Jul. **Fruit** with cypsela oblong, slightly flattened, long-lanate. **Pappus** absent. Mountain plateau, hillsides, among rocks. *Boegoekapok*, *klein-bergkapokbossie* (A).

DrGr MsGr KarSh Zastr

## **Eumorphia** DC. (sthn Afr.: 6 spp.)

(Anthemideae)

### Key to species:

Leaves up to 3.5 mm long, decussate, densely imbricate, glabrous . . . . **E. dregeana**
Leaves up to 8 mm long, opposite, often with axillary leaf tufts, grey silky-woolly . . . . . **E. sericea** subsp. **sericea**

### **dregeana** DC.

Shrub, 0.3–1.0 m high; erect, young branches softly hairy. **Leaves** decussate, sessile, densely imbricate, more distant on flowering branches; blade small, linear, up to 3.5 mm long, margins entire, initially with some longish hairs becoming glabrous. **Heads** radiate, terminal, corymbose, pedunculate. **Involucral bracts** imbricate, narrowly ovate, with orange oil glands at outer tips of outer bracts. **Receptacle** with paleae enveloping disc florets. **Flowers**: ray florets white or

pink; disc florets yellow; Nov. [Feb.–Apr.] **Fruit** with cypsela narrowly cylindric, ribbed, glabrous, crowned with a thickened rim. **Pappus** absent. Grassland, mountain slopes and plateaus.

DrGr? MsGr

**sericea** J.M.Wood & M.S.Evans subsp. **sericea**

Dwarf shrub, up to ± 2 m high; much branched, grey silky-woolly, glabrescent. **Leaves** opposite; sessile; blade linear or digitately 3-lobed, up to 8 mm long, grey silky-woolly, hairs fluffed up from leaf surface, often with axillary leaf tufts. **Heads** radiate, solitary, terminal, shortly pedunculate. **Involucral bracts** imbricate, villous, with large oil glands, easily seen on inner faces. **Receptacle** paleate. **Flowers**: ray florets usually white, sometimes rose-pink; disc florets yellow; Jan. [Dec.–Jul.] **Fruit** with cypsela narrowly cylindric, closely ribbed, glabrous, crowned with a thickened rim. **Pappus** absent. Rough montane grassland or dwarf shrub communities, often near streams, alt > 2 800 m. *Lirullello* (SS).

MsGr

## **Euryops** (Cass.) Cass. (sthn Afr.: 89 spp.)

(Senecioneae)

### Key to species:

[after Nordenstam: 37 (1968)]

1a Pappus absent or of few, very short bristles . . . . . **E. laxus**
1b Pappus present . . . . . 2
2a Peduncles lateral, axillary . . . . . 3
2b Peduncles terminal at the branch tips and ramification points . . . . . 8
3a At least some leaves fascicled or crowded together on distinct lateral brachyblasts or short shoots. . . . . 4
3b Leaves evenly and ± closely set on young branches, often imbricate at tips, but not fascicled on brachyblasts . . . . . 5
4a Branchlets straight, divaricate, rigid, spinescent; leaves entire, fascicled, with distinct woolly tufts at the bases; flower heads minutely radiate or discoid on short peduncles (< 5 mm long) . . . . . **E. asparagoides**
4b Branchlets not as above; leaves mostly 3–5-lobed; flower heads radiate on short or long peduncles (> 7 mm long) . . . **E. subcarnosus** subsp. **vulgaris**
5a Leaf margins shortly and rigidly ciliolate . . . . . **E. empetrifolius**
5b Leaf margins smooth or not ciliolate. . . . . 6
6a Leaves < 2.5 mm wide . . . . . **E. annae**
6b Leaves > 2.5 mm wide . . . . . 7
7a Cypselae glabrous; involucral bracts connate nearly to tips . . . . . **E. tysonii**
7b Cypselae pubescent; involucral bracts connate up to ½ . . . . **E. lateriflorus**
8a Leaves midribbed or without distinct veins, laxly to closely set, 3-forked to pinnatipartite, 8–80 mm long, herbaceous or somewhat coriaceous; leaf lobes linear to filiform. . . . . **E. pedunculatus**
8b Leaves abaxially distinctly 1–many-nerved with prominent nerves, imbricate, pinnatifid to 3-forked, 5–20 mm long, rigid and coriaceous; leaf lobes subulate to setiform . . . . . 9
9a Leaves pinnatifid with usually 4–8 pairs of lobes, glaucous or greyish green; rachis 2–5 mm wide, (5–)8–12-nerved . . . . . **E. transvaalensis** subsp. **transvaalensis**

9b Leaves pinnatipartite with 2–8 pairs of lobes or 3-forked (rarely entire), ± pure green; rachis 0.5–3.0 mm wide, 1–5(–8)-nerved . . . . . **E. transvaalensis** subsp. **setilobus**

## **annae** E.Phillips

Shrub, 0.2–1.5 m high; dense, rounded, erect, resiniferous, glabrous; stems closely leafy, later nude with leaf scars. **Leaves** alternate, sessile, closely set, ± spreading; blade linear, 5–20 × 1–2 mm, apex obtuse, minutely apiculate, base dilated, ± half-clasping, margins entire, smooth; thick, leathery. **Heads** radiate, solitary; peduncles 5–25 mm long, lateral in apical leaf axils, in a corymb or ± raceme. **Involucral bracts** uniseriate, 5 or 6, connate to $^1/_4$–$^1/_3$, veins absent to many-veined, ecalyculate. **Flowers**: ray florets 2–5, female, fertile; disc florets 8–20, bisexual; all florets yellow; Feb.–Apr. **Fruit** with cypsela oblong-obovate, glabrous, brown, ribs 5–8. **Pappus** of many barbellate bristles, white. Grassland, karoo, dominating disturbed veld. *Waterharpuis*, *klein-bitterharpuis* (A); *sehalahala-sa-qoqolosi* (SS).

DrGr KarSh

## **asparagoides** (Licht. ex Less.) DC.

Shrub, 0.3–1.0 m high; closely branched, branchlets straight, divaricate, rigid, spinescent. **Leaves** sessile, crowded on brachyblasts or scattered along branchlets; blade linear-oblong, 1.5–8.0 × 0.5–1.0 mm, apex obtuse or subobtuse, margins entire, woolly at base otherwise glabrous. **Heads** minutely radiate or discoid; peduncles 1–5 mm long, few or many, sometimes solitary in leaf axils, lateral. **Involucral bracts** uniseriate, 5–7, connate up to $^1/_3$, 1–3-nerved, ecalyculate. **Flowers**: ray florets 0–2, very short, female, fertile; disc florets 5–13, bisexual; all florets yellow; Jul.–Sep. **Fruit** with cypsela oblong, sericeous-lanate, hairs white or light brown, slightly mucilaginous when wet, indistinctly 5-ribbed. **Pappus** of many barbellate or subplumose bristles. Open karoo, grassland and rocky outcrops, sometimes sandy, calcareous soil. *Doringharpuis*, *draaibos* (A).

AcGr KarSh

## **empetrifolius** DC.

Dwarf shrub, up to 1 m high; lax, glabrous. **Leaves** alternate, sessile, laxly to closely set, crowded towards branch tips; blade narrowly ovate to elliptic-oblong, 3–16 × 1–4 mm, apex acute or subacute to obtuse, margins entire, rigidly stiffly ciliolate; suberect to spreading, leathery. **Heads** radiate or discoid, solitary; peduncles 5–40 mm long, lateral in upper leaf axils. **Involucral bracts** ± uniseriate, 5 or 6, connate to $^1/_4$, 3–10-nerved, ecalyculate. **Flowers**: fragrant; ray florets 0–5, female, fertile; disc florets 13–30, bisexual; all florets yellow; Jul.–Jun. **Fruit** with cypsela obovate, densely hairy, mucilaginous when wet, indistinctly 5-ribbed. **Pappus** of many barbellate or subplumose bristles. Stony or rocky flats, sandstone and dolerite. *Resin bush*; *harpuisbos* (A).

Nordenstam (1968) also described an intermediate hybrid *E. empetrifolius* DC. × *E. subcarnosus* DC. subsp. *vulgaris* B.Nord. from one collection at the Karoo Flora Reserve, Fauresmith.

DrGr KarSh

## **lateriflorus** (L.f.) DC.

Shrub, 0.3–2.5 m high; viscid, glabrous, with stiffly, erect branches. **Leaves** alternate, sessile, closely set above; blade oblong to obovate or narrowly elliptic, sometimes orbicular, 8–30 × 3–15 mm, often 3-veined from base, apex acute to obtuse or rounded, margins entire, smooth

(rarely denticulate or ciliolate), leathery, greyish green. **Heads** radiate, solitary; peduncles 2–60 mm long, few to many, lateral in upper leaf axils. **Involucral bracts** ± uniseriate, 5–11, connate up to 1/2, 5–8-nerved, ecalyculate. **Flowers**: ray florets 5–11, female, fertile; disc florets 30–75, bisexual; all florets yellow; Aug. [Apr.–Dec.] **Fruit** with cypsela oblong-obovate, densely white or brownish lanate or villous, mucilaginous when wet, 5-ribbed. **Pappus** of many barbellate, sometimes ± subplumose, bristles, white. Dry sandstone and shale slopes. *Vetharpuis*, *soetharpuis* (A).

DrGr KarSh

## **laxus** (Harv.) Burtt Davy

*Gamolepis laxa* Harv.

Perennial herb, 20–200(–350) mm high; caudex subterranean, thick, lignified. **Leaves** alternate, sessile; blade filiform-linear, 10–110 mm long, 3-lobed or pinnatipartite, sometimes entire, glabrous. **Heads** radiate, solitary, terminal, on nude peduncles 50–260 mm long. **Involucral bracts** uniseriate, 11–17, connate to middle or more, distinctly or faintly 3–many-veined, ecalyculate. **Flowers**: ray florets 8–17, female, fertile; disc florets ± 25–70, bisexual; all florets yellow; Nov., Jan. **Fruit** with cypsela narrowly obovate, papillate-puberulous, often only basally, sometimes glabrous, 8–12-ribbed. **Pappus** of few, very short (up to 1 mm long) bristles or absent. Grassland, also in sandy-stony soil among rocks and boulders on mountainsides, koppies and tops of krantzes. *Resin bush*; *harpuisbossie* (A).

MsGr

## **pedunculatus** N.E.Br.

*E. rogersii* Burtt Davy

Shrub or suffrutex, up to 1 m high; caudex subterranean, thick, lignified, sometimes branching apically, weakly to strongly lignified. **Leaves** alternate, sessile, laxly to closely set; blade linear-filiform, 8–80 mm long, 3-forked from or above (seldom below) the middle or pinnatipartite, lobes linear to filiform, glabrous or with hairs in axils, with faint or distinct midrib or without distinct veins. **Heads** radiate; peduncle solitary, terminal, 60–250(–350) mm long. **Involucral bracts** ± uniseriate, 8–17, connate ± 1/4–1/3(–1/2), 3–10-veined, ecalyculate. **Flowers**: ray florets 8–20, female, fertile; disc florets 30–100, bisexual; all florets yellow; Nov.–Apr. **Fruit** with cypsela obovate, shortly hirsute with brownish or greyish white hairs, indistinctly 10-ribbed. **Pappus** of white, barbellate bristles, soon caducous. Mountain grassland and on rocky outcrops.

MsGr

## **subcarnosus** DC. subsp. **vulgaris** B.Nord.

Shrub or dwarf shrub, up to 1.5 m high; twiggy. **Leaves** alternate, sessile, crowded at branch tips and short shoots; blade usually tripartite from or above (sometimes below) middle with lateral lobes 2- or 3-forked (as a whole 3- or 5-lobed), sometimes entire or bipartite, 5–35 mm long, segments filiform-linear, terete to flattened, apices distinctly or minutely white-apiculate; glabrous. **Heads** radiate; peduncles solitary, 7–80 mm long, lateral in upper leaf axils. **Involucral bracts** uniseriate, 5–9, connate at base, multi-veined, ecalyculate. **Flowers**: ray florets 5–9, female, fertile; disc florets 8–35, bisexual; all florets yellow; Mar.–Dec. **Fruit** with cypsela oblong-obovate, densely villous to lanate, hairs white to brown, mucilaginous when wet. **Pappus** of barbellate bristles. Varied habitats, mostly mountain grassland in the east. *Soetharpuis* (A).

DrGr KarSh

**transvaalensis** Klatt subsp. **setilobus** (N.E.Br.) B.Nord.

*E. setilobus* N.E.Br.

*E. striatus* N.E.Br.

Perennial herb, 20–250 mm high; with lignified, subterranean caudex. **Leaves** alternate, sessile, imbricate, densely set; blade pinnatipartite with 2–8 pairs of lobes or 3-forked (rarely entire), 5–20 mm long, lobes subulate to setiform, ± pure green; rachis 0.5–2.0(–3.0) mm wide near base, 1–5(–8)-nerved, rigid and coriaceous; hairy in leaf axils. **Heads** radiate; peduncles solitary, terminal, up to 250 mm long. **Involucral bracts** uniseriate, 10–16, connate to middle or more, 3-veined, ecalyculate. **Flowers**: ray florets 8–15, blade 4–6 mm long, female, fertile; disc florets 40–100, corolla 2.5–3.5 mm long, bisexual; all florets yellow; Oct.–Feb. **Fruit** with cypsela oblong-obovate to elliptic-oblong, puberulous, hairs white or brown, with ± 10 ribs. **Pappus** of few, barbellate bristles, soon caducous. Short grassland on hills and mountains, often rocky or stony places, sometimes rock crevices.




**transvaalensis** Klatt subsp. **transvaalensis**

*E. multinervis* N.E.Br.

Perennial herb, 20–250 mm high; with lignified, subterranean caudex. **Leaves** alternate, sessile, imbricate, densely set; blade pinnatifid with usually 4–8 pairs of lobes, 5–20 mm long, lobes subulate to setiform, glaucous or greyish green; rachis 2–5 mm wide near base, (5–)8–12-nerved, rigid and coriaceous, glabrous or hairy in leaf axils. **Heads** radiate; peduncles solitary, terminal, up to 250 mm long. **Involucral bracts** uniseriate, 10–16, connate to middle or more, 3-veined, ecalyculate. **Flowers**: ray florets 8–15, blade 3–7 mm long, female, fertile; disc florets 40–100, corolla 2.5–4.0 mm long, bisexual; all florets yellow; Nov., Dec. **Fruit** with cypsela oblong-obovate to elliptic-oblong, puberulous, hairs white or brown, with ± 10 ribs. **Pappus** of few barbellate bristles, soon caducous. Grassland and in shallow soil over rocks.




**tysonii** E.Phillips

Shrub, up to 1.5 m high; much branched. **Leaves** alternate, sessile, closely set, usually imbricate; blade elliptic to narrowly oblong, 10–30 × 2–8 mm, apex acute, base broad, clasping, margins entire, smooth or laxly denticulate; coriaceous, glabrous, except white-woolly in leaf axils. **Heads** radiate; peduncles solitary, up to 40 mm long, lateral in upper leaf axils, corymbosely arranged. **Involucral bracts** uniseriate, 5–7, connate nearly to tips, 3–7-veined, ecalyculate. **Flowers**: ray florets 5–8, female, fertile; disc florets 13–30, bisexual; all florets yellow; Nov., Feb. **Fruit** with cypsela narrowly oblong to elliptic-oblong, obscurely 5–8-ribbed, glabrous. **Pappus** of many copious white barbellate bristles, soon deciduous? Rocky mountain slopes, gullies, boulder bed scrub of mountain streams. *Sehlakoana-se-senyenyane* (SS).




## **Felicia** Cass. (sthn Afr.: 80 spp.)

(Astereae)

### Key to species:

[after Grau: 258 (1973)]

1a Involucral bracts strictly biseriate, equal in size. . . . . 2
1b Involucral bracts in > 2 rows, imbricate, or biseriate with a few additional, smaller outer bracts, or 3-seriate, almost equal in size . . . . . 3

2a Leaves petiolate, alternate, upper leaves often sessile . . . . . **F. petiolata**
2b Leaves sessile, opposite, weakly connate around stem . . . . . **F. ovata**
3a Cypselae long silky hairy, hairs lax to dense; pappus bristles of distinctly different lengths . . . . . 4
3b Cypselae shortly setaceous or glabrous; pappus bristles of similar length . . . . . 5
4a Leaves glabrous . . . . . **F. filifolia** subsp. **filifolia**
4b Leaves hairy in axils, apex with few short hairs, otherwise glabrous . . . . . **F. burkei**
5a Perennial herbs . . . . . 6
5b Shrubs or dwarf shrubs . . . . . 7
6a Stems with single head; leaves shortly and densely white-hairy . . . . . **F. rosulata**
6b Stem with 2–4-headed inflorescence; leaves rough-hairy to nearly glabrous . . . . . **F. quinquenervia**
7a Peduncles glabrous, hairy or rarely with sessile glands below the head . . . . . **F. muricata** subsp. **muricata**
7b Peduncles densely covered with stalked glands below the head, with or without hairs . . . . . 8
8a Leaves opposite . . . . . **F. ovata**
8b Leaves alternate . . . . . 9
9a Leaves linear-filiform, thin acicular, with strongly dilated (broadened) bases, sessile, glabrous . . . . . **F. fascicularis**
9b Leaves linear to narrowly obovate and thick, base not broadened, white-hairy . . . . . **F. hirsuta**

## **burkei** (Harv.) L.Bolus

*Aster burkei* Harv.

Shrub, 0.07–0.45 m high. **Leaves** alternate; blade linear, margins entire, hairy within axils, apex with a few short hairs, otherwise glabrous, slightly succulent. **Heads** radiate, solitary; peduncle long, densely hairy or glabrous. **Involucral bracts** imbricate, 3- or 4-seriate, with resin ducts on backs. **Flowers**: ray florets blue-purple; disc florets yellow; Oct., Feb.–May. **Fruit** with cypsela obovate to elliptic, covered by long silky hairs. **Pappus** uniseriate, of barbellate bristles, of different lengths, present in ray and disc cypsela. Grassland.

| | | DrGr | | KarSh | |
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## **fascicularis** DC.

Dwarf shrub, up to 300 mm high; much branched. **Leaves** alternate, sessile; blade linear-filiform, thin acicular, with strongly dilated (broadened) bases, often with axillary tufts of leaves, margins entire, slightly succulent, glabrous. **Heads** radiate, solitary; peduncles long, often with stalked glands. **Involucral bracts** 4-seriate, imbricate. **Flowers**: ray florets violet; disc florets yellow; Aug.–May. **Fruit** with cypsela obovate, brownish, shortly hairy. **Pappus** uniseriate, of many barbellate bristles, equal in length, present in ray and disc cypsela. Grassland. *Bloublommetjieskaroo* (A).

| VreDm | | DrGr | MsGr | KarSh | Zastr |
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## **filifolia** (Vent.) Burtt Davy subsp. **filifolia**

*Aster filifolius* Vent.
*Diplopappus filifolius* (Vent.) DC.

Shrub, 0.6–1.5 m high; much branched. **Leaves** alternate; blade linear, elliptic to round in cross section, margins entire, glabrous, slightly succulent. **Heads** radiate, sessile or long

pedunculate; peduncles glabrous. **Involucral bracts** 3- or 4-seriate, imbricate. **Flowers**: ray florets purple, rarely white; disc florets yellow; Jul.–Jun. **Fruit** with cypsela obovate to elliptic, with long, silky villous hairs. **Pappus** uniseriate, of barbellate bristles of different lengths, present in ray and disc cypsela. Hillsides or mountainsides, grassland. *Fine-leaved felicia*; *persbergdraaibos*, *wilde-aster* (A); *sehalahala-se-seholo* (SS).

| | | DrGr | MsGr | KarSh | Zastr |
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**hirsuta** DC.

*F. buchubergensis* (Dinter) Merxm.

Dwarf shrub, 0.1–0.6 m high; much branched, rounded, roughly hairy, bark often reddish. **Leaves** alternate; blade linear to narrowly obovate, thick, margins entire, white-hairy; young leaves also glandular-pubescent. **Heads** radiate, solitary; peduncles glandular-pubescent. **Involucral bracts** 3- or 4-seriate, imbricate; hairy and glandular-pubescent. **Flowers**: ray florets blue-violet; disc florets yellow; Jul., Oct.? **Fruit** with cypsela obovate, brownish, shortly hairy. **Pappus** uniseriate, of barbellate bristles, of equal length, present in ray and disc cypsela. Hill slopes and along drainage lines. *Bloublommetjie* (A).

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**muricata** (Thunb.) Nees subsp. **muricata**

*Aster muricatus* Thunb.

Shrub, up to 0.7 m high; much branched. **Stems** young ones thinly hispid. **Leaves** alternate; blade linear, acicular, with scattered hairs, often glabrescent and glandular, often with axillary tufts of leaves. **Heads** radiate, solitary; peduncles hairy or glabrous, rarely with sessile glands below the head. **Involucral bracts** 4-seriate, imbricate, hairy or glabrescent. **Flowers**: ray florets white, pink, blue or mauve; disc florets yellow; Aug.–May. **Fruit** with cypsela narrowly obovate, reddish brown, shortly hairy. **Pappus** uniseriate, of many barbellate bristles, of similar length, present in ray and disc cypsela. Grassland, can become weedy in disturbed places. *Wild aster*; *karooblommetjie*, *kapokblommetjie* (A); *koelehane*, *moroka-hloho*, *mosala-tsela*, *mohantsoane* (SS).

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**ovata** (Thunb.) Compton

*Aster barbatus* (DC.) Harv.

Dwarf shrub, up to 300 mm high; much branched, white-hairy, diffuse. **Leaves** opposite, sessile, basally weakly connate around stem; blade narrowly ovate to narrowly obovate, apex acute and recurved, margins entire, revolute, with long, white hairs. **Heads** radiate, large, solitary; peduncles with white spreading hairs and with stalked glands. **Involucral bracts** 2- or 3-seriate, equal in size, hairy and glandular. **Flowers**: ray florets blue; disc florets yellow; Feb.–Oct. **Fruit** with cypsela elliptic, black-green, with short hairs. **Pappus** uniseriate, of barbellate bristles, of similar length, present in ray and disc cypsela. Karroid mountain slopes. *Grootbloublommetjie*, *baardbloublom* (A).

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**petiolata** (Harv.) N.E.Br.

*Aster petiolatus* Harv.

Perennial herb; stems 0.9–1.0 m long, sprawling or pendulous. **Leaves** alternate, petiolate; blade ovate to elliptic, upper leaves often sessile, margins dentate, densely bristly hairy.

**Heads** radiate, solitary, pedunculate. **Involucral bracts** biseriate, ± equal in size, bristly hairy. **Flowers**: ray florets white or mauve; disc florets yellow; Apr., Jul.–Oct. **Fruit** with cypsela obovate, yellow-brown, shortly hairy. **Pappus** uniseriate, of barbellate bristles, present in ray and disc cypsela. Along streams, in grassland, often trailing/cascading over rocks.

DrGr | MsGr

### **quinquenervia** (Klatt) Grau

*Aster quinquenervius* Klatt

Perennial herb, up to 0.6 m high; rhizomatous, branched above into 2–4-headed inflorescence. **Leaves** alternate, mostly crowded in basal tufts; sessile; blade ovate or obovate, base dilated, roughly hairy or nearly glabrous, thin-textured, ± 5-nerved, margins entire or obscurely dentate, smaller upwards. **Heads** radiate in 2–4-headed panicles; peduncle remotely leafy, then bracteate, densely hairy. **Involucral bracts** 3-seriate, outer row smaller than 2 inner rows, outer row densely glandular and hairy. **Flowers**: ray florets blue, pink, mauve or magenta; disc florets yellow; Nov.–Jan. **Fruit** with cypsela obovate, blackish brown, shortly appressed-pubescent. **Pappus** bristles barbellate, of equal length, uniseriate. Grassland, particularly along streamsides and other damp situations.

MsGr

### **rosulata** Yeo

*Aster natalensis* (Sch.Bip.) Harv.

Perennial herb, up to 300 mm high; rhizomatous. **Stems** unbranched, each with a single head. **Leaves** mostly in a basal rosette, alternate upwards; blade elliptic to obovate, margins entire or denticulate, 3- or 5-nerved, shortly and densely white-hairy; stem leaves smaller, narrowly obovate. **Heads** radiate, solitary, terminal on densely white-hairy and glandular stems. **Involucral bracts** 3-seriate, ± equal in size, long hairy and sparsely glandular. **Flowers**: ray florets blue; disc florets yellow; Sep.–Nov. **Fruit** with cypsela obovate, brown, shortly hairy. **Pappus** uniseriate, of barbellate bristles, of similar length. Grassland on mountain slopes and rocky outcrops.

MsGr

## **Flaveria** Juss. (sthn Afr.: 1 sp.)

(Helenieae)

### ***bidentis** (L.) Kuntze

*F. contrayerba* (Cav.) Pers.

Annual herb, up to 1 m high. **Leaves** opposite; blade narrowly ovate to elliptic, up to 80 × 20 mm, apex acute, margins subentire or callose-serrulate, base cuneate, tapering petiole-like. **Heads** discoid, few-flowered, many tightly clustered in shortly pedunculate, terminal and axillary, secondary heads. **Involucral bracts** 3, uniseriate, elliptic, concave, imbricate, forming a cylinder, yellow. **Receptacle** epaleate. **Flowers**: disc florets only, yellow; Jan.–May. **Fruit** with cypsela elliptic or narrowly obovate, ribbed, glabrous. **Pappus** absent. Weed of cultivation and roadsides, on sandy soils, often streamsides or damp ditches. Native to tropical America. *Smelter's bush*; *smelterbossie* (A).

VreDm | DrGr | KarSh

## **Foveolina** Källersjö (sthn Afr.: 4 spp.)

(Anthemideae)

**burchellii** (DC.) Magee
*Cotula burchellii nom. nud.*
*F. albidiformis* (Thell.) Källersjö
*Pentzia burchellii* (DC.) Fenzl ex Harv. *pro parte*
*Tanacetum burchellii* DC.

Annual herb, stems up to 150 mm long, procumbent. **Leaves** alternate, sessile; blade pinnatipartite, up to 20 mm long, segments linear, margins entire or sometimes bilobed, pubescent. **Heads** disciform, solitary, terminal, pedunculate. **Involucral bracts** ± 3-seriate, imbricate, with prominent resin canal. **Receptacle** epaleate. **Flowers**: outer female florets filiform; disc florets bisexual, 4- or 5-lobed, yellow; May, Aug.–Oct. **Fruit** of 2 kinds, glabrous; cypsela of female florets terete, tapering at both ends, conspicuously wrinkled, with glands in wrinkles; cypsela of disc florets obovoid, smooth or faintly ribbed. **Pappus** absent. Disturbed places, weedy.




## **Gaillardia** Foug. (sthn Afr.: 2 spp.)

(Helenieae)

***pulchella** Foug.

Annual herb, up to 500 mm high. **Leaves** alternate, mostly sessile; blade oblong or narrowly obovate, up to 90 × 20 mm, margins entire, obscurely toothed or lobed. **Heads** radiate, solitary on long, nude peduncles terminating branch tips. **Involucral bracts** ± 3-seriate, lanceolate, appressed-hairy, ciliate on margins. **Receptacle** epaleate, setose. **Flowers**: ray florets yellow in upper half, purple-red in lower; disc florets yellow; Jan. **Fruit** with cypsela turbinate, villous. **Pappus** of long-awned scales. Escaped from cultivation; in disturbed places. Native to southern United States and Mexico. *Indian blanket flower*, *firewheel*.




## **Galinsoga** Ruiz & Pav. (sthn Afr.: 2 spp.)

(Heliantheae)

***parviflora** Cav.
*Adventina parviflora* Raf.

Annual herb, up to 500 mm high. **Leaves** opposite; blade ovate, up to 60 × 40 mm, apex acute or acuminate, base broadly cuneate, margins subentire to serrate-crenate, hispidulous or glabrescent, 3-veined from base; petiole up to 15 mm long. **Heads** radiate; peduncles long, cymosely arranged at branch tips and upper leaf axils, with hairs short, appressed-ascending and few, short, glandular hairs. **Involucral bracts** 1- or 2-seriate, ovate, free. **Receptacle** with paleae trifid. **Flowers**: ray florets female, fertile, small; disc florets bisexual; ray and disc florets white; Dec.–Mar., Jun. **Fruit** dimorphic; cypsela of ray florets obovate, somewhat compressed; cypsela of disc florets narrowly turbinate, angled. **Pappus** absent or vestigial in ray cypsela, of

disc cypsela fimbriate scales without marked terminal awn. Weed in gardens and waste places. Native to South America. *Gallant soldier*, *small-flowered galinsoga*; *knopkruid* (A).

VreDm | | DrGr | MsGr | KarSh |

## **Gamochaeta** Wedd. (sthn Afr.: 5 spp.)

(Gnaphalieae)

### Key to species:

[after Hilliard: 17 (1983)]

Upper leaves flat, not recurved; involucral bracts buff-coloured or pale brown . . . . . **G. pennsylvanica**
Upper leaves folded lengthwise, tips recurved; involucral bracts tinged red-purple when young, buff-coloured or pale brown later . . . . . **G. subfalcata**

### ***pennsylvanica** (Willd.) Cabrera

*Gnaphalium pennsylvanicum* Willd.
*Gnaphalium peregrinum* Fernald

Annual herb, up to 400 mm high. **Leaves** alternate; blade obovate, narrowed to petiole-like base, apex rounded, margins entire, decreasing in size upwards, upper leaves flat, not folded or recurved; loosely white-woolly on upper surface, densely so on lower surface, not discolorous. **Heads** disciform, sessile, in small, axillary glomerules, racemosely arranged. **Involucral bracts** 3-seriate, buff-coloured or pale brown, apices pellucid, stereome undivided. **Flowers**: outer female florets many, filiform; disc florets 2 or 3, whitish, tipped red-purple; Apr.–Nov. **Fruit** with cypsela oblong, minutely myxogenic hairy, duplex hairs globose. **Pappus** of many scabrid bristles, bases fused in smooth ring. Damp places and weed of cultivation. Native to North America. *Wandering cudweed*.

VreDm | | | | | |

### ***subfalcata** (Cabrera) Cabrera

*Gnaphalium subfalcatum* Cabrera

Annual herb, up to 350 mm high. **Leaves** alternate; blade of lower leaves obovate, of upper leaves very narrowly obovate to linear, folded lengthwise, tips recurved, base narrowed petiole-like, margins entire, both surfaces grey-green silky-woolly, not discolorous. **Heads** disciform, sessile, in small, woolly glomerules, racemosely arranged at branch tips. **Involucral bracts** ± 3-seriate, pellucid, apices tinged red-purple when young, buff-coloured or pale brown later, stereome undivided. **Flowers**: outer female florets many, filiform; disc florets 4, white, tipped red-purple; Aug.–Nov., May. **Fruit** with cypsela oblong, minutely myxogenic hairy, duplex hairs globose. **Pappus** of many scabrid bristles, bases fused in smooth ring. Weed of cultivation and disturbed places. Native to Argentina. *Silky cudweed*.

VreDm | | | | | |

## **Garuleum** Cass. (sthn Afr.: 8 spp.)

(Calenduleae)

### Key to species:

Plants minutely velvety (downy) and minutely glandular; involucral bracts biseriate, all ± the same length . . . . . **G. pinnatifidum**
Plants rough with conspicuous glandular hairs; involucral bracts ± 4-seriate, imbricate . . . . . **G. woodii**

### **pinnatifidum** (Thunb.) DC.

Shrub or perennial herb, 0.3–1.5 m high; minutely velvety. **Leaves** alternate, petiolate; blade ovate in outline, up to 40 × 20 mm, pinnatipartite, lobes oblong, toothed, serratures blunt or subacute, callous-tipped. **Heads** radiate, terminal, solitary or few together, pedunculate. **Involucral bracts** biseriate, all ± the same length, very narrowly ovate, apices acuminate. **Flowers**: ray florets female, fertile, blue or purplish; disc florets functionally male, yellow; Dec.–Jun. **Fruit** with cypsela narrowly obovate, somewhat 3-angled. **Pappus** absent. Streambanks, mountain ridges, along rivers.

DrGr KarSh

### **woodii** Schinz

Small shrub, up to 0.6 m high; all parts rough with conspicuous glandular hairs. **Leaves** alternate, sessile; blade oblong in outline, 50 × 20 mm, once or twice pinnatisect, ultimate segments very narrow, ± 1 mm, base half-clasping, glandular-hairy. **Heads** radiate, solitary, on long peduncles. **Involucral bracts** in several series (± 4), imbricate, outer much shorter than inner, ovate, apices obtuse to acute. **Flowers**: ray florets female, fertile, blue or white; disc florets functionally male, yellow; Sep.–Mar. **Fruit** with cypsela narrowly obovate, somewhat 3-angled, obscurely winged, light yellowish brown. **Pappus** absent. Rocky slopes and cliffs. *Mahloko-a-Baroa* (SS).

DrGr MsGr

## **Gazania** Gaertn. (sthn Afr.: 19 spp.)

(Arctotideae)

### Key to species:

[after Roessler: 365, 402 (1959)]

1a Apices of involucral bracts spinose; ray florets white . . . . . **G. jurineifolia** subsp. **jurineifolia**
1b Apices of involucral bracts not spinose; ray florets yellow, orange or rarely white . . . . . 2
2a Leaf blade linear, totally undivided . . . . . 3
2b Leaf blade either undivided or pinnatifid . . . . . 4
3a Inner involucral bracts obtuse or subacute, 3–4(–5) mm long . . . . . **G. krebsiana** subsp. **serrulata**
3b Inner involucral bracts acuminate, 4–6(–8) mm long . . . . . **G. krebsiana** subsp. **krebsiana**
4a Inner involucral bracts obtuse or subacute, 3–5 mm long . . . . . **G. krebsiana** subsp. **arctotoides**

4b Inner involucral bracts acuminate, 4–6(–8) mm long . . . . . .
. . . . . **G. krebsiana** subsp. **krebsiana**

## **jurineifolia** DC. subsp. **jurineifolia**

Perennial herb, up to 80 mm high, with milky latex. **Leaves** in basal rosette, petiolate; blade rigid, ± coriaceous, 10–70 mm long, pinnatifid, with 2–5 pairs of narrowly oblong lobes, 2–8 mm long, apices acute, margins revolute, upper surface covered with rough short hairs, glabrescent, lower surface white-tomentose, except for midvein. **Heads** radiate, solitary, on nude scapes 5–80 mm long. **Involucre** campanulate, glabrous or rarely lightly tomentose; involucral bracts ± 3-seriate, basally connate; outer bracts linear or triangular, 1–3 mm long, margins densely ciliate with spinules; inner bracts ovate-triangular or narrowly triangular, (3–)4–6(–8) mm long, margins ± ciliate or entire, apices spinose. **Flowers**: ray florets white on upper surface, purple-striped on lower surface; disc florets white, Sep.–Dec., May. **Fruit** with cypsela turbinate, sericeous. **Pappus** of many, delicate scales. Disturbed grassland, sandveld.

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## **krebsiana** Less. subsp. **arctotoides** (Less.) Roessler

*G. arctotoides* Less.

Perennial herb, up to 200 mm high, with milky latex. **Leaves** in basal rosette, petiolate; blade either linear with entire margins or pinnatifid, lobes linear or elliptic, margins revolute, upper surface harshly pubescent, glabrescent, lower surface white-tomentose. **Heads** radiate, solitary, on nude scapes up to 150 mm long. **Involucre** campanulate, glabrous or lightly tomentose; involucral bracts 2- or 3-seriate, connate basally, free part shorter than fused part, outer bracts 2–8(–10) mm long, inner bracts triangular or ovate triangular, apices obtuse to subacute, 3–5 mm long, not spinose. **Flowers**: upper surface of ray florets yellow or orange, lower surface with brown, grey or purple band, sometimes with black spot at base of ray floret on upper surface; disc florets yellow or orange; Jul.–Jun. **Fruit** with cypsela turbinate, sericeous. **Pappus** of many delicate scales. Grassland. *Botterblom* (A).

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## **krebsiana** Less. subsp. **krebsiana**

Perennial herb, up to 200 mm high, with milky latex. **Leaves** in basal rosette, petiolate; blade linear with mostly entire margins or pinnatifid, rarely all leaves entire, lobes linear or elliptic, margins revolute, upper surface harshly pubescent, glabrescent, lower surface white-tomentose. **Heads** radiate, solitary, on nude scapes up to 150 mm long. **Involucre** campanulate, glabrous or lightly tomentose; involucral bracts 2- or 3-seriate, connate basally, free part shorter than fused part, outer bracts linear, 3–7 mm long, acute, margins ciliate, inner bracts narrowly triangular, acuminate, 4–6(–8) mm long, apices not spinose. **Flowers**: upper surface of ray florets yellow or orange, lower surface with brown, grey or purple band, sometimes with black spot at base of ray floret on upper surface; disc florets yellow or orange; Sep.–Feb., May. **Fruit** with cypsela turbinate, sericeous. **Pappus** of many delicate scales. Grassland. *Common gazania*; *bruingousblom* (A); *shoeshoe*, *tsikitlane* (SS); *isapokwe*, *umkwinti* (X); *ubendle* (X, Z). Figure 38.

| VreDm | | DrGr | MsGr | KarSh | |
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## **krebsiana** Less. subsp. **serrulata** (DC.) Roessler

*G. munroi* E.Phillips

*G. pygmaea* Sond.

Perennial herb, up to 200 mm high, with milky latex. **Leaves** in basal rosette; blade linear, margins always entire, revolute, upper surface harshly pubescent, glabrescent, lower surface



**Figure 38.** *Gazania krebsiana* subsp. *krebsiana* (Asteraceae).

white-tomentose. **Heads** radiate, solitary, on nude scapes up to 150 mm long. **Involucre** campanulate, glabrous or lightly tomentose; involucral bracts 2- or 3-seriate, connate basally, free part shorter than fused part, outer bracts 3–10(–14) mm long, inner bracts triangular or ovate triangular, apices obtuse to subacute, 3–4(–5) mm long, not spinose. **Flowers**: ray florets mostly white with green, brown or purple band on lower surface, sometimes pure yellow; disc florets white or yellow; Aug.–Apr. **Fruit** with cypsela turbinate, sericeous. **Pappus** of many delicate scales. Grassland. *Witgousblom*, *kleingousblommetjie* (A). Figure 10B, p. 7.

VreDm | AcGr | DrGr | MsGr | KarSh

## **Geigeria** Griess. (sthn Afr.: 21 spp.)

(Inuleae)

### Key to species:

1a Plant acaulescent (stemless) or rosulate-like branched; leaves rosulate; several flower heads crowded together near ground level. . . . . .2
1b Plant caulescent (stemmed), stems erect or procumbent, elongate, branched; leaves alternate, sessile; flower heads solitary or few together at forking of branches. . . . . 3
2a Leaf blade linear, > 2 mm wide. . . . . **G. ornativa** subsp. **ornativa**
2b Leaf blade filiform, < 2 mm wide. . . . . **G. filifolia**
3a Stems procumbent. . . . . 4
3b Stems erect. . . . . 5
4a Leaf blade linear, filiform, < 1 mm wide . . . . . .**G. burkei** subsp. **diffusa**
4b Leaf blade linear, > 1 mm wide. . . . . **G. aspera** var. **rivularis**

5a Much-branched shrub; leaf blade up to 10 mm long . . . . . **G. brevifolia**
5b Perennial herb; leaf blade > 10 mm long . . . . . 6
6a Leaf blade elliptic to ovate or narrowly obovate, with a pungent apex, stiff and leathery . . . . . **G. obtusifolia**
6b Leaf blade linear or filiform, without a pungent apex, herbaceous . . . . . 7
7a Leaf blade filiform, < 2 mm wide; pappus scales not awned . . . . . **G. burkei** subsp. **burkei** var. **zeyheri**
7b Leaf blade linear, > 2 mm wide; inner pappus scales with slender awn . . . . . **G. aspera** var. **aspera**

## **aspera** Harv. var. **aspera**

Perennial herb, up to 300 mm high; tufted. **Stems** erect. **Leaves** densely set, alternate, sessile; blade linear, up to 55 × 3 mm, apex acute, not pungent, margins entire or remotely denticulate, herbaceous, glandular-punctate, hispid to glabrous. **Heads** radiate, sessile, solitary at each forking of branches. **Involucre** narrowly ovoid, ± 5 mm wide; involucral bracts ± 4-seriate, imbricate. **Receptacle** paleate. **Flowers**: ray and disc florets yellow; Oct.–Mar., Jun. **Fruit** with cypsela turbinate, silky villous. **Pappus** of 10 scales, alternate ones tipped with slender awn. Grassland, tending to spread in overgrazed veld. *Misbekvermeerbos*, *vermeersiektebossie* (A).




## **aspera** Harv. var. **rivularis** (J.M.Wood & M.S.Evans) Merxm.

Perennial herb, up to 200 mm long; tufted. **Stems** procumbent. **Leaves** alternate, sessile; blade linear, up to 55 × 2.5 mm, apex acute, not pungent, margins entire or remotely denticulate, glandular-punctate, hispid to glabrous. **Heads** radiate, sessile, solitary at tips of branches. **Involucre** campanulate, ± 9 mm wide; involucral bracts ± 4-seriate, imbricate. **Receptacle** paleate. **Flowers**: ray and disc florets yellow; Dec.–Feb. **Fruit** with cypsela turbinate, silky villous. **Pappus** of 10 scales, alternate ones tipped with slender awn. Grassland, tending to spread in overgrazed veld.




## **brevifolia** (DC.) Harv.

Shrub, up to 1 m high; much branched. **Stems** erect, very narrowly winged. **Leaves** alternate, sessile; blade small, linear to linear-elliptic, up to 10 × 2 mm, apex obtuse or submucronate, margins entire, cobwebby when young, glabrous, glandular-punctate. **Heads** radiate, sessile, solitary, terminally and axillary, in forks of branches. **Involucre** 5 mm in diameter; involucral bracts ± 4-seriate, imbricate. **Receptacle** paleate, clasping cypsela. **Flowers**: ray and disc florets yellow; Feb. **Fruit** with cypsela turbinate, silky villous, 5-ribbed. **Pappus** of 10 scales, lacerated almost to base. Grassland or savanna, tending to spread to disturbed veld.




## **burkei** Harv. subsp. **burkei** var. **zeyheri** (Harv.) Merxm.

Perennial herb, up to 500 mm high. **Stems** erect, branched. **Leaves** alternate, sessile; blade linear, filiform, up to 70 × 1 mm, apex acute, not pungent, margins entire, herbaceous, scaberulous to glabrous, gland-pitted. **Heads** radiate, sessile, solitary, at apex or forks of branches. **Involucre** 6–8 mm in diameter; involucral bracts ± 5-seriate, imbricate. **Receptacle** paleate. **Flowers**: ray and disc florets yellow; Feb., May. **Fruit** with cypsela turbinate, silky villous. **Pappus** of scales, biseriate, not awned. Grassland. *Gifbossie* (A).



**burkei** Harv. subsp. **diffusa** (Harv.) Merxm.

Perennial herb, up to 0.35 m long. **Stems** woody, elongately branched, procumbent. **Leaves** alternate, sessile; blade linear, filiform, up to 100 × 1 mm, apex acute, not pungent, margins entire, herbaceous, glabrous, glandular-punctate. **Heads** radiate, sessile, solitary at forking of branches, or sometimes appearing crowded or tufted along stunted, woody branches. **Involucre** up to 8 mm in diameter; involucral bracts ± 5-seriate, imbricate. **Receptacle** paleate. **Flowers**: ray and disc florets yellow; Apr. **Fruit** with cypsela turbinate, silky villous. **Pappus** of scales, biseriate, alternate scales tipped with slender awn. Grassland and rocky places.

DrGr

**filifolia** Mattf.

*G. africana* Griess. subsp. *filifolia* (Mattf.) Merxm.

*G. passerinoides* Harv. *p.p.*

Annual, occasionally perennial herb, up to 150 mm high; stemless. **Leaves** in rosettes, sessile; blade linear, filiform, up to 60 × 1.5 mm, apex acute, margins entire or sometimes remotely and minutely denticulate, scabrid, glabrescent, glandular-punctate. **Heads** radiate, several crowded together near ground level in leaf axils at base of rosettes. **Involucre** ± 7 mm in diameter; involucral bracts 2- or 3-seriate, outer with long, linear, leaf-like appendage, inner long-acuminate with ciliate margins. **Receptacle** paleate. **Flowers**: ray and disc florets yellow; Sep.–Jun. **Fruit** with cypsela turbinate, silky villous. **Pappus** of 10 scales, alternate ones tipped with slender awn. Grassland.

AcGr DrGr KarSh Zastr

**obtusifolia** L.Bolus

*G. arenicola* Muschl. ex Dinter

*G. plumosa* Muschl. subsp. *obtusifolia* (L.Bolus) Merxm.

Perennial herb, up to 0.5 m high; hairy. **Stems** erect. **Leaves** alternate, sessile; blade elliptic to ovate or narrowly obovate, up to 30 × 10 mm, stiff, leathery; apex obtuse, pungent-mucronate, base obtuse, amplexicaul, margins entire, often undulate, viscid-hispidulous, sparsely glandular. **Heads** radiate, solitary at branch tips or short lateral branches. **Involucre** ± 10 mm in diameter; involucral bracts ± 4-seriate. **Receptacle** paleate. **Flowers**: ray and disc florets yellow; Dec.–Jun. **Fruit** with cypsela turbinate, silky villous. **Pappus** of 10 scales, alternate ones tipped with slender awn. Grassland on sandy soil, tending to spread to disturbed places.

AcGr DrGr

**ornativa** O.Hoffm. subsp. **ornativa**

*G. africana* Griess. subsp. *ornativa* (O.Hoffm.) Merxm.

Perennial herb, up to 300 mm high, stemless or with erect stems. **Leaves** in rosettes in stemless specimens or alternate along stem, sessile; blade linear, up to 100 × 7 mm, apex acute or obtuse, margins entire or distantly and minutely denticulate, scaberulous, glabrescent, ciliate along petiole-like base, gland-pitted. **Heads** radiate, solitary in leaf axils or in small groups in leaf axils in stemless specimens. **Involucre** ± 10 mm in diameter; involucral bracts ± 3-seriate, subequal. **Receptacle** paleate. **Flowers**: ray and disc florets yellow; Dec.–Apr. **Fruit** with cypsela turbinate, silky pilose. **Pappus** of 10 scales, alternate ones tipped with slender awn. Dry woodland, bushveld or grassland. *Misbeksiektebos*, *vermeerbos* (A).

DrGr KarSh

## **Gerbera** L. (sthn Afr.: 15 spp.)

(Mutisieae/Dicomeae)

### Key to species:

[after Hansen: 7, 21 (1985)]

1a Scapes widened below head; cypselae very long beaked (> 5 mm long) . . . . . **G. piloselloides**
1b Scapes not widened below head; cypselae beaked (< 5 mm long). . . . . 2
2a Lower leaf surface persistently whitish or lemon-tomentose. . . . .**G. ambigua**
2b Lower leaf surface glabrescent to glabrous at maturity . . . . . **G. viridifolia**

**ambigua** (Cass.) Sch.Bip.
*G. discolor* Sond. ex Harv.
*G. kraussii* Sch.Bip.

Perennial herb, acaulescent; crown whitish silky villose. **Leaves** in basal rosette; blade narrowly ovate, narrowly obovate, elliptic, oblong or ovate to subrotund, margins entire or sinuate, with remote, obscure teeth, ciliate; upper surface green, glabrescent to densely velvety pilose with light hairs, lower surface persistently whitish or lemon-tomentose; petiole up to 200 mm long. **Heads** radiate, solitary, on long peduncles (scapes). **Scapes** up to 0.5 m high, villose or tomentose, not swollen below head. **Flowers**: ray florets biseriate, prominent, white above, pink, mauve or red below, rarely yellow; disc florets white, yellow, reddish or blackish; Oct.–Feb. **Fruit** with cypsela hairy, with beak 1–4 mm long. **Pappus** of many barbellate bristles, violet-purple, rarely whitish or whitish tawny. Submontane areas, open woodland, savanna, along rivers or damp grassland. *Botterblom*, *griekwa-teebossie* (A); *moarubetso*, *moku-betso*, *tsebe-ea-pela* (SS); *ucabazane*, *uhlambihloshane*, *ulimi-lwenkomo* (Z).

DrGr | MsGr

**piloselloides** (L.) Cass.
*Piloselloides hirsuta* (Forssk.) C.Jeffrey

Perennial herb, acaulescent; crown ± silky villose or silky pilose. **Leaves** in a basal rosette, sessile to distinctly petiolate; blade elliptic, oblong or ovate to almost orbicular or narrowly obovate, base cuneate, decurrent or rarely narrowly cordate, margins entire or obscurely undulate, ciliate; upper leaf surface dark, dull green, with appressed scattered or dense whitish or brownish hairs, lower leaf surface subglabrous or with appressed, dense hairs mixed with longer, whitish hairs. **Heads** radiate, solitary, on long peduncles (scapes). **Scapes** up to 0.45 m high, tomentose, widened below head. **Flowers**: ray florets biseriate, very short, white or tinged pink below, but also yellow and red; disc florets yellow, white or as rays; Jul.–Feb. **Fruit** with cypsela papillose-pilose, sometimes glabrous, with beak 5–10 mm long. **Pappus** of many barbellate bristles, whitish. Submontane; open grassland, savanna, grassy slopes, rocky soil, along streams. *Swartteebossie* (A); *moarubetso*, *mothuntšetso*, *tsebe-ea-pela* (SS); *ubulawu*, *umqwashu* (X); *indlebeyempithi*, *uhlango olumpofu*, *umoya-wezwe* (Z). Figure 39.

DrGr | MsGr | KarSh

**viridifolia** (DC.) Sch.Bip.
*G. glandulosa* Dummer
*G. plantaginea* Harv.
*G. speciosa* S.Moore

Perennial herb, acaulescent; crown ± silky pilose-villose. **Leaves** in basal rosette, sessile or distinctly petiolate; blade narrowly obovate, elliptic, oblong or rarely ovate, base cuneate,



**Figure 39.** *Gerbera piloselloides* (Asteraceae)



**Figure 40.** *Gerbera viridifolia* (Asteraceae)

sometimes cordate, margins entire or with remote crenate, distinct teeth, ciliate; young leaves and scapes moderately pilose-villose with whitish hairs; glabrescent to glabrous at maturity. **Heads** radiate, solitary, on long peduncles (scapes). **Scapes** up to 200 mm high, not swollen below head; contemporary with leaves. **Flowers**: ray florets biseriate, prominent, white above, pink, red, mauve, crimson below or even yellow; disc florets white, yellow or tinged greenish; Sep.–Feb. **Fruit** with cypsela pubescent-pilose, with beak 2–5 mm long. **Pappus** of many barbellate bristles, whitish, sometimes violet-purple. Open grassland, savanna, open woodland, riverbanks and mountainsides. *Blushing Barberton daisy*. Figure 40.

DrGr | MsGr | KarSh | Zastr

## **Gnaphalium** L. (sthn Afr.: 14 spp.)

(Gnaphalieae)

### Key to species:

[after Hilliard: 17 (1983)]

Annual herb; outer involucral bracts of mature flower heads woolly or cobwebby on backs at least in lower part . . . . . **G. confine**
Perennial herb; outer involucral bracts of mature flower heads glabrous on backs . . . . . **G. filagopsis**

### **confine** Harv.

*G. drakensbergense* Markötter

Annual herb, up to 200 mm high or long; erect or decumbent. **Leaves** alternate; blade very narrowly obovate linear-oblong, apex obtuse to subacute, mucronate, grey-woolly. **Heads** disciform, few to several clustered at branch tips, closely surrounded by leaves. **Involucral**

**bracts** 4-seriate, outer pale brown, woolly on backs, inner with tips dirty white, sometimes tinged purple, acute or subacute, stereome undivided. **Flowers**: female florets many, filiform; disc florets few; greenish, sometimes tinged purple; Oct.–Jan., Apr. **Fruit** with cypsela ellipsoid, with myxogenic hairs. **Pappus** of female florets barbellate, of disc florets with subplumose tips. Damp places, sometimes weedy.

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**filagopsis** Hilliard & B.L.Burtt
*Amphidoxa filaginea* Ficalho & Hiern

Perennial herb, up to 250 mm high or long; erect or decumbent. **Leaves** alternate; blade linear or oblong-linear, apex acute or subacute, mucronate, silvery grey-tomentose or silky tomentose. **Heads** disciform, few, subcorymbosely arranged, surrounded by leaves. **Involucral bracts** 4-seriate, 2 outer rows shorter, golden-brown, glabrous on backs, inner rows with obtuse, snow-white apices, stereome undivided. **Flowers**: female florets many, filiform, less disc florets, yellowish, tinged purple?; Sep.–May. **Fruit** with cypsela ellipsoid, with myxogenic hairs. **Pappus** usually absent in female florets, occasionally with few barbellate bristles. Wet or seasonally wet places.

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## **Gymnanthemum** Cass. (sthn Afr.: 6 spp.)

(Vernonieae)

**corymbosum** (L.f.) H.Rob.
*Vernonia corymbosa* (L.f.) Less.
*V. neocorymbosa* Hilliard
*V. tigna* Klatt

Shrub, up to 1.8 m high. **Leaves** alternate; blade obovate, cuneate-oblong or deltoid, up to 60 × 40 mm, coarsely toothed in upper half or at apex, sometimes entire, base cuneate, upper surface glabrescent, lower surface silky canescent, discolorous; petiole ± 5 mm long. **Heads** discoid, many in terminal, corymbose panicles. **Involucral bracts** 4- or 5-seriate, imbricate, ovate-elliptic or oblong, apex obtuse, mucronate. **Flowers**: disc florets only, pale to deep violet; Mar., Jun. **Fruit** with cypsela narrowly turbinate-cylindric, somewhat angular, ± 10-ribbed, hairy. **Pappus** of outer short, caducous setae (scales?); inner longer, persistent barbellate setae. Mountains in scrub on forest margins, sometimes open grassland. *Swartteebossie* (A); *uhlunguhlungu* (Z).

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## **Gymnopentzia** Benth. (sthn Afr.: 1 sp.)

(Anthemideae)

**bifurcata** Benth.
*Athanasia turbinata* Burtt Davy
*G. pilifera* N.E.Br.

Shrub, up to 1.2 m high; erect or decumbent. **Leaves** opposite; sessile, bases sheathing; blade linear, simple or 1–3 × dichotomously forked, lobes narrowly linear, glabrous to thinly or densely villous. **Heads** discoid, many in terminal corymbs. **Involucral bracts** in few rows, imbricate. **Receptacle** epaleate. **Flowers**: disc florets only, bright yellow; Apr. **Fruit** with

cypsela cylindric, 10-ribbed, papillose. **Pappus** absent. Open grassland, rocky gullies and on rock outcrops. *Sehalahala* (SS).

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## **Haplocarpha** Less. (sthn Afr.: 6 spp.)

(Arctotideae)

### Key to species:

[after Hilliard: 537 (1977)]

Involucral bracts several-seriate; cypselae with long-acuminate pappus scales, longer than cypsela, and a conspicuous basal coma of long silky hairs . . . . . **H. scaposa**

Involucral bracts biseriate; cypselae with pappus scales very short or rudimentary, basal coma of short delicate hairs . . . . . **H. nervosa**

### **nervosa** (Thunb.) Beauverd

Perennial herb, acaulescent; flowering stem up to 200 mm high. **Leaves** in a basal rosette; blade oblong, elliptic or ovate in outline, up to 150 × 80 mm, apex subacute to rounded, base attenuate, margins entire, irregularly dentate, runcinate or subpinnatifid, upper surface glabrous or coarsely hairy, lower surface white-felted; petiole up to 60 mm long. **Heads** radiate, solitary; peduncle up to 80 mm long. **Involucral bracts** ± biseriate, imbricate. **Flowers**: ray florets female, fertile, pale yellow, sometimes tinged greenish grey on lower surface; disc florets yellow; Sep., Oct. **Fruit** with cypsela turbinate, obscurely 8-ribbed, glabrous except for delicate basal coma of hairs. **Pappus** of very short or rudimentary scales. Damp grassland, marshes and marshy streambanks.

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### **scaposa** Harv.

*H. thunbergii* DC.

Perennial herb, acaulescent; flowering stem up to 0.6 m high. **Leaves** in basal rosette, petiolate; blade broadly elliptic or obovate, up to 150 × 70 mm, apex obtuse, base attenuate, margins entire, sinuate or more deeply lobed and faintly to distinctly dentate, upper surface shortly, densely pubescent, lower surface white-felted. **Heads** radiate, solitary; peduncle up to 750 mm long. **Involucral bracts** several seriate, imbricate. **Flowers**: ray florets female, fertile, pale yellow; disc florets yellow; Oct.–Apr. **Fruit** with cypsela turbinate, obscurely 8-ribbed, glabrous except for basal coma of long, silky hairs. **Pappus** of long-acuminate scales, longer than cypsela. Grassland. *Tonteldoosbossie* (A); *khutsana*, *lengoako*, *leshala*, *lisebo*, *moarubetso* (SS); *isikhali*, *umkhanzi* (X).

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## **Helianthus** L. (sthn Afr.: 3 spp.)

(Heliantheae)

### ***annuus** L.

Annual herb, up to 4 m high; usually branching from base. **Leaves** alternate, sometimes opposite below; blade ovate to triangular, up to 100 × 60 mm, apex acuminate, base cordate to truncate

and abruptly descending on petiole, margins dentate or denticulate, scabrid-pubescent on both surfaces; petiole up to ± 100 mm long. **Heads** radiate, generally 80–100 mm in diameter, sometimes larger, solitary on long peduncles terminating upper branches. **Involucral bracts** 3-seriate, ovate, usually > 4 mm wide, mostly abruptly long-acuminate, scabridulous. **Receptacle** with paleae enfolding disc florets. **Flowers**: ray florets neuter, yellow; disc florets bisexual, brownish or purplish black; Mar. **Fruit** with cypsela narrowly obovate, ± 5 mm long, somewhat compressed, thinly hispid. **Pappus** of 2 small scales, soon caducous. Escaped from cultivation, disturbed areas; probably more widespread but herbarium material scanty. Native to North America. *Sunflower*; *sonneblom* (A).




## **Helichrysum** Mill. (sthn Afr.: ± 243 spp.)

(Gnaphalieae)

### Key to groups and species:

[after Hilliard: 61 (1983)]

The following groups do not have representatives in the FS and were left out of the key: Group 3, 10, 13, 18, 19.

1a Flower heads depressed-globose, large (containing at least 300 florets); cypselae glabrous though epidermis often rough-looking from imbricate cells; coarse annuals, biennials, perennials or shrubs; involucral bracts frequently bright yellow, sometimes brown outside or wholly brown, very rarely white, whitish or pink . . . . . **Group 30**

1b Flower heads cylindric, turbinate, campanulate or subglobose, never depressed-globose . . . . . 2

2a Flower heads 4–5 mm long, containing 5 florets; involucral bracts opaque white or sometimes rosy; ovaries (cypselae) glabrous; small shrubs; leaf margins undulate . . . . . **Group 1 (H. zeyheri)**

2b Combination of characters not as above . . . . . 3

3a Flower heads either discoid containing < 30 florets or disciform with < 20 florets; involucral bracts ± as long as florets, not radiating (though occasionally squarrose), yellow, receptacle smooth or honeycombed (not fimbrilliferous) . . . . . 4

3b Flower heads with involucral bracts either not bright yellow or heads with > 30 florets or bracts radiating or receptacle fimbrilliferous or characters otherwise not as combined above . . . . . 12

4a Ovaries and cypselae glabrous . . . . . 5

4b Ovaries and cypselae hairy . . . . . 7

5a Flower heads generally disciform with (0)1–3 female florets . . . . . **Group 2**

5b Flower heads discoid . . . . . 6

6a Pappus bristles shortly subplumose in upper part, bases cohering by patent cilia . . . . . **Group 7 (H. evansii)**

6b Pappus bristles few, nude below, shortly plumose above . . . . . **Group 6**

7a Flower heads many, felted together to form 1 or a few, flat, umbrella-like discs . . . . . **Group 5**

7b Flower heads either free from one another or, if felted together, not forming a flat, umbrella-like disc . . . . . 8

8a Pappus either absent, or if present, leaf bases decurrent in long narrow stem wings . . . . . **Group 4**

8b Pappus present, leaf bases not decurrent in long wings . . . . . 9
9a Pappus bristles nude below, not cohering . . . . . **Group 6**
9b Pappus bristles with patent cilia at base, cohering or not . . . . . 10
10a Flower heads containing 5 florets . . . . . **Group 7** (**H. evansii**)
10b Flower heads containing 6–30 florets . . . . . .11
11a Stems ± uniformly leafy throughout; leaves mostly 4–20 × 1–8 mm . . . . . **Group 12**
11b Plants with tufts of basal leaves ± 80–250 × 15–50 mm . . . . . **Group 21**
12a Flower heads discoid, receptacle fimbrilliferous, ovaries and cypselae glabrous . . . . . 13
12b Flower heads disciform, or if discoid, either receptacle smooth or honeycombed but not fimbrilliferous or ovaries and cypselae hairy . . . . . 17
13a Shrubs or subshrubs, hard- or soft-wooded . . . . . 14
13b Perennial herbs, frequently with tufts of basal leaves . . . . . 15
14a Leaves sessile, sometimes subdecurrent; flower heads 3(–5) × 1–2(–3) mm . . . . . **Group 8**
14b Leaves minutely petiolate; flower heads ± 5 × 3 mm . . . . . **Group 11 (H. pentzioides)**
15a Stems tufted, wiry, decumbent . . . . . **Group 22**
15b Stems solitary or subsolitary, stout, erect . . . . . 16
16a Involucral bracts ± equalling florets, not radiating, though squarrose in 1 species . . . . . **Group 23**
16b Involucral bracts exceeding florets, radiating, sometimes squarrose as well in 1 species . . . . . **Group 24**
17a Receptacle paleate . . . . . 18
17b Receptacle smooth, honeycombed or fimbrilliferous, but not paleate . . . . 19
18a Flower heads ± 5 mm long, many, either clustered or in large, corymbose panicle; involucral bracts white or brownish yellow . . . . . **Group 20 (H. platypterum)**
18b Flower heads ± 10 mm long, solitary or few in lax corymbs; involucral bracts lemon-yellow . . . . . **Group 29**
19a Leaves on petioles up to 25 mm long, blade ovate to subrotund, up to ± 80 × 50 mm, base cordate; flower heads 2–3 mm long, many in small clusters arranged in spreading corymbose panicles. . . . **Group 16 (H. hypoleucum)**
19b Either leaves or flower heads not as above . . . . . 20
20a Flower heads 7–30 mm long; involucral bracts exceeding florets, radiating, usually white, pink, rose or combinations of these colours, often with brown as well, sometimes yellow or light brown . . . . . 21
20b Flower heads up to 6 mm long; involucral bracts either equalling or longer than florets, erect or radiating, variously coloured, or if heads 7 mm long, then bracts either equalling florets and not radiating or bright canary-yellow . . . . . 28
21a Annuals; arid areas . . . . . **Group 15**
21b Herbaceous perennials, subshrubs or shrubs . . . . . 22
22a Ovaries and cypselae glabrous; pappus bristles without patent cilia at base, not cohering . . . . . 23
22b Ovaries and cypselae hairy or rarely glabrous and then pappus bristles either with minute patent cilia at base, cohering or not, or bristles fused at base . . . . . 24
23a Involucral bracts mostly white with some brown or crimson, if yellow, then plants either mat-forming or herbaceous perennials . . . . . **Group 29**
23b Involucral bracts yellow or light brown; shrubs or coarse, woody perennials . . . . . **Group 30**
24a Pappus bristles fused at base in a smooth ring; involucral bracts white, commonly tinged or tipped rose-pink; receptacle smooth . . . . . **Group 26 (H. praecurrens)**

24b Pappus bristles either free at base or cohering by patent cilia, if fused or with some fusion in bundles as well, involucral bracts either white or rose-coloured, but not combinations of both, or receptacle fimbrilliferous . . . . 25
25a Herbaceous perennials or dwarf shrubs with 1 or more tufts of basal leaves; flowering stems simple, erect, usually 1-headed, rarely (in 2 or 3 species) bearing several flower heads in a lax, corymbose panicle; involucral bracts usually self-coloured, sometimes parti-coloured in *H. adenocarpum* . . . . . **Group 28**
25b Habit, arrangement of flower heads and bracts not as above . . . . . 26
26a Plants mat-forming or tufted; leaves linear to very narrowly obovate, sessile; involucral bracts white or sometimes palest yellowish buff-coloured outside; bases of pappus bristles cohering strongly by patent cilia. . . . . **Group 25**
26b Plants differing from above in habit, or leaf shape (ignore uppermost reduced leaves), or bracts variously coloured, or bases of pappus bristles not cohering strongly by patent cilia. . . . . 27
27a Flower heads 10–15 mm long; involucral bracts white, rose-coloured and brown, or if only ± 7 mm long, then a hard cushion-forming shrub with pale lemon-yellow involucral bracts . . . . . **Group 27**
27b Flower heads 7–11 mm long; involucral bracts white or white tipped brown . . . . . **Group 17**
28a Involucral bracts in 4 series, 2 outer short, webbed together with wool, often ± persistent, 2 inner soon caducous, tip of blade with an opaque median patch often drawn-out into an acute or acuminate and then recurved tip; woolly herbs, often decumbent then erect; leaves oblong-spathulate to linear-oblong . . . . . **Group 14 (H. spiralepis)**
28b Involucral bracts not as described above. . . . . 29
29a Involucral bracts silvery, white, white and rose-coloured or wholly rose-coloured, or white with brown tips or pale brown outside; receptacle smooth or honeycombed or rarely fimbrilliferous and then flower heads discoid . . .30
29b Involucral bracts straw-coloured, tawny or various shades of yellow or brown, red tints sometimes associated with these colours; if white or whitish, or with some rose-coloured or wholly rose-coloured, then flower heads disciform and receptacle fimbrilliferous . . . . . 34
30a Twiggy dwarf shrub with stiff branches and hard spathulate leaves; flower heads ± 4 × 1 mm tightly clustered. . . . . **Group 2**
30b Habit, foliage or flower heads not as above . . . . . 31
31a Outer involucral bracts white, spathulate, larger than inner . . . . . **Group 27**
31b Involucral bracts neither spathulate nor outer larger than inner. . . . . 32
32a Tips of inner involucral bracts either ± equalling florets and not radiating or minutely radiating; leaves generally linear with revolute margins, if broader, receptacle either fimbrilliferous or with flattened tubercles. . . . . **Group 12**
32b Tips of involucral bracts mostly exceeding florets, radiating or squarrose; leaves mostly broad with flat margins, or if linear with revolute margins, receptacle honeycombed; if bracts ± equalling florets and either not radiating or minutely radiating, leaves not linear with revolute margins . . . . . .33
33a Annual herbs, or if perennial or shrubby, then involucral bracts either acute to acuminate or squarrose, or both; or leaves linear with revolute margins; in dry sandy places . . . . . **Group 15**
33b Either shrubs or perennial herbs with obtuse involucral bracts; on the mountains. . . . . **Group 17**
34a Involucral bracts white or sometimes partly or wholly rosy, receptacle fimbrilliferous . . . . . 35
34b Involucral bracts straw-coloured, tawny or various shades of yellow or brown, red tints sometimes associated with these colours. . . . . 36
35a Ovaries and cypselae glabrous. . . . . **Group 8**
35b Ovaries and cypselae hairy . . . . . **Group 9**

36a Flower heads disciform, few-flowered (up to 8 florets); involucral bracts not radiating; receptacle smooth; ovaries and cypselae glabrous . . . . . **Group 2**
36b Characters not combined as above . . . . . 37
37a Receptacle fimbrilliferous; ovaries and cypselae glabrous; corolla of disc florets funnel-shaped . . . . . **Group 8**
37b Receptacle smooth or honeycombed or if fimbrilliferous, either ovaries and cypselae hairy or corolla of disc florets campanulate above . . . . . 38
38a Flower heads discoid, containing < 30 florets; corolla of disc florets funnel-shaped; ovaries and cypselae usually hairy, occasionally hairs few or absent on same plant. . . . . **Group 12**
38b Flower heads either disciform (female florets sometimes very few or only 1) or if discoid, either corollas of disc florets campanulate above, or ovaries and cypselae glabrous, or both . . . . . 39
39a At least inner involucral bracts clear yellow, minutely radiating but not squarrose; receptacle honeycombed. . . . . **Group 22**
39b Involucral bracts straw-coloured, tawny or shades of golden-brown, sometimes with red or purple admixtures, rarely clear yellow and then either involucral bracts ± squarrose, or receptacle fimbrilliferous . . . . . 40
40a Corollas of disc florets funnel-shaped . . . . . **Group 15**
40b Corollas of disc florets campanulate above . . . . . 41
41a Flower heads either disciform with involucral bracts shortly radiating or not; leaf margins flat or revolute; or rarely flower heads discoid and then tips of involucral bracts minutely radiating or leaf margins strongly revolute . . . . . **Group 9**
41b Flower heads discoid; involucral bracts not radiating, but leaf margins flat. . . . . **Group 11 (H. pentzioides)**

## Key to Group 2:

1a Leaves closely woolly . . . . . **H. callicomum**
1b Leaves enveloped in tissue paper-like indumentum, becoming woolly only with age. . . . . 2
2a Involucral bracts pale lemon-yellow, not webbed together. . . . . **H. rutilans**
2b Involucral bracts silvery, webbed together at base with delicate tissue paper-like indumentum. . . . . **H. dasycephalum**

## Key to Group 4:

Leaves variable, bases decurrent; flower heads disciform. . . . . **H. odoratissimum**
Leaves linear, bases not decurrent; flower heads discoid . . . . . **H. infaustum**

## Key to Group 5:

Stems leafy throughout, becoming bracteate then nude only near the flower heads . . . . . **H. umbraculigerum**
Stems leafy only in the lower half, leaves frequently rosetted . . . . . **H. krookii**

## Key to Group 6:

1a Stem leaves erect, closely imbricate, all ± the same size. . . **H. glomeratum**
1b Stem leaves ± spreading, or if appressed, then reduced in size . . . . . 2
2a Leaf margins strongly revolute and outer involucral bracts very acute . . . . . **H. nanum**
2b Leaf margins either flat or outer involucral bracts obtuse, or both . . . . . **H. subglomeratum**

## Key to Group 8:

1a Leaves linear, margins strongly revolute; stiffly branched dwarf shrub . . . . . **H. kraussii**
1b Leaves oblong, linear-oblong, elliptic-oblong, oblong-spathulate, very narrowly ovate or linear, margins flat or weakly revolute; soft-wooded tufted perennial herbs or dwarf shrubs; branches often tangled . . . . . 2
2a Leaves oblong or oblong-spathulate, obtuse or subacute, both surfaces appressed-woolly; flower heads campanulate. . . . . **H. aureonitens**
2b Leaves either very narrowly ovate or linear, very acute to acuminate and flower heads cylindric or campanulate; or leaves linear-oblong to elliptic-oblong, acute or acuminate and then upper surface with thin papery indumentum and flower heads cylindric. . . . . 3
3a Tips of at least inner involucral bracts straw-coloured or tawny. . . . . **H. melanacme**
3b Tips of at least the inner involucral bracts yellow. . . . . **H. cymosum** subsp. **calvum**

## Key to Group 9:

1a Tips of at least the inner involucral bracts white, cream-coloured or rosy . . . 2
1b Tips of at least inner involucral bracts straw-coloured, tawny or purplish brown . . . . . 4
2a Tips of bracts smooth or very nearly so . . . . . **H. rosum** var. **arcuatum**
2b Tips of bracts crisped . . . . . 3
3a Flower heads 2–3 mm wide, 2–5 clustered at the branch tips . . . . . **H. dregeanum**
3b Flower heads 3–5 mm wide, usually few to many in corymbose panicles, if few, then heads ± 5 mm wide. . . . . **H. rugulosum**
4a Perennial herbs with tufts of stems from a creeping stock; stems simple or branching near base; leaves linear; flower heads ± 2 mm wide, many in a compact, terminal cluster . . . . . **H. ammitophilum**
4b Well-branched dwarf shrubs, stock creeping or not; flower heads 2–3 mm wide, 2–5 clustered at the branch tips . . . . . **H. dregeanum**

## Key to Group 12:

1a At least tips of inner involucral bracts white or pink. . . . . 2
1b Involucral bracts various shades of yellow, buff-coloured or brown, sometimes with red patches as well, particularly above the stereome, but never with white or rosy tips . . . . . 3
2a Flower heads ± 4 mm long with 8–14 florets; branches loosely spreading . . . . . **H. lineare**
2a Flower heads ± 5 mm long with 11–24 florets; branches densely tufted, forming dense mats . . . . . **H. caespititium**
3a Leaves linear-oblong, margins revolute; flower heads ± 3 mm long . . . . . **H. arenicola**
3b Leaves obovate, margins ± crisped-undulate; flower heads 5–7 mm long . . . . . **H. lucilioides**

## Key to Group 15:

1a Involucral bracts various shades of brown, buff-coloured, gold-coloured or yellow (tips of inner bracts may be white or pink) . . . . . 2
1b Involucral bracts usually white, rose-coloured or pink . . . . . 3
2a Tips of involucral bracts acute to acuminate; flower heads 5–6 mm long . . . . . **H. pumilio** subsp. **pumilio**
2b Tips of involucral bracts obtuse; flower heads ± 4 mm long. . . . **H. obtusum**

3a Flower heads ± 6 mm long, solitary at tips of short, erect branchlets, these racemosely arranged . . . . . **H. paronychioides**
3b Flower heads 7–10 mm long, solitary or a few clustered together, not racemosely arranged . . . . . 4
4a Flower heads subglobose . . . . . **H. argyrosphaerum**
4b Flower heads campanulate . . . . . **H. cerastioides** var. **cerastioides**

## Key to Group 17:

Leaves rhomboid or elliptic, up to ± twice as long as wide, lower surface white-felted . . . . . **H. sutherlandii**
Leaves narrowly elliptic or oblong, at least twice as long as wide, surface of indumentum drying like tissue-paper . . . . . **H. sessile**

## Key to Group 21:

Leaves glandular-pubescent or lightly cobwebby to thickly tomentose; involucral bracts densely imbricate . . . . . **H. acutatum**
Leaves silky-woolly; involucral bracts loosely imbricate . . . . . **H. oreophilum**

## Key to Group 22:

1a Tufted perennial herbs . . . . . **H. psilolepis**
1b Shrubs, sometimes mat-forming . . . . . 2
2a Flower heads campanulate at maturity, outer involucral bracts pale golden-brown, remaining closely imbricate, inner bracts bright yellow, more loosely imbricate . . . . . **H. trilineatum**
2b Flower heads hemispherical at maturity, all the bracts yellow, loosely imbricate . . . . . 3
3a Virgate shrub, usually erect, rarely sprawling; leaves linear, linear-oblong or linear-obovate, apex acute or subacute . . . . . **H. splendidum**
3b Mat-forming dwarf shrub, with short congested branches; leaves obovate, lingulate or subspathulate, apex very obtuse . . . . . **H. montanum**

## Key to Group 23:

1a Flowering stem leafy throughout or more distantly leafy above . . . . . 2
1b Flowering stem mainly leafy in lower half, with a few reduced leaves or bracts in upper part . . . . . 3
2a Stem leaves decurrent in long narrow wings . . . . . **H. mundtii**
2b Stem leaves not decurrent in long narrow wings . . . . . **H. miconiifolium**
3a Crown not clothed in brown silky wool . . . . . **H. pallidum**
3b Crown clothed in brown silky wool, the wool sometimes hidden in leaf axils . . . . . 4
4a Upper leaf surface variously pubescent or woolly at least on main veins and margins . . . . . 5
4b Upper leaf surface glabrous and smooth, though initially it may be covered with papery indumentum or a little wool may cling to midline . . . . . 6
5a Upper leaf surface with long, coarse hairs . . . **H. nudifolium** var. **pilosellum**
5b Upper leaf surface with minute soft pubescence or woolly. . . . . **H. nudifolium** var. **nudifolium**
6a Involucral bracts reddish brown . . . . . **H. pedunculatum**
6b Involucral bracts pale brown or yellow . . . . . **H. nudifolium** var. **nudifolium**

## Key to Group 24:

1a Involucral bracts pure white, or white tipped light or dark brown . . . . . 2
1b Involucral bracts not as above . . . . . 3

2a Involucral bracts white; leaves markedly discolorous, green often drying black, white-felted below . . . . . **H. opacum**
2b Involucral bracts white, tipped brown; leaves ± concolorous, grey-woolly . . . . . **H. albo-brunneum**
3a Flower heads (6–)7–14 mm long; involucral bracts dull, creamy white to yellowish, often washed brown, purplish or crimson, tips acute to acuminate, often squarrose . . . . . **H. appendiculatum**
3b Flower heads 4–5(–6) mm long; involucral bracts glossy, bright yellow or deep straw-coloured, outer often overlaid or tipped golden-brown or rarely purple-brown, tips of outer bracts acute, tips of inner bracts obtuse, apiculate . . . . . **H. cephaloideum**

## Key to Group 25:

Involucral bracts glossy; flower heads either solitary or a few clustered at branch tips . . . . . **H. chionosphaerum**
Involucral bracts dull; flower heads several clustered at stem apex . . . . . **H. grandibracteatum**

## Key to Group 27:

1a Perennial herbs . . . . . **H. bellidiastrum**
1b Dwarf shrubs . . . . . 2
2a Leaf blades obovate or broadly spathulate; plants mat-forming. . . . . **H. haygarthii**
2b Leaf blades linear to narrowly obovate; plants cushion-forming . . . . . **H. sessilioides**

## Key to Group 28:

1a Involucral bracts dull white . . . . . **H. marginatum**
1b Involucral bracts glossy . . . . . 2
2a Heads 25–30 mm long. . . . . **H. ecklonis**
2b Heads ± 10–20 mm long. . . . . 3
3a Flowering stems lateral to leaf rosette; involucral bracts white, rose-coloured, crimson or parti-coloured . . . . . **H. adenocarpum** subsp. **adenocarpum**
3b Flowering stems terminal; involucral bracts white . . . . . **H. monticola**

## Key to Group 29:

Involucral bracts yellow or yellow and brown . . . . . **H. herbaceum**
Involucral bracts white, usually with some brown or crimson **H. confertifolium**

## Key to Group 30:

1a Involucral bracts glossy light brown . . . . . **H. fulvum**
1b Involucral bracts yellow, sometimes brown outside . . . . . 2
2a Perennial herbs with a stout woody caudex crowned with one or more leaf rosettes . . . . . **H. aureum** var. **monocephalum**
2b Biennial herb with basal leaves rosetted in first year of growth; or perennial herbs or dwarf shrubs, sometimes with vegetative buds or small leaf tufts at base of stem, but lacking stout caudex . . . . . 3
3a Leaf bases not decurrent in stem wings . . . . . **H. setosum**
3b Leaf bases decurrent on stem in short or long wings . . . . . **H. cooperi**

**acutatum** DC. (Group 21)

*H. eriophorum* Conrath
*H. floccosum* Klatt
*H. galpinii* Schltr. & Moeser

Perennial herb; flowering stems 0.45–0.60 m high, solitary or several together, erect, simple, cobwebby to woolly tomentose, leafy in lower part, pedunculoid and bracteate upwards. **Leaves**: blade of basal leaves elliptic or ovate-elliptic up to 250(–350) × 50(–80) mm, tapering into winged petiole, apex acute, becoming smaller upwards, oblong-linear, sessile; glandular-pubescent or lightly cobwebby to thickly tomentose, with prominent nerves. **Heads** discoid, oblong-campanulate, 5–7 × 3 mm, many in dense, corymbose clusters. **Involucral bracts** in ± 4 series, densely imbricate, outer webbed together with wool, inner slightly shorter than or equalling florets, tips acute, bright yellow, not radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: disc florets only, 7–13; corolla narrowly campanulate above, yellow; Oct.–Jan. **Fruit** with cypsela (and ovary) hairy. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia, some light fusion as well. Grassland. *Sticky everlasting*, *sword-leaved everlasting*; *taaisewejaartjie* (A); *uzangume* (Z).

MsGr

**adenocarpum** DC. subsp. **adenocarpum** (Group 28)

Perennial herb; flowering stems 40–450 mm high, lateral, decumbent or erect, simple or forking above, glandular pubescent or woolly, closely leafy. **Leaves** in 1 to several basal rosettes; blade of basal leaves suborbicular to elliptic-oblong, 20–40(–140) × 15–25(–40) mm, mostly loosely grey-woolly or cobwebby; blade of stem leaves oblong to narrowly ovate, smaller. **Heads** disciform, campanulate, 15–20 × 25–35 mm, solitary or many-headed, open corymb at tips of branches. **Involucral bracts** in 9–11 series, graded, loosely imbricate, much exceeding florets, glossy, acute, white tipped rose, crimson or scarlet, or entirely rose-coloured or crimson, radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: female and disc florets ± 165–520, 20–90 female; corolla of disc florets narrowly funnel-shaped, yellow often tipped red; Nov.–May. **Fruit** with cypsela (and ovary) hairy. **Pappus** bristles several, barbellate to subplumose in upper part, bases nude, not cohering. Grassland, often on moist slopes or in moist depressions. *Pink everlasting*; *pienk- of rooisewejaartjie* (A); *toane-balingoana* (SS); *uhlambahloshane obomvu* (Z). Figure 41.

MsGr KarSh

**albo-brunneum** S.Moore (Group 24)

Perennial herb; flowering stems up to 300 mm high, simple, ± decumbent then erect, loosely greyish white-woolly, closely leafy. **Leaves** in several basal rosettes; blade of basal leaves obovate or oblong-obovate, 30–80 × 10–35 mm, apex subacute, base ± narrowed, clasping, both surfaces densely grey-woolly, ± concolorous; blade of stem leaves similar, narrowly obovate to linear-oblong, smaller upwards, ± appressed. **Heads** discoid or rarely disciform, broadly campanulate, ± 7–15 mm long, 1–14 crowded at stem tip. **Involucral bracts** in ± 8–12 series, graded, loosely imbricate, much exceeding florets, radiating, stereome divided; outer glossy white, tipped brown, pure white inwards. **Receptacle** epaleate, with fimbrils equalling or exceeding ovaries. **Flowers** 50–335, mostly disc florets, rarely with 2–7 female florets; corolla of disc florets narrowly funnel-shaped, yellow, sometimes purplish; mainly Dec.–Feb. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of many bristles, barbellate above, bases cohering by patent cilia. Montane, colonies on stony slopes.

MsGr



**Figure 41.** *Helichrysum adenocarpum* subsp. *adenocarpum* (Asteraceae).

**ammitophilum** Hilliard (Group 9)

Perennial herb, up to 200 mm high; tufts of stems from creeping rootstock, simple or branched at or near base, erect, white-felted, closely leafy. **Leaves**: blade linear, mostly 8–15 × 0.5–1.0 mm, suberect, imbricate, apex acute, mucronate, sometimes strongly recurved, base broad, margins revolute, upper surface with thin, tissue paper-like indumentum of woolly hairs, lower surface white-felted. **Heads** disciform, oblong-campanulate, ± 3 × 2 mm, in compact, terminal clusters. **Involucral bracts** in ± 4 series, thinly webbed together with wool, graded, closely imbricate, inner nearly equalling florets, pellucid, straw-coloured, tips tawny, blunt, crisped-denticulate, ± squarrose, stereome divided. **Receptacle** epaleate, shortly toothed. **Flowers**: female and disc florets 18–31, 8–15 female; corolla of disc florets campanulate above, bright yellow; Jan.–Mar. **Fruit** with cypsela? (and ovary) hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Stony or sandy turf on hilltops and slopes.




**appendiculatum** (L.f.) Less. (Group 24)
*Gnaphalium appendiculatum* L.f.

Perennial herb, up to 0.55 m high; stems 1 or several from crown, simple or occasionally forked, thinly greyish woolly, closely leafy. **Leaves**: blade of basal leaves elliptic-oblong, 80 × 20 mm, apex acute, base clasping, both surfaces woolly; blade of stem leaves smaller, linear-oblong to narrowly ovate. **Heads** discoid, campanulate, (6–)7–14 mm long, many in corymbose clusters arranged in compact or open, corymbose panicle. **Involucral bracts** in ± 6 series, graded, loosely imbricate, inner equalling or exceeding florets, tips radiating, acute to acuminate, often squarrose, dull, creamy white or yellowish often washed brown, purplish or crimson, stereome divided. **Receptacle** epaleate, with fimbrils ± equalling ovaries. **Flowers**: disc florets only, 28–58; corolla narrowly funnel-shaped, yellow; Jan.–Mar., Jun. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia. Grassland. *Sheep's ears*; *skaapoorbossie* (A); *senkotoana* (SS); *ibode*, *indlebeyemvu* (Z).




**arenicola** M.D.Hend. (Group 12)

Annual or short-lived perennial herb, up to 200 mm high; low-growing, stems many from crown, procumbent or suberect, slender, subsimple or much branched in upper half, thinly white-woolly, glabrescent, leafy. **Leaves**: blade linear-oblong, 4–13 × 1(–2) mm, narrowed in upper $^{2}/_{3}$, apex obtuse, margins revolute, lower $^{1}/_{3}$ broadened, base half-clasping, margins flat; both surfaces glandular, thinly woolly cobwebby, glabrescent. **Heads** discoid, campanulate, ± 3 × 2 mm, several in tight clusters at branch tips, closely surrounded by reduced leaves and webbed to them with wool, old clusters overtopped by several younger flowering branchlets. **Involucral bracts** in 3 series, subequal, equalling florets, not radiating, pellucid, yellow or straw-coloured, glossy, tips obtuse, erose, soon caducous, stereome divided. **Receptacle** epaleate, with flattened tubercles. **Flowers**: disc florets only, 16–28; corolla narrowly funnel-shaped, yellow; Oct., Nov. **Fruit** with cypsela (and ovary) glabrous or hairy. **Pappus** of many barbellate bristles, bases with patent cilia not cohering. In red Kalahari sands, depressions of dunes.




**argyrosphaerum** DC. (Group 15)

Annual herb, up to 300 mm high; stems procumbent or decumbent, thinly woolly, leafy throughout. **Leaves**: blade spathulate to narrowly obovate, up to 25 × 7 mm, apex subacute, mucronate, narrowed to petiole-like base, both surfaces thinly grey-woolly. **Heads** disciform, subglobose, ± 7–10 × 7–10 mm, solitary at tips of branchlets, surrounded by leaves. **Involucral**

**bracts** in ± 9 series, graded, imbricate, inner ± equalling florets, shining, silvery becoming increasingly pink-tinged inwards, fading at maturity, tips obtuse, radiating, stereome divided. **Receptacle** epaleate, very shortly honeycombed. **Flowers**: female and disc florets 166–290, 19–36 female; corolla of disc florets funnel-shaped, yellow, tipped pink; Jun–Feb. **Fruit** with cypsela (and ovary) hairy. **Pappus** of many barbellate bristles, bases cohering lightly by patent cilia. Hot, dry, sandy places, becoming weedy. *Wild everlasting*; *poprosie* (A).

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## **aureonitens** Sch.Bip. (Group 8)

*H. helodes* Hiern

Perennial herb, up to 300 mm high; tufted, stems slender, simple or sparsely branched; greyish white appressed-woolly, leafy throughout. **Leaves**: blade oblong or oblong-spathulate, 20(–30) × 3(–6) mm, apex obtuse or subacute, base broad, half-clasping, margins flat or subrevolute, both surfaces greyish white appressed-woolly. **Heads** disciform, campanulate, 4 × 3 mm, in compact, corymbose clusters at branch tips. **Involucral bracts** in ± 3 series, graded, imbricate, apex obtuse, inner ± equalling florets, not radiating, outer shorter, woolly at base, yellow, often washed pale brown, stereome divided. **Receptacle** epaleate, with fimbrils ± equalling ovaries. **Flowers**: female and disc florets 37–57, 13–23 female; corolla of disc florets funnel-shaped, yellow; Sep.–Feb. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Grassland. *Gouesewejaartjie* (A); *toane-ntja*, *toane-poli* (SS); *impepho-emhlophe*, *inkondlwana* (Z).

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## **aureum** (Houtt.) Merr. var. **monocephalum** (DC.) Hilliard (Group 30)

*H. fulgidum* (L.f.) Willd. var. *monocephalum* DC.

Perennial herb; flowering stems 50–300 mm high, lateral, simple; glandular setose, often thinly woolly or cobwebby, leafy, from stout, woody caudex. **Leaves** in several basal rosettes; blade of basal leaves narrowly or broadly elliptic-spathulate, 30–120 × 10–20 mm, apex obtuse to subacute, base broad clasping, both surfaces glandular setose, greyish white-woolly or wool confined to margins; blade of stem leaves oblong, narrowly obovate to linear, 30(–50) × 5(–10) mm, glandular setose, margins woolly or not. **Heads** disciform, depressed-globose, 8–15 × 17–32 mm, usually solitary, rarely 2 or 3 corymbosely arranged on long, leafy peduncles. **Involucral bracts** in ± 7–9 series, graded, imbricate, much exceeding florets, radiating, glossy, bright yellow, stereome divided. **Receptacle** epaleate, scarcely honeycombed. **Flowers**: female and disc florets 290–1 341, 32–149 female; corolla of disc florets cylindric, yellow; Sep.–Jan. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of many barbellate bristles, bases with patent cilia not or scarcely cohering. Open grassland.

DrGr | MsGr | Zastr

## **bellidiastrum** Moeser (Group 27)

Perennial herb; flowering stems up to 250 mm high, solitary; loosely greyish white woolly, leafy. **Leaves** in basal rosette; blade of basal leaves elliptic to obovate, ± 70 × 30 mm, upper surface initially loosely white or greyish woolly, later shortly pubescent, lower surface white-felted, older leaves discolorous; blade of stem leaves narrowly elliptic, ± 15 × 5 mm, becoming smaller upwards, greyish white-woolly. **Heads** discoid, campanulate, ± 15 × 30 mm, solitary. **Involucral bracts** in ± 15 series, graded, loosely imbricate, much exceeding florets, tips acute, radiating, outer palest golden-brown, sometimes pinkish or crimson, inner opaque white, pinkish at base inside, stereome divided. **Receptacle** epaleate, nearly smooth. **Flowers**: disc florets only, 217–277; corolla campanulate above, yellow; Nov.–Jan. **Fruit** with cypsela (and

ovary) hairy. **Pappus** of many bristles with subplumose tips, bases with patent cilia, sometimes cohering. Damp turf slopes, seepage areas and banks of streams.

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## **caespititium** (DC.) Harv. (Group 12)

*H. lineare* DC. var. *caespititium* DC.

Perennial herb, up to 20 mm high; procumbent, densely tufted, mat-forming, closely leafy. **Leaves**: blade linear, up to 5–10 × 0.5 mm, apex obtuse to subacute, base broad, clasping, margins revolute, both surfaces enveloped in silvery tissue paper–like indumentum, with orange glands. **Heads** discoid, cylindric-turbinate, ± 5 × 2 mm, solitary to several clustered at branchlet tips. **Involucral bracts** in ± 6 series, outermost short, webbed together and to surrounding leaves with wool, inner series subequal, tips opaque white or sometimes pale pink, slightly exceeding florets, minutely radiating, stereome divided. **Receptacle** epaleate, with flattened tubercles. **Flowers**: disc florets only, 11–24; corolla narrowly funnel-shaped, yellow, often tipped pink; Aug.–Dec. **Fruit** with cypsela (and ovary) hairy. **Pappus** of many barbellate bristles, bases with minute patent cilia not cohering. On bare or sparsely grassed areas, often on disturbed sites. *Speelwonderblom* (A); *boriba*, *botsikinyane*, *lelula-phooko*, *moriri-oa-lefatse*, *phate-ea-ngaka* (SS). Figure 10C, p. 7.

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## **callicomum** Harv. (Group 2)

Perennial herb, up to 400 mm high, tufted; stems woody at base, closely greyish white-felted, densely leafy. **Leaves**: blade spathulate, oblong-spathulate or oblong, up to 25 × 6 mm, apex obtuse, of upper leaves acute, base half-clasping, both surfaces closely greyish woolly. **Heads** disciform, cylindric, ± 4.5 × 1.0 mm, many closely aggregated in corymbose panicles. **Involucral bracts** in ± 4 series, graded, closely imbricate, inner ± equalling florets, not radiating, tips acuminate, glossy, pale straw-coloured, stereome divided. **Receptacle** epaleate, smooth. **Flowers**: female and disc florets 4–6, 1–3 female; corolla of disc florets narrowly campanulate above, yellow; Dec.–May. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of several barbellate bristles, bases with patent cilia, not cohering. Grassland. *Motoantoanyane*, *pulumo-tšeou* (SS).

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## **cephaloideum** DC. (Group 24)

*H. adscendens sensu* Moeser *non* (Thunb.) Less.
*H. adscendens* var. *cephaloideum* (DC.) Moeser

Perennial herb; flowering stems up to 400 mm high, erect, loosely grey-woolly, leafy throughout. **Leaves** in a basal rosette; blade of basal leaves narrowly elliptic or narrowly obovate-oblong, 20–50 × 10–20 mm, apex acute, base broad, clasping, both surfaces loosely grey-woolly; blade of stem leaves smaller, very narrowly ovate to linear. **Heads** discoid, campanulate, 4–5(–6) mm long, several in a compact, subglobose cluster. **Involucral bracts** in ± 6 series, subequal, loosely imbricate, exceeding florets, radiating, glossy, bright yellow or deep straw-coloured; outer often overlaid or tipped golden-brown or rarely purple-brown, acute; inner obtuse, apiculate, stereome divided. **Receptacle** epaleate, with fimbrils exceeding ovaries. **Flowers**: disc florets only, 30–103; corolla narrowly funnel-shaped, yellow; Dec.–May. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Grassland. *Mosuoane-oa-thaba* (SS); *ibhade* (Z).

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**cerastioides** DC. var. **cerastioides** (Group 15)

*H. cerastioides* DC. var. *gracile* Moeser

*H. obvallatum* DC.

Perennial herb, up to 200 mm high; stems erect, decumbent or procumbent, grey-woolly, closely leafy throughout. **Leaves**: blade linear, narrowly obovate or oblong, 5–20 × 1–4 mm, apex obtuse to acute, base half-clasping, margins slightly revolute, both surfaces grey-woolly. **Heads** disciform, campanulate, ± 7–10 × 6–10 mm, solitary or few clustered at tips of short side branches, surrounded by leaves, webbed together with wool. **Involucral bracts** in ± 6 series, subequal, loosely imbricate, exceeding florets, tips acute to acuminate, white, pellucid and glossy below, tips white, sometimes tinged rose, radiating, outermost sometimes tinged pale golden-brown, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: female and disc florets 41–172, 10–36 female; corolla of disc florets funnel-shaped, yellow, tipped pink; Sep.–Mar. **Fruit** with cypsela (and ovary) hairy. **Pappus** of many barbellate bristles, bases with patent cilia, not cohering. Open flats and slopes on sand, gritty quartzites or calcareous soils; can become weedy. *Wolbossie*, *sewejaartjie* (A).

AcGr DrGr KarSh

**chionosphaerum** DC. (Group 25)

*H. pondoense* Schltr.

*H. randii* S.Moore

Perennial herb or subshrub; flowering stems up to 150 mm high; procumbent, mat-forming, leafy. **Leaves** sessile; blade linear or very narrowly obovate, 10–100 × 1.5–3.0(–5.0) mm, upper surface glandular-pubescent, sometimes white-felted, lower surface usually glabrous with wool confined to margins, margins slightly involute; 3-veined. **Heads** discoid, campanulate, 7–12(–15) × 12–25 mm, solitary or up to 4 clustered at tips of stems. **Involucral bracts** in ± 6 series, graded, loosely imbricate, ± equalling florets, glossy white, occasionally washed palest yellowish brown outside, radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: disc florets only, 71–154; corolla narrowly campanulate above, yellow; Sep.–Mar. **Fruit** with cypsela (and ovary) hairy. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia. Stony grassland, over rock sheets, or draped over low rock or earth cliffs and big boulders. *Tiny snowball everlasting*; *sewejaartjie* (A); *molepelle*, *senkotoana* (SS).

DrGr MsGr Zastr

**confertifolium** Klatt (Group 29)

Perennial herb; flowering stems up to 400 mm high, terminal; mat-forming, procumbent and erect, leafy. **Leaves**: blade of basal leaves linear, 10–40(–70) × 2–3(–5) mm, apex acute, apiculate, base broad, clasping, margins weakly revolute, both surfaces silvery white-felted, with 3–5 side veins; blade of stem leaves similar, but shorter and closely imbricate. **Heads** disciform, campanulate, 12–15 × ± 25 mm, mostly solitary, occasionally 2 or 3 corymbosely arranged. **Involucral bracts** in ± 8 series, graded, loosely imbricate, inner much exceeding florets, glossy white, very pale to dark chestnut-brown or reddish brown outside in upper half, radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: female and disc florets 153–443, 15–28 female; corolla of disc florets funnel-shaped, yellow; Feb., Mar. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of many barbellate bristles, bases not cohering. Short rocky grassland, rock sheets and other bare areas.

MsGr

**cooperi** Harv. (Group 30)

Biennial herb, up to 1.5 m high; stem simple below inflorescence, glandular-setose, leafy. **Leaves** in a basal rosette in first year of growth; blade of basal leaves elliptic, up to 150(–

250) × 60 mm, tapering to broad clasping base, glandular or thinly woolly; blade of stem leaves oblong to narrowly ovate, 65–130 × (15–)20–45 mm, smaller upwards, apex acute to acuminate, apiculate, base cordate clasping, main stem leaves decurrent in long or short wings; both surfaces glandular-setose, margins often white-woolly as well. **Heads** disciform, depressed-globose, (8–)10–12 × ± 15–25 mm, many in leafy, corymbose panicles. **Involucral bracts** in ± 9 series, slightly graded, imbricate, much exceeding florets, glossy bright yellow, radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: female and disc florets ± 650–1200, 50–160 female; corolla of disc florets narrowly cylindric, yellow; Jan.–May, Oct. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of many barbellate bristles, bases with patent cilia, lightly cohering or not. Grassland, often in coarse herbage on or near forest margins. *Geelsewejaartjie* (A); *bohloko*, *phefo-ea-thaba*, *toane-balimo*, *toane-balingoana* (SS); *umadotsheni* (Z).

MsGr

## **cymosum** (L.) D.Don subsp. **calvum** Hilliard (Group 8)

*H. infaustum* J.M.Wood & M.S.Evans var. *discolor* Moeser

Subshrub, up to 1 m high; stems often decumbent at base, then erect, thinly greyish white-woolly, densely leafy, becoming pedunculoid upwards. **Leaves** crowded; blade linear-oblong to elliptic-oblong, 8–15 × 2–4 mm, smaller and more distant upwards, apex acute or rarely acuminate, margins flat or subrevolute; upper surface with thin, silvery grey, sericeous indumentum, lower surface closely white-woolly. **Heads** disciform, sometimes discoid, cylindric, ± 3.0–4.5 × 1–3 mm, many in compact cymes, corymbose-paniculately arranged at branch tips. **Involucral bracts** in ± 4 series, graded, closely imbricate, inner ± equalling florets, not radiating, glossy, bright canary-yellow, tips smooth, stereome divided. **Receptacle** epaleate, with fimbrils ± as long as ovaries. **Flowers**: with female and/or only disc florets 4–7, 0–4 female; corolla of disc florets funnel-shaped, yellow; Jan.–Apr. **Fruit** with cypsela (and ovary) glabrous. **Pappus** absent. Stony grassland or steep turf slopes. *Yellow-tipped straw-flower*; *impepho* (Z).

MsGr

## **dasycephalum** O.Hoffm. (Group 2)

Dwarf shrub, up to 300 mm high; twiggy, covered with silver-grey felt with a tissue paper-like surface, old stems woody, branches procumbent or decumbent, ultimately stiffly erect, densely leafy. **Leaves** rigid; blade spathulate to oblong, up to 20 × 5 mm, apex obtuse to subacute, mucronate, hooked, base half-clasping. **Heads** disciform, cylindric, ± 4 × 1 mm, webbed together with woolly hairs, many in tight clusters arranged in corymbose panicles at branch tips. **Involucral bracts** in ± 3 series, closely imbricate, ± equalling florets, not radiating, webbed together at base with delicate tissue paper-like indumentum, pellucid, silvery, tips sometimes pale brown or yellow, stereome divided. **Receptacle** epaleate, smooth. **Flowers**: female and disc florets 4–6, 1–3 female; corolla of disc florets narrowly campanulate above, bright yellow; Jan.–Apr. **Fruit** with cypsela? (and ovary) glabrous. **Pappus** of few barbellate bristles, bases with patent cilia, not cohering. Forms mats and cushions on rock sheets and hard bare soil. *Moqabola*, *motoantoanyane*, *senkotoana* (SS).

DrGr MsGr Zastr

## **dregeanum** Sond. & Harv. (Group 9)

Dwarf shrub, up to 150 mm high; mat-forming, stems stiff, diffuse to erect, closely leafy, thinly white-woolly, often with axillary shoots. **Leaves**: blade linear, (4–)14 × (0.5–)2.0 mm, apex subacute, margins strongly revolute, base broad, upper surface thinly and loosely woolly, lower white-woolly. **Heads** disciform, 3.5–4.0(–5.0) × 2–3(–4) mm, campanulate, 2–5, rarely more,

clustered at tips of branchlets. **Involucral bracts** in ± 4 series, graded, closely imbricate, inner ± equalling florets, tips obtuse, crisped, whitish, straw-coloured, tawny or sometimes reddish; not radiating, stereome divided. **Receptacle** epaleate, shortly toothed. **Flowers**: female and disc florets 18–36, 5–10 female; corolla of disc florets campanulate above, yellow; Oct.–Mar. **Fruit** with cypsela (and ovary) hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Dry sandy or stony grassland, or in dwarf shrub communities, becoming a weed along roadsides and in overgrazed places. *Vaalbergankerkaroo* (A).

AcGr | DrGr | MsGr | KarSh

**ecklonis** Sond. (Group 28)

*H. calocephalum* Schltr.

*H. scapiforme* Moeser

Perennial herb; flowering stem up to 500 mm high, terminal, solitary, loosely woolly, leafy. **Leaves**: blade of basal leaves oblong to elliptic-obovate, up to 200 × 20 mm, commonly < 100 × 20 mm, loosely woolly cobwebby, upper surface sometimes glabrescent, lower surface persistent woolly, 3- or 5-nerved; blade of stem leaves similar but narrower and smaller. **Heads** disciform or rarely discoid, campanulate, 25–30 × ± 50 mm, solitary. **Involucral bracts** in ± 10 series, graded, loosely imbricate, much exceeding florets, glossy, white to deep rosy pink, radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: female and/or only disc florets 231–407, 0–13 female; corolla of disc florets narrowly funnel-shaped, pink; Oct.–Jan. **Fruit** with cypsela (and ovary) hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia, some fusion in bundles also. Grassy slopes. *Ecklon's everlasting*; *toane-balingoana-e-kholo*, *toane-ea-loti* (SS); *umuthi wechanti* (X).

MsGr

**evansii** Hilliard (Group 7)

*H. alticolum* Bolus var. *montanum* Bolus

Perennial herb; flowering stems up to 100 mm high, leafy, lateral; mat-forming, young parts densely clothed in a greyish white silky-woolly indumentum, many dwarf branches. **Leaves** crowded in basal rosettes; blade spathulate, up to 20(30) × 10 mm, apex rounded, base broad, half-clasping, both surfaces closely greyish white-woolly felted. **Heads** discoid, subcylindric, 5–6 × 3 mm, many in a subglobose terminal cluster, their bases felted together with grey wool. **Involucral bracts** in ± 4 series, subequal, very loosely imbricate, ± equalling florets, spreading at top but not radiating, glossy, bright canary-yellow, outermost sometimes brownish, stereome divided. **Receptacle** epaleate, pit margins slightly produced. **Flowers**: disc florets 4–6; corolla narrowly funnel-shaped, yellow; Feb.–Apr., Jul., Aug. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of many, slightly flattened bristles, tips subplumose, bases cohering lightly by patent cilia. Cliff faces, rock platforms or stony ground.

MsGr

**fulvum** N.E.Br. (Group 30)

Perennial herb, up to 1 m high; strongly aromatic, with slender rhizome; flowering stems simple, glandular-pubescent, leafy throughout. **Leaves** in a basal rosette, withered at flowering; blade of basal leaves narrowly obovate, up to 350 × 55 mm, apex subacute or obtuse, narrowed to broad, petiole-like base, clasping; both surfaces thinly grey-woolly; blade of stem leaves elliptic-obovate, up to ± 120 × 30 mm, smaller upwards, apex acute to acuminate, base cordate-clasping, shortly decurrent, both surfaces minutely glandular-pubescent. **Heads** disciform, depressed-globose, ± 7–8 × ± 15–18 mm, many in a large, spreading, leafy, corymbose panicle. **Involucral bracts** in 6 series, graded, imbricate, exceeding florets, radiating, glossy

light brown, very acute, stereome divided. **Receptacle** epaleate, honeycombed. **Flowers**: female and disc florets 423–731, 26–97 female; corolla of disc florets cylindric, orange-yellow; Oct.–Dec., Mar., May. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of many barbellate bristles, bases with patent cilia, lightly cohering or not. Montane, along streams, rooted in mud.

MsGr

## **glomeratum** Klatt (Group 6)

Perennial herb, up to ± 0.45 m high; rhizomatous, stems 1–3 together, erect, simple, loosely grey-cottony, densely leafy. **Leaves** in a basal rosette, spreading; blade of basal leaves ovate to elliptic, up to 30 × 10 mm, apex acute, base broad, half-clasping, both surfaces enveloped in silvery, silky indumentum; blade of stem leaves similar but smaller, up to 20 × 8 mm, erect, closely imbricate. **Heads** discoid, cylindric, 3–4 × 1.0–1.5 mm, many in congested, ± round, corymbose clusters, matted together with wool at base, these congested in a flat, corymbose cyme. **Involucral bracts** in ± 4 series, graded, imbricate; outer brownish; inner tipped bright canary-yellow, ± equalling florets, not radiating, translucent, stereome divided. **Receptacle** epaleate, pit margins slightly produced. **Flowers**: disc florets only, 5 or 6; corolla narrowly funnel-shaped, yellow; Jan.–May, Jul. **Fruit** with cypsela? (and ovary) glabrous. **Pappus** of ± 6 bristles, tips shortly plumose, bases nude, not cohering. Large colonies in open grassland.

MsGr

## **grandibracteatum** M.D.Hend. (Group 25)

Perennial herb, tufted; flowering stems up to 200 mm high, terminal, solitary, grey-woolly, leafy. **Leaves** in several basal rosettes; blade of basal leaves linear, up to 120 × 4 mm, apex acute, base broad, clasping, margins slightly involute, upper surface glabrous, lower surface silvery, silky, woolly felted, striate from strongly raised parallel veins; stem leaves much smaller. **Heads** discoid, campanulate, 8–10 × 18–20 mm, several clustered at stem apex. **Involucral bracts** in ± 12 series, loosely imbricate, inner subequal, much exceeding florets, dull, tips acute to acuminate, snow-white, radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: disc florets only, 51–89; corolla narrowly campanulate above, yellow; Sep.–Jan. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia. Poor stony grassland.

MsGr

## **haygarthii** Bolus (Group 27)

Dwarf shrub, flowering shoots up to 50 mm high; diffuse, procumbent, mat-forming, main stems bare, gnarled, blackish, producing dwarf side shoots, leafy. **Leaves** in rosettes; blade of basal leaves obovate, up to 10 × 5 mm; blade of stem leaves subspathulate, conduplicate, ± 6 × 3 mm, imbricate, tips slightly recurved; all silvery sericeous. **Heads** discoid, campanulate, ± 15 × 20 mm, sessile, solitary at tips of dwarf shoots. **Involucral bracts** in ± 8 series, graded, closely imbricate, radiating; outer glossy crimson overlaid brown, much shorter and broader than inner; inner much exceeding florets, white streaked crimson particularly at base, opaque, stereome divided. **Receptacle** epaleate, smooth. **Flowers**: disc florets only, ± 50–91; corolla campanulate above, yellow; Dec.–Feb. **Fruit** with cypsela hairy. **Pappus** of many, scabrid bristles, bases with patent cilia, scarcely cohering. Very broken, weathered, basalt cliffs, alt ± 2 225 m.

MsGr

**herbaceum** (Andrews) Sweet (Group 29)

*H. squamosum auctt. non* (Jacq.) Thunb.
*Xeranthemum herbaceum* Andrews

Perennial herb; flowering stems up to 400 mm high, solitary or few together, simple or forking above, closely leafy throughout. **Leaves** in a basal rosette; blade of basal leaves elliptic or obovate, up to 50 × 20 mm, upper surface loosely cobwebby, glabrescent, lower surface white-felted; blade of stem leaves linear to very narrowly elliptic, 10–20(–25) × 1–2(–5) mm, imbricate, apex acute to acuminate, base broad, clasping, margins often revolute, upper surface greyish white cobwebby, lower surface loosely felted. **Heads** disciform, rarely discoid, campanulate, 18–20 × 26–28 mm, solitary at tips of branches or sometimes in a few-headed corymb. **Involucral bracts** in ± 8 series, closely imbricate, outer shorter and broader than inner, radiating, glossy, golden-brown, inner lemon-yellow, sometimes washed brown outside, much exceeding florets, tips acute to obtuse, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: female and/or only disc florets 102–209, 0–38 female; corolla of disc florets funnel-shaped, yellow; Dec.–Apr. **Fruit** with cypsela glabrous. **Pappus** of many barbellate bristles, bases not cohering. Grassland, confined to mountains. *Monkey-tail everlasting*; *hlohoana-kholoana* (SS); *impepho-yamakhosi* (Z).

MsGr

**hypoleucum** Harv. (Group 16)

*Gnaphalium subcordatum* Kuntze

Shrub or climber; stems up to 2 m long, erect or scandent, white-felted, leafy. **Leaves**: blade cordate-ovate, 80 × 50 mm, apex acute to acuminate, upper surface thinly cobwebby at first, later minutely glandular pubescent, lower surface white-felted, digitately veined; petiole up to 25 mm long, winged, base clasping, auriculate. **Heads** disciform, campanulate, ± 2 × 2 mm, many in congested, corymbose clusters, these in large, spreading, corymbose panicles. **Involucral bracts** in 4 series, graded, imbricate, outer bracts woolly, inner ± equalling florets, glossy, silvery translucent, tips obtuse, minutely radiating, stereome divided. **Receptacle** epaleate, honeycombed. **Flowers**: female and disc florets 8–13, 1–4 female; corolla of disc florets campanulate above, bright yellow; Jan.–Apr. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases lightly cohering by patent cilia. Steep grassy mountainsides or forest margins.

MsGr

**infaustum** J.M.Wood & M.S.Evans (Group 4)

Dwarf shrub; flowering stems up to ± 200 mm high; forming mats or cushions, old branches woody, decumbent, nude, rooting, branchlets closely grey-woolly, densely leafy, becoming nude and remotely leafy upwards. **Leaves**: blade linear, up to 12 × 1.5 mm, becoming smaller and more distant below flowering heads, apex obtuse, apiculate, base broad, half-clasping, margins strongly revolute, upper surface thinly grey-woolly, lower surface densely white-woolly. **Heads** discoid, cylindric, ± 3 × 1 mm, many in compact, cymose clusters at branch tips. **Involucral bracts** in 2–4 series, graded, closely imbricate; outer tipped pale brown; inner bright canary-yellow, ± equalling florets, not radiating, stereome divided. **Receptacle** epaleate, pit margins slightly produced. **Flowers**: disc florets only, 2–5; corolla campanulate above, yellow; Jan.–May. **Fruit** with cypsela hairy. **Pappus** absent. Bare rock sheets, bare eroded sparsely grassed areas.

MsGr

**kraussii** Sch.Bip. (Group 8)

Dwarf shrub, up to 1 m high; stiffly branched, stems thinly greyish white-felted, glabrescent, closely leafy. **Leaves**: blade linear, up to 20 × 2 mm, apex acute, mucronate, margins strongly

revolute, upper surface cobwebby, glabrescent, lower surface white-felted. **Heads** disciform or discoid, cylindric, ± 3.5 × 1 mm, many in dense, cymose clusters, corymbose-paniculately arranged at branch tips. **Involucral bracts** in ± 5 series, graded, closely imbricate, ± equalling florets, not radiating, glossy, pale lemon-yellow or straw-coloured, stereome divided. **Receptacle** epaleate, with fimbrils equalling ovaries. **Flowers**: female and/or only disc florets 5 or 6, 0–2 female; corolla of disc florets funnel-shaped, pale yellow; Feb. **Fruit** with cypsela? (and ovary) glabrous. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia. Sandy grassland or open woodland.

VreDm

## **krookii** Moeser (Group 5)

Perennial herb; tuberous-rooted, rhizomatous; flowering stems up to 400 mm high, solitary, simple, erect, leafy in lower half, glandular, thinly cobwebby. **Leaves** mostly in a basal rosette; blade of basal leaves elliptic, up to 100 × 50 mm, apex subacute, abruptly narrowed to a broad, clasping, petiole-like base up to 30 × 6 mm, both sides glandular-pubescent; blade of stem leaves smaller, sessile, passing into distant bracts. **Heads** discoid, ± 3–4 × 2–3 mm, many felted together in compact, corymbose clusters, these further felted together into a ± flat disc. **Involucral bracts** in 2 or 3 series, loosely imbricate, ± equalling florets, not radiating, bright canary-yellow, stereome divided. **Receptacle** with paleae equalling corolla. **Flowers**: disc florets only, 7–18; corolla narrowly campanulate above, yellow, sometimes tinged red; Jan.–Mar. **Fruit** with cypsela hairy. **Pappus** of few bristles, tips barbellate, bases free. Forms small colonies in grassland, mainly near streams or on steep moist slopes. *Leme-la-khomo* (SS).

MsGr

## **lineare** DC. (Group 12)

*H. seineri* Moeser

Perennial herb; procumbent or rarely decumbent, with branches loosely spreading, up to 200 mm long, thinly white-woolly, closely leafy. **Leaves**: blade linear or lingulate, 5–10(–13) × 0.75–1.00(–4.00) mm, apex obtuse, margins revolute, both surfaces white-woolly. **Heads** discoid, cylindric, ± 4 × 2 mm, in small glomerules at branch tips, closely surrounded by leaves. **Involucral bracts** in ± 6 series, outermost short, webbed to surrounding leaves with wool, inner subequal, erect, tips subacute to obtuse, often erose, opaque white, rarely buff-coloured or pinkish, not radiating, stereome divided. **Receptacle** epaleate, tuberculate. **Flowers**: disc florets only, 8–14; corolla narrowly funnel-shaped, yellow, sometimes tipped pink; Aug.–Feb. **Fruit** with cypsela? (and ovary) hairy or glabrous. **Pappus** of many barbellate bristles, bases with patent cilia not cohering. Bare places, often seasonally wet places, on sand, alluvium or limestone soils, colonising streamsides, areas around pans and disturbed ground.

VreDm AcGr DrGr MsGr KarSh

## **lucilioides** Less. (Group 12)

Dwarf shrub, 0.5–0.6 m high; gnarled, branched or lax with spreading branches, twigs ± tomentose, closely leafy. **Leaves**: blade obovate, 3–12 × 2–5 mm, thick, apex obtuse, tip recurved-mucronate, base narrowed, petiole-like in larger leaves, margins ± crisped-undulate; both sides ± greyish white-woolly. **Heads** discoid, cylindric, 5–7 × 2–4 mm, 2–many clustered terminally, surrounded by leaves. **Involucral bracts** in 4 series, graded, imbricate; outer ± webbed to 1 or 2 upper leaves, inner ± equalling florets, all subpellucid, pale yellow or straw-coloured, sometimes ± red below, glossy, oblong, tips obtuse, ± concave, not radiating, stereome divided. **Receptacle** epaleate, scarcely honeycombed. **Flowers**: disc florets only, 9–18; corolla narrowly funnel-shaped, yellow; Oct.–Mar. **Fruit** with cypsela? (and ovary) hairy.

**Pappus** of many barbellate bristles, bases cohering strongly by patent cilia. Rocky or stony hills and karroid plains; valuable grazing. *Bergkerriebos* (A).

KarSh

## **marginatum** DC. (Group 28)

Dwarf shrub, mat-forming; main stems procumbent, branching; flowering stems up to 150 mm high, terminal, often solitary, erect, loosely greyish white-woolly, leafy. **Leaves** crowded in many basal rosettes; blade of basal leaves lingulate (obovate), up to ± 40 × 10 mm, leathery, glandular-punctate, glabrous to glandular-pubescent, margins white-woolly; blade of stem leaves similar but smaller upwards. **Heads** disciform, campanulate, ± 15–20 × ± 40 mm, solitary. **Involucral bracts** in ± 10 series, graded, loosely imbricate, much exceeding florets, radiating, dull white, crimson blotch near base inside, tips acute, stereome divided. **Receptacle** epaleate, scarcely honeycombed. **Flowers**: female and disc florets 195–259, 18–29 female; corolla of disc florets narrowly funnel-shaped, yellow?; Dec.–Feb. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases free. Montane, steep stony slopes, rock sheets. *Mankhama-khama*, *senkotoana*, *toane-balingoana-e-tšoeu* (SS).

MsGr

## **melanacme** DC. (Group 8)

*H. kuntzei* (Kuntze) Moeser
*H. pullulum* Burtt Davy

Perennial herb or shrub, up to 500 mm high; soft-wooded, branches often tangled; thinly greyish white-woolly, closely leafy. **Leaves**: blade very narrowly ovate or linear, 8–35 × 1–5 mm, apex acuminate, base broad, ear-clasping, margins revolute, upper surface woolly or cobwebby, lower surface white-woolly. **Heads** disciform, cylindric or narrowly campanulate, ± 3 × 2 mm, many in cymose clusters arranged in a compact, sometimes lax, terminal, corymbose panicle. **Involucral bracts** in ± 4 series, graded, closely imbricate, inner nearly equalling florets, tips obtuse, crisped, scarcely radiating, tawny or innermost straw-coloured, stereome divided. **Receptacle** epaleate, with fimbrils equalling ovaries. **Flowers**: female and disc florets (15–)20–45, 6–18 female florets, fewer than disc florets; corolla of disc florets funnel-shaped, yellow; Nov.–Mar. **Fruit** with cypsela glabrous. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Grassy mountainsides.

DrGr MsGr KarSh

## **miconiifolium** DC. (Group 23)

Perennial herb; flowering stem up to 0.6 m high, usually solitary, leafy, but more distantly leafy above, thinly woolly. **Leaves**: blade of basal leaves narrowly to broadly elliptic, up to 300 × 45 mm, apex acute, contracted to thin, wiry petiole, 3-nerved, upper surface scabridulous or smooth, lower surface white-felted, sometimes glabrescent; blade of stem leaves similar but soon sessile, linear, apex acuminate, margins strongly revolute, base not decurrent. **Heads** discoid, campanulate, ± 5 × 5 mm, many in loose or compact, flat-topped, corymbose panicle. **Involucral bracts** in 6 series, graded, loosely imbricate, ± equalling florets, base woolly, glossy, ovate, apex acute to acuminate, lemon-yellow, often washed light golden-brown, not radiating, stereome divided. **Receptacle** epaleate, with fimbrils ± equalling ovaries. **Flowers**: disc florets only, 12–23; corolla campanulate above, yellow; Oct.–Feb. **Fruit** with cypsela glabrous. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia, lightly fused as well. Grassland.

DrGr? MsGr

**montanum** DC. (Group 22)

Dwarf shrub, 100–450 mm high; mat-forming, branches short, congested, densely leafy; flowering stems terminal, erect, up to 200 mm long, greyish white-woolly. **Leaves**: blade obovate, lingulate or subspathulate, up to 50 × 10 mm, apex very obtuse, base ± clasping, both sides thickly greyish white-woolly, clearly striped with 3–5 parallel nerves. **Heads** disciform, hemispherical, 4–5 × 5–8 mm, many in compact, terminal, corymbose panicles. **Involucral bracts** in 6 or 7 series, graded, loosely imbricate, inner slightly exceeding florets, glossy, bright yellow, tips minutely radiating, stereome divided. **Receptacle** epaleate, honeycombed. **Flowers**: female and disc florets 53–133, 12–26 female; corolla of disc florets narrowly campanulate above, yellow; Aug.–Mar. **Fruit** with cypsela hairy. **Pappus** of many bristles, tips barbellate or subplumose, bases with patent cilia, cohering or not. Montane, cliff faces, rocky gullies, steep rocky slopes. *Toana-ea-loti* (SS).




**monticola** Hilliard (Group 28)

Perennial herb; flowering stems up to 300 mm high, solitary, terminal, from thick woody rootstock, closely leafy. **Leaves**: blade of basal leaves narrowly to broadly obovate, up to 90 × 15 mm, upper surface glandular-pubescent and cobwebby, lower surface greyish white-woolly; blade of stem leaves similar but smaller, ± imbricate. **Heads** disciform, campanulate, 15–20 × 20–30 mm, solitary or more usually in a few- to several-headed corymb. **Involucral bracts** in ± 10 series, graded, loosely imbricate, much exceeding florets, glossy, white, inner tinged pink or crimson at base inside, rarely outer bracts with brownish pink overcast, tips acute, radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: female and disc florets 102–329, 10–26 female; corolla of disc florets narrowly funnel-shaped, yellow; Dec.–Feb. **Fruit** with cypsela hairy. **Pappus** of few barbellate bristles, bases not cohering. Stony grass slopes.




**mundtii** Harv. (Group 23)

Perennial herb, up to 1.5 m high; from stout, woody rootstock; flowering stems simple, thinly white-felted in upper part, leafy throughout. **Leaves**: blade of basal leaves elliptic, up to 600 × ± 60 mm, half of this petiolar, apex acute or subacute, base tapering into long, narrowly winged petiole, base clasping, upper surface glabrous, often rugose, lower surface white-felted, 3-nerved; blade of stem leaves oblong-obovate to linear-elliptic, apex acute, base decurrent in long narrow wings. **Heads** discoid, campanulate, ± 4 × 3.5 mm, many in cymose clusters, arranged in large, much-branched, corymbose panicle. **Involucral bracts** in 5 or 6 series, graded, closely imbricate, inner ± equalling florets, opaque creamy white, not radiating, stereome divided. **Receptacle** epaleate, with fimbrils equalling ovaries. **Flowers**: disc florets only, 18–24; corolla campanulate above, cream-coloured or yellowish; Feb.–Apr. **Fruit** with cypsela? (and ovary) glabrous. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia, some light fusion as well. Marshy places, often along streamsides or in seepage areas. *Phefo-ea-liliba* (SS).




**nanum** Klatt (Group 6)

Perennial herb, mat-forming; main branches stoloniferous, nude, producing many erect dwarf shoots; flowering stems terminal, solitary, erect, 50–120 mm high, simple, closely leafy. **Leaves** crowded in rosettes and spread along stem, stiff, erect; blade linear, up to 35 × ± 1 mm, apex obtuse, base broad, clasping, margins strongly revolute; both sides with silvery, silky,

closely felted indumentum. **Heads** discoid, cylindric, 4–5 × 1.5 mm, many felted together in small, congested corymbose clusters, not felted, in a terminal, cymose-corymbose cluster. **Involucral bracts** in 2 or 3 series; subequal, loosely imbricate, outer brown, tips very acute; inner tipped bright yellow, ± equalling florets, translucent, not radiating, stereome divided. **Receptacle** epaleate, smooth. **Flowers**: disc florets only, 4–6; corolla narrowly funnel-shaped, yellow; Feb.–Apr., Jun., Jul. **Fruit** with cypsela (and ovary) glabrous. **Pappus** of ± 5 bristles, slender, tips shortly plumose, bases nude, not cohering. Mats in stony grassland or over rock sheets; colonises eroded areas.

| | | | MsGr | | |
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**nudifolium** (L.) Less. var. **nudifolium** (Group 23)

*Gnaphalium nudifolium* L.
*H. coriaceum* Harv.
*H. gerberifolium* A.Rich.
*H. leiopodium* DC.
*H. quinquenerve* (Thunb.) Less.

Perennial herb; flowering stems up to 1.5 m high, solitary or several, simple, leafy below, pedunculoid upwards, thinly woolly; from stout, woody rootstock; crown ± brown silky-woolly. **Leaves**: blade of basal leaves linear-obovate, narrowly elliptic to ovate, up to 600 × 130 mm, often much less, narrowed to petiole-like base, apex acute, mucronate, margins sometimes undulate; upper surface glabrous or thinly woolly, lower surface scabrid, cobwebby or thinly to thickly white-woolly, (3–)5(–7)-nerved; stem leaves similar, smaller, sessile, lower leaves sometimes decurrent. **Heads** discoid, narrowly campanulate, ± 4–6 × 2.5–3.0 mm, many in large, corymbose panicle. **Involucral bracts** in ± 6 series, closely imbricate, woolly at base, tips obtuse, pale brown or yellow; outer sometimes palest brown, equalling florets, not radiating, stereome divided. **Receptacle** epaleate, with fimbrils ± equalling ovaries. **Flowers**: disc florets only, 16–69; corolla campanulate above, yellow; Oct.–Mar. **Fruit** with cypsela glabrous. **Pappus** of many barbellate bristles, bases slightly fused and also cohering by patent cilia. Grassland. *Mohlomela-tsie-oa-thaba* (SS); *icholocholo* (X, Z); *isidwaba-somkhovu*, *umagada-emthini* (Z). Figure 10E, p. 7.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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**nudifolium** (L.) Less. var. **pilosellum** (L.f.) Beentje (Group 23)

*H. pilosellum* (L.f.) Less.

Similar to *H. nudifolium* var. *nudifolium* but **basal leaves** without petiole, upper surface with sparse long hairs or scabridulous. **Heads** 6–8 mm long, usually in dense globose clusters. **Involucral bracts** brown. **Flowering time**: Oct.–Jan. Grassland. *Boleba*, *boleba-ba-liliba*, *leboko*, *papetloane-e-kholo*, *tsebe-litelele* (SS); *isicwe* (X, Z); *umadotsheni*, *umaphephesa* (Z).

| VreDm | | DrGr | MsGr | | |
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**obtusum** (S.Moore) Moeser (Group 15)

Dwarf shrub, up to 150 mm high; main stem 5–50 mm long, bare, woody; branches intricate, spreading, forming a dense cushion up to 150 × 300 mm, white-silky or woolly felted, leafy. **Leaves**: blade oblong-obovate to suborbicular, 4–10 × 2–5 mm, narrowed below, ± clasping, apex subacute, recurved, margins undulate, both surfaces densely white-woolly felted. **Heads** disciform, rarely discoid, campanulate, 4 × 4 mm, solitary or few clustered terminally, closely surrounded by leaves. **Involucral bracts** in 3 or 4 series, subequal, loosely imbricate, ± equalling florets, not radiating, tips obtuse, often emarginate, golden-brown to buff-coloured or whitish, often red-purple above stereome; outer webbed to surrounding leaves, stereome

divided. **Receptacle** epaleate, nearly smooth. **Flowers**: female and/or only disc florets 12–42, 0–9 female; corolla of disc florets funnel-shaped, yellow; Oct. **Fruit** with cypsela? (and ovary) hairy or rarely glabrous. **Pappus** of many barbellate bristles, bases with patent cilia, not cohering. On sand, gravel, limestone among rocks on dry hills.

KarSh

## **odoratissimum** (L.) Sweet (Group 4)

*Gnaphalium odoratissimum* L.

Perennial herb, up to 1.5 m high; stems decumbent and erect, glandular, thinly greyish white-woolly, leafy, becoming pedunculoid upwards. **Leaves**: blade linear-oblong, lingulate or narrowly obovate, broadest above middle, 5–60 × 1.5–15.0 mm, apex obtuse, sometimes acute, mucronate, base clasping, decurrent in narrow or broad stem wings; upper surface glandular and setose-scabrid, glabrescent or greyish white-woolly on both surfaces, aromatic. **Heads** disciform, ± 2.5–3.0 mm long, many matted together with wool at base, in dense or loose, flattened or rounded, terminal, cymose clusters. **Involucral bracts** closely imbricate, innermost ± equalling florets, not radiating, outer pale brown, inner bright or pale canary-yellow, stereome divided. **Receptacle** epaleate, with fimbrils ± equalling ovaries. **Flowers**: female and disc florets (3–)7–15, 1–4 female; corolla of disc florets campanulate above, yellow; Jan.–Mar., Jun. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia. On grassy or rocky slopes, colonising bare areas e.g. roadsides. *Phefo-ea-setlolo*, *tooane* (SS); *impepho* (X, Z).

DrGr MsGr

## **opacum** Klatt (Group 24)

Perennial herb; flowering stem up to 400 mm high, nearly always solitary, thinly greyish white-felted, remotely leafy; crown loosely brown-woolly. **Leaves** mostly basal with blade narrowly elliptic or narrowly ovate, 150 × 12 mm, narrowed to broad, clasping base, markedly discolorous, green often drying black, lower surface white-felted, striate from many raised veins; stem leaves few, distant, smaller. **Heads** discoid, campanulate, ± 5 × 10 mm, many in a corymbose panicle. **Involucral bracts** in ± 8 series, inner subequal, loosely imbricate, much exceeding florets, snow-white, apex very acute, radiating, stereome divided. **Receptacle** epaleate, with fimbrils much exceeding ovaries. **Flowers**: disc florets only, 23–28; corolla narrowly funnel-shaped, yellow; Dec.–Feb. **Fruit** with cypsela glabrous. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia. On grassy mountainsides.

MsGr

## **oreophilum** Klatt (Group 21)

Perennial herb; flowering stems up to 300 mm high, erect, simple, thinly grey silky-woolly, leafy. **Leaves**: blade narrowly obovate to narrowly elliptic, 80 × 15 mm, smaller upwards, apex acute, base half-clasping, both surfaces grey silky-woolly. **Heads** discoid, turbinate-campanulate, ± 7 mm long, several to many in compact, corymbose panicle. **Involucral bracts** in ± 5 series, subequal, loosely imbricate, cobwebby at base, tips acute, slightly exceeding florets, not radiating, lemon-yellow, stereome divided. **Receptacle** epaleate, honeycombed. **Flowers**: disc florets only, 9–12; corolla narrowly campanulate above, yellow; Oct.–Feb. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia, some light fusion as well. Grassland and invading overgrazed and eroded areas.

MsGr

**pallidum** DC. (Group 23)

*H. undatum* (J.F.Gmel.) Less. var. *agrostophilum* (Klatt) Moeser

*H. undatum* (J.F.Gmel.) Less. var. *pallidum* (DC.) Harv.

Perennial herb; flowering stem up to 0.65 m high, usually solitary, leafy in lower half, becoming pedunculoid upwards, thinly woolly; crown not woolly. **Leaves**: blade of basal leaves broadly to narrowly elliptic, up to 400 × 120 mm, contracted to long, flat petiole-like base, expanded and clasping, apex acute to acuminate, margins often undulate, upper surface harshly pubescent, lower surface thinly greyish white-felted, 5–7-nerved, tertiary veins scalariform; stem leaves similar, sessile, cordate-clasping. **Heads** discoid, campanulate, ± 6–7 × 6–7 mm, many in compact, flat-topped corymb. **Involucral bracts** in ± 4 series, subequal, closely imbricate, equalling florets, backs woolly, tips ovate, subobtuse, creamy to pale yellow, sometimes washed palest brown, scarcely radiating, stereome divided. **Receptacle** epaleate, with fimbrils ± equalling ovaries. **Flowers**: disc florets only, 18–34; corolla campanulate above, white to pale yellow; Nov.–Jan. **Fruit** with cypsela? (and ovary) glabrous. **Pappus** of many barbellate bristles, bases lightly fused. Grassland. *Boleba*, *bolebatsi*, *papetloane-ea-thaba* (SS).

MsGr

**paronychioides** DC. (Group 15)

Subshrub, mat-forming, procumbent, stems up to 300 mm long, closely felted, densely leafy; flowering stems very short, up to 5 mm high. **Leaves** imbricate, blade linear, 3–8 × 0.50(–1.75) mm, apex acute, base broad, half-clasping, margins revolute, both surfaces silky grey-hairy, glandular. **Heads** disciform, campanulate, ± 6 × 4 mm, sessile, solitary at tips of short, erect branchlets, these racemosely arranged. **Involucral bracts** in ± 6 series, graded, loosely imbricate, inner exceeding florets, radiating, glossy, outer white, inner rose-red, tips white, subacute, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: female and disc florets 19–31, 3–10 female; corolla of disc florets funnel-shaped, yellow, tipped pink; Aug.–Nov. **Fruit** with cypsela? (and ovary) hairy. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia. Dry sandy open places. *Poprosie* (A).

VreDm AcGr DrGr

**pedunculatum** Hilliard & B.L.Burtt (Group 23)

Perennial herb, up to 0.5 m high; rootstock woody, silky-brown wool in axils of leaf bases; stem solitary, simple, erect, white-woolly, leafy below, bracteate upwards. **Leaves** mostly basal with blade elliptic, up to 130 × 40 mm, apex acute, tapering to petiole-like base, broad, flat, clasping, upper surface glabrous, lower surface with a white silky-woolly, felted indumentum; stem leaves similar but soon sessile, bracteate. **Heads** discoid, campanulate, ± 7.5 × 7 mm, many in compact or loose, terminal, corymbose panicle. **Involucral bracts** in ± 5 series, graded, inner ± equalling florets, loosely imbricate, oblong, woolly below, tips subacute, reddish brown, crisped, not radiating, stereome divided. **Receptacle** epaleate, with fimbrils exceeding ovaries. **Flowers**: disc florets only, 30–65; corolla campanulate above, whitish; Jan., Feb. **Fruit** with cypsela? (and ovary) glabrous. **Pappus** of many barbellate bristles, bases lightly fused. Grassland.

DrGr Zastr

**pentzioides** Less. (Group 11)

Shrub, up to 1 m high; aromatic, branches short, stiff, old branches bare, rough, twigs thinly grey silky-felted, closely leafy. **Leaves** erect to spreading; blade spathulate or obovate, mostly 3–10 × 2–4 mm, smaller upwards, thick, apex mucronate, recurved, narrowed to base, margins flat, both sides grey silky-felted, glandular-punctate; minutely petiolate. **Heads** discoid,

turbinate-cylindric, ± 5 × 3 mm, few in terminal, corymbose clusters. **Involucral bracts** in 4 series, graded, imbricate, inner equalling florets, oblong, white-woolly and glandular-punctate, tips rounded, glabrous, straw-coloured or golden-brown, not radiating, stereome divided. **Receptacle** epaleate, smooth or very shortly toothed. **Flowers**: disc florets only, 8–15; corolla broadly campanulate above, yellow; Nov.–May. **Fruit** with cypsela? (and ovary) hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Karroid and other dry scrub. *Kerriebos* (A).




## **platypterum** DC. (Group 20)

*Cassinia alba* O.Hoffm.
*Gnaphalium amplum* Kuntze

Perennial herb, up to 1 m high; stems solitary or several together, erect, simple, thinly white-cottony, leafy below, bracteate above. **Leaves**: blade broadly elliptic to narrowly obovate, 250 × 80 mm, apex acute, contracted to broadly winged base, clasping, decurrent in long stem wings, upper surface thinly and harshly pubescent, lower surface more markedly so, particularly on nerves, 3- or 5-nerved; stem leaves smaller. **Heads** discoid, campanulate, ± 5 × 5 mm, many in large corymbose panicle. **Involucral bracts** in ± 5 or 6 series, graded, closely imbricate, base woolly, inner ± equalling florets, tips obtuse, silvery (creamy) white, sometimes tinged palest brown, not radiating, stereome divided. **Receptacle** paleate, fimbrilliferous. **Flowers**: disc florets only, 33–55; corolla narrowly campanulate above, yellow; Feb., Mar. **Fruit** with cypsela? (and ovary) hairy. **Pappus** of several barbellate bristles, bases cohering lightly by patent cilia, some light fusion as well, or bases nude, free. Forest margins or damp grassy mountainsides.




## **praecurrens** Hilliard (Group 26)

Perennial herb, up to 20 mm high; densely tufted, mat-forming; main stems diffuse, procumbent, nude, rooting, producing many, erect, closely leafy branchlets. **Leaves** closely imbricate, appearing rosulate from above; blade linear to very narrowly obovate, up to ± 7 × 2 mm, with a smooth sericeous indumentum that strips off in a sheet, green with a silvery sheen, drying silvery-grey. **Heads** discoid or rarely disciform, campanulate, ± 10 × ± 18 mm, sessile, solitary at tips of branches. **Involucral bracts** in ± 7 series, graded, closely imbricate; outer pellucid, palest brown; inner much exceeding florets, white, commonly tinged or tipped rose-pink, opaque, radiating, stereome divided. **Receptacle** epaleate, smooth. **Flowers**: female and/or only disc florets 18–24, rarely 1–4 female; corolla of disc florets narrowly funnel-shaped, yellowish?; Sep.–Nov. **Fruit** with cypsela glabrous or with few hairs. **Pappus** of many barbellate bristles, bases fused in smooth ring. Colonising bare or sparsely grassed areas, alt > 3 000 m.




## **psilolepis** Harv. (Group 22)

Perennial herb, up to 400 mm high; tufted, stems many, erect or ascending, simple or branched from base, greyish white-woolly, closely leafy. **Leaves**: blade linear or linear-oblong, up to 30 × 4 mm, apex acute, mucronate, base broad, half-clasping; both surfaces greyish white-woolly. **Heads** disciform, campanulate, ± 5 × 5 mm, many in congested, terminal, rounded, corymbose clusters. **Involucral bracts** in ± 7 series, 4 inner subequal, loosely imbricate, tips slightly exceeding florets, obtuse, crisped, yellow, slightly radiating; outer tipped pale golden-brown, bases woolly, stereome divided. **Receptacle** epaleate, minutely tuberculate. **Flowers**: female and disc florets 112–156, 54–81 female; corolla of disc florets narrowly campanulate

above, yellow; Sep.–Mar. **Fruit** with cypsela? (and ovary) hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Grassland.

DrGr MsGr

**pumilio** (O.Hoffm.) Hilliard & B.L.Burtt subsp. **pumilio** (Group 15)

*H. bolusianum* Moeser

*H. laneum* S.Moore

Dwarf shrub, up to 200 mm high; usually closely branched, rounded, sometimes lax and open, taproot thick, woody, main stem gnarled, short, branches erect or spreading, grey-woolly, densely leafy. **Leaves**: blade linear-spathulate, 4–20 × 1–4 mm, apex subacute, apiculate, base narrowed, petiole-like, shortly decurrent, margins subrevolute; both sides glandular-pubescent, glandular hairs hidden by grey wool. **Heads** disciform, campanulate, 5–6 × 3–7 mm, sessile, solitary, terminal, overtopped by new growth or in small, terminal, corymbose clusters. **Involucral bracts** in 5 series, graded, loosely imbricate, inner ± equalling florets; outer webbed to surrounding leaves, often flushed red on backs, tips golden-brown to pale buff-coloured or whitish, acute to acuminate, somewhat squarrose, stereome divided. **Receptacle** epaleate, nearly smooth. **Flowers**: female and disc florets 30–96, 6–51 female; corolla of disc florets funnel-shaped, yellow, sometimes tipped pink; Sep.–Mar. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases ± cohering by patent cilia. Arid areas, gravelly, rocky places; palatable to stock. *Wolbossie*, *sewejaartjie* (A).

DrGr KarSh

**rosum** (P.J.Bergius) Less. var. **arcuatum** Hilliard (Group 9)

Dwarf shrub; stems decumbent, radiating, often arcuate and producing short, simple erect flowering stems, up to 50 mm high; young stems thinly white-felted, closely leafy, some leaves with dwarf axillary shoots. **Leaves**: blade linear to oblong-obovate, 8–25 × 1–5 mm, apex ± acute, base shortly decurrent, margins ± revolute, often undulate-dentate, upper surface glabrous to thinly cobwebby felted, often wrinkled, lower surface white-felted, hairs often stringy. **Heads** disciform, oblong-campanulate, ± 4 × 3 mm, few to many in compact, terminal, corymbose panicles. **Involucral bracts** in 5 or 6 series, graded, inner ± equalling florets, imbricate, tips blunt, often opaque or semi-opaque, smooth or rarely slightly crisped, white or whitish, mostly or all pellucid, not radiating, stereome divided. **Receptacle** epaleate, honeycombed. **Flowers**: female and disc florets 15–28, 4–11 female; corolla of disc florets campanulate above, yellow; Sep.–Jan. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Stony places, karroid scrub or along roadsides. *Bergankerkaroo* (A).

AcGr KarSh

**rugulosum** Less. (Group 9)

Perennial herb, up to 300 mm high; stems from creeping rootstock, tufted, simple or branching near base, thinly white-felted, closely leafy. **Leaves**: blade of lower leaves oblong-obovate, acute, upper leaves narrowly obovate, acuminate, 15–25 × 2–5 mm, margins subrevolute, upper surface thinly cobwebby-felted, rugose, lower surface white-felted. **Heads** disciform, campanulate, 3–5 × 4 mm, few to many in compact corymbose panicles. **Involucral bracts** in ± 4 or 5 series, graded, inner ± equalling florets, loosely imbricate, tips crisped-dentate; creamy, often purplish or pink initially, minutely radiating, stereome divided. **Receptacle** epaleate, with fimbrils exceeding ovaries. **Flowers**: female and disc florets 17–42, 8–19 female; corolla of disc florets campanulate above, creamy yellow; Nov.–Apr. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Poor

sandy or stony grassland, readily invading overgrazed areas and roadsides. *Motlosa-ngoaka*, *motoantoanyane*, *pulumo-tšeou* (SS).

VreDm | | DrGr | MsGr | KarSh | Zastr

**rutilans** (L.) D.Don (Group 2)

Dwarf shrub, up to 0.6 m high and in diameter; lax or dense, twiggy, covered with silver-grey indumentum with tissue paper-like surface, woolly when old, ± viscid, branches very leafy. **Leaves** very variable; blade linear, oblong, narrowly obovate to spathulate, 6–30 × 1–6 mm, often folded lengthwise, apex subacute, mucronate, often recurved, base shortly decurrent, indumentum as for stems. **Heads** disciform, rarely discoid, cylindric, ± 3–4 × 1.5–2.5 mm, many in clusters crowded in terminal, corymbose panicles. **Involucral bracts** in 4 series, graded, inner equalling florets, imbricate, ovate, acute, pellucid, glossy, lemon-yellow, not radiating, stereome divided. **Receptacle** epaleate, smooth. **Flowers**: female and/or only disc florets 3–8, 0–2 female; corolla of disc florets narrowly campanulate above, bright yellow; Oct., Nov., Feb., Mar. **Fruit** with cypsela glabrous. **Pappus** of 2–4 barbellate bristles, or absent. Among shrubs and dwarf shrubs on poor sandy, shaly or stony soils. *Sandsewejaartjie* (A).

| | | DrGr | | KarSh | Zastr

**sessile** DC. (Group 17)

*H. laevigatum* Markötter

Dwarf shrub, 40–100 mm high; very compact, cushion-forming; old stems gnarled, branches densely tufted. **Leaves**: upper leaves closely imbricate, appearing rosetted; blade narrowly elliptic or oblong, 5–40 × 1–4 mm, apex subacute to obtuse, both sides with thick, white indumentum, surface silky-smooth, drying like crumpled tissue paper, becoming felty. **Heads** discoid, campanulate, 5–7 × 8–12 mm, solitary or 2–12 on leafy peduncles, terminal. **Involucral bracts** in 4–6 series, loosely imbricate, base woolly, sometimes crimson on backs, tips opaque milk-white, acute, radiating, stereome divided. **Receptacle** epaleate, scarcely honeycombed. **Flowers**: disc florets only, 20–38; corolla narrowly campanulate above, yellow; Dec., Jan. **Fruit** with cypsela hairy. **Pappus** of many scabrid bristles, bases cohering by patent cilia. Montane; among rocks.

| | | | MsGr | | |

**sessilioides** Hilliard (Group 27)

Dwarf shrub, up to 100 mm high; cushion-forming, compact, branches densely tufted, leafy. **Leaves** closely imbricate, rosulate when viewed from above; blade linear to narrowly obovate, 4–15 × 1–5 mm, upper surface with silky, tissue paper-like indumentum, green with silvery sheen, drying silver-grey, lower surface white-felted. **Heads** discoid, campanulate, 10–15 × ± 25 mm, sessile, solitary at branch tips. **Involucral bracts** in 8–12 series, graded, closely imbricate, much exceeding florets; outer pale brown, rose-coloured or crimson; inner white or tinged rose, opaque, radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: disc florets only, 37–118; corolla campanulate above, yellow; Oct. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases cohering lightly by patent cilia. Montane, among dolerite or basalt rocks.

| | | | MsGr | | |

**setosum** Harv. (Group 30)

Perennial herb or dwarf shrub, up to 1 m high; stems woody, branched from base, glandular-setose, upper parts sometimes white-cobwebby, closely leafy. **Leaves**: blade oblong-ovate,

becoming elliptic-ovate to narrowly ovate on inflorescence branches, 20–50 × 10–20 mm, smaller upwards, apex obtuse to acute, mucronate, base broad, ± cordate clasping; both surfaces and margins glandular-setose, margins and midline above sometimes woolly. **Heads** disciform, 10–12(–14) × ± 25 mm, depressed-globose, solitary at tips of long, leafy branchlets, corymbosely arranged. **Involucral bracts** in ± 9 series, graded, imbricate, inner much exceeding florets, glossy, yellow, often overlaid pale brown outside; radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed or nearly smooth. **Flowers**: female and disc florets 480–1 100, 65–160 female; corolla of disc florets cylindric, yellow; Jan.–Apr. **Fruit** with cypsela glabrous. **Pappus** of many barbellate bristles, base with patent cilia, cohering or not. Mountain grassland. *Yellow everlasting*; *geelsewejaartjie* (A); *bohloko*, *phefo-ea-thaba*, *toane-balingoana* (SS).

VreDm | | | MsGr | | |

**spiralepis** Hilliard & B.L.Burtt (Group 14)

*H. involucratum* Klatt

*Leontonyx squarrosus* (L.) DC.

*L. tomentosus* Cass.

Perennial herb, up to 300 mm high; erect or decumbent and then erect, simple or branched from near base, grey-woolly, leafy. **Leaves** in a basal rosette with blade oblong-spathulate to linear-oblong, 70 × 15 mm; stem leaves smaller; grey-woolly. **Heads** disciform or rarely discoid, ± 5 × 3 mm, narrowly campanulate, congested in small, terminal glomerules, surrounded by leafy bracts, glomerules in corymbose panicles. **Involucral bracts** in 4 series, 2 outer shorter, webbed to subtending leaves with wool; 2 inner longer, equalling or slightly exceeding florets, nearly glabrous, tips apiculate to acuminate-squarrose; whitish, creamy, pink or red-purple, stereome divided. **Receptacle** epaleate, nearly smooth. **Flowers**: female and/or only disc florets 12–36, 0–8 female; corolla of disc florets funnel-shaped, creamy; Nov.–Apr. **Fruit** with cypsela hairy or glabrous. **Pappus** of several, minutely barbellate bristles, bases cohering lightly by patent cilia. Grassland. *Mosuoane-oa-metsi*, *toane-ea-metsi* (SS).

| | | | MsGr | | |

**splendidum** (Thunb.) Less. (Group 22)

*Gnaphalium splendidum* Thunb.

*H. strictum* (Lam.) Druce

Shrub, up to 1.5 m high; virgate, rarely sprawling; branches thinly grey-woolly, closely leafy. **Leaves**: blade linear, linear-oblong or linear-obovate, 10–30(–40) × 1–2(–6) mm, apex acute or subacute, mucronate, base broad, half-clasping, margins revolute; upper surface thickly or thinly greyish white-woolly or glabrous, lower surface greyish white-woolly. **Heads** disciform, hemispherical, 4–5 × 5–8 mm, many in congested or open, corymbose panicles, terminal. **Involucral bracts** in ± 5 series, graded, loosely imbricate, inner ± equalling or slightly exceeding florets, bright canary-yellow, rarely orange, glossy, tips minutely radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: female and disc florets 47–105, 8–14 female; corolla of disc florets narrowly campanulate above, yellow; Oct.–Jan. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Rocky places, on forest margins, in stream gullies and on mountain tops. *Cape gold*; *geelsewejaartjie* (A); *phefo-ea-loti*, *toane-moru* (SS).

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**subglomeratum** Less. (Group 6)

*H. subglomeratum* Less. var. *lingulatum* Harv.

Perennial herb; flowering stems 0.08–0.60 m high, several, lateral to rosettes, [tufted,] often decumbent at base or ascending, mostly simple, densely leafy. **Leaves**: blade of basal leaves

lingulate, oblong or elliptic, 120 × 15 mm, apex obtuse or subacute, base broad, clasping, both surfaces with very close silvery silky-felted hairs; blade of stem leaves similar but smaller. **Heads** discoid, narrowly cylindric, 2.5–3.5 × 1.5–2.0 mm, many in small, corymbose clusters, congested in flattened, spreading, cymose corymb, the whole matted together below with closely interwoven wool. **Involucral bracts** in 3 or 4 series, subequal, loosely imbricate, outer brown or straw-coloured, inner tipped bright canary-yellow, ± equalling florets, not radiating, stereome divided. **Receptacle** epaleate, shortly honeycombed. **Flowers**: disc florets only, 4–13; corolla narrowly funnel-shaped, yellow; Mar.–Jun. **Fruit** with cypsela glabrous. **Pappus** of few delicate bristles with shortly plumose tips, bases nude, not cohering. Scattered in stony grassland or forming small mats over rock sheets. *Kerriekruie* (A); *thethebijane*, *thethebilone* (SS).

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## **sutherlandii** Harv. (Group 17)

Shrub, up to 400 mm high; well branched, lax to compact, closely leafy; flowering stems distantly leafy. **Leaves**: blade rhomboid or elliptic, up to 25 × 12 mm, abruptly narrowed to a flat, petiole-like, clasping base, apex ± acute; upper surface thinly grey-woolly, lightly cobwebbed or sometimes glabrous, lower surface white-felted, triplinerved, nerves prominent below. **Heads** discoid, narrowly campanulate, 4–5 × 5–7 mm, in few- to many-headed, corymbose panicles. **Involucral bracts** in ± 6 series, graded, imbricate; outer pale brownish, webbed together with wool; inner much exceeding florets, tips milk-white, opaque, radiating, stereome divided. **Receptacle** epaleate, honeycombed. **Flowers**: disc florets only, 9–25; corolla narrowly campanulate, yellow; Jan.–Apr. **Fruit** with cypsela hairy. **Pappus** of many, scabrid bristles, bases not cohering. Cracks in cliff faces or rock outcrops, rarely on steep rocky slopes. A high elevation form is compact with small leaves and very short flowering twigs. *Molepelle*, *ntlo-ea-mokhoabane*, *senkotoana* (SS).

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## **trilineatum** DC. (Group 22)

Shrub, up to 1 m high; rounded, old branches bare, rough with leaf scars, young branchlets greyish white-woolly, closely leafy. **Leaves**: blade linear or oblong, 3–25 × 1–5 mm, apex mucronate, acute, subacute or obtuse, tip recurved, base ± clasping, margins revolute; upper surface minutely gland-dotted, glabrous to greyish white-woolly, lower surface white-woolly, ribbed by parallel veins. **Heads** mostly disciform, rarely discoid, campanulate, 4–6 × 4–8 mm, many in compact, corymbose clusters. **Involucral bracts** in 5 series, graded; outer pale golden-brown, closely imbricate; inner ± equalling florets, tips obtuse, bright yellow, more loosely imbricate; minutely radiating, stereome divided. **Receptacle** epaleate, honeycombed. **Flowers**: mostly female and disc florets 25–60, rarely only disc florets, 0–13 female; corolla of disc florets narrowly campanulate above, yellow; mainly Aug.–Apr. **Fruit** with cypsela hairy. **Pappus** of many barbellate bristles, bases cohering by patent cilia. Montane, rocky outcrops and gullies, steep slopes, grassy or shrubby plateaux. *Hukobetsi*, *phefshoana-ea-loti* (SS); *impepho* (X).

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## **umbraculigerum** Less. (Group 5)

*H. coactum* M.D.Hend.

Perennial herb, up to 1 m high; stems often decumbent and rooting, then erect, young parts thinly grey-woolly, leafy, nude only near flower heads. **Leaves**: blade variable in shape, narrowly obovate, elliptic, ovate or rhomboid-ovate, 20–80 × 3–25 mm, smaller upwards passing into bracts, apex acute or subacute, base attenuate, cuneate or abruptly petiole-like narrowed, ear-

clasping; upper surface cobwebby or thinly to thickly greyish white-woolly and glandular-hairy, lower surface thickly greyish white-woolly, wool sometimes absent. **Heads** discoid, cylindric, ± 3 × 1 mm, many crowded and webbed together with white wool to form flattened umbrella-like disc. **Involucral bracts** in 2 series, subequal, loosely imbricate, ± equalling florets, not radiating, canary-yellow; outer often golden-brown, stereome divided. **Receptacle** epaleate, nearly smooth. **Flowers**: disc florets only, 3–6; corolla narrowly campanulate above, yellow; Jan.–Mar. **Fruit** with cypsela hairy. **Pappus** absent or of few barbellate bristles, bases not cohering. Rough grassland or scrub, often on forest margins or in damp gullies and along streams. *Kerriekruie* (A).

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### **zeyheri** Less. (Group 1)

Shrub, up to 1 m high; branches virgate, greyish white-woolly, leafy. **Leaves**: blade linear-oblong, oblong or obovate, 6–23 × 2–9 mm, decreasing upwards, apex obtuse to acute, mucronate, bases broad and subcordate-clasping, petiole-like in larger obovate leaves, margins undulate or crisped; both surfaces closely greyish white-woolly. **Heads** discoid, cylindric, 4–5 × 2 mm, many in terminal, compact, corymbose panicles. **Involucral bracts** in 4 or 5 series, graded, inner ± equalling florets, imbricate, not radiating, oblong, ± distinctly keeled, tips blunt or subacute, often ± truncate and emarginate, opaque white or inner sometimes rosy, stereome divided. **Receptacle** epaleate, with fimbrils nearly equalling ovaries. **Flowers**: disc florets only, 5; corolla cylindric, yellowish; Nov.–Mar. **Fruit** with cypsela glabrous. **Pappus** of many barbellate bristles, bases cohering strongly by patent cilia. Sandy and stony soils. *Vaalbergkaroo* (A).

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## **Hertia** Less. (sthn Afr.: 5 spp.)

(Senecioneae)

### Key to species:

[after Herman: 192 (1998)]

Flower heads radiate. . . . . .**H. pallens**
Flower heads disciform. . . . . .**H. ciliata**

### **ciliata** (Harv.) Kuntze

Dwarf shrub, up to 0.6 m high; succulent, ± glabrous, stems ± angular. **Branches** with grey-brown bark. **Leaves** alternate, sessile; blade cuneate-oblong, up to 40 × 5–10 mm, apex shallowly 3–5-dentate, rest of the margins entire, sparsely pectinate-ciliate, leathery, glabrous, faintly 3-nerved. **Heads** disciform, solitary, up to 10 mm in diameter; peduncle short, terminal or opposite leaves. **Involucral bracts** 4 or 5, up to 15 mm long, broadly oblong, acute, connate at base, edges membranous, ecalyculate. **Flowers**: outer female florets filiform, small (± 1.5 mm long), fertile; disc florets functionally male; yellow; Feb.–Nov. **Fruit** with marginal cypsela glabrous or weakly hairy. **Pappus** of many barbellate bristles. Grassland on limestone. *Skilpadbossie* (A).

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**pallens** (DC.) Kuntze

Shrub, up to 1 m high; erect, succulent, glabrous. **Branches** with light, papery bark. **Leaves** alternate, sessile, with decurrent line from each side of base; blade coriaceous, linear-oblong, up to 25 × 1.5–3.0(–6.0) mm, apex subobtuse, margins entire or with few minute teeth. **Heads** radiate, terminal, solitary; peduncle 6–12 mm long. **Involucral bracts** 5, 8–10 mm long, oblong, acute, connate at base, edges membranous, ecalyculate. **Flowers**: ray florets 5, ± 10 mm long, inconspicuous, fertile; disc florets functionally male; yellow; Aug.–Nov. **Fruit** with marginal cypsela silky-villous. **Pappus** of many barbellate bristles. Calcareous soil, on hillsides, rocky ridges, dry riverbeds, flats, along roadsides. Can become weedy. *Springbok bush*; *springbokbossie*, *harpuisbos*, *vleibos* (A).

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## **Heteromma** Benth. (sthn Afr.: 3 spp.)

(Astereae)

### Key to species:

[after Hilliard: 100 (1977)]

1a Apices of at least outer involucral bracts very obtuse or truncate; flower heads turbinate . . . . . **H. krookii**
1a Apices of at least outer involucral bracts acute or subacute; flower heads broadly campanulate . . . . . 2
2a Leaves lyrate or pinnatisect, uppermost ones passing into inflorescence bracts . . . . . **H. decurrens**
2b Leaves simple. . . . . **H. simplicifolium**

**decurrens** (DC.) O.Hoffm.
*Chrysocoma decurrens* DC.
*Senecio evansii* N.E.Br.

Perennial herb, up to 2.5 m high. **Stems** stout, erect, sparsely branched; rough-hairy. **Leaves** alternate; blade narrowly obovate in outline, 200 × 70 mm, lyrate or pinnatisect, passing upwards into simple or dissected inflorescence bracts, lobes obovate-oblong, margins coarsely and irregularly dentate, narrowed to a winged, petiole-like base, decurrent on stem in broad wing. **Heads** discoid, broadly campanulate, up to 8 × 8 mm, many, corymbosely arranged in large branching panicles. **Involucral bracts** 2- or 3-seriate, linear to narrowly ovate-elliptic, equalling disc florets, gland-dotted, midline pilose, with immersed oil sacs; outer with apices acute or subacute, margins membranous. **Flowers**: disc florets only, bright yellow; Jan., Feb. **Fruit** with cypsela elliptic to obovate, slightly compressed, usually 3-ribbed, pubescent, 3 mm long. **Pappus** biseriate, of caducous, barbellate bristles. Forest margins, along mountain streams and gullies. *Lesitsi*, *moqhoboqhobo-o-moholo* (SS).

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**krookii** (O.Hoffm. & Muschl.) Hilliard & B.L.Burtt
*Pentheriella krookii* O.Hoffm. & Muschl.

Perennial herb or subshrub, up to 1(–2) m high. **Stems** stout, simple and nude below, well branched above, young stems softly pilose. **Leaves** alternate, crowded at stem tips; blade narrowly elliptic to narrowly ovate, 130 × 30 mm, tapering to a petiole-like, half-clasping base, uppermost leaves sessile, passing into inflorescence bracts, thinly hairy, margins entire or serrulate. **Heads** discoid, turbinate, ± 6 mm in diameter, in congested clusters, corymbose-paniculately arranged at ends of

branches. **Involucral bracts** biseriate; outer oblong, obtuse to truncate; inner linear, pilose, viscid, midline with immersed oil sacs. **Flowers**: disc florets only, bright yellow; Oct.–Dec., Mar. **Fruit** with cypsela elliptic to obovate, slightly compressed, usually 3-ribbed, pubescent, 3 mm long. **Pappus** biseriate, of caducous, barbellate bristles. Drainage lines on steep mountain slopes, rocky stream gullies, steep stony margins of forest patches and scrub.

MsGr

**simplicifolium** J.M.Wood & M.S.Evans

Perennial herb, up to 1 m high; rosulate. **Stems** simple below, with spreading white hairs. **Leaves** simple, basal and along stem, alternate; blade of basal leaves oblong, up to 200 × 40 mm, apex blunt, base somewhat cordate or rounded, margins subentire or irregularly crenulate-serrulate, petiole up to 150 mm long, base expanded, semi-amplexicaul; upper leaves smaller, sometimes dissected, shortly decurrent, uppermost leaves and inflorescence bracts sessile; all leaves with spreading white hairs. **Heads** discoid, broadly campanulate or subrotund, ± 10 mm in diameter, in very open, compound inflorescence. **Involucral bracts** linear to elliptic, apices acute, equalling disc florets, gland-dotted, pilose, midline with embedded oil sacs, margins membranous. **Flowers**: disc florets only, bright yellow; Jan., Feb. **Fruit** with cypsela elliptic to obovate, slightly compressed cypsela, usually 3-ribbed, pubescent, 2.5 mm long. **Pappus** biseriate, of caducous, barbellate bristles. Damp grassy hollows on mountain slopes and grassy terraces along mountain streams.

MsGr

## **Hilliardiella** H.Rob. (sthn Afr.: 5 spp.)

(Vernonieae)

### Key to species:

[after Hilliard: 27 (1977), extracted from *Vernonia*]

1a Lower leaf surface greyish white woolly felted, leaf base cordate . . . **H. hirsuta**
1b Lower leaf surfaces silky silvery, leaf base cuneate or rounded . . . . . 2
2a Leaves usually ± twice as long as wide . . . . . **H. oligocephala**
2b Leaves much longer than wide . . . . . 3
3a Involucral bracts oblong-elliptic, ± abruptly contracted to mucronate apex, rarely acute, never long acuminate; leaves linear, up to 4 mm wide, upper surface thinly hairy or glabrous, lower surface silky silvery hairy, discolorous . . . . . **H. pinifolia**
3b Involucral bracts generally narrowly ovate, apex attenuate to a long-acuminate bristle tip or acute and bristle-tipped; leaves linear, narrowly elliptic to elliptic or narrowly obovate, up to 20 mm wide, silky silvery on both surfaces, concolorous . . . . . **H. aristata**

**aristata** (DC.) H.Rob.
*Vernonia aristata* (DC.) Sch.Bip.
*V. natalensis* Sch.Bip. ex Walp.
*Webbia aristata* DC.

Perennial herb, up to 1 m high. **Leaves** alternate; blade linear, narrowly elliptic to elliptic or narrowly obovate, up to 60 × 20 mm, apex acute or obtuse, mucronate, base cuneate, margins entire, silky silvery on both surfaces, concolorous; petiole 1–2 mm long. **Heads** discoid, few to many in terminal, corymbose panicles. **Involucral bracts** generally narrowly ovate, apex attenuate to a long-acuminate bristle tip or acute and bristle-tipped. **Flowers**: disc florets only,

violet; Nov.–Apr. **Fruit** with cypsela turbinate to subcylindric, densely hairy. **Pappus**: outer of short, linear scales; inner of barbellate bristles. Grassland. *Silver vernonia*; *ileleva*, *isibhaha sasenkangala*, *umlahlankosi-omhlophe* (Z).

MsGr

**hirsuta** (DC.) H.Rob.

*Vernonia hirsuta* (DC.) Sch.Bip. ex Walp.
*V. hirsuta* (DC.) Sch.Bip. ex Walp. var. *obtusifolia* Harv.
*Webbia hirsuta* DC.

Perennial herb, up to 1 m high. **Leaves** alternate, sessile; blade ovate, narrowly ovate or oblong, up to 80 × 50 mm, apex obtuse, acute or acuminate, base cordate to subcordate, margins entire, crenate or serrate, upper surface rough-hairy, lower surface greyish white woolly felted, discolorous. **Heads** discoid, many in terminal corymbose panicles. **Involucral bracts** in several series, outer linear or subulate, inner oblong-elliptic, apex mucronate. **Flowers**: disc florets only, violet, occasionally pinkish or white; Nov.–Jan. **Fruit** with cypsela terete, obscurely ± 4-ribbed, densely long-sericeous. **Pappus**: outer of short, linear scales; inner of barbellate bristles. On mountains, in grassland and in scrub on forest margins. *Lowveld bitter tea*; *laeveldbittertee* (A); *hlele-hlele*, *phefo-e-kholo*, *sechee* (SS); *ijungitheka*, *ikhambi lenyongo*, *uhlunguhlungwana lwentaba*, *umhlazawentaba* (Z).

MsGr

**oligocephala** (DC.) H.Rob.

*Vernonia kraussii* Sch.Bip. ex Walp.
*V. oligocephala* (DC.) Sch.Bip. ex Walp.
*Webbia oligocephala* DC.

Perennial herb, up to 1 m high. **Leaves** alternate; blade elliptic, ovate or subrotund, up to 40 × 25 mm, apex obtuse, acute or acuminate, base rounded, margins entire, often undulate towards apex, thinly hairy to glabrous above, silky silvery below, markedly discolorous; petiole 1–4 mm long. **Heads** discoid, few to many in corymbose panicles. **Involucral bracts** in a few series, oblong to linear, abruptly contracted to mucronate tip or apex attenuate. **Flowers**: disc florets only, violet; Oct.–Feb. **Fruit** with cypsela subcylindric, densely hairy. **Pappus**: outer of short, linear scales; inner of barbellate bristles. Grassland on mountainsides, rocky outcrops or on streambanks. *Bitterbossie*, *groenamarabossie*, *maagbossie* (A); *mofefa-bana* (SS); *ihlambihloshane*, *uhlungu-hloshana* (Z).

VreDm DrGr MsGr

**pinifolia** (Lam.) H.Rob.

*Conyza pinifolia* Lam.
*Vernonia capensis* (Houtt.) Druce
*V. pinifolia* (Lam.) Less.

Perennial herb, up to 1 m high. **Leaves** alternate, sessile; blade linear, up to 70 × 4 mm, apex acute, mucronate, base cuneate, margins entire, generally revolute, upper surface thinly hairy or glabrous, lower surface silky silvery hairy, discolorous. **Heads** discoid, few to many in corymbose panicles. **Involucral bracts** in a few series, oblong-elliptic, ± abruptly contracted to mucronate apex, rarely acute. **Flowers**: disc florets only, violet; Dec., Jan. **Fruit** with cypsela subcylindric, densely hairy. **Pappus**: outer of short, linear scales; inner of barbellate bristles. Open grassland. *Blounaaldetee* (A); *bolou*, *mofefa-bana-oa-thaba*, *phefo* (SS).

DrGr Zastr

## **Hirpicium** Cass. (sthn Afr.: 8 spp.)

(Arctotideae)

### Key to species:

[after Roessler: 334 (1959)]

Lower leaf surface white-felted, leaf margins mostly entire, without long, spiny bristles . . . . . **H. armerioides**
Lower leaf surface not white-felted, leaf margins usually with 1–3 short, linear lobes on each side and with long, spiny bristles . . . . . **H. echinus**

**armerioides** (DC.) Roessler
*Gazania armerioides* DC.
*H. armerioides* (DC.) Roessler subsp. *rudatisii* Roessler

Perennial herb, up to 300 mm high. **Leaves** in a basal rosette; blade mostly linear, also narrowly obovate or pinnatifid, up to 100 × 4 mm, narrowed to petiole-like clasping base, lobes (when present) linear to narrowly elliptic, apices apiculate, margins revolute, upper surface harshly pubescent, lower surface white-felted. **Heads** radiate, solitary on nude peduncles, ciliate with long white hairs. **Involucral bracts** in many series, connate below to form cup, with long white hairs. **Flowers**: ray florets white or creamy on upper surface, purple band on lower surface; disc florets yellow; Oct.–Dec. **Fruit** with cypsela turbinate, ribbed, villous with long silky hairs. **Pappus** biseriate, outer of long, acuminate, fimbriate scales; inner of small, scale-like bristles. On poor stony soils, rock sheets and bare areas. *Skynloodkruid* (A); *shoeshoe-ea-loti*, *tsikitlane* (SS).

MsGr

**echinus** Less.

Perennial herb, 50–400 mm high; procumbent to erect. **Leaves** sessile; blade linear, up to 80 × 2 mm, margins entire or pinnatifid with 1–3 short, linear lobes on each side, apices with rigid, white spinules, surfaces shortly bristly, margins revolute, with scattered longer spiny bristles; lower surface not tomentose, also glandular-hairy. **Heads** radiate, solitary, terminal, on nude, glandular-hairy peduncles. **Involucral bracts** connate basally, glandular pubescent-pilose, apices shortly spine-tipped, margins spinose ciliate. **Flowers**: ray florets yellow on upper surface, brown or purplish on lower surface; disc florets yellow; Nov., Mar. **Fruit** with cypsela ± stipitate-turbinate, villous with long, silky hairs. **Pappus** biseriate; outer of long, attenuate, fimbriate scales; inner of small, ovate scale-like bristles. Grassland on sandy soils.

DrGr KarSh

## **Hypochaeris** L. (sthn Afr.: 4 spp.)

(Cichorieae)

### Key to species:

[after Hilliard: 599 (1977)]

1a Pappus biseriate, outer of much shorter, scabrid bristles, inner of long, plumose setae; cypselae multi-ribbed . . . . . **H. radicata**
1b Pappus uniseriate, all setae long and plumose; cypselae 5-ribbed . . . . . 2

2a Flowers yellow . . . . . **H. brasiliensis**
2b Flowers white . . . . . **H. microcephala** var. **albiflora**

### ***brasiliensis** (Less.) Griseb.

Perennial herb, up to 1 m high, with milky latex. **Leaves** mostly basal with blade narrowly elliptic, up to 200 × 40 mm, margins subentire to sinuate to pinnatifid, apex acute, base narrowed, broadly winged, petiole-like, hispid mainly on nerves and margins; stem leaves similar but broad-based, half-clasping. **Heads** ligulate, on long peduncles, in terminal, corymbose panicle. **Involucral bracts** in several series, imbricate. **Receptacle** paleate. **Flowers**: yellow; Nov., Dec., Mar. **Fruit** with cypsela reddish brown, narrowly cylindric, 5-ribbed, transversely wrinkled, with long beak. **Pappus** uniseriate, all setae long and plumose. Weed in old fields and along roadsides. Native to South America. *Cat's ear*.

VreDm | | DrGr | MsGr | | |

### ***microcephala** (Sch.Bip.) Cabrera var. **albiflora** (Kuntze) Cabrera

*H. brasiliensis* (Less.) Griseb. var. *albiflora* Kuntze

Perennial herb, up to 300 mm high, with milky latex. **Leaves**: blade of basal leaves oblong in outline, 150 × 40 mm, narrowed to broad, winged, petiole-like base, margins coarsely dentate or runcinate-pinnatifid; stem leaves similar but sessile. **Heads** ligulate, on long peduncles, corymbose paniculate. **Involucral bracts** in several series, imbricate. **Receptacle** paleate. **Flowers**: white; Oct.–Mar. **Fruit** with cypsela reddish brown, cylindric, 5-ribbed, transversely wrinkled, with slender beak. **Pappus** uniseriate, all setae long and plumose. Weed in disturbed places. Native to South America.

VreDm | | DrGr | MsGr | | |

### ***radicata** L.

Perennial herb, up to 600 mm high, with milky latex. **Leaves** in a basal rosette; blade narrowly obovate, 200 × 30 mm, narrowed to clasping base, margins sinuate-toothed to sinuate-pinnatilobed, hispid to glabrous. **Heads** ligulate, on long peduncles, solitary or corymbose-paniculate. **Involucral bracts** in several series, imbricate. **Receptacle** paleate. **Flowers**: corollas longer than involucre, yellow; Oct.–Apr. **Fruit** with cypsela cylindric, multi-ribbed, with long beak; beak of outer cypsela shorter than inner. **Pappus** biseriate; outer of much shorter, scabrid bristles; inner of long, plumose setae. Weed along roadsides and other disturbed areas. Native to Europe and Asia. *Hairy wild lettuce*, *spotted cat's ear*; *harige skaapslaai* (A); *umkhothane* (X).

VreDm | | DrGr | MsGr | | |

## **Ifloga** Cass. (sthn Afr.: 13 spp.)

(Gnaphalieae)

### Key to species:

[after Hilliard: 298 (1981)]

Dwarf shrub; disc florets with sterile ovaries . . . . . **I. decumbens**
Annual herb; disc florets fertile. . . . . **I. glomerata**

**decumbens** (Thunb.) Schltr.

*I. woodii* (N.E.Br.) B.L.Burtt

*Trichogyne decumbens* (Thunb.) Less.

Dwarf shrub, stems up to 200 mm long; erect or decumbent and then sometimes rooting where stems touch the ground. **Leaves** alternate, sessile; blade linear-filiform, up to 7 × 0.75 mm, thick, closely set along stems, margins entire, involute, upper surface white-tomentose, but not obvious, lower surface thinly hairy. **Heads** disciform, several together in terminal clusters, surrounded by leaves. **Involucral bracts** in several series; outer brown, thinly hairy; inner thinly hairy to glabrous, often with obtuse or abruptly acute, white tips. **Flowers**: outer florets filiform, female, 3–7, purplish, in axils of outer involucral bracts; disc florets 8–14, bisexual with sterile ovaries; corolla cylindric below, campanulate above, yellowish; Dec.–Feb. **Fruit** with cypsela triangular, hairy. **Pappus** absent in female florets, in disc florets of bristles with white, irregularly, plumose upper half and naked below. Bare sandy or stony ground or on rock platforms. *Naaldebos* (A).

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**glomerata** (Harv.) Schltr.

*I. aristulata* Thell.

*Trichogyne glomerata* Harv.

Annual herb, up to 200 mm high; procumbent, decumbent or erect. **Leaves** alternate, sessile; blade linear-filiform or narrowly ovate, up to 18 × 2 mm, often twisted, margins either involute or flat, lower surface with thin tissue paper-like indumentum, upper thinly white-tomentose. **Heads** disciform, many, crowded in leafy glomerules. **Involucral bracts** in several series, translucent, pale golden-brown or straw-coloured, sometimes tinged red, glabrous. **Flowers**: outer female florets filiform, 20–38, in axils of outer involucral bracts; disc florets 4–11, bisexual, fertile; corolla cylindric, greenish; Jun.–Mar. **Fruit** with cypsela elliptic, minutely hairy. **Pappus** absent in female florets, in disc florets of bristles with intermingling cilia at base, naked shaft and shortly, regularly plumose tip. Sandy and gravelly places, roadsides and weed of cultivation. *Bekvol* (A).

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## **Inulanthera** Källersjö (sthn Afr.: 7 spp.)

(Anthemideae)

### Key to species:

[after Hilliard: 333 (1977), extracted from *Athanasia*]

Cypselae with superficial glands between ribs, ribs smooth; pappus of small but relatively broad scales, often fused at base . . . . . **I. dregeana**
Cypselae without superficial glands between ribs, ribs ± scabrid; pappus of minute teeth (upward prolongations of cypselar ribs) . . . . . **I. calva**

**calva** (Hutch.) Källersjö

*Athanasia calva* Hutch.

Shrub, up to 1.5 m high. **Leaves** alternate, often crowded and tufted, sessile; blade oblong or narrowly obovate, mostly with a pair of basal, linear, stipule-like lobes, margins entire or apex 3-toothed or sharply serrate in upper half, glabrous or thinly to densely hairy, glandular-

punctate. **Heads** discoid, subglobose, many in terminal, compound corymbs. **Involucral bracts** in several series, imbricate. **Receptacle** paleate. **Flowers**: disc florets only, bright yellow; Mar. **Fruit** with cypsela narrowly obovate, ribs ± scabrid, without superficial glands between ribs. **Pappus** of minute teeth from upward prolongations of cypselar ribs. Forest margin scrub or grassland.

MsGr

**dregeana** (DC.) Källersjö
*Athanasia dregeana* (DC.) Harv.
*A. punctata* (DC.) Harv.
*Hymenolepis dregeana* DC.

Shrub, up to 1.5 m high. **Leaves** alternate, often crowded and tufted, sessile; blade oblong, rarely narrowly elliptic, always with a pair of basal, linear, stipule-like lobes, margins entire or serrate, glabrous or thinly to densely hairy, glandular-punctate. **Heads** discoid, subglobose, many in terminal, compound corymbs. **Involucral bracts** in several series, imbricate. **Receptacle** paleate. **Flowers**: disc florets only, bright yellow; Feb.–May. **Fruit** with cypsela narrowly obovate, ribs smooth, with large, superficial glands between ribs. **Pappus** of small but relatively broad scales, often fused at base. Open grassland or forest margin scrub.

MsGr

## **Kleinia** Mill. (sthn Afr.: 6 spp.)

(Senecioneae)

**longiflora** DC.
*Senecio longiflorus* (DC.) Sch.Bip.

Shrub, up to 2 m high; glabrous, succulent. **Branches** angular, grey-green or stained purple. **Leaves** alternate, petiolate to subpetiolate; blade minute, linear-subulate, margins entire; plant often seems leafless. **Heads** discoid, solitary or few together on very short peduncles at ends of branches and axillary. **Involucral bracts** 5 or 6, linear, striate, with 2 or 3 minute, calyculus bracts below involucral bracts. **Flowers**: disc florets only, white to cream-coloured; Jun., Sep.–Nov. **Fruit** with cypsela cylindrical, ribbed, hispidulous between ribs. **Pappus** of white, barbellate bristles, shiny white and long in mature cypsela. Among rocks in grassland or open woodland. *Sjambokbos* (A). Figure 42.

AcGr DrGr KarSh

## **Lactuca** L. (sthn Afr.: 5 spp.)

(Cichorieae)

### Key to species:

[after Pope: 196 (1992)]

1a Florets white or bluish, rarely yellow. . . . . **L. inermis**
1b Florets yellow . . . . . 2



**Figure 42.** *Kleinia longiflora* (Asteraceae). Artist: G. Condy.

2a Stem leaves undivided, linear, apex attenuate, lowermost leaves sometimes lobed . . . . . **L. dregeana**
2b Stem leaves broadly elliptic in outline, runcinate-pinnate with recurved lobes, undivided leaves (if present) oblong-obovate . . . . . **L. serriola**

## **dregeana** DC.

Perennial herb, up to 1.2 m high; lower part of stems spinulose; plant with milky latex. **Leaves** alternate, sessile; blade up to 150 × 15 mm; basal leaves runcinate or sinuate-dentate, apex acuminate, base sagittate; stem leaves linear, apex attenuate, base sagittate, margins entire; midrib aculeate. **Heads** ligulate, small, several in large, terminal, pyramidal panicle. **Involucre** ± 8 × 2 mm, increasing up to ± 12 × 4 mm in fruiting; involucral bracts 2–4-seriate, imbricate. **Flowers** yellow?; Dec.–Feb. **Fruit** with cypsela greyish brown, obovate, dorsiventrally flattened, multistriate, ciliate at apex, ± 3 × 1 mm, with long beak. **Pappus** of many, soft barbellate bristles. Open veld, often in seasonally wet conditions. *Wildeslaai*, *melkdissel* (A).

DrGr | KarSh | Zastr

## **inermis** Forssk.

*L. capensis* Thunb.
*L. pallidocoerulea* Dinter

Perennial herb, up to 1 m high; plant with milky latex. **Leaves** basally and along lower part of stem, sessile; blade of basal leaves linear or narrowly elliptic, up to 150 × 10 mm, apex acuminate, margins entire, irregularly dentate or runcinate-pinnatifid; blade of stem leaves linear, margins entire, base amplexicaul, auriculate, auricles triangular. **Heads** ligulate, many in lax panicle. **Involucre** ± 10 × 2 mm, increasing up to ± 18 × 4 mm in fruiting; involucral bracts in several series, imbricate. **Flowers**: white or bluish, very rarely yellow; Aug.–Mar. **Fruit** with cypsela dark brown or black, oblong, compressed, up to 6 × 2 mm, tapering to beak, with median rib on each face and marginal wings, transversely wrinkled; beak shorter than body of cypsela. **Pappus** of many yellowish white, barbellate bristles. Short grassland and as a pioneer in disturbed areas. *Kho-loboto*, *lekologoto* (SS); *iklabeklabe* (Z). Figure 10D, p. 7.

VreDm | AcGr | DrGr | MsGr | KarSh

## ***serriola** L.

*L. scariola* L.
*L. virosa auct. non* L.

Biennial or perennial herb, up to 2 m high; plant with milky latex. **Leaves** alternate, sessile; blade up to 200 × 100 mm, broadly elliptic in outline, runcinate-pinnate, lateral lobes 2–6, recurved, apices rounded to obtuse mucronate, margins irregularly denticulate and ± sinuate-dentate, base sagittate-auriculate, auricles narrowly pointed, some leaves undivided, oblong-obovate; glabrous but midrib on lower surface often spinulose. **Heads** ligulate, many in lax, pyramidal panicle. **Involucre** 6–8 mm long and cylindric, increasing up to 13 × 3.5 mm in fruiting; involucral bracts in several series, imbricate. **Flowers**: pale yellow; Oct.–Jan. **Fruit** with cypsela pale or greyish brown, narrowly obovate, laterally compressed, up to 3 × 1 mm, broadly ribbed on margins, each face closely and equally ± 5-ribbed, hispidulous towards apices, with beak longer than body of cypsela. **Pappus** of many, white, barbellate bristles. Weed along roadsides and in waste places on outskirts of towns. Native to Europe, Asia and North Africa. *Compass plant*, *prickly lettuce*; *wildeslaai*, *melkdissel* (A).

VreDm | DrGr | KarSh

## **Lasiopogon** Cass. (sthn Afr.: 8 spp.)

(Gnaphalieae)

### Key to species:

[after Hilliard: 5 (1983)]

Pappus bristles delicately plumose from base and barbs longest there . . . . . .
. . . . . .**L. muscoides**
Pappus bristles uniformly barbellate throughout . . . . . .**L. glomerulatus**

### **glomerulatus** (Harv.) Hilliard

*Gnaphalium glomerulatum* Harv.

Annual herb, stems up to 80 mm long; procumbent, greyish white-woolly. **Leaves** alternate; blade small, linear to very narrowly obovate, margins entire, loosely greyish white-woolly. **Heads** disciform, surrounded by leaves and webbed together with wool, few or many together in small, woolly glomerules terminating branchlets. **Involucral bracts** glabrous, biseriate; outer short, ovate, acute; inner linear, exceeding florets, apex obtuse, often minutely notched, straw-coloured, sometimes tinged purple, stereome divided. **Flowers**: outer florets female, narrowly tubular or filiform, more than disc florets, purple-tipped; disc florets bisexual, corolla tubular below, campanulate above, purple-tipped; May–Oct. **Fruit** with cypsela oblong, usually minutely myxogenic hairy. **Pappus** of barbellate bristles with scabrid tips, bases cohering strongly by patent cilia. Stony and gravelly flats, hard-packed sand. *Groenbossie* (A).

KarSh

### **muscoides** (Desf.) DC.

*Gnaphalium muscoides* Desf.

Annual herb, stems up to 150 mm long; mat-forming. **Leaves** alternate; blade small, thin, very narrowly obovate to linear-oblong, margins entire, loosely woolly. **Heads** disciform, closely surrounded by leaves, massed in woolly glomerules at branchlet tips. **Involucral bracts** biseriate, subequal, slightly exceeding florets, apices obtuse, pale straw-coloured, stereome divided. **Flowers**: outer filiform female florets at least 6 × as many as bisexual disc florets; disc whitish, tips sometimes reddish; Aug., Sep. **Fruit** with cypsela oblong, usually myxogenic hairy. **Pappus** of bristles cohering by a few patent cilia at base, delicately plumose from base, tipped with a pair of pointed cells. Bare sandy or gravelly places e.g. watercourses, edges of pans. *Wolbossie* (A).

DrGr KarSh

## **Lasiospermum** Lag. (sthn Afr.: 4 spp.)

(Anthemideae)

### **bipinnatum** (Thunb.) Druce

*Lidbeckia bipinnata* Thunb.

Perennial herb, up to 0.6 m high; erect but becoming decumbent with age, much branched. **Leaves** alternate; blade bipinnatisect, lobes linear, mucronate with hard white mucro, margins entire, initially sparsely long-pilose, soon glabrous, yellow-green; petiole semi-amplexicaul, sheathing. **Heads** radiate or discoid, terminal, solitary, long pedunculate. **Involucral bracts** 3- or 4-seriate, imbricate; outer narrowly oblong to obovate; inner broadly obovate to ovate, with narrow membranous margins, glabrous. **Receptacle** paleate. **Flowers**: ray florets female, corolla white or pale red-purple, sometimes absent; disc florets many, corolla tube campanulate above,

with 5 ovate lobes, pale yellow; Aug., Nov., Dec. **Fruit** with cypsela dark yellow-brown, smooth, narrowly ovate, flattened triangular, densely white-woolly. **Pappus** absent. Sandy soil or clay soil in moist conditions like vleis, marshes, riverbanks and roadsides where pools of water have formed, sometimes weedy. *Gansbossie*, *gansieskweek*, *ganskweek* (A); *manku* (SS); *isifikane* (X).

MsGr KarSh

## **Leysera** L. (sthn Afr.: 2 spp.)

(Gnaphalieae)

### **tenella** DC.

Annual or occasionally perennial herb, up to 450 mm high. **Leaves** alternate, sessile; blade linear, up to 25 × ± 0.5 mm, greyish tomentose to green and glabrescent, glandular. **Heads** radiate, solitary on long peduncles. **Involucral bracts** in several series, imbricate, inner bracts with scarious and often brown apex. **Flowers**: ray and disc florets yellow; Oct. **Fruit** with cypsela brown, linear, angular-terete; cypsela of ray florets more densely pubescent than of disc florets. **Pappus** of ray cypsela consisting of obtuse-truncate, white scales only; of disc cypsela consisting of both obtuse-truncate, white scales and basally barbellate, apically plumose bristles. Open sandy flats.

KarSh

## **Litogyne** Harv. (sthn Afr.: 1 sp.)

(Inuleae)

### **gariepina** (DC.) Anderb.

*Epaltes alata* (Sond.) Steetz
*E. gariepina* (DC.) Steetz

Perennial herb or shrub, up to 1 m high; aromatic. **Stems** winged. **Leaves** alternate, sessile; blade narrowly elliptic to linear-oblong, up to 50 × 10 mm, apex acute, base decurrent on stem as wings, margins entire or remotely denticulate; gland-dotted, glabrous to glandular-scabrid. **Heads** disciform, small, few together in subumbellate clusters, terminating side branches, shortly pedunculate. **Involucral bracts** in many series, imbricate, apices often purplish. **Flowers**: outer female florets in many rows, filiform; disc florets functionally male; both purple; Nov.–Jun. **Fruit** with cypsela cylindric, 5-ribbed. **Pappus** absent or 2 or 3 bristles in disc cypsela. Sandy grassland or open woodland or as a roadside weed.

VreDm AcGr DrGr

## **Mesogramma** DC. (sthn Afr.: 1 sp.)

(Senecioneae)

### **apiifolium** DC.

*Senecio apiifolius* (DC.) Benth. & Hook.f. ex O.Hoffm.

Annual herb, up to 1.5 m high, erect, branching from base, glabrous. **Leaves** alternate; blade narrowly ovate to elliptic in outline, up to 70 × 30 mm, deeply dentate, lobed or pinnate, glabrous, smaller upwards; petiole up to 30 mm long. **Heads** radiate, solitary or up to 12 corymbosely

arranged. **Involucral bracts** 10–21, 4–6 mm long, ± biseriate, green with scarious margins, midribbed with thin, blackish, resin vein and 2 lateral, blackish, resin ducts; lateral resin stripes of inner bracts broad and glandular dotted; minutely calyculate. **Flowers**: ray florets 8–13; disc floret corollas tubular, gradually widening above, 5-lobed, distinctly 5-veined, with black veins from corolla tips down to base of tube, corolla lobes with thin lateral veins additionally to dark midvein, ray and disc florets yellow; Aug.–Oct. **Fruit** with cypsela subtriquetrous or somewhat compressed, black, constricted apically and basally, sparsely papillose on 3 ridges, apically and basally with crown of longer hairs. **Pappus** of many barbellate bristles, basally connate. In grassland, often at edges of pans and vleis; becoming a weed in disturbed places.




## **Metalasia** R.Br. (sthn Afr.: 52 spp.)

(Gnaphalieae)

### **densa** (Lam.) P.O.Karis

*Metalasia muricata sensu* Hilliard

Shrub, up to 2.5(–4.0) m high; erect. **Leaves** alternate, sessile; blade linear to very narrowly obovate, up to 16 × 3 mm, apex acute to acuminate, usually ± half-twisted, margins involute, glabrous or sometimes whitish tomentose on upper surface, with axillary brachyblasts. **Heads** discoid, 3–5-flowered, sessile or shortly pedunculate, arranged in clusters. **Involucral bracts** 6–8(9)-seriate, 1.5–3.0 mm wide, most not petaloid, obtuse and slightly apiculate, apically erect; outermost brownish, rarely reddish or light pink, hairy; inner bracts white, glabrous or glabrescent. **Flowers**: disc florets only, pink?; Sep.–Nov., Mar.–Jun. **Fruit** with cypsela narrowly oblong, brown. **Pappus** of serrate to dentate bristles. Various habitats, becoming weed-like along roadsides, on disturbed ground, etc. *Drakensbergse steekbos*, *blombos* (A); *lehlohlo*, *sehalahala-se-seputsoa*, *tee* (SS).




## **Nidorella** Cass. (sthn Afr.: 11 spp.)

(Astereae)

### Key to species:

[after Wild: 214 (1969)]

1a Outer female florets 3- or 4-toothed; pappus bristles few (up to ± 10) . . . . . **N. anomala**

1b Outer florets with a short ray, sometimes opposed by a minute lobe; pappus bristles copious . . . . . 2

2a Plants perennial . . . . . 3

2b Plants annual . . . . . 4

3a Leaves in basal rosette and along stem; base of stem leaves cordate-clasping, not auriculate . . . . . **N. agria**

3b Leaves arranged along stem; base mostly distinctly auriculate. . . **N. auriculata**

4a Leaves obovate to linear-obovate, apex acute to obtuse, lanate, sometimes becoming glabrescent with age, but always retaining some lanate hairs especially at nodes or in leaf axils . . . . . **N. hottentotica**

4b Leaves pinnatipartite with 1 or 2 pairs of lateral lobes, upper leaves simple, oblong or oblong-obovate, never lanate **N. resedifolia** subsp. **resedifolia**

**agria** Hilliard

Perennial herb, up to 0.6 m high; hispid. **Leaves** in a basal rosette, usually withered at flowering, and along stem, alternate; blade of basal leaves elliptic, up to 150 × 40 mm, apex obtuse, base tapering to petiole-like region, margins nearly entire or callose-denticulate to crenate, both surfaces hispid and minutely glandular; stem leaves similar, becoming smaller and oblong to very narrowly obovate to linear upwards, base cordate-clasping. **Heads** disciform (inconspicuously radiate), ± 4 mm in diameter, many in compact, corymbose clusters; peduncles hispid, bracts cordate-clasping. **Involucral bracts** biseriate, glandular. **Flowers**: (ray) outer florets female, in several series; disc florets with abortive ovary; yellow; Mar., Apr. **Fruit** with cypsela turbinate, slightly compressed, thinly hairy. **Pappus** uniseriate, of many scabrid bristles. Dry grassland or grass and rubble mountain slopes.




**anomala** Steetz

*N. angustifolia* O.Hoffm.
*N. depauperata* Harv.
*N. solidaginea auct. non* DC., Wild

Annual, occasionally perennial herb, up to 0.6 m high. **Leaves** alternate, sessile; blade linear, linear-obovate or ovate-oblong, often folded lengthwise, up to 40 × 4 mm, apex acute, base of lower leaves attenuate, base of upper leaves clasping, margins entire, scabrid-pubescent, viscid. **Heads** disciform, small, ± 2 mm in diameter, crowded in corymbose clusters. **Involucral bracts** biseriate, minutely glandular. **Flowers**: outer female florets 3- or 4-toothed, in several series; disc florets bisexual; yellow; Dec.–Mar. **Fruit** with cypsela elliptic, slightly compressed, faintly ribbed, thinly hairy, gland-dotted. **Pappus** uniseriate, of few (up to ± 10) bristles. Grassland and on edge of marshes; also invading overgrazed grasslands and roadsides. *Mokoteli* (SS).




**auriculata** DC.

*N. auriculata* DC. subsp. *polycephala* (DC.) Wild

Perennial herb, up to 1.5 m high. **Leaves** alternate, arranged along stem; blade up to 90 × 35 mm, varying from linear and tapering to both base and apex, to oblong-elliptic or obovate, contracting to petiole-like, clasping base, mostly distinctly eared (auriculate), margins entire or coarsely dentate or lobed, main and side veins strongly raised below; upper leaves often narrower; pubescent. **Heads** minutely radiate (disciform), small, many in compact, corymbose clusters. **Involucral bracts** 2- or 3-seriate, pilose. **Flowers**: outer flowers with a short ray, female, in several series; disc florets bisexual, fertile; both pale or deep yellow; Jan. **Fruit** with cypsela elliptic, slightly compressed, faintly ribbed, appressed pubescent. **Pappus** uniseriate, of copious, barbellate bristles. On grassy slopes, in marshy places or forest margins; sometimes invading disturbed areas. *Inhlanga* (Z).




**hottentotica** DC.

Annual herb, up to 1 m high. **Leaves** alternate, sessile; blade obovate to linear-obovate, apex acute to obtuse, margins entire, lanate, sometimes becoming glabrescent with age, but always retaining some lanate hairs at nodes or in leaf axils. **Heads** minutely radiate (disciform), small, many in compact, corymbose clusters. **Involucral bracts** 2- or 3-seriate, pilose. **Flowers**: outer flowers with a short ray, female, in several series; disc florets bisexual; both yellow; Dec., Jan. **Fruit** with cypsela elliptic, slightly compressed, faintly ribbed, appressed-pubescent. **Pappus**

uniseriate, of copious, barbellate bristles. Grassland or woodland, often among rocks on hillsides; can spread to disturbed places.

VreDm | DrGr

**resedifolia** DC. subsp. **resedifolia**

*N. hirta* DC.

*N. pinnatilobata* DC.

Annual herb, up to 1 m high. **Leaves** alternate, sessile; blade up to 60 × 8 mm, often pinnatipartite with 1 or 2 pairs of lateral lobes, apex obtuse, mucronulate, base narrowed, half-clasping, not auriculate at base; blade of upper leaves simple, oblong or oblong-obovate, margins entire, rough-hairy or glabrous. **Heads** minutely radiate (disciform), small, many in compact, corymbose clusters. **Involucral bracts** biseriate, pilose or glabrous. **Flowers**: ray florets female, fertile, in several series; disc florets bisexual; both bright yellow; Oct.–May. **Fruit** with cypsela elliptic, slightly compressed, faintly ribbed, appressed-pubescent. **Pappus** uniseriate, of short, scabrid bristles. Weed of roadsides, cultivated land and overgrazed grassland. *Stinkkruid*, *wurmbossie* (A).

VreDm | AcGr | DrGr | MsGr | KarSh

## **Nolletia** Cass. (sthn Afr.: 12 spp.)

(Astereae)

### Key to species:

[after Herman: 8 (2013)]

1a Cypsela surface shiny, honey-coloured, with circular epicarpic cells; leaves appressed-pubescent on both sides . . . . . **N. chrysocomoides**

1b Cypsela surfaces dull, pale to dark or reddish brown, with oblong epicarpic cells; leaves glabrous or appressed-pubescent on lower surface only . . . . 2

2a Involucral bracts without yellow, orange or almost black oil sacs; leaves appressed-pubescent on lower surface. . . . . **N. jeanettae**

2b Involucral bracts with yellow, orange or almost black oil sacs; leaves glabrous . . . . . 3

3a Leaves close-set, imbricate. . . . . **N. ciliaris**

3b Leaves distant . . . . . **N. rarifolia**

**chrysocomoides** (Desf.) Cass. ex Less.

*Conyza chrysocomoides* Desf.

*N. arenosa* O.Hoffm.

Perennial herb or suffrutex, up to 0.4 m high. **Leaves** alternate, sessile; blade linear, up to 20 × 1.5 mm, decreasing in size upwards, apex bluntly acute, margins entire, appressed-pubescent on both surfaces. **Heads** disciform, usually in few-headed, loose corymbs, rarely solitary, terminal; peduncle appressed-pubescent. **Involucral bracts** 3- or 4-seriate, imbricate, appressed-pubescent. **Flowers**: outer female florets filiform, uniseriate, yellow; disc florets bisexual, yellow but sometimes purplish on upper part of tube and lobes; Dec., Mar. **Fruit** with cypsela narrowly obovoid, honey-coloured, shiny, minutely hairy, surface covered with circular epicarpic cells. **Pappus** uniseriate, of caducous, barbellate bristles. In sand.

KarSh

**ciliaris** (DC.) Steetz
*Leptothamnus ciliaris* DC.
*N. ericoides* Merxm.

Suffrutex or perennial herb, up to 300 mm high. **Leaves** subopposite at base, alternate upwards; sessile, close-set, imbricate; blade linear-triangular to linear, up to 6 × 1 mm, apex acute, base semi-amplexicaul, margins entire, mostly strongly ciliate, rarely without cilia; glabrous. **Heads** disciform, solitary, terminal; peduncle glabrous, spreading-pubescent and/or sparsely glandular-pubescent. **Involucral bracts** 3- or 4-seriate, imbricate, midline with large, yellow or almost black embedded oil sacs. **Flowers**: outer female florets filiform, uniseriate, yellow or purplish; disc florets bisexual, yellow or purplish towards apex; Sep.–Apr. **Fruit** with cypsela narrowly obovoid, dull, densely light brownish hairy; epicarpic cells oblong, arranged in parallel rows. **Pappus** uniseriate, of barbellate bristles. Grassland in sandy soil, among rocks, on flats, koppies or slopes. *Kaalriekte* (A); *moloka* (SS).

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**jeanettae** P.P.J.Herman

Perennial herb, up to 0.2 m high. **Leaves** alternate, sessile; blade linear-filiform, up to 40 × 1 mm, margins entire, ciliate, upper surface glabrous, lower surface appressed-pubescent. **Heads** disciform, solitary, terminal; peduncle sparsely to densely stipitate-glandular. **Involucral bracts** 3-seriate, imbricate, appressed-pubescent. **Flowers**: outer female florets filiform, uniseriate, pale yellowish, sometimes purplish at apex; disc florets bisexual, yellow, apex reddish or purplish; Nov. **Fruit** with cypsela obovoid, dull, brownish or dark purplish, hairy; epicarpic cells oblong, arranged in regular rows. **Pappus** uniseriate, of barbellate bristles. Savanna, in loam soil, black turf or clay.

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**rarifolia** (Turcz.) Steetz
*Leptothamnus rarifolius* Turcz.

Suffrutex or perennial herb, up to 450 mm high. **Leaves** alternate, distant, sessile; blade filiform, up to 20 × 1 mm, margins entire; glabrous. **Heads** disciform, solitary or in loose corymbs, terminal; peduncle glabrous. **Involucral bracts** 4-seriate, imbricate, with large, embedded, orange to almost black oil sacs, spreading-pubescent or glabrous. **Flowers**: outer female florets filiform, uniseriate, yellow; disc florets bisexual, yellow; Jan.–Apr. **Fruit** with cypsela obovoid, dull, dark reddish brown with whitish thickened margins, hairy; epicarpic cells oblong, arranged in regular rows. **Pappus** uniseriate, of barbellate bristles. Open grassland, in sandy or rocky soil, on flats, hill slopes and rocky outcrops.

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## **Oncosiphon** Källersjö (sthn Afr.: 7 spp.)

(Anthemideae)

**piluliferum** (L.f.) Källersjö
*Pentzia globifera* (Thunb.) Hutch.
*P. pilulifera* (L.f.) Fourc.

Annual herb, up to 500 mm high; bad smelling. **Leaves** alternate, petiolate; blade bipinnatisect with narrow lobes. **Heads** discoid, solitary, terminal on long peduncles. **Involucral bracts**

glabrous. **Receptacle** conical-globose, epaleate. **Flowers**: disc florets only; corolla 4-lobed, tube swollen, thick and brittle, yellow; Sep.–Jan. **Fruit** with cypsela yellowish brown, terete, tapering at base, 4-ribbed, glandular between ribs. **Pappus** a small, apically dentate crown. Grassland, often on old cultivated lands. *Knoppies-stinkkruid*, *gansogie* (A).

DrGr | MsGr | KarSh

## **Osteospermum** L. (sthn Afr.: 40 spp.)

(Calenduleae)

### Key to species:

1a Cypselae not winged . . . . . 2
1b Cypselae winged . . . . . 3
2a Leaves linear to oblong, margins denticulate to pinnatifid; cypselae obovoid- or obpyramidal-triangular with a number of processes. . . . . **O. muricatum** subsp. **muricatum**
2b Leaves narrowly obovate, oblong or elliptic, margins remotely denticulate, upper leaves entire; cypselae narrowly obovoid to ellipsoid, pitted, ± sulcate as well in lower part . . . . . **O. thodei**
3a Plants spinescent; leaves linear, linear-oblong to linear-obovate, apex (2)3-dentate or (2)3-fid, or margins entire; rachis and lobes flat. . . . . **O. spinescens**
3b Plants not spinescent; lower leaf blades pinnately 5–7-partite, upper leaf blades 3–5-dentate or 3–5-lobed in upper part, or uppermost leaf blades entire or apex inconspicuously dentate, rachis and leaf lobes linear and semiterete . . . . . **O. leptolobum**

### **leptolobum** (Harv.) Norl.

*Tripteris leptoloba* Harv.

Shrub, 0.3–0.6 m high; without spines. **Leaves** alternate; lower leaf blades pinnately 5–7-partite, upper leaf blades 3–5-dentate or 3–5-lobed in upper part, or uppermost leaf blades entire or apex inconspicuously dentate; densely glandular-viscid; rachis and leaf lobes linear and semiterete. **Heads** radiate, solitary, terminal, shortly pedunculate or sessile. **Involucral bracts** ± uniseriate, glandular-hairy, margins broadly white-scarious. **Flowers**: ray florets female, fertile, yellow, sometimes with purple stripe on lower surface; disc florets functionally male, pale yellow; Aug.–Apr., Jun. **Fruit** with cypsela 3-winged, without apical cavity; wings lacerated when mature. **Pappus** absent. Grassland. *Gousbos*, *geeldraaibos*, *beesghombossie* (A).

DrGr | KarSh

### **muricatum** E.Mey. ex DC. subsp. **muricatum**

Perennial herb, 0.2–0.6 m high; whole plant usually clothed with short, rigid, glanduliferous hairs. **Leaves** alternate, sessile; blade linear to oblong, margins denticulate to pinnatifid; viscid hispidulous, glabrescent. **Heads** radiate, solitary, terminal, shortly pedunculate. **Involucral bracts** ± uniseriate, glandular-hairy, margins white-scarious. **Flowers**: ray florets very short, as long as or slightly longer than involucral bracts, female, fertile, pale to bright yellow; disc florets functionally male, pale yellow; Jul.–Jun. **Fruit** with cypsela obovoid- or obpyramidal-triangular with a number of processes. **Pappus** absent. Variety of habitats. *Bietou*, *boegoebossie* (A); *motlapa-tsunyana* (SS).

VreDm | AcGr | DrGr | KarSh

**spinescens** Thunb.

*Tripteris pachypteris* (DC.) Harv.

Spiny shrub, 0.5–1.0 m high. **Leaves** alternate; blade linear, linear-oblong to linear-obovate, apex (2)3-dentate or (2)3-fid, or margins entire; rachis and lobes flat, glandular-viscid. **Heads** radiate, solitary; peduncle short, glandular-hairy, forming spine after flowering. **Involucral bracts** uniseriate, glandular-hairy, margins broadly white-scarious. **Flowers**: ray florets female, fertile, yellow; disc florets functionally male, yellow; Jul.–Jun. **Fruit** with cypsela 3-winged, without apical cavity; wings deeply lacerated when mature. **Pappus** absent. Edges of pans, riverbanks or streambanks. *Geeldraaibos*, *rivierdraaibos* (A).

DrGr MsGr KarSh

**thodei** Markötter

Shrub, up to 0.5 m high; compact, well branched; young stems, peduncles, leaves and involucral bracts thickly beset with stalked glands. **Leaves** alternate, sessile; blade narrowly obovate, oblong or elliptic, apex obtuse to acute, mucronulate, base broad, half-clasping, margins remotely denticulate, upper leaves entire, glandular. **Heads** radiate, solitary, axillary or terminal, on long peduncles, glandular. **Involucral bracts** subbiseriate, glandular-hispid, margins white-scarious. **Flowers**: ray florets female, fertile, yellow; disc florets functionally male, yellow; Oct., Feb. **Fruit** with cypsela narrowly obovoid to ellipsoid, pitted, ± sulcate as well in lower part. **Pappus** absent. Stony grass slopes, rocky ridges and rock platforms; alt. 1 800–2 700 m.

MsGr

## **Othonna** L. (sthn Afr.: ± 95 spp.)

(Senecioneae)

### Key to species:

1a Erect, dwarf shrub with succulent main stem; leaves crowded at branch tips . . . . . **O. protecta**
1b Stemless herbs; leaves arranged basally. . . . . 2
2a Leaf blades obovate, apex obtuse to rounded, margins variably incised, lobed, denticulate or sinuate or rarely entire . . . . . **O. auriculifolia**
2b Leave blades linear to narrowly elliptic or narrowly obovate, apex acute, margins usually entire . . . . . **O. natalensis**

**auriculifolia** Licht. ex Less.

Perennial herb, up to 0.75 m high; glabrous, glaucous, ± fleshy, ± stemless, crown woolly, rootstock tuberous. **Leaves** in a basal rosette, petiolate; blade obovate, apex obtuse to rounded, margins variably incised, lobed, denticulate or sinuate, rarely entire, axils woolly. **Heads** radiate, campanulate, up to 30 mm in diameter, solitary; peduncles up to 150 mm long. **Involucral bracts** 12–14, uniseriate, narrowly ovate to linear, connate to ± halfway, edges membranous, ecalyculate. **Flowers**: ray florets 12–14, female or bisexual, yellow above, often red-brown below, dries ± blue; disc florets functionally male, yellow; Jul., Sep. **Fruit** with cypsela ellipsoid, silky, 8 mm long. **Pappus** of scabrid bristles, 20 mm long. Stony slopes and flats, on clay or loam. *Wildepatat*, *sandkool* (A).

KarSh

**natalensis** Sch.Bip.
*O. scapigera* Harv.

Perennial herb, 200–500 mm high; stemless, from woody rootstock, crown woolly. **Leaves** in a basal rosette; blade linear to narrowly elliptic or narrowly obovate, apex acute, margins usually entire or rarely somewhat toothed, glabrous, thick, tapering to petiole-like base, flushed reddish purple at base. **Heads** radiate, up to 40 mm in diameter, solitary or in few-headed, open corymb, terminal; peduncles up to 400 mm long. **Involucral bracts** uniseriate, ovate, connate at base, ecalyculate. **Flowers**: ray florets ± 8, female or bisexual; disc florets functionally male, all florets yellow; Oct.–Jan. **Fruit** with cypsela oblong-elliptic, closely ribbed, silky, 10 mm long. **Pappus** of dirty white or buff-coloured scabrid bristles, persistent. Lowland or montane grassland. *Geelbossie* (A); *naka*, *phela* (SS); *incamu* (Z).

DrGr | MsGr

**protecta** Dinter

Dwarf shrub, up to 300 mm high; with succulent, bottle-shaped main stem. **Leaves** crowded at branch tips; blade fusiform to terete, linear, fleshy, woolly in axils. **Heads** radiate, ± 10 mm in diameter, few on sparsely bracteate peduncles, peduncle up to 300 mm long. **Involucral bracts** uniseriate, narrowly ovate, connate at base, ecalyculate. **Flowers**: ray florets ± 22, soon rolling backwards, female or bisexual; disc florets functionally male; all florets greenish yellow; Feb.–Apr. **Fruit** with cypsela glabrous. **Pappus** of scabrid bristles, much elongated in fruit. Karroid slopes, often under shrubs.

DrGr

## **Pegolettia** Cass. (sthn Afr.: 9 spp.)

(Inuleae)

**retrofracta** (Thunb.) Kies
*P. polygalaefolia* Less.

Subshrub, up to 0.6 m high. **Leaves** alternate, sessile or subsessile; blade narrowly elliptic to ovate, apex acute to obtuse, margins entire. **Heads** discoid, solitary to laxly corymbose. **Involucral bracts** ± 3-seriate, imbricate. **Flowers**: disc florets only; corolla lobes recurved outwards, yellow or sometimes purplish; Oct.–Jun. **Fruit** with cypsela narrowly cylindric, ribbed, scattered hairy. **Pappus** with outer row of conspicuous scales, several inner rows of barbellate bristles. Sandy, gravelly and stony places. *Geelbergdraaibos*, *perdebos* (A).

DrGr | KarSh

## **Pentzia** Thunb. (sthn Afr.: 22 spp.)

(Anthemideae)

### Key to species:

[after Hutchinson: 242 (1916b), Magee & Tilney: 151 (2012]

1a Flower heads many together in terminal corymbs. . . . . 2
1b Flower heads solitary or with 1–3 additional heads from leaf axils below . . 3

2a Leaves sessile, entire, apex 2- or 3(–5)-toothed, apex of upper leaves entire . . . . . **P. cooperi**
2b Leaves petiolate, pinnatisect or bipinnatisect . . . . . **P. punctata**
3a Pappus absent . . . . . 4
3b Pappus present . . . . . 6
4a Leaves opposite . . . . . **P. oppositifolia**
4b Leaves alternate . . . . . 5
5a Leaf blade pinnately 3–7(9)-lobed, petiolate, upper leaves sessile . . . **P. calva**
5b Leaf blade very narrowly obovate, apex truncate, shortly and bluntly 3–5-lobed, sessile . . . . . **P. tortuosa**
6a Plants spinescent because of peduncles eventually hardening and spinose . . . . . **P. spinescens**
6b Plants not spinescent. . . . . 7
7a Lower leaves petiolate, upper sometimes sessile . . . . . 8
7b All leaves sessile . . . . . 10
8a Flower heads large, ± 15 mm in diameter . . . . . **P. sphaerocephala**
8b Flower heads small, ± 8 mm in diameter . . . . . 9
9a Involucre constricted at rim, terminal heads always solitary. . . . . **P. calcarea**
9b Involucre not constricted at rim, terminal heads solitary or often with 1–3 additional heads from leaf axils below . . . . . **P. incana**
10a Leaf blade obovate in outline, apex truncate, 3–5-toothed or lobulate, teeth or lobes obtuse, upper leaves linear, entire . . . . . **P. quinquefida**
10b Leaf blade variously pinnatisect or pinnatilobed . . . . . 11
11a Leaf lobes all spread in various planes. . . . . **P. viridis**
11b Leaf lobes in on plane . . . . . 12
12a Leaves very short, scarcely as long as internodes or exceeding them . . . . . **P. globosa**
12b Leaves longer than internodes . . . . . 13
13a Young branches densely white-hairy (lanate) . . . . . **P. lanata**
13b Young branches glabrous . . . . . **P. pinnatisecta**

## **calcarea** Kies

Dwarf shrub, up to 400 mm high; aromatic, sprawling. **Leaves** alternate, petiolate; blade 3-fid to pinnately 3–7(9)-lobed, lobes ovate to narrowly oblong, uppermost often entire, densely white- or grey-felted on both surfaces. **Heads** discoid, ± 8 mm in diameter, terminal, solitary; peduncle 4–35 mm long. **Involucre** constricted at rim; involucral bracts 4- or 5-seriate, margins and apices broadly membranous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, golden-yellow; Nov.–Jun. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** an obliquely cup-shaped, white scale, adaxially longer, irregularly lobed. Seasonally waterlogged or moist soils often in and around pans, almost exclusively on calcareous soils. *Bewerasiekaroo*, *meerkatkaroo*, *papkaroo* (A).




## **calva** S.Moore

Dwarf shrub, up to 0.6 m high; aromatic, spreading to erect. **Leaves** alternate, petiolate, upper leaves sessile; blade pinnately 3–7(9)-lobed, lobes ovate to narrowly oblong, densely white- or grey-felted on both surfaces. **Heads** discoid, solitary or often with 1 or 2 additional heads from leaf axils below; peduncle up to 28 mm long. **Involucre** erect to spreading at rim; involucral bracts 4- or 5-seriate, margins and apices broadly membranous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Oct.–Jun. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** absent. On hills and in plains, often in or around pans.



**cooperi** Harv.

Shrub, up to 1.5 m high; aromatic. **Leaves** alternate, sessile; blade oblong or linear, margins entire, apex 2- or 3(–5)-toothed, apex of upper leaves entire, base narrowly cuneate; gland-dotted, glabrous. **Heads** discoid, many in terminal, compound corymbs; pedunculate. **Involucral bracts** with scarious margins. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, bright yellow; Mar.–Jul. **Fruit** with cypsela obliquely wedge-shaped, 5-ribbed, with glands between ribs. **Pappus** a single, oblique scale. Grassland on hillsides. *Lebaila*, *leriane*, *napjane* (SS).

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**globosa** Less.

*P. globifera* Licht. ex Less.

Dwarf shrub, up to 500 mm high. **Leaves** alternate, sessile; blade pinnatipartite, very short, scarcely as long as internodes or exceeding them, lobes short, linear. **Heads** discoid, ± 6–8 mm in diameter, solitary, on pedunculoid branches. **Involucral bracts** linear, acuminate. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Oct.–Jun. **Fruit** with cypsela wedge-shaped, 5-ribbed, with glands between ribs. **Pappus** an auriculately shaped scale, dentate. Grassland. *Bitter karoo bush*, *hair karoo*; *bitterkaroo*, *langbeenkaroo*, *vaalkaroo* (A).

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**incana** (Thunb.) Kuntze

*Chrysanthemum incanum* Thunb.

*P. virgata* Less.

Dwarf shrub, up to 0.6 m high; ± grey-pubescent, aromatic, spreading to erect. **Leaves** alternate, petiolate, upper leaves sessile; blade pinnately 3–7(9)-lobed, lobes ovate to narrowly oblong, densely white- or grey-felted on both surfaces. **Heads** discoid, ± 7 mm in



**Figure 43.** *Pentzia incana* (Asteraceae).

diameter, terminal, solitary or with 1–3 additional heads from leaf axils below; peduncles up to 110 mm long. **Involucre** erect to spreading at rim; involucral bracts 4- or 5-seriate, margins and apices membranous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Mar., Apr. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** an auriculate or obliquely cup-shaped, white scale, adaxially longer, irregularly lobed. Rocky or sandy soil, open grassland. *Sheep bush*, *sweet karoo*; *soetkaroo*, *skaapkaroo*, *ankerkaroo* (A); *mohantsoana* (SS). Figure 43.

KarSh

## **lanata** Hutch.

Shrub, up to 1 m high; young branches densely white-hairy. **Leaves** alternate, sessile; blade pinnate, pinnatipartite or bipinnatipartite, longer than internodes, lobes linear, shortly pubescent. **Heads** discoid, solitary, terminal; peduncle up to 70 mm long. **Involucral bracts** 4-seriate, linear to narrowly ovate, margins broadly membranous, inner bracts conspicuously membranous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Oct.–May. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** an auriculately shaped scale. Grassland. *Bitterkaroo* (A).

AcGr DrGr KarSh

## **oppositifolia** Magee

Dwarf shrub, up to 150 mm high; aromatic, erect to spreading. **Leaves** opposite, petiolate, often basally connate; blade pinnately 3–7-lobed, lobes ovate to narrowly ovate, densely white- or grey-felted on both surfaces; upper leaves sessile. **Heads** discoid, solitary or sometimes with 1 or 2 additional heads from leaf axils below; peduncle up to 10 mm long. **Involucre** erect to spreading at rim; involucral bracts 4-seriate, margins and apices membranous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Jan.–May. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** absent. Restricted to alluvium in and around dolomite limestone pans.

AcGr KarSh

## **pinnatisecta** Hutch.

Shrub, up to 1 m high; branches glabrous. **Leaves** alternate, sessile; blade pinnatisect, usually longer than internodes, lobes long, linear-filiform. **Heads** discoid, ± 10 mm in diameter, solitary, terminal, pedunculate. **Involucral bracts** 4- or 5-seriate, linear, not membranous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Jun. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** an auriculately shaped scale. Along watercourses.

KarSh

## **punctata** Harv.

Shrub, up to 1.5 m high; much branched. **Leaves** alternate, petiolate; blade pinnatisect or bipinnatisect, segments entire or 3–5-lobed, lobes linear, glabrous, glandular-punctate. **Heads** discoid, many together in terminal corymbs, pedunculate. **Involucral bracts** oblong, obtuse. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; May. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** an auriculately shaped scale, irregularly torn or cut. Grassland on mountain and hill slopes. *Beeskaroo*, *berggansie* (A).

DrGr? KarSh

**quinquefida** (Thunb.) Less.

Shrub, up to 0.75 m high; erect, all young parts silky canescent. **Leaves** alternate, sessile; blade obovate in outline, apex truncate, 3–5-toothed or lobulate, teeth or lobes obtuse, upper leaves linear, entire, base cuneate, tapering to petiole-like base, silky canescent. **Heads** discoid, solitary; peduncle up to 150 mm long. **Involucral bracts** obtuse, silky canescent. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Jan.–Mar. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** an auriculately shaped scale, dentate. Hill slopes.

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**sphaerocephala** DC.

Shrub, up to 0.6 m high; rigid, erect. **Leaves** alternate, petiolate; blade pinnatipartite, lobes linear, upper leaves trifid or entire, thinly hairy. **Heads** discoid, large, ± 15 mm in diameter, solitary, long pedunculate. **Involucral bracts** oblong, obtuse, margins membranous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Jan., Feb., May. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** an auriculately shaped scale, dentate. Hills or flats. *Large karoo bush*; *grootberggansiekaroo*, *langsteelkaroo* (A).

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**spinescens** Less.

Dwarf shrub, up to 0.5 m high; divaricately branched, spinescent, young branches silvery-felted. **Leaves** alternate, petiolate; blade pinnately 5-lobed or apex 3-lobed, lobes shortly linear, green, thinly hairy or glabrescent. **Heads** discoid, globose, 8–10 mm in diameter, solitary on slender peduncles 10–50 mm long, becoming spinescent after fruiting. **Involucral bracts** narrowly ovate, obtuse, narrowly membranous, with dark margins. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Feb., May, Aug.–Nov. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** an auriculately shaped scale, $^{1}/_{2}$ as long as cypsela. Stony flats and plateaux. *Witstamkaroo*, *doringkaroo* (A).

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**tortuosa** (DC.) Fenzl ex Harv.

Dwarf shrub, up to 300 mm high; much branched, branches short, tortuous, cushion-formed. **Leaves** alternate, almost rosulate at branch tips, sessile; blade very narrowly obovate, apex truncate, shortly and bluntly 3–5-lobed, base cuneate and with sclerified scale-like leaf sheaths, glabrous. **Heads** discoid, solitary; peduncle slender, up to 50 mm long. **Involucral bracts** broad, obtuse, with median resin duct. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Dec.–Feb., Jun.?, Jul., Sep. **Fruit** with cypsela oblong, 5-ribbed, glandular between ribs. **Pappus** absent. Mountain grassland, wet rock sheets, seepage areas. *Sehalahala* (SS).

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**viridis** Kies

Dwarf shrub, up to 300 mm high; aromatic, erect. **Leaves** alternate, sessile; blade pinnately 3–5-lobed, lobes linear, all spread in various planes, apices with minute bristle, bright green. **Heads** discoid, solitary, terminal; peduncle up to 20 mm long. **Involucral bracts** 3- or 4-seriate, apices membranous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, deep

golden-yellow; Oct.–Jun. **Fruit** with cypsela obpyramidal, 5-ribbed. **Pappus** an oblique coroniform scale, lacerated. In damp sand near dams and rivers. *Vleikaroo* (A).

DrGr KarSh

## **Phymaspermum** Less. emend. Källersjö (sthn Afr.: 19 spp.)

(Anthemideae)

### Key to species:

[after Hutchinson: 174 (1916a) and Hilliard: 333 (1977)]

1a Primary leaves with axillary leaf tufts or shoots . . . . . 2
1b Primary leaves without axillary leaf tufts or shoots . . . . . 3
2a Leaves pinnate . . . . . **P. acerosum**
2b Leaves entire . . . . . **P. parvifolium**
3a Plants sparsely or distantly leafy; flower heads radiate or discoid . . . . . **P. aciculare**
3b Plants densely leafy; flower heads discoid. . . . . 4
4a Flower heads ± 10 mm in diameter; outer involucral bracts short, broad . . . . . **P. athanasioides**
4b Flower heads ± 5 mm in diameter; outer involucral bracts narrow, linear . . . . . **P. bolusii**

### **acerosum** (DC.) Källersjö

*Athanasia acerosa* (DC.) Harv.

Shrub, up to 2 m high, densely leafy, with leaf tufts in axils of primary leaves. **Leaves** alternate, sessile; blade pinnate, segments filiform, glabrous, sparsely hairy or villous. **Heads** discoid, narrowly cylindrical, 2–12-flowered, many in dense, terminal, compound corymbs. **Involucral bracts** narrow gutter-shaped, in several rows, imbricate, glabrous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, bright yellow; Mar.–May. **Fruit** with cypsela cylindric, ribbed, ribs with elongated oil sacs. **Pappus** absent but cypsela crowned with a thickened rim, entire or minutely crenate. Open grassland or forest margin scrub. *Geelblombos* (A); *isibhaha-segceke*, *umhlonishwa* (Z).

MsGr

### **aciculare** (E.Mey. ex Harv.) Benth. & Hook. ex B.D.Jacks.

*Iocaste acicularis* E.Mey. ex Harv.

Dwarf shrub, up to 0.9 m high. **Leaves** alternate, distantly set; mostly on lower half of branches; blade linear, margins entire, pungent-tipped, glabrous. **Heads** radiate or discoid, 12–15-flowered, 7–8 mm in diameter, in lax corymbs, pedunculate. **Involucral bracts** 2- or 3-seriate, imbricate, ciliate. **Receptacle** epaleate. **Flowers**: ray florets (if present) 1 or 2, white; disc florets corolla 5-lobed, yellow; Oct.–May. **Fruit** with cypsela cylindric, ribbed, glandular. **Pappus** absent. On calcareous soil. *Heuningkaroo* (A).

DrGr KarSh

### **athanasioides** (S.Moore) Källersjö

*Brachymeris athanasioides* (S.Moore) Hutch.
*Pentzia athanasioides* S.Moore

Shrub, up to 1.5 m high, densely leafy. **Leaves** alternate, sessile; blade linear, up to 40 mm long, margins mostly entire, sometimes pinnate in upper half. **Heads** discoid, campanulate, many-

flowered, up to 10 mm in diameter, in terminal umbels. **Involucral bracts** in several rows, imbricate, outer bracts short, broad. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Aug.–Nov. **Fruit** with cypsela cylindric, ribbed, glandular. **Pappus** absent. Mountain grassland.

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**bolusii** (Hutch.) Källersjö

*Brachymeris bolusii* Hutch.

Shrub, up to 2 m high, densely leafy. **Leaves** alternate, sessile; blade linear, up to 50 mm long, margins mostly entire, sometimes pinnate in upper half, glabrous. **Heads** discoid, ± 5 mm in diameter, in terminal umbels. **Involucral bracts** 4- or 5-seriate, imbricate, outer bracts narrow, linear, glabrous. **Receptacle** epaleate. **Flowers**: disc florets only; corolla 5-lobed, yellow; Mar.–Dec. **Fruit** with cypsela cylindric, ribbed, glandular. **Pappus** absent. Mountain grassland.

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**parvifolium** (DC.) Benth. & Hook. ex B.D.Jacks.

Dwarf shrub, up to 0.8 m high; much branched, with leaf tufts or leafy shoots in axils of primary shoots. **Leaves** alternate, sessile; blade linear, ± 7 mm long, margins entire, glabrous. **Heads** radiate, small, in terminal corymbs. **Involucral bracts** in several rows, imbricate. **Receptacle** epaleate. **Flowers**: ray florets white; disc florets with corolla 5-lobed, yellow; Oct.–May. **Fruit** with cypsela cylindric, ribbed, with thickened rim. **Pappus** absent. Grassland on slopes and open veld. *Good karoo*; *galsteenbossie*, *witheuningkaroo*, *witblommetjie* (A).

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## **Picris** L. (sthn Afr.: 2 spp.)

(Cichorieae)

***echioides** L.

Annual or perennial herb, up to 1 m high; hispid; with milky latex. **Leaves** alternate; blade of basal and lower stem leaves narrowly obovate, narrowed to petiole-like base, margins irregularly dentate; blade of upper leaves narrowly ovate to oblong, sessile, clasping, sometimes decurrent on stem. **Heads** ligulate, on short peduncles arranged in irregular corymb. **Involucral bracts**: outer bracts large, ovate-cordate; inner bracts linear to very narrowly ovate, apex long subulate. **Receptacle** epaleate. **Flowers**: yellow; Jan., May. **Fruit** with cypsela of 2 kinds: the outer hairy, with short beak, embraced by involucral bracts; the inner glabrous, wrinkled, long-beaked. **Pappus** of outer cypsela reduced bristles, of inner cypsela plumose bristles. Weed of disturbed places. Native to Europe and Asia. *Bristly ox tongue*; *stekelrige-beestong*, *wildedissel* (A).

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## **Platycarphella** V.A.Funk & H.Rob. (sthn Afr.: 2 spp.)

(Platycarpheae – see Arctotideae)

### Key to species:

Plants usually large: up to 400 mm in diameter and secondary heads up to 60 mm in diameter; leaf blades narrowly obovate, margins almost entire to deeply lobed and also dentate or denticulate, lobes rounded to acute . . . . . **P. carlinoides**

Plants smaller: up to 80 mm in diameter and secondary heads up to 35 mm in diameter; leaf blades narrowly obovate, apex obtuse, margins denticulate . . . . . **P. parvifolia**

**carlinoides** (Oliv. & Hiern) V.A.Funk & H.Rob.
*Platycarpha carlinoides* Oliv. & Hiern

Perennial, acaulescent, herb with woolly root crown, spreading up to 400 mm in diameter. **Leaves** in rosette, radiating from crown, lying flat on the ground; blade narrowly obovate, margins almost entire to deeply lobed and also dentate or denticulate, lobes rounded to acute, base tapering petiole-like; upper surface smooth, green, lower surface white, woolly. **Heads** discoid, many crowded together in secondary inflorescences up to 60 mm in diameter, sessile. **Involucral bracts** 3–5-seriate, imbricate, apex acuminate, glabrous or with tufts of hairs. **Receptacle** paleate. **Flowers**: disc florets only, purple, fading to white; Sep. **Fruit** with cypsela cylindrical, obscurely ribbed, glabrous. **Pappus** of 5–10 long, narrow scales, truncate, margins overlapping. Seasonally moist depressions and dry rivercourses.

DrGr

**parvifolia** (S.Moore) V.A.Funk & H.Rob.
*Platycarpha parvifolia* S.Moore

Perennial, acaulescent herb with woolly root crown, spreading up to 80 mm in diameter. **Leaves** in rosette, radiating from crown, lying flat on the ground; blade narrowly obovate, apex obtuse, margin denticulate, base tapering petiole-like, upper surface smooth, green, lower surface white, woolly. **Heads** discoid, many crowded together in secondary inflorescences up to 35 mm in diameter, sessile. **Involucral bracts** 3–5-seriate, imbricate, apex acuminate, glabrous. **Receptacle** paleate. **Flowers**: disc florets only, mauve to pale purple, fading to



**Figure 44.** *Platycarphella parvifolia* (Asteraceae).

white; Aug., Sep. **Fruit** with cypsela cylindrical, obscurely ribbed, glabrous. **Pappus** of 12 long, narrow scales, truncate, margins overlapping. Grassland in damp situations. Figure 44.

VreDm | AcGr | DrGr

## **Polydora** Fenzl (sthn Afr.: 5 spp.)

(Vernonieae)

### **poskeana** (Vatke & Hildebr.) H.Rob.

*Vernonia poskeana* Vatke & Hildebr.

Annual herb, up to 1.5 m high. **Leaves** alternate, sessile; blade linear to linear-filiform, up to 80 × 6 mm, margins entire, revolute, puberulous to scabridulous. **Heads** discoid, many in open panicles; peduncles up to 60 mm long. **Involucral bracts** 3–5-seriate, imbricate; outer narrowly ovate; inner lorate and obtuse at apex, subapically mucronate or aristate, whitish pilose or tomentose outside, often purple-tipped. **Flowers**: disc florets only, purple; Apr., Dec. **Fruit** with cypsela narrowly obconical or obpyramidal, 8–12-ribbed, hispidulous and glandular. **Pappus**: outer of many short oblong scales, inner of barbellate bristles. Sandy soil in hot dry areas, in grassland and dry deciduous woodland.

VreDm

## **Printzia** Cass. (sthn Afr.: 6 spp.)

(Astereae)

### Key to species:

[after Kroner: 110 (1980)]

1a Perennial herb . . . . . **P. nutans**
1b Shrubs or dwarf shrubs . . . . . 2
2a Plants much branched; leaves thin-textured, margins coarsely and irregularly denticulate, with auricles . . . . . **P. auriculata**
2b Plants sparsely branched; leaves thick-textured, margins closely and regularly denticulate, without auricles . . . . . **P. pyrifolia**

### **auriculata** Harv.

*P. densifolia* J.M.Wood & M.S.Evans
*P. laxa* N.E.Br.

Shrub, up to 2 m high; much branched. **Leaves** alternate; blade ovate-elliptic, margins coarsely and irregularly denticulate, upper surface sparsely hairy and glandular, lower surface densely white-hairy and glandular; thin-textured; petiole up to 10 mm long, with auricles often conspicuous, particularly on main stem leaves, sometimes absent. **Heads** radiate, solitary at ends of branches forming a compound inflorescence, pyramidal in outline. **Involucral bracts** in several rows, imbricate, straw-like, yellowish. **Flowers**: ray florets conspicuous, longer than involucre, white, pink or mauve; disc florets white often tinged mauve or yellow; May–Oct., Jan. **Fruit** with cypsela cylindric, brown, 9–11-ribbed, glandular. **Pappus** of many barbellate bristles, 2- or 3-seriate. In scrub on forest margins, mountains, along rocky and cliff-backed watercourses. *Giant daisy bush*; *sephomolo* (SS).

DrGr | MsGr | Zastr

**nutans** (Bolus) Leins

Perennial herb, up to 0.6 m high, single stemmed, unbranched. **Leaves** alternate, sessile, with broad auricles; blade ovate to elliptic, margins coarsely dentate, surfaces hairy, clammy, gland-dotted below. **Heads** radiate or disciform, solitary, nodding on peduncles up to 100 mm long. **Involucral bracts** 4- or 5-seriate, imbricate, green, herbaceous. **Flowers**: ray florets, inconspicuous, dull creamy yellow or greenish; disc florets dull creamy yellow or greenish; Feb., Mar. **Fruit** with cypsela cylindric, brown, 9- or 10-ribbed, glandular. **Pappus** of many barbellate bristles, 2- or 3-seriate. Grassy mountain slopes, in shelter of rock outcrops. (no material in PRE for FS)




**pyrifolia** Less.

Shrub, up to 1.6 m high; erect, sparsely branched. **Leaves** alternate; blade ovate to suborbicular, margins closely and regularly denticulate, upper surface glabrescent, lower surface densely white- or grey-felty hairy, discolorous, thick-textured; sessile or petiole up to 7 mm long, without auricles. **Heads** radiate, pedunculate, solitary at ends of branches, forming compound inflorescence, ± oblong in outline. **Involucral bracts** 7- or 8-seriate, imbricate, grey-felty hairy and sparsely glandular, straw-like, yellowish, thick-textured. **Flowers**: ray florets distinct, white or pale to dark purple; disc florets white, yellow or purple; Apr. **Fruit** with cypsela cylindric, brown, 9–10-ribbed, glandular. **Pappus** of many, barbellate bristles, 2- or 3-seriate. Damp, rocky grassland on mountain slopes, often near rivers and streams. *Lekhisa*, *phefo*, *semanamana*, *sephomolo* (SS).




## **Pseudognaphalium** Kirp. (sthn Afr.: 3 spp.)

(Gnaphalieae)

### Key to species:

[after Hilliard: 53 (1983)]

1a Leaves concolorous; blade of lower leaves with apex obtuse; flower heads in clusters cymosely arranged; cypselae hairy . . . . . **P. luteo-album**
1b Leaves discolorous; leaf blades with apex acute to acuminate; flower heads in clusters arranged in corymbose panicles; cypselae glabrous . . . . . 2
2a At least main stem leaves decurrent, wings often reaching to node below; flower heads with up to 100 florets . . . . . **P. undulatum**
2b Main stem leaves not decurrent, at most cordate-clasping; flower heads with at least 145 florets . . . . . **P. oligandrum**

***luteo-album** (L.) Hilliard & B.L.Burtt
*Gnaphalium luteo-album* L.

Annual herb, up to 500 mm high; decumbent or erect. **Leaves** alternate, sessile; blade of lower ones narrowly obovate, becoming smaller and linear upwards, apex obtuse, those of upper leaves acute to acuminate, base clasping; greyish white-woolly, concolorous. **Heads** disciform, many in clusters cymosely arranged at branch tips. **Involucral bracts** ± 3-seriate, translucent, palest golden-brown, buff-coloured or whitish, stereome divided. **Flowers**: outer female florets filiform, many; disc florets few; whitish, tipped reddish; Aug.–May. **Fruit** with cypsela ellipsoid, myxogenic-hairy. **Pappus** of many barbellate bristles. Sandy or clayey soils

near streams and marshes, weed of cultivation. Native to southern Europe. *Jersey cudweed*; *roerkruid*, *vaalbossie* (A); *mosuoane*, *toane*, *manku* (SS); *umgilane* (Z).

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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**oligandrum** (DC.) Hilliard & B.L.Burtt

*Gnaphalium oligandrum* (DC.) Hilliard & B.L.Burtt

Annual herb, up to 1 m high, erect. **Leaves** alternate, sessile; blade oblong, oblong-linear or linear, apex acute or subacute, main stem leaves not decurrent, at most base cordate-clasping; upper surface glandular, green, drying brown, lower surface white-felted, discolorous. **Heads** disciform, with up to at least 145 flowers, several in tight clusters, arranged in corymbose panicles. **Involucral bracts** ± 4-seriate, whitish, outer 2 rows white-woolly on backs, stereome undivided. **Flowers**: outer female florets many, filiform; disc florets few; whitish or yellow; Oct.–May. **Fruit** with cypsela ellipsoid, glabrous. **Pappus** of many barbellate bristles. Dry sandy or stony places, often on roadsides.

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**undulatum** (L.) Hilliard & B.L.Burtt

*Gnaphalium undulatum* L.

*Helichrysum montosicolum* Gand.

Annual herb, up to 0.6 m high, erect. **Leaves** alternate, sessile; blade very narrowly ovate to linear, apex acute to acuminate, bases of main stem leaves decurrent, wings often reaching node below, bases of upper leaves cordate; upper surface glandular, green, drying brown, lower surface white-felted, discolorous. **Heads** disciform, with up to 100 flowers, several in tight clusters, arranged in corymbose panicles. **Involucral bracts** ± 4-seriate, whitish, woolly at base, stereome divided. **Flowers**: outer female florets many, filiform; disc florets few; yellowish; Dec.–Apr. **Fruit** with cypsela ellipsoid, glabrous. **Pappus** of many barbellate bristles. Damp places, particularly around rock outcrops or on streambanks and riverbanks. *Cudweed*; *groenbossie* (A).

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## **Pteronia** L. (sthn Afr.: 72 spp.)

(Astereae)

### Key to species:

[after Hutchinson & Phillips: 282 (1917)]

| | | |
|---|---|---|
| 1a | Leaves woolly pubescent with whitish hairs, always opposite | 2 |
| 1b | Leaves ciliate or glabrous, opposite or alternate | 4 |
| 2a | Involucral bracts acutely cuspidate-acuminate | **P. acuta** |
| 2b | Involucral bracts acute or subacute | 3 |
| 3a | Pappus purplish red | **P. erythrochaeta** |
| 3b | Pappus straw-coloured | **P. glauca** subsp. **glauca** |
| 4a | Leaves ciliate, otherwise glabrous | 5 |
| 4b | Leaves glabrous, sometimes minutely puberulous when young | 7 |
| 5a | Heads 3 together at ends of shoots | **P. tricephala** |
| 5b | Heads solitary | 6 |
| 6a | Apex of involucral bracts mucronate, recurved | **P. mucronata** |

6b Involucral bracts saccate below apex. . . . . .**P. punctata**
7a Leaves tufted or alternate . . . . . **P. glaucescens**
7b Leaves opposite . . . . . .**P. sordida**

## **acuta** Muschl.

Shrub, up to 220 mm high. **Leaves** small, opposite, sessile, connate at base, densely set; blade linear, apex acute or subobtuse, margins entire, thick, woolly pubescent with silvery hairs. **Heads** discoid, solitary, terminal. **Involucral bracts** ± 6-seriate, imbricate, bright greenish yellow, linear to linear-oblong, all with narrow, membranous margins, acutely cuspidate-acuminate, woolly villous. **Flowers**: disc florets only, yellow; Oct. **Fruit** with cypsela obconic, densely appressed-villous. **Pappus** of straw-coloured bristles, barbellate, outer more slender than inner. Limestone flats and slopes.

KarSh

## **erythrochaeta** DC.

Shrub, up to 0.9 m high; branches arching. **Leaves** small, opposite, sessile; blade ovate or ovate-elliptic, apex subacute, margins entire, finely canous-pubescent. **Heads** discoid, solitary, terminal. **Involucral bracts** 5- or 6-seriate, imbricate, very narrowly ovate, apex acute or subacute, margins membranous, minutely ciliate, tinged red, finely puberulous. **Flowers**: disc florets only, yellow; Aug.– Oct. **Fruit** with cypsela oblong-linear, densely villous. **Pappus** of purplish red bristles, barbellate, biseriate. Sandy soil, grassland. *Buchukaroo*; *boegoebos* (A).

DrGr? KarSh

## **glauca** Thunb. subsp. **glauca**

*P. candollei* Harv.
*P. glabrata* DC.

Shrub, up to 0.7 m high. **Leaves** small, opposite, sessile; blade very narrowly ovate or linear, margins entire, whitish or silvery canous-tomentose. **Heads** discoid, 4-flowered, solitary, terminal. **Involucral bracts** 5- or 6-seriate, imbricate, subacute with membranous margins, distinct midrib and band of canous hairs up the middle. **Flowers**: disc florets only, yellow; Jul.–Sep. **Fruit** with cypsela obovate, hairy in lower half. **Pappus** of straw-coloured, barbellate bristles, biseriate. Sandy soil. *Yellow buchukaroo*; *geelboegoekaroo*, *perdekaroo* (A).

KarSh

## **glaucescens** DC.

Shrub, up to 0.9 m high; straggly. **Leaves** tufted or when scattered, alternate, sessile; blade linear or very narrowly obovate-linear, apex obtuse, narrowed to base, margins entire, glabrous, succulent. **Heads** discoid, solitary, terminal. **Involucral bracts** 4-seriate, imbricate, linear, subobtuse, membranous, shortly ciliate, otherwise glabrous. **Flowers**: disc florets only, yellow; Jan.–Mar., Oct. **Fruit** with cypsela narrow, with thickened margins, shortly villous. **Pappus** of yellowish bristles, subplumose, biseriate. Brakveld, along rivers and edges of vleis. *Geelbergdraaibos* (A).

KarSh

## **mucronata** DC.

Shrub, up to 1 m high; much branched. **Leaves** small, opposite, sessile, shortly connate at base; blade linear, apex obtuse, margins serrulate-ciliolate, otherwise glabrous. **Heads**

discoid, solitary, terminal. **Involucral bracts** 6- or 7-seriate, imbricate, ovate to oblong-linear, membranous and straw-coloured, apex mucronate, recurved, margins jagged, ciliate, otherwise glabrous. **Flowers**: disc florets only, yellow; Jul., Oct. **Fruit** with cypsela narrow, densely hairy. **Pappus** of yellowish, subplumose bristles, biseriate. Plains. *Kersbossie* (A).

KarSh

### **punctata** E.Phillips

Subshrub, up to 0.6 m high; sparsely branched. **Leaves** opposite, upper ones sometimes alternate, sessile; blade obovate-oblong to linear-oblong, apex obtuse, narrowed at base, punctate with black dots, margins ciliate, otherwise glabrous. **Heads** discoid, terminal, solitary. **Involucral bracts** 5–7-seriate, imbricate, oblong-orbicular, saccate below apex, margins membranous, glabrous. **Flowers**: disc florets only, yellow; Aug.–Oct., Feb. **Fruit** with cypsela oblong, densely appressed-hairy. **Pappus** of straw-coloured, subplumose bristles, outer more slender than inner. Hillsides, river flats or vlei areas. *Perdeboegoebos* (A).

DrGr KarSh

### **sordida** N.E.Br.

Dwarf shrub, up to 0.6 m high. **Leaves** ericoid, opposite, sessile, subconnate at base, closely set; blade linear or very narrowly ovate, apex obtuse, margins entire, glabrous, minutely puberulous when young. **Heads** discoid, terminal, solitary or few together, subcorymbosely arranged. **Involucral bracts** ± 7-seriate, imbricate, oblong-linear, obtuse, green along middle with membranous margins, glabrous. **Flowers**: disc florets only, yellow; Jul.–Sep. **Fruit** with cypsela oblong, densely long-hairy. **Pappus** of straw-coloured, subplumose bristles, outer more slender than inner. Sandy soil or stony flats. *Gombos(sie)*, *perdebossie*, *swartkaroo* (A).

KarSh

### **tricephala** DC.

Shrub, up to 0.8 m high. **Leaves** opposite, sessile, almost free from each other at base; blade linear-trigonous, apex acute and hooked, glabrous or slightly scabrous on margins. **Heads** discoid, in threes at branch tips, rarely solitary. **Involucral bracts** 6- or 7-seriate, imbricate, apex acute or subacute, keeled near apex, glabrous, margins membranous and finely ciliate. **Flowers**: disc florets only, yellow; Nov.–Jan. **Fruit** with cypsela obovate-oblong, densely hairy. **Pappus** of straw-coloured, subplumose bristles, outer more slender than inner. Grassland and hill slopes. *Biltongbos* (A). According to literature; no material in PRE for FS.

AcGr

## **Pulicaria** Gaertn. (sthn Afr.: 1 sp.)

(Inuleae)

### **scabra** (Thunb.) Druce

Annual herb, up to 1.52 m high, pubescent to glabrescent. **Leaves** alternate, sessile; blade linear-oblong, decreasing in size upwards, apex mucronate, base cordate-amplexicaul, margins entire or remotely denticulate. **Heads** shortly radiate (disciform), solitary, pedunculate, arranged in large or small spreading corymbs. **Involucral bracts** 4- or 5-seriate, linear, glandular, hairy. **Flowers**: marginal florets shortly radiate, 1- or 2-seriate; marginal and disc

florets yellow; Nov.–Feb. **Fruit** with cypsela narrowly cylindric, ribbed, thinly hairy. **Pappus** of an inner row of barbellate bristles and outer row of small scales fused into a shallow corona. In marshy or damp places. *Aambeibos* (A), *umkhathula* (Z).

DrGr MsGr KarSh

## **Rosenia** Thunb. emend. K.Bremer (sthn Afr.: 4 spp.)

(Gnaphalieae)

### Key to species:

[after Bremer: 105 (1976)]

Involucre < 6 mm wide, cylindrical, with loose, apically brown bracts . . . . . **R. oppositifolia**

Involucre often > 6 mm wide, globose, rarely cyathiform or campanulate, if narrower then urceolate, with yellowish brown, appressed bracts . . . . . **R. humilis**

### **humilis** (Less.) K.Bremer

*Nestlera conferta* DC.
*N. humilis* Less.

Shrub, up to 1 m high; densely to moderately branched, compact or diffuse. **Leaves** opposite or alternate, sessile; blade variable, linear to narrowly elliptic to obovate, 1–20 mm long, glabrous and bright green, glandular, young leaves often densely tomentose. **Heads** radiate, solitary, sessile, terminal on stems. **Involucre** globose, rarely urceolate, cyathiform or campanulate, 2–11 mm wide; imbricate, outer ovate, inner gradually longer and oblong-obovate, apically scarious and spreading, sometimes brownish, mostly glabrous. **Flowers**: ray florets 5–22, blade 3.5–13.0 mm long, yellow, sometimes with brownish purple stripe on lower surface; disc florets 5–40, yellow; mainly Jun.–Feb. **Fruit** with cypsela almost terete, oblong, 2.0–4.8 mm long, glabrous or sparsely pilose, always with a basal tuft of hairs. **Pappus** of crown-like scales, minutely toothed, connate, up to 1.5 mm long, often also with 1–3 barbellate bristles. Stony soil, sand, shale or clayey karoo flats, sometimes in partially moist, partially dried-up areas. *Hartebeeskaroo*, *perdekaroo* (A).

AcGr DrGr KarSh

### **oppositifolia** (DC.) K.Bremer

*Nestlera prostrata* Harv.
*Polychaetia oppositifolia* DC.

Shrub, up to 1 m high; moderately branched, sometimes procumbent. **Leaves** opposite, sessile; blade triquetrous with projecting midrib dorsally, linear, 1.5–12.0 × 0.4–0.8 mm, tomentose on both sides, dark greyish green. **Heads** radiate, solitary, sessile, terminal on stems. **Involucre** cylindrical, rarely narrowly cyathiform–campanulate, 2–6 mm wide; bracts 12–45, imbricate, outer elliptic, inner gradually longer and obovate-oblong, apically spreading and brown with scarious margins. **Flowers**: ray florets 3–8, blade 3.0–4.5 mm long, yellow, sometimes with brownish purple stripe on lower surface; disc florets 5–15, yellow; Sep., Oct. **Fruit** with cypsela oblong, 2.0–3.3 mm long, glabrous. **Pappus** of crown-like, connate scales, up to 1.3 mm long, often also with 1 or 2 barbellate bristles. Shaly, sandy or stony karoo veld, often regarded as undesirable for grazing. *Blouperdekaroo* (A).

KarSh

## **Schistostephium** Less. (sthn Afr.: 6 spp.)

(Anthemideae)

**crataegifolium** (DC.) Fenzl ex Harv.
*S. artemisiifolium* Baker
*S. heptalobum* (DC.) Hutch., *non* Oliv. & Hiern
*S. saxicola* Hutch.
*S. villosum* Hutch.
*Tanacetum crataegifolium* DC.
*T. heptalobum* DC.
*T. heptalobum* Sch.Bip.

Perennial herb or small shrub, up to 1 m high; grey silky-villous, erect. **Leaves** alternate, sessile; blade ovate or oblong-ovate in outline, sharply and deeply toothed, pinnately lobed or cut almost to midrib, margins entire or with 1 or 2 teeth. **Heads** disciform, pedunculate, in terminal corymbs. **Involucral bracts** in several series, imbricate. **Receptacle** epaleate. **Flowers**: outer florets female, few; disc florets 4-lobed; bright yellow; Nov.–Apr. **Fruit** with cypsela of outer florets flattened and winged, of inner florets 3- or 4-angled, sometimes glandular. **Pappus** absent. Stony grass slopes, particularly around rock outcrops. *Golden flat-flower*; *bergkruie* (A); *kobo-ea-marena*, *kobo-kholo*, *leapi*, *lehakanya* (SS).

VreDm | DrGr | MsGr

## **Schkuhria** Roth (sthn Afr.: 1 sp.)

(Helenieae)

***pinnata** (Lam.) Thell.
*S. bonariensis* Hook. & Arn.

Annual herb, up to 0.6 m high. **Stems** ribbed with small, clavate glands on ribs. **Leaves** alternate; blade pinnately dissected, lobes filiform, glandular-punctate. **Heads** minutely radiate, on long, filiform peduncles, terminal and axillary, in corymbose panicles. **Involucre** turbinate; involucral bracts few, 5–8, glistening glandular-punctate. **Flowers**: 1 ray floret per head, ray and disc florets yellow; Aug., Nov.–Apr. **Fruit** with cypsela narrowly turbinate, 4-angled, appressed-hairy on angles. **Pappus** of small scales. Weed found along roadsides, overgrazed grassland, river valleys and woodland. Native to South America. *Yellow tumbleweed*, *khaki bush*; *rolkakiebos*, *kousbossie*, *hardebossie*, *kleinkakiebos*, *bitterbossie* (A); *letapiso* (SS).

VreDm | DrGr | MsGr | KarSh

## **Senecio** L. (sthn Afr.: ± 302 spp.)

(Senecioneae)

### Key to species:

[after Hilliard: 388 (1977)]

1a Flowers purple, blue, mauve, pink, pale creamy or mustard-yellow or white, never bright clear yellow nor orange-yellow. . . . . 2
1b Flowers bright clear yellow or occasionally orange-yellow. . . . . 16

2a Flower heads radiate . . . . . 3
2b Flower heads discoid . . . . . 5
3a Involucral bracts 4–6(–7) mm long . . . . . **S. polyodon** var. **subglaber**
3b Involucral bracts (7–)8–15 mm long . . . . . 4
4a Basal leaves mostly with a long, broad, flat petiole, margins deeply lobed or toothed; flower heads corymbosely arranged; involucral bracts mostly 10 mm long . . . . . **S. speciosus**
4b Basal leaves narrowed to base, but scarcely petioled, margins entire, repand or shallowly toothed; flower heads solitary to many and then with a tendency towards a racemose arrangement, but often corymbose; involucral bracts mostly 12 mm long . . . . . **S. macrocephalus**
5a Cypselae (ovaries) glabrous, or if minutely and sparsely hispid between the ribs, then leaves glabrous or nearly so . . . . . 6
5b Cypselae (ovaries) hispid at least between the ribs, or more densely hairy . . . . . 8
6a Leaf margins coarsely toothed to lyrate-pinnatifid; flower heads many in congested clusters arranged in corymbose panicles . . . . . **S. gerrardii**
6b Leaf margins entire, callose dentate or denticulate; flower heads few in open inflorescences . . . . . 7
7a Wisps of white cobwebby indumentum particularly in leaf and bract axils and on involucre . . . . . **S. discodregeanus**
7b Plants without cobwebby indumentum . . . . . **S. cathcartensis**
8a Wisps of white cobwebby indumentum particularly in leaf and bract axils and at base of the involucre . . . . . **S. anomalochrous**
8b Indumentum not cobwebby . . . . . 9
9a Flowering stems closely leafy; flower heads in congested racemose panicles, all parts clothed in long, soft, shaggy, gland-tipped hairs . . . . . **S. barbatus**
9b Plants not as described above . . . . . 10
10a Flower heads ± 2 × as long as broad; sometimes whole plant with a strong sweet scent . . . . . **S. subrubriflorus**
10b Flower heads not 2 × as long as broad; whole plant not sweetly scented . . . 11
11a Basal rosette of leaves at flowering, stem leaves often reduced . . . . . 12
11b Leaves mostly along stem at flowering . . . . . 15
12a Leaves rather stiff, narrow, erect with short, stiff, harsh glandular hairs . . . . . **S. glanduloso-pilosus**
12b Leaves soft, with dense, soft glandular-pubescence . . . . . 13
13a Plants of marshy places and streamsides; involucral bracts (4–)5(–7) mm long . . . . . **S. polyodon** var. **polyodon**
13b Plants of grassland or stony places; involucral bracts mostly (6–)7–12 mm long . . . . . 14
14a Veins several from base, ascending and ± parallel . . . . . **S. subcoriaceus**
14b Veins pinnate . . . . . **S. erubescens** var. **crepidifolius**
15a Involucral bracts (4–)5(–7) mm long; plants often in marshy or damp places or along streamsides . . . . . **S. polyodon** var. **polyodon**
15b Involucral bracts 6.5–9.0 mm long; grassland plants . . . . . **S. erubescens** var. **crepidifolius**
16a Ovaries (cypselae) variously pubescent . . . . . 17
16b Ovaries (cypselae) glabrous . . . . . 35
17a Flower heads radiate . . . . . 18
17b Flower heads discoid . . . . . 30
18a Dwarf shrub . . . . . **S. intricatus**
18b Annual or perennial herbs . . . . . 19
19a Leaves with a cobwebby, cottony or woolly tomentum at least on the lower surface or in the leaf axils, often glabrescent, hairs then persisting in wisps, particularly in the leaf axils or as silky wool on the crown, though sometimes hidden by fibres derived from old leaf bases . . . . . 20
19b Leaves glabrous, glandular or pubescent, but then hairs not cobwebby, cottony nor woolly . . . . . 22

20a Crown clothed in long silky-woolly hairs; involucral bracts (7–)8–10 mm long . . . . . **S. coronatus**
20b Crown fibrous from old leaf bases, if silky-woolly as well, then involucral bracts 6–7 mm long . . . . . 21
21a Stem leaves narrowly elliptic-obovate or oblong . . . . . **S. lydenburgensis**
21b Stem leaves linear tapering to a long, acute apex . . . . . **S. striatifolius**
22a Plants without a tuft of basal leaves, stems ± uniformly leafy . . . . . 23
22b Plants with a tuft of basal leaves, stem leaves rapidly becoming distant and bracteate upwards . . . . . 25
23a Ray florets 5–8(–11) . . . . . **S. consanguineus**
23b Ray florets at least 13 . . . . . 24
24a Involucral bracts (4–)5–6 mm long, calyculus bracts few, not overlapping, much shorter than involucre . . . . . **S. inaequidens**
24b Involucral bracts (5–)6–7(–9) mm long, calyculus bracts in 3 or 4 series, bracts overlapping, innermost ± $^1/_3$–$^1/_2$ as long as involucre **S. harveianus**
25a Leaf blade glabrous . . . . . **S. reptans**
25b Leaf blade variously pubescent and/or glandular, sometimes only margins or midrib ciliate . . . . . 26
26a Involucral bracts (ignore calyculus bracts) glabrous, except for apical tufts of hairs . . . . . **S. brevidentatus**
26b Involucral bracts (ignore calyculus bracts) glandular or pilose, sometimes sparsely so . . . . . 27
27a Involucral bracts 6.0–7.5 mm long . . . . . **S. hieracioides**
27b Involucral bracts at least 8 mm long, mostly 9 mm or more . . . . . 28
28a Flower heads 12–14 mm long . . . . . **S. hypochoerideus**
28b Flower heads 10–11 mm long, measured from base of involucral bracts to top of pappus about the time the ray florets are withering . . . . . 29
29a Basal leaves mostly > 10 mm broad, often pinnately cut; flower heads several to many in corymbose panicles . . . . . **S. hastatus**
29b Basal leaves mostly < 10 mm broad; flower heads solitary or few (± 4–6) in corymbose panicles. . . . . **S. dissimulans**
30a Plants somewhat succulent; stems and leaves glabrous; involucral bracts ± 8–12. . . . . **S. rhomboideus**
30b Herbaceous plants; stems and leaves variously pubescent and/or glandular, though sometimes sparsely so; involucral bracts ± 12–20. . . . . 31
31a Leaves pinnately cut . . . . . **S. subrubriflorus**
31b Leaves sometimes dentate but never pinnately cut. . . . . 32
32a Involucral bracts ± 6 mm long . . . . . **S. striatifolius**
32b Involucral bracts at least 9 mm long . . . . . 33
33a Involucral bracts slightly shorter than disc florets at anthesis; median lines in corolla lobes, if present, running back down inflated part of tube . . . . . **S. mooreanus**
33b Involucral bracts ± equalling disc florets; median lines in corolla lobes, if present, not running down inflated part of tube . . . . . 34
34a Tips of basal leaves acute or acuminate, margins either entire or nearly so or callose-toothed, the teeth themselves rarely toothed, though sometimes interspersed with smaller teeth . . . . . **S. asperulus**
34b Tips of basal leaves obtuse or subobtuse, margins callose-serrate, margins of at least some of the teeth with one or several minute teeth . . . . . **S. hypochoerideus**
35a Leaves with various kinds of hairs, often glabrescent or floccose, the hairs then clinging in wisps particularly in leaf and bract axils, or sometimes confined to very young leaves. . . . . 36
35b Leaf blade glabrous, completely lacking traces of woolly or cottony hairs, though the crown of plant and lowest nodes may be woolly and then there may be woolly hairs completely hidden in leaf axils . . . . . 47
36a Flower heads discoid. . . . . 37

36b Flower heads radiate . . . . . 38
37a Involucral bracts 8–9 mm long, calyculus bracts ± equalling involucre; leaf blades broadly to narrowly elliptic or narrowly obovate; plants favour open grassy places . . . . . **S. conrathii**
37b Involucral bracts 6.5 mm long, calyculus bracts shorter than involucre; leaf blades narrowly elliptic; plants favour rocky streambanks and boulder beds . . . . . **S. flanaganii**
38a Leaves harshly glandular-pubescent, not woolly, cottony nor cobwebby . . . . . **S. napifolius**
38b Leaf hairs woolly, cottony or cobwebby (glandular hairs sometimes present as well) . . . . . 39
39a Leaves pinnatisect, bipinnatisect or lyrate-pinnatifid (and then apical lobe very large, basal lobes very small, often reduced to 1 or 2 pairs of linear teeth) . . . . . 40
39b Leaves not pinnately cut, margins entire to coarsely toothed. . . . . 42
40a Leaves persistently grey- or white-woolly at least on lower surface. . . . . **S. tanacetopsis**
40b Leaves without wool at maturity though sometimes glandular . . . . . 41
41a Vegetative and inflorescence branches virgate (straight and rod-like) . . . . . **S. achilleifolius**
41b Vegetative and inflorescence branches divaricate . . . . . **S. seminiveus**
42a Involucral bracts mostly 3.5–5.5 mm long, if up to 7 mm long, then rays only 5. . . . . **S. inornatus**
42b Involucral bracts mostly 6–13 mm long, if shorter, then rays at least 8. . . . .43
43a Stem leaves decurrent in broad or narrow wings running down to node below . . . . . **S. digitalifolius**
43b Stem leaves not decurrent or occasionally very shortly decurrent, but not running down to node below. . . . . 44
44a Involucral bracts much shorter than pappus of disc florets . . . . . **S. affinis**
44b Involucral bracts ± equalling pappus of disc florets, if slightly shorter, then involucral bracts ± 16–20 . . . . . 45
45a Calyculus bracts subbiseriate, longest calyculus bracts $^1/_2$–$^2/_3$ as long as involucre . . . . . **S. albanensis** var. **albanensis**
45b Calyculus ample, the longest bracts ± equalling involucre . . . . . 46
46a Involucral bracts 8–9 mm long, calyculus bracts ± equalling involucre; leaf blades broadly to narrowly elliptic or narrowly obovate; plants favour open grassy places . . . . . **S. conrathii**
46b Involucral bracts 6.5 mm long, calyculus bracts shorter than involucre; leaf blades narrowly elliptic; plants favour rocky streambanks and boulder beds . . . . . **S. flanaganii**
47a Calyculus composed of several or many bracts, if bracts only 1 or 2, then bracts or base of involucre hairy or glandular . . . . . 48
47b Calyculus absent or composed of 1 or 2 bracts, they and base of involucre glabrous and eglandular . . . . . 52
48a Ray florets 5 . . . . . **S. inornatus**
48b Ray florets 8 or more . . . . . 49
49a Leaves technically lyrate-pinnatifid, apical lobe very large, basal lobes very small, reduced to 1 or a few pairs of linear teeth . . . . . **S. gregatus**
49b Leaves not lyrate-pinnatifid . . . . . 50
50a At least some of the leaves decurrent on the stem in broad or narrow wings reaching nearly or quite to the node below . . . . . **S. digitalifolius**
50b Leaves not decurrent or very shortly so, but not running down to the node below. . . . . 51
51a Involucral bracts 5.5–7.0 mm long, much shorter than pappus of disc florets . . . . . **S. affinis**
51b Involucral bracts 8–11 mm long, ± equalling pappus of disc florets . . . . . **S. albanensis** var. **albanensis**

52a Flower heads discoid . . . . . 53
52b Flower heads radiate . . . . . 58
53a Involucral bracts 8 or more . . . . . 54
53b Involucral bracts 4–6 . . . . . 56
54a Involucral bracts 3.5–5.0 mm long . . . . . **S. glaberrimus**
54b Involucral bracts at least 7 mm long . . . . . 55
55a Crown of plant woolly; leaf blades oblong, very narrowly elliptic or very narrowly obovate . . . . . **S. othonniflorus**
55b Crown of plant glabrous; leaf blades orbicular, obovate, deltoid or rhomboid in outline . . . . . **S. rhomboideus**
56a Side nerves briefly ascending then spreading almost at right angles to midrib before looping upwards near margins; crown glabrous . . . . . **S. isatidioides**
56b Side nerves sharply ascending . . . . . 57
57a Crown glabrous; involucral bracts 7–10 mm long . . . . . **S. adnatus**
57b Crown and basal nodes woolly; involucral bracts 4.5–7.0 mm long . . . . . **S. isatideus**
58a Involucral bracts 4 or 5, 7–11 mm long . . . . . **S. adnatus**
58b Involucral bracts mostly 7–16, if only 5, then 4–5 mm long . . . . . 59
59a Crown and leaf axils glabrous . . . . . **S. ruwenzoriensis**
59b Crown and lowest nodes woolly, wool hidden deep in leaf axils . . . . . 60
60a Leaves basal, crowded in a rosette, mostly obovate . . . **S. paucicalyculatus**
60b Leaves along stem, sometimes crowded on lower part of stem, but not rosulate nor obovate (it will not be possible to key all specimens in this group) . . . . . 61
61a Stems generally with many leaves passing ± gradually into inflorescence bracts . . . . . **S. latifolius**
61b Stems with 3–7(8) leaves passing abruptly into much smaller inflorescence bracts . . . . . 62
62a Leaves at least (8–)10 × as long as broad . . . . . **S. scitus**
62b Leaves 2–8 × as long as broad . . . . . 63
63a Leaves 4–8 × as long as broad, main side nerves (i.e. those running out and looping near margin) ± 5, often rather indistinct; involucral bracts (4–)5–7 mm long; rays (5)6–8 . . . . . **S. scitus**
63b Leaves 2–5 × as long as broad; involucral bracts 3.5–5.0 mm long; rays 2–5(8) . . . . . **S. glaberrimus**

**Fruit** with cypselae in all taxa ± terete, ribbed. **Pappus** in all taxa of copious, scabrid or barbellate bristles.

## **achilleifolius** DC.

Shrub or perennial herb, up to 1.2 m high; procumbent, decumbent or ascending; vegetative stems and inflorescence branches virgate (straight and rod-like), loosely woolly initially, soon glabrous, closely leafy. **Leaves** petiolate or sessile; blade oblong in outline, pinnatisect or bipinnatisect, up to 40 mm long, loosely woolly at first, soon glabrous. **Heads** radiate; solitary or several corymbosely arranged. **Involucral bracts** 8–12, 4.5–6.0 mm long, ± equalling disc florets, gland-dotted or with stalked glands, often cobwebby at base as well. **Flowers**: ray florets ± 13, ray and disc florets bright canary-yellow; Mar.–May. **Fruit** with cypsela (and ovary) glabrous. Rocky streambeds and along streams rooted in rock crevices, damp hollows. *Slootopdammer* (A).

VreDm | DrGr | KarSh | Zastr

## **adnatus** DC.

Perennial herb, up to 1 m high from woody rootstock, not woolly at crown; flowering stem solitary, simple below inflorescence branches, leafy throughout, glabrous. **Leaves**: blade

narrowly elliptic to linear, up to 150 × 20 mm, smaller upwards, passing into inflorescence bracts, apex acute to acuminate, base of lower leaves narrowed, half-clasping, base of upper leaves broad, ± subcordate, stem clasping, shortly decurrent, margins slightly revolute, entire, remotely and obscurely callose-denticulate or minutely and distinctly callose-toothed; ± fleshy when fresh, drying thick and leathery, side nerves ascending; glabrous. **Heads** radiate, rarely discoid, many in flat-topped, corymbose panicle. **Involucral bracts** 4 or 5, (7–)8–10 mm long, shorter than disc florets; calyculus bracts 0 or 1, very small, glabrous. **Flowers**: ray florets 1 or 2(3), rarely absent, ray and disc florets bright yellow; Dec. **Fruit** with cypsela (and ovary) glabrous. Grassland.




**affinis** DC.

*Hertia natalensis* O.Hoffm. ex Kuntze

*S. albanensis* DC. var. ?*leiophyllus* Harv.

Perennial herb, up to 1 m high from stout, woody stock crowned with old fibrous leaf bases; flowering stems solitary or several from crown, simple below inflorescence, glabrous or sometimes lightly cobwebby, glabrescent or thinly pilose, leafy. **Leaves**: blade of basal leaves linear (very narrowly obovate), up to 350 × 15 mm, $^1/_2$ of this petiolar, apex subacute, base tapering to narrowly winged petiolar part, then expanded, clasping; margins closely and minutely callose-denticulate, glabrous or rarely thinly cottony; stem leaves similar but narrower, passing upwards into inflorescence bracts, sessile, ± eared at base, shortly decurrent. **Heads** radiate, up to 35 corymbose-paniculately arranged. **Involucral bracts** ± 12, 5.5–7.0 mm long, much shorter than pappus of disc florets; calyculus bracts ample, inner ± equalling involucre or much shorter. **Flowers**: ray florets 8; ray and disc florets bright yellow; Dec.–Feb. **Fruit** with cypsela (and ovary) glabrous. Open grassland.




**albanensis** DC. var. **albanensis**

*S. leiocarpus* DC.

Perennial herb; flowering stems up to 0.9 m high from stout, woody stock, crowned with fibrous leaf bases, not woolly, mostly simple, sometimes forking once near base, forking above into compound inflorescence, glabrous or woolly cobwebby, glabrescent, distantly leafy. **Leaves**: blade of basal leaves narrowly elliptic to linear, up to 400 × 45 mm, lower half petiolar, apex acute or subacute, base contracted into petiole, margins callose-denticulate, subrevolute, ciliate, glabrous or cobwebby; stem leaves similar, soon sessile, ear-clasping, passing into bracts. **Heads** radiate, in a corymbose panicle, up to 20-headed. **Involucral bracts** 12–20, 8–11 mm long, ± equalling pappus of disc florets, often thinly cobwebby, sometimes merely with glandular margins; calyculus bracts 1- or 2-seriate, ± $^1/_2$–$^2/_3$ as long as involucral bracts. **Flowers**: ray florets 8–13; disc and ray florets yellow to orange-yellow; Nov. **Fruit** with cypsela? (and ovary) narrowly cylindrical, glabrous, rarely with few minute cilia, faintly ribbed. Grassland among rocks, often vleis or marshy areas. *Unodlwabiyele* (X).




**anomalochrous** Hilliard

Perennial herb; flowering stems up to 1 m high, solitary, simple, leafy in lower part, thinly white-woolly cobwebby initially, wool often persists in wisps only at nodes and base of involucre. **Leaves** mostly basal with blade linear to very narrowly elliptic, up to 160 × 10 mm, apex acute to subacute, base tapering to long, narrow petiole $^1/_3$–$^1/_2$ leaf length, expanded and half-clasping below, margins minutely and closely callose-crenulate; stem leaves similar, sessile,

passing into inflorescence bracts; wisps of white cobwebby indumentum in leaf and bract axils. **Heads** discoid, ± 8 × 10 mm, 3–12 corymbosely arranged. **Involucral bracts** ± 12, 6 mm long, shorter than disc florets, glabrous except for apical tuft of hairs and occasionally wisps of white cobwebby indumentum; calyculus bracts few, small. **Flowers**: disc florets only, dull purple; Dec.–Apr. **Fruit** with cypsela? (and ovary) hirsute. Grassland, often among rock outcrops or in crevices of rock sheets.

MsGr

## **asperulus** DC.

Perennial herb, up to 0.6 m high, from thick rhizome; older parts with leaf bases; flowering stems several from each crown, ± simple below inflorescence branches, harshly pubescent, remotely leafy. **Leaves** in basal rosettes; blade linear, up to 300 × 10 mm, tips acute or acuminate, gradually narrowed to flat petiole-like base, expanded below, clasping, margins ± revolute, entire or callose-toothed, larger teeth rarely denticulate, sometimes interspersed with smaller teeth; stem leaves similar but smaller, sessile, half-clasping, passing upwards into bracts; both surfaces minutely glandular scabrid. **Heads** discoid, solitary or several corymbosely arranged. **Involucral bracts** ± 14–20, 10–12 mm long, equalling disc florets; calyculus bracts sparse; all glandular-hispid. **Flowers**: disc florets only, bright yellow; Sep.–Apr. **Fruit** with cypsela (and ovary) white hispid. Poor sandy soil, readily becoming a weed along roadsides.

DrGr MsGr Zastr

## **barbatus** DC.

*S. thyrsoideus* DC.

Perennial herb; flowering stems up to 300 mm high, several from crown, slightly decumbent at base, then erect, mostly simple, closely leafy; all parts with long, soft, shaggy, gland-tipped hairs. **Leaves**: blade of basal leaves elliptic or spathulate (obovate), up to 70 × 20 mm, narrowed to broad, flat, petiole-like base, margins ± entire or repand-dentate; blade of stem leaves narrowly oblong, apex ± obtuse, base subcordate, clasping, margins denticulate. **Heads** discoid, ± 12 × 10 mm, in congested, racemose panicles. **Involucral bracts** ± 14–22, ± 10 mm long; calyculus bracts very few, short. **Flowers**: disc florets only; whitish, yellowish, purple or blue; Dec., Jan. **Fruit** with cypsela (and ovary?) hairy. Grassland. *Sticky plume senecio*. Figure 45.

MsGr

## **brevidentatus** M.D.Hend.

Perennial herb, up to 0.6 m high, from slender rootstock, crowned with fibrous leaf bases; flowering stems simple or rarely branching from crown, thinly hairy, leafy only at base. **Leaves** basal, erect or flat on ground; blade of basal leaves elliptic to subrotund, up to 150 × 60 mm, apex obtuse, base short, flat, petiole-like, margins thickened, ± entire to crenulate or denticulate, ciliate; both sides glabrous to pubescent; blade of stem leaves similar or ± spathulate to oblong, base broad, ± cordate-clasping, becoming bracts. **Heads** radiate, 1–18, in corymbs; peduncles remotely bracteate, simple, thinly hairy. **Involucral bracts** ± 20, 7–8 mm long, ± equalling disc florets, glabrous; calyculus bracts few, margins glabrous or sparsely and minutely ciliate. **Flowers**: ray florets 8–13; ray and disc florets bright yellow; Nov.–Jan. **Fruit** with cypsela? (and ovary) hairy, cylindrical, ribbed. Colonies in damp mountainous places.

MsGr



**Figure 45.** *Senecio barbatus* (Asteraceae).

ASTERACEAE

**cathcartensis** O.Hoffm.

Perennial herb; flowering stems up to 0.6 m high from stout, woody rootstock; stems 1 or few from crown, erect, branching low down or from ± middle, lower part ± glabrous, inflorescence branches ± glandular. **Leaves** ± leathery, ± dense on lower part of stem; blade narrowly or broadly elliptic, up to 110 × 30 mm, base narrow, flat, winged, petiole-like, clasping; smaller, narrower upwards, broad-based, ear-clasping; margins ± callose dentate, both surfaces glabrous or nearly so. **Heads** discoid, 10–12 × 12–15 mm, few to many, in open, corymbose panicle. **Involucral bracts** ± 16(14–18), up to 7 mm long, glandular-pilose; calyculus bracts ± 3–5, small. **Flowers**: disc florets only, purple; Nov.–Feb. **Fruit** with cypsela (and ovary) cylindrical, ribbed, ± glabrous or minutely and sparsely hispid between ribs. Damp or wet grassland.

MsGr

**conrathii** N.E.Br.

Perennial herb; flowering stems up to 1.5 m high from stout, woody rootstock, crowned with old leaf bases; simple, leafy in lower part; crown not woolly but stems and leaves initially with white-cobwebby indumentum; whole plant with strong sweetish smell. **Leaves**: blade of basal leaves broadly to narrowly elliptic or narrowly obovate, up to 600 × 110 mm, apex obtuse to subacute, tapering to broad, petiole-like clasping base, margins callose-dentate or denticulate; stem leaves similar, distant, sessile, base cordate-clasping, sometimes slightly decurrent, passing into bracts. **Heads** radiate, rarely discoid, up to ± 30 on long peduncles in corymbose panicles. **Involucral bracts** ± 16–20, (6.5–)8.0–9.0 mm long, slightly shorter than pappus of disc florets; calyculus bracts many, ± equalling involucre, margins often minutely glandular. **Flowers**: ray florets 8(–11), sometimes absent, ray and disc florets bright yellow; Dec.–Feb. **Fruit** with cypsela (and ovary) narrowly barrel-shaped, ribbed, glabrous. Open grassland.

DrGr MsGr

**consanguineus** DC.

Annual herb, up to 1 m high; stems erect, branching from or near base, glandular-hispid, leafy. **Leaves**: blade oblong in outline, pinnatisect, ± 100 × 20 mm, decreasing in size upwards, lobes up to 7 each side, distant, margins coarsely and sharply dentate; lower leaves with petiole-like base, bases of all leaves broadened, ear-clasping, glandular-pubescent. **Heads** radiate, up to ± 15 on sparsely bracteate peduncles, corymbose-paniculately arranged. **Involucral bracts** ± 14, 7.5–8.0 mm long, ± equalling disc florets, glandular-hispid; calyculus bracts few, small. **Flowers**: ray florets 6–8(–11); ray and disc florets bright yellow; Jan.–Dec. **Fruit** with cypsela (and ovary) cylindric, ribbed, hispidulous between ribs. Riverbanks, but has become a troublesome weed of cultivation. *Starvation bush*, *ragwort*; *sprinkaanbossie*, *hongerbos-senecio* (A).

VreDm AcGr DrGr MsGr KarSh

**coronatus** (Thunb.) Harv.

*Cineraria coronata* Thunb.

Perennial herb; flowering stems up to 0.75 m high, 1 or several from crown, simple below inflorescences, loosely woolly, glabrescent, leafy in lower part; crown clothed in long silky-woolly hairs and old leaf bases. **Leaves**: blade of basal leaves narrowly to broadly elliptic or round, up to 200 × 80 mm, apex acute to obtuse, narrowed to petiole-like base, expanded below, half-clasping and silky-woolly there; stem leaves similar but sessile, concentrated in lower half, passing into bracts; both surfaces lightly cobwebby, glabrescent, leaf margins minutely callose-denticulate. **Heads** radiate, 2–20 corymbosely arranged. **Involucral bracts** (16–)20, (7–)8–10 mm long, thinly woolly to glabrous; calyculus bracts few, short. **Flowers**: ray florets (8–)10–13; ray and disc florets bright yellow; Oct.–Dec. **Fruit** with cypsela (and ovary)

cylindric, ribbed, hairy. Grassland. *Grassland senecio*; *sybossie* (A); *lehlomane*, *moremoholo*, *motabo* (SS); *ikhubalo lesikhova*, *indlebe yebokwe* (X); *izonkozonko*, *ubulibazi* (Z).

VreDm | DrGr | MsGr

## **digitalifolius** DC.

Biennial herb, up to 1.5 m high; stem simple below inflorescence, glabrous, densely leafy. **Leaves**: blade of basal leaves narrowly elliptic, up to 400 × 60 mm, $^1/_3$ of this petiole-like; upper leaves smaller, passing into bracts, sessile, base narrowed, auriculate, decurrent in conspicuous wings, margins callose-denticulate; both surfaces glabrous or upper surface glabrescent, lower surface cobwebby. **Heads** radiate, many in broad, flat-topped, corymbose panicle. **Involucral bracts** ± 20, 7–8 mm long, shorter than disc florets, occasionally cobwebby; calyculus bracts many, in several series, margins glandular. **Flowers**: ray florets ± 13; ray and disc florets bright yellow; Jan. **Fruit** with cypsela (and ovary) cylindric, ribbed, glabrous. Open grassland.

DrGr

## **discodregeanus** Hilliard & B.L.Burtt

*S. dregeanus* DC. var. *discoideus* DC.

Perennial herb; flowering stem up to 1 m high, solitary, simple, leafy in lower part, thinly white-woolly cobwebby, wool persisting in wisps in leaf axils and on involucre. **Leaves**: blade variable, very narrowly obovate to broadly elliptic, up to 400 × 40 mm, apex acute to acuminate, base tapering to petiole up to $^1/_2$ length of leaf; upper leaves becoming sessile, broad-based, half-clasping, passing into bracts; margins callose-denticulate; wisps of white cobwebby indumentum in leaf and bract axils. **Heads** discoid, ± 12 × 15 mm, few to many, corymbosely or racemosely arranged. **Involucral bracts** ± 20, ± 9 mm long, shorter than disc florets, lightly calycled, with wisps of white cobwebby indumentum on involucre. **Flowers**: disc florets only, dull deep violet; Nov.–Jan. **Fruit** with cypsela (and ovary?) glabrous. Grassland. *Lehlomane-le-lenyanyane*, *mantoana*, *sebiloane* (SS).

MsGr

## **dissimulans** Hilliard

Perennial herb; flowering stem up to 400 mm high from woody rhizome, 1–several, lateral to leaf rosettes, decumbent to erect, simple below inflorescence branches, glandular-pubescent, remotely leafy. **Leaves**: blade of basal leaves linear to very narrowly obovate, up to 150 × 10(–15) mm, apex subobtuse, base broad, flat, petiole-like, clasping; margins serrate or serrulate; stem leaves few, similar, smaller, sessile, half-clasping, passing into bracts; glandular-pubescent. **Heads** radiate, 1–few, 10–11 mm long, in a corymbose panicle. **Involucral bracts** 12–20, 9–13 mm long, equalling disc florets, glandular pubescent; calyculus bracts few, small. **Flowers**: ray florets 8–13, ray and disc florets yellow; Dec.–Apr. **Fruit** with cypsela (and ovary) cylindrical, ribbed, furrows white-hispid. Moist grassy mountain slopes.

MsGr

## **erubescens** Aiton var. **crepidifolius** DC.

Perennial herb; flowering stems up to 1 m high, often solitary, decumbent or erect, glandular-pilose, simple below inflorescences, densely leafy in lower half. **Leaves**: ± along 1 side of stem; blade oblong-elliptic or oblong-spathulate, up to 140 × 20 mm, upper ± narrowly obovate to linear, apex subacute, ± narrowed to broad, cordate-clasping base, margins coarsely toothed to denticulate; both surfaces densely glandular-pilose; veins pinnate. **Heads** discoid, ± 10 ×

15 mm, up to ± 12 racemosely arranged. **Involucral bracts** 18–20, 6.5–8.0 mm long, glandular-pilose; calyculus bracts very few (up to ± 8), small. **Flowers**: disc florets only; purple or mauve; Oct.–Mar. **Fruit** with cypsela cylindric, ribbed, hispidulous between ribs. Open grassland.

VreDm | | DrGr | MsGr | | |

## **flanaganii** E.Phillips

Perennial herb; flowering stems up to ± 1.5 m high, simple, leafy in lower part; crown not woolly but stems and leaves initially with white-cobwebby indumentum, glabrous. **Leaves**: blade of lower leaves narrowly elliptic, 250 × 60 mm, apex obtuse, tapering to broad, petiole-like clasping base, margins callose-dentate or denticulate; stem leaves similar, distant, sessile, base cordate-clasping; young leaves cottony. **Heads** radiate or discoid, several in corymbose panicles. **Involucral bracts** ± 15, 6.5 mm long, slightly shorter than pappus of disc florets, apex glandular, otherwise glabrous; calyculus bracts shorter than involucre. **Flowers**: ray florets 8(–11), short, sometimes absent; ray and disc florets bright yellow; Jan., Feb. **Fruit** with cypsela (and ovary) narrowly barrel-shaped, ribbed, glabrous. Rocky streambanks and boulder beds.

| | | | MsGr | | |

## **gerrardii** Harv.

Perennial herb, up to 2 m high; stems woody, glandular pubescent, leafy throughout, branching above into inflorescences. **Leaves**: blade elliptic or ovate-elliptic, occasionally lyrate-pinnatifid, up to 200 × 120 mm, lower stem leaves ± abruptly contracted to a narrow, winged, petiole-like base, then expanded into 2 large, rounded, toothed auricles, upper broad based, clasping, margins coarsely and irregularly toothed, callose-denticulate, scabrid-pubescent. **Heads** discoid, 7–8 × 5 mm, many in cymose-corymbose clusters, arranged in large, corymbose panicle. **Involucral bracts** ± 10–12, 5–6 mm long, glandular-hispid; calyculus bracts very few. **Flowers**: disc florets only, purple; Jan.–Mar. **Fruit** with cypsela (and ovary) glabrous. Forest margin scrub or damp marshy hollows.

| | | | MsGr | | |

## **glaberrimus** DC.

*S. inophyllus* E.Phillips & C.A.Sm.

Perennial herb; flowering stems up to 0.6(–0.9) m high, solitary, simple below inflorescences, leafy, glabrous; crown and leaf axils woolly. **Leaves** few, glabrous, concentrated in lower part of stem passing into bracts; blade narrowly elliptic, oblong-elliptic, ovate or suborbicular, up to 140 × 100 mm, at least middle leaf (1)2–4(5) × as long as broad, apex obtuse, acute or acuminate, base ± cordate-clasping, often very shortly decurrent, margins entire or remotely and obscurely callose-denticulate, often ± revolute. **Heads** radiate or discoid, few to many on sparsely bracteate peduncles, corymbose-paniculately arranged. **Involucral bracts** 6–8(–10), 3.5–5.0 mm long, much shorter than disc florets; calyculus bracts 0–2, very small. **Flowers**: ray florets 5, sometimes fewer or absent, rarely 8; ray and disc florets bright yellow; Oct.–Apr. **Fruit** with cypsela (and ovary) ribbed, glabrous. Grassland.

| | | DrGr? | MsGr | | |

## **glanduloso-pilosus** Volkens & Muschl.

*S. serratus* (Thunb.) Sond.

Perennial herb; flowering stems up to 0.6 m high, 1–4, erect, simple below, branching into inflorescences; harshly glandular-pubescent. **Leaves**: mostly in a basal rosette; blade narrowly

elliptic, up to ± 150 × 20 mm, tapering to flat, narrowly winged, petiole-like base, margins coarsely and irregularly toothed, larger teeth and sinuses often denticulate; stem leaves similar, smaller, sessile, confined to lower half of stem; with short, stiff, harsh, glandular hairs. **Heads** discoid, ± 10 × 8 mm, few to many in corymbose panicles. **Involucral bracts** 12–14, 6.5–10.0 mm long, gland-tipped hairy; calyculus bracts 2 or 3, short. **Flowers**: disc florets only, purple or dull yellow; Nov. **Fruit** with cypsela (and ovary) hispid between ribs. Open grassland.

DrGr MsGr

## **gregatus** Hilliard

*S. serratuloides* DC. var. *dieterlenii* Thell.
*S. serratuloides* DC. var. *gracilis* Harv.
*S. serratuloides* DC. var. *holubii* Thell.
*S. serratuloides* DC. var. *rehmannii* Thell.

Perennial herb, up to 1 m high; from woody rootstock, stems solitary, simple or branching low down, glabrous, densely leafy in upper part. **Leaves**: blade narrowly ovate to elliptic (technically lyrate-pinnatifid with large apical lobe and few small basal lobes), 120 × 13 mm, apex acute, base narrowed, half stem-clasping, margins regularly serrulate with 1 to 3 pairs of elongated lobes at base; glabrous. **Heads** radiate, many in terminal, congested, corymbose panicle. **Involucral bracts** 12, 3.0–3.5 mm long, ± $^1/_2$ as long as disc florets, glabrous; calyculus bracts similar. **Flowers**: ray florets 8–13; ray and disc florets yellow; Mar.–May. **Fruit** with cypsela (and ovary) glabrous. On streambanks, often growing in water. *Unsukumbili* (Z).

DrGr MsGr

## **harveianus** MacOwan

Perennial herb, up to 1 m high; branching from base, woody, glabrous or very sparsely hairy, leafy, often with axillary leaf tufts. **Leaves**: blade linear, up to 100 × 10 mm, apex acute, base half-clasping, often hastately eared, lower leaves sometimes narrowed to petiole-like base, margins ± revolute, denticulate, sometimes more coarsely toothed or pinnately lobed; glabrous. **Heads** radiate, few to many in open, corymbose panicles. **Involucral bracts** ± 20, (5–)6–7(–9) mm long, slightly shorter than or equalling disc florets; calyculus bracts ample, in 3 or 4 series, bracts overlapping, innermost ± $^1/_3$–$^1/_2$ as long as involucre. **Flowers**: ray florets ± (7–)13; ray and disc florets canary-yellow; Oct.–Apr. **Fruit** with cypsela (and ovary) hispid between ribs. Grassy mountainsides.

DrGr MsGr KarSh

## **hastatus** L.

Perennial herb, up to 400 mm high; glandular-pubescent to softly pilose, rhizomatous; flowering stems several, lateral to leaf rosettes, simple below inflorescences or branching low down, leafy. **Leaves** blade of basal leaves oblong or obovate in outline, pinnatifid or lobulate, up to 200 × 40 mm, tapering to broad, flat, half-clasping, petiole-like base, lobes oblong, rounded, margins ± toothed or also lobed, sinuses broad; stem leaves similar to smaller, upper linear, base eared, half-clasping, margins serrate, passing into bracts; glandular-pubescent to softly pilose. **Heads** radiate, few to ± 20, 10–11 mm long, in a spreading, corymbose panicle; peduncles long. **Involucral bracts** 12–14, 9–12 mm long, ± equalling disc florets, glandular-pubescent to softly pilose; calyculus bracts very few. **Flowers**: ray florets 8–12; ray and disc florets yellow; Aug.–May. **Fruit** with cypsela (and ovary) narrowly cylindrical, ribbed, furrows white-hispid. Rocky areas. *Groundsel*.

DrGr MsGr KarSh

**hieracioides** DC.

*S. johannesburgensis* S.Moore

Perennial herb, up to 350 mm high from stout, woody stock; flowering stems several from crown, simple or branching from near base, remotely leafy, glandular-pubescent. **Leaves** mostly basal with blade narrowly elliptic, up to 100 × 10 mm, apex acute, narrowed to petiole-like base for ± $^1/_2$ length of leaf, broad below, half-clasping, margins irregularly serrate to pinnatisect, then lobes dentate, sinuses obliquely rounded; stem leaves decreasing in size upwards passing into bracts, sessile, eared, half-clasping; glandular-pubescent. **Heads** radiate, several corymbose-paniculately arranged. **Involucral bracts** ± 13–18, 6.0–7.5 mm long, ± equalling disc florets; calyculus bracts very few, short; all glandular-pubescent. **Flowers**: ray florets 8–11; ray and disc florets bright yellow; Sep.–Mar. **Fruit** with cypsela (and ovary) hispid, narrowly cylindric, ribbed. Poor grassland and among rocks, often becoming a weed along roadsides.

DrGr | MsGr | KarSh

**hypochoerideus** DC.

Perennial herb, up to 0.9 m high from thick, branched rootstock; flowering stems 1 or several from each crown, lateral to leaf rosettes, simple below inflorescences, leafy, white glandular-hairy; older parts covered with leaf bases. **Leaves** in many dense rosettes; blade oblong or narrowly obovate, up to 300 × 40 mm, apex obtuse, tapering to broad, flat, petiole-like, clasping base, bases persistent, ± thick-textured, rigid, margins doubly callose-serrate; both sides harshly glandular-hairy; stem leaves ± similar, smaller, sessile, bases cordate clasping. **Heads** discoid or radiate, 3–10, 12–14 mm long, in a corymbose panicle. **Involucral bracts** 16–20, 10–13 mm long, ± equalling disc florets; calyculus bracts sparse; all glandular-pilose. **Flowers**: ray florets (when present) 8–13; ray and disc florets bright yellow; Jan., Oct. **Fruit** with cypsela (and ovary) narrowly cylindrical, ribbed, white-hairy. Montane, colonies on rocky, grassy slopes.

MsGr

**inaequidens** DC. (including *S. laevigatus* Thunb. var. *integrifolius* Harv.)

*S. burchellii* DC. in part

Perennial herb, up to 1 m high; branching from base, woody, glabrous or sparsely hairy, leafy, often with axillary leaf tufts. **Leaves**: blade linear to very narrowly elliptic, up to 100 × 10 mm, apex acute, base half-clasping, often hastately eared, lower leaves sometimes narrowed to petiole-like base, margins ± revolute, denticulate, sometimes coarsely dentate or pinnately lobed; glabrous, stems uniformly leafy. **Heads** radiate, few to many on long, bracteate peduncles arranged in open, corymbose panicles. **Involucral bracts** 20, (4–)5(–7) mm long, slightly shorter than or equalling disc florets; calyculus bracts few, often dark tipped, not overlapping, much shorter than involucre. **Flowers**: ray florets 7–13; ray and disc florets canary-yellow; Jul.–Jun. **Fruit** with cypsela (and ovary?) cylindric, hispid between ribs. Among rock outcrops on steep, moist, grassy mountainsides and along rocky watercourses, becoming a weed in disturbed places. *Canary weed*; *geelopslag* (A). Often misidentified as *S. burchellii* DC., but that species only occurs in WC. Figure 11A, p. 8.

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

**inornatus** DC.

Perennial herb, up to 1.8 m high; rootstock stout, woody, crowned with old leaf bases; flowering stem solitary, simple below inflorescence, initially light cobwebby, glabrescent, leafy. **Leaves**: blade of basal leaves elliptic, up to 600 × 50 mm, lower half petiolar, base broad, clasping, apex acute to acuminate, margins callose-crenulate or denticulate; stem leaves similar, soon sessile, base broad, ± auricled, ± decurrent, sometimes stem wings broad; glabrous, sometimes with

traces of cobwebby wool or minutely puberulous below. **Heads** radiate, many in a flat-topped, corymbose panicle. **Involucral bracts** 10–12, 3.5–7.0 mm long, shorter than disc florets; calyculus bracts few, much shorter than involucre; base hairy or glandular. **Flowers**: ray florets 5; ray and disc florets bright yellow; Dec.–May. **Fruit** with cypsela (and ovary) fusiform, ribbed, glabrous. Grassland, colonies. *Lehlongoana-le-leholo* (SS); *inkanga*, *uhlabo* (Z).

VreDm | | DrGr | MsGr | | |

## **intricatus** S.Moore

Dwarf shrub, up to 0.45 m high, branches rigid, semispinescent, canous-tomentose. **Leaves** sometimes in fascicles; blade obovate or oblong-obovate, ± 14 × 9 mm, apex obtuse, narrowed to petiole-like base, margins lobed and dentate; lower surface faintly and sparsely tomentose. **Heads** radiate, solitary, terminal, pedunculate. **Involucral bracts** 12, ± 7 mm long, cobwebby, calyculus bracts ± 3 mm long. **Flowers**: 1–4 ray florets; ray and disc florets yellow; May, Oct. **Fruit** with cypsela linear, hairy. Calcareous loam over limestone.

| | | | | KarSh | |

## **isatideus** DC.

Perennial herb; flowering stem up to 1.5 m high from stout, woody stock; solitary, simple below inflorescences, leafy in lower part, glabrous; crown and basal nodes woolly. **Leaves**: blade of lower leaves oblong-obovate, up to 200 × 65 mm, contracted into broad, flat, winged petiole, expanded below and half-clasping, apex obtuse, margins obscurely or distinctly denticulate or serrulate, side nerves sharply ascending; upper leaves similar, few, distant, soon sessile, broad-based, stem-clasping, often shortly decurrent, passing into bracts; glabrous. **Heads** discoid, many in congested, corymbose clusters, arranged in large corymbose panicle. **Involucral bracts** 4 or 5, (5–)7 mm long, reaching only to base of expanded part of corollas; calyculus bracts 0–2, very small. **Flowers**: disc florets only, bright yellow; Nov.–Mar. **Fruit** with cypsela (and ovary) ribbed, glabrous. Grassland. *Dan's cabbage*, *poisonous ragwort*; *blouvleibossie* (A); *lebato lehlomane-le-leputsoa* (SS).

| | | DrGr | MsGr | | |

## **isatidioides** E.Phillips & C.A.Sm.

*S. isatideus* DC. var. *macrophyllus* Thell.
*S. macrophyllus* E.Phillips

Perennial herb; flowering stem up to 2.4 m high, solitary, simple below inflorescences, closely leafy throughout, glabrous; stout woody stock not woolly at crown. **Leaves**: elliptic, up to 200 × 115 mm, decreasing slightly in size upwards, apex abruptly contracted to small apiculus, base rounded, stem-clasping, shortly decurrent, margins finely and closely callose-dentate, side veins briefly ascending then spreading almost at right angles to midrib before looping upwards near margin; glabrous. **Heads** discoid, many in congested, corymbose clusters, arranged in large corymbose panicle. **Involucral bracts** 4 or 5, 7–9 mm long, reaching only to base of expanded part of corollas; calyculus bracts 0–2, very small. **Flowers**: disc florets only, bright yellow; Jan.–May. **Fruit** with cypsela? (and ovary) glabrous. Forest margin or other damp situations.

| | | | MsGr | | |

## **latifolius** DC.

*S. sceleratus* Schweick.

Perennial herb, up to 1 m high; glabrous but crown and lowest nodes woolly, wool hidden deep in leaf axils; stems solitary, occasionally 2 from crown, usually simple below inflorescence

branches, ± uniformly leafy, up to inflorescence branches. **Leaves**: blade oblong, oblong-elliptic, oblong-ovate, occasionally obovate, up to 140 × 80 mm, decreasing only slightly upwards, apex subacute to acute, base ± cordate, half-clasping, sometimes slightly decurrent, margins thickened, distantly callose-denticulate, occasionally entire, main side veins sharply ascending; glabrous. **Heads** radiate, many in large, well-branched, corymbose panicles. **Involucral bracts** 7 or 8, (4.0–)5.5–6.0(–7.0) mm long, much shorter than disc florets; calyculus bracts absent or 1 or 2, very small. **Flowers**: ray florets (1–4)5; ray and disc florets bright yellow; Nov., Dec. **Fruit** with cypsela (and ovary) glabrous. Grassland or open woodland, often disturbed places. *Molteno-disease plant*; *gifbossie-senecio*, *krakerbossie* (A); *iyesa lasekaya*, *idwara* (X), *idwakala*, *ingcobangcoba*, *uhlambahlanyana*, *uqedizwe* (Z).

Zastr

## **lydenburgensis** Hutch. & Burtt Davy

*Hertia kuntzei* O.Hoffm. ex Kuntze
*S. verdoorniae* R.A.Dyer

Perennial herb, up to 1.3 m high, from thick, woody rootstock, crown silky-woolly and with old leaf bases; flowering stem solitary, simple below inflorescences, loosely cottony or woolly, densely leafy. **Leaves**: few, basal with blade narrowly elliptic-obovate or oblong, up to 150 × 10 mm, apex acute, narrowed to broad, petiole-like base, expanded, half-clasping, margins closely and minutely callose-denticulate; both surfaces black-punctate, thinly woolly or cobwebby, sometimes glabrescent or hairs persisting at base; stem leaves similar, sessile, base eared, half-clasping, passing into bracts. **Heads** radiate, up to 40 corymbose-paniculately arranged; peduncles thinly woolly, cottony or glabrous. **Involucral bracts** ± 12, 6–7 mm long; shorter than disc florets; calyculus bracts few, longest ± equalling involucral bracts; all loosely woolly or cottony or nearly glabrous. **Flowers**: ray florets (5–)8; ray and disc florets bright yellow; Nov.–Jan. **Fruit** with cypsela (and ovary) villous. Grassland.

DrGr MsGr

## **macrocephalus** DC.

*S. gyrophyllus* Klatt

Perennial herb; flowering stems up to 600 mm high, several from crown, mostly simple, decumbent then erect, softly glandular-pilose, sparsely to closely leafy. **Leaves** mostly basal with blade oblong to spathulate, up to 150 × 30 mm, narrowed to base but scarcely petioled, apex subacute to obtuse, margins entire, repand or shallowly toothed; shortly glandular-pubescent, sometimes lightly cobwebbed below at first; stem leaves smaller, base subauricled, clasping, passing into bracts. **Heads** radiate, 12–15 × 15–20 mm, few to many racemosely arranged, inflorescence branches glandular-hairy. **Involucral bracts** 16–20, (10–)12(–15) mm long, ± villous to pilose with long gland-tipped hairs; calyculus bracts ± 3–5, short. **Flowers**: ray florets 12 or 13(–18); ray and disc florets deep pink to purple; Sep.–Nov., Apr. **Fruit** with cypsela (and ovary) with long, white hairs. Open grassland.

MsGr

## **mooreanus** Hutch. & Burtt Davy

Perennial herb, up to 0.6 m high from stout, woody stock; flowering stems several from crown, lateral to rosettes, simple below inflorescences, thinly pilose with long, white, spreading hairs, leafy. **Leaves**: blade of basal leaves narrowly obovate, up to 250 × 40 mm, tapering to flat, petiole-like base comprising $^1/_2$ leaf length, expanded and half-clasping, apex obtuse, margins irregularly callose-serrate or serrulate; both surfaces glabrous but with long white hairs on midrib; stem leaves similar but smaller, sessile, base half-clasping. **Heads** discoid, up to ± 10 corymbose-paniculately arranged. **Involucral bracts** 16–20, 9–12 mm long, little shorter than

disc florets; calyculus bracts sparse; all with long hairs on back. **Flowers**: disc florets only; corolla lobes with median line running down inflated part of tube, yellow; Nov.–Apr. **Fruit** with cypsela (and ovary) cylindric, ribbed, hispid between ribs. Open grassland, often in damp situations.

MsGr

**napifolius** MacOwan

Perennial herb, up to ± 0.75 m high; stem solitary, erect, simple below inflorescence, harshly glandular-pilose to nearly glabrous, leafy mainly in lower part. **Leaves**: blade lyrate-pinnatisect, up to 200 × 90 mm, lobes up to ± 5 each side, apical lobe triangular in outline, sinuately lobed, lateral lobes ± oblong, upper margins of larger lobes also shallowly lobed, all margins coarsely, irregularly and sharply dentate; blade of lowest leaves tapering into broad, flat, remotely dentate, half-clasping petiole-like base; upper leaves broad-based, auriculate, dentate, half-clasping; all harshly glandular-pubescent on both surfaces. **Heads** radiate, many in congested clusters in compact, rounded, corymbose panicle. **Involucral bracts** ± 20, 9–12 mm long, equalling disc florets, glandular-hispid; calyculus bracts few, long, glandular mainly on margins. **Flowers**: ray florets 8; ray and disc florets bright yellow; Nov.–Jan. **Fruit** with cypsela (and ovary) cylindric, ribbed, glabrous. Open grassland, often in moist depressions or gullies.

MsGr

**othonniflorus** DC.

*Brachyrhynchos eupatorioides* Less.
*Doria denticulata* Thunb.

Perennial herb; flowering stems up to 0.6(–1.0) m high from rhizomatous stock; crown of plant and leaf axils woolly, stems several from crown, simple below inflorescence branches, leafy in lower part, glabrous. **Leaves** crowded on lower half of stem; blade oblong, very narrowly elliptic or very narrowly obovate, 120 × 15 mm, smaller and more distant upwards, apex acute to subacuminate, base narrowed, sessile, margins entire or distantly callose-denticulate, often ± revolute; glabrous, ± fleshy. **Heads** discoid, 1–8, corymbose-paniculately arranged. **Involucral bracts** 12(–16), 8.5–11.0 mm long, shorter than disc florets; calyculus bracts 1 or 2, very small. **Flowers**: disc florets only, bright yellow; Nov.–Feb. **Fruit** with cypsela (and ovary) glabrous. Grassland, often on steep slopes and among rock outcrops.

DrGr MsGr Zastr

**paucicalyculatus** Klatt

*S. launayaefolius* O.Hoffm.

Perennial herb; flowering stems up to 1 m high, from stout rhizomatous stock, central to each leaf rosette, simple below inflorescences; glabrous except for woolly crown and wool hidden in leaf axils. **Leaves** crowded in a basal rosette; blade mostly obovate to elliptic, up to 150 × 50 mm, tapering to broad, flat, petiole-like clasping base, apex obtuse to subacute, margins callose-denticulate to -dentate, sometimes callose-dentate, callose-serrate; stem leaves few, reduced, distant, passing into bracts; glabrous. **Heads** radiate, few to many, corymbose-paniculately arranged. **Involucral bracts** 8–12, 6.0(–7.5) mm long, much shorter than disc florets; calyculus bracts 1 or 2, very small. **Flowers**: ray florets (5–)8; ray and disc florets bright yellow; Sep.–Jan. **Fruit** with cypsela (and ovary) glabrous, cylindric, ribbed. Grassland in black, peaty, waterlogged soil.

DrGr MsGr

**polyodon** DC. var. **polyodon**

Perennial herb, up to 0.75 m high; stem usually solitary, simple below, branching above into inflorescence, ± decumbent at base and rooting, then erect, glandular-pubescent or nearly glabrous, leafy. **Leaves** in a basal rosette; blade spathulate or elliptic, up to 300 × 40 mm, including petiole, apex subacute to obtuse, margins coarsely toothed to sinuate-denticulate, both surfaces glandular-pubescent; stem leaves similar but smaller, base cordate-clasping. **Heads** discoid, 7–8 × 10–12 mm, few to many corymbose-paniculately arranged. **Involucral bracts** 12–20, 4–5(–7) mm long, glandular-pubescent; calyculus bracts few. **Flowers**: disc florets only, whitish or pale violet to purple, sometimes becoming yellowish; Oct.–Dec. **Fruit** with cypsela (and ovary) cylindric, ribbed, hispid between ribs. Along marshy streamsides, in marshes or in seasonally waterlogged grassland. *Ihubo* (Z).

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**polyodon** DC. var. **subglaber** (Kuntze) Hilliard & B.L.Burtt

*S. concolor* DC. var. *subglaber* O.Hoffm. ex Kuntze

Perennial herb, up to 0.75 m high; stem usually solitary, simple below, branching above into inflorescence, ± decumbent at base and rooting, then erect, glandular-pubescent or nearly glabrous, leafy. **Leaves** in a basal rosette; blade spathulate or elliptic, up to 300 × 40 mm, including petiole, apex subacute to obtuse, margins coarsely toothed to sinuate-denticulate, both surfaces glandular-pubescent; stem leaves similar but smaller, base cordate-clasping. **Heads** radiate, 7–8 × 10–12 mm, few to many corymbose-paniculately arranged. **Involucral bracts** 12–20, 4–5(–7) mm long, glandular-pubescent; calyculus bracts few. **Flowers**: ray florets (8–)12–13(–18), mauve, magenta or bluish; disc florets whitish or pale violet to purple, sometimes becoming yellowish; Sep.–Feb. **Fruit** with cypsela (and ovary) cylindric, ribbed, hispid between ribs. Along marshy streamsides, in marshes or in seasonally waterlogged grassland.

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**reptans** Turcz.

Perennial herb, stoloniferous; flowering stems up to 100 mm high, simple, erect, short, harshly glandular-pubescent; leafy below. **Leaves**: blade of basal leaves linear-oblong, ± 25–50 × 3 mm, apex obtuse, margins inciso-dentate or subpinnatifid, petiolate, glabrous; stem leaves smaller, sessile. **Heads** radiate, solitary. **Involucral bracts** 18–20, ± 7 mm long, slightly shorter than disc florets, glandular; calyculus bracts few, short. **Flowers**: ray florets ± 8–10; ray and disc florets yellow; Aug.–Jan., May, Jun. **Fruit** with cypsela (and ovary) puberulous. Edges of pans or in vleis; occasionally in sandy soil among rocks on hills.

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**rhomboideus** Harv.

*S. dieterlenii* E.Phillips

Perennial herb; flowering stems up to 1 m high from tuberous, woody rootstock; stems 1 or several from crown, simple below inflorescence branches, densely leafy near base, glabrous, fleshy. **Leaves**: blade rhomboid or obovate, up to 200 × 80 mm, apex subacute, mucronate, cuneate and tapering to a broad, flat, petiole-like, half-clasping base, margins distantly callose-denticulate in upper part, sinuate-lobed or more sharply dentate; fleshy, glabrous. **Heads** discoid, few to many, corymbosely to paniculately arranged. **Involucral bracts** 10–12, (8.0–)9.5–10.0 mm long, ± equalling disc florets; calyculus bracts 1 or 2, very small. **Flowers**: disc florets only, bright yellow; Oct.–Jan. **Fruit** with cypsela (and ovary) hispid between ribs or

glabrous. Grassland, often among rock outcrops, or on margins of scrubby growth. *Lekoto-la-litšoene*, *lelutla-la-pula* (SS).

DrGr MsGr

**ruwenzoriensis** S.Moore
*S. othonniformis* Fourc.
*S. paucifolius* DC.

Perennial herb; flowering stems up to 0.75 m high from tuberous, woody rootstock, 1 or several from crown, simple below inflorescence branches, closely leafy near base, nude above, glabrous. **Leaves**: blade narrowly to broadly elliptic, up to 100 × 40 mm, triplinerved, apex obtuse to subacute, base broad or slightly narrowed, half-clasping, margins entire or distantly callose-denticulate; somewhat fleshy, glabrous. **Heads** radiate, up to ± 15 on long peduncles, corymbose-paniculately arranged. **Involucral bracts** 10–12, (6.0–)7.5(–10.0) mm long, ± equalling disc florets; calyculus bracts 1 or 2, very small. **Flowers**: ray florets 8–10; ray and disc florets bright yellow; Nov.–Apr. **Fruit** with cypsela (and ovary) cylindric, ribbed, glabrous. Grassland, particularly around rock outcrops.

DrGr MsGr KarSh

**scitus** Hutch. & Burtt Davy

Perennial herb; flowering stems up to 0.6 m high from woody stock; glabrous except for woolly crown and woolly hairs hidden in leaf axils; stems solitary, simple below inflorescence branches, leafy mainly in lower part. **Leaves**: 3–6, passing abruptly into inflorescence bracts; blade linear to very narrowly ovate, up to ± 160 × 40 mm, at least middle leaf (4–)6–10 × or more as long as broad, apex acute to acuminate, base clasping, often minutely eared, sometimes slightly decurrent, margins entire or distantly callose-denticulate, ± revolute, side nerves sharply ascending, glabrous. **Heads** radiate, many, corymbose-paniculately arranged. **Involucral bracts** (8–)12(–16), (4–)5–6 mm long, much shorter than disc florets; calyculus bracts 1 or 2, very small. **Flowers**: ray florets (5, 6)8(10); ray and disc florets bright yellow; Nov., Dec. **Fruit** with cypsela (and ovary) glabrous. Grassland.

MsGr

**seminiveus** J.M.Wood & M.S.Evans

Dwarf shrub, up to 0.25 m high; compact, stems erect or procumbent and rooting, divaricate, glabrous or loosely woolly at first, upper parts and peduncles glandular-pilose, densely leafy. **Leaves**: blade oblong in outline, pinnatisect or bipinnatisect, up to 30 mm long, including broad, half-clasping petiole-like base, lobes up to 4 mm long, young unfurled leaves densely white-woolly (white-woolly leaf buds), later glabrous, with stalked glands. **Heads** radiate, 1–3 in terminal corymbs. **Involucral bracts** ± 12, 6–8 mm long, ± equalling disc florets, glandular-pilose, base often cobwebby. **Flowers**: ray florets ± 13; ray and disc florets bright canary-yellow, Jan.–Mar. **Fruit** with cypsela (and ovary) cylindrical, ribbed, glabrous. Montane, rocky areas.

MsGr

**speciosus** Willd.
*S. concolor* DC.

Perennial herb; flowering stems up to 0.7 m high, from stout, woody stock, several from crown, often decumbent at base, then erect, nearly glabrous to softly glandular-pilose, simple below,

forking above into corymbose inflorescence, sparsely leafy. **Leaves** mostly in basal rosettes; blade obovate to elliptic, ± 400 × 110 mm, tapering to broad, flat petiole-like clasping base, apex subacute to obtuse, margins pinnately or sinuately lobed, lobulate or coarsely deltoid-toothed, margins of lobes often denticulate; glandular-pubescent, glabrous or lightly cobwebby below; stem leaves smaller, passing into bracts, base subauricled, clasping. **Heads** radiate, 12–15 × 12–15 mm, few to many, corymbosely or sometimes subracemosely arranged. **Involucral bracts** 16–20, (9–)10(–12) mm long, glandular-pilose to glabrous; calyculus bracts very few, short. **Flowers**: ray florets 8–12–14(–20); ray and disc florets deep pink to purple; Sep., Oct., Jan. **Fruit** with cypsela (and ovary) cylindric, pubescent between ribs. Damp situations such as damp grassland or marshy depressions. *Sebea-mollo-se-senye-nyane* (SS); *idambiso* (X); *ibohlololo*, *idambiso*, *inzwabuhlungu* (Z).




**striatifolius** DC.

Perennial herb, up to 0.6 m high from woody rootstock, crowned with old leaf bases; flowering stem solitary, simple below inflorescence, very lightly cobwebby, hairs eventually clinging in woolly patches, persisting at crown among leaf bases, leafy throughout. **Leaves**: blade of basal leaves linear, up to 400 × 80 mm, tapering to long, acuminate apex, narrowed to petiole-like base, expanded below, clasping, margins closely and minutely callose-denticulate, sometimes undulate, often revolute; stem leaves similar, sessile, base often auricled, half-clasping; usually with traces of wool, otherwise glabrous, glabrescent. **Heads** discoid or radiate, many corymbose-paniculately arranged. **Involucral bracts** 16–20, 6 mm long, shorter than disc florets; calyculus bracts several, short; all thinly woolly especially at base. **Flowers**: ray florets, when present, 8; ray and disc florets bright yellow; Oct.–Jan. **Fruit** with cypsela (and ovary) villous. Grassland.




**subcoriaceus** Schltr.

*S. basutensis* Thell.

Perennial herb; flowering stem up to 300 mm high, 1 or several from stout, woody stock, simple below inflorescences, thinly glandular-pilose. **Leaves** mostly basal, pressed flat on ground; blade subrotund to broadly spathulate or rhomboid, up to ± 50 × 40 mm, apex obtuse or rounded, narrowed to a short, flat, broad, petiole-like base, half-clasping, margins entire or obscurely dentate, veins several from base, ascending and ± parallel; both leaf surfaces thinly pilose, some hairs gland-tipped; stem leaves reduced, few, distant. **Heads** discoid, 8 × 10 mm, 3–5 corymbosely arranged on long, nude, glandular-pubescent peduncles. **Involucral bracts** 16–20, 6 mm long, equalling disc florets, glandular-pilose; calyculus bracts 1 or 2. **Flowers**: disc florets only, whitish or dull yellow, ageing brown, sometimes tips of lobes dull blue; Oct.–Jan., Apr. **Fruit** with cypsela (and ovary) ribbed, white-hispid between ribs. Short stony grassland.




**subrubriflorus** O.Hoffm.

*S. pseudo-rhyncholaenus* Thell. excl. var. *auriculatus* Thell.
*S. viscidus* N.E.Br.

Perennial herb, up to 0.6 m high; tufts of stems from woody stock, often branching from near base, leafy, glandular-pubescent, viscid, whole plant with strong sweet scent. **Leaves**: blade of basal leaves pinnatifid, up to 200 × 40 mm, $^1/_3$ of this petiolar, lobes ± oblong, margins coarsely toothed or lobed; stem leaves similar, sessile, often ear-clasping; glandular-pubescent. **Heads** discoid, 10 × 5 mm, few to many in spreading, corymbose panicles. **Involucral bracts** 8–12,

6–8 mm long; glandular-pubescent; calyculus bracts very few, short. **Flowers**: disc florets only, pale mauve, white or deep yellow; Dec., Jan., Apr. **Fruit** with cypsela (and ovary) hispid between ribs. Rocky, grassy mountainsides. *Mahoaneng*, *mahoanyana* (SS).

DrGr MsGr

### **tanacetopsis** Hilliard

Dwarf shrub, up to 0.45 m high; spreading, stems erect, ascending or pendulous, grey-woolly, glabrescent or densely glandular-pilose, closely leafy. **Leaves**: blade oblong in outline, pinnatisect to bipinnatisect, up to 30 mm long, including broad, ± clasping, petiole-like base, lobes up to 4 mm long; grey-woolly or glandular-pilose. **Heads** radiate, in an open, corymbose panicle. **Involucral bracts** ± 12, 4–7 mm long, ± equalling disc florets, glandular-pilose, often cobwebby at base as well. **Flowers**: ray florets ± 13; ray and disc florets bright canary-yellow; Jan.–Apr., Oct. **Fruit** with cypsela (and ovary) cylindrical, ribbed, glabrous. Montane, cliff faces, rock sheets.

DrGr MsGr Zastr

## **Sonchus** L. (sthn Afr.: 10 spp.)

(Cichorieae)

### Key to species:

[after Hilliard: 622 (1977)]

1a Cypselae strongly compressed with broad marginal wings . . . . . 2
1b Cypselae narrowly ellipsoid or narrowly obovate, if somewhat compressed, marginal ribs narrow and thick, not wing-like . . . . . 3
2a Leaves stout, firm, margins irregularly dentate; cypselae with flat, broad, glabrous marginal wings . . . . . **S. asper** subsp. **asper**
2b Leaves more rigid and leaf margins more prickly; cypselae with ciliate, recurved margins . . . . . **S. asper** subsp. **glaucescens**
3a Cypselae distinctly transversely wrinkled, usually rough with minute retrorse tubercles at least towards both extremities . . . . . **S. oleraceus**
3b Cypselae not transversely wrinkled and without retrorse tubercles though occasionally minutely ciliate or glandular . . . . . 4
4a Involucre glabrous at base at least at maturity . . . . . 5
4b Involucre white-woolly at base . . . . . 7
5a Leaves crowded in basal rosette; peduncles nude or occasionally minutely bracteate, 1-headed . . . . . **S. nanus**
5b Leaves may be crowded towards base, but peduncles remotely leafy upwards, often branched, bearing 2 or 3 flower heads. . . . . 6
6a Leaves up to 30 mm wide; flower heads large, 20 × 10 mm . . . . . **S. integrifolius** var. **integrifolius**
6b Leaves up to 5 mm wide; flower heads small, ± 16 × 6–7 mm . . . . . **S. integrifolius** var. **schlechteri**
7a Leaves mostly along stem, rosetted only in juvenile stage . . . . . **S. wilmsii**
7b Leaves all or mostly crowded in basal rosettes . . . . . 8
8a Peduncles usually nude, occasionally minutely bracteate, 1-headed. . . . . **S. nanus**
8b Peduncles remotely leafy or with large bracts, bearing up to 5 flower heads . . . . . **S. dregeanus**

### *asper (L.) Hill subsp. asper

*S. gigas* Boulos ex Humbert
*S. oleraceus* L. var. *asper* L.

Annual or perennial herb, up to 1.5 m high, with milky latex. **Stems** hollow, ribbed, reddish purple-tinged. **Leaves** in a basal rosette, alternate upwards; blade of lower leaves narrowly obovate-panduriform, seldom pinnatifid, 200 × 50 mm, sinuate-dentate, apices acute, leaf and lobe margins irregularly dentate, base auriculate, semi-amplexicaul, auricles rounded and appressed, with petiole-like base; blade of upper leaves ovate to linear, margins lobed and/or strongly dentate, sessile. **Heads** ligulate, ± 15 × 10 mm, in corymbiform, cymose clusters; peduncle glabrous or glandular-setose. **Involucre** glabrous, base becoming swollen in fruiting stage; bracts many, in several series, imbricate; outer bracts sometimes with conspicuous glandular setae on midribs. **Flowers**: ligules pale yellow; Oct.–Jan. **Fruit** with cypsela reddish brown, elliptic, tapering equally at both ends, strongly compressed, ribbed, ± 3 mm long, with broad, glabrous, marginal wings. **Pappus** of barbellate bristles intermixed with down-like hairs. Weed of cultivation and roadsides. Native to Europe and Asia. *Spiny sowthistle*, *common sowthistle*; *doringsydissel*, *gewone sydissel* (A).

VreDm | DrGr | KarSh

### *asper (L.) Hill subsp. glaucescens (Jord.) Ball

Biennial herb, up to 0.5 m high. Similar to *S. asper* subsp. *asper*, but leaves more rigid and leaf margins more prickly. **Flowers**: pale yellow; Aug.–Nov., Jan. **Fruit** with cypsela with ciliate, recurved margins. Weed of cultivation and roadsides. Native to Europe and Asia. *Spiny sowthistle*, *common sowthistle*; *doringsydissel*, *gewone sydissel* (A).

DrGr

### dregeanus DC.

*S. ecklonianus* DC.

Perennial herb, up to 0.9 m high; with milky latex. **Stems** ribbed. **Leaves** mostly in a basal rosette, upper leaves alternate, sessile; blade of lower leaves narrowly ovate to linear-elliptic, up to ± 120 × 30 mm, apex attenuate-acute, margins remotely lobed to sinuate-dentate or sharply denticulate, sometimes entire, lobes linear; upper leaves linear or narrowly ovate, margins entire, base semi-amplexicaul, sagittate. **Heads** ligulate, 20 × 10 mm, up to ± 5 in lax, corymbiform cymes; peduncle remotely leafy or with large bracts. **Involucral bracts** white-woolly at base; in several series, imbricate; outer usually beset with fleshy setae. **Flowers**: ligules yellow; Nov.–Feb. **Fruit** with cypsela pale brown, narrowly ellipsoid, tapering slightly and equally at both ends, slightly compressed, 4-ribbed, margins thickened, smooth, ± 5 mm long. **Pappus** of barbellate bristles intermixed with down-like hairs. Open grassland. *Sowthistle*; *leharasoana* (SS).

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### integrifolius Harv. var. integrifolius

Perennial herb, up to 400 mm high; with milky latex. **Stems** finely ribbed. **Leaves** sometimes crowded towards base, sessile; peduncles remotely leafy upwards, alternate; blade of basal leaves narrowly obovate or elliptic, up to 120 × 30 mm, margins entire to sinuate-dentate, sometimes with remote spreading lorate lobes; blade of stem leaves linear-elliptic to narrowly elliptic becoming narrowly ovate towards stem apex, apex attenuate-acute, base semi-amplexicaul and sagittate. **Heads** ligulate, solitary or few in lax corymb, 20 × 10 mm. **Involucral bracts** in several series, imbricate, glabrous at base, ± 20 mm long. **Flowers**: ligules yellow,

pink or reddish; Oct., Jan. **Fruit** with cypsela pale brown, narrowly ellipsoid, tapering slightly and equally at both ends, slightly compressed, ribbed, margins thickened, smooth, ± 5 mm long. **Pappus** of barbellate bristles intermixed with down-like hairs. Open grassland, invading disturbed areas.

VreDm | | | MsGr | | |

### **integrifolius** Harv. var. **schlechteri** R.E.Fr.

Similar to *S. integrifolius* var. *integrifolius*, but leaves much narrower, up to 5 mm wide, margins entire or sparsely denticulate, occasionally with few coarse teeth and smaller heads ± 16 × 6–7 mm. **Flowers**: ligules yellow, pink or reddish; Nov. Open grassland.

| | | | MsGr | | |

### **nanus** Sond. ex Harv.

Perennial herb, up to 200 mm high; mostly acaulescent, with milky latex. **Leaves** crowded in a basal rosette, sessile; blade obovate or elliptic, up to 80 × 25 mm, margins entire, denticulate, pinnatifid or runcinate-pinnatifid. **Heads** ligulate, 20 × 10 mm, solitary, almost sessile at flowering, peduncles elongating as fruit mature, nude or occasionally minutely bracteate. **Involucre** white-woolly or glabrous at base; bracts in several series, imbricate, glabrous or with a few fleshy setae. **Flowers**: ligules yellow; Oct., Nov., Feb. **Fruit** with cypsela pale brown, narrowly ellipsoid, tapering slightly and equally at both ends, slightly compressed, ribbed, smooth, margins thickened, ± 5 mm long. **Pappus** of barbellate bristles intermixed with down-like hairs. Short open grassland. *Thistle*; *sethokojane*, *leshoabe* (SS).

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### ***oleraceus** L.

Annual herb, up to 1.5 m high; with milky latex. **Stems** hollow, reddish tinged. **Leaves** crowded basally and along flowering stems; blade of lower leaves obovate in outline, 200 × 50 mm, pinnately lobed or coarsely runcinate-pinnatifid, with broad ovate-hastate apical lobe, apex rounded to acute, margins dentate, with petiole-like base; upper leaves runcinate-pinnatifid or coarsely and sharply dentate, base auriculate, auricles large, acute, sessile, amplexicaul. **Heads** ligulate, 15 × 10 mm, several in irregular, corymbose umbel, pedunculate. **Involucral bracts** in several series, imbricate, glabrous or glandular-hairy. **Flowers**: ligules pale yellow; Oct.–Jan., Jun. **Fruit** with cypsela light to reddish brown, narrowly obovate, attenuate towards base, slightly compressed, ribbed, transversely wrinkled, minutely retrorsely hispid, margins thickened, ± 3 mm long. **Pappus** of barbellate bristles intermixed with down-like hairs. Weed of cultivation, roadsides and waste places. Native to Europe and Asia. *Sowthistle*; *sydissel* (A); *bono-sa-lekhoaba* (SS); *ihlaba* (X); *ihahabe* (Z).

| | | DrGr | | KarSh | |

### **wilmsii** R.E.Fr.

Perennial herb, up to 1 m high; with milky latex. **Stems** hollow. **Leaves** alternate, sessile, amplexicaul; along stem, in a rosette only in juvenile stage; blade obovate in outline, up to 150 × 90 mm, runcinate-pinnatifid or pinnatisect, occasionally panduriform and scarcely cut, narrowed towards base, margins of lobes coarsely, sharply and irregularly dentate, with large, round auricles. **Heads** ligulate, 20 × 12 mm, several in corymbose panicle, pedunculate. **Involucral bracts** in several series, imbricate, white-woolly at base. **Flowers**: ligules yellow

inside, pink or reddish outside; Nov. **Fruit** with cypsela pale brown, narrowly ellipsoid, tapering slightly and equally at both ends, slightly compressed, ribbed, smooth, margins thickened, ± 4.5 mm long. **Pappus** of barbellate bristles intermixed with down-like hairs. Along roadsides and in secondary grassland. *Milk thistle*; *melkdissel* (A); *lesabe* (SS).

DrGr

## **Stoebe** L. (sthn Afr.: 30 spp.)

(Gnaphalieae)

Leaves with distinct swelling at base of midrib on lower surface. . . . . .**S. cinerea**
Leaves without obvious swelling at base of midrib on lower surface . . **S. vulgaris**

### **cinerea** (L.) Thunb.

Shrub, up to 1.5 m high; greenish or yellowish green, sometimes with short shoots in axils of leaves. **Leaves** alternate, sessile; blade ericoid, twisted, upper surface densely woolly, lower surface slightly woolly or glabrous, with distinct swelling at base of midrib on lower surface; leaves on short shoots smaller than those on long shoots and not conspicuous. **Heads** discoid, 1-flowered, grouped in axils of upper leaves, forming spike-like inflorescence. **Involucral bracts** in several series, imbricate, inner bracts brown and with acuminate apex. **Flowers**: brown or purple, Mar.–May. **Fruit** with cypsela oblong, 5-ribbed, scabrid. **Pappus** of several, delicate, plumose bristles. Sandy loam, often close to water, frequent among boulders.

VreDm?

### **vulgaris** Levyns

Shrub, 1.0–1.5 m high; grey-green, vegetative parts differentiated into long and short shoots. **Leaves** alternate, sessile; blade ericoid, straight or slightly twisted, margins involute, upper surface persistently white-woolly, lower surface glabrescent or persistently cobwebby, leaves of short shoots ± half length of main leaves. **Heads** discoid, 1-flowered, few in a spike-like or branched inflorescence. **Involucral bracts** in several series, imbricate, acute, innermost bracts brown. **Flowers**: brownish, purple-tipped; Jan.–May, Dec. **Fruit** with cypsela oblong, thickly 5-ribbed, pubescent. **Pappus** of several, delicate, plumose bristles, fused in a ring at base. Grassland, can become a weed in disturbed and overgrazed areas. *Zigzag bush*, *bankrupt bush*; *bankrotbos* (A); *sehalahala* (SS).

VreDm DrGr MsGr Zastr

## **Symphyotrichum** Nees (sthn Afr.: 1 sp.)

(Astereae)

### ***squamatum** (Spreng.) Nesom

*Aster squamatus* (Spreng.) Hieron.
*Conyza squamata* Spreng.

Annual herb, up to 2 m high; glabrous. **Stems** slender, erect, leafy, glabrous. **Leaves** alternate, sessile; blade narrowly obovate, up to ± 150 × 20 mm, apex acute, base attenuate, clasping, margins entire or obscurely dentate, glabrous; upper leaves linear, progressively smaller. **Heads**

up to 5 mm in diameter, disciform, many in large, terminal panicles, pedunculate. **Involucral bracts** ± 3-seriate, inner exceeding outer, ± equalling disc florets, very narrowly obovate, very acute, minutely gland-dotted. **Receptacle** epaleate. **Flowers**: ray florets inconspicuous (filiform), female, fertile, in several series, whitish or very pale mauve; disc florets bisexual, yellow; Dec., Feb.–May. **Fruit** with cypsela subcylindric, slightly compressed, appressed-hairy. **Pappus** uniseriate, of scabrid bristles. Damp places. Native to North America (South America?). *Swamp aster*; *moeras aster* (A); *moroko hloko* (SS).

DrGr KarSh

## **Tagetes** L. (sthn Afr.: 2 spp.)

(Helenieae)

### ***minuta** L.

Annual herb, up to 3 m high; all parts with embedded oil sacs, aromatic. **Leaves** opposite or alternate in upper part, petiolate; blade pinnately dissected, leaflets narrowly ovate, margins sharply serrate, base half-clasping. **Heads** minutely radiate, many in congested, terminal, corymbose panicles. **Involucre** narrowly cylindric; bracts uniseriate, connate nearly to top, with embedded oil sacs. **Flowers**: ray and disc florets creamy white; Feb.–May. **Fruit** with cypsela awl-shaped, black. **Pappus** of several scales, one much elongated. Weed in disturbed and waste places. Native to South America. *Khaki weed*; *khakibos* (A); *jeremane* (SS); *insangwana*, *unukani* (Z).

VreDm DrGr MsGr

## **Taraxacum** Weber ex F.H.Wigg. (sthn Afr.: 15 spp.)

(Cichorieae)

### Key to species:

[after Hilliard: 609 (1977)]

| | | |
|---|---|---|
| 1a | Style branches black or blackish in the dried state | 2 |
| 1b | Style branches yellow, yellowish or greyish in the dried state | 3 |
| 2a | Cypselae bright red-brown, ± 2.5 mm long, cone 0.75–1.00 mm long | **T. brachyglossum** |
| 2b | Cypselae straw-coloured or greyish, at least 3 mm long, cone 1.0–1.5 mm long | **T. breviscapum** |
| 3a | Style branches yellow or yellowish in the dried state | 4 |
| 3b | Style branches greyish in dried state | 6 |
| 4a | Cone of cypsela 0.5 mm long | **T. hamatiforme** |
| 4b | Cone of cypsela 0.75–1.00 mm long | 5 |
| 5a | Beak of cypsela 4–7 mm long | **T. officinale** |
| 5b | Beak of cypsela 9 mm long | **T. privum** |
| 6a | Cypselae 3 mm long, beak 9.5 mm long | **T. dilatatum** |
| 6b | Cypselae 2.50–2.75 mm long, beak 7 mm long | **T. ekmanii** |

### ***brachyglossum** (Dahlst.) Dahlst.

Perennial, acaulescent herb, with milky latex. **Leaves** in rosettes; blade up to 30 mm long, oblong in outline, pinnately lobed, with 4–6 narrow lobes on each side, lobes acute, patent

or slightly recurved, sinuses usually sharply dentate; petiole purplish, not winged. **Heads** ligulate, solitary, terminal; peduncle up to 60 mm long, hollow, often purplish, cobwebby at first, glabrescent. **Involucral bracts** biseriate; inner ± 10 mm long, margins white-membranous; outer ± 7 mm long, reflexed, often purplish, with small hump on back near apex. **Flowers**: ligules yellow, purplish on lower surface; style branches black when dry; Aug.–Nov., Feb. **Fruit** with cypsela bright red-brown, fusiform, ± 2.5 mm long, with muricate ribs, narrowed and shortly conical apically, cone 0.75–1.0 mm long, with 7.5–11.0 mm long beak. **Pappus** of many, creamy white, barbellate bristles. Moist grassland, edges of wetlands. Native to central and northwestern Europe and southern Scandinavia, widespread weed in America.




### *breviscapum A.J.Richards

Perennial, acaulescent herb, with milky latex. **Leaves** in rosettes; blade up to 150 mm long, oblong in outline, sinuate to runcinate-pinnatifid, with 4 or 5 lobes, broadly to narrowly triangular, acute, patent or slightly recurved, both margins often filiform-dentate, sinuses filiform-dentate to acutely lobulate, apical lobe triangular; petiole often purplish, not winged. **Heads** ligulate, solitary, terminal; peduncle usually shorter than leaves at flowering, up to 150 mm long in fruit, purplish, white-cottony, glabrescent. **Involucral bracts** biseriate, imbricate; inner 12–18 mm long, membranous-winged in lower half; outer up to 10 mm long, with small hump on back near apex, purple, reflexed. **Flowers**: ligules yellow, greyish on lower surface; style branches blackish when dry; Feb., May–Oct. **Fruit** with cypsela straw-coloured or greyish, fusiform, 3.0–3.5 mm long, with muricate ribs, narrowed and conical apically, cone 1.0–1.5 mm long, with 8–11 mm long beak. **Pappus** of many, creamy white, barbellate bristles. Weed in lawns and other grassy sites. Native to Afghanistan.




### *dilatatum H.Lindb.

Perennial acaulescent herb, with milky latex. **Leaves** in rosettes; blade runcinate-pinnatifid, with 3 or 4 lobes, apical lobe triangular, all lobes acute, recurved, upper margins convex, they and sinuses coarsely acute-dentate, lower margins straight or slightly concave, entire or nearly so; petiole scarcely winged. **Heads** ligulate, solitary, terminal; peduncle usually up to 300 mm long in fruit, glabrous or nearly so. **Involucral bracts** biseriate, imbricate; inner 18 mm long, membranous-winged in lower part; outer ± 10 mm long, reflexed. **Flowers**: ligules yellow, dark on lower surface; style branches greyish when dry; Jan. **Fruit** with cypsela pale brown, fusiform, 3 mm long, with muricate ribs, narrowed and conical apically, cone 0.75 mm long, with 9.5 mm long beak. **Pappus** of many, creamy white, barbellate bristles. Weed in disturbed places. Native to northern Europe.




### *ekmanii Dahlst.

Perennial, acaulescent herb, with milky latex. **Leaves** in rosettes; blade runcinate-pinnatifid, with 3–6 lobes, apical lobe mostly very large, triangular or elliptic, acute, margins coarsely and sharply dentate, teeth recurved, lateral lobes triangular, acute, recurved, upper margins convex, laciniate-dentate, lower margins straight or curved, often entire; petiole short, winged, purplish, thinly white-hairy. **Heads** ligulate, solitary, terminal; peduncle usually up to 300 mm long in fruit, glabrous or nearly so. **Involucral bracts** biseriate, imbricate; inner ± 16 mm long, narrowly membranous winged; outer up to 12 mm long, reflexed. **Flowers**: ligules yellow, dark on lower surface; style branches greyish when dry; Sep.–Dec. **Fruit** with cypsela greyish, fusiform, 2.50–2.75 mm long, with muricate ribs, narrowed and conical apically, cone 0.5–

0.75 mm long, with 7 mm long beak. **Pappus** of many, creamy white, barbellate bristles. Weed of disturbed places. Native to western and northern Europe.

VreDm

### *__hamatiforme__ Dahlst.

Perennial, acaulescent herb, with milky latex. **Leaves** in rosettes; blade runcinate-pinnatifid, with 3–5 lobes, apical lobe triangular, all lobes acute, somewhat recurved, upper margins convex or sometimes straight in lower lobes, lower lobes sometimes sharply and narrowly dentate; petiole narrowly winged below blade or not, purplish or not. **Heads** ligulate, solitary, terminal; peduncle up to 200 mm long, initially lightly cobwebby, glabrescent. **Involucral bracts** biseriate, imbricate; inner ± 15 mm long, with narrow membranous margins; outer up to 10 mm long, reflexed. **Flowers**: ligules yellow, greyish on lower surface; style branches yellowish when dry; Sep.–Feb. **Fruit** with cypsela straw-coloured, fusiform, 2.5–3.0 mm long, with muricate ribs, narrowed and conical apically, cone 0.5 mm long, with 7.0–8.5 mm long beak. **Pappus** of many, creamy white, barbellate bristles. Weed of disturbed places. Native to northern and western Europe.

MsGr

### *__officinale__ Weber *s.l.*

Perennial acaulescent herb, with milky latex. **Leaves** in rosettes; blade narrowly obovate in outline, runcinate-pinnatifid, with 2–6 lateral lobes, apical lobe ovate-hastate, lateral lobes spreading recurved-falcate to broadly triangular, acute, margins entire to laciniate-dentate, sinuses sometimes strongly dentate; petioles not winged or only slightly so. **Heads** ligulate, solitary, terminal; peduncle up to 400 mm long, often initially densely lanate, glabrous. **Involucral bracts** biseriate, imbricate; inner ± 14 mm long, margins scarious; outer up to 17 mm long, spreading or reflexed. **Flowers**: ligules yellow with dark strip on lower surface; style branches yellowish when dry; Sep.–May. **Fruit** with cypsela pale to dark brown, fusiform, 2.5–3.0 mm long, with muricate ribs, narrowed and conical apically, cone 0.75–1.00 mm long, with 4–7 mm long beak. **Pappus** of many, white, barbellate bristles. Weed of lawns and nurseries. Uncertain origin. *Common dandelion*; *platdissel*, *perdeblom* (A); *irwabe lenyoka* (X); *umashwababa* (Z).

MsGr

### *__privum__ Dahlst.

Perennial, acaulescent herb, with milky latex. **Leaves** in rosettes; blade runcinate-pinnatifid, with 4 or 5 lobes, apical lobe triangular, all lobes acute, recurved, margins ± straight, entire or dentate; petiole short, winged, purplish or not. **Heads** ligulate, solitary, terminal; peduncle up to 350 mm long, initially white-cottony, glabrescent. **Involucral bracts** biseriate, imbricate; inner ± 16 mm long, membranous winged in lower half; outer up to 8 mm long, reflexed. **Flowers**: ligules yellow, greyish on lower surface; style branches yellow when dry; Jun. **Fruit** with cypsela pale brown, fusiform, 3.5 mm long, with muricate ribs, narrowed and conical apically, cone 1 mm long, with 9 mm long beak. **Pappus** of many, creamy white, barbellate bristles. Weed of cultivation and disturbed places. Native to western and northern Europe.

DrGr

## **Tarchonanthus** L. (sthn Afr.: 6 spp.)

(Tarchonantheae)

### Key to species:

[after Herman: 21 (2002)]

Heads in dense, spicate, axillary or terminal clusters; involucral bracts of male and female heads free; peak flowering time Sep.–Dec.; cottony hairs enveloping cypsela white . . . . . **T. minor**
Heads in lax, open panicles; involucral bracts of male heads fused halfway, of female heads free; peak flowering time (Feb.)May–Aug.; cottony hairs enveloping cypsela creamy or yellowish . . . . . **T. camphoratus**

**camphoratus** L.
*T. camphoratus* L. var. *litakunensis* (DC.) Harv.
*T. litakunensis* DC.

Shrub or small tree, up to 8 m high; aromatic, male and female florets on separate plants. **Leaves**: alternate; blade narrowly elliptic to slightly narrowly obovate, up to 80 × 20 mm, apex acute, often mucronate, sometimes obtuse, base cuneate, margins entire, upper surface grey-green or khaki-green, reticulate, glabrous, lower surface densely grey- or greenish hairy, main and secondary veins prominent; petiole up to 5 mm long. **Heads** discoid, sessile or shortly pedunculate, in lax, open, terminal panicles. **Involucral bracts** of male plants uniseriate, fused halfway; of female plants 2- or 3-seriate, free, imbricate. **Flowers**: disc florets only, creamy white; (Feb.)May–Aug. (for FS not recorded in Feb.) **Fruit** with cypsela of female plants elliptic, ribbed, densely long, creamy or yellowish hairy. **Pappus** absent. Grassland, woodland or bushveld, often on hillsides or rocky outcrops; also flats and riverbanks. *Wild camphor bush*, *African fleabane*; *wilde-kanferbos* (A); *mathola* (X); *iGqeba-elimhlophe* (Z). Figure 10F, p. 7.

VreDm | AcGr | DrGr | | KarSh |

**minor** Less.
*T. angustissimus* DC.

Shrub or small tree, up to 5 m high; aromatic, male and female florets on separate plants. **Leaves** alternate, shortly petiolate; blade small, narrowly elliptic, up to 50 × 15 mm, apex acute, base cuneate, margins entire, rarely denticulate, discolorous, upper surface bright to dark green, reticulate, glabrous, lower surface densely whitish hairy. **Heads** discoid, sessile or very shortly pedunculate, in dense, spicate, axillary or terminal clusters. **Involucral bracts** in both male and female florets 2- or 3-seriate, free. **Flowers**: disc florets only, dark, brownish; Sep.–Dec. **Fruit** with cypsela of female plants elliptic, densely long, white-hairy. **Pappus** absent. Stony or rocky hillsides, mountain slopes. *Small-leaf camphor bush*; *kleinblaarkanferbos* (A).

| | | DrGr | MsGr | KarSh | |

## **Tolpis** Adans. (sthn Afr.: 1 sp.)

(Cichorieae)

**capensis** (L.) Sch.Bip.
*Hieracium capense* L.

Perennial herb, acaulescent, with milky latex. **Leaves** in a basal rosette, sessile or base cuneate to long attenuate, petiole-like; blade elliptic to narrowly obovate, apex rounded or

acute, margins remotely and minutely toothed or more deeply cut, glabrous or sparsely hairy. **Heads** ligulate, few to many on long peduncles arranged in corymbose panicle; flowering stem up to 0.6 m high. **Involucral bracts** 2- or 3-seriate, subequal. **Flowers**: ligules yellow; Nov.–Apr. **Fruit** with cypsela narrowly obconic, 4- or 5-angled, 2.0–3.5 mm long, apex truncate, with fine rough ribs rough. **Pappus** of barbellate bristles. Open grassland or disturbed areas. *Fukuthoane* (SS).

VreDm | | DrGr | MsGr | | |

## **Tragopogon** L. (sthn Afr.: 3 spp.)

(Cichorieae)

### Key to species:

[after Hilliard: 606 (1977)]

Involucral bracts usually 13, sometimes more, occasionally only 8 on late flower heads or on depauperate plants; ligules yellow . . . . . **T. dubius**
Involucral bracts usually 8, rarely up to 12; ligules violet . . . . . **T. porrifolius**

### ***dubius** Scop.

*T. majus* Jacq.

Biennial herb, up to 1 m high; with milky latex, loosely white-woolly at first, soon glabrous, or wisps of wool persisting at leaf bases. **Leaves** alternate, sessile; blade grass-like, linear, apex long acuminate, base broad, half-clasping, margins entire, glabrous or with white wool in leaf axils. **Heads** ligulate, solitary, long pedunculate. **Involucral bracts** uniseriate, usually (8–)13(–17), subconnate at base. **Receptacle** epaleate. **Flowers**: ligules shorter than involucral bracts, yellow; Nov.–Mar. **Fruit** with cypsela fusiform, terete, ribs muricate, narrowed upwards into long beak. **Pappus** of plumose bristles. Weed along roadsides and sometimes in old fields. Native to southern Europe. *Yellow goat's beard*; *geelbokbaard* (A).

| | | DrGr | MsGr | KarSh | |

### ***porrifolius** L.

Similar to *T. dubius* but glabrous; involucral bracts usually 8(–12); florets (ligules) violet; Oct. Escaped from cultivation. Native to Europe and Asia. *Purple goat's beard*, *oyster plant*, *salsify*; *persbokbaard* (A).

| | | | | KarSh | |

## **Tripteris** Less. (sthn Afr.: 16 spp.)

(Calenduleae)

### Key to species:

Leaves alternate . . . . . **T. aghillana** var. **aghillana**
Leaves opposite . . . . . **T. sinuata** var. **sinuata**

### **aghillana** DC. var. **aghillana**

*Osteospermum scariosum* DC. var. *scariosum*
*Tripteris flexuosa* Harv.

Perennial herb or dwarf shrub, up to 0.6 m high. **Leaves** at base ± rosulate, upper alternate; blade of lower leaves obovate, narrowly obovate to oblong, semisucculent, apex obtuse or subacute, margins remotely dentate to sinuate-dentate to repand, sometimes entire, petiole 10–30 mm long; stem leaves similar but smaller and decreasing in size upwards, blade linear to narrowly obovate, sessile, often auriculate; densely to sparsely hairy to glabrescent and/or glandular. **Heads** radiate, terminal, solitary or rarely laxly corymbose; peduncle up to 170 mm long, ribbed, hairy and glandular with few scattered bracts, nodding in fruiting stage. **Involucral bracts** 12–15, subuniseriate, almost equal, margins of 'inner' bracts broadly white-scarious, those of outer bracts narrowly white-scarious, often reddish or purplish towards apex, glandular and hairy. **Flowers**: ray florets female, fertile, yellow with brownish, reddish or purplish stripes below, sometimes with dark spot at base of limb; disc florets functionally male, yellow; Sep.–May. **Fruit** with cypsela slightly curved, 3-winged; wings membranous, semitranslucent, greenish with pinkish margins, turning brown at maturity, 4–6 mm broad, with 3 apical windows enveloping apical cavity. **Pappus** absent. Grassland. *Bietou* (A). Figure 46.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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### **sinuata** DC. var. **sinuata**

*Osteospermum sinuatum* (DC.) Norl. var. *sinuatum*

Dwarf shrub, up to 0.9 m high. **Leaves** opposite; sessile or base petiole-like, semi-amplexicaul; blade of basal leaves elliptic to narrowly obovate, semisucculent, apex obtuse, margins sinuate-dentate to sparsely denticulate; upper leaves smaller, blade very narrowly elliptic to linear; glabrous, young leaves glandular-hairy. **Heads** radiate, terminal, solitary or rarely a few corymbosely arranged; peduncle up to 40 mm long, glandular. **Involucral bracts** ± 12, subuniseriate, margins white-scarious, glandular, sometimes purplish. **Flowers**: ray florets female, fertile, yellow; disc florets functionally male, yellow; May–Oct. **Fruit** with cypsela straight, 3-winged, wings membranous, semitranslucent, purplish, turning brown at maturity, 3–5 mm broad, with 3 apical windows enveloping apical cavity. **Pappus** absent. Sandy flats and valleys, rocky ridges and hill slopes.

| | | | | KarSh | |
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## **Troglophyton** Hilliard & B.L.Burtt (sthn Afr.: 6 spp.)

(Gnaphalieae)

### Key to subspecies:

[from descriptions by Hilliard: 40 (1983)]

Involucral bracts obtuse, white with purple blotch or rarely totally purple; pappus bristles without clavate cilia . . . . . **T. capillaceum** subsp. **capillaceum**
Involucral bracts smoothly rounded, markedly opaque white at tips; pappus bristles with clavate cilia . . . . . **T. capillaceum** subsp. **diffusum**

### **capillaceum** (Thunb.) Hilliard & B.L.Burtt subsp. **capillaceum**

Annual herb, up to 300 mm high; delicate, white-woolly. **Leaves** alternate; blade small, elliptic to elliptic-ovate, or ovate, ± tapering at both ends, or sometimes base truncate to broadly rounded, apex mucronate, margins entire, pale green and glabrescent above; petiole filiform.




**Figure 46.** *Tripteris aghillana* var. *aghillana* (Asteraceae). Artist: G. Condy.

**Heads** discoid, up to 3 mm long, solitary, subracemosely arranged on long, filiform peduncles. **Involucral bracts** 3-seriate, apex of bracts obtuse, generally emarginate, erose or rounded, white with purple blotch or rarely totally purple. **Flowers**: disc florets only, yellow, sometimes tipped pink; May, Jun., Sep. **Fruit** with cypsela oblong, hairy. **Pappus** of barbellate bristles. Damp shady slopes under shrubs or rocks.

DrGr KarSh

**capillaceum** (Thunb.) Hilliard & B.L.Burtt subsp. **diffusum** (DC.) Hilliard

Similar to *T. capillaceum* subsp. *capillaceum*, except involucral bracts smoothly rounded and markedly opaque white at tips; flowering time Jul., Nov.–Feb; pappus of bristles tipped with several clavate cilia. *Mosuoane-oa-lehaha* (SS).

DrGr MsGr

## **Ursinia** Gaertn. (sthn Afr.: 40 spp.)

(Anthemideae)

### Key to species:

[after Prassler: 376 (1967)]

| | | |
|---|---|---|
| 1a | Pappus biseriate, 5 broad outer scales and linear inner scales | 2 |
| 1b | Pappus uniseriate, 5 broad scales only | 7 |
| 2a | Leaves linear | 3 |
| 2b | Leaves pinnatipartite | 4 |
| 3a | Leaf lobes abruptly mucronate | **U. montana** subsp. **montana** |
| 3b | Leaf lobes attenuate in long bristle | **U. montana** subsp. **apiculata** |
| 4a | Annual herb | **U. nana** subsp. **nana** |
| 4b | Perennial herbs | 5 |
| 5a | Erect herb | **U. nana** subsp. **leptophylla** |
| 5b | Tufted herbs | 6 |
| 6a | Leaf lobes abruptly mucronate | **U. montana** subsp. **montana** |
| 6b | Leaf lobes attenuate in long bristle | **U. montana** subsp. **apiculata** |
| 7a | Peduncle nude or with few small scattered bracts; leaf lobes long, slender | **U. saxatilis** |
| 7b | Peduncle with many bracts; leaf lobes short, broad | **U. alpina** |

**alpina** N.E.Br.

Perennial herb, up to 400 mm high; mat-forming. **Leaves** crowded in rosettes; blade pinnatifid or bipinnatifid, lobes short, broad, apices apiculate; base petiole-like; glandular-punctate, glabrous. **Heads** radiate, solitary, terminal, scape (peduncle) long, bracteate. **Involucral bracts** in several series, imbricate, inner with broad, rounded, scarious apex. **Receptacle** paleate. **Flowers**: ray florets yellow above, often reddish below; disc florets yellow; Dec.–Feb. **Fruit** with cypsela straight or slightly curved, narrowly turbinate, ribbed, basal coma of long, delicate hairs. **Pappus** uniseriate, of 5 broad, white, membranous scales only. Earth and rock cliffs and steep slopes against rock outcrops and earth terraces.

MsGr

### **montana** DC. subsp. **apiculata** (DC.) Prassler

Similar to *U. montana* subsp. *montana* but apices of leaf lobes attenuate in long bristle. Flowering time: Jul.–Jun.

Zastr

### **montana** DC. subsp. **montana**

Perennial herb, up to 250 mm high; procumbent or erect, mat-forming. **Leaves** alternate, often crowded at branch tips, petiolate; blade pinnatipartite, lobes linear, abruptly contracted, mucronate; rarely linear with entire margins. **Heads** radiate, solitary, terminal; peduncle long, nude. **Involucral bracts** in several series, imbricate, margins brown, inner bracts with broad, rounded, membranous apex. **Receptacle** paleate. **Flowers**: ray florets yellow above, coppery or reddish below, rarely yellow on both sides; disc florets yellow; Nov.–Apr. **Fruit** with cypsela curved almost 90°, ribbed, glabrous, basal tuft of hairs absent. **Pappus** biseriate, outer row of 5 broad, membranous scales and inner row of narrow, linear scales. Around edges and in crevices of sandstone platforms on high mountains. *Leabo* (SS).

MsGr

### **nana** DC. subsp. **leptophylla** Prassler

Similar to *U. nana* subsp. *nana* but: Perennial herb, up to 400 mm high, erect. **Leaves** with blade 25–50 mm long, pinnatipartite, lobes 10–20 mm long. **Flowers**: Feb.–May, Oct. Mountain grassland.

VreDm DrGr MsGr

### **nana** DC. subsp. **nana**

*U. annua* Less. ex Harv.

Annual herb, up to 400 mm high, erect. **Leaves** alternate; blade pinnatipartite to bipinnatipartite, 15–35 mm long, lobes 2–6 mm long, mucronate, subsucculent. **Heads** radiate, solitary, terminal, peduncle long, nude. **Involucral bracts** in several series, imbricate, margins often brown; inner bracts with broad, rounded, membranous apex. **Receptacle** paleate. **Flowers**: ray florets yellow on both sides or often reddish below; disc florets yellow, rarely white; Jul.–Jun. **Fruit** with cypsela curved almost 90°, ribbed, glabrous, basal tuft of hairs absent. **Pappus** biseriate, outer row of 5 broad, membranous scales and inner row of narrow, linear scales. Mountain grassland, can become weedy. *Yellow margaret*; *geelmagriet* (A); *sehalikane* (SS).

VreDm DrGr MsGr KarSh

### **saxatilis** N.E.Br.

Perennial herb, up to 700 mm high, tufted. **Leaves** crowded in rosette or alternate; blade pinnatipartite or apex tripartite, lobes linear, slender, mucronate; blade rarely linear with entire margin. **Heads** radiate, solitary, terminal, scape long, nude or with very few small bracts. **Involucral bracts** in several series, imbricate; inner bracts with broad, rounded, membranous apex. **Receptacle** paleate. **Flowers**: ray florets with lower surface coppery, rarely pale yellow, upper pale yellow; disc florets yellow; Nov.–Apr. **Fruit** with cypsela straight or slightly curved, with basal tuft of hairs. **Pappus** uniseriate, of 5 broad, white, membranous scales only. Mountain grassland in rock crevices and cracks.

MsGr

## **Verbesina** L. (sthn Afr.: 1 sp.)

(Heliantheae)

### ***encelioides** (Cav.) Benth. & Hook. var. **encelioides**

Annual herb, up to 1 m high. **Leaves** mostly alternate, sometimes opposite; blade ovate-cordate, apex acute, base cuneate, margins coarsely serrate, lower surface white-tomentose, upper surface appressed grey-pubescent, 3-nerved from base; petiole up to 50 mm long, narrowly winged, auriculate at base. **Heads** radiate, solitary on terminal branches, pedunculate. **Involucral bracts** ± biseriate, ± equal. **Receptacle** paleate. **Flowers**: ray florets neuter or sterile; disc florets bisexual; ray and disc florets yellow to orange; Dec. **Fruit** with cypsela obovoid, black with white marginal wing, enfolded by paleae. **Pappus** of 2 awns. Weed in sandy areas, especially on banks of rivers. Native to North America. *Wild sunflower*; *wilde sonneblom* (A).

DrGr

## **Vernonia** Schreb. (sthn Afr.: 15 spp.)

(Vernonieae)

### Key to species:

[partly after Hilliard: 26 (1977)]

1a Subshrub; outer involucral bracts with apex obtuse . . . . . **V. staehelinoides**
1b Annual or perennial herbs; involucral bracts with apex acute to acuminate . . . . . 2
2a Involucral bracts recurved (squarrose). . . . . **V. fastigiata**
2b Involucral bracts erect . . . . . 3
3a Flower heads many in dense, terminal, corymbose panicles . . . **V. flanaganii**
3b Flower heads solitary, occasionally paired . . . . . 4
4a Leaves scattered along stem, blade narrowly elliptic . . . . . **V. galpinii**
4b Leaves in basal rosette, blade obovate to broadly elliptic. . . . . **V. thodei**

### **fastigiata** Oliv. & Hiern

*V. schinzii* O.Hoffm.

Annual or sometimes perennial herb, up to 1 m high. **Leaves** alternate, sessile; blade linear or very narrowly elliptic, up to 90 × 8 mm, apex acute, mucronate or acuminate, margins entire, revolute, minutely pubescent or subglabrous. **Heads** discoid, pedunculate, solitary but several arranged together in open corymbs. **Involucral bracts** in several series, imbricate, apices long-acuminate, bristle-tipped, ± squarrose, persistently woolly araneose. **Flowers**: disc florets only, purple; Nov., Dec. **Fruit** with cypsela black, cylindric, angular or faintly ribbed, densely silvery strigose. **Pappus**: outer of short, linear, seta-like scales; inner of subplumose setae. Dry, sandy habitats, grassland, can become weedy. *Blouteebossie*, *langbeenbossie* (A); *lehlanye* (North Sotho).

MsGr

### **flanaganii** (E.Phillips) Hilliard

*V. hirsuta* (DC.) Sch.Bip. var. *flanaganii* E.Phillips

Perennial herb, up to 1 m high. **Stems** simple, erect, leafy, rough with mixture of forked and curled hairs. **Leaves** alternate, very shortly petiolate or subsessile; blade ovate, elliptic or round, up to ± 80 × 50 mm, apex acute or acuminate, base cuneate, margins entire, faintly and distantly crenate or serrate, upper surface rough with mixture of forked and curled hairs,

lower surface greyish white-woolly felted, discolorous. **Heads** discoid, many in dense, terminal, corymbose panicles, elongating in fruit. **Involucral bracts** in several series, imbricate, erect, narrowly ovate, apex long-acuminate, equalling pappus, grey-hairy. **Flowers**: disc florets only, violet, occasionally pinkish or white; Oct.–Dec. **Fruit** with cypsela cylindric, angular or faintly ribbed, pilose. **Pappus**: outer of very short, narrow scales; inner long scabrid bristles. Grassland and in scrub on forest margins, often in moist places.

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| | | | MsGr | | |

**galpinii** Klatt

*V. monocephala* Harv.

Perennial herb, up to 0.6 m high; flowering stems leafy. **Leaves** alternate, sessile; blade narrowly elliptic, up to 55 × 20 mm, apex acute, mucronate, margins entire; roughly pubescent. **Heads** discoid, solitary or occasionally up to 3 or 4 at stem apex. **Involucral bracts** linear-subulate, attenuate, erect, purple-tipped, subequal and uniform. **Flowers**: disc florets only, purple; Oct.–Dec. **Fruit** with cypsela narrowly cylindric, ribbed, glabrous or sparsely hairy on ribs, glandular. **Pappus**: outer of short, narrow scales; inner setae barbellate. Grassland. *Bloukwasbossie*, *perskwasbossie* (A).

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| VreDm | | | MsGr | | |

**staehelinoides** Harv.

Subshrub, up to 1 m high. **Leaves** alternate, sessile; blade narrow-linear, up to 45 × 2 mm, apex obtuse or bluntly acute, margins entire, revolute, thinly appressed-pubescent. **Heads** discoid, solitary, terminal and axillary. **Involucral bracts** in several series, imbricate, oblong; outer roundish or ovate, apex obtuse; inner oblong, apex subacute, all close-pressed, silky at first, glabrate. **Flowers**: disc florets only, purple; Feb.–May. **Fruit** with cypsela minutely pubescent. **Pappus**: outer row of short scales; inner row of subplumose bristles. Grassland on hillsides and rocky outcrops. *Blouteebossie* (A).

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**thodei** E.Phillips

*V. collina* Schltr.

Perennial herb, up to 200 mm high. **Leaves** in basal rosette; blade obovate to broadly elliptic, 40–50 × 20 mm, apex obtuse, narrowed to petiole-like base, margins entire; glabrous. **Heads** discoid, solitary or paired on nude or subnude scapes. **Involucral bracts** linear, erect, apex acuminate. **Flowers**: disc florets only, purple; Sep.–Jan. **Fruit** with cypsela obovate, hairy. **Pappus**: outer row of short scales; inner row of scabrid bristles. On mountains in damp grassland.

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## **Xanthium** L. (sthn Afr.: 2 spp.)

(Heliantheae)

### Key to species:

[after Hilliard: 298 (1977)]

Plant with a trifid spine subtending the petiole; leaves with blade narrowly rhomboidal, prominently discolorous . . . . . **X. spinosum**
Plant not spiny; leaves with blade deltoid, concolorous. . . . . **X. strumarium**

***spinosum** L.

Annual herb, up to 1 m high. **Leaves** alternate; blade narrowly rhomboidal, usually 3-lobed, apical lobe long and narrow, margins entire, prominently discolorous; petiole ± 10 mm long, each subtended by yellow trifid spine. **Heads** unisexual, discoid; male heads many in upper leaf axils; female heads solitary in lower leaf axils. **Involucral bracts** in male heads few, narrow, 1- or 2-seriate; in female heads enveloping female florets, covered in hooked spines. **Flowers**: corolla of male florets greenish, absent in female florets; Dec.–Mar. **Fruit** with cypsela obovoid or oblong, enveloped by hardened, spiny involucral bracts. **Pappus** absent. Weed in dry habitats. Native to tropical America. *Spiny cocklebur*, *dagger-weed*; *boetebossie*, *speldebossie*, *vernietbossie* (A); *hlaba-hlabane* (SS); *iligcume* (Z).

VreDm? | DrGr | KarSh

***strumarium** L.
*X. natalense* Widder
*X. pungens* Wallr.

Annual herb, up to 1.5 m high; not spiny. **Leaves** alternate; blade deltoid or broadly ovate, simple or 3- to 5-lobed, base cordate, margins coarsely and irregularly dentate, concolorous; petiole up to 100 mm long. **Heads** unisexual, discoid; male heads many, terminal in short axillary inflorescences; female heads several below them. **Involucral bracts** in male heads few, narrow, 1- or 2-seriate; in female heads enveloping female florets, covered in hooked spines. **Flowers**: corolla of male florets greenish or yellowish, absent in female florets; Dec.–Mar. **Fruit** with cypsela obovoid or oblong, enveloped by hardened, spiny, involucral bracts. **Pappus** absent. Weed of disturbed places, particularly along streambanks and riverbanks. Native to tropical America. *Large cocklebur*, *burweed*; *kankerroos* (A); *hlaba-hlabane* (SS).

VreDm | DrGr | MsGr | KarSh

## **Zinnia** L. (sthn Afr.: 1 sp.)

(Heliantheae)

***peruviana** (L.) L.
*Chrysogonum peruvianum* L.
*Z. multiflora* L.

Annual herb, up to 0.5 m high. **Leaves** opposite, sessile or subsessile; blade oblong or narrowly ovate, up to ± 60 × 15 mm, margins entire, often with 3 prominent main veins, rough-hairy. **Heads** radiate, terminating main and short, corymbosely arranged lateral branches; peduncles gradually thickened upwards. **Involucral bracts** ± 4-seriate, imbricate, oblong-elliptic, apex rounded, papery, dark-margined. **Receptacle** with palea enveloping disc florets. **Flowers**: ray florets female, fertile, reddish or brownish red, rarely yellow; disc florets bisexual, yellowish to red or brownish red; Nov.–Apr. **Fruit** with cypsela narrowly oblong-obovate, 10 mm long; outer ± 3-angled; inner compressed. **Pappus** of a single lateral awn, absent in ray cypsela. Weed, often along roadsides. Native to southern United States. *Wild zinnia*, *redstar zinnia*; *wilde jakobregop* (A); *lipii* (SS).

VreDm | DrGr | MsGr | KarSh

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# BALSAMINACEAE

Soft herbs, rarely woody at base, subsucculent. **Stems** translucent and watery. **Leaves** simple, opposite or alternate; blade with margin entire or variously toothed. **Flowers**: on axillary peduncles, zygomorphic; sepals 3–5, free, with one produced into a spur or bag, usually coloured; petals 3–5, usually ± connate, anterior one the largest, laterals 2-lobed; stamens 5, anthers large, cohering to form a cap over ovary, filaments free; ovary superior, style 0, stigma simple, sessile, 5-toothed or -lobed. **Fruit** an explosively, dehiscent capsule. *Balsam family*.

## **Impatiens** L. (sthn Afr.: 5 spp.)

### **hochstetteri** Warb. subsp. **hochstetteri**

*I. capensis* Thunb.
*I. duthieae* L.Bolus

Erect to procumbent, annual or perennial herb, up to 0.75 m high. **Leaves** alternate, petiolate; blade ovate to broadly elliptic, 30–80 × 25–40 mm, margins toothed, each tooth ends with a hair tapering to a long tip, sparsely hairy on upper surface; petiole 15–40 mm long. **Flowers**: lower lateral petal unevenly bilobed, lateral united petals up to 15 mm long; spur up to 24 mm long;

corolla pinkish mauve; Nov.–May. Forests, moist, usually shaded places, edge of streams. *Common wild impatiens*; *kruidjie-roer-my-nie* (A); *ihlula*, *umadolwane* (Z).

MsGr

# BEGONIACEAE

Monoecious herbs. **Stems** often softly succulent, swollen at nodes. **Leaves** alternate, persistent or deciduous; blade asymmetrical, membranous; stipules present. **Flowers**: inflorescences axillary, bracteate, cymose; regular or zygomorphic; perianth segments 2 or more, petaloid; stamens many; ovary inferior; styles 2–5, stigmas 2-fid or twisted, usually papillose. **Fruit** a 3-angled or unequally 3-winged, membranous capsule. *Begonia family*.

## **Begonia** L. (sthn Afr.: 6 spp.)

**sutherlandii** Hook.f. subsp. **sutherlandii**
*B. dissecta* Irmsch.

Perennial herb, up to 1 m high. **Stems** and leaves glabrous to sparsely hairy. **Leaves** with blade ovate, 160–250 × 100–150 mm, base very asymmetrical, margin acutely and irregularly serrate, frequently lobed as well; stipules 2, conspicuous. **Flowers**: in axillary, bracteate cymes; corolla up to 35 mm in diameter, pale to deep orange or brick-red; Nov.–Apr. **Fruit** 3-winged. In forest, on steeply sloping forest floor or on earth banks, rock faces or mossy boulders, sometimes epiphytic. *Wild orange begonia*, *Sutherland-begonia*; *uqamamawene* (Z).

MsGr

# BETULACEAE

Trees and shrubs; mono- or dioecious. **Leaves** simple, alternate, deciduous; blade with margins dentate or entire; with stipules. **Flowers**: in 1–3-flowered clusters; male flowers pendulous, in conspicuous, bracteate catkins; female flowers erect or pendulous on a stiff axis; perianth scale-like segments; stamens 4–6; ovary inferior. **Fruit** a single-seeded nut. *Birch or Alder family*.

## **Alnus** Mill. (sthn Afr.: 4 spp.)

***glutinosa** (L.) Gaertn.

Tree, 20–30 m high; young growth glutinous; monoecious. **Leaves** petiolate; blade elliptic to broadly ovate, 60–120 mm long, apex truncate, base cuneate, margins shallowly toothed, sticky when young, later glossy green; petiole up to 50 mm long. **Flowers**: male catkins 50–100 mm

long, pendulous, reddish; female catkins 200 mm long, dark brown to black; Nov.–May. **Fruit** cone-like with 5-lobed scales, persistent; nutlets winged. Native to Europe. *Black alder*.

DrGr

# BIGNONIACEAE

Trees, shrubs, often scandent, woody. **Leaves** opposite, compound or simple, with articulated leaflets. **Flowers**: bisexual, ± irregular, often large and brightly coloured; calyx 5-toothed, 5-lobed or spathe-like, shorter than corolla tube; petals 5, fused basally, lobed distally; stamens usually 4, sometimes 5, fused to petals; ovary superior, stigma of 2 flattened, ovate or oblong lobes. **Fruit** a 2-valved capsule or fleshy and indehiscent; seeds usually flat, with a broad hyaline wing. *Bignonia family*.

## **Rhigozum** Burch. (sthn Afr.: 5 spp.)

Key to species:

Corolla white or whitish pink to pink; margin of leaf blade undulate . . . . . **R. trichotomum**
Corolla yellow; margin of leaf blade not undulate . . . . . **R. obovatum**

### **obovatum** Burch.

Small tree or shrub, 1.0–4.5 m high. **Leaves** simple or 1-jugate, fascicled on small cushions (abbreviated shoots); blade obovate to oblong-obovate; petiole ± 2–6(–8) mm long. **Flowers**: corolla bright yellow; Jul., Oct., Nov. **Fruit** a 'pod-like' capsule. Dry rocky places or granite sand veld. *Karoo gold*; *granaatbos*, *geelberggranaat* (A).

DrGr KarSh

### **trichotomum** Burch.

Shrub, 1–2 m high. **Stems** trichotomously branched, branches rigid, spine-tipped. **Leaves** simple, solitary or fascicled; blade spathulate, apex rounded, margin undulate, gland dotted; sessile or shortly petiolate. **Flowers**: usually terminal; corolla white or whitish pink to pink; Sep.–Mar. *Three-thorn*; *driedoring*, *korumbos*, *wildegranaat* (A).

KarSh

# BORAGINACEAE

Annual or perennial herbs, shrubs or trees; variably pubescent, hairs often with conspicuous multicellular bases. **Leaves** usually alternate, simple, sessile or petiolate, margins mainly entire, stipules 0. **Flowers**: bisexual, regular or occasionally irregular, in terminal or axillary, cymes, scorpioid or helicoid arranged, inflorescence coiled when

young, uncoiling as flowers open; bracts small or absent; calyx persistent, sometimes accrescent in fruit, tube campanulate or cylindric; corolla imbricate or occasionally contorted in bud (*Myosotis*), tube cylindric, ± funnel-shaped, campanulate or rotate, sometimes tube very reduced; faucal appendages often present between lobes; stamens as many as and alternating with corolla lobes, epipetalous, exserted or included; anthers 2-thecous, opening by longitudinal slits; disc present or absent; ovary superior, entire or deeply 4-lobed, 2-locular with 2 ovules in each or with 4, 1-ovuled locules due to development of false partitions; style terminal or gynobasic (arising from between ovary lobes), entire, 2- or 4-fid or occasionally absent; stigmas various. **Fruit** schizocarp with 1–4 nutlets, or a drupe or capsule. *Forget-me-not family*.

## Key to genera

| | | |
|---|---|---|
| 1a | Style terminal | 2 |
| 1b | Style gynobasic; predominantly perennial herbs, occasionally shrubs | 3 |
| 2a | Fruit a drupe; shrubs or trees; style 2-fid | **Ehretia** |
| 2b | Fruit of nutlets; decumbent or erect herbs; style 1 or 0, stigmatose ring present below the entire or 2-fid apex of the style | **Heliotropium** |
| 3a | Calyx strongly accrescent in fruit; anthers with connectives prolonging into long, appendages, twisted above thecae | **Trichodesma** |
| 3b | Calyx not or slightly accrescent in fruit; anthers not prolonged into long appendages | 4 |
| 4a | Stamens exserted | 5 |
| 4b | Stamens included; corolla with fornices | 6 |
| 5a | Corolla with fornices in throat; lobes regular, folding back | **Afrotysonia** |
| 5b | Corolla naked in throat, irregular; annulus consisting of 5 or 10 minute, hairy lobules present at base of corolla tube | **Echium** |
| 6a | Nutlets glabrous | 7 |
| 6b | Nutlets glochidiate | 10 |
| 7a | Corolla lobes contorted in bud | **Myosotis** |
| 7b | Corolla lobes imbricate in bud | 8 |
| 8a | Nutlets smooth, or smooth and pitted | **Lithospermum** |
| 8b | Nutlets rugose, tuberculate and verrucose | 9 |
| 9a | Corolla throat with 5 well-developed, elongated, vertical lines of hairs | **Buglossoides** |
| 9b | Corolla throat without vertical lines of hairs, fornices present | **Anchusa** |
| 10a | Inflorescence ebracteate; nutlets attached to gynobase for their entire length | **Cynoglossum** |
| 10b | Inflorescence bracteate; nutlets attached to gynobase for only part of their length | **Lappula** |

## **Afrotysonia** Rauschert (sthn. Afr.: 2 spp.)

### **glochidiata** (R.R.Mill) R.R.Mill

Perennial herb with annual stems from a woody rootstock, up to 1.5 m high. **Leaves** densely hairy, blade ovate to narrowly ovate, basal ones large, 140–230 × 65–130 mm, decurrent with petiole up to 300 mm long, upper stem leaves smaller, sessile, narrowly ovate, greyish, hairs on upper surface antrorse, those on lower surface retrorse. **Flowers**: ebracteate; inflorescence a branched panicle of 8–15-flowered, scorpioid cymes, elongating considerably in fruit; calyx deeply divided into 5 narrowly oblong lobes, ± as long as campanulate corolla tube; corolla white with fornices prominently exserted when the narrowly oblong lobes fold back; stamens exserted; Dec.–Apr. **Fruit** of 1 or 4 nutlets, wingless, densely glochidiate. Grassy plains, edge

of forests, kloofs, vleis, marginal scrub forest, streambanks, damp, rough grassland in valley bottoms and drainage lines.

| | | | MsGr | | |
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## **Anchusa** L. (sthn Afr.: 2 spp.)

### Key to species:

Calyx deeply divided, lobes narrowly linear-acuminate; nutlets erect . . . **A. azurea**
Calyx lobed to not > $^{2}/_{3}$, lobes deltoid with acute or obtuse apices; nutlets strongly convex on back . . . . . **A. riparia**

### ***azurea** Mill.

*A. italica* Retz.

Perennial herb, 0.2–1.5 m high, roughly hairy with long, white bristles. **Leaves** with blade ovate to narrowly obovate-elliptic, up to 140 × 20 mm, apex acute. **Flowers** in scorpioid cymes; calyx divided ± to base, lobes narrowly linear, 6–8 mm long in flower, 12–15 mm long in fruit, apices acuminate; corolla with tube, ± 6 mm long, equalling or longer than limb, limb (8–)10–15 mm in diameter, lobes ± 4 mm long, violet or deep blue; Oct.–Mar. **Fruit** an erect nutlet, longer than wide, at least 6 mm long. Native to Europe and Asia.

| | | DrGr | | | |
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### **riparia** DC.

*A. capensis* Thunb. *sens. auct.*
*A. dregei* DC.
*A. officinalis* Thunb. *non* L.

Perennial herb, with annual flowering stems up to 0.4 m high. **Stems** erect or decumbent; sparsely setose. **Leaves** with blade narrowly ovate, up to 90 × 9 mm, apex acute. **Flowers**: in scorpioid cymes; calyx not divided to base, lobed to not > $^{2}/_{3}$, lobes deltoid with acute or obtuse apices accrescent; corolla up to 7 mm in diameter, tube 3–4 mm long, white, lobes 1–2 mm long, bright blue, fornices white; Sep.–Mar. **Fruit** a nutlet, ± 3 mm long, rugose, tuberculate, verrucose. Grassland, mountain slopes, dunes, disturbed places, roadsides.

| | AcGr | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

## **Buglossoides** Moench (sthn Afr.: 1 sp.)

### ***arvensis** (L.) I.M.Johnst.

*Lithospermum arvense* L.

Annual herb, up to 0.6 m high. **Roots** purplish red. **Stems** erect or decumbent, densely hairy. **Leaves** sessile; blade narrowly ovate or narrowly obovate, 15–45 × 3–8 mm, apex acute, margin entire, densely setulose. **Flowers**: bracteate; inflorescences terminal, cymes scorpioid; calyx > $^{1}/_{2}$ as long as corolla tube, lobes with apices acute, indumentum whitish, hairs long, sparse; corolla with 5 well-differentiated, longitudinal bands of hairs extending from bases of lobes downwards to tips of anthers; stamens included, tube 5–7 mm long, white; Aug.–Nov. **Fruit** of 4 tuberculate nutlets, brownish or greyish, not shining, with hard pericarp. Weed growing in disturbed places. Native to Europe. *Corn gromwel*; *naelbossie* (A).

| | AcGr | DrGr | | | Zastr |
|---|---|---|---|---|---|

## **Cynoglossum** L. (sthn Afr.: 8 spp.)

### Key to species:

1a Inflorescence divaricately bifid; nutlets shortly stalked, stalks up to 3 mm long, or sessile; corolla lobes white, sometimes pale blue or white with blue in throat of corolla . . . . . **C. lanceolatum**

1b Inflorescence not as above; nutlets prominently stalked, stalks often pendulous; corolla lobes white, shades of blue or shades of purple . . . . . 2

2a Glochidia concentrated along margins and median line of nutlet . . . . . **C. spelaeum**

2b Glochidia covering ± the whole nutlet . . . . . 3

3a Glochidia cylindrical, slender, not swollen at base . . . . **C. austroafricanum**

3b Glochidia swollen at base . . . . . **C. hispidum**

### **austroafricanum** Hilliard & B.L.Burtt

Annual, occasionally perennial herb, 0.3–1.0 m high. **Leaves** sessile; blade obovate, up to 100 × 16 mm, apex acute, base truncate. **Flowers**: in helicoid cymes; corolla bright blue to purple; Dec.–Apr. **Fruit** of nutlets, covered with cylindrical, slender glochidia. Grassland, mountain slopes, hillsides, stony grassland, damp places, waste patches, shade.




### **hispidum** Thunb.

*C. enerve* Turcz.

Perennial herb, with annual or biennial stems, up to 0.6 m high in flower. **Stems** erect. **Leaves** with secondary nerves not well-marked; blade narrowly ovate to oblong. **Flowers**: pedicels at flowering ± 1.5 mm long, elongated in fruit up to 15(–25) mm; corolla lobes 0.6–0.8 mm long; purplish violet or reddish; Sep.–Feb. **Fruit** of nutlets, densely covered with bulbous-based glochidia; stalk deflexed. Open grassland with slightly shaded areas, grassy slopes, disturbed places. *Hound's tongue*; *beestongblaar*, *knoppiesklitsbossie*, *ossetongblaar* (A).




### **lanceolatum** Forssk.

*C. micranthum* Desf.

Biennial, annual or sometimes perennial herb, 0.3–1.2(–1.8) m high. **Stems** divaricately branched. **Leaves** sessile; blade obovate, up to 120 × 15 mm, apex acute, venation of lower surface prominent with secondary nerves merged into 2 submarginal, well-marked nerves. **Flowers**: in helicoid inflorescences, divaricately branched, pedicels 1.0–2.5(–3.0) mm long in flowering, not elongated in fruit; corolla lobes 0.6–1.5 mm long, white or blue or with tube mauve and limb white or bluish and deep blue at throat; Nov.–Feb. **Fruit** of sessile or shortly stalked nutlets, stalks < 3 mm long, covered with glochidia. Grassland, savanna, along watercourses, in riverine forest, in vleis, weed in plantations, clay, sandy loam, black soils. *Knoppiesklits* (A).




### **spelaeum** Hilliard & B.L.Burtt

Perennial herb, up to 1 m high. **Leaves** sessile; blade decurrent, obovate, up to 100 × 40 mm, apex acute, base truncate, margins entire. **Flowers** in helicoid cymes; corolla lobes white; Dec.–Mar. **Fruit** of stalked nutlets, with cylindrical, well-spaced glochidia concentrated along

margins and median line of nutlet. Mountain grassland, dolerite cliffs; loose soil in shade of large boulders.

DrGr

## **Echium** L. (sthn Afr.: 2 spp.)

### Key to species:

[after Retief & Van Wyk: 173 (1998)]

Corolla glabrous, except for sparse, unbranched hairs on veins and margin; basal leaves petiolate, blade broadly ovate with prominent lateral veins; 2 stamens long-exserted, 3 enclosed. . . . . **E. plantagineum**
Corolla softly hairy with unbranched hairs prominently longer on veins; basal leaves subsessile, blade narrowly ovate with lateral veins obscure; 4 stamens long-exserted . . . . . **E. vulgare**

### ***plantagineum** L.

*E. lycopsis* L.

Annual or biennial herb, with 1–many flowering stems, up to 0.8 m high. **Stems** erect or decumbent. **Leaves** petiolate or sessile; basal leaves with blade broadly ovate to narrowly obovate, 50–300 × 10–70 mm, apex rounded to somewhat acute, decurrent, base attenuate, lateral veins prominent on both surfaces; petiole up to 55 mm long; cauline leaves sessile; blade narrowly ovate. **Flowers**: in helicoid cymes; stamens with lower pair long-exserted, other 3 enclosed; filaments with long hairs; calyx up to 12 mm long in fruit; corolla broadly funnel-shaped, 10–20 mm long, glabrous except for hairs on veins and margins of outer surface, blue or deep purplish blue; Sep.–Mar. **Fruit** with nutlets, 2.0–3.0 × 2.0–2.5 mm, greyish brown, rugose, tuberculate. Roadsides, waste ground, weed of cultivation. Native to western and southern Europe, northern Africa and southwestern Asia. *Paterson's curse*, *purple bugloss*; *bloudissel*, *bloudisseldoring* (A).

MsGr Zastr

### ***vulgare** L.

Biennial or perennial herb, up to 1 m high. **Stems** erect or decumbent. **Leaves** subsessile or sessile; basal leaves attenuating into a short petiole (subsessile); blade linear to narrowly obovate or ovate, 50–260 × 10–30 mm, lateral veins not prominent; cauline leaves narrowly ovate. **Flowers**: in helicoid cymes; stamens with 4 long-exserted, 1 short, included; calyx lobes 6–8 mm long in fruit; corolla broadly funnel-shaped, 10–15 mm long, outer surface puberulous and with long, simple hairs on veins and margins, brilliant blue, fading to mauve; Nov.–Mar. Weed of old cultivated lands, waste places, roadsides, occasionally in montane grassland. Native to Europe. *Blue devil*, *blue weed*, *viper's bugloss*.

DrGr MsGr

## **Ehretia** P.Br. (sthn Afr.: 3 spp.)

### Key to species:

[after Retief & Van Wyk: 16 (2001)]

1a Corolla tube and lobes white, young buds mauve. . . . . **E. alba**
1b Corolla tube white, lobes purple . . . . . 2

2a Inflorescences terminal, 1 or several in a head on young shoots; peduncles and pedicels thick, up to 1.5 mm in diameter. . . . . **E. rigida** subsp. **rigida**
2b Inflorescences terminal on very short young shoots, 1- or 2-branched; peduncles and pedicels thinner, up to 1 mm in diameter . . . . . **E. rigida** subsp. **nervifolia**

### **alba** Retief & A.E.van Wyk

Shrub, up to 4 m high. **Stems** rigid. **Leaves** petiolate; blade oblong to obovate, 6–25 × 3–13 mm, apex obtuse or acute, glabrous except for appressed setae along margin, thickening when older or under unfavourable climatic conditions. **Flowers**: in scorpioid cymes; peduncles and pedicels with multicellular hairs and scattered setae; calyx lobes narrowly triangular, up to 3 mm long, apices acute to acuminate; corolla tube and lobes ± 3 mm long, white fading to cream-coloured; Aug.–Oct. **Fruit** a drupe with 4 pyrenes; pyrenes subglobose, 3 × 4 mm. *Bergwitboom*, *bergwitbos* (A).

AcGr DrGr KarSh

### **rigida** (Thunb.) Druce subsp. **nervifolia** Retief & A.E.van Wyk

*E. hottentotica* Burch.

Small tree or shrub, 0.8–6.0 m high. **Stems** entangled, arching or drooping. **Leaves** petiolate or sessile; blade obovate to broadly elliptic, 16–35 × 7–15 mm, apex acute, obtuse or emarginate, glabrous except for appressed setae along margins or pubescent with setae also along midrib and veins, lower surface with midrib and lateral veins prominent, acarodomatia present; petiole 0 or up to 4 mm long. **Flowers**: in scorpioid cymes, inflorescences terminal on very short young shoots, 1- or 2-branched; peduncles and pedicels thinner, up to 1 mm in diameter; corolla lobes as long as or shorter than tube, ± spreading; mauve to pale blue or white; Aug.–Dec. **Fruit** a drupe with 4 pyrenes; pyrenes subglobose, 4 × 5 mm. Savanna, bush clumps, granite hills, next to fences. *Puzzle bush*; *deurmekaarbos* (A); *môrobê* (T). Figure 7D, p. 3

DrGr

### **rigida** (Thunb.) Druce subsp. **rigida**

Much-branched shrub or multi-stemmed tree, up to 4 m high; often stunted. **Leaves** petiolate; blade obovate, 20–35 × 12–23 mm, apex acute or rounded, glabrous or main veins with setae, other veins with scattered setae, usually coriaceous; petioles 3–8 mm long. **Flowers** in scorpioid cymes, inflorescences terminal, 1 or several in a head on young shoots; peduncles and pedicels thick, up to 1.5 mm in diameter; corolla with tube 8–10 mm long, white, lobes shorter than tube, lilac, blue, bluish purple or purple; Oct.–Mar. **Fruit** a drupe with 4 pyrenes; pyrenes subglobose, 5 × 7 mm. Scrub, bush clumps. *Cape lilac*.

KarSh

## **Heliotropium** L. (sthn Afr.: 17 spp.)

### Key to species:

1a Corolla lobes rounded . . . . . 2
1b Corolla lobes with apices acute . . . . . 3
2a Plant succulent. . . . . **H. curassavicum**
2b Plant non-succulent. . . . . **H. nelsonii**
3a Leaves distinctly petiolate, petiole > 11 mm long, blade ovate to elliptic; indumentum not characterised by 2-armed hairs . . . . . **H. ciliatum**

3b Leaves sessile to shortly petiolate, petiole up to 3 mm long, blade linear; indumentum characterised by 2-armed hairs . . . . . **H. lineare**

**ciliatum** Kaplan

*H. gibbosum* Friedr.
*H. pustulatum* Kaplan
*Tournefortia tuberculosa* Cham.

Perennial herb, much branched from a woody base, 0.2–0.8 m high. **Stems** erect. **Leaves** petiolate; blade ovate to elliptic, 10–30 × 2–10 mm, slightly decurrent, base cuneate, apex acute, margin undulate, shallowly toothed, lower leaf blade with bulbous-based setae, upper part of seta short and stout; petioles 3–12 mm long. **Flowers**: in helicoid cymes, ebracteate; upper part of style head cylindrical; calyx pubescent, persistent, deeply lobed, much shorter than corolla, lobes triangular; corolla white, throat orange, tube cylindrical, ± 3.5 mm long, appressed pubescent in upper part, lobes acuminate, ± 1.5 mm long; Oct.–May. **Fruit** 2 nutlets, rugose, tuberculate-crested, saddle-shaped at apex, connate in pairs. Grassland, riverbanks, savanna with trees and shrubs and dry woodland, rocky hills, roadsides, dry pans, sandy or rocky soil.

VreDm | AcGr | DrGr | | KarSh |

***curassavicum** L.

Perennial, succulent herb. **Stems** annual, procumbent from a woody rootstock, glabrous; stems procumbent or erect (flowering branches), up to 0.5 m high. **Leaves** bluish green, sessile or blade decurrent; blade narrowly obovate, 10–65 × 1–13 mm, base cuneate, apex obtuse, margin entire, lower surface with undeveloped hairs. **Flowers** in helicoid cymes, ebracteate; upper part of style head discoid; calyx persistent, lobes triangular, shorter than corolla, ± 3 mm long in fruit; corolla with tube cylindrical, ± 2 mm long, naked in throat, lobes oblong, ± 1 mm long, apex rounded, white or light cream-coloured; Sep.–Apr. **Fruit** of nutlets, ± 2 mm long, glabrous, rugose. Halophyte, in saline soils, at edges of salt pans, margins of streams, vleis and pans in mud, disturbed areas. Native to North and South America. *Smooth heliotrope*; *brakganna*, *panbrak* (A).

| AcGr | DrGr | | KarSh |

**lineare** (A.DC.) Gürke

*H. kuntzei* Gürke
*Heliophytum lineare* A.DC.

Perennial herb, up to 0.6 m high. **Stems** erect. **Leaves** sessile; young shoots often in axils of leaves; blade linear, up to 30 × 2 mm, apex acute to obtuse, base cuneate, margin entire, lower surface with 2-armed hairs on midrib and undeveloped setae on blade. **Flowers**: in helicoid cymes, ebracteate; style with upper part of style head cylindrical, glabrous; calyx persistent, much shorter than corolla tube; corolla with tube 4–5 mm long, throat naked, lobes triangular, apices acuminate, white, cream-coloured or yellow; Oct.–May. **Fruit** two 2-seeded nutlets, rugose. Grassland, savanna, margins of streams, vleis, pans ruderal of bare disturbed soil, abandoned land, hill slopes; sandy, red sandy loam, brack, gravelly, clayey, limestone soils.

| AcGr | DrGr | | KarSh |

**nelsonii** C.H.Wright

*H. rogersii* Kaplan
*H. steudneri* Vatke *sens. auct.*

Perennial herb, 0.6–0.9 m high. **Stems** erect; short stems present in axils of leaves. **Leaves** sessile or shortly petiolate; blade narrowly ovate, elliptic or linear, (40–)50 × 10(–70) mm, base

cuneate, apex acute to obtuse, margin entire, sometimes slightly undulate, lower surface with long, narrow and bulbous-based setae, prominent on veins; petioles up to 3 mm long. **Flowers**: in helicoid cymes, ebracteate; style with upper part of style head cylindrical and with scattered hairs; calyx persistent, divided almost to base into linear lobes, lobes much shorter than corolla tube; corolla appressed pubescent, tube cylindrical, densely covered with appressed, antrorse hairs, lobes obtuse, slightly undulate, white, throat yellow; Aug.–May. **Fruit** 2 nutlets, glabrous, ridged. Open grounds, grasslands and in dry bushes on dry, poor and often sandy soils.

AcGr KarSh

## **Lappula** Moench (sthn Afr.: 4 spp.)

### Key to species:

Nutlets in a single row of glochidia, flattened . . . . . **L. capensis**
Nutlets with an outer row of very short glochidia and an inner row of longer glochidia . . . . . **L. heteracantha**

### **capensis** (A.DC.) Gürke

Annual herb, up to 0.3 m high. **Leaves** sessile; softly hairy; blade narrowly obovate, 55 × 5 mm, with a tendency to fold. **Flowers** in terminal, leafy, scorpioid cymes elongating in fruit, pedicels very short; corolla ± 1 mm, white; Sep.–Apr. **Fruit** of nutlets, glochidiate; glochidia a single row, flattened, confluent at base. Disturbed places, banks of watercourses, roadsides.

MsGr KarSh

### **heteracantha** Ledeb.

*L. echinata* Gilib.
*L. squarrosa* (L.) Dumort. subsp. *heteracantha* (Ledeb.) Chater

Annual or perennial herb, up to 0.6 m high. **Leaves** sessile; softly hairy; blade narrowly obovate, 65 × 7 mm, with a tendency to fold. **Flowers**: in terminal, leafy, scorpioid cymes elongating in fruit, pedicels very short; corolla ± 2 mm long, blue; Sep.–Mar. **Fruit** of nutlets, nutlets with an outer row of very short glochidia and an inner row of longer glochidia; glochidia confluent at base. Grassland, limestone flats, banks of watercourses, roadsides, in cultivated land, disturbed places, weed in gardens. *European stickseed*; *klitsgras*, *steeksaadgras* (A).

DrGr MsGr KarSh

## **Lithospermum** L. (sthn Afr.: 9 spp.)

### Key to species:

[after Wright: 21 (1904)]

1a Stems with an indumentum of appressed hairs. . . . . **L. cinereum**
1b Stems with an indumentum of patent hairs . . . . . 2
2a Leaves appressed . . . . . **L. papillosum**
2b Leaves spreading. . . . . 3
3a Leaves pubescent; upper leaves with apex of blade obtuse. . . . **L. scabrum**
3b Leaves densely pubescent; upper leaves with apex of blade acute. . . . . **L. hirsutum**

### **cinereum** DC.

Perennial herb, 0.1–0.3 m high; closely appressed greyish strigose. **Stems** corymbosely branched. **Leaves** with blade linear-oblong, apex obtuse, base cuneate. **Flowers** terminal between leaves; style included; calyx as long as corolla; corolla with tube 1.5–2.0 mm long, lobes white or yellowish white; Nov.–Apr. **Fruit** of nutlets, 2.5–3.0 mm long, white or rufescent, surface glabrous, smooth and pitted. Grassland, along watercourses, disturbed places, roadsides, stony soil. *Naelbossie* (A).

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### **hirsutum** E.Mey. ex .DC.

Perennial herb, up to 0.45 m high. **Stems** erect, branched; patently hairy. **Leaves** sessile, spreading; blade narrowly ovate, hirsute on both surfaces, lower leaf blades up to 50 × 5 mm, decurrent, long attenuate, apices obtuse, upper leaves with acute apices. **Flowers**: in terminal, leafy cymes; calyx irregular, densely hirsute; corolla with tube much longer than calyx, ± 6 mm long, lobes ± 1.5 mm long; white; Oct.–Dec. Disturbed places.

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### **papillosum** Thunb.

Perennial herb, 0.15–0.30 m high; stems with indumentum of patent hairs, densely leafy. **Leaves** appressed, sessile; blade narrowly ovate to elliptic, up to 35 × 9 mm, apex acute or obtuse, base cordate, margins entire, pubescent. **Flowers**: in leafy, scorpioid cymes, cymes accrescent; corolla with tube ± 3 mm, lobes 1–2 mm long, white; Sep.–Apr. **Fruit** of nutlets, smooth, white or greyish white. Grassland, grassy mountain slopes, under sandstone overhangs, along watercourses, well-drained rocky soil, moist loamy soil, full sun.

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### **scabrum** Thunb.

*L.affine* A.DC.

Perennial herb, with annual stems from rootstock. **Leaves** pubescent; blade narrowly ovate-oblong, up to 40 × 8 mm, apex obtuse, basal leaves decurrent, lower ones attenuate at base, margins entire. **Flowers**: in leafy terminal cymes; corolla with tube ± 3–4 mm long, lobes ± 1–2 mm long, white; Sep.–Mar. **Fruit** of nutlets, white, smooth, shining. Rocky hillsides, disturbed places.

| | | DrGr | | KarSh | |
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## **Myosotis** L. (sthn Afr.: 7 spp.)

### Key to species:

1a Calyx 1-nerved; leaves basally narrowly obovate . . . . . **M. graminifolia**
1b Calyx 3-nerved; leaves basally not narrowly obovate . . . . . 2
2a Cauline leaves with semi-amplexicaul blade bases . . .**M. semiamplexicaulis**
2b Cauline leaves with rounded to cordate blade bases . . . . . **M. sylvatica**

### **graminifolia** DC.

Perennial herb, 0.2–0.4 m high. **Stems** pilose. **Leaves** sessile; blade basally narrowly obovate, up to 20 × 4 mm, apex obtuse, decurrent, base attenuate, upper surface scabrid, lower surface

almost glabrous. **Flowers**: in scorpioid cymes; calyx 1-nerved; corolla ± 2–3 mm long, blue, fornices yellow; Dec.–Mar. Grassland; wet places.

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**semiamplexicaulis** DC.

*M. afropalustris* C.H.Wright *sens. auct.*

Perennial herb, up to 0.5 m high. **Stems** patently hirsute. **Leaves** basally with blade oblong, up to 100 × 13 mm, apex acute, decurrent, base attenuate; leaves towards inflorescence ovate, semi-amplexicaul, hirsute-pilose on both surfaces. **Flowers**: in scorpioid cymes; calyx 3-nerved; corolla ± 3 mm long, blue, fornices yellow; Nov.–Mar. Grassland, along streambanks and marshy areas.

| | | | MsGr | | |
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***sylvatica** Hoffm.

Perennial herb, 0.4–0.6 m high; hirsute. **Leaves** basally with blade elliptic, decurrent, up to 50 mm long, apex acute, base attenuate; upper leaves sessile, narrowly obovate, apex acute, base rounded to cordate, margins entire. **Flowers**: in scorpioid cymes, cymes usually forked; calyx 3-nerved, hairs hooked; corolla 3–4 mm long, bright blue, fornices yellow; Oct.–May. Grassland, streambanks, swampy areas, often in water. Native to Europe. *Forget-me-not*.

| | | | MsGr | KarSh | |
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## **Trichodesma** R.Br. (sthn Afr.: 5 spp.)

**angustifolium** Harv. subsp. **angustifolium**

Perennial herb, up to 1.2 m high; appressed-hairy, indumentum setulose, setae with distinct spaces in between. **Stems** erect or decumbent-ascending; epidermis often flaking off in older plants. **Leaves** shortly petiolate; blade decurrent, linear to narrowly elliptic, 20–50 × 3.0–6.0 mm, apex acute, base cuneate, margins entire; petiole up to 3 mm long. **Flowers**: terminal in scorpioid, cymose panicles; calyx winged, 11 × 4 mm in flower, ± 25 × 20 mm in fruit, apex long-acute, base cordate; corolla with tube cylindric, ± 9–15 mm long, lobes triangular, ± 5.5 × 4 mm, long-acuminate, often twisted, pinkish in bud, changing to blue or mauve, fading white; Oct.–May. **Fruit** 4 nutlets, ± 5–6 mm long, glochidiate, glochidia several-barbed, coalescing at their bases to form a distinct rim. Open grassland, mixed shrub savanna, disturbed places, red, sandy loam, stony soils.

| VreDm | AcGr | DrGr | | | |
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# BRASSICACEAE

Annual, biennial or perennial herbs, suffrutices, shrubs, glabrous or hairy; hairs simple, medifixed, branched, stellate or glandular. **Leaves** mostly alternate, often crowded in a rosette in short-lived herbs, simple, trifoliolate or pinnate, entire or variously lobed or cut, often auriculate; stipules minute or 0. **Flowers**: in a terminal raceme, occasionally a corymbose panicle, or solitary; bisexual, regular; sepals 4, in 2 pairs, equal or unequal, inner (lateral) pair often saccate or spurred; petals 4 or 0, usually clawed, sometimes with appendage at base; stamens (2, 4)6, lateral 2 shorter than median 4 arising in pairs; filaments with or without wings or appendages; anthers 2-thecous, opening by longitudinal slits; nectaries at base of filaments variable; ovary superior; style simple, stigma capitate or bilobed. **Fruit** a capsule, divided into 2 locules by the septum, referred to as a silicula (short) or siliqua (long), frequently with seed-bearing beak, usually dehiscing by 2 valves falling to reveal septum, rarely indehiscent or transversely articulate. **Seeds** discoid to globose, often winged, seed coat often mucilaginous. *Cabbage or mustard family*.

The view to regard *Cardaria* and *Coronopus* as synonyms of *Lepidium* is not followed here.

## Key to genera

[after Dreyer & Jordaan: 184 (2000)]

| | | |
|---|---|---|
| 1a | Inflorescences lateral opposite leaves | **Coronopus** |
| 1b | Inflorescences terminal or in leaf axils | 2 |
| 2a | Fruit transversely articulate with 2 or more segments which separate at maturity; lower segment indehiscent or whole fruit breaking into 1-seeded portions. | **Raphanus** |
| 2b | Fruit not transversely articulate; siliquae or siliculae opening by valves or breaking into 1-seeded portions, or hard and indehiscent | 3 |
| 3a | Fruit at least 4 × as long as broad (including length of style or beak) | 4 |
| 3b | Fruit < 3.5 × as long as broad | 15 |
| 4a | Hairs stellate, branched or a mixture of simple and branched hairs | **Matthiola** |
| 4b | Hairs simple or absent | 5 |
| 5a | Upper stem leaves with clasping auricles | **Brassica** |
| 5b | Upper stem leaves without clasping auricles | 6 |
| 6a | Stem leaves pinnate, pinnatisect, trifoliolate or digitate | 7 |
| 6b | Stem leaves simple, toothed or lobed to pinnatifid | 10 |
| 7a | Seeds in 2 rows, rarely irregularly in 1 row; petals white or yellow | 8 |
| 7b | Seeds in 1 row; petals white, mauve, lilac or purple | 9 |
| 8a | Leaf blade pinnate; petals white | **Rorippa** |
| 8b | Leaf blade with margins toothed or pinnatisect; petals yellow | **Nasturtium** |
| 9a | Leaf blade pinnately or sub-bipinnately partite; valves 1–3(–7)-nerved; | **Heliophila** |
| 9b | Leaf blade trifoliolate or pinnate with petiolulate leaflets; valves nerveless | **Cardamine** |
| 10a | Petals white, blue, lilac, pink, mauve or purple | **Heliophila** |
| 10b | Petals yellow, occasionally white | 11 |
| 11a | Seeds in 2 rows in each locule | 12 |
| 11b | Seeds in 1 row in each locule | 13 |
| 12a | Beak large, flat, ensiform or lanceolate, never seed-bearing; valves hispid; flowers large, > 15 mm long, yellow with dark veins | **Eruca** |

12b Style not beak-like, 1.5–2.5 mm long, narrowly cylindrical or ± obconical, sometimes seed-bearing; flowers small, < 9 mm long, yellow, sometimes tinged with violet when fading . . . . . **Diplotaxis**
13a Style never beak-like and seed-bearing . . . . . **Sisymbrium**
13b Style beak-like, often seed-bearing . . . . . 14
14a Fruit ± compressed or subterete, > 2 mm wide; racemes ebracteate . . . . . **Brassica**
14b Fruit ± quadrangular, < 2 mm wide; racemes often bracteate, at least in lower part . . . . . **Erucastrum**
15a Fruit indehiscent; stem leaves sagittate, amplexicaul; inflorescence a corymbose panicle . . . . . **Cardaria**
15b Fruit breaking into two 1-seeded portions or valves falling away from the seeds; stem leaves not amplexicaul; inflorescences racemes . . . . . 16
16a Fruit obtriangular, > 2 seeds in a locule . . . . . **Capsella**
16b Fruit elliptic to suborbicular, 2 seeds, 1 in each locule . . . . . **Lepidium**

## **Brassica** L. (sthn Afr.: 5 spp.)

### Key to species:

1a Upper stem leaves sessile, blade with auricles clasping stem . . . . . **B. rapa**
1b Upper stem leaves petiolate, blade not clasping stem . . . . . 2
2a Fruit with a distinct stipe . . . . . **B. elongata** subsp. **elongata**
2b Fruit with a stipe < 1 mm long, or stipe absent . . . . . **B. juncea**

### ***elongata** Ehrh. subsp. **elongata**

Biennial or short-lived perennial herb, up to 1 m high. **Stems** erect. **Leaves** with basal and upper stem leaves petiolate, blade obovate to elliptic, not clasping stem, margins sinuate-pinnatifid or entire, both surfaces covered with bristles. **Flowers**: petals 7–10, yellow; Oct., Nov. **Fruit** with stipe 1.5–4.5 mm long, siliquae 15–22 mm long, attenuate into seedless beaks 0.5–2.5 mm long. Disturbed places. Native to Europe. *Elongated mustard*.




### ***juncea** (L.) Czern. & Coss.

*Sinapis juncea* L.

Annual herb, up to 1 m high. **Stems** erect. **Leaves** petiolate; lower ones lyrate-pinnatisect with 1 or 2 pairs of small, broad, lateral lobes, terminal large, ovate or obovate, margins dentate, sparsely hispid; upper leaves not clasping stem, petiolate, simple, margins entire or dentate, glabrous. **Flowers**: in dense racemes; petals 7–9 mm long, yellow; Dec.–Feb. **Fruit** with pedicels erect to spreading; stipe < 1 mm long or 0, siliquae 25–50 × 2–3 mm, lateral veins ± anastomosing, beak 5–10 mm long, subulate-conical. Disturbed places. Native to Asia. *Indian mustard*, *Chinese mustard*, *leaf mustard*.




### ***rapa** L.

Annual or biennial herb, up to 1.5 m high. **Stems** erect. **Leaves** basal ones petiolate, blade lyrate-pinnatisect, lobes dentate, terminal lobe broadly ovate, lobulate, sparsely hispid; upper leaves sessile, simple, blade obovate-oblong, base amplexicaul, glabrous. **Flowers**: in dense racemes; petals 6–10 mm long, yellow; Nov.–Feb. **Fruit** with pedicels spreading; siliquae 35–65

× 2–4 mm, reticulately veined, beak 8–20 mm long, attenuate. Disturbed places. Native to Asia. *Turnip*, *rape*; *beesraap*, *wilde-raap* (A).

MsGr

## **Capsella** Medik. (sthn Afr.: 1 sp.)

### ***bursa-pastoris** (L.) Medik.

*Thlaspi bursa-pastoris* L.

Annual herb, up to 0.6 m high; stems and leaves with appressed, branched and spreading simple hairs. **Stems** erect, simple or branched. **Leaves** petiolate and sessile; basal ones rosulate, petiolate, blade narrowly obovate, 40–160 mm long; upper leaves narrowly ovate-oblong, amplexicaul. **Flowers**: in dense racemes; petals 1.8–3.0 mm long, white; Sep.–Nov. **Fruit** with ± horizontally spreading pedicels; siliquae 6–9 × 4–8 mm, obcordate-triangular, emarginate, lateral margins almost straight. Disturbed places. Native to Europe. *Pepper plant*, *case weed*, *shepherd's purse*; *herderstassie*, *wagter-se-sakkie* (A); *sebitsa* (SS).

DrGr KarSh

## **Cardamine** L. (sthn Afr.: 5 spp.)

### Key to species:

Leaves trifoliolate . . . . . **C. africana**
Leaves pinnate . . . . . **C. flexuosa**

### **africana** L.

Perennial herb, up to 0.3 m high. **Stems** erect or decumbent; rooting at nodes, internodes long; **Leaves** alternate, petiolate, trifoliolate; leaflets petiolulate, blade of lateral leaflets obliquely ovate, terminal leaflet oblong-ovate or narrowly ovate, base cordate, apices acute or acuminate, ciliolate, crenate or crenate-dentate, each crenation with a mucronulate vein-ending, surfaces glabrous or strigillose. **Flowers**: in few-flowered racemes; petals 3.5–4.5 mm long, obovate, apex rounded or emarginate, clawed, white; Oct.–Mar. **Fruit** with pedicels stout; siliquae 30–45 × 1.8–2.2 mm, smooth. Forest, kloofs.

MsGr

### ***flexuosa** With.

Biennial, perennial or occasionally annual herb, up to 0.5 m high. **Stems** erect or decumbent, flexuous, hairy. **Leaves** with basal leaves in 2–7 pairs, pinnate; leaflets ovate to reniform, terminal leaflets larger; cauline leaves in 2–6 pairs, lateral leaflets narrowly ovate, margins dentate to entire. **Flowers**: petals 2.5–4.0 mm long, twice as long as sepals; white; Nov., Dec. **Fruit** with pedicels ascending or spreading; siliquae 12–25 × 1 mm. Forest, kloofs, damp, shady places. Native to Europe. *Wavy bittercress*.

MsGr

## **Cardaria** Desv. (sthn Afr.: 1 spp.)

### ***draba** (L.) Desv.

*Lepidium draba* L.

Perennial herb, up to 0.9 m high. **Stems** erect, several annually from rootstock; finely retrorsely puberulous in lower half, glabrous above. **Leaves** with basal ones dying off soon, petiolate; blade obovate, sublyrate or sinuately lobed; stem leaves sessile, ovate-oblong, up to 100 mm long, amplexicaul, base sagittate, apex acute, margins sinuate, dentate, the lower ones thinly puberulous on lower surface, upper ones glabrous. **Flowers**: in a dense, ebracteate, corymbose panicle; sepals 1.5–2.0 long; petals obovate, 3–4 mm long, white; Nov.–Feb. **Fruit** with pedicels ± reflexed or horizontally spreading; siliquae obcordate, 3.0–4.5 mm long, inflated. Native to Europe. *Pepper cress*, *hoary cress*, *white top*; *peperbos* (A).

| | | DrGr | | | |
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## **Coronopus** Zinn (sthn Afr.: 3 spp.)

### Key to species:

All leaves pinnatipartite or pinnatifid; stems pilose; fruit laterally compressed. . . . . **C. didymus**

All or at least upper leaves with margins entire; stems puberulous; fruit with 2 globose halves . . . . . **C. integrifolius**

### ***didymus** (L.) Sm.

*Lepidium didymum* L.

Biennial herb, up to 0.3 m high. **Stems** procumbent or erect; pilose. **Leaves** basally with blade up to 90 mm long, margins pinnatipartite, upper leaves pinnatifid, smaller. **Flowers**: in dense racemes; sepals 0.8–0.9 mm long, greenish white; petals < 0.5 mm long, white; Sep., Oct. **Fruit** with spreading or recurved-spreading pedicels; siliquae reniform to subcircular, 1.4–1.5 × 2.0–2.6 mm, reticulately netted and pitted. Disturbed places. Native to South America. Swinecress; peperbos (A).

| | | DrGr | | | |
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### ***integrifolius** (DC.) Spreng.

*Senebiera integrifolia* DC.

Perennial herb, up to 0.5 m high. **Stems** procumbent, decumbent or erect; puberulous. **Leaves** petiolate, basally crowded in a rosette; blade of basal ones pectinately 7–15-lobed, lobes semi-lunate, all or at least upper leaves with margins entire, upper leaves narrowly ovate or narrowly obovate, 5–75 mm × 1–5 mm, shortly petiolate. **Flowers**: in dense racemes; petals scarcely longer than sepals, ± 0.8 mm long, white; Sep.–Mar. **Fruit** with pedicels erect; siliquae of ± 2 globose halves, 0.8–1.0 mm in diameter, warted or pitted. Disturbed places, sandy soil. Native to Madagascar. *Peperbos* (A).

| | AcGr | DrGr | | KarSh | |
|---|---|---|---|---|---|

## **Diplotaxis** DC. (sthn Afr.: 1 sp.)

### ***muralis** (L.) DC. subsp. **muralis**

*Sisymbrium murale* L.

Annual or occasionally perennial herb, up to 0.5 m high. **Stems** erect, woody at base; sparsely hispid, hairs retrorse. **Leaves** mostly basal, in annual plants in a rosette, in older plants more laxly tufted; petiolate; blade narrowly obovate or ± spathulate, margins lyrate-pinnatifid or dentate. **Flowers**: in dense racemes; petals 5–8 mm long, yellow, sometimes tinged with violet when fading; Nov.–Apr. **Fruit** with pedicels ascending; siliquae linear, 20–40 × 1.5–2.5 mm, smooth. Disturbed places. Native to southern and Central Europe. *Stinking wall rocket*, *sand rocket*; *sandkool*, *stink diplotaxis* (A).

DrGr MsGr KarSh

## **Eruca** Mill. (sthn Afr.: 1 sp.)

### ***sativa** Mill.

Annual herb, up to 0.6 m high. **Stems** erect, stout, branched; hispid with retrorse hairs. **Leaves** with basal ones petiolate, upper sessile; all lyrate-pinnatifid or pinnatifid, 2–5-jugate lobes narrow, margins entire or lobulate, terminal lobe oblong or obovate. **Flowers**: in terminal racemes, dense in flower, lax in fruit; petals spathulate, 15–20 mm long, long-clawed, whitish yellow with dark purple-brown; Dec., Jan. **Fruit** with short, stout pedicels; siliquae 12–30 × 3–5 mm, valves elliptic, 1-nerved, glabrous or hispid, beak narrowly ovate, flat, at least half as long as valves. Disturbed places. Native to Europe. *Rocket*, *garden eruca*; *wildekool*, *tuin-eruca* (A).

DrGr

## **Erucastrum** (DC.) C.Presl (sthn Afr.: 3 spp.)

### Key to species:

1a Siliquae 70–125 mm long, puberulous . . . . . **E. austroafricanum**
1b Siliquae 20–48 mm long, glabrous or scabrous . . . . . 2
2a Siliquae 25–48 mm long, glabrous . . . . . **E. strigosum**
2b Siliquae 20–35 mm long, scrabous . . . . . **E. griquense**

### **austroafricanum** Al-Shehbaz & S.I.Warwick

*Sisymbrium thellungii* O.E.Schulz

Annual herb, up to 0.6 m high; small and simple or robust and much branched. **Stems** erect or decumbent. **Leaves** petiolate and sessile; trifoliate; basal leaves lyrate-pinnatifid, 3–7-jugate, stem leaves similar but gradually reduced in size, uppermost ones sessile, amplexicaul. **Flowers**: in 5–12-flowered racemes, rachis scabro-hispid, pedicels all or only lower ones subtended by a bract; petals narrowly obovate, 6–8 mm long, yellow; Aug.–Dec. **Fruit** with pedicels stout, wide-spreading; siliquae linear, 70–125 × 1.9–2.2 mm, subcompressed, puberulous. Forest, kloofs.

DrGr MsGr KarSh

**griquense** (N.E.Br.) O.E.Schulz
*Brassica griquensis* N.E.Br.
*Diplotaxis griquensis* (N.E.Br.) Sprague

Annual herb, up to 0.35 m high. **Stems** erect, branched; hispid with very coarse, spreading hairs and finer, ± retrorse hairs. **Leaves** petiolate or sessile; all leaves hispid on both surfaces, dense below, midrib of lower surface with coarser hairs; basal and lower ones with blade lyrate-pinnatifid, 1- or 2-jugate, upper pair ± confluent with terminal lobe, lateral lobes deltoid to deltoid-ovate; petiole 25–75 mm long; upper stem leaves sessile, blade oblong to narrowly ovate, margins dentate or serrate. **Flowers**: in terminal racemes; petals narrowly obovate or ± spathulate with a long, narrow claw, 5.5–7.0 mm long, yellow, tinged purple fading; Jan.–Apr. **Fruit** on wide-spreading or ascending pedicels; siliquae linear, 20–35 × 1.3–1.6 mm, scabrous with short, upward-pointing hairs; beak 0.5–2.0 mm long with a flat-capitate stigma. Grassland, on limestone or soil over limestone.

DrGr

**strigosum** (Thunb.) O.E.Schulz
*Brassica strigosa* (Thunb.) DC. var. *glabrata* Sond.
*Sisymbrium strigosum* Thunb. *p.p.*

Annual herb, up to 1 m high. **Stems** simple or branched in upper part; densely appressed-strigose with coarse, retrorse hairs in lower part. **Leaves** petiolate or sessile; petioles retrorsely hispid, blade thinly hispid; basal ones petiolate, blade lyrate-pinnatifid, 4–6-jugate with small deltoid-oblong or larger oblong-ovate lateral lobes, terminal lobe large, ovate; stem leaves with gradually shorter petioles, upper ones sessile, narrowly oblong-ovate, margins serrate-dentate or repand dentate-lobate. **Flowers**: in dense racemes; petals narrowly obovate, 6.5–9.0 mm long, long-clawed, white or cream-coloured, fading mauve; Oct.–Mar. **Fruit** with pedicels erect or wide-spreading; siliquae linear, 25–48 × 1.5–2.2 mm, glabrous; beak 3.0–10.5 mm long. Roadsides, disturbed places.

DrGr MsGr KarSh

## **Heliophila** L. (sthn Afr.: 71 spp.)

### Key to species:

| | | |
|---|---|---|
| 1a | Annual herbs | **H. minima** |
| 1b | Perennial herbs | 2 |
| 2a | Leaves rosulate | **H. carnosa** |
| 2b | Leaves spread along stem | 3 |
| 3a | Leaves 1 per node or fascicled; fruit erect | **H. suavissima** |
| 3b | Leaves only 1 per node; fruit pendulous | **H. rigidiuscula** |

**carnosa** (Thunb.) Steud.
*Cheiranthus carnosus* Thunb.
*H. sulcata* P.Conrath

Perennial herb, up to 0.6 m high. **Stems** annual, erect, glabrous. **Leaves** crowded near base or plants tussock-forming with leaves in a dense rosette; petiolate; blade filiform to strap-shaped, or lobed in upper half with lobes short, 3–5 mm long, or up to 30 mm long, or finely to coarsely pinnately lobed, somewhat fleshy, apex acute or acuminate, midribs of basal leaves persistent. **Flowers**: in accrescent racemes, peduncles 80–350 mm long; petals narrowly obovate to obovate-circular, 6.5–13.5 mm long, clawed; white to purple; Oct.–Jan. **Fruit** with pedicels

recurved; siliquae linear, 25–80 × 2.5–5.0 mm, flat, faintly reticulate. Grassland, hill slopes. *Blompeperbossie*, *sporrie* (A).

DrGr MsGr KarSh

**minima** (Stephens) Marais

Annual herb, occasionally perennial, up to 0.6 m high. **Stems** erect, much branched; basal part and young shoots pubescent. **Leaves** simple or lobed; blade linear or linear-filiform, glaucous, upper surface puberulous or shortly hairy; stipulate. **Flowers**: in lax racemes, elongating in fruit; pedicels 10–20 mm long in fruit; style 3–4 mm long, stigma wider than style; petals narrowly elliptic, 6.0–8.8 mm long, clawed; pale mauve, blue, lilac or white; Aug.–Dec. **Fruit** with pedicels pendulous or spreading, siliquae linear, 25–90 × 2–4 mm. Hillsides, flats, sandy soil.

DrGr KarSh

**rigidiuscula** Sond.

*H. virgata sensu* Eckl. & Zeyh.

Perennial herb, up to 0.9 m high. **Stems** annual, slender or robust; glabrous, striate. **Leaves** only 1 per node; blade linear to narrowly ovate or obovate, 20–125 × 0.5–7.0 mm, subulate, thin or slightly fleshy; stipulate. **Flowers**: in terminal, contracted racemes, lax in fruit; peduncles ± leafless; style 5.5–12.0 mm long, stigma small, capitate; petals broadly obovate, 6.5–11.5 × 4–10 mm, each with a large, papillate appendage on one side of claw, or occasionally each petal with large, hollow, cup-like gland on inside of claw; mauve, blue, white; Nov.–Jan. **Fruit** with pedicels recurved or reflexed, siliquae linear-oblong or narrowly ovate, 30–70 × 3–8 mm. Grassland. *Blue cress*; *bloubekkie* (A); *uvemvane oluncane* (Z).

MsGr

**suavissima** Burch. ex DC.

Dwarf shrub, up to 0.6 m high. **Stems** lax or straggly, sometimes stems only 50–70 mm high with annual shoots from a woody crown; young branches densely, older more thinly glandular-puberulous or finely papillate glandular. **Leaves** 1 per node or fascicled on old branches; blade linear, 5–45 × 0.75–1.50 mm, apex acute, fleshy; stipulate. **Flowers**: in lax, terminal racemes, peduncles up to 250 mm long; style 1.5–4.0 mm long, stigma in diameter wider than style; petals obovate-circular, 8–15 × 5–9 mm, clawed; blue, purple or mauve; May–Jul. **Fruit** with pedicels spreading or recurved; siliquae submoniliform, 45–65 × 3.0–3.5 mm. Hillsides, stony soil. *Ruikpeperbossie*, *bloubekkie* (A).

DrGr MsGr KarSh

## **Lepidium** L. (sthn Afr.: 18 spp.)

### Key to species:

1a Siliculae not or only very slightly emarginate; style projecting beyond apex of fruit . . . . . 2
1b Siliculae emarginate, sometimes only slightly; style shorter than, or as long as sinus, but not projecting . . . . . 6
2a Stamens 6. . . . . **L. schlechteri**
2b Stamens 2. . . . . 3
3a Nectaries elongate-triangular . . . . . **L. myriocarpum**

3b Nectaries filiform . . . . . 4
4a Fruiting pedicels wide-spreading, arcuate . . . . . **L. desertorum**
4b Fruiting pedicels erect, slightly curving outwards or appressed-erect, straight . . . . . 5
5a Racemes dense in fruit . . . . . **L. schinzii**
5b Racemes lax in fruit . . . . . **L. mossii**
6a Siliculae subcircular or broadly obovate, > 2.5 mm broad . . . **L. bonariense**
6b Siliculae ovate, oblong, oblong-ovate, or oblong-obovate to subcircular-oblong, < 2.5 mm broad . . . . . 7
7a Annual or biennial herbs, branching mostly in upper flowering part . . . . . **L. africanum** subsp. **africanum**
7b Perennial herbs, often woody at base . . . . . 8
8a Siliculae 1.8–2.3 mm broad . . . . . **L. africanum** subsp. **divaricatum**
8b Siliculae 1.2–1.7 mm broad . . . . . 9
9a Plants completely glabrous . . . . . **L. trifurcum**
9b Plants pubescent . . . . . **L. transvaalense**

## **africanum** (Burm.f.) DC. subsp. **africanum**

*L. schlechteri* Burtt Davy
*Thlaspi africanum* Burm.f.

Annual or biennial herb, up to 0.75 m high; 1- or several stemmed, yellowish green. **Stems** branched in upper, flowering part. **Leaves** with basal ones in a rosette, petiolate, blade narrowly obovate, margins coarsely serrate-dentate, teeth near apex larger, glabrous or pubescent; stem leaves similar, smaller, upper ones with margins less serrate or entire. **Flowers**: in terminal racemes, elongate, lax or dense in fruit; nectaries triangular or elongate-triangular; petals linear-oblong, 0.2–0.5 mm long, white; Sep.–Mar. **Fruit** with ascending or arcuate pedicels; siliculae broadly ovate to ovate-oblong, 1.8–2.7 × 1.3–1.9 mm, shallowly emarginate. Weed in disturbed places. *Birdseed*, *pepperweed*, *Cape pepper cress*; *kanariesaadgras*, *peperbossie*, *sterkgras* (A); *sebista* (SS).

DrGr | KarSh

## **africanum** (Burm.f.) DC. subsp. **divaricatum** (Aiton) Jonsell

Perennial herb, up to 1 m high. **Stems** spreading, much branched; puberulous. **Leaves** petiolate; basal ones with blade narrowly linear-obovate to narrowly obovate, margins pinnately 3–11-lobed with short, narrowly ovate lobes, serrate; upper leaves with fewer lobes or only toothed; all leaves puberulous on midrib, margin ciliolate. **Flowers**: in terminal racemes, elongate, lax or dense in fruit; nectaries triangular or elongate-triangular; petals linear-oblong, 0.2–0.5 mm long, white; Sep.–Mar. **Fruit** with ascending or arcuate pedicels; siliculae broadly ovate to ovate-oblong, 2.3–3.7 × 1.8–2.3 mm, shallowly emarginate. Weed in disturbed places.

DrGr

## ***bonariense** L.

Annual herb, up to 0.6 m high. **Stems** erect; leafy; densely hairy or puberulous. **Leaves** with basal leaves rosulate, petiolate, blade bipinnatipartite, densely hairy; upper leaves pinnatifid, puberulous or glabrescent. **Flowers**: in terminal racemes, later apparently leaf-opposed as they become overtopped by lateral shoots; stamens 2; nectaries triangular-rounded; petals linear or narrowly subulate-ovate, 0.1–0.8 mm long, white; Jun.–Nov. **Fruit** with pedicels erect-arcuate; siliculae obovate or subcircular, 3.0–3.5 × 2.6–3.2 mm, emarginate, with small apical wings. Disturbed places. Native to South America. *Birdseed*, *pepper weed*; *peperbossie* (A).

VreDm | AcGr | DrGr | MsGr

**desertorum** Eckl. & Zeyh.

Annual herb, up to 0.25 m high. **Stems** decumbent or erect; minutely puberulous. **Leaves** petiolate and sessile; basal ones rosulate, petiolate; blade 15–75 mm long, pinnately lobed, lobes broad, ± lobulate or dentate or smaller leaves frequently with an obovate or narrowly ovate laciniate-serrate blade, only petiole and upper surface of midrib puberulous; upper leaves usually narrowly obovate, petiolate, margins entire or serrate. **Flowers**: in terminal, corymbose racemes; nectaries filiform; stamens 2; petals mostly absent, if present, minute. **Fruit** with pedicels wide-spreading, slightly arcuate; siliculae obcordate or obcordate-ovate, 1.6–2.1 × 1.4–1.8 mm, style just projecting. Karroid scrub.

KarSh

**mossii** Thell

Perennial herb, up to 0.2 m high. **Stems** annual, erect; densely and minutely puberulous. **Leaves** petiolate and sessile; basal ones petiolate, base of petiole expanded; blade narrowly obovate, 40–60 mm long, margins entire or few-toothed, upper surface glabrous, lower surface, veins and margins puberulous; stem leaves few, sessile, blade linear-oblong or narrowly ovate, margins entire, puberulous. **Flowers**: in terminal, lax racemes; nectaries filiform; stamens 2; petals spathulate, 0.4–0.5 mm long, white; Sep., Oct. **Fruit** with pedicels erect or slightly curving outwards; siliculae ovate, 2.5–2.8 × 1.8–2.0 mm, shallowly emarginate. Grassland.

VreDm

**myriocarpum** Sond.

Perennial herb, up to 0.7 m high; glabrous in all parts except leaf margins, sometimes upper part of midrib minutely puberulous. **Stems** erect, much branched, leafy. **Leaves** with blade narrowly linear-obovate, ± 75 mm long, apex acuminate, margins entire. **Flowers**: in terminal racemes; nectaries elongate-triangular; stamens 2; petals linear-oblong, 0.4–0.5 mm long; white; Jan., Feb. **Fruit** with pedicels slender, erect, very slightly arcuate; siliculae ovate or ovate-elliptic, 1.4–1.7 × 0.9–1.2 mm, not emarginate; style short, projecting. Along watercourses.

MsGr

***schinzii** Thell.

*L. trifurcum sensu* Thell.

Perennial herb, up to 0.5 m high. **Stems** erect; densely retrorse-puberulous with subclavate papillae. **Leaves** petiolate and sessile; basal ones rosulate, petiolate; blade 40–100 mm long, pinnatipartite with 6–11 lobes, each lobe variously lobed in rounded lobules of different sizes; lower stem leaves sessile, clasping, pinnately lobed, upper ones cuneate, margins entire or bluntly toothed. **Flowers**: in terminal racemes, dense in fruit; nectaries filiform; stamens 2; petals linear, 0.2–0.4 mm long or absent, white; Nov.–Feb. **Fruit** with pedicels appressed-erect, straight; siliculae elliptic to ovate-oblong, 1.6–2.7 × 1.2–1.8 mm, shallowly emarginate; style short with just stigma projecting or included in sinus. Disturbed places, mountain slopes. Native to Europe. *Pepperwort*; *peperbossie* (A).

VreDm DrGr MsGr KarSh

**schlechteri** Thell.

Perennial herb, up to 0.2 m high. **Stems** annual, erect; minutely scabrous-puberulous. **Leaves** petiolate and sessile; rosulate; basal ones petiolate; blade obovate to narrowly obovate, 40–60 × 8–15 mm, margins entire or lyrate-pinnatifid with short, ovate, outwardly curved lobes, upper surface glabrous, lower surface and margins puberulous; stem leaves few, sessile; blade linear-

oblong or narrowly obovate, margins entire, puberulous. **Flowers**: in terminal, lax racemes; stamens 6; petals linear-spathulate, 1.0–1.2 mm long, white; Oct., Nov. **Fruit** with pedicels ascending or arcuate; siliculae rhomboid, narrowed towards both ends, 4 × 2.2–2.5 mm, not emarginate; style short, projecting. Grassland.

DrGr

### **transvaalense** Marais

Perennial herb, up to 0.3 m high; many stemmed. **Stems** erect; sparsely to densely retrorse pubescent. **Leaves** with basal ones pinnately 9–15-lobed, lobes variously lobed with rounded lobules; lower stem leaves narrow, pinnately 7–9-lobed, middle ones pinnately 3–7-lobed with short, sharp lobes, margins ciliolate, upper leaves sharply toothed, narrowly linear-obovate. **Flowers**: in terminal racemes, dense in fruit; stamens 2; nectaries triangular; sepals oblong, 0.6–0.8 mm long, margins membranous; petals 0.3–0.4 mm long, white; Nov.–Feb. **Fruit** with pedicels ascending or arcuate; siliculae ovate-oblong to subcircular-oblong, 1.8–2.5 × 1.4–1.7 mm, shallowly emarginate. Hillsides, rocky grassland.

DrGr MsGr

### **trifurcum** Sond.

Perennial herb, up to 0.6 m high; completely glabrous. **Stems** spreading, much branched; woody at base. **Leaves** petiolate; blade narrowly linear-ovate to narrowly obovate, pinnately 3–11-lobed with lobes serrate, 3-fid near apex; upper leaves with a few lobes or only toothed; frequently revolute, appearing linear-filiform. **Flowers**: in terminal racemes, dense in fruit; stamens 2; nectaries triangular; sepals 0.7–1.0 mm long, green or tinged with purple; petals narrowly oblong, 0.3–0.9 mm long, white; Dec.–Mar. **Fruit** with ascending, slender pedicels; siliculae oblong, 1.9–2.6 × 1.2–1.5 mm, emarginate. Hillsides, rocky soil. *Sterkgras* (A).

KarSh

## **Matthiola** R.Br. (sthn Afr.: 2 spp.)

### Key to species:

Petals 15–25 × 3–7 mm . . . . . **M. bicornis**
Petals 6.5–10.0 × 1.0–1.5 mm . . . . . **M. torulosa**

### ***bicornis** (Sibth. & Sm.) DC.

Annual or biennial herb, up to 0.5 m high. **Stems** erect. **Leaves** with margins sinuate-dentate to pinnatifid. **Flowers**: sepals ± 6 mm long; petals obovate to oblong, 15–25 × 3–7 mm, expanding at night, inconspicuous during the day and apparently shrivelled; pink or purple; Nov., Dec. **Fruit** with siliquae ± cylindric, 50–150 × 1–2 mm, strongly horned, horns 2–10 mm long, curved upwards. Disturbed places. Native to Greece. *Night-scented stock*.

DrGr

### **torulosa** (Thunb.) DC.

*Cheiranthus torulosus* Thunb.
*M. stelligera* Sond.

Perennial herb, up to 0.45 m high; all vegetative parts as well as sepals, ovary and fruit densely covered and grey with stalked glands, stellate and simple hairs. **Stems** spreading erect; lower

dead leaves or leaf bases persistent. **Leaves** narrowly linear-obovate, 15–70 × 1.5–6.0 mm, rarely pinnatifid with 2 or 3 pairs of narrow, upward-pointing lateral lobes and an oblong terminal lobe. **Flowers**: in lax, terminal racemes; petals narrowly spathulate, 6.5–10.0 × 1.0–1.5 mm, margins wavy; green, dirty cream-coloured, creamy brown or dull purplish; Oct.–Jan. **Fruit** subsessile; siliquae linear, 35–70 mm long, stellately and glandular-hairy. Limestone or calcareous soils.

DrGr KarSh

## **Nasturtium** R.Br.

### ***officinale** R.Br.

*Rorippa nasturtium-aquaticum* (L.) Hayek
*Sisymbrium nasturtium-aquaticum* L.

Perennial herb, up to 0.6 m high. **Stems** creeping or floating, rooting at nodes, without taproot; hollow; glabrous or pubescent in axils of branches. **Leaves** petiolate; blade pinnate with 3–9 leaflets, terminal leaflet elliptic to broadly circular, lateral leaflets elliptic, margins entire or repand, dark green; petiole with narrowly ovate auricles. **Flowers**: in terminal, ebracteate racemes, dense in flower; petals spathulate, ± 4 mm long, white; Sep.–Mar. **Fruit** with siliquae 13–20 mm long, often curved-ascending, valves weakly 1-nerved, eventually bulged by seeds. In water or in wet places. Native to Europe. *Watercress*; *bronkorstslaai* (A).

DrGr MsGr

## **Raphanus** L. (sthn Afr.: 2 spp.)

### ***raphanistrum** L.

Annual or biennial herb, up to 0.1 m high. **Stems** erect, hispid in lower part, less densely hairy above. **Leaves** petiolate; basal and lower stem leaves lyrate-pinnatipartite, 2–5-jugate, 100–150 mm long, lobes ovate, margins dentate, appressed-hairy and ciliate, petiole grooved; upper stem leaves ± oblong to narrowly ovate, base cuneate; petiole with margins sharply dentate. **Flowers**: in terminal racemes, congregated into a panicle; petals obovate, 15–20 mm long, apices rounded or emarginate; white, yellow, shades of purple; Oct.–May. **Fruit** with siliquae on ascending pedicels of variable length, 20–60 × 3–5 mm, breaking into 1-seeded portions, hard. Grassland, woodland, disturbed places. Native to Europe. *Wild radish*, *jointed charlock*; *wilde-radys*, *ramnas* (A).

DrGr MsGr

## **Rorippa** Scop. (sthn Afr.: 5 spp.)

### Key to species:

1a Perennial herb, often in moist places but not generally aquatic . . . . . **R. nudiuscula**
1a Semi-aquatic herbs . . . . . 2
2a Stigma small, inconspicuous, not broader than stout style . . . . . **R. fluviatilis** var. **fluviatilis**
2a Stigma capitate, broader than slender style . . **R. fluviatilis** var. **caledonica**

**fluviatilis** (E.Mey. ex Sond.) Thell. var. **caledonica** (Sond.) Marais

*Nasturtium caledonicum* Sond.
*R. caledonica* (Sond.) R.A.Dyer

Perennial herb, up to 0.75 m high; semi-aquatic. **Stems** stout, not branched in lower part. **Leaves** with basal ones in a rosette, dying off soon, blade lyrate-pinnatifid, 4–7-jugate; stem leaves ± auriculate-amplexicaul, narrowly obovate or ovate, pinnatifid with dentate lobes or lobes reduced to teeth; upper stem leaves sessile, ± auriculate, narrowly ovate or linear-ovate. **Flowers**: in terminal racemes, dense in flower, subdense or lax in fruit; stigma capitate, broader than slender style; petals obovate, base cuneate or clawed, 4.0–7.5 mm long, yellow; Jan.–Apr. **Fruit** with pedicels ascending or wide-spreading; siliquae linear-oblong, 10–14 × 2.0–2.5 mm, reticulately veined. Riverbanks, vleis.

DrGr KarSh

**fluviatilis** (E.Mey. ex Sond.) Thell. var. **fluviatilis**

*Nasturtium fluviatile* E.Mey. ex Sond.
*R. fluviatilis* (E.Mey. ex Sond.) Thell.

Perennial herb, up to 0.6 m high; semi-aquatic. **Stems** stout, not branched in lower part. **Leaves** with basal ones in a rosette, dying off soon, blade lyrate-pinnatifid, 4–7-jugate; stem leaves ± auriculate-amplexicaul, narrowly obovate or ovate, pinnatifid with dentate lobes or lobes reduced to teeth; upper stem leaves sessile, ± auriculate, narrowly ovate or linear-ovate. **Flowers**: in terminal racemes, dense in flower, subdense or lax in fruit; stigma small, inconspicuous, not broader than stout style; petals obovate, base cuneate or clawed, 4.5–5.5 mm long, yellow; Oct.–Jun. **Fruit** with pedicels ascending or wide-spreading; siliquae linear-oblong, 13–25 × 2.0–2.5 mm, reticulately veined. Riverbanks, vleis. *Waterkerwel* (A).

DrGr MsGr

**nudiuscula** Thell.

*Nasturtium elongatum* E.Mey. ex Burtt Davy
*N. integrifolium* Szylszyl.

Perennial herb, up to 0.6 m high; often in moist places but not generally aquatic. **Stems** erect, slender; minutely and sparsely tuberculate in lower half or smooth. **Leaves** with basal leaves in a rosette; petiolate, blade lyrate-pinnatifid, 2–9-jugate with lateral, short, rounded or lobulate, lateral lobes, terminal lobe ovate or obovate, dentate to lobulate or blade broadly obovate-ovate to ovate, serrate or dentate, not lobulate; stem leaves few, smaller. **Flowers**: in terminal racemes; petals narrowly obovate, base cuneate, 3.0–4.5 mm long, yellow; Oct.–Feb. **Fruit** with pedicels wide-spreading; siliquae linear-oblong, 12–33 × 2.0–2.8 mm; reticulately veined; style clavate or obconical. Grassland, moist places.

VreDm DrGr MsGr

## **Sisymbrium** L. (sthn Afr.: 8 spp.)

### Key to species:

[after Marais: 110 (1970)]

1a Hairs branched, or a mixture of simple and branched hairs on same plant . . . . . .**S. burchellii** var. **burchellii**
1b Hairs always simple . . . . . 2

2a Siliquae glabrous . . . . . **S. capense**
2b Siliquae hairy at least in lower half . . . . . 3
3a Siliquae puberulous in lower half only . . . . . **S. orientale**
3b Siliquae hairy all over with short, erect hairs . . . . . **S. turczaninowii**

## **burchellii** DC. var. **burchellii**

Perennial herb, up to 0.3 m high. **Stems** erect or decumbent, annual from rootstock; densely hispid or patently hairy with branched and simple hairs. **Leaves** with basal ones dying off soon, petiolate, blade pinnatisect, 4–11-jugate; stem leaves similar but smaller, upper ones sessile; all leaves hairy, densely grey-tomentose to sparsely hairy. **Flowers**: in dense, terminal racemes, lax in fruit; rachis hairy; sepals 2.0–3.5 mm long; petals linear-oblong or oblong with a broad, membranous margin, 2.5–5.5 mm long, yellow; Nov.–May. **Fruit** with pedicels stout and horizontally spreading or slender, ascending, 2–12 mm long; siliquae linear, terete, 2.0–4.5 × 0.8–1.4 mm, scabrid, puberulous or glabrescent. Along watercourses, flats, sandy soil. *Wilde-mosterd* (A).

DrGr | KarSh

## **capense** Thunb.

Perennial herb, up to 1 m high. **Stems** erect, annual or biennial from woody base; patently, greyish hairy in lower parts, less dense higher up. **Leaves** with basal ones subrosulate, long-petiolate, narrowly ovate, 200 × 6 mm, margins pinnately lobed, lobes opposite or alternate, often pointing backwards, apices obtuse; stem leaves shortly petiolate, fewer, smaller, narrower lobes, upper leaves sessile, glabrous, lobed or dentate. **Flowers**: in dense, corymbose racemes, elongating in fruit, ebracteate; rachis glabrous or sparsely hairy; petals spathulate or narrowly obovate, 6–8 × 1.5–2.5 mm, yellow; Oct.–Apr. **Fruit** with pedicels ascending, slender; siliquae linear-filiform, 40–85 × 0.8–1.0 mm, glabrous. Disturbed places, along watercourses. May hybridise with *S. turczaninowii*. *Cape mustard*, *wild mustard*; *strandmosterd*, *wilde-mosterd* (A).

DrGr | MsGr | KarSh

## ***orientale** L.

*S. strigosum* Thunb. *p.p.*

Annual or biennial herb, up to 1 m high; hairs simple. **Stems** erect; densely hairy in lower part, thinly in upper. **Leaves** basally rosulate, petiolate, pinnatisect, 4- or 5-jugate, lateral lobes ± triangular, entire or dentate, terminal lobe triangular-ovate, apex obtuse; stem leaves smaller, upper leaves narrowly ovate, margins entire; all leaves softly puberulous, ciliolate. **Flowers**: in terminal racemes, at first dense, lax in fruit, ebracteate; petals obovate, 7–8 mm long, claw long, yellow; May.–Aug. **Fruit** with siliquae linear, terete, 50–85 × 1.2–1.5 mm, puberulous in lower half only. Disturbed places. Native to Europe and Asia. *Eastern rocket*, *Indian hedge mustard*; *wilde-mosterd* (A); *liababa* (SS).

DrGr

## **turczaninowii** Sond.

*S. burchellii* DC. var. *turczaninowii* (Sond.) O.E.Schulz

Perennial herb, up to 0.45 m high. **Stems** annual from rootstock; patently hairy with simple hairs. **Leaves** basally in a rosette, petiolate, 4–12 mm long, pinnatifid with up to 10 pairs of short, broad, ovate-triangular, dentate lobes, terminal lobe ovate; stem leaves petiolate, pinnatifid, lobes dentate, upper ones sessile; all leaves patently hairy, glaucous. **Flowers**: in terminal racemes, at first dense, lax in fruit, ebracteate; petals yellow; Nov.–Apr. **Fruit** with

pedicels stout, wide-spreading; siliquae terete, 10–23 × 1.3–1.5 mm, hairy all over with short, erect, coarse, thick-based hairs. Grassland, disturbed places.

DrGr MsGr KarSh

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# CACTACEAE

Compiled by P.J.D. Winter, E. Retief & N.L. Meyer

Perennial plants with variously modified, succulent stems; stem divisions named joints (cladodes), often spiny; sometimes epiphytes; spines, branches and flowers arising from special sunken cushions or areoles which can be regarded as condensed lateral branches, glochidia present or absent in areoles. **Leaves** rudimentary or absent. **Flowers**: bisexual, usually showy, regular; sepals, petals, stamens and bracts many, spirally arranged; ovary inferior, 1-locular. **Fruit** a juicy berry, berry surface smooth, spiny, glabrous or hairy; sometimes dry and leathery; seeds many. *Cactus or prickly pear family.*

## Key to genera

[after Winter, Zimmermann & Mashope: 89 (2011)]

1a Glochidia absent in areoles; flowers nocturnal, large, > 60 mm in diameter, perianth segments greenish white, white or with a pinkish tinge (Cactoideae) . . . . . 2
1b Glochidia present in areoles; flowers diurnal, 30–70(–100) mm in diameter, coloured (Opuntioideae) . . . . . 4
2a Branches scrambling or pendent, never erect or columnar, slender, often segmented, sometimes emitting aerial roots . . . . . **Harrisia**
2b Branches erect, ascending, not scrambling, slender to very stout, not producing aerial roots . . . . . 3
3a Stems columnar or arching, only rarely branched above 0.5 m from base; ribs 9–15; troughs between ridges obscured by radial spines extending over them and interlacing; pericarpel with many hair-spines or hairs; scales conspicuous to obsolete . . . . . **Echinopsis**
3b Stems erect, columnar when young, later usually with at least some branching above 0.5 m from base; ribs 4–9, troughs between ribs exposed, radial spines not extending over them, not interlacing; floral tube (at anthesis) nearly naked, or with scales only . . . . . **Cereus**
4a Spines with the epidermis separating either completely, or only at spine apex, as a deciduous papery sheath . . . . . **Cylindropuntia**
4b Spines without a papery sheath . . . . . 5

5a Branches, including terminal ones, cylindric, > 15 mm in diameter; perianth segments scarlet to orange. . . . . **Austrocylindropuntia**

5b Branches compressed, i.e. modified to cladodes (at least the terminal ones), or, if all branches cylindric, then only up to 10 mm in diameter; perianth segments yellow to orange . . . . . **Opuntia**

[Descriptions of taxa follow Henderson (2001), Winter, Zimmermann & Mashope (2011)].

## **Austrocylindropuntia** Backeb. (sthn Afr.: 2 spp.)

### Key to species:

[after Winter, Zimmermann & Mashope: 94 (2011)]

Leaves with blade up to 15 mm long; perianth segments up to 17 mm long . . . . . **A. cylindrica**

Leaves with blade 30–60 mm long; perianth segments 20–30 mm long . . . . . **A. subulata**

### ***cylindrica** (Lam.) Backeb.

*Opuntia cylindrica* (Lam.) DC.

Shrub or small tree, up to ± 2 m high; trunk woody; branch segments distinctly rhomboid-tuberculate, arising laterally from previous segments, not fragile, dark or bluish green. **Spines** 2–5(–8), 10(–30) mm long, sometimes with later accruals on older growth, porrect, straight, terete or slightly flattened, yellowish; a few long hairs sometimes present. **Leaves** up to 15 mm long, rather persistent, finally deciduous. **Flowers**: floral tube elongate-urceolate; areoles many, glochidiate; spines occasional, bristly; perianth segments up to 17 mm long, scarlet. **Fruit** ellipsoid to oblong-urceolate, up to 90 mm long. Not a declared weed in South Africa. Native to Ecuador.

DrGr

### ***subulata** (Muehlenpf.) Engelm.

*Opuntia exaltata* A.Berger

*O. subulata* (Muehlenpf.) Engelm.

Shrub, up to 5 m high; cladodes cylindrical; tuberculate; glaucous green; areoles white woolly. **Spines** 1–4, strong, straight, up to 80 mm long, greyish white, white or yellowish brown when young. **Leaves** linear, 30–60 mm long, curved, fleshy, persistent. **Flowers**: 60–70 mm long; floral tube relatively long, tuberculate, with porrect, subulate bract scales resembling small leaves. perianth $^1/_3$ of flower length; perianth segments 20–30 mm long, scarlet, orange or yellowish. **Fruit** elongate, obovoid-oblong to clavate or ± spherical, > 50 mm long, ± spiny. Grassland. Native to South America. *Devil's rope*, *long-spine cactus*; *langdoringkaktus* (A).

DrGr

## **Cereus** Mill. (sthn Afr.: 2 spp.)

### ***jamacaru** DC. subsp. **jamacaru**

Shrub or tree-like, 3–10 m high; densely branched; branches 70–200 mm in diameter, often strongly greyish green when young, later dark blue-green. **Stems** with 4–9 ribs, areoles 25–50 mm apart; plant sometimes almost spineless. **Spines** few to many, yellow or brown

when young, eventually turning grey to blackish; central spines 1–4 or more, 10–20 mm long, up to 3 mm broad at base; radial spines 7 or 8, up to 30 mm long. **Leaves** 0. **Flowers**: nocturnal, funnel-shaped. 210–300 mm; floral tube and hypanthium up to 160 mm long; green, bearing small, red or reddish scales; perianth segments 80–100 mm long, outer segments greenish white, sometimes tinged crimson, inner segments white; Nov.–Jan. **Fruit** ellipsoid, ± 60 mm long, crimson to pinkish red, pulp white. Savanna, rocky ridges. Escaped from cultivation, becoming a troublesome weed. Native to South America. *Peruvian apple cactus*, *pitaya*, *queen-of-the-night*; *bobbejaanpaal*, *môrester*, *nagblom* (A).

DrGr | KarSh

## **Cylindropuntia** (Engelm.) F.M.Knuth (sthn Afr.: 6 spp.)

### ***imbricata** (Haw.) F.M.Knuth

*Cereus imbricatus* Haw.
*Opuntia imbricata* (Haw.) DC.
*O. rosea* DC.

Shrub, often tree-like, up 3 m high, with a short trunk; much branched, old branches hang downwards; cladodes cylindric to subclavate, tubercles prominent, areoles elliptic. **Spines** 5–30, stout, up to 30 mm long, silver-grey to yellow to reddish or brown, sheaths silver-grey to yellow, in groups of 8–30; covered with papery sheaths, light brown; glochidia 0.5–3.0 mm long, pale yellow. **Leaves** subulate, 10–20 mm long, early deciduous. **Flowers**: perianth segments obovate to spathulate, dark pink, magenta or reddish magenta; Nov.–Jan. **Fruit** obovoid, 20–45 mm long, fleshy, spineless, yellow. Grassland, savanna, karroid vegetation. Native to North and Central America. *Devil's rope pear*, *imbricate cactus*, *rosea cactus*; *kabelturksvy*, *roseakaktus*, *toukaktus* (A).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

## **Echinopsis** Zucc. (sthn Afr.: 1 sp.)

### ***schickendantzii** F.A.C.Weber

*Echinopsis spachiana* (Lem.) Friedrich & Rowley = misapplied name

Shrub, up to 2 m high; multi-stemmed; stems green, columnar, 80–100 mm in diameter, branching from base or below ground; ribs 10–15, margins relatively straight or evenly spiral; areoles 10–15 mm apart, with curly yellow wool. **Spines** straight, yellow or reddish yellow when young, ageing brown or whitish; 8–10, central spine longer than others. **Leaves** 0. **Flowers**: 180–200 mm long; floral tube and hypanthium covered with long, dark hairs, areoles densely hirsute in upper half; perianth segments white; Nov.–Mar. **Fruit** globose, ± 50 mm long, green, remaining clothed with long, dark hairs of floral tube and conspicuous, persistent hypanthium, dehiscent along one side; pulp white. Grassland, savanna, karroid vegetation. Native to South America. *Columnar torch cactus*, *torch cactus*; *orrelkaktus* (A).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

## **Harrisia** Zucc. (sthn Afr.: 2 spp.)

### ***martinii** (Labour.) Britton

*Eriocereus martinii* (Labour.) Riccob.

Sprawling or clambering shrub, resprouting from an underground rootstock, up to 3 m high; stems much branched, often arching; branches dark green, 20–25 mm in diameter, 4- or

5-ribbed, lending the stems an appearance of plaited rope; areoles seated on broad tubercles. **Spines** in groups with 1 or 2 central spines longer than peripheral spines. **Flowers** nocturnal; 15–22 mm long; floral tube areoles felted and ± hairy; outer perianth segments narrow, greenish white; inner perianth segments white or pale pink; Nov.–Mar. **Fruit** globose, 30 mm in diameter, tuberculate and very shortly spiny, red, splitting down one side; pulp white. Savanna. Native to South America. *Harrisia cactus*, *Martin's harrisia*, *moon cactus*; *toukaktus* (A).

AcGr

## **Opuntia** Mill. (sthn Afr.: 12 spp.)

### Key to species:

[after Winter, Zimmermann & Mashope: 131 (2011)]

1a At least some stem segments slender, cylindric or semi-cylindric, up to 25 mm in diameter . . . . . **O. aurantiaca**
1b All stem segments flattened (cladodes), > 30 mm in diameter . . . . . 2
2a Cladode surface minutely velvety pubescent . . . . . **O. leucotricha**
2b Cladode surface glabrous . . . . . 3
3a Cladodes orbicular (not > 1.5 × as long as broad) . . . . . 4
3b Cladodes obovate or elliptic, attenuate towards the base (usually > 1.5 × longer than broad) . . . . . 5
4a Arborescent, (1.5–)3.0 (–5.0) m high; cladodes up to 400 mm in diameter; areoles somewhat sunken; glochidia few or inconspicuous; fruit broadly obovoid to globose, 70–80 mm long and as wide, long-tuberculate (at least while green) . . . . . **O. robusta**
4b Shrub with branches close to ground, 0.4–1.5 m high; cladodes < 250 mm in diameter; areoles somewhat raised; glochidia unusually large, prominent in areoles of upper half of cladode, particularly along the distal margin; fruit obovoid or ellipsoid, ± 70 mm long and ± half as wide, smooth . . . . . **O. engelmannii**
5a Dwarf shrubs up to 0.3 m high, stems procumbent; fruit < 30 mm in diameter . . . . . **O. humifusa**
5b Shrubs or trees; fruit > 30 mm in diameter . . . . . 6
6a Shrubs or trees, 2–5 m high; cladodes 200–600 mm long; floral tube with many areoles; fruit ellipsoid or obovoid, greenish to orange or red, with pale pulp . . . . . **O. ficus-indica**
6b Low spreading shrubs, 1–2 m high; cladodes 100–200 mm long; floral tube with few or no areoles; fruit obovoid or pyriform, narrowed at base, smooth, red turning purple with deep red-purple pulp . . . . . **O. stricta** var. **stricta**

### ***aurantiaca** Lindl.

Dwarf shrub, 0.3–1.0 m high; spreading, spiny; subterranean parts developed into tubers; lower (older) branch segments almost cylindric, up to 25 mm in diameter; upper segments (cladodes) somewhat compressed, not tuberculate, easily detached, bright green, sometimes tinged reddish purple. **Spines** usually 2 or 3 per areole, sturdy, rigid, 10–30 mm long, pale brown. **Leaves** 0. **Flowers**: 25–40 mm in diameter; perianth bright yellow; Nov.–Jan. **Fruit** obovoid, up to 30 mm long, purple-red or green with few spines. Grassland, savanna, karroid vegetation. Native to South America. *Jointed cactus*, *long spine cactus*, *tiger pear*; *langdoringkaktus*, *litjieskaktus*, *suurtjie* (A).

VreDm AcGr DrGr Zastr

***engelmannii** Salm-Dyck.

*O. engelmannii* Salm-Dyck var. *lindheimeri* (Engelm.) B.D.Parfitt & Pinkava
*O. lindheimeri* Engelm.

Shrub, 0.4–1.5 m high; ± erect to decumbent; trunk usually absent; cladodes orbicular or broadly obovate, 150–200 mm long, tuberculate, glabrous, often glaucous; areoles elliptic, 5–8 in a row diagonally across centre of cladode, hairs tawny, ageing blackish; glochidia large, yellow, becoming brown. **Spines** 1–3, sometimes absent from lower areoles, subulate, slightly flattened, mostly curved lying near stem surface, up to 40 mm long, yellow or paler, becoming brown or grey with age. **Leaves** minute, early deciduous. **Flowers:** 50–80 mm long; perianth yellow, rarely red; Oct.–Dec. **Fruit** obovoid or ellipsoid, 30–70 mm long, purple or red; pulp reddish purple, almost spineless. Native to North and South America. *Small round-leaved prickly pear*; *kleinrondeblaarturksvy* (A). Figure 13D, p. 10.

| VreDm | | DrGr | | | |
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***ficus-indica** (L.) Mill.

*Cactus ficus-indica* L.
*O. maxima* Mill.
*O. megacantha* Salm-Dyck

Shrub or tree, up to 5 m high; mostly with a trunk up to 1 m in diameter; cladodes obovate to oblong 200–600 mm long, much longer than broad, dull green or blue-green, base attenuate, fairly thick, glaucous, with straight margins; areoles small, ± 5 mm in diameter. **Spines** 3–6, greyish white, up to 30 mm long, or absent in older plants. **Leaves** caducous. **Flowers**: 60–70 mm long; floral tube with many areoles, with a few long glochidia in addition to many short glochidia; perianth segments yellow or orange; Oct.–Dec. **Fruit** ellipsoid or obovoid, 5–10 mm long, greenish to orange or red in different cultivars, with pale pulp. Dry, rocky places. Native to South America. *Indian fig*, *mission prickly pear*, *prickly pear*, *sweet prickly pear*; *boereturksvy*, *doringturksvy*, *grootdoringturksvy*, *Indiaanse turksvy*, *turksvy* (A); *umthelekisi* (Z).

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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***humifusa** (Raf.) Raf.

Perennial dwarf shrub, forming clumps or mats 0.1–0.3 × 2 m or more; cladodes procumbent or decumbent, glabrous, no > two pads high, elliptic to obovate or elliptic, 50–125 mm long, pale green, often tinged purple; areoles with dense glochidia. **Spines** absent or 1–3. **Leaves** up to 10 mm long, apex acute, early deciduous. **Flowers**: up to 100 mm long, 80 mm in diameter, perianth golden-yellow, orange or red in throat; Oct.–Dec. **Fruit** narrowly obovoid, 40–60 mm long, purple or red, purple inside. Grassland, savanna. Native to North America. *Large-flowered prickly pear*, *creeping prickly pear*.

| | AcGr | DrGr | MsGr | KarSh | Zastr |
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***leucotricha** DC.

Shrub or small tree, 3–4 m high; densely covered with spines in a regular subspiral arrangement; cladodes oblong to broadly ovate, up to 250 mm long, velvety; areoles < 20 mm apart. **Spines** in groups of 3–6, up to 20 mm long. **Leaves** small, subulate, aristate, velvety, caducous. **Flowers**: ± 50 mm long; perianth segments yellow; Nov., Dec. **Fruit** yellowish green, spineless to clothed with long, wispy, filiform spines; spines or even complete areoles caducous to varying degrees. Native to Central America. *Aaron's beard prickly pear.*

| VreDm | | DrGr | | | |
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***robusta** Pfeiff.

Shrub or tree, usually 2–5 m high; much branched, spiny; cladodes ± orbicular, ± 400 mm in diameter, bluish green; areoles sparse, impressed and often sunken; densely covered with spines in a regular sub-spiral arrangement; slightly bluish green. **Spines** absent or 2–12, unequal, filiform, up to 50 mm long, white, pale brown or yellow below. **Leaves** soon deciduous. **Flowers**: ± 50 mm long; perianth segments yellow; Nov., Dec. **Fruit** broadly obovoid to globose, 70–80 mm long, long-tuberculate while still green, areoles with a few long glochidia in addition to many short glochidia, deep red to purple; pulp purple, sour. Native to Central America. *Blue-leaf cactus*, *robusta blue-leaf opuntia*; *bloublad*, *robusta turksvy*, *turksvy* (A).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

***stricta** (Haw.) Haw. var. **stricta**

*Cactus strictus* Haw.

Shrub, 1–2 m high, spreading, thicket-forming; cladodes broadly to narrowly obovate or oblong, 100–200 mm long, blue-green, usually tuberculate (areoles prominent). **Spines** 0 or 1, then restricted to marginal areoles, usually stout, straight, flattened, 15–40 mm long, yellow. **Leaves** minute, early deciduous. **Flowers**: 50–60 mm long; floral tube with 0–4(–8) areoles, smooth; perianth segments yellow; Nov.–Jan. **Fruit** obovoid or pyriform, narrowed at base, 40–60 mm long, smooth, red turning purple; pulp red-purple, sour. Grassland, savanna. Native to North America and West Indies. *Australian pest pear*, *sour prickly pear*; *suurturksvy* (A).

AcGr | DrGr | MsGr | KarSh | Zastr

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# CAMPANULACEAE

Compiled by C.N. Cupido, E. Retief & N.L. Meyer

Annual or perennial herbs or dwarf shrubs; often with latex. **Leaves** alternate, rarely opposite or whorled, sessile, axillary clusters of smaller leaves often present, simple, margins entire, toothed, lobed or incised; without stipules. **Flowers**: bisexual, protandrous, regular, in cymes, racemes or panicles or axillary and solitary; bracts present or absent; calyx tube fused to hypanthium; corolla gamopetalous, 4- or 5-lobed; tube campanulate, cylindric, rarely funnel-shaped, arising at line where calyx becomes

free from ovary; stamens as many as corolla lobes and alternating with them, free from or arising in corolla tube; filaments free often dilated at base; anthers free, 2-thecous, opening lengthwise; ovary inferior, half-superior or rarely superior, (1)2–5(6–10)-locular, with axile placentas, rarely basal or apical, 2–few to many ovules in each locule; style simple, upper part with pollen-collecting hairs, stigmas as many as locules. **Fruit** a capsule, often crowned with persistent calyx, variously dehiscent by terminal valves or cap. **Seeds** small, smooth or reticulate-rugose. *Bell flower family*.

The Campanulaceae are treated here as a family separate from the Lobeliaceae, Cyphiaceae, Nemacladaceae, Pentaphragmataceae and Sphenocleaceae. As traditionally conceived, the Campanulaceae is very heterogeneous and, in many classifications, these families were treated as subfamilies of a much-enlarged Campanulaceae. The consistently different floral morphology, biochemistry and pollen structure of the Lobeliaceae favours the recognition of this predominantly tropical group as a separate family. Welman (2000) treats the Campanulaceae separately from Lobeliaceae, within which she included the genus *Cyphia* P.J.Bergius.

## Key to genera

Capsule opening by a terminal cap; mat-forming, perennial herbs . . . **Craterocapsa**
Capsule opening regularly by terminal valves; annual or perennial herbs or dwarf shrubs . . . . . **Wahlenbergia**

## **Craterocapsa** Hilliard & B.L.Burtt (sthn Afr.: 4 spp.)

### Key to species:

Flowers on pedicels; calyx tube and hypanthium villous with long, white, spreading hairs . . . . . **C. montana**
Flowers sessile; calyx tube and hypanthium glabrous, occasionally ciliate on ribs . . . . . **C. tarsodes**

### **montana** (A.DC.) Hilliard & B.L.Burtt

*Wahlenbergia basutica* E.Phillips
*W. montana* A.DC. var. *montana*

Perennial herb, procumbent, much branched. **Leaves** opposite or alternate, often crowded at tips of branches; blade narrowly lanceolate to elliptic, tapering to a broad, flat petiole-like base, 6–10 × 3–6 mm, margins ciliate. **Flowers**: pedicellate, solitary in upper leaf axils or pseudoterminal; hypanthium villous; corolla mauve blue; Oct.–Dec. Bare, stony soil, short, sparse grassland.




### **tarsodes** Hilliard & B.L.Burtt

*Wahlenbergia montana* A.DC. var. *angustisepala* Brehmer
*W. montana* A.DC. var. *glabrata* Sond.

Perennial herb, mat-forming. **Leaves** mostly in a rosette at tips of branchlets, lanceolate to elliptic, tapering to a broad, flat, petiole-like base, ± 15–25 × 5 mm, margins of the base ciliate. **Flowers**: sessile, solitary in axils of rosette leaves; style base expanded, but not surrounded

by a fleshy disc; hypanthium glabrous; corolla pale blue or white; Nov.–Mar. Stony grassland. *Carpet bell flower*.

DrGr MsGr

## **Wahlenbergia** Schrad. ex Roth (sthn Afr.: ± 170 spp.)

### Key to species:

1a Corolla with distinct tube; annual or perennial herbs . . . . . 2
1b Corolla tube almost split to base; dwarf shrubs . . . . . 14
2a Annual . . . . . **W. androsacea**
2b Perennial . . . . . 3
3a Plants mat-forming . . . . . **W. polytrichifolia** subsp. **polytrichifolia**
3b Plants erect . . . . . 4
4a Leaves few and inconspicuous . . . . . **W. virgata**
4b Leaves many and conspicuous . . . . . 5
5a Leaves linear-lanceolate . . . . . 6
5b Leaves lanceolate, elliptic or ovate . . . . . 10
6a Inflorescence lax; flowers on long pedicels . . . . . **W. capillacea** subsp. **capillacea**
6b Inflorescence variously contracted; flowers subsessile . . . . . 7
7a Leaf margins cartilaginous . . . . . 8
7b Leaf margins not cartilaginous . . . . . 9
8a Leaves crowded, ascending . . . . . **W. dieterlenii**
8b Leaves distant, spreading . . . . . **W. denticulata**
9a Slender, erect herbs; leaves with axillary clusters; flowers blue-mauve . . . . . **W. fasciculata**
9b Dense, tufted herbs; leaves without axillary clusters; flowers white or pale blue . . . . . **W. depressa**
10a Inflorescence contracted; flowers sessile . . . . . **W. squamifolia**
10b Inflorescence lax; flowers pedicellate . . . . . 11
11a Leaf margins undulate . . . . . 12
11b Leaf margins flat . . . . . 13
12a Calyx lobes narrowly triangular, 9.5–17.0 mm long . . . . . **W. cuspidata**
12b Calyx lobes broadly triangular, 3–4 mm long . . . . . **W. undulata**
13a Leaves linear to oblanceolate or obovate, crowded towards base . . . . . **W. krebsii** subsp. **krebsii**
13b Leaves elliptic to lanceolate, not crowded towards base . . . . . **W. rivularis**
14a Leaves ovate or ovate-lanceolate . . . . . **W. nodosa**
14b Leaves linear-ericoid or linear to lanceolate . . . . . 15
15a Leaves linear-ericoid; flowers in a branched inflorescence; bushy, grey-green dwarf shrub . . . . . **W. albens**
15b Leaves linear to lanceolate; flowers in a compact simple or branched spike-like inflorescence; erect, green dwarf shrub . . . . . **W. huttonii**

### **albens** (Spreng. ex A.DC.) Lammers

Dwarf shrub, slender, grey-green, much branched, 0.2–0.5 m high. **Leaves** linear-ericoid, ciliate at base, appearing greyish, axillary cluster of leaves present. **Flowers**: in divaricate clusters; calyx lobes slightly revolute; corolla with tube almost split to base, yellow or white; Oct.–Jan. Rocky soil.

DrGr MsGr KarSh

**androsacea** A.DC.
*W. nana* Brehmer

Annual, erect, 0.1–0.5 m high. **Leaves** ± rosulate, flat, narrowly obovate to narrowly oblanceolate or spathulate, acute, ciliate towards base. **Flowers**: campanulate in a lax inflorescence; stigma lobes 3 with glands present below pollen-collecting hairs; corolla with distinct tube, white, pale blue or mauve; Sep.–Jan. Riverbanks and grassland in sandy and damp places. *Lesser bell flower*, *hare-bell*.

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

**capillacea** (L.f.) A.DC. subsp. **capillacea**
*W. capillata* Brehmer

Perennial herb, erect, 0.15–0.50 m high. **Leaves** sessile, many, linear to filiform, entire or lower leaves sparsely dentate, crowded, often clustered. **Flowers**: in a lax inflorescence, on long pedicels; corolla tube hairy inside, half the length of the corolla, blue; stigma lobes without glands; Jan.–Jul. Grassland.

DrGr

**cuspidata** Brehmer

Perennial or annual herb, erect, 0.3–0.6 m high. **Leaves** many, sessile, half clasping the stem, ovate to lanceolate, hairy, margins undulate-dentate. **Flowers**: campanulate in a lax inflorescence, large, pedicellate; calyx lobes narrowly triangular, elongate, 9.5–17.0 mm long, margins ± dentate; corolla with distinct tube, violet-blue; Dec.–Apr. Forest margins, damp rocky slopes or cliff faces.

MsGr

**denticulata** (Burch.) A.DC. *s.l.*
*Campanula denticulata* Burch.
*Lightfootia denticulata* (Burch.) Sond. var. *denticulata*
*L. denticulata* (Burch.) Sond. var. *transvaalensis* Adamson

Perennial herb, decumbent or ascending, 0.10–0.45 m high. **Leaves** sessile, distant, ± spreading, linear to linear-lanceolate, margins cartilaginous and denticulate. **Flowers**: in terminal, lax or variously contracted inflorescence; corolla deeply split into linear-lanceolate lobes, hairy inside near base, blue to white or yellow; stigma without glands; Nov.–May. Grassland, damp soil along watercourses.

AcGr | DrGr | KarSh

**depressa** J.M.Wood & M.S.Evans
*W. lycopodioides* Schltr. & Brehmer

Perennial, erect herb, dense tufts, up to 0.16 m high. **Leaves** many, sessile, linear to narrowly lanceolate, slightly pilose. **Flowers**: shortly pedicellate, terminal; corolla with distinct tube, white or pale blue; Feb.–Jun. Moist montane grassland, fissures of rocks, silt near vernal pools.

DrGr

**dieterlenii** (E.Phillips) Lammers

*Lightfootia caledonica* Sond. (non *W. caledonica* Sond.)
*L. dieterlenii* E.Phillips

Erect or sprawling dwarf shrub, up to 0.5 m high. **Leaves** many, all similar, ascending, crowded, linear, margins cartilaginous, denticulate. **Flowers**: subsessile, crowded in upper axils; corolla with distinct tube, pale blue with tinge of violet; Nov.–Apr. Grassland, rocky places.

DrGr MsGr

**fasciculata** Brehmer

Perennial herb, erect, slender, 0.15–0.35 m high. **Leaves** crowded, linear, axillary cluster of leaves present. **Flowers**: sessile, crowded in upper axils; corolla with distinct tube, blue-mauve; Jan.–Mar. Plateaux on mountain tops, rocky places.

MsGr

**huttonii** (Sond.) Thulin

Perennial herb or dwarf shrub, erect, green, simple or branched from base, 0.10–0.45 m high. **Leaves** sessile, linear to lanceolate, entire, crowded, sometimes hairy. **Flowers**: in a spike-like, sometimes branched inflorescence; corolla deeply split into linear lobes, blue or mauve, tube < 1 mm long; Dec.–Apr. Open grassland and savanna

VreDm MsGr

**krebsii** Cham. subsp. **krebsii**

*W. zeyheri* H.Buek

Perennial herb, erect or procumbent, 0.1–1.0 m high. **Leaves** sessile, almost linear to oblanceolate or obovate, margins cartilaginous, dentate, crowded towards base or scattered along stem. **Flowers**: in a lax inflorescence, pedicellate; corolla with distinct tube, blue to violet, often with dark veins; Oct.–May. Grassland, hill slopes, roadsides, railway sides, riverbeds. *Tenane* (SS).

VreDm MsGr

**nodosa** (H.Buek) Lammers

Dwarf shrub, erect or diffuse, rigid, 0.2–0.45 m high. **Leaves** recurved, ovate-lanceolate, concave, axillary clusters of leaves present. **Flowers**: in divaricately branched panicles; corolla with tube split to base, white fading to yellow; Oct.–May. Stony soil. *Muistepelkaroo* (A).

AcGr DrGr KarSh

**polytrichifolia** Schltr. subsp. **polytrichifolia**

Perennial herb, mat-forming, 0.03–0.12 m high. **Leaves** linear, crowded. **Flowers**: in terminal groups of 2–5 or solitary; corolla with distinct tube, white or blue, sometimes with darker blue spots in throat; Jan.–Mar. Grassland. *Moss-leaved bell flower*.

MsGr

**rivularis** Diels

Perennial, erect herb, 0.4–0.7 m high. **Leaves** many, elliptic to lanceolate, apex obtuse to acute, margins flat, sparsely hairy. **Flowers**: in a lax inflorescence, pedicellate; corolla with distinct tube, blue to mauve to almost white; Jan.–Mar. Grassland, streambanks, forest margins.

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**squamifolia** Brehmer

Perennial herb, up to 0.45 m high, with taproot. **Stems** erect or sprawling, branched at base. **Leaves** many, overlapping, lanceolate, apex acute, 2 or 3 times as long as broad, margins slightly thickened, not pilose. **Flowers**: sessile in contracted inflorescence; corolla tubular, blue or purple; Dec.–May. Grassland.

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**undulata** (L.f.) A.DC.
*W. caledonica* Sond.
*W. dinteri* Brehmer

Perennial or annual herb, erect, 0.15–1.00 m high. **Leaves** many, sessile, lanceolate to linear, margins cartilaginous, ± undulate-dentate. **Flowers**: campanulate, in a lax inflorescence, pedicellate; calyx lobes broadly triangular, 3–4 mm long; stigma lobes 3, with glands present between their bases; corolla with a distinct tube, blue; Nov.–Apr. Grassland, often in rocky or seasonally moist places, also roadsides, cultivated or waste ground. *African bluebell*, *harebell*.

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| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |

**virgata** Engl.
*W. subnuda* Conrath

Perennial herb, up to 0.7 m high. **Stems** erect, simple or branched. **Leaves** few and inconspicuous, often scale-like, usually < 7 mm long and 2 mm wide. **Flowers**: corolla 8–10 mm long, with distinct tube, white or pale blue or mauve or yellowish; ovary 2-locular; Sep.–May. Grassland, along streams, montane grassland, stony soil.

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# CANNABACEAE

Erect, annual herbs, dioecious (male and female flowers on different plants), plants glandular-hairy. **Leaves** alternate or opposite, digitately compound, 3–11-partite or 1–3-partite in upper part of plant, all leaf parts serrate; with stipules. **Flowers**: male flowers fascicled, perianth 5-parted, stamens 5; female flowers crowded under convolute bracts, ovary superior, style short, stigma branches 2, filiform. **Fruit** a globose to ovoid achene tightly covered by thin, crustaceous perianth, through which reticulate venation of surface beneath perianth is visible. *Marijuana or dagga family*.

## **Cannabis** L. (sthn Afr.: 1 sp.)

### ***sativa** L.

Erect, annual, aromatic herb, up to 4 m high, with minute appressed glandular hairs on most parts of plant. **Leaves** 5–7-foliolate, blades of leaflets narrowly ovate. **Flowers**: female flowers without a perianth, but with ovary enclosed in a sheath-like bract copiously dotted with glands, secreting a narcotic resinous substance; green; Nov.–May. Gardens, open veld and cultivated land. Native to central Asia. *Marijuana*, *hashish*; *makdagga* (A); *matekoane*, *'moana (S)*; *insangu* (Z).

MsGr Zastr

# CAPPARACEAE

Trees or shrubs, sometimes scandent. **Leaves** alternate, simple or digitately compound; usually without stipules. **Flowers**: in terminal or axillary racemes or solitary in leaf axils; regular or irregular; sepals usually 4, free, sometimes petaloid; petals present or absent; stamens 4 to many; ovary superior, stalked; style short or absent. **Fruit** a long, narrow capsule opening by means of 2 valves, or a berry. *Caper family*.

## Key to genera

Shrubs; leaves present or absent, except on very young shoots; androphore elongated, longer than sepals . . . . . **Cadaba**
Evergreen trees; leaves always present, usually in groups of 4; androphore elongated, not as long as sepals . . . . . **Boscia**

### **Boscia** Lam. (sthn Afr.: 9 spp.)

**albitrunca** (Burch.) Gilg & Gilg-Ben.

Tree (or rarely a shrub), up to 7 m high. **Crown** rounded. **Bark** smooth, grey to whitish grey. **Leaves** fascicled, with lateral veins indistinct and similar in colour on both surfaces; blade narrowly obovate to elliptic, 15–80 × 4–20 mm, stiff and leathery. **Flowers**: in dense clusters on short branchlets; perianth yellowish green; Sep.–Dec. **Fruit** a berry, 5–12 mm in diameter, glabrous, dull red when mature. Woodland. *Shepherds tree*, *white-stemmed tree*; *matoppie*, *witgat* (A); *mohlôpi* (T).

AcGr KarSh

### **Cadaba** Forssk. (sthn Afr.: 4 spp.)

**aphylla** (Thunb.) Wild
*Cleome aphylla* Thunb.

Shrub or small tree, up to 3 m high. **Branches** becoming spine-tipped, sometimes subsucculent. **Leaves** 0, except on young branches. **Flowers**: stamens 8 or more; nectary hooded or saucer-shaped, with no conspicuous neck; perianth 20–30 mm in diameter, yellowish green, orange or dark red; Aug.–Jan. **Fruit** cylindrical, up to 90 × 7 mm, warty with sticky glands. Mixed scrub, sandy loam soil. *Leafless wormbush*; *rooistormbos*, *swartstorm* (A); *mfitshwana* (T).

AcGr KarSh

# CARYOPHYLLACEAE

Annual or perennial herbs, rarely dwarf shrubs. **Stems** often swollen at nodes, often dichotomously branched. **Leaves** opposite, decussate or apparently whorled, often united at base; simple; blade with margins entire; with or without stipules, stipules, when present, scarious, sometimes connate at base. **Flowers**: in dichasial inflorescences, rarely solitary; usually bisexual, regular; sepals (4)5; petals 0 or (4)5, free, entire, emarginate, bifid or lacerate, clawed or not; stamens (1–4)5–10(11), in 1 or 2 whorls; styles free or at least partly fused; ovary superior, 1-locular. **Fruit** a capsule splitting from apex, or a nutlet, sometimes enclosed in persistent calyx. *Carnation or pink family*.

## Key to genera

[after Jordaan: 207 (2000)]

1a Leaves with stipules present; petals 0 or small; styles at least partly fused . . . 2
1b Leaves without stipules; petals present, rarely absent or minute . . . . . 7

| | | |
|---|---|---|
| 2a | Leaves alternate | **Corrigiola** |
| 2b | Leaves opposite | 3 |
| 3a | Fruit a nutlet | 4 |
| 3b | Fruit a capsule | 6 |
| 4a | Infructescence succulent, berry-like, translucent white; leaves often in false whorls | **Pollichia** |
| 4b | Infructescence not succulent; leaves opposite, upper ones sometimes alternate by reduction | 5 |
| 5a | Stipules conspicuous; sepals often hooded and with a dorsal, subapical awn | **Paronychia** |
| 5b | Stipules inconspicuous; sepals mostly planoconcave, not hooded or awned | **Herniaria** |
| 6a | Leaves linear to filiform; plants glandular-viscid | **Spergularia** |
| 6b | Leaves broader than above; plants not glandular-viscid | **Polycarpon** |
| 7a | Sepals free or only basally connate | 8 |
| 7b | Sepals connate, often for most of their length | 10 |
| 8a | Fruit splitting into as many valves as there are styles | **Sagina** |
| 8b | Fruit splitting into twice as many valves as there are styles | 9 |
| 9a | Stamens 5; styles (2)3 | **Stellaria** |
| 9b | Stamens 10; styles (4)5 | **Cerastium** |
| 10a | Calyx tube with 1–12 pairs of bracts at base | **Dianthus** |
| 10b | Calyx tube without bracts at base | 11 |
| 11a | Calyx tube 5-winged; styles 2 | **Vaccaria** |
| 11b | Calyx tube 10–30(–60)-veined; styles (2)3(–5) | **Silene** |

## **Cerastium** L. (sthn Afr.: 6 spp.)

### Key to species:

| | | |
|---|---|---|
| 1a | Plant annual | 2 |
| 1b | Plant perennial | 3 |
| 2a | Style with only upper $^2/_3$ papillate | **C. arabidis** |
| 2b | Style clothed with papillae all the way | **C. capense** |
| 3a | Capsule twice as long as persistent sepals | **C. fontanum** subsp. **triviale** |
| 3b | Capsule equalling or slightly exceeding persistent sepals | **C. indicum** |

### **arabidis** E.Mey. ex Fenzl

*C. dregeanum* Fenzl

Annual herb, 0.05–0.30 m high. **Stems** erect, slender; glandular-hairy. **Leaves** sessile; blade narrowly ovate to ovate, 10–30 × 3–10 mm, sessile. **Flowers**: style with only upper $^2/_3$ papillate; corolla white; Oct.–Jan. **Fruit** a membranous capsule, splitting into 10 short lobes above. Vleis, damp places, grass tussocks in marshes. *Snow-flower*; *qoqobala-sa-loti* (SS).

DrGr MsGr

### **capense** Sond.

Annual herb, 0.03–0.45 m high. **Stems** erect, slender. **Leaves** sessile; blade narrowly ovate. **Flowers**: style clothed with papillae all the way; corolla white. **Fruit** a membranous capsule, splitting into 10 short lobes above. Damp, shady places, garden weed.

DrGr MsGr

### *fontanum Baumg. subsp. triviale (Link) Jalas

Perennial herb, up to 0.5 m high. **Stems** erect or decumbent, leafy, glandular-pubescent. **Leaves** sessile; obovate, narrowly ovate or elliptic. **Flowers**: in lax cymes; petals deeply notched, white; Sep.–Mar. **Fruit** with capsule twice as long as persistent sepals. Grassland, disturbed places. Native to Europe.




### *indicum Wight & Arn.

*C. africanum* (Hook.f.) Oliv.
*C. indicum* Wight & Arn. var. *ruwenzoriense* (F.N.Williams) Möschl

Perennial herb, 0.05–0.50 m high. **Stems** erect. **Leaves** sessile or subsessile; blade narrowly ovate or oblong-elliptic, apex acute; sparsely silky-hairy. **Flowers**: few to several together in a terminal, dichotomously branched inflorescence; petals emarginate, 5–8 mm long, white; Dec.–Feb. **Fruit** with capsule equalling or only slightly exceeding persistent sepals. In scrub. Native to India.




## Corrigiola L. (sthn Afr.: 2 spp.)

### litoralis L. subsp. litoralis var. litoralis

Annual herb. **Stems** procumbent, slender, spreading. **Leaves** alternate, sessile; blade narrowly obovate-ovate to narrowly elliptic, up to 17 × 3 mm, decurrent, apex acute, margins entire; stipules asymmetrically ovate-auriculate, membranous, white. **Flowers**: in dense, sessile or subsessile, terminal or axillary clusters; sepals 5, persistent, green with white membranous margins; petals 5, membranous, white; Nov.–Mar. **Fruit** trigonously ovoid, ± 9 × 7 mm, enclosed in persistent perianth. Sandy, open riverbanks.




## Dianthus L. (sthn Afr.: 15 spp.)

### Key to species:

[after Hooper: 5 (1959)]

| | | |
|---|---|---|
| 1a | Antical petal margin fringed | **D. mooiensis** |
| 1b | Antical petal margin entire, crenate or dentate | 2 |
| 2a | Plant not densely tufted | **D. transvaalensis** |
| 2b | Plant densely tufted | 3 |
| 3a | Petals deltoid or obovate, up to 5 mm long | **D. micropetalus** |
| 3b | Petals obovate, 6–13 mm long | **D. basuticus** subsp. **basuticus** |

### basuticus Burtt Davy subsp. basuticus *s.l.*

*D. micropetalus* Ser. var. *galpinii* Burtt Davy

Perennial herb, up to 0.4 mm high, densely tufted, glabrous. **Shoots**: vegetative short, without elongate internodes bearing close-set leaves; flowering very short, leafy. **Leaves** with blade

linear, 50–120 × 1.5–2.0 mm, narrowing to a slender, acute apex with a yellowish, thickened margin at least towards base, 5 or 7 veins distinct on lower surface, sheath length ± equalling leaf width. **Flowers**: 1–7 in 1–several axillary inflorescences; bracts narrowly ovate to linear; calyx 19–23 mm long, pale green, sometimes tinged purple; petals obovate, 6–13 mm long, antical margin irregularly dentate, pink; Nov.–Mar. Grassland.

| | | DrGr | MsGr | KarSh | |
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### **micropetalus** Ser.

Perennial herb, up to 0.45 m high; slender, densely tufted, glaucous. **Shoots**: vegetative several, clustered, bearing leaves in apical tufts; flowering with a basal tuft of leaves. **Leaves** with blade linear-subulate or narrowly linear, 15–100 × 1 mm, tapering from base to narrow, acuminate apex, 3- or 5-veined. **Flowers**: (1–)3(–7) per peduncle, in 1–several inflorescences; lowermost bracts linear, diminishing in size upwards; calyx 20–30 × 3 mm; petals obovate or deltoid, up to 5 mm long, often recurved, antical margin crenulate or coarsely dentate-incised, creamy white or pale purplish pink; Nov.–Mar. Vleis.

| VreDm | AcGr | DrGr | MsGr | KarSh | |
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### **mooiensis** F.N.Williams *s.l.*

Perennial herb, up to 0.6 m high; tufted, glaucous, glabrous. **Shoots**: vegetative erect, arising from woody base or from lower nodes of flowering shoots; flowering several, fastigiated, leafy in lower half, terminating above in a branched inflorescence. **Leaves** mostly basal; blade narrowly linear-ovate, 25–45 × 3–5 mm, tapering from base to acute apex, 5–11-veined, striate on both surfaces. **Flowers**: 5–15 in a branched inflorescence; bracts linear-ovate; calyx green, tinged purple in upper part, 16–20 mm long, lobes brown or purple; petals elliptic or obovate, cuneate at base 5–10 mm long, antical margin fimbriate, white or pale pink; Oct.–Jan. Grassland.

| VreDm | | DrGr | | | |
|---|---|---|---|---|---|

### **transvaalensis** Burtt Davy

*D. scaber* Thunb. var. *graminifolius* Fenzl ex Szyszyl.

Perennial herb, up to 0.45 m high; erect, not densely tufted, glabrous, usually with a tuft of leaves at base of inflorescence axis. **Shoots**: vegetative few, green or glaucous, internodes very short; flowering several, crowded with a tuft of long leaves at base. **Leaves** with blade linear, 60–170 × 1–2 mm, tapering from base to a slender, acute apex, margins ciliate at base, 5- or 7-veined, striate sheath 1.5–2.0 × leaf-width. **Flowers**: (2–)5(–11) in 1–several terminal inflorescences; bracts linear; calyx shortly cylindrical mm long; petals elliptic or narrowly obovate, 6–10 mm long, tapering gradually into a claw, antical margin dentate or crenulate, white or pink; Oct.–Feb. Grassland.

| | | DrGr | MsGr | | |
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## **Herniaria** L. (sthn Afr.: 5 spp.)

### Key to varieties:

Leaves glabrescent; corolla shortly hirtellous to puberulous . . . . . **H. erckertii** subsp. **erckertii** var. **dewetii**

Leaves hirsute; corolla densely hirsute . . . . . **H. erckertii** subsp. **erckertii** var. **erckertii**

**erckertii** Herm. subsp. **erckertii** var. **dewetii** Herm.

Perennial herb with branches up to 0.2 m long. **Leaves** opposite; glabrescent. **Flowers**: perianth shortly hirtellous to puberulous with soft, 0.2–0.3 mm-long hairs, yellowish green; Oct.–Jan. Grassland.

DrGr MsGr

**erckertii** Herm. subsp. **erckertii** var. **erckertii**

Perennial herb with branches up to 0.2 m long. **Leaves** opposite; hirsute with hairy margins. **Flowers**: corolla densely hirsute with 0.30–0.45 mm-long, stiff, patent hairs, light green; Oct.–Mar. Grassland, cultivated land.

DrGr MsGr KarSh

## **Paronychia** Mill. (sthn Afr.: 1 spp.)

***brasiliana** DC. var. **pubescens** Chaudhri

Annual herb. **Stems** procumbent, mat-forming. **Leaves** opposite; sessile; upper ones sometimes alternate by reduction, margins entire. **Flowers**: in head-like cymose clusters, infructescence not succulent; bracts large, silvery-membranous, concealing flowers; sepals hooded with a dorsal, spreading awn near apex; petals 0; Sep.–Dec. **Fruit** a nut. Weed in lawns, especially on golf courses. Native to South America.

DrGr MsGr

## **Pollichia** Aiton (sthn Afr.: 1 sp.)

**campestris** Aiton

Dwarf shrub, up to 0.6 m high; much branched. **Leaves** opposite, often arranged in false whorls. **Flowers**: in dense, axillary clusters; infructescence succulent, berry-like, translucent, swollen fleshy bracts waxy white or dull orange; perianth white; Nov.–May. **Fruit** a nut. Grassland, sandy soil.

AcGr DrGr MsGr KarSh

## **Polycarpon** L. (sthn Afr.: 2 spp.)

***tetraphyllum** (L.) L.

Annual herb, up to 0.2 m high; glabrous. **Stems** procumbent or decumbent. **Leaves** with blade ovate, mostly in whorls of 4, green. **Flowers**: in clusters; inflorescence lax, spreading, much branched; corolla with petals shorter than sepals, white; Sep.–Dec. **Fruit** a 3-valved capsule. Waste places. Native to Europe. *Four-leaved allseed*.

DrGr

## **Sagina** L. (sthn Afr.: 2 spp.)

### ***apetala** Ard.

Annual herb; glandular-hairy. **Stems** filiform, ascending to decumbent, much branched. **Leaves** in a basal rosette withering early; cauline leaves with blade linear, 4–8 mm long, apex aristate, margins ciliate. **Flowers**: axillary, 4-merous; perianth glandular-hairy, segments ovoid to elliptic, margins hyaline, petals 0. **Fruit** a capsule, 1.5–2.0 mm long, ± equalling perianth; Aug.–Nov. Disturbed places, dry sandy places. Native to Europe. *Annual pearlwort*.

DrGr

## **Silene** L. (sthn Afr.: 13 spp.)

Key to species:

| | | |
|---|---|---|
| 1a | Flowers in a spike-like inflorescence | 2 |
| 1b | Flowers in a dichasium or cluster | 3 |
| 2a | Petals deeply lobed, pink with white centre | **S. pilosellifolia** |
| 2b | Petals shallow lobed, white or pink, sometimes with a deep red spot | **S. gallica** |
| 3a | Flowers in a cluster | **S. vulgaris** subsp. **vulgaris** |
| 3b | Flowers in a dichasium | 4 |
| 4a | Flowering stems from side of rosette | **S. undulata** |
| 4b | Flowering stems centre of rosette | **S. bellidioides** |

### **bellidioides** Sond.

Perennial herb, up to 0.9 m high. **Stems** sticky hairy; flowering stems from centre. **Leaves** opposite; in a basal rosette; blade narrowly ovate, 80–110 × 10–20. **Flowers**: calyx ± 35 mm long; petals notched, white to pale pink. Open grassland. *Ugwayelaso*, *ugwayintombi*, *umjuju* (Z).

DrGr MsGr Zastr

### ***gallica** L.

Annual herb, up to 0.45 m high. **Stems** sticky hairy. **Leaves** opposite, sessile; narrowly ovate. **Flowers**: in a spike-like inflorescence, mostly pointing in one direction; calyx 10–12 mm long; petals notched, white or pink or with a deep red mark (var. *quinquevulnera*). Native to Britain. *Small-flowered catchfly*.

DrGr

### **pilosellifolia** Cham. & Schltdl.

*S. burchellii* Otth var. *angustifolia* Sond.
*S. burchellii* Otth var. *burchellii*

Annual or perennial herb, up to 0.8 m high. **Stems** sticky hairy. **Leaves** sessile; blade narrowly ovate, up to 60 × 8 mm. **Flowers**: in a spike-like inflorescence, mostly pointing in one direction; calyx green- and red-veined, inflated; petals ± 10 mm in diameter, deeply lobed, pink with white centre; Nov.–Mar. *Gunpowder plant*; *kruitbossie* (A).

VreDm DrGr MsGr KarSh

**undulata** Aiton

*S. capensis* Otth

Perennial herb, up to 1 m high. **Stems** sticky hairy; flowering stems leafy, from side of rosette. **Leaves** in a basal rosette; blade narrowly ovate, 80–130 × 20–30 mm, margins undulate. **Flowers**: in a dichasium; calyx dark ribbed, 22–35 mm long; petals white to pale pink; Oct.–Apr. Damp places, slopes below cliffs, flats. *Gunpowder plant*, *large-flowered campion*; *wilde-tabak* (A); *lithotoana*, *molokoloko* (SS).

DrGr MsGr KarSh

***vulgaris** (Moench) Garcke subsp. **vulgaris**

Perennial herb, up to 0.4 m high. **Stems** erect, all flowering, woody at base, glabrous. **Leaves** sessile; blade ovate, margins often wavy. **Flowers**: several in a cluster; calyx inflated to form a bladder; petals white, lobes deeply cleft. Grassland, waste places. Native to Britain. *Bladder campion*.

DrGr

## **Spergularia** (Pers.) J.Presl. & C.Presl. (sthn Afr.: 4 spp.)

***media** (L.) C.Presl ex Griseb.

Perennial herb, up to 1 m high. **Stems** erect, spreading, glabrous. **Leaves** opposite, fleshy; blade linear. **Flowers**: in cymes; 9–12 mm long; petals pink; Dec.–Feb. Roadsides. Native to Eurasia and the Mediterranean. *Spurrey*.

DrGr KarSh

## **Stellaria** L. (sthn Afr.: 3 spp.)

Key to species:

[after Wild: 349 (1961)]

Sepals 5; styles 3 . . . . . **S. media**
Sepals 4; styles 2 . . . . . **S. sennii**

***media** (L.) Vill.

Annual herb, up to 0.15 m high. **Stems** slender, glabrous except for line of hairs from within leaf base to between next pair above. **Leaves** opposite; blade ovate. **Flowers**: styles 3; sepals 5; petals white; May–Nov. Common weed in gardens. Native to Europe and Asia.

Zastr

***sennii** Chiov.

Annual herb. **Stems** procumbent, trailing, branches up to 0.4 m long. **Leaves** opposite, petiolate; blade ovate to broadly ovate. **Flowers**: solitary in axils at end of branches; styles 2; sepals 4, 3–4 mm long; petals 0; Dec.–Mar. Disturbed places, roadsides. Native to Europe and Asia.

MsGr

## **Vaccaria** Medik. (sthn Afr.: 1 sp.)

***hispanica** (Mill.) Rauschert var. **hispanica**
*Saponaria vaccaria* L. var. *grandiflora* Fisch. ex Ser.
*V. pyramidata* Medik. *var. pyramidata*

Annual herb, up to 0.6 m high. **Stems** erect. **Leaves** opposite, sessile; blade ovate, base cuneate, margins entire. **Flowers**: in open cymes, 16–50-flowered; styles 2; calyx 5-winged, 5-lobed, accrescent, tube without bracts at base; corolla 11–22 mm long, light pink; Sep.–Mar. **Fruit** with capsules included in calyx tube. Weed in lawns, waste places, fields. Native to Europe and Asia. *Cowherb*, *cowckle*.

DrGr

## References

HOOPER, S.S. 1959. The genus *Dianthus* in Central and South Africa. *Hooker's Icones Plantarum*, fifth series, 7,1: 1–58.
JORDAAN, M. 2000. Caryophyllaceae. In O.A. Leistner, Seed plants of southern Africa: families and genera. *Strelitzia* 10: 206–213. National Botanical Institute, Pretoria.

# CELASTRACEAE

Trees or shrubs, sometimes scandent. **Spines** present or absent. **Leaves** alternate or opposite, usually simple; stipules minute. **Flowers**: small, regular, white or greenish, with fleshy, nectar-secreting disc surrounding ovary; petals 5, free; stamens 5, free, alternating with petals, arising from margin of disc; ovary superior but partly sunken into disc; style short, often 3-lobed. **Fruit** a capsule or drupe. **Seeds** often ± enclosed in brightly coloured aril. *Spindle tree family*.

### Key to genera

1a Plants usually with spines; leaves fasciculate on short abbreviated branches . . . . . **Gymnosporia**
1b Plants without spines . . . . . 2
2a Fruit a drupe . . . . . **Mystroxylon**
2b Fruit a capsule . . . . . **Maytenus**

## **Gymnosporia** (Wight & Arn.) Hook.f. (sthn Afr.: 28 spp.).

Key to species:

1a Plant unarmed or with slender, sharp spines up to 20 mm . . . . **G. tenuispina**
1b Plant with spines > 20 mm long . . . . . 2

2a Leaves with blade 10–25 mm wide . . . . . **G. buxifolia**
2b Leaves with blade narrow, < 3 mm wide . . . . . **G. sp. A**

### **buxifolia** (L.) Szyszyl.

*Celastrus heterophyllus* Eckl. & Zeyh.

Shrub or tree, up to 7 m high, armed. **Spines** > 20 mm long. **Twigs** often strongly angled or striate. **Leaves** fasciculate or not, blade obovate to narrowly obovate, 25–45 × 10–25 mm, base cuneate, usually decurrent on petiole, margin acutely irregularly serrulate to entire. **Flowers**: corolla white; Jun.–Dec. **Fruit** a 2- or 3(4)-locular capsule, usually yellow. Woodland, scrub and forest margins. *Common spikethorn*; *gewone-pendoring*, *lemoendoring* (A); *umhlongwe* (X); *lingqwangane* (Z).

VreDm

### **tenuispina** (Sond.) Szyszyl.

*Celastrus tenuispinus* Sond.

Dwarf shrub, up to 1.5 m high. **Spines** < 20 mm long. **Leaves** fasciculate on short abbreviated branchlets; blade narrowly ovate, narrowly obovate to elliptic, 16–70 × 9–17 mm, apex acute, margin entire or shallowly toothed. **Flowers**: corolla pale yellow; Oct.–Dec. **Fruit** with yellow capsule, 7–13 mm long, obconic, 3-gonous, truncate, papery. Woodland, thickets, scrub, sandy or stony soil. *Bell spikethorn*; *klokkiespendoring* (A).

VreDm

### **sp. A**

Many-stemmed shrub, up to 2 m high. **Spines** > 20 mm long. **Leaves** with short petioles; blade narrowly obovate, 10–40 × 15–30 mm, margin entire, glabrous. **Flowers**: corolla white or cream-coloured; Oct.–May. **Fruit** a roundish, yellow capsule; seeds partially covered by a yellow aril. Rocky hillsides.

DrGr KarSh

## **Maytenus** Molina (sthn Afr.: 14 spp.)

### Key to species:

1a Latex threads visible when leaf is broken . . . . **M. acuminata** var. **acuminata**
1b Latex threads not visible when leaf is broken. . . . . 2
2a Branchlets and petioles glabrous . . . . . **M. undata**
2b Branchlets with black hairs, petioles yellowish hairy. . . . . **M. peduncularis**

### **acuminata** (L.f.) Loes. var. **acuminata**

*Celastrus acuminatus* L.f.

Shrub or tree, up to 15 m high. **Leaves** with blade ovate to narrowly ovate, 10–30 × 5–12 mm, apex acuminate and frequently mucronate; latex threads visible when leaf is broken. **Flowers**: green to white or white-tinged-red; Jan., Feb. Forest, forest margins. *Silky bark*; *sybas* (A); *umnama* (X); *umlulama* (Z).

DrGr MsGr

**peduncularis** (Sond.) Loes.
*Celastrus peduncularis* Sond.
*Gymnosporia peduncularis* (Sond.) Loes.

Tree, up to 8 m high; plants, or at least young parts, with black hairs. **Leaves** with blade narrowly ovate to ovate, 13–90 × 8–40 mm, apex emarginate, margin toothed, lateral veins prominent below, glossy dark green above, paler below; petiole ± 2 mm long, yellowish hairy; latex threads not visible when leaf is broken. **Flowers**: on conspicuously long peduncles, up to 25 mm long; corolla greenish yellow; Dec.–May. Forest and riverine woodland. *Cape blackwood*; *Kaapse swarthout* (A); *umnqai* (X).

DrGr MsGr

**undata** (Thunb.) Blakelock
*Celastrus undatus* Thunb.

Shrub or tree, up to 10 m high. **Leaves** with blade ovate, oblong, elliptic to almost circular, 22–130 × 10–90 mm, margin obscurely angled to sharply and spinously dentate or serrate, usually with > 6 teeth on either side, green, greyish green or whitish on lower surface; petiole glabrous; latex threads not visible when leaf is broken. **Flowers**: small; corolla pale yellow to greenish yellow; Nov.–May. Forest, scrub and woodland. *Indigenous blackwood*, *koko tree*; *saffraanhout*, *kokoboom* (A); *iNqayi-elibomvu* (X); *idohame* (Z).

DrGr MsGr KarSh

## **Mystroxylon** Eckl. & Zeyh. (sthn Afr.: 1 sp.)

**aethiopicum** (Thunb.) Loes. subsp. **burkeanum** (Sond.) R.H.Archer
*Cassine burkeana* (Sond.) Kuntze
*Mystroxylon burkeanum* Sond.

Small, bushy tree, up to 6 m high. **Leaves** alternate; blade elliptic or oblong-elliptic, 15–30 × 10–20 mm, apex obtuse, margin entire and tightly rolled under, dark green and sparsely hairy above, pale green and velvety below, venation obscure. **Flowers**: corolla cream-green; Sep.–Feb. **Fruit** a drupe, orange-brown when mature. Dry woodland, rocky outcrops. *Highveld kooboo berry*; *Hoëveldse koeboebessie* (A).

VreDm

# CERATOPHYLLACEAE

Submerged, aquatic herbs with elongated, floating, leafy branches; monoecious. **Leaves** verticillate, filiform, once or more dichotomously branched, with 2 rows of minute teeth along ultimate segments, apical segments truncate, tipped with 2 spines; without stipules. **Flowers:** in axil of 1 leaf in a whorl, male and female usually on alternate nodes; unisexual; sessile or shortly pedicellate; perianth herbaceous or submembranous; segments 6–13, irregularly toothed at apex; stamens up to 30, anthers linear-oblong or oblong, connective produced into a thick, 2- or 3-toothed, coloured appendage or small brown point; ovary superior tapering into long style. **Fruit** a 1-seeded nut, ovoid

or ellipsoid, tipped by persistent style, often with additional marginal and basal spines, also often warty. *Hornwort family*.

## **Ceratophyllum** L. (sthn Afr.: 3 spp.)

### **demersum** L. var. **demersum**

Perennial, aquatic herb; height depending on depth of water. **Leaves** 7–11 per whorl, blade 8–40 × 0.2–0.7 mm; branching twice, rarely once or thrice, with spiny teeth on margins, bright to olive green. **Flowers**: male flowers 1–3 per node, perianth broadly cup-shaped, lobes 0.5–1.3 × 0.2–0.4 mm; female flowers solitary, perianth closely surrounding ovary, persistent in fruit, lobes resembling male ones; Aug., Sep. **Fruit** 4.0–5.5 × 3.0–3.5 mm, with long apical spine and 2 prominent basal spines, ± smooth, yellow-green, becoming red-brown with sparse to many slightly raised dark glands. Various watercourses, in standing or running water; tolerant of brackish conditions, not found in seasonal, highly alkaline pools. *Rigid hornwort*.

VreDm | | DrGr | | | |

# CLEOMACEAE

Annual or perennial herbs, shrubs or dwarf shrubs. **Leaves** alternate; petiolate; usually 3-foliolate, sometimes simple or up to 7(–13)-foliolate; with or without stipules. **Flowers**: in terminal, bracteate or ebracteate racemes, elongating in fruit, or solitary and axillary; regular or irregular; sepals and petals usually 4, free or fused at base; petals clawed; stamens 1–many, staminodes present or absent; ovary superior, borne on a gynophore. **Fruit** a dry, cylindric capsule (siliqua). *Spider flower or African cabbage family*.

## **Cleome** L. (sthn Afr.: 21 spp.)

### Key to species:

[after Codd & Kers: 120 (1970)]

1a Leaves all simple . . . . . **C. monophylla**
1b Leaves compound, or compound and simple on same plant . . . . . 2
2a Stamens borne on a long androphore, well exserted from corolla . . . . . **C. gynandra**
2b Stamens on a receptacle within flower . . . . . 3
3a Flowers yellow . . . . . **C. angustifolia** subsp. **diandra**
3b Flowers pink or white . . . . . 4
4a Stems glabrous or sparsely puberulous; bracts very small, caducous . . . . . **C. maculata**
4b Stems glabrous or glandular-hirsute; bracts leaf-like, persistent . . . . **C. rubella**

### **angustifolia** Forssk. subsp. **diandra** (Burch.) Kers

Perennial herb, up to 0.8 m high. **Stems** erect, little branched; usually aculeolate-glandular towards base. **Leaves** 3–9(–13)-foliolate; blade linear-filiform, 10–40 × 0.4–1.0(–2.0) mm.

**Flowers**: stamens with anthers ± 4 mm long, anthers of staminodes minute; bracts 1-foliolate, often caducous; petals yellow with a violet basal area; Feb.–May. **Fruit** 40–100 × 3–5 mm; seeds brown; reticulate-foveolate, patently pubescent. Rocky hillsides, gravel, red sandy soil.

KarSh

## **gynandra** L.

*Gynandropsis gynandra* (L.) Briq.
*G. pentaphylla* (L.) Briq.

Annual herb, up to 0.6 m high. **Stems** erect, viscid glandular-pubescent to glabrescent. **Leaves** 3–5-foliolate; petiolate; blade obovate to narrowly obovate, terminal leaflet up to 40 × 20 mm; petiole 20–50 mm long, glandular-pubescent. **Flowers**: stamens borne on long androphore, well exserted from corolla; petals obovate, 10–20 × 3–5 mm, white to rose-pink; Nov.–Apr. **Fruit** 30–150 × 2.5–5.0 mm; seeds brown, circular, obscurely reticulate-rugose. Woodland, cultivated land. *African herbage*, *spider-wisp*; *oorpynpeultjie*, *snotterbelletjie*, *vingerblaartee* (A); *umzonde* (Z).

VreDm AcGr DrGr KarSh

## **maculata** (Sond.) Szyszyl.

*Polanisia maculata* Sond.
*Tetratelia maculata* (Sond.) Sond.

Annual herb, up to 300 mm high. **Stems** erect; glabrous or sparsely puberulous. **Leaves** 3–5-foliolate; petiolate; leaflets linear, 10–45 × 0.5–1.5 mm; petiole up to 25 mm long. **Flowers**: stamens fertile and sterile, borne on short receptacle, fertile ones longer than sterile ones; petals pink to mauve; two upper petals with a median yellow band, margined with purple; Dec.–Apr. **Fruit** 4–10 × 2.5–3.0 mm; seeds brown, ± circular, transversely ridged. Woodland, rocky slopes, overgrazed veld.

DrGr

## **monophylla** L.

Annual herb, up to 500 mm high. **Stems** erect; pubescent, often with glandular hairs. **Leaves** all simple petiolate; blade narrowly ovate to oblong-ovate, 20–70 × 3–25 mm, base truncate or rounded, apex acute; petiole up to 40 mm long. **Flowers**: stamens all fertile; petals spathulate, 3–9 mm long, pink to pale mauve, rarely white, two upper petals with a transverse yellow band outlined in purple; Nov.–May. **Fruit** 50–110 × 3 mm; seeds brown to dark brown, ± circular, ± 2 mm in diameter, transversely ridged. Cultivated land, hills. *Single-leaved cleome*, *spindlepod*; *rusperbossie*, *enkelblaarcleome* (A); *matlepelo*, *munyenyae*, *musa pelo* (SS).

VreDm DrGr

## **rubella** Burch.

*C. rupestris* Sond.

Annual herb, up to 400 mm high. **Stems** erect; viscid glandular-pubescent. **Leaves** 5–7-foliolate; leaflets linear-spathulate, 5–20 × 1.0–2.5 mm, usually folded along midrib; petioles ± 20 mm long. **Flowers**: stamens 6–9, filaments slender, pink; sepals pink, 2–3 mm long; petals 5–8 × 1.5–2.5 mm long, mauve-pink to rose; Jul.–Jun. **Fruit** glandular-pubescent, 25–90 × 2.0–2.5 mm long; seeds brown, broadly comma-shaped, 1.5–2.0 mm in diameter, transversely rugose. Woodland, grassland. *Pretty lady*, *spindlepod*; *mooinooientjie*, *wilde-bosganna* (A).

VreDm AcGr DrGr KarSh

## Reference

CODD, L.E. & KERS, L.E. 1970. *Cleome*. *Flora of southern Africa* 13: 119–140.

# COMBRETACEAE

Trees, shrubs or climbers. **Leaves** opposite, whorled or sometimes alternate, simple; without stipules. **Flowers**: usually clustered in dense heads or spikes; small, regular, sessile, with a cup-shaped receptacle tube; petals 4 or 5, insignificant and arising from receptacle tube; stamens 8–10, protruding; filaments bent inward in bud; ovary inferior (easily mistaken for flower stalk); style simple. **Fruit** a samara, usually 4-winged, indehiscent. *Combretum family*.

## **Combretum** Loefl. (sthn Afr.: 30 spp.)

**molle** R.Br. ex G.Don
*C. gueinzii* Sond.
*C. holosericeum* Sond.

Semideciduous tree or shrub, up to 10 m high. **Bark** of young branchlets coming off in untidy irregular fibrous strips or threads. **Leaves** opposite; blade narrowly to broadly elliptic, occasionally broadly obovate, 60–170 × 40–110 mm, apex acute, densely greyish tomentose, net-veining prominent on lower surface, veins distinctly sunken above. **Flowers**: in axillary spikes; corolla yellow or greenish yellow; Aug.–Nov., Feb. **Fruit** 4-winged, 15–20 mm long, yellowish green flushed red, drying to golden reddish brown. Savanna. *Velvet bushwillow*, *velvet-leaved bushwillow*; *fluweelboswilg*, *basterrooibos* (A); *modubatshipi* (T); *umbondwe omhlope* (Z).




## Reference

COATES PALGRAVE, M. 2002. *Keith Coates Palgrave trees of southern Africa*, edn 3. Struik, Cape Town.

# CONVOLVULACEAE

Compiled by H.J.T. Venter, E. Retief & N.L. Meyer

Herbs or undershrubs, sometimes parasitic. **Stems** procumbent, spreading, erect, trailing or twining. **Leaves** alternate; simple; blade often lobed or ± heart-shaped or much reduced, scale-like; without stipules. **Flowers**: in axillary cymes, regular, bisexual, often subtended by 2 or more bracts; calyx 4–6-partite; corolla 5-lobed, with distinct midpetaline zones (plaits), twisted in bud, tube funnel-shaped; stamens 5, inserted towards base of corolla tube; ovary superior, 1–4-locular, with 1–4 ovules in each loculus; disc absent or present surrounding base of ovary; styles 1 or 2, terminal or inserted between lobes of ovary; stigmas terete, capitate, dilated or linear. **Fruit** capsular or indehiscent. *Morning glory family*.

[after Meeuse & Welman: 1 (2000)]

## Key to genera

1a Stems twining; leaves minute, scale-like or absent, yellowish; flowers in clusters . . . . . **Cuscuta**
1b Stems procumbent, spreading, erect or twining; leaves well developed, green; flowers solitary, in clusters or in cymose inflorescences . . . . . 2
2a Stems procumbent; styles 2, inserted between lobes of ovary . . . . . 3
2b Stems procumbent, spreading or erect; style simple or 2 terminal on ovary . . . . . 4
3a Leaf blade broadly ovate to reniform . . . . . **Dichondra**
3b Leaf blade narrowly ovate to oblong-ovate . . . . . **Falkia**
4a Styles 2, free or united at base . . . . . 5
4b Style 1 . . . . . 6
5a Stems procumbent to erect; style bifid with 2 subpeltate, bilobed stigmas . . . . . **Seddera**
5b Stems spreading; styles free, each with 4 linear-terete or subclavate stigmas . . . . . **Evolvulus**
6a Stigma long and linear, ± as thick as style . . . . . **Convolvulus**
6b Stigma globose . . . . . 7
7a Leaf blade linear to narrowly oblong with small, toothed, hastate, basal auricles . . . . . **Xenostegia**
7b Leaf blade not as above . . . . . 8
8a Leaf blade with margin palmately to pedately lobed; corolla cream-coloured to yellow . . . . . **Merremia**
8b Leaf blade with margin entire, pinnately, palmately or pedately lobed; corolla pink or mauve to deep magenta, white, rarely yellow . . . . . **Ipomoea**

## **Convolvulus** L. (sthn Afr.: 13 spp.)

### Key to species:

1a Corolla 4–5 × as long as calyx . . . . . **C. arvensis**
1b Corolla < 4–5 × as long as calyx . . . . . 2
2a Peduncles 1-flowered; plants with all parts glabrous . . . . . **C. dregeanus**
2b Peduncles 1–several-flowered; plants hairy, if glabrous, then leaf blade > 20 mm long . . . . . 3

3a Peduncles 0 or rarely up to ± 2 mm long; corolla with lobes distinctly acute . . . . . 4
3b Peduncles distinct, occasionally very short, up to 10 mm long; corolla lobes rounded to obtuse . . . . . 5
4a Calyx lobes densely tomentose; leaves thick with revolute margins, densely tomentose . . . . . **C. ocellatus**
4b Calyx lobes ± laxly covered with silky, shiny, golden-brown hairs; leaves flat and rather thin . . . . . **C. boedeckerianus**
5a Leaf blade with margins deeply lobed, lobes several, linear or filiform . . . . 6
5b Leaf blade simple, margins not deeply lobed . . . . . 7
6a Stems procumbent, covered with rusty brown to fawn-coloured, short, stiff hairs . . . . . **C. thunbergii**
6b Stems suberect to procumbent, densely hairy, pubescence tomentose to silky . . . . . **C. multifidus**
7a Leaf blade ovate to deltoid, base cordate . . . . . **C. farinosus**
7b Leaf blade linear, narrowly ovate to oblong . . . . . 8
8a Leaf blade narrowly ovate to oblong, margins undulate . . . . . **C. natalensis**
8b Leaf blade linear, often falcate, margins entire . . . . . **C. sagittatus**

### *arvensis L.

Perennial herb. **Stems** procumbent or twining, sparsely pubescent to glabrous. **Leaves** with blade ovate-oblong or oblong, 20–50 mm long, base hastate or sagittate, apex obtuse, mucronate, margins entire. **Flowers**: solitary or sometimes in 2- or 3-flowered cymes; calyx lobes elliptic-oblong to almost orbicular, apices obtuse, mucronate; corolla 4–5 × as long as calyx, ± 20 mm long, white with pink or red midpetaline bands or pink; Oct.–Mar. **Fruit** an ovoid-globose, glabrous capsule, 5–8 mm long. Weed in cultivated land. Native to Europe and Asia. *Wild morning-glory*, *bindweed*; *akkerwinde*, *monnikbaard* (A).




### boedeckerianus Peter

Perennial herb. **Stems** procumbent or twining, covered with adpressed, usually golden-brown or fulvous hairs. **Leaves** with margins of blade deeply lobed, central lobe the largest, 10–60 mm long, flat, rather thin. **Flowers**: solitary, sessile or with very short peduncles; calyx lobes laxly covered with silky, shiny, golden-brown hairs, ovate, apices acute; corolla 7–10 mm long, lobes distinctly acute, white, pale pink or pale pinkish mauve; Oct.–May. **Fruit** a globose, glabrous capsule, 5–7 mm in diameter. Grassland.




### dregeanus Choisy

*C. liniformis* Rendle

Perennial herb, all parts glabrous. **Stems** trailing or suberect. **Leaves** with blade variable, basally oblong to broadly obovate, upper ones linear, 4–40 mm long, margin entire or with 2 basal auricles, sometimes palmately lobed. **Flowers**: solitary, distinctly pedunculate, peduncles 5–30(–45) mm long; calyx lobes ± obovate, apices obtuse; corolla 12–20 mm long, pinkish white or white; Nov.–Mar. **Fruit** a globose, glabrous capsule, ± 6 mm in diameter. Grassland, disturbed areas, sandy clay or brackish soils.



**farinosus** L.

Perennial herb. **Stems** procumbent or twining, pubescent or farinose-puberulous, younger shoots often silvery. **Leaves** with blade ovate to deltoid, 40–120 × 30–90 mm, base cordate, apex acute with mucro, margins shallowly and irregularly toothed. **Flowers**: subumbellately 1–6-flowered; calyx lobes oblong or elliptic to suborbicular, apices acute or obtuse with terminal mucro; corolla 12–14 mm long, lobes rounded to obtuse, white, very pale pink or pale pinkish mauve; Jan.–Dec. **Fruit** a subglobose, glabrous capsule, 5–8 mm in diameter. Grassland, forest margins, banks of watercourses.




**multifidus** Thunb.

*C. thunbergii* Hallier f.

Perennial herb. **Stems** suberect to procumbent, densely hairy, pubescence tomentose to silky. **Leaves** up to ± 25 mm long; blade with margins deeply lobed, with 5–9 narrow, linear or filiform lobes, central lobe usually pinnatifid, basal ones hastate, bifid, upper surface glabrescent, lower surface densely hairy, hairs very short, white, silvery or rarely fawnish. **Flowers**: solitary, peduncles up to 20 mm long; calyx lobes broadly ovate, apices obtuse or acute; corolla 10–12 mm long, lobes rounded to obtuse, pale pink or white; Nov.–Mar. **Fruit** a subglobose, glabrous capsule, ± 5 mm in diameter. Grassland, banks of dry riverbeds, sandy or rocky soil or on limestone.




**natalensis** Bernh. ex Krauss

*C. natalensis* Bernh. ex Krauss var. *transvaalensis* (Schltr.) A.Meeuse

Perennial herb; with short stiff hairs, pubescence silky or woolly, fawn-coloured, rusty brown to silvery white. **Stems** procumbent or twining. **Leaves** with blade narrowly ovate to oblong, 10–90 × 7.5–50.0 mm, margins crenate, undulate. **Flowers**: peduncles 1–few-flowered; calyx lobes narrowly ovate, elliptic or oblong, apices obtuse to acute; corolla 20–35 mm long, lobes rounded to obtuse, white, cream-coloured or white tinged with green; Aug.–Mar. **Fruit** a subglobose to ovoid, glabrous capsule, 8–10 mm long and in diameter. Rocky areas in grassland.




**ocellatus** Hook.f.

*C. ocellatus* Hook.f. var. *ornatus* (Engl.) A.Meeuse

*C. randii* Rendle

Perennial herb, up to ± 0.6 m high, covered with brownish or greyish hairs. **Stems** erect to decumbent. **Leaves** with blade linear to linear-oblong, base hastate or sagittate to palmately 5-fid, 9–30 × 2–8 mm, thick, margins revolute. **Flowers**: peduncles 1- or 2-flowered; calyx lobes ovate to oblong, apices acute to acuminate, densely tomentose; corolla 12–20 mm long, lobes distinctly acute, white or pink, with dark reddish purple centre; Oct.–Apr. **Fruit** a globose to ovoid-conical capsule with apex glabrous or hairy. Grassland, woodland, often on red sandy soil.




**sagittatus** Thunb. *s.l.*

Perennial herb. **Stems** procumbent or twining, usually hairy. **Leaves** often folded and falcate; blade linear, > 25 mm long, base sagittate, apex obtuse, margins entire, pubescence varies

from densely hairy to nearly glabrous. **Flowers**: usually with 1-flowered peduncles; peduncle up to 45 mm long; calyx lobes narrowly ovate to orbicular, apices acute to obtuse; corolla 8–15 mm long, lobes rounded to obtuse, white or sometimes with pink or purple-red centre or pink with purple centre; Sep.–Mar. **Fruit** a subglobose, glabrous capsule, 6–7 mm long. Open woodland, grassland, growing in pans and along roadsides. *Wild bindweed*; *bobbejaantou*, *wilde-akkerwinde* (A); *moroto-oa-poho* (SS); *uVimbukhalo*(Z).

AcGr | DrGr | MsGr | KarSh

### **thunbergii** Roem. & Schult.

Perennial herb. **Stems** procumbent, covered with rusty brown to fawn-coloured, rarely silvery white, short, stiff hairs. **Leaves** with margins deeply lobed, lobes linear to linear-oblong with hastate and toothed to dissected bases, margin of central lobe often sinuous, or ± irregularly lobed, 20–50 × 5–30 mm, both surfaces thinly to densely covered with same hairs on stems. **Flowers**: peduncles distinct, 1- or 2-flowered; calyx lobes ovate, narrowly ovate or elliptic, apices acuminate or acute; corolla 18–25 mm long, lobes rounded to obtuse, white or pale pink; Aug.–Mar. **Fruit** a subglobose, glabrous capsule, 7–9 mm in diameter. Grassland, along roadsides, disturbed places. *Vlaktebobbejaantou*, *bobbejaantou* (A).

DrGr | MsGr | Zastr

## **Cuscuta** L. (sthn Afr.: 15 spp.)

### Key to species:

Flowers in loose paniculate, cymose clusters; calyx shorter than corolla tube . . . . . **C. appendiculata**
Flowers in dense clusters; calyx as long as corolla tube . . . . . **C. campestris**

### **appendiculata** Engelm.

Twining parasite. **Flowers**: in loose paniculate, cymose clusters; pedicels papillose or verrucose; calyx shorter than corolla tube, usually very loose at base of corolla to almost spreading, with wart-like processes at base; scales in corolla tube free; styles 2, free to base; stigmas globose; corolla campanulate, lobes nearly as long as tube, 1.5–4.0 mm long, white or cream-coloured; Oct.–Mar. **Fruit** an ovoid or globose capsule. Recorded on various hosts.

DrGr | KarSh

### ***campestris** Yunck.

Twining parasite. **Flowers**: in dense spherical clusters; pedicels not papillose or verrucose; calyx as long as corolla tube; scales ovate, elliptic or obovate, often exserted between corolla lobes, usually abundantly fringed; styles 2, free to base; stigmas globose; corolla campanulate, lobes broadly triangular, acute, often with inflexed tips, greenish yellow; Oct.–May. Recorded on a wide range of hosts, often a pest on lucerne. Native to North America. *Common dodder*, *field dodder*; *luserndodder*, *dodder* (A); *umankunkunku*, *unyendenyende* (Z).

VreDm | AcGr | DrGr | MsGr

## **Dichondra** (sthn Afr.: 1 sp.)

***micrantha** Urb.
*D. repens* auctt. non J.R.Forst. & G.Forst.

Perennial herb, appressed-pubescent. **Stems** procumbent, rooting at nodes. **Leaves** with blade reniform to cordate-circular, 4–25 mm in diameter, base broadly cordate, apex rounded to emarginate, margin entire, upper surface glabrescent, lower surface hairy; petioles 8–70 mm long. **Flowers**: solitary, axillary, pedicellate; styles 2, inserted between ovary lobes; calyx lobes 2–3 mm long, hairy on back and margins; corolla ± as long as calyx, greenish yellow; Sep.–May. **Fruit** 1.5–2.5 mm in diameter. Weed in grassland, lawns, paths and cultivated areas. Native to Cuba. *Wonder lawn*, *dewdrop lawn*, *kidney weed*.

VreDm | AcGr | DrGr | MsGr

## **Evolvulus** L. (sthn Afr.: 2 spp.)

**alsinoides** (L.) L.
*Convolvulus alsinoides* L.
*C. linifolius* L.

Annual or perennial herb; thinly or sometimes densely covered with long, patent, silky hairs. **Stems** decumbent or erect. **Leaves** with blade elliptic, ovate-oblong, narrowly ovate to linear-oblong, mucronate. **Flowers**: peduncles axillary, 1–few-flowered; style bifid with 2 subpeltate, bilobed stigmas; corolla rotate to broadly funnel-shaped, shallowly lobed, 6–8 mm long, blue, rarely white; Jul.–Jun. **Fruit** a globose-depressed, glabrous capsule, 3–4 mm long. Grassland, savanna, edges of thickets, roadsides, sandy soils and weed of cultivated land.

VreDm

## **Falkia** Thunb. (sthn Afr.: 2 spp.)

**oblonga** Bernh. ex C.Krauss
*F. abyssinica* Engl.

Perennial herb; hairy to glabrous. **Stems** procumbent, creeping underground, rooting at nodes. **Leaves** petiolate; blade narrowly ovate or oblong-ovate, usually twice as long as broad, 10–70 × 3–14 mm, base truncate or slightly cuneate, lower surface silvery silky, appressed-hairy; petioles up to 80 mm long. **Flowers**: solitary, axillary; calyx 4–7 mm long; corolla 5–15 mm long, white to pale pink or mauve; Aug.–Jan. **Fruit** with capsule ± 2 mm long, membranous, pilose, enclosed by accrescent calyx. Damp grassland and saline sandy clays.

VreDm | DrGr | MsGr | KarSh

## **Ipomoea** L. (sthn Afr.: 52 spp.)

Key to species:

1a Leaf blade with margin pinnately, palmately or pedately lobed to near main vein . . . . . 2
1b Leaf blade with margin entire, shallowly lobed . . . . . 4

2a Leaf blade with lower surface covered with white cobwebby hairs . . . . . **I. magnusiana**
2b Leaf blade glabrous or sometimes hairy, but without white cobwebby hairs . . . . . 3
3a Calyx hairy . . . . . **I. oenotherae**
3b Calyx glabrous . . . . . **I. bolusiana**
4a Corolla < 18 mm long; base of leaf blade sometimes with toothed auricles . . . . . **I. gracilisepala**
4b Corolla > 18 mm long; base of leaf blade without toothed auricles . . . . . 5
5a Leaf blade linear, narrowly ovate or oblong . . . . . 6
5b Leaf blade ovate . . . . . 8
6a Leaves subsessile; blade long-tapering . . . . . **I. simplex**
6b Leaves petiolate . . . . . 7
7a Leaves with blade decurrent . . . . . **I. oenotheroides**
7b Leaves with blades not decurrent . . . . . **I. crassipes**
8a Base of leaf blade prominently cordate . . . . . 9
8b Base of leaf blade subcordate, truncate or rounded . . . . . 11
9a Apex of leaf bade rounded or emarginate . . . . . **I. bathycolpos**
9b Apex of leaf blade acute to acuminate . . . . . 10
10a Calyx lobes bristly, patently hairy on basal portion, glabrous towards apex . . . . . **I. purpurea**
10b Calyx lobes pubescent or glabrous . . . . . **I. obscura** var. **obscura**
11a Flowers with peduncle 1-flowered. . . . . **I. crassipes**
11b Flowers in pedunculate, few- to many-flowered heads . . . . . 12
12a Calyx lobes linear, bristly pubescent with long, yellowish hairs . . . . **I. pellita**
12b Calyx lobes narrowly ovate to ovate, pubescent with hairs dense along margins, hairs not yellowish . . . . . 13
13a Leaf blade ovate, narrowly ovate or oblong, gradually tapering towards apex . . . . . **I. ommanneyi**
13b Leaf blade oblong or elliptic with apex acute to emarginate. . . . **I. oblongata**

## **bathycolpos** Hallier f.

*I. bathycolpos* Hallier f. var. *sinuatodentata* Hallier f.

Perennial herb; scabrid in all parts except corolla. **Stems** annual, procumbent. **Leaves** ovate, with base of blade cordate to triangular-cordate, 15–55 × 7.5–40.0 mm, apex rounded or emarginate, margin thickened, upper surface finely net-veined, lower surface similar but with raised veins. **Flowers**: peduncles 1- or 2-flowered; calyx lobes unequal, 12–18 mm long, apices obtuse; corolla 35–50 mm long, pale mauve to almost white with darker, mauve-magenta centre, midpetaline bands glabrous, conspicuous; Oct.–Mar. **Fruit** a globose capsule, ± 15 mm in diameter; seeds hairy. Grassland, rocky places and disturbed places. *Veldsambreeltjies* (A).

VreDm | AcGr | DrGr

## **bolusiana** Schinz

*I. angustisecta* Engl.
*I. mesenterioides* Hallier f.

Perennial herb; glabrous. **Stems** erect or procumbent. **Leaves** with blade either palmately 3–9-sect, with segments 20–70 × 0.5–3.0 mm, or simple, linear to bilobed, 40–150 × 2–7 mm. **Flowers**: peduncles 1-flowered; calyx lobes equal or unequal, narrowly ovate, 7–20 mm long, apices acute or acuminate, glabrous; corolla 40–75 mm long, bright magenta-pink, lighter outside, darker in centre and on midpetaline bands; Aug.–Apr. **Fruit** a subglobose-conical capsule, 10–12 mm in diameter; seeds with long, shiny, fawn-coloured hairs. Savanna, grassland with scattered shrubs, rocky and sandy soils. *Seakhoe* (SS).

VreDm | DrGr

**crassipes** Hook.

*I. adumbrata* Rendle & Britten

*I. bellecomans* Rendle

Perennial herb. **Stems** annual, procumbent, sometimes decumbent. **Leaves** petiolate; blade usually narrowly ovate to ovate, 15–80 × 3–28 mm, base truncate, rounded or slightly hastate, both surfaces covered with long, fulvous hairs. **Flowers**: peduncles usually 1-flowered, bracts leafy; calyx lobes unequal, 10–28 mm long, apices acute to obtuse; corolla 30–65 mm long, mauve to purple with lighter midpetaline bands, also pink or white with dark purple centre; Sep.–Jun. **Fruit** an ovoid-globose capsule, 8–10 mm in diameter; seeds glabrous or pubescent. Savanna, grassland, sandy soil. *Wildepatat*, *wildewinde* (A); *mothokhoana*, *maime*, *sekutle*, *seletjane-se-setona* (SS).

DrGr MsGr

**gracilisepala** Rendle

*I. xiphosepala* Baker

Annual herb. **Stems** procumbent or trailing. **Leaves** with blade oblong to narrowly ovate, 20–60 × 5–20 mm, base hastate-truncate or with toothed auricles, upper surface dark green, glabrescent, lower surface paler, more densely hairy. **Flowers**: peduncle 1- or 2-flowered, very short or absent; calyx lobes narrowly ovate to linear, apex acuminate; corolla 12–15 mm long, mauve or white; Dec.–Mar. **Fruit** a globose, hirsute capsule; seeds pubescent, hairs stiff, appressed. Grassland and damp soil near rivers.

VreDm

**magnusiana** Schinz

*I. lugardi* N.E.Br. var. *parviflora* Rendle

*I. magnusiana* Schinz var. *eenii* (Rendle) A.Meeuse

Perennial herb. **Stems** procumbent or suberect. **Leaves** with blade deeply palmately 3- or 5-lobed, 20–40 mm in diameter, lower surface densely covered with white cobwebby hairs and prominently veined. **Flowers**: in a dense, 1–few-flowered head; calyx lobes narrowly ovate, acute, hairy; corolla 12–20 mm long, magenta-purple, mauve, cream-coloured or white with darker magenta centre; Jan.–Mar. **Fruit** a subglobose, glabrous capsule, 6–8 mm in diameter; seeds pubescent, hairs often in small tufts and sometimes with long hairs along angles. Savanna, grassland, roadsides, sandy soil.

DrGr

**oblongata** E.Mey. ex Choisy

*I. atherstonei* Baker

*I. randii* Rendle

*Turbina oblongata* (E.Mey. ex Choisy) A.Meeuse

Perennial herb. **Stems** procumbent or suberect. **Leaves** with blade oblong or elliptic, 20–150 × 4–80 mm, apex acute to emarginate, covered with strigose yellowish hairs. **Flowers**: peduncles 1–several-flowered; calyx lobes narrowly ovate to ovate, apices acute or acuminate, outer lobes densely covered with stiff hairs; corolla 35–60 mm long, magenta; Oct.–Apr. **Fruit** a subglobose, glabrous, indehiscent capsule, 12–15 mm in diameter, loosely enclosed by calyx lobes. Savanna, grassland, wet and sandy soils. *Krismisblom*, *nuwejaarsblom* (A); *mothokho* (SS).

VreDm DrGr MsGr

**obscura** (L.) Ker Gawl. var. **obscura**

*Convolvulus obscurus* L.

*I. obscura* (L.) Ker Gawl. var. *fragilis* (Choisy) A.Meeuse

Perennial herb. **Stems** procumbent or twining. **Leaves** with blade ovate, 30–90 × 20–70 mm, base cordate, apex acuminate or apiculate, margin entire or undulate and often ciliate. **Flowers**: peduncle 1–few-flowered; calyx lobes ovate, ovate-orbicular or narrowly ovate, pubescent or glabrous; corolla 15–25 mm long, yellow, orange, cream-coloured or white, concolorous or with purple centre; Aug.–May. **Fruit** an ovoid to subglobose, glabrous capsule, 7–12 mm in diameter; seeds appressed pubescent or velvety. Woodland, grassland, cultivated land, roadsides, sandy soils. *Wild petunia*; *wildepatat* (A); *usiboniseleni* (Z).

VreDm | AcGr | DrGr

**oenotherae** (Vatke) Hallier f.

*Convolvulus oenotherae* Vatke

*I. petunioides* Baker

Perennial herb; producing a rosette of leaves. **Stems** procumbent or ascending. **Leaves** with blade linear (radical leaves) to subpalmately or pinnately 3–7-lobed (cauline leaves) with linear to narrowly ovate lobes, middle ones longest and often lobed or dentate at first, 40–100 mm long, with soft, silvery white hairs, main veins prominent below. **Flowers**: solitary, axillary, subsessile or pedicel 5–15 mm long; calyx lobes ovate or narrowly ovate, aristate, ciliate with median keel of hairs; corolla up to 50 mm long, mauve to purple; Nov.–Mar. **Fruit** a globose, glabrous capsule, 8–10 mm in diameter; seeds densely pubescent. Mixed woodland, grassland, sandy soil.

VreDm

**oenotheroides** (L.f.) Raf. ex Hallier f.

*Convolvulus oenotheroides* L.f.

*I. argyreoides* Choisy

Shrub, 0.3–1.0 m high. **Stems** erect, covered with a short, silvery, adpressed pubescence. **Leaves** with blade linear to narrowly ovate, 30–110 × 2–30 mm, base decurrent into short petiole, apex acute or obtuse, mucronate, margin entire; petioles up to 6 mm long. **Flowers**: peduncle 1-flowered, up to 15 mm long; calyx lobes narrowly ovate, acute or subacute; corolla 35–70 mm long, bright magenta or magenta-pink; Nov.–Feb. **Fruit** ovoid or ovoid-globose, 15–20 mm long, glabrous; seeds glabrous. Grassland, often in sand.

DrGr | KarSh

**ommanneyi** Rendle

Perennial herb. **Stems** trailing. **Leaves** with blade ovate, narrowly ovate or oblong, gradually tapering towards apex, up to 300 × 120 mm, base rounded to shallowly cordate, margin densely yellow-ciliate, both surfaces densely covered with silvery white hairs. **Flowers**: several together in dense head; calyx lobes narrowly ovate, 20–35 mm long, acuminate-cuspidate; corolla 50–70(–90) mm long, rose-magenta; Oct.–Feb. **Fruit** a globose capsule, ± 10 mm in diameter, enclosed by calyx; seeds glabrous. Grassland, pans, roadsides, rocky soil. *Ox potato*; *beespatat* (A). Figure 47.

VreDm | AcGr | DrGr

**pellita** Hallier f.

*I. ovata* E.Mey. ex Rendle

Perennial herb. **Stems** procumbent. **Leaves** with blade ovate to oblong, 40–100 × 20–65 mm, base rounded, truncate or shallowly cordate, margin entire, with a dense yellowish fringe of hairs. **Flowers**: in dense few-flowered heads on long peduncles, peduncles bristly; calyx lobes linear to linear-subulate, very bristly with yellowish hairs, gradually tapering into acute point; corolla 40–70 mm long, magenta; Jan., Feb. **Fruit** a subglobose, glabrous capsule, 12–15 mm in diameter; seeds glabrous. Grassland and disturbed places. *Ubhoqo* (Z).

MsGr

***purpurea** (L.) Roth

Annual herb; glabrous or retrorsely hairy. **Stems** trailing or twining. **Leaves** broadly ovate to suborbicular, 40–150 × 25–120 mm, base of blade cordate with rounded auricles, apex acuminate, margin entire, hairy to glabrous on both surfaces; petioles 20–150 mm long. **Flowers**: peduncle 1–few-flowered; calyx lobes unequal, outer ones oblong, inner ones ± linear, 10–15 mm long, apices acute, with bristly patent hairs on basal portion; corolla 50–60 mm long, ± 60 mm in diameter, white, pink, magenta, reddish purple or purplish blue with paler tube, distinct midpetaline bands; Nov.–May. **Fruit** a globose, glabrous capsule; seeds glabrescent. Savanna, grassland, fast-growing weed on waste or cultivated ground. Native to Central America. *Morning glory*; *purperwinde* (A).

VreDm



**Figure 47.** *Ipomoea ommanneyi* (Convolvulaceae). Artist: G. Condy.

**simplex** Thunb.
*I. plantaginea* (Choisy) Hallier f.

Perennial herb, up to 100 mm high. **Stems** erect. **Leaves** subsessile; blade linear to narrowly ovate, 30–100 mm long, apex long-tapering, margin entire or with a few teeth or lobes. **Flowers**: solitary, axillary; calyx lobes narrowly ovate to narrowly ovate-oblong, acute; corolla 20–35 mm long, white; Oct.–Dec. **Fruit** a subglobose, glabrous capsule, 7–9 mm in diameter; seeds tomentose. Grassland and disturbed areas. *Seakhoe* (SS).

DrGr MsGr

## **Merremia** Dennst. (sthn Afr.: 10 spp.)

**verecunda** Rendle
*Ipomoea quinquefolia* Hochst. ex Hallier f. var. *pubescens* Baker
*I. verecunda* (Rendle) N.E.Br.

Annual herb. **Stems** trailing. **Leaves** with blade palmately to pedately 7–11-lobed, 20–80 mm in diameter. **Flowers**: peduncle usually 1-flowered; stigma globose; calyx turbinate, lobes 10–15 mm long, inflated in fruit enclosing capsule completely, pale green with 6 or 7 conspicuous, longitudinal, purplish red, raised veins on outer lobes, purple-dotted between veins; corolla up to 20 mm long, yellow or whitish with purple centre; Nov.–Apr. **Fruit** a 4-lobed capsule, 8–12 mm in diameter; seeds black, shiny. Grassland on deep sand.

DrGr KarSh

## **Seddera** Hochst. (sthn Afr.: 2 spp.)

**capensis** (E.Mey. ex Choisy) Hallier f.
*Bonamia capensis* (E.Mey. ex Choisy) Burtt Davy
*Evolvulus capensis* E.Mey. ex Choisy

Subshrub; stems, leaves, pedicels, calyx and midpetaline bands of corolla covered with stiff, rusty brown, appressed to patent hairs. **Stems** procumbent or decumbent. **Leaves** with blade ovate to narrowly ovate, 5–25 × 3–12 mm, base rounded to truncate, apex obtuse to acute, strigose on both surfaces. **Flowers**: always solitary, sessile, rarely pedicellate; style bifid with 2 subpeltate, bilobed stigmas; calyx lobes 7–10 mm long, ciliate with bulbous-based hairs; corolla ± 10 mm long, pinkish white; Sep.–Apr. **Fruit** subglobose, ± 5 mm in diameter, usually crowned with a tuft of hairs. Thornveld, grassland, waste places, damp veld.

VreDm AcGr DrGr

## **Xenostegia** D.F.Austin & Staples (sthn Afr.: 1 sp.)

**tridentata** (L.) D.F.Austin & Staples subsp. **angustifolia** (Jacq.) Lejoly & Lisowski
*Merremia tridentata* (L.) Hallier f. subsp. *angustifolia* (Jacq.) Ooststr. var. *angustifolia*
*M. tridentata* (L.) Hallier f. subsp. *hastata* (Desr.) Ooststr.

Perennial herb; usually glabrous. **Stems** procumbent or twining. **Leaves** petiolate; blade linear to narrowly oblong, 20–80 × 2–6 mm, apex acute, margin entire except for small, basal

auricles; petioles up to 5 mm long. **Flowers**: peduncle slender, 1–3-flowered; stigma globose; calyx lobes 5–10 mm long, apex cuspidate; corolla 12–20 mm long, lobes broadly triangular, acute, midpetaline bands well defined, pale to bright yellow, often with a dark reddish or brown centre; Nov.–May. **Fruit** globose, ± 6 mm in diameter. Savanna, grassland. *Ulonja* (Z).

AcGr DrGr

## Reference

MEEUSE, A.D.J. & WELMAN, W.G. 2000. Convolvulaceae. *Flora of southern Africa* 28,1: 1–38.

# CRASSULACEAE

Herbs, dwarf shrubs or shrubs, usually succulent. **Stems** erect, slightly carnose, but somewhat woody. **Leaves** opposite, rarely whorled, often in a basal rosette, sessile, occasionally petiolate; fleshy, persistent; without stipules. **Flowers**: in a thyrse with 1–several dichasia usually ending in monochasial branches; bracts on peduncle distinct, abruptly shorter than leaves; regular; 4- or 5-merous; calyx 5-partite; corolla with lobes 4 or 5, free or united at base; stamens 10, in 2 whorls; filaments usually with a tuft of hairs where fused to lower third of corolla tube, filaments free, anthers exserted, terminal appendage spherical or almost so, various colours; ovaries 4 or 5, separate or slightly joined at base only, superior; nectar gland present at base of each ovary; styles slender. **Fruit** usually comprising free follicles. *Stonecrop family*.

## Key to genera

[after Toelken: 1 (1985)]

1a Leaves spirally arranged; inflorescence a spike-like thyrse . . . **Adromischus**
1b Leaves opposite or in whorls, at least on vegetative branches; inflorescence a thyrse with dichasia ending in monochasia . . . . . 2
2a Opposite leaves ± fused to one another; stamens as many as calyx lobes . . . . . **Crassula**
2b Leaves, opposite or spirally arranged, free; stamens twice as many as calyx lobes . . . . . 3
3a Flowers 5-merous . . . . . **Cotyledon**
3b Flowers 4-merous . . . . . **Kalanchoe**

## **Adromischus** Lem. (sthn Afr.: 27 spp.)

### **trigynus** (Burch.) Poelln.

Perennial herb, up to 0.55 m high in flower. **Stems** erect. **Leaves** spirally arranged, remarkably uniform in shape and size; blade elliptic to orbicular, ± 20–30 × 12–20 mm, dark spotted

with a horny margin extending to base. **Flowers**: in a spike-like thyrse with 1-flowered cymes; 5-merous; anthers exserted; calyx lobes 2–3 mm long, grey, often powdery; corolla hairy in throat, tube 10–13 mm long, pale yellowish green, covered with a thick bloom, lobes ovate, 1.5–2.5 mm long, gradually constricted into acute apex, off-white to slightly tinged pink or deeper pink in throat; Nov., Dec. **Fruit** square to ovate, 0.8–1.2 × 0.8–1.3 mm, apex deeply emarginate. Rock crevices. *Bontplakkie*.

KarSh

## **Cotyledon** L. (sthn Afr.: 10 spp.)

### Key to species:

Corolla tube campanulate . . . . . **C. orbiculata** var. **dactylopsis**
Corolla tube cylindrical . . . . . **C. orbiculata** var. **oblonga**

### **orbiculata** L. var. **dactylopsis** Toelken

Dwarf shrub, up to 0.25 m high. **Stems** short, spreading, rigid and woody. **Leaves** with blade narrowly ovate to linear, 50–80 × 6–12 mm, apex acute, green rarely greyish green. **Flowers**: in a thyrse, peduncle 0.2–0.3 m long, 1 pair of bracts present; corolla with tube campanulate, 8–10 mm long, lobes 5–8 mm long, recurved, yellow, tinged orange or red; Oct.–Dec. Among dolerite boulders, upper slopes of hillsides. *Pig's ear*; *krimpsiektebos*, *vingerplakkie* (A); *seredile* (SS).

DrGr KarSh

### **orbiculata** L. var. **oblonga** (Haw.) DC.

*C. oblonga* Haw.

Dwarf shrub, up to 0.8 m high; robust. **Stems** decumbent. **Leaves** with blade obovate to narrowly obovate, 50–110 × 35–60 mm, margins red at apex, variable from glabrous to hairy, green to greyish green. **Flowers**: inflorescence a thyrse, peduncle 0.20–0.35 m long, 1 or 2 pairs of bracts present; corolla with tube cylindrical, 18–30 mm long, lobes recurved, 10–13 mm long, red to pinkish orange; Jun.–Oct. Rocky slopes.

DrGr MsGr

## **Crassula** L. (sthn Afr.: 152 spp.)

### Key to species:

[after Toelken: 78 (1985)]

1a Annual herbs; corolla cup-shaped . . . . . 2
1b Perennial herbs; corolla cup-, star- or tubular-shaped . . . . . 4
2a Calyx lobes acute, as long as or longer than lobes . . . . . **C. campestris**
2b Calyx lobes obtuse, ± as long as lobes . . . . . 3
3a Leaves linear to linear-elliptic . . . . . **C. vaillantii**
3b Leaves narrowly obovate, obovate to elliptic oblong **C. natans** var. **natans**
4a Perennial herbs with corolla star-shaped . . . . . 5
4a Perennial herbs with corolla urceolate, cup- or tubular-shaped . . . . . 7

5a Leaf blade obovate, elliptic or orbicular, apex obtuse . . . . . **C. umbraticola**
5b Leaf blade narrowly linear-ovate or ovate to narrowly ovate-spathulate . . . 6
6a Leaf blade narrowly linear-ovate . . . . . **C. peploides**
6b Leaf blade ovate to narrowly ovate-spathulate. . . . . .**C. pellucida** subsp. **brachypetala**
7a Corolla urceolate . . . . . **C. corallina** subsp. **corallina**
7b Corolla cup- or tubular-shaped . . . . . 8
8a Corolla cup-shaped . . . . . 9
8b Corolla tubular-shaped . . . . . 16
9a Sepal apices acute. . . . . 10
9b Sepal apices obtuse or bluntly pointed . . . . . 12
10a Calyx lobes $^{2}/_{3}$ length of lobes; stems woody . . . . **C. muscosa** var. **muscosa**
10b Calyx lobes as long as or longer than lobes; stems fleshy . . . . . .11
11a Leaves all ± equal in length; blade apices acute not awned . . . . . .**C. lanceolata** subsp. **lanceolata**
11b Leaves with lower ones distinctly longer than upper ones; blade apices with a sharp awn . . . . . **C. lanceolata** subsp. **transvaalensis**
12a Leaf blade narrowly ovate, elliptic to broadly elliptic . . . . . 13
12b Leaf blade linear. . . . . 14
13a Stems erect or decumbent, becoming slightly woody at base. . . . . .**C. expansa** subsp. **expansa**
13b Stems procumbent not becoming woody at base. . . . . **C. tenuicaulis**
14a Rhizome ending in small tubers . . . . . **C. tuberella**
14b Rhizome absent or not ending in small tubers. . . . . 15
15a Stamens with red anthers . . . . . .**C. gemmifera**
15b Stamens with yellow to purple anthers. . . . . .**C. inanis**
16a Corolla lobes with a smooth, ovoid appendage in terminal position . . . . . .**C. nudicaulis** var. **nudicaulis**
16b Corolla lobes with or without a dorsal appendage . . . . . 17
17a Corolla lobes with a canaliculate beak . . . . . .**C. subaphylla** var. **subaphylla**
17b Corolla lobes without a beaked apex . . . . . 18
18a Leaves (glabrous or hairy) without marginal cilia or just a few at base. . . . . 19
18b Leaves (glabrous or hairy) with marginal cilia . . . . . 20
19a Stems erect or spreading; old leaves deciduous with leaf sheaths . . . . . .**C. sarcocaulis** subsp. **rupicola**
19b Stems decumbent or procumbent; old leaves drying, breaking off, leaving leaf sheath, but eventually stems also without remains of leaves. . . . . .**C. dependens**
20a Inflorescence a flat or round-topped thyrse . . . . . 21
20b Inflorescence a spike-like or elongate thyrse. . . . . 25
21a Corolla lobes with apices obtuse or rounded, dorsal appendage indistinct . . . . . 22
21b Corolla lobes with apices acute, dorsal appendage distinct . . . . . 23
22a Leaf sheath on lower part of erect stems (5–)8–15 mm long; taproot tuberous . . . . . **C. vaginata** subsp. **vaginata**
22b Leaf sheath on lower part of erect stems 1–3 mm long; taproot fibrous . . . . . .**C. natalensis**
23a Leaf blade 60–150(–170) × 5–15 mm . . . . . .**C. alba** var. **alba**
23b Leaf blade 6–20(–35) × (1–)2–10 mm. . . . . 24
24a Leaf blade 4–10 mm broad . . . . . .**C. setulosa** var. **setulosa**
24b Leaf blade 1–3 mm broad . . . . . .**C. setulosa** var. **rubra**
25a Leaves abruptly shorter below inflorescence. . . . . **C. compacta**
25b Leaves gradually becoming shorter below inflorescence. . . . . 26
26a Flowers pedicellate . . . . . 27
26b Flowers sessile. . . . . 28
27a Flowers prominently pedunculate and pedicellate . . . . . **C. tabularis**
27b Flowers with a very short peduncle . . . . . .**C. capitella** subsp. **thrysiflora**

28a Bracts subtending part-inflorescences glabrous except for marginal cilia . . . . . **C. capitella** subsp. **capitella**

28b Bracts subtending part-inflorescences covered with hairs and marginal cilia . . . . . .**C. capitella** subsp. **nodulosa**

[Descriptions after Toelken: 75–229 (1985)]

### **alba** Forssk. var. **alba**

*C. milleriana* Burtt Davy

*C. stewartiae* Burtt Davy

Perennial or biennial herb. **Stems** up to 0.5 m high, with 1 rosette, **Leaves** slightly fleshy; blade narrowly ovate to linear-triangular, 60–150 × 5–15 mm, apex sharply acute, margins with cilia, glabrous, dark green to yellowish green, sometimes with purple marks on both surfaces. **Flowers**: in a many-flowered, flat-topped thyrse, peduncle covered with leaf-like bracts; 5-merous; anthers dark brown; calyx lobes acute; corolla tubular, lobes oblong to oblong-obovate, 5.0–6.0 mm long, apices acute, dorsal appendage tuberculate, deep red or white, tinged pink; Jan.–May. Grassland, slopes. Figure 48.

DrGr MsGr

### **campestris** (Eckl. & Zeyh.) Endl. ex Walp.

Annual herb. **Stems** erect, rarely decumbent, up to 0.1 m high. **Leaves** fleshy; blade narrowly ovate to narrowly triangular, 4–6 × 1–2 mm, apex acute, drawn into a sharp point in shade forms, glabrous, green to brown. **Flowers**: in a thyrse with many sessile dichasia, pedicels short; 5-merous; anthers yellow; calyx lobes acute, as long as or longer than lobes; corolla cup-shaped, lobes narrowly triangular-ovate, 0.5–0.8 mm long, apices acute to acuminate, erect, folded; pale yellow to brown; Aug.–Nov. Grassland, sandy or gravelly slopes.

DrGr KarSh

### **capitella** Thunb. subsp. **capitella**

Biennial, rarely perennial herb. **Stems** 0.4 m high when flowering. **Leaves** fleshy; in a rosette; blade narrowly linear-ovate to ovate, 20–70 × 10–20 mm, apex acute, often drying up from apex, dorsiventrally compressed, glabrous to sparsely hairy, marginal cilia present, green to brown, often tinged red or with red spots. **Flowers**: in a spike-like thyrse, dichasia sessile, bracts glabrous; 5-merous; anthers brown to black; calyx lobes acute; corolla tubular, lobes oblong, ± 3 mm long, each with a terminal, rounded, dorsal appendage, fleshy, petal apex spreading towards centre of flower; Nov.–Mar. Grassland, dry slopes.

DrGr KarSh Zastr

### **capitella** Thunb. subsp. **nodulosa** (Schönland) Toelken

Perennial, rarely biennial, herb. **Stems** 0.4 m high when flowering. **Leaves** sessile in a rosette; pubescent, hairs short, marginal cilia present, fleshy; green to brown, often tinged red or with red spots; blade obovate, 20–50 × 10–25 mm, apex acute, often drying up from apex, dorsiventrally compressed. **Flowers**: in a spike-like thyrse, dichasia sessile, bracts subtending part-inflorescences covered with hairs and marginal cilia; 5-merous; anthers brown to black; calyx lobes acute; corolla tubular, lobes oblong, ± 3 mm long, each with a terminal, rounded dorsal appendage, fleshy, petal apex spreading towards centre of flower; Jan.–Apr. Grassland, gravelly slopes, in depressions.

DrGr

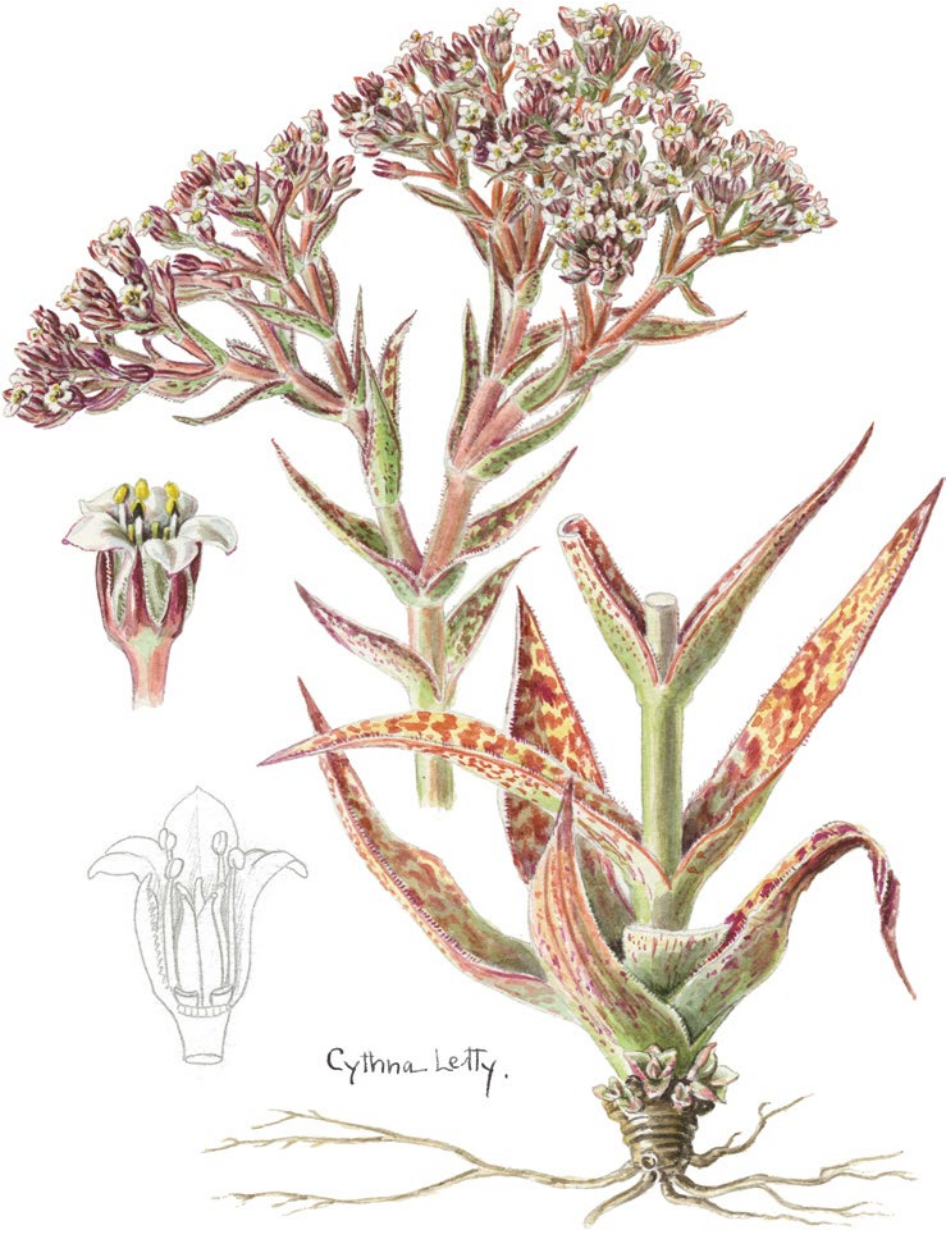



**Figure 48.** *Crassula alba* (Crassulaceae). Artist: C. Letty.

**capitella** Thunb. subsp. **thyrsiflora** (Thunb.) Toelken

Annual herb. **Stems** erect, rarely decumbent, up to 0.1 m high when flowering. **Leaves** fleshy; in a rosette; blade narrowly ovate to narrowly triangular, 4–6 × 1–2 mm, apex acute, drawn into a sharp point in shade forms, upper surface flat, lower surface convex, glabrous, green to brown. **Flowers**: in a thyrse with many, sessile dichasia, pedicels short, bracts glabrous; 5-merous; calyx lobes acute; corolla tubular, lobes oblong, ± 3 mm long, each terminal with a rounded dorsal appendage, fleshy, petal apex spreading towards centre of flower, pale yellow to brown; Aug.–Nov. Grassland, sandy or gravelly slopes.

DrGr KarSh

**compacta** Schönland

Perennial or annual herb. **Stems** up to 0.2 m high when flowering, shortly tomentose. **Leaves** fleshy; in a rosette, abruptly shorter below inflorescence; blade ovate, elliptic or obovate, 15–35 × 10–25 mm, apex acute to obtuse, dorsiventrally flattened, glabrous except for a dense row of marginal cilia, green to reddish brown. **Flowers**: in a spike-like thyrse; with ± sessile dichasia and flowers, peduncle covered with bracts; 5-merous; anthers black; calyx lobes acute; corolla tubular, lobes oblong-obovate, 4.5–5.5 mm long, apices obtuse, erect or slightly recurved, white or cream-coloured; Nov.–Mar. Grassland, in open patches, shallow soil on rocks.

MsGr

**corallina** Thunb. subsp. **corallina**

Perennial herb. **Stems** procumbent, up to 80 mm long, with adventitious roots. **Leaves** fleshy; blade angular, obovate to elliptic, 3–5 × 2–3 mm, apex bluntly acute, verruculose, sometimes covered with a waxy layer, greyish green to greyish brown. **Flowers**: in a terminal thyrse, 1–many-flowered; 5-merous; anthers yellow; corolla urceolate, lobes oblong-obovate, 2.0–3.5 mm long, apex rounded, recurved, cream-coloured; Dec.–Apr. Grassland, sandy soil, surface limestone, shallow soil over granite and dolerite rocks.

DrGr KarSh

**dependens** Bolus

*C. harveyi* Britten & Baker f.

*C. laxa* Schönland

Perennial herb. **Stems** decumbent or procumbent; old leaves drying, breaking off, leaving leaf sheath, but eventually stems also without remains of leaves, up to 0.2 m long; thin and wiry, covered with hair-like papillae, at least when young. **Leaves** fleshy; blade narrowly ovate to linear, 5–15 × 1–2 mm, apex sharply acute, dorsiventrally compressed, glabrous, green to brown. **Flowers**: in a ± flat-topped dichasium with few to many flowers; 5-merous; anthers brown; calyx lobes acute; corolla tubular, lobes narrowly ovate-oblong, 4–5 mm long, apices acute, dorsally ridged, recurved, white or cream-coloured; Dec.–Feb. Grassland, on shallow soil or in rock crevices.

DrGr MsGr KarSh Zastr

**expansa** Dryand. subsp. **expansa**

Perennial herb. **Stems** erect or decumbent, 0.1–0.2 m long, herbaceous or becoming slightly woody at base, with or without adventitious roots. **Leaves** fleshy; blade narrowly ovate to elliptic, 6–20 × 1.5–3.0 mm, apex subulate to obtuse, dorsiventrally compressed to terete,

glabrous, green, yellowish green to brown with 1 or 2 rows of hydathodes arranged along margin. **Flowers**: in a thyrse; 5-merous; anthers black; calyx lobes obtuse; corolla cup-shaped, lobes elliptic-oblong, 2.5–4.0 mm long, apex acute or obtuse, recurved, white, often tinged red; Jan.–Apr. Karroid vegetation, usually on rocky or sandy slopes.

KarSh

### **gemmifera** Friedrich

Perennial herb. **Stems** erect to decumbent, up to 70 mm long, often with adventitious roots. **Leaves** fleshy; blade linear to narrowly linear-obovate, 3–5 × 1 mm, apex obtuse, flat above, convex below, glabrous, pale green. **Flowers**: solitary, terminal in axil of a leaf; 4-merous; anthers red; calyx lobes obtuse; corolla cup-shaped, lobes elliptic-oblong, ± 1.5 mm long, apex bluntly acute, recurved, white; Nov.–Feb. Moist places near standing water, shaded rock crevices.

MsGr

### **inanis** Thunb.

Perennial herb. **Stems** up to 0.3 m long, upper branches often floating but still attached to underground rhizome. **Leaves** slightly fleshy; blade narrowly ovate to triangular, 10–20 × 2–3 mm, apex obtuse, dorsiventrally compressed, glabrous, green. **Flowers**: in a thyrse with sessile dichasia; 4-merous; anthers yellow to purple; calyx lobes obtuse; corolla cup-shaped, lobes obovate, 1–2 mm long, apices obtuse, strongly recurved, white; Oct.–Mar. Vleis, streams, rivers.

DrGr MsGr KarSh

### **lanceolata** (Eckl. & Zeyh.) Endl. ex Walp. subsp. **lanceolata**

*C. filamentosa* Schönland
*C. lanceolata* (Eckl.& Zeyh.) Endl. ex Walp.

Perennial herb. **Stems** spreading or decumbent, fleshy, up to 0.1 m high, often mat-forming with branches usually filiform. **Leaves** fleshy; all ± equal in length, blade narrowly ovate, 5–12 × 1.5–2.0 mm, apex acute but not awned, often papillose towards apex, glabrous or with a few marginal teeth; soft to leathery, green, grey-green or brown. **Flowers**: in a thyrse with many, usually sessile, dichasia in axils of leaves; 5-merous; anthers yellow; calyx lobes acute; corolla cup-shaped, lobes narrowly triangular, up to 1 mm long, apices acute, keeled, erect, pale yellowish green turning brown; Dec.–Jul. Grassland, sheltered rock crevices, shade of other plants.

DrGr MsGr KarSh

### **lanceolata** (Eckl. & Zeyh.) Endl. ex Walp. subsp. **transvaalensis** (Kuntze) Toelken

*C. transvaalensis* (Kuntze) K.Schum.

Perennial herb. **Stems** erect, fleshy, up to 0.15 m high, new branches annually from fleshy roots. **Leaves** fleshy; lower ones distinctly longer than upper ones; 5–12 × 1.5–2.0 mm, apex acute drawn into a colourless awn, rarely papillose towards apex, glabrous or with a few marginal teeth; soft to leathery, green, grey-green or brown. **Flowers**: in a thyrse with many, usually sessile, dichasia in axils of leaves; 5-merous; anthers yellow; calyx lobes acute; corolla cup-shaped, lobes narrowly triangular, up to 1 mm long, apices acute, keeled, erect, pale yellowish green turning brown; Jan.–Apr. Grassland, open patches, rarely on slopes.

AcGr DrGr MsGr KarSh

### **muscosa** L. var. **muscosa**

Perennial herb, up to 0.4 m high. **Stems** erect, woody; branches 0.2–0.4 mm long, 5–10 mm in diameter; old leaves remaining attached to branches. **Leaves** fleshy; blade narrowly ovate to obovate, 2–4 × 1.5–2.0 mm, apex acute, flat on both surfaces, glabrous, leathery, greyish green to brown; appressed, internodes not visible between leaves. **Flowers**: in an axillary thyrse with many sessile dichasia; 5-merous; anthers yellow; calyx lobes acute; corolla cup-shaped, lobes triangular, 1–2 mm long, apices sharply acute, keeled, erect, pale yellowish green to brown; Sep.–Feb. Karroid vegetation.

KarSh

### **natalensis** Schönland

Perennial or biennial herb. **Stems** up to 0.4 m high when flowering; leaf sheath on lower part of erect stems 1–3 mm long; taproot fibrous. **Leaves** fleshy; in a rosette; blade obovate, 15–60 × 5–15 mm, abruptly tapering into a blunt apex, dorsiventrally flattened, glabrous except for marginal cilia, often swollen towards apices, green, often tinged red. **Flowers**: in a round-topped thyrse, pedicellate, peduncle covered with leaf-like bracts; 5-merous; anthers reddish brown; calyx lobes acute; corolla tubular, lobes oblong to elliptic, 2–3 mm long, apices rounded, slightly hooded, recurved, white, tinged pink to reddish; Feb.–Apr. Grassland, rocky outcrops, shallow soil on rocks.

DrGr MsGr

### **natans** Thunb. var. **natans**

*Helophytum fluitans* Eckl. & Zeyh.

Annual herb. **Stems** decumbent or floating in water, branches up to 0.25 m long, 1–3 mm in diameter. **Leaves** fleshy; blade narrowly obovate, obovate or elliptic-oblong, 3–12 × 1–4 mm, apex obtuse, glabrous, green. **Flowers**: terminal in axils of leaf-like bracts; pedicels up to 15 mm long, spreading when flowering and fruiting; 4-merous; anthers yellow to purple; calyx lobes obtuse, ± as long as lobes; corolla shallowly cup-shaped, lobes obovate, 1–2 mm long, often strongly recurved, white, sometimes tinged pink-mauve; Oct.–Jan. Moist depressions, standing water.

DrGr MsGr KarSh

### **nudicaulis** L. var. **nudicaulis**

Perennial herb. **Stems** up to 0.3 m high, fleshy to slightly woody at base. **Leaves** fleshy; in a rosette; blade oblong-elliptic, 50–80 × 6–15 mm, apex acute to rounded, upper surface flat, lower surface convex, glabrous to pubescent, with or without marginal cilia, green, yellowish green to brown. **Flowers**: in a thyrse with many dense dichasia, dichasia stalked or sessile, spreading; 5-merous; anthers yellow; calyx lobes obtuse; corolla tubular to almost cylindrical, lobes fiddle-shaped, 3.0–3.5 mm long, apices membranous, each with a terminal, smooth, ovoid appendage, cream-coloured, rarely white; Sep.–Dec. Grassland, gravelly slopes, rock crevices.

DrGr MsGr KarSh

### **pellucida** L. subsp. **brachypetala** (Drège ex Harv.) Toelken

*C. diabolica* N.E.Br.

Perennial herb. **Stems** decumbent to procumbent, up to 0.6 m long; internodes hairy. **Leaves** fleshy; blade ovate to narrowly ovate-spathulate, 10–25 × 5–12 mm, apex acute with a sharp

point. **Flowers**: terminal, solitary in axil of one of two leaves per node; 5-merous; anthers white to purple; calyx lobes sharply acute; corolla star-shaped, lobes elliptic to narrowly obovate-oblong, 3–5 mm long, apices sharply acute, white, often tinged pink; Dec.–Apr. Grassland, in moist places, on rocky outcrops.

MsGr

**peploides** Harv.

*C. galpinii* Schönland

Perennial herb, with several terminal rosettes on fleshy stems, up to 0.4 m high. **Leaves** fleshy; blade narrowly linear-ovate, 5–15 × 2–3 mm, apex acute, almost terete, glabrous, sometimes minutely papillose, green, often tinged red or reddish brown. **Flowers**: inflorescences terminal on axillary branches; 5-merous; anthers yellow; calyx lobes abruptly constricted into blunt apices; corolla star-shaped, lobes elliptic to obovate, 3.0–4.5 mm long, white, tinged red; Jan.–Apr. Moist shallow soil on rocks.

MsGr

**sarcocaulis** Eckl. & Zeyh. subsp. **rupicola** Toelken

Shrub. **Stems** erect or spreading, much branched, up to 0.4 m high; hair-like papillae on young branches, older ones with bark peeling. **Leaves** fleshy; old leaves deciduous with leaf sheaths; blade narrowly linear-ovate, 8–20 mm long, up to 1.5 mm broad, apex acute, dorsiventrally flattened to terete. **Flowers**: in a dense thyrse with 1–several dichasia; 5-merous; anthers brown; calyx lobes bluntly acute; corolla tubular, lobes oblong to narrowly oblong-obovate, 3–5 mm long, apices acute, recurved, usually with a dorsal ridge, white fading to cream-coloured; Jan.–Apr. Sheltered corners between boulders or wedged in rock crevices.

DrGr MsGr KarSh

**setulosa** Harv. var. **rubra** (N.E.Br.) G.D.Rowley

Perennial herb, up to 0.25 m high when flowering; usually forming cushions of rosettes. **Leaves** fleshy; blade narrowly obovate, rarely narrowly elliptic, 6–10 × 1–3 mm, apex obtuse, dorsally flattened, margins with erect cilia towards base, glabrous, green often tinged red. **Flowers**: in a flat-topped thyrse with many flowers; 5-merous; anthers yellow, rarely salmon-coloured; calyx lobes acute; corolla tubular, lobes narrowly oblong-obovate, apices obtuse, dorsal appendages insignificant, papillose, recurved, red; Jan.–Apr. Grassland, rocks, rock crevices.

MsGr

**setulosa** Harv. var. **setulosa**

Perennial herb, up to 0.25 m high when flowering; usually forming cushions of rosettes. **Leaves** fleshy; blade broadly elliptic to narrowly ovate, 8–15 × 4–10 mm, apex acute, margin with a dense row of recurved cilia, covered with recurved hairs or glabrescent to rarely glabrous, green often tinged red. **Flowers**: in a round-topped thyrse with many flowers; 5-merous; anthers dark purple or brown; calyx lobes acute; corolla tubular, lobes narrowly oblong-obovate, apices acute, each with a prominent dorsal appendage, papillose, recurved, white, often tinged red; Jan.–Apr. Grassland, rocks, rock crevices.

DrGr MsGr

**subaphylla** (Eckl.& Zeyh.) Harv. var. **subaphylla**

Dwarf shrub. **Stems** wiry-woody, up to 0.8 m high; much branched, sometimes scrambling in other dwarf shrubs; puberulous to tomentose. **Leaves** fleshy; blade linear-elliptic to narrowly linear-ovate, 8–15 × 2–3 mm, apex acute or obtuse, pubescent with short, recurved, appressed hairs, green, grey-green to brown. **Flowers**: in elongated thyrse with few to many dense dichasia, peduncle 0.03–0.15 m long, covered with recurved hairs; 5-merous; anthers yellow to brown; calyx lobes obtuse; corolla tubular, lobes 3.5–4.5 mm long, with a canaliculate beak, an ovoid to ellipsoid appendage terminal, membranous petal apex on inside, cream-coloured; Oct.–Dec. Karroid scrub, gravelly or sandy slopes.

DrGr MsGr

**tabularis** Dinter

Annual or perennial herb. **Stems** up to 0.3 m high when flowering, old leaves remaining attached to stems. **Leaves** slightly fleshy; in a rosette; blade narrowly ovate to ovate, 10–35 × 5–15 mm, apex acute, dorsiventrally flattened, but slightly keeled along main vein, glabrous except for a dense row of marginal cilia, slightly fleshy, green to brown, often with darker spots above. **Flowers**: pedicellate, in a spike-like thyrse with many sessile or slightly stalked dichasia, peduncle covered with leaf-like bracts; 5-merous; anthers yellow; calyx lobes sharply acute; corolla tubular, lobes oblong to oblong-obovate, 2.0–4.5 mm long, apices obtuse to rounded, reflexed, white; Feb.–Apr. Grassland, hill slopes, rock faces.

DrGr KarSh Zastr

**tenuicaulis** Schönland

Perennial herb. **Stems** slender, procumbent, often forming dense carpets with adventitious roots. **Leaves** fleshy; shortly petiolate; blade elliptic to broadly elliptic, 4–10 × 2–4 mm, apex obtuse, glabrous, greyish green to yellowish green; petiole up to 7 mm long. **Flowers**: solitary in axils of leaves; 5-merous; anthers yellow; calyx lobes obtuse; corolla cup-shaped, lobes elliptic, 3–4 mm long, apex bluntly acute, erect or slightly recurved, white; Jan.–Apr. Grassland, along watercourses, on moist soil in shaded caves.

MsGr

**tuberella** Toelken

Perennial herb. **Stems** fastigiate, erect, up to 150 mm long; underground rhizome with small side branches terminating in tubers up to 3 mm in diameter. **Leaves** fleshy; blade linear, 5–15 × 1.0–1.5 mm, apex obtuse, glabrous, green. **Flowers**: inflorescence with 1–3 flowers per leaf axil owing to sympodial growth; 4-merous; anthers purple; calyx lobes bluntly pointed; corolla cup-shaped, lobes ovate to almost rhombic, 1.5–2.0 mm long, bluntly pointed, recurved, white; Jan.–Mar. Marshy areas or shallow vleis.

DrGr MsGr

**umbraticola** N.E.Br.

Perennial herb. **Stems** erect, up to 0.1 m high when flowering. **Leaves** scarcely fleshy; in 3 or 4 pairs; petiolate; blade obovate, elliptic or orbicular, 20–35 × 15–25 mm, apex obtuse, margins sharply toothed, glabrous, yellowish green; petioles up to 10 mm long. **Flowers**: in a terminal, loosely branched thyrse, peduncle 20–30 mm long; 5-merous; calyx lobes obtuse; corolla star-shaped, lobes narrowly ovate, 2.5–4.0 mm long, apex sharply acute; Jan.–Apr. Moist places under rocks or in caves.

MsGr

**vaginata** Eckl. & Zeyh. subsp. **vaginata**

*C. drakensbergensis* Schönland

Perennial herb. **Stems** up to 0.5 m high when flowering; leaf sheath on lower part of erect stems (5–)8–15 mm long, taproot tuberous. **Leaves** fleshy; blade narrowly ovate to linear-triangular, (45–)50–250 × (4–)6–20(–35) mm, apex acute, glabrous or pubescent but always with stout, marginal cilia, green to yellowish green. **Flowers**: in a many-flowered, flat-topped thyrse, pedicellate, peduncle covered with leaf-like bracts; 5-merous; anthers yellow; calyx lobes acute; corolla tubular, lobes oblong to narrowly oblong-obovate, 2.5–5.0 mm long, apices obtuse, recurved to reflexed, yellow to white; Jan.–Apr. Grassland.

| | | | | | |
|---|---|---|---|---|---|
| | | | MsGr | | |

***vaillantii** (Willd.) Roth

Annual herb, rarely up to 0.15 m high. **Stems** erect or decumbent, often with adventitious roots. **Leaves** fleshy; blade linear to linear-elliptic, 2–6 × 1–2 mm, apex obtuse or acute, flat above, convex below, glabrous, green to brown or deep red. **Flowers**: solitary, terminal in axil of a leaf; 4-merous; anthers purple; calyx lobes obtuse, ± as long as lobes; corolla cup-shaped, lobes ovate to elliptic, 1–2 mm long, apex obtuse, recurved, white or tinged red; Sep.–Jan. Native to southwestern Europe.

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## **Kalanchoe** Adans. (sthn Afr.: 13 spp.)

### Key to species:

1a Inflorescence a slender, elongate thyrse . . . . . **K. thyrsiflora**
1b Inflorescence a flat-topped or rounded thyrse . . . . . 2
2a Inflorescence a flat-topped thyrse. . . . . **K. paniculata**
2b Inflorescence a rounded thyrse. . . . . **K. rotundifolia**

**paniculata** Harv.

*K. oblongiflora* Harv.

Perennial herb, up to 1.2 m high; single stemmed from base; glabrous. **Leaves** petiolate to sessile; blade ovate to almost orbicular, 100–160 × 60–100 mm, apex obtuse or rounded, base ± cuneate, margin entire, tinged red, folded lengthwise. **Flowers**: inflorescence a flat-topped thyrse; calyx lobes triangular, 2–3 mm long; corolla with tube 11–13 mm long, yellowish green, lobes ovate 3–4 mm long, deep yellow; May–Sep. Rocky outcrops. *Hasie-oor* (A); *sehlakwahlakwane* (SS).

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**rotundifolia** (Haw.) Haw.

*K. luebbertiana* Engl.

Perennial herb, up to 1.2 m high; branches erect, terete. **Leaves** petiolate to sessile; blade elliptic to oblong-elliptic, 30–50 × 8–25 mm, apex acute to rounded, base cuneate, margin entire or lobed, blue-green. **Flowers**: inflorescence a sparsely flowered, rounded thyrse; calyx narrowly triangular, 0.5–1.5 mm long; corolla with tube 6–10 mm long, lobes narrowly ovate, 2.5–4.0 mm long, orange to deep red; Mar.–Aug. Bush clumps, in shade or half-shade. *Nentakalanchoe*; *nentabos* (A); *idambisa* (Z).

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**thyrsiflora** Harv.

Perennial herb, up to 1.5 m high; single stemmed from base; glabrous. **Leaves** sessile; blade obovate to narrowly obovate-oblong, 80–120 × 30–70 mm, apex rounded, base clasping, margins entire, greyish green with red margins. **Flowers**: inflorescence a slender, elongate thyrse; calyx lobes ovate, 2.5–4.0 mm long; corolla tube 12–16 mm long, greyish green with a bloom, lobes almost square, 2–3 mm long, deep yellow; Feb.–Jul. Bush clumps, rocky outcrops, near top of hills. *White lady*, *white bird's brandy*; *geelplakkie*, *meelplakkie* (A); *serilile* (SS).

DrGr

## References

TOELKEN, H.R. 1985. Crassulaceae. *Flora of southern Africa* 14: 1–244.

# CUCURBITACEAE

Herbs, often covered with rough hairs, with trailing stems, often climbing by means of spirally coiled tendrils; sap watery. **Leaves** alternate, usually palmately veined; without stipules. **Flowers**: regular, unisexual, axillary; petals 5, free or united, often yellow or orange; stamens basically 5, with anthers variously cohering, often curved or flexuous; ovary inferior, unilocular or sometimes 3-locular; style simple or divided; stigmas large and fleshy, usually 3. **Fruit** a large berry, with a hard or leathery wall, and sometimes spines or warts. *Cucumber or pumpkin family*; *pampoenfamilie* (A).

## Key to genera

| | | |
|---|---|---|
| 1a | Fruit surface smooth | 2 |
| 1b | Fruit surface with protuberances | 6 |
| 2a | Fruit globose | 3 |
| 2b | Fruit ovoid or cylindrical | 4 |
| 3a | Fruit small, < 35 mm in diameter | **Zehneria** |
| 3b | Fruit large, > 50 mm in diameter | **Citrullus** |
| 4a | Receptacle tubular, funnel-shaped, longer than wide | **Peponium** |
| 4b | Receptacle shortly tubular, not much longer than wide | 5 |
| 5a | Corolla < 10 mm long | **Kedrostis** |
| 5b | Corolla > 15 mm long | **Coccinia** |
| 6a | Fruit muricate or tubercled | **Momordica** |
| 6b | Fruit with spine-like protuberances | 7 |
| 7a | Tendrils reduced to straight spines | **Acanthosicyos** |
| 7b | Tendrils robust, 2- or 3-fid | **Cucumis** |

## **Acanthosicyos** Welw. ex Hook.f. (sthn Afr.: 2 spp.)

### **naudinianus** (Sond.) C.Jeffrey

*Citrullus naudinianus* (Sond.) Hook.f.

Perennial herb; dioecious. **Stems** procumbent. **Tendrils** rigid, reduced to straight spines. **Leaves** petiolate; blade deeply palmately 5-lobed, lobes narrowly ovate to elliptic, deeply pinnately lobulate, often sinuate at margins, upper surface scabrid, lower surface pilose; petiole 10–35 mm long. **Flowers**: corolla 15–20 mm long, light yellow; Oct.–Apr., Jul. **Fruit** ellipsoid or subglobose, 60–120 × 40–80 mm, pale yellow when mature, covered with prominent, seta-tipped, spine-like protuberances. Woodland, grassland, sandy soils. *Wild watermelon*; *wildewaatlemoen*, *gemsbokdommer* (A).

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## **Citrullus** Eckl. & Zeyh. (sthn Afr.: 3 spp.)

### **lanatus** (Thunb.) Matsum. & Nakai

*C. vulgaris* Eckl. & Zeyh.
*Colocynthis citrullus* (L.) Kuntze

Annual herb; monoecious. **Stems** procumbent or scandent. **Tendrils** 2- or 3-fid. **Leaves** petiolate; blade deeply palmately 3–5-lobed, lobes elliptic, shallowly to deeply pinnately lobulate, margin subentire or obscurely sinuate-denticulate; petioles up to 120 mm long. **Flowers**: male and female solitary; corolla yellow; Oct.–May. **Fruit** subglobose, 15–200 mm in diameter, greenish mottled with darker green. Grassland, bush groups, often along watercourses. *Colocynth*, *bitter melon*, *tsamma melon*, *wild watermelon*; *bitterappel*, *bitterkarkoer*, *bitterkalabas*, *kolokwint* (A); *lehapu*, *kaate*, *semane*, *tjoko*, *mokakaoane* (SS); *ikhabe*, *ibhece* (Z).

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## **Coccinia** Wight & Arn. (sthn Afr.: 7 spp.)

### Key to species:

[after Meeuse: 96 (1962)]

| | | |
|---|---|---|
| 1a | Leaves sessile | **C. sessilifolia** |
| 1b | Leaves distinctly petiolate | 2 |
| 2a | Stems persistently hairy with soft, curved or curly hairs | **C. hirtella** |
| 2b | Stems glabrescent, if pubescent hairs stiff | **C. rehmannii** |

### **hirtella** Cogn.

Perennial herb; dioecious. **Stems** annual from a fusiform rootstock, scandent or procumbent, persistently hairy with soft, curved or curly hairs. **Tendrils** simple or 2-fid. **Leaves** petiolate; blade broadly ovate to ovate, 40–100 × 30–90 mm, palmately lobed or 5–7-sect, base cordate, both surfaces pubescent; petioles up to 45 mm long. **Flowers**: corolla 19–23 mm long, apricot-yellow to pale buff-coloured with green venation on outside; Oct.–Jan. **Fruit** oblong- or ovoid-fusiform; 70–80 mm long, 25–40 mm in diameter, sparsely hairy, bright orange-red when ripe. Wooded grassland. *Foma*; *leraka-la-balimo*, *monyaku* (SS).

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**rehmannii** Cogn.

*C. ovifera* Dinter & Gilg

*C. rehmannii* Cogn. var. *littoralis* A.Meeuse

Perennial herb; dioecious. **Stems** procumbent or scandent, glabrescent or with stiff hairs. **Tendrils** simple. **Leaves** distinctly petiolate; blade deeply broadly ovate, 30–60 × ± 30–60 mm, palmately 3(–5)-lobed, lower surface sparsely setulose on veins; petioles up to 20 mm long. **Flowers**: corolla lobes 10–30 mm long, whitish cream-coloured to pale yellow, green-veined; Oct.–Jan. **Fruit** subglobose or broadly elliptic, not rostrate, white- and green-mottled when young, turning scarlet. Wooded grassland, along streams. *Wild cucumber*; *uselwa-lwenyoka* (Z).

DrGr MsGr

**sessilifolia** (Sond.) Cogn.

*C. schinzii* Cogn.,

*Cephalandra sessilifolia* Sond.

Perennial herb; dioecious. **Stems** climbing. **Tendrils** simple. **Leaves** sessile; blade deeply palmately 5-lobed, 30–120 mm in diameter, lobes narrowly ovate-oblong, linear with apices acute, terminating in a mucro, glabrous. **Flowers**: corolla 20–30 mm long; pale yellow to almost white, sometimes with pinkish tinge, green-veined; Sep.–May. **Fruit** oblong-fusiform, 60–90 mm long, 20–30 mm in diameter, glabrous, red when ripe. Wooded grassland. *Bobbejaankomkommer*, *muisvoëlkomkommer*, *wildekarkoer*, *ystervarkkambroo* (A).

AcGr DrGr KarSh

## **Cucumis** L. (sthn Afr.: 14 spp.)

### Key to species:

[after Meeuse: 60 (1962)]

1a Perennial herb; fruit not variegated . . . . . **C. zeyheri**
1b Annual or perennial herb; fruit variegated . . . . . 2
2a Segments of almost completely palmatisect leaf linear, < 4 mm wide, margin entire . . . . . **C. heptadactylus**
2b Segments of leaf not linear, > 4 mm wide, margin coarsely dentate or lobed . . . . . 3
3a Spine-like protuberances on fruit laterally compressed, large, dense; corolla 10–15 mm long; fruit narrowly ellipsoid to oblong . . . . . **C. africanus**
3b Spine-like protuberances on fruit terete or very small; corolla 4–6 mm long; fruit ellipsoid or subglobose . . . . . 4
4a Fruit ellipsoid, when mature bands a dirty orange to rusty brown colour, spines dense . . . . . **C. myriocarpus** subsp. **myriocarpus**
4b Fruit subglobose, when mature pale yellow with or without indistinct, pale, narrow bands, spines sparse . . . . . **C. myriocarpus** subsp. **leptodermis**

**africanus** L.f.

Annual herb; dioecious. Stems procumbent, slender to stout. Tendrils simple. Leaves with blade broadly ovate, ± 20–100 × 20–100 mm, base cordate, margins deeply 3–5(–7)-lobed. Flowers: corolla 10–15 mm long; bright yellow; Oct.to Apr. Fruit narrowly ellipsoid to oblong, 30–50 × 20–40 mm, greenish white with purplish brown longitudinal bands, spine-like protuberances laterally compressed, large, dense. Grassland; disturbed places, flats, in seasonal streams.

DrGr

**heptadactylus** Naudin

Perennial herb, dioecious. **Stems** procumbent. **Tendrils** simple. **Leaves** with blade palmatisect, segments 5–7, linear, < 4 mm wide, margin usually entire, revolute. **Flowers**: corolla up to 4 mm long; pale yellow; Nov.–Apr. **Fruit** ovoid or ellipsoid, with dark longitudinal bands, 30–50 × 20–40 mm, covered with thick subcylindric, spine-like protuberances. Grassland in deep sand.

KarSh

**myriocarpus** Naudin subsp. **leptodermis** (Schweick.) C.Jeffrey & P.Halliday

*C. leptodermis* Schweick.

Annual herb; monoecious. **Stems** procumbent. **Leaves** with blade ovate, 40–100 × 30–70 mm, (3–)5(–7)-lobed, margins dentate. **Flowers**: corolla 4–6 mm long; yellow; Feb. **Fruit** as subsp. *myriocarpus*, but subglobose, green, concolorous or with indistinct, narrow, paler, longitudinal bands, pale yellow with or without indistinct banding when mature; spines up to 2 mm long, sparse, sometimes very short and/or very sparse. Sandy soil in open grassland.

DrGr MsGr KarSh

**myriocarpus** Naudin subsp. **myriocarpus**

*C. dissectifolius* Naudin

*C. merxmuelleri* Suess.

Annual herb, monoecious. **Stems** procumbent or scandent. **Leaves** with blade ovate, 40–100 × 30–70 mm, (3–)5(–7)-lobed, margins dentate. **Flowers**: corolla 4–6 mm long, pale yellow; Sep.–Jun. **Fruit** globose to ellipsoid, 18–27 mm long, striped dark and light green or white or sometimes purplish brown, becoming rusty orange with less conspicuous striping when ripe; fruit stalk 45–68 mm long, slender; spines on fruit weak, terete, slender, 1.5–5.0 mm long, rather dense. Grassland, wooded grassland and bushland, on sandy soils; weed of cultivated ground. *Striped wild cucumber*, *small wild melon*, *small thorny cucumber*, *gooseberry cucumber*, *bitter apple*; *gifappel*, *wilde-agurkie*, *wildekomkommertjie*, *streepwildekomkommer*, *bitterappel*, *gifkeboe* (A); *monyaku* (SS); *thlare-se-mpja* (T); *sendelenja* (Z).

AcGr DrGr MsGr

**zeyheri** Sond.

*C. africanus* L.f. var. *zeyheri* (Sond.) Burtt Davy

*C. prophetarum* L. subsp. *zeyheri* (Sond.) C.Jeffrey

Perennial herb. **Stems** procumbent or scandent. **Tendrils** simple. **Stems** and petioles retrorsely scabrid-setose. **Leaves** with blade ovate or elliptic to oblong, 25–100 × 20–70 mm, deeply palmately 3–5-lobed. **Flowers**: corolla up to 9 mm long; yellow; Oct.–May. **Fruit** uniformly yellow when ripe, softly spiny, spines rather slender, 2–16 mm long; fruit stalk 19–51 mm long, not expanded upwards. Open woodland and grassland, also a weed of cultivated land. *Wild cucumber*; *wilde-agurkie*, *bitterappel* (A); *monyaku*, *lerakana* (SS); *inhlakahlela*, *iselwa-lenja* (Z).

VreDm DrGr KarSh

## **Kedrostis** Medik. (sthn Afr.: 8 spp.)

### Key to species:

[after Meeuse: 25 (1962)]

1a Leaf blade undivided, faintly 3–5-lobed with short, obtuse lobes . . . . . **K. foetidissima**

1b Leaves distinctly lobed or dissected. . . . . 2

2a Fruit long-rostrate. . . . . **K. capensis**
2b Fruit spherical. . . . . **K. africana**

**africana** (L.) Cogn.
*Bryonia africana* L.
*K. digitata* (Thunb.) Cogn.

Perennial herb; glabrous to scabrid-punctulate. **Stems** procumbent or climbing. **Tendrils** simple, slender. **Leaves** sessile to shortly petioled; blade distinctly lobed or dissected, varying from deeply pinnately or digitately dissected to only pinnately or palmately lobed, 20–100 mm in diameter; petioles 1–12 mm long. **Flowers**: male peduncles slender, 20–80 mm long; corolla 1–2 mm long, densely papillose, yellowish green, whitish or cream-coloured; Oct.–Apr. **Fruit** spherical, often shortly and abruptly pointed, glabrous, 8–15 mm in diameter; seeds ovoid-oblong or ovoid, 4.5–6.0 mm long. Grassland, vleis, streambanks; also in disturbed places. *Cape bryony*; *basterdawidjieswortel*, *kleinbobbejaankomkommer*, *leloentjie* (A).




**capensis** (Sond.) A.Meeuse
*Pisosperma capense* Sond.

Perennial herb; vegetative parts covered with soft, white, curved hairs. **Stems** procumbent or climbing. **Tendrils** reduced or wanting. **Leaves** greyish green; petiolate; blade distinctly lobed to deeply dissected, up to 70 × 50 mm in diameter; petioles 40–150 mm long. **Flowers**: male peduncles stout, distinct from pedicels which are more slender, up to 60 mm long; corolla 3–6 mm long, densely papillose, pale yellow or greenish yellow; Oct.–Jan. **Fruit** elongate, long-rostrate, 15–25(–30) mm long, glabrous; seeds thick, ± 5–6 mm long. Grassland, disturbed places.




**foetidissima** (Jacq.) Cogn.
*K. foetidissima* (Jacq.) Cogn. subsp. *obtusiloba* (Sond.) A.Meeuse
*Trichosanthes foetidissima* Jacq.

Perennial herb; viscid-glandular, foetid when crushed. **Stems** procumbent or climbing. **Tendrils** simple. **Leaves** petiolate; green; blade undivided, ovate to broadly ovate, base cordate, margins faintly 3–5-lobed with short, obtuse lobes; petioles up to 10 mm long. **Flowers**: male peduncles and pedicels slender, peduncles up to 30 mm long; corolla 2–5 mm long, hairy or papillose-hairy, cream-coloured, yellow or greenish yellow; Dec.–May. **Fruit** globose, 9–13 mm long, pilose; seeds asymmetrically ovoid, 4.0–5.0 mm long. Woodland and grassland, often on river margins and termite mounds. *Umafuthasimba* (Z).




## **Momordica** L. (sthn Afr.: 9 spp.)

**balsamina** L.
*M. involucrata* E.Mey. ex Sond.
*M. schinzii* Cogn.

Perennial herb. **Stems** procumbent or scandent. **Tendrils** simple, unbranched. **Stems** and petioles concolorous, uniformly green. **Leaves** with blade deeply palmately 3–7-lobed, usually

to middle or beyond, lobes narrowed towards base, rhombic, elliptic or obovate in outline, ± sinuate-lobulate. **Flowers**: male flowers solitary, pedicel 2–5 mm long, peduncle free from petiole of subtending leaf; corolla 7–15 mm long, pale yellow, cream-coloured or white, green-veined, dark at base; Jul.–Jun. **Fruit** with longitudinal rows of small tubercles, otherwise smooth; pedicels 6–17 mm long. Woodland, wooded grassland and riverine fringes, on sandy soils. *Bursting beauty*, *balsam apple*, *African cucumber*; *aloentjie*, *laloentjie* (A); *mohudu* (SS); *mmapuupuu* (T); *intshungu*, *umkaka*, *intshungwana yehlathi* (Z).

AcGr

## **Peponium** Engl. (sthn Afr.: 4 spp.)

### **caledonicum** (Sond.) Engl.

*Luffa caledonica* Sond.

Perennial herb; monoecious. **Stems** procumbent, climbing. **Leaves** with blade broadly ovate to orbicular, 5-partite, lobes oblong or obovate, contracted at base, base cordate, margins dentate, teeth mucronate. **Flowers**: male flowers ± 12 in racemes, peduncle up to 120 mm long; female flowers subsessile, corolla 24–30 mm long, yellow to pale yellow; Nov.–Apr. **Fruit** oblong-fusiform or subcylindric, 70–100 × 20–35 mm, conical-acuminate at apex, red, glabrous; pedicels < 10 mm long, stout. Grassland, rocky outcrops.

AcGr DrGr MsGr

## **Zehneria** Endl. (sthn Afr.: 3 spp.)

### **scabra** (L.f.) Sond. subsp. **scabra**

*Melothria cordata* (Thunb.) Cogn.
*M. punctata* Cogn.

Perennial herb; dioecious. **Stems** procumbent or scandent. **Leaves** petiolate; blade ovate to broadly ovate, 19–110 × 20–110 mm, base cordate, margins shallowly toothed, apex of terminal lobe mucronate; petioles 10–30 mm long. **Flowers**: male flowers 3–60 or more in dense subumbelliform, axillary clusters; female flowers solitary or 2–10 or more in subumbelliform, axillary clusters; white becoming yellowish with age; Nov.–Jul. **Fruit** globose or ellipsoid, 10–12 × 7–8 mm, rounded at apex, red; pedicels 2–68 mm long. Along watercourses. *Dawidjieswortel* (A); *leraka-mposhane*, *lerakane*, *monyaka* (SS); *ukalimela*, *itanga*, *simbene* (X).

DrGr MsGr

## References

MEEUSE, A.D.J. 1962. The Cucurbitaceae of southern Africa. *Bothalia* 8: 1–111.

# CURTISIACEAE

Small trees or shrubs. **Leaves** opposite, simple; blade with margins coarsely toothed, leathery, lower surface prominently veined; without stipules. **Flowers**: bisexual, regular, in panicles; 4-merous; calyx persistent; tube ± 4-angled, twice as long as lobes, lobes triangular-ovate; petals free, valvate; stamens alternating with petals, ± as long; ovary inferior with 1 anatropous, pendulous ovule in each locule; style 1, shorter than stamens, stigma 4-lobed. **Fruit** a globose drupe, crowned with calyx lobes, reticulately veined.

## **Curtisia** Aiton (sthn Afr.: 1 sp.)

### **dentata** (Burm.f.) C.A.Sm.

Small tree or shrub, up to 20 m high; young growth densely greyish- or brownish-tomentose. **Leaves** opposite, simple, petiolate; blade oblong, elliptic to almost circular, 25–100 × 25–75 mm, base cuneate to truncate, margins coarsely toothed, rolled under, upper surface shiny, dark green, glabrous with veins prominent, lower surface light green with woolly hairs, veins covered with short, soft grey, rusty or brown hairs; petiole up to 15 mm long. **Flowers**: in branched terminal heads or panicles; calyx tubular, petals twice as long as calyx tube; Oct.–Mar. **Fruit** round, fleshy, ± 10 mm in diameter, crowned with remains of calyx, white changing to red. Forest, grassy mountain slopes. *Assegai*; *assegaai* (A).

MsGr

# DIPSACACEAE

Perennial herbs, glabrous or hairy. **Leaves** simple, opposite or in a basal rosette; margin of blade entire, lobed or toothed; without stipules. **Flowers**: in heads, head surrounded by an involucre of bracts in 1, 2 or several rows; irregular, somewhat 2-lipped; calyx with tube usually constricted above ovary, limb cup-shaped or divided into spreading bristles; petals 4 or 5, united, usually hairy on outer surface, lobes shorter than tube; stamens 4(5), free, arising from throat of corolla tube; ovary inferior; style filiform, stigma globose, disc-like or oblong. **Fruit** dry, indehiscent, crowned with persistent calyx limb, enclosed in a cup-like involucre. *Scabiose family*; *poeierkwasfamilie* (A).

## Key to genera

Involucral bracts in several rows; calyx without persistent bristles . . . . **Cephalaria**
Involucral bracts in 1 or 2 rows; calyx with persistent bristles . . . . . **Scabiosa**

## **Cephalaria** Roem. & Schult. (sthn Afr.: 14 spp.)

### Key to species:

1a Upper stem leaves with margins of blades similarly lobed as those of basal leaves . . . . . **C. natalensis**
1b Upper stem leaves with margins of blades more deeply lobed than those of basal leaves . . . . . 2

2a Basal leaves with margins of blades deeply lobed or at least with two lateral ones . . . . . **C. zeyheriana**
2b Basal leaves with margins of blades entire or shallowly and distantly lobed . . . . . 3
3a Basal leaves with blades narrowly elliptic to obovate, blade decurrent, petiole long . . . . . **C. pungens**
3b Basal leaves with blades elliptic to broadly elliptic, blade decurrent, petiole short . . . . . **C. oblongifolia**

## **natalensis** Kuntze

Perennial herb, up to 2.5 m high. **Stems** with margins of blades of upper leaves similarly lobed as those of basal leaves. **Leaves** with blade lobed to near rachis, 150–180 mm long, margins dentate, sparsely hairy on lower surface. **Flowers**: in a head, 20–30 mm in diameter; bracts with apices obtuse, black-tipped, ciliate; corolla white; Dec.–Apr. Mountain slopes, sheltered wooded kloofs, forest margins.




## **oblongifolia** (Kuntze) Szabó

Perennial herb, up to 1.5 m high. **Stems** with margins of blades of upper leaves more deeply lobed than those of basal ones. **Leaves** with blade of basal leaves elliptic to broadly elliptic, up to 150 × 50 mm, margins entire, one leave narrowly elliptic, shallowly and distantly lobed, upper stem leaves with blade linear, small lobes, sparsely appressed-hairy; petiole short. **Flowers**: in a head, 20–30 mm in diameter; bracts with apices obtuse, margins dark coloured; corolla white, hairy on outside; Sep.–Apr. Grassland, mountain slopes, marshes. *Tsoene* (SS)




## **pungens** Szabó

*C. petiolata* Compton

Perennial herb, up to 2 m high. **Stems** with margins of blades of upper leaves more deeply lobed than those of basal ones. **Leaves** mainly in a basal rosette; stem leaves few, smaller, more dissected than basal ones; basal leaves with blades narrowly elliptic to obovate, up to 150 × 20 mm, decurrent, margins entire, rarely lobed or crenate, lower surface prominently veined, glabrous or sparsely pilose; petiole long. **Flowers**: in heads, ± 15 mm in diameter, bracts with apices subacuminate to pungent; corolla white, cream-coloured or yellow; Jan.–Apr. Upland grassland, stream sides and swampy places.




## **zeyheriana** Szabó

Perennial herb, up to 1 m high. **Stems** with margins of blades of upper leaves more deeply lobed than those of basal ones. **Leaves** with stem leaves few; basal leaves with blades narrowly obovate, up to 130 × 30 mm, margins lobed, serrate, subtomentose or pilose to almost glabrous. **Flowers**: in heads, ± 20 mm in diameter; bracts with apices acute to acuminate; corolla white or cream-coloured; Oct.–Jun. Grassland, rocky outcrops or in seepage areas.



## **Scabiosa** L. (sthn Afr.: 9 spp.)

Key to species:

Leaves with blade narrowly obovate, length:width 4:1 . . . . . **S. columbaria**
Leaves with blade broadly obovate, length:width 2:1 . . . . . **S. drakensbergensis**

### **columbaria** L.

*S. anthemifolia* Eckl. & Zeyh.
*S. austro-africana* Heine

Perennial herb, up to 1.5 m high. **Leaves** in a basal rosette, stem leaves few, long internodes prominent; with blade narrowly obovate, up to 90 × 20 mm, upper stem leaves 1- or 2-pinnatifid or -pinnatisect, segments linear to narrowly ovate to obovate, terminal segment larger than lateral. **Flowers**: corolla, ± 10 mm long, mauve or white, or tube white and lip mauve; Jan.–Dec. Upland grasslands, mountainsides and open woodland. *Wild scabious*, *rice flower*; *bitterbos*, *meerjarige skurfkruid* (A); *mamokhale*, *moholungoane*, *selomi*, *tlhako-ea-pitsi* (SS).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### **drakensbergensis** B.L.Burtt

Perennial herb, up to 1.8 m high; leafy. **Leaves** sessile; basal leaves with blade deeply lobed and dentate, 90–100 × 35–40 mm, upper stem leaves lobed, margins serrate. **Flowers**: corolla, ± 7–8 mm long white; Jan.–Mar. Grassland, edge of bush clumps, stony places. *Drakensberg scabious*, *white cloud*.

MsGr

# DROSERACEAE

Annual or perennial, small herbs or floating aquatics, insectivorous, usually growing in moist places, glanduliferous. **Leaves** usually in a basal rosette, covered with sticky glandular hairs; blade obovate or spathulate; with stipules. **Flowers**: in scapose, axillary or terminal cymes; regular; calyx 5-lobed; petals 5, free; stamens 5, free; ovary superior, styles 3, free. **Fruit** a capsule, enclosed in persistent calyx. *Sundew family*.

## **Drosera** L. (sthn Afr.: 20 spp.)

Key to species:

1a Leaves sessile . . . . . **D. dielsiana**
1b Leaves petiolate . . . . . 2
2a Leaves only with terete tentacles, tipped with knob-shaped glands . . . . . **D. madagascariensis**
2b Leaves with terete tentacles, tipped with knob-shaped glands and tapered tentacles with flattened glands . . . . . 3
3a Plants forming flat rosettes; petioles ± 15 mm long . . . . . **D. burkeana**
3b Plants with leaves erect or spreading; petioles up to 50 mm long . . . . . **D. collinsiae**

**burkeana** Planch.

Perennial herb, 0.10–0.23 m, acaulescent. **Leaves** in a flat rosette; petiolate; blade with terete tentacles, tipped with knob-shaped glands and tapered tentacles with flattened glands; petioles ± 15 mm long. **Flowers**: in an inflorescence 50–200 mm long; petals up to 8 mm long; pink or white; Sep.–Feb. **Fruit** oblong, 3 mm long. Vleis, streambanks. *Sundew*; *slakblom*, *doublom*, *sondou* (A); *tholo-ea-metsi* (SS).

MsGr

**collinsiae** N.E.Br. ex Burtt Davy

Perennial herb, 0.2–0.5 m, acaulescent. **Leaves** in a lax basal rosette, erect or spreading; petiolate; blade with terete tentacles, tipped with knob-shaped glands and tapered tentacles with flattened glands; petioles up to 50 mm long. **Flowers**: in an inflorescence up to 170 mm long; petals up to 8 mm long, pink; Oct.–Feb. **Fruit** globose, 1.5 mm in diameter. Vleis, grassland. *Slakblom* (A).

DrGr KarSh

**dielsiana** Exell & J.R.Laundon

Perennial herb, 0.01–0.25 m, acaulescent. **Leaves** in a compact, basal rosette; sessile; blade with terete tentacles, tipped with knob-shaped glands and tapered tentacles with flattened glands. **Flowers**: stipules laciniate, auriculate. **Flowers**: in an inflorescence 100–200 mm long; petals pink, mauve, violet or white; Dec.–Apr. **Fruit** oblong, 5 mm long. Mountain summits.

MsGr

**madagascariensis** DC.

*D. curvipes* Planch.

*D. madagascariensis* DC. var. *major* Burtt Davy

Perennial herb, 0.20–0.25 m, caulescent. **Stems** thin, covered with old leaf remains. **Leaves** alternate on stems; petiolate; blade only with terete tentacles, tipped with knob-shaped glands, distinct from petiole; petiole ± 30 mm long. **Flowers**: in an inflorescence 20–40 mm long; petals pink; Dec.–Feb. **Fruit** oblong. Grassland, vleis. *Sundew*; *slakblom*, *doublom*, *sondou* (A); *tholo-ea-metsi* (SS).

MsGr

# EBENACEAE

Trees, shrubs or suffrutices, dioecious **Leaves** alternate or subopposite; simple; without stipules. **Flowers**: in cymes, subsessile fascicles, racemes, panicles or solitary; unisexual; petals 3–8, united, often urn-shaped; lobes contorted; stamens 3–many, anthers longer than the short filaments; ovary superior, borne on smooth or fringed disc. **Fruit** a pulpy or fibrous berry. *Ebony family*.

## Key to genera

Calyx usually accrescent; ovary on glabrous disc; fruits usually with 2 or more seeds . . . . . **Diospyros**

Calyx not accrescent; ovary on fringed disc; fruits usually 1-seeded . . . . . **Euclea**

## **Diospyros** L. (sthn Afr.: 21 spp.)

### Key to species:

1a Calyx urceolate, 5-lobed on rim . . . . . **D. whyteana**
1b Calyx deeply divided . . . . . 2
2a Corolla pink, cream-coloured flushed with pink, or deep red . . . . . 3
2b Corolla yellow, cream-coloured or white . . . . . 4
3a Leaf blade up to 15 mm long; corolla pink or cream-coloured tinged with pink . . . . . **D. austro-africana** var. **microphylla**
3b Leaf blade up to 25 mm long; corolla pink to deep red . . . . . **D. austro-africana** var. **rubriflora**
4a Leaf blade with nerves not raised . . . . . **D. lycioides** subsp. **lycioides**
4b Leaf blade with secondary and tertiary veins prominently raised . . . . . **D. lycioides** subsp. **guerkei**

### **austro-africana** De Winter var. **microphylla** (Burch.) De Winter

*Royena microphylla* Burch.

Shrub, 0.5–3.0 m high. **Leaves** with blade narrowly obovate**,** up to 15 mm long, with conspicuous, reticulate venation on lower surface. **Flowers**: solitary; calyx deeply divided, accrescent; corolla ± 3 mm long, pink or cream-coloured, flushed with pink; Sep., Oct. **Fruit** globose, 8–12 mm in diameter, tomentose, clasped at base by calyx. Rocky ridges and outcrops of hillside slopes, banks of water courses. *Jackal bush*, *fire-sticks*; *jakkalsbos* (A).

VreDm | DrGr | MsGr | KarSh | Zastr

### **austro-africana** De Winter var. **rubriflora** (De Winter) De Winter

Shrub, 0.4–3.0 m high. **Leaves** with blade narrowly obovate, 15–25 mm long, with conspicuous, reticulate venation on lower surface. **Flowers**: solitary; calyx deeply divided, accrescent; corolla ± 4 mm long, pink to deep red; Sep., Oct. **Fruit** globose, 10–13 mm in diameter, tomentose, clasped at base by calyx. Mountain slopes, rocky slopes of hillsides, along watercourses. *Jackal bush*, *fire-sticks*; *jakkalsbos* (A); *liperekisi-tsa-makhoaba*, *senokonoko* (SS).

DrGr | MsGr

### **lycioides** Desf. subsp. **guerkei** (Kuntze) De Winter

Shrub or tree, up to 5 m high. **Leaves** with blade narrowly obovate to elliptic, 20–50 × 7–20 mm, base cuneate to obtuse, nerves raised on lower surface, prominently reticulate, impressed on upper surface. **Flowers**: solitary; calyx deeply divided, accrescent with lobes narrowly oblong, strongly reflexed; corolla 4–5 mm long, white, cream-coloured or yellow; Sep.–Dec. **Fruit** ovoid, broadly oblong to subglobose, ± 15 mm in diameter, glabrescent. *Bushveld bluebush*; *bosveld-bloubos*, *jakkalsbos* (A); *letlhajwa* (T); *umnqandane* (Z).

DrGr | MsGr

### **lycioides** Desf. subsp. **lycioides**

*D. lycioides* Desf.
*Royena lycioides* (Desf.) A.DC.

Shrub, 0.6–7.0 m high. **Leaves** with blade narrowly obovate to elliptic, up to 40 mm long when mature, base cuneate to obtuse, nerves not raised on lower surface, sparsely hairy, glabrescent. **Flowers**: solitary; calyx deeply divided, accrescent, up to 9 mm long, lobes

strongly reflexed; corolla ± 4–5 mm long, white, cream-coloured or yellow; Sep.–Dec. **Fruit** subglobose, ± 10 mm in diameter. Grassland, banks of water courses, foot of hillsides. *Karoo bluebush*, *monkey plum*; *Karoo-bloubos*, *swartwortel* (A); *motlhaja* (T); *umnqandane* (Z).

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### **whyteana** (Hiern) F.White

*Royena whyteana* Hiern

Shrub or tree, 0.5–2.0(–6.0) m high; dense, evergreen. **Leaves** with blade narrowly elliptic to ovate-oblong, 25–45 × 10–30 mm, base cordate, upper surface dark green, glossy, lower surface paler dull green, sparsely hairy. **Flowers**: solitary or in small pseudo-racemes; calyx urceolate, densely hairy, shortly 5-lobed at apex of tube, bladder-shaped and enclosing fruit; corolla 5–6 mm long, creamy white; Aug.–Dec. **Fruit** subglobose, up to 20 mm in diameter, red, completely enclosed in inflated, bladder-shaped calyx with 5 teeth on rim; calyx remains on tree for a long time after fruits have fallen. Mountainsides and ridges, often in rocky situations. *Bladder-nut*, *blackbark*; *swartbas*, *bos-tolbos* (A); *umanzimane* (Z). Figure 49.

| | | DrGr | MsGr | | |
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## **Euclea** Murray (sthn Afr.: 15 spp.)

### Key to species:

1a Corolla shallowly lobed; fruit turning green to yellow to deep red when ripe . . . . . **E. coriacea**
1b Corolla cleft at least halfway down or more; fruit turning black when ripe. . 2
2a Ovary covered with grey scale-like glands. . . . . **E. undulata** var. **myrtina**
2b Ovary densely covered with bristles. . . . . 3
3a Leaf blade ovate, densely hairy especially when young . . . . . **E. crispa** subsp. **ovata**
3b Leaf blade variable, narrowly elliptic, obovate or ovate, glabrous or with a rust-coloured granular exudate when young . . . . . **E. crispa** subsp. **crispa**

### **coriacea** A.DC.

Shrub or tree, 1–3(–10) m high. **Branches** pubescent when young, with coarse spreading hairs. **Leaves** alternate, occasionally subopposite; blade discolorous, coriaceous and stiff, ovate, narrowly ovate or ovate-oblong, 20–50 × 10–30 mm, margin distinctly undulate, entire or minutely crenulated. **Flowers**: in a 2–7-flowered, densely hairy, axillary inflorescence; corolla ± 2–4 mm long, shallowly lobed, white to cream-coloured; Sep.–Nov. **Fruit** 12–15 mm in diameter, turning green to yellow to deep red when ripe. *Mountain guarri*; *berg-ghwarrie* (A).

| | | DrGr | MsGr | | |
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### **crispa** (Thunb.) Gürke subsp. **crispa**

Shrub or tree, 1–5(–8) m high. **Branches** densely to sparsely pubescent when young. **Leaves** subopposite, rarely alternate; blade greyish green, variable, narrowly elliptic, obovate or ovate, glabrous or with a rust-coloured granular exudate when young, margin not or slightly undulate. **Flowers**: in a pseudo-raceme; ovary densely covered with bristles; corolla up to 2 mm long, cleft halfway down, glabrous except for median line of appressed bristles, greenish cream-coloured, cream-coloured or white; Sep.–Apr. **Fruit** 4–5 mm in diameter, turning black



**Figure 49.** *Diospyros whyteana* (Ebenaceae). Artist: G. Condy.

EBENACEAE

when ripe. Forest margins and kloofs or a component of bush groups found scattered in veld. *Blue guarri*, *bush guarri*; *blou-ghwarrie*, *bos-ghwarrie* (A); *mohlakola*, *motlhaletsogane*, *seretlwane* (T).

VreDm | | DrGr | MsGr | | Zastr

**crispa** (Thunb.) Gürke subsp. **ovata** (Burch.) F.White

Shrub or tree, 1–5(–8) m high. **Branches** densely hairy when young. **Leaves** subopposite, rarely alternate; blade ovate, narrowly ovate to elliptic, margin strongly undulate, often minutely crenulate, coriaceous and stiff. **Flowers**: in a pseudo-raceme; ovary densely covered with bristles; corolla up to 2 mm long, cleft halfway down, greenish cream-coloured, cream-coloured or white; Dec. **Fruit** 4–5 mm in diameter, turning black when ripe. Component of bush groups found scattered in veld. *Karoo guarri*; *karoo-ghwarrie*, *ghwarriebos* (A).

| | | DrGr | | KarSh |

**undulata** Thunb. var. **myrtina** (Burch.) Hiern

Evergreen shrub or tree, 0.75–5.00(–7.00) m high. **Branches** covered with rust-brown scale-like glands when young. **Leaves** subopposite or alternate; blade narrowly elliptic, elliptic or narrowly obovate-elliptic, usually 4 × as long as broad. **Flowers**: in axillary inflorescences, 5–7-flowered, 5–20 mm long; ovary covered with grey scale-like glands; corolla up to 2 mm long, cleft halfway down, white, greenish white or cream-coloured; Dec., Jan. **Fruit** 4–6 mm in diameter, red turning purple or black when ripe. Bush clumps. *Small-leaved guarri*; *fynblaar-ghwarrie*, *kartelblaar-ghwarrie* (A); *motlhakola*, *mokwêrêkwêrê* (T).

VreDm | AcGr | DrGr | | KarSh |

# ELATINACEAE

Annual or perennial herbs or dwarf shrubs, often aquatic or semi-aquatic. **Branches** either perennial or deciduous from a persistent woody crown. **Leaves** decussate or verticillate, simple, sessile or subsessile; margin of blade serrate, rarely entire; with stipules paired, interpetiolar, small. **Flowers**: usually small, regular, axillary; sepals 2–5, free or fused at base; petals 3–5, free, shorter or longer than sepals; ovary superior; styles 3–5, stigmas swollen. **Fruit** a capsule. *Bergia family*.

## **Bergia** L. (sthn Afr.: 10 spp.)

### Key to species:

[after Obermeyer: 24 (1976)]

1a Annual herb . . . . . **B. anagalloides**
1b Perennial herb . . . . . 2
2a Stems procumbent, pilose; sepals with apices spine-tipped . . . . . **B. pentheriana**
2b Stems erect or decumbent, glabrous or hispidulous; sepals with apices acuminate . . . . . **B. decumbens**

**anagalloides** E.Mey. ex Fenzl
*B. alsinoides* Holzhammer

Annual herb. **Stems** procumbent, with many radiating branches, woody at base. **Leaves** with blade narrowly obovate, up to 30 × 6 mm, soft in texture. **Flowers**: solitary, axillary, evenly distributed along stems, on long pedicels, up to 15 mm; petals longer than sepals, bright pink; Jun.–Aug. **Fruit** ovoid; seeds yellow to golden-brown. In damp places, usually calciphilous.

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**decumbens** Planch. ex Harv.

Dwarf shrub, up to 0.5 m high. **Stems** erect or decumbent, glabrous or hispidulous. **Leaves** with blade linear to broadly linear, 15–25 × 2–4 mm, margin with 6–9 teeth, swollen when dry, prominently veined, leathery in texture. **Flowers**: in 2–8-flowered dichasia; sepals ovate, 4–5 mm long, apices acuminate; petals slightly longer than sepals, white or pink; Jul.–Apr. **Fruit** narrowly ovoid; seeds black. Grassland, often along roadsides.

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**pentheriana** Keissl.
*B. prostrata* Schinz

Perennial herb. **Stems** procumbent with long, annual branches, radiating from a perennial crown; pilose. **Leaves** with blade narrowly ovate, 5–10 × 3 mm, margin raised, coriaceous. **Flowers**: in 4–7-flowered, axillary glomerules; sepals short, ± 2 mm long, spine-tipped; petals slightly longer than sepals, white or pink; Nov.–Jul. **Fruit** globose; seeds brown. Grassland, sandy soil, often in limestone areas.

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| | AcGr | DrGr | | | |

## References

OBERMEYER, A.A. 1976. Elatinaceae. *Flora of southern Africa* 22: 23–32.

# ERICACEAE

Compiled by S.P. Bester, E. Retief & N.L. Meyer

Dwarf shrubs, shrubs or small trees, often associated with acid soils. **Leaves** simple, alternate or opposite, usually whorled; blade firm, usually linear-oblong to ovate, obtusely 3-angled with plane faces and revolute margins, sometimes reduced and scale-like; without stipules. **Flowers**: regular, usually axillary, sometimes variously arranged in inflorescences at ends of leafy branches or on short lateral branches; pedicels present, sometimes much reduced; calyx and corolla usually 4, united; corolla tubular, urceolate,

globose, ovoid, campanulate, cyathiform or funnel-shaped; stamens 4, opening by means of pores, exserted or included, sometimes awned or tailed; ovary superior, glabrous or variously hairy, usually 4-locular; style filiform, exserted or included; stigma simple-truncate, capitate, peltate, cyathiform or funnel-shaped, enlarged in wind-pollinated species, rarely 4-lobed. **Fruit** an achene, berry, capsule or drupe. *Heath family*.

## **Erica** L. (sthn Afr.: 646 spp.)

### Key to species:

[after Hilliard & Burtt: 187 (1987); with additions.]

1a Calyx as conspicuous as corolla, white or pink, glabrous . . . . . 2
1b Calyx usually much shorter than corolla, if nearly as long, then clad in long hairs . . . . . 3
2a Corolla 2–3 mm long; anthers without tails . . . . . **E. dominans**
2b Corolla ± 5 mm long; anthers tailed . . . . . **E. caffrorum** var. **caffrorum**
3a Corolla at least 8 mm long . . . . . 4
3b Corolla up to 7 mm long . . . . . 5
4a Corolla ± 25–35 mm long, red, coral-coloured or white tipped red; awns on anthers minute and vestigial . . . . . **E. cerinthoides** var. **cerinthoides**
4b Corolla 8–13 mm long, pink or red; awns on anthers long, broad and curved . . . . . **E. oatesii** var. **oatesii**
5a Corolla decidedly longer than broad and narrowed in throat . . . . . 6
5b Corolla either ± as long as broad, or if longer than broad, not constricted in throat . . . . . 11
6a Flowers massed in a thick, 10–70 mm long, terminal pseudo-spike . . . . . **E. alopecurus** var. **alopecurus**
6b Flowers not massed in a thick spike . . . . . 7
7a Flowers held together in small globose clusters by intermingling hairs on bracts and calyx lobes . . . . . **E. reenensis**
7b Flowers variously arranged, but not in dense hairy clusters . . . . . 8
8a Leaves clad in long hairs, spreading at right angles to stem, often somewhat recurved . . . . . **E. frigida**
8b Leaves glabrous, except for very small marginal glands or cilia . . . . . 9
9a Style exserted; corolla white; ovary glabrous . . . . . **E. thodei**
9b Style included; corolla white or pink; ovary hairy . . . . . 10
10a Corolla glabrous, pink; flowering mainly Mar.–Jun. . . . . **E. schlechteri**
10b Corolla, hairy, white or pink; flowering Oct.–Mar. . . . . **E. flanaganii**
11a Corolla constricted in throat, sticky . . . . . **E. aestiva** var. **aestiva**
11b Corolla not constricted in throat, not sticky . . . . . 12
12a Corolla ± 3.5–4.0 mm long . . . . . 13
12b Corolla up to 2.0 mm long . . . . . 14
13a Corolla pubescent, pink; dwarf shrub; flowers 4-nate, in clusters at branch tips . . . . . **E. algida**
13b Corolla glabrous, white; erect shrub; flowers 2–6-nate, not in clusters . . . . . **E. drakensbergensis**
14a Leaves conspicuously hairy, hairs gland-tipped or forked . . . . . 15
14b Leaves either glabrous or with minute pubescence . . . . . 16
15a Anthers with long thin tails . . . . . **E. woodii** var. **woodii**
15b Anthers without tails; inflorescence terminal (compared to *E. leucopelta*) . . . . . **E. maesta**
16a Leaves with minute glands on margins . . . . . 17
16b Leaves minutely pubescent (hairs often very few) or at least with minute hairs on margins . . . . . 18
17a Twigs sticky when grasped . . . . . **E. evansii**

17b Twigs not sticky when grasped . . . . . **E. dissimulans**
18a Corolla funnel-shaped . . . . . **E. dominans**
18b Corolla almost globose . . . . . 19
19a Corolla with minute hairs on backs of lobes; calyx hairy at least on margins (inflorescence axillary with lateral anthers compared to *E. maesta*) . . . . . .**E. leucopelta** var. **leucopelta**
19b Corolla and calyx glabrous . . . . . **E. caespitosa**

## **aestiva** Markötter var. **aestiva**

Dwarf shrub, much branched, 0.15–0.60 m high. **Branches** sturdy and erect, leaves with plumose (feather-like) hairs. **Leaves** 4-nate; on short side shoots; spreading to erect, overlapping; blade linear, 2–4 mm long. **Flowers**: in masses, forming plumes; pedicels hairy; anthers with broad and somewhat serrated awns; style exserted; ovary with long, straight hairs; calyx hairy; corolla bell- or urn-shaped, narrowing to mouth, up to 3 mm long, glabrous, sticky, purple to pink or white; Jan.–Aug. Grassland, amongst rocks, on rock sheets, especially in high mountainous areas.

MsGr

## **algida** Bolus

Shrub or dwarf shrub, with erect stems, 0.3–0.6 m high. **Branches** rigid, pubescent, sometimes covered with compound feather-like or woolly hairs. **Leaves** 4-nate; clustered, needle-like, erect, incurved, overlapping; blade linear to narrowly ovate or oblong, 3–5 mm long, sometimes slightly open-backed, puberulous and ciliate with branched or plumose hairs, becoming glabrous with age. **Flowers**: 4-nate; in clusters at tips of branches; pedicels 2–3 mm long, hairy; bracts 3, with long soft hairs, nearly as large as calyx; anthers just visible above corolla tube, dark-coloured, ± 1 mm long, aristate or subulate; style subexserted; stigma capitate; ovary with short, curly, white, flat hairs; calyx ovate, ± 2 mm long, sticky, lobes obtuse, villous, glandular-ciliate; corolla red, pink to purple, or whitish, bell-, egg- or cup-shaped, coarsely pubescent; Oct.–Dec. Grassy slopes, valley bottoms; often in large conspicuous stands. *Lekhapu-le-leynyenyane* (SS), *sehalahala* (SS).

MsGr

## **alopecurus** Harv. var. **alopecurus**

Compact, tufted, erect, dwarf shrub, 300–500 mm high. **Branches** long, slender, straight, hairy, densely covered with leaves. **Leaves** 3- or 4-nate; erect, incurving; blade linear, 4–6 mm long, grooved down back below, midrib visible beneath and covered with coarse hairs. **Flowers**: 3-nate; densely packed at tips of branches in unbranched false-spikes; pedicels 2 mm long; bracts 3, remote, leaf-like; anthers included, distinctly broad, ovate, pale brown, < $^1/_2$ mm long, aristate, simple, short awns; style included, curved; stigma capitate; ovary villous, with fine, curly and straight, relatively short hairs; calyx ± 2 mm long, linear, pubescent or with bristles, ciliate; corolla urn- or egg-shaped, mouth contracted, hairy, 2–6 mm long, pink or white; Jan.–Oct. Mountainous country on rocky terrain, damp grassy streambanks, marshy grassland. *Foxtail erica*; *chalebeke-e-nyenyane*, *chesa-litelu*, *molomo-oa-lekolukotaoane* (SS).

MsGr

## **caespitosa** Hilliard & B.L.Burtt

Resprouting, tufted, dwarf shrub, 150–500 mm high. **Branches** hairy, regenerating freely from a woody stock after fire. **Leaves** 3-nate; blade linear, 1.5–3.0 × 0.5 mm, apex subacute. **Flowers**: 3-nate; pedicels 1–2 mm long, hairy; bracts 0 or 1; anthers included, without awns, filaments thread-like; style exserted; stigma large, peltate and cup-shaped, covering most of

mouth of corolla; ovary glabrous; calyx glabrous; corolla urn-, globe-, or cup-shaped, 1–5 mm long, glabrous, yellow, orange or white; Aug.–Mar. Grassland, especially around outcropping Cave Sandstone rocks.




### **caffrorum** Bolus var. **caffrorum**

Shrub, sprawling or prostrate over rocks, or a small tree, 0.5–2.5 m high. **Branches** strongly spreading or erect, hairy. **Leaves** usually 3-, sometimes 4-nate; clustered at ends of branches, stiff and densely covering stem; blade linear, 4.0–8.5 mm long, shiny, bright green, usually recurved-spreading, ciliate, glabrous. **Flowers**: 4-nate; clustered at ends of branches; pedicels 2–3 mm long, puberulous; bracts 3, usually remote, ± 2 mm long, scabrid on margins only; anthers included with small, short ciliated awns; style exserted, stigma clavate, capitate or simple, sometimes distinctly 4-toothed or with 4 lobes; ovary glabrous; calyx 2–3 mm long, glabrous or hairy, generally $^{3}/_{4}$ length of corolla, usually pink and glabrous; corolla tube-, urn- or cup-shaped, widening slightly at mouth, 3–5 mm long, almost concealed by calyx, showy to dirty white, pink or cerise; Jul.–Apr. Rocky streamsides, boulder beds, rock outcrops, grassy slopes, edges of forest, cliffs and mountain tops. *Mountain heath*; *bergboomheide* (A).




### **cerinthoides** L. var. **cerinthoides**

Erect, resprouting shrub with woody base, 0.15–1.00 m high. **Branches** ascending, often virgate and simple. **Leaves** 3–6-nate, erect, closely overlapping, spreading or recurved; blade needle-like, 5–17 × 1 mm, glandular, grooved down back, variously pubescent, rarely glabrous. **Flowers**: in tightly packed terminal clusters; pedicels 2–13 mm long, pubescent with hairs up to 1.5 mm long; bracts 3, ± 4 mm long, approximate, or one subremote; calyx 4–7 mm long, like bracts but larger, densely glandular-hairy; anthers muticous, included with very short or rudimentary, minute awns; style included or exserted; ovary villous; calyx lanceolate, acuminate, 8 × 3 mm, hirsute and ciliate with long gland-tipped hairs; corolla tubular, ± inflated, slightly constricted at mouth, 20–35 mm long, ± pubescent, sometimes shortly pilose or with longer (sometimes glandular) hairs, crimson, rarely rosy or white, dark pinkish red or white with red tips; Jan.–Dec. Rock outcrops, in crevices of Cave Sandstone sheets, cliffs and on rocky slopes. *Erica heath*, *fire heath*; *rooihaartjie*, *klipheide* (A); *momonyane*, *morita-nkoe*, *semomonyane* (SS).




### **dissimulans** Hilliard & B.L.Burtt

Shrub, up to 1.5 m high. **Branches** with leaves aggregated at terminal ends. **Leaves** 3-nate; margins of blade with small glands; 3–7 × 0.50–0.75 mm. **Flowers**: on terminal parts of branches; pedicels 1.5–2.5 mm, hairy; bracts 3, 1.5 mm long; anthers included, not awned throughout year; style scarcely exceeds 1 mm, exserted at maturity; stigma peltate; ovary glabrous, calyx lobes rhomboid, 1 × 0.75–1.00 mm with marginal cilia; corolla cup-, urn- or tube-shaped, 1.5–2.5 × 1.5 mm, glabrous, red to pink; Jul.–Jan. **Capsule** persistent long after flowering. Wet cliff faces, rocky stream gullies and boulder beds.




### **dominans** Killick

Much-branched shrub, 0.15–0.45(–1.2 m on summit) high. **Branches** erect or procumbent, hairy. **Leaves** 3-nate; olive-green, glossy, overlapping, held erect, close to stem; blade

linear, 2–3 mm long, margins of young leaves with coarse, often forked hairs or glabrous, tall specimens with larger leaves 19–33 mm long. **Flowers**: in nodding heads at tips of branches; pedicels hairy; bracts 3; anthers muticous, included, with minute and bristle-like awns or without; style ± 2 mm; stigma well exserted; ovary glabrous; calyx 1–3 mm long, conspicuous, hairy; corolla funnel-, egg- or cup-shaped, flares out at mouth, glabrous, pink, red, or almost purple; Jul.–Jan. Steep grassy slopes, rocky slopes near streams, exposed ridges, Cave Sandstone platforms. *Lekhapu* (SS).




## **drakensbergensis** Guthrie & Bolus

Erect to spreading-erect, much-branched shrub, 0.3–0.6(–2.0) m high. **Branches** woody; bark rough, dark grey, flaking, new growth softly hairy. **Leaves** 3- or 4-nate; erect, overlapping; blade needle-like, 2–4 mm long, glabrous. **Flowers**: 3- or 4–6-nate; pedicels 2–4 mm long, straight or decurved, puberulous; bracts 3, linear, remote; anthers subexserted, rarely exserted, with aristate awns, filaments straight and slender; ovary glabrous, style prominently exserted, sometimes decurved; stigma peltate-capitate; calyx ± 1/3 length of corolla, ovate to narrowly ovate, 1.0–1.5 mm long, keel-tipped, usually glabrous; corolla urn-, bell- or cup-shaped, slightly or not constricted at throat, 2.5–4.5 mm long, glabrous, white or brown; Jan.–Dec. Rocky, grassy slopes, frequently immediately above Cave Sandstone cliffs, usually in moist places, small colonies. *Drakensberg erica*; *Drakensbergheide* (A); *chalebeke-e-kholo* (SS).




## **evansii** (N.E.Br.) E.G.H.Oliv.

*Philippia evansii* N.E.Br.

Shrub, 1.0–2.4 m high. **Branches** spreading, glandular-hairy, twigs sticky to touch. **Leaves** 3-nate; ascending or spreading, light green; blade linear-oblong, 1.5–2.0 mm long, minutely gland-denticulate on margins. **Flowers**: 1–3 together, terminal; pedicels 0.8–1.5 mm long, glabrous or hairy; no bracts; anthers 0.8 mm long, bifid to 1/2-way down, included, without awns, filaments 0.2 mm long and free; style ± as long as corolla, included; stigma peltate, orbicular, 1 mm in diameter; ovary globose, 4-grooved, glabrous; calyx up to 1 mm long, leathery, broadly ovate, subacute and grooved down back, with minute gland-ciliate margin, hairy; corolla globe- or bell-shaped, 1.0 × 1.4 mm, 4-lobed for ± half its length, glabrous, white, soon turning brown or pale green; Oct.–Dec. Along rocky streams, boulder beds, steep moist slopes, directly below Cave Sandstone cliffs and forest margins.




## **flanaganii** Bolus

Erect, stout, rigid, branched shrub, 0.6–0.9 m high. **Branches** densely leafy and softly hairy. **Leaves** 4-nate; erect, crowded; blade linear, 8–11 mm long, grooved down back, glabrous or not. **Flowers**: 4-nate; pedicels thick, 4 mm long, hairy; bracts 3, linear, thinly pubescent, leathery, thick, pallid, 6.0–7.5 mm long; anthers affixed above base, narrow-oblong, slightly curved, included, pale brown, over 2 mm long, broad at base, with aristate or cristate-aristate awns, filaments rather broad, bent at apex; style stout, included; stigma simple; ovary deeply lobed, pubescent; calyx hairy, clasping-boat-shaped; corolla urn- or egg-shaped, mouth contracted, ± 8 mm long, softly hairy, densely white-pubescent; segments erect, rounded with overlapping margin, scarcely 1/5 length of tube, white; Oct.–Mar. Amongst and at foot of cliffs and boulders, on slopes of high mountain grassland, in stony to rocky loam soils.



### **frigida** Bolus

Shrub or dense dwarf shrub, 0.5–1.0 m high, sometimes forming mats. **Branches** slender, straggling, hairy. **Leaves** ± recurved, covered in long hairs, spreading at right angles to stems, 4-nate; blade subrecurved, squarrose, elliptical or oblong, thick, sulcate, margins rough with tubercle-based glandular hairs, rarely subnaked and glossy, 1.5–3.0 mm long. **Flowers**: sub-4-nate or umbellate (4- or 5-flowered); terminal; pedicels viscid, ± 2 mm long; bracts 3, subapproximate, glandular-ciliate, small; anthers included, smooth, > 0.5 mm long, aristate with appendages; style included; stigma subsimple; ovary pubescent; calyx broad to narrowly ovate, acute, scarious, coloured, viscid, keel-tipped and gland-ciliate near apex, ± 1.5 mm long, corolla urn- or egg- to urn-shaped, gradually contracted towards mouth and well constricted at throat, 2.5–3.5 mm long, sticky, glabrous or rarely very minutely hairy, white, often pink or seldom deep red, rosy and whitish; Sep.–Feb. Cliffs and very steep slopes. *Khoarai* (SS).

MsGr

### **leucopelta** Tausch var. **leucopelta**

Well-branched, dwarf shrub to shrub, 0.6–1.0(–2.0) m high. **Branches** erect, rounded, with green appearance, pubescent or hispid with scanty or dense, coarse, stiff, white, sometimes gland-tipped hairs. **Leaves** 3-nate, erect or spreading; blade narrowly oblong or linear, 2–5 mm long, pubescent, sulcate or very rarely subopen-backed. **Flowers**: 3-nate**,** mostly scantly, or at least not in dense masses, pedicels 1.0–1.5 mm long; bracts remote, mostly 3, one rather large and foliaceous, and two usually minute, or wanting; anthers subexserted or included, without awns, elliptic or subovate, obtuse, smooth, pale brown, 0.5–0.8 mm long, muticous, filaments capillary, shorter than anther; style included or exserted; stigma cyathiform or peltate, large, exserted; ovary thinly hispidulous; calyx linear or oblong, foliaceous, pubescent, hispid-ciliate or naked, ± 0.7 mm long; corolla urn- to cup-shaped (broad-cyathiform), widened to mouth, 0.5–1.5 mm long, glabrous, smooth or minutely papillose red-brown, white, green or yellow, cream-coloured to greenish, dull yellow; Jul.–Dec. Stony rocky soil on mountain peaks in grassland or on sandstone, on moist northern slopes, in shadow of rock boulders, streamside rocks and earth banks, Cave Sandstone sheets and rocky places below Cave Sandstone cliffs.

DrGr MsGr

### **maesta** Bolus var. **longistyla** Dulfer

Description as for *Erica maesta* var. *maesta*. Differs from the typical species in the distinctly exserted styles and glabrous corolla.

DrGr MsGr

### **maesta** Bolus var. **maesta**

Erect shrub, 0.9–2.0 m high. **Branches** many, soft, leafy, subvirgate, ashy-grey pubescent, sometimes pilose with longer white hairs. **Leaves** 3-nate; erect-spreading, subimbricate; blade linear, 2–4 mm long, subacute, thick, sulcate, pubescent, ashy-grey, ciliate with a few longer tubercle-based hairs, older ones glabrescent. **Flowers**: in plumes along upper branches; pedicels pubescent, < 2 mm long; bracts 3, remote, small; anthers included or subincluded without appendages, manifest, subterminal, tapering to base, narrow-subobovate, smooth, ± 0.7 mm long, muticous, filaments capillary; style exserted or not; stigma large, cyathiform; ovary globose, pallid, glabrous except for a few scattered hairs, calyx lobes ovate-lanceolate, pubescent ± ½ length of corolla; corolla cup-shaped (cyathiform), mouth scarcely widened or contracted, < 1 mm long, hairy or glabrous; greenish yellow; Aug.–Nov. Stony-rocky, sandy to clay soil in open shrubland and grassland, on mountain slopes and along rock sheets on mountain tops.

DrGr MsGr

### **oatesii** Rolfe var. **oatesii**

Erect shrub, 0.3–1.3 m high. **Branches** spreading, hairy, pubescent and hispid, hairs sometimes gland-tipped; **Leaves** 3- or 4-nate, suberect, spreading or recurved, blade linear, 6–10 mm long, up to 3 mm broad, sharp edged, margins rolled under, naked or ciliate with long, gland-tipped hair, subacute. **Flowers**: in few-flowered terminal umbels, pedicels hairy; bracts 3, two approximate, lower remote, or all subremote; anthers included, 1.5–1.8 mm long, shortly awned; style included but eventually exserted, rarely subexserted; ovary villous; calyx narrowly ovate, acute or acuminate, somewhat scarious below and tapering to a linear foliaceous point, pubescent, gland-ciliate; corolla 6–14 mm long, lobes short, hairless, urn- or egg-shaped, slightly inflated, glabrous or puberulous, scarlet, red, pink or white tipped pink; Nov.–Aug. On streambanks, rocky grassy slopes, usually in mountainous terrain. Figure 8B, p. 4.




### **reenensis** Zahlbr.

Dwarf shrub with grey-green fluffy appearance due to fine hairs on tightly packed leaves, up to 0.5 m high. **Branches**: decumbent and procumbent; hairy. **Leaves** 4-nate; blade pointed with broad base, almost as long as corolla, densely covered with long ciliate and glandular hairs. **Flowers**: in dense clusters at tips of stems or side-branches; pedicels up to 1 mm long, hairy or not; bracts 3; anthers with appendages; ovary with short pubescent hairs, style included; calyx hairy, calyx and corolla with 4 segments; corolla urn-shaped, 1–5 mm, glabrous, pink, purple or white; Jan.–Mar. Damp shady cliffs and very steep broken slopes, usually in rock crevices.




### **schlechteri** Bolus

Erect shrub, up to 1.5 m high. **Branches** ascending, flexuous, puberulous, glabrescent. **Leaves** 4-nate, erect to spreading, overlapping; blade linear, ± 5 mm long, grooved, blunt tipped; erect or subspreading, imbricate, bluntish, sulcate, glabrous or hairy, dry or the younger subviscid, 3–6 mm long. **Flowers**: in terminal clusters of 3 or 4, pink or pale rosy spikes at tips of long flexuous branches; pedicels viscid, pubescent, 2–4 mm long; bracts 3, approximate or remote, linear, sticky (viscid) pubescent, 2 mm long; anthers with crested appendages, included, > 0.7 mm long; style included; stigma capitate; ovary densely hirsute; calyx narrowly ovate, 2–3 mm long, glabrous or hairy, coloured, viscid; corolla bell- to urn-shaped with slightly constricted mouth, 4.7–7.8 mm long, viscid, glabrous, pink or whitish; Nov.–Jun. Grassy slopes, valley bottoms especially near streams, occasionally on Cave Sandstone platforms; often in conspicuous stands.




### **thodei** Guthrie & Bolus

Dwarf shrub or spreading shrublet, sometimes procumbent against rocks, 0.3–0.6 m high. **Branches** many, rigid, softly hairy, leafy above, covered with scars below. **Leaves** 3-nate; spreading, overlapping imbricate; blade oblong or narrowly elliptic, 3–4 mm long, petiole ± $^1/_2$ this length, thick, keeled, glabrous, shiny. **Flowers**: 3-nate; terminal; pedicels puberulous, lengthening during or after flowering, up to 3 mm long; bracts 3, remote or subapproximate, erect, linear, scarious, 2 mm or less; anthers included, lateral, longitudinally semi-ovate, smooth, membranous, pale brown, ± 1 mm long, crested-aristate, awns broadly subulate, acute, long-ciliate, filaments capillary, over 2 mm long; style included; stigma subsimple; ovary glabrous; calyx erect, adpressed, narrowly ovate, acute, concave, scarious, keeled, not imbricate at base, glabrous, ciliolate as leaves, 2.5–3.0 mm long, ± $^2/_3$ of corolla; corolla tube-, urn-, bell- or cup-shaped, half-covered by calyx lobes, lobes broader than long, ± 4 mm long,

white to pink; Dec.–Jul. At high altitudes, forming dense mats or cushions against moist rocks, on damp rock sheets, cliffs and steep rocky slopes.

MsGr

**woodii** Bolus var. **woodii**

Dwarf shrub, 0.15–0.60 m high. **Branches** diffuse spreading or erect, sometimes mat-forming; with long, branched, or gland-tipped hairs. **Leaves** 3-nate (rarely 4-nate on same plant); crowded on short side branches; spreading; blade ovate to narrowly ovate, apex obtuse, margins revolute or reflexed, closed or open-backed, hispid-ciliate, scabrid-hispidulous or glabrous, shining on upper surface, with conspicuous long, white, pointed hairs, hispid-ciliate, scabrid-hispidulous or glabrous, 2–4 mm long. **Flowers**: mostly axillary in masses; pedicels curved, ± 2 mm long; bracts 3, remote, small, occasionally one wanting; anthers 6–8, aristate with long thin tails, included, variable in length; style swollen, just exserted or not, stalk dark red, capitate-peltate and large; ovary with short-pubescent hairs; calyx lobes dark red, linear, subspathulate-linear, subulate or narrowly ovate, hispid or gland-ciliate, foliaceous, ± 1 mm long; corolla bell-, urn- or cup-shaped, slightly wider at mouth, ± 2 mm long, glabrous, white, pale pink, purple to red; Jan.–Jul. Grassland, rocky ground, ravines and on mountains. *Pienkheide* (A); *hlaha-hlaha*, *tlali-tlali* (SS).

MsGr

## References

HILLIARD, O.M. & BURTT, B.L. 1987. *The botany of the southern Natal Drakensberg*. National Botanic Gardens, Cape Town.

# EUPHORBIACEAE

Herbs, shrubs, trees, sometimes succulent, sometimes twining or climbing, monoecious or dioecious; latex, if present, milky, sometimes watery, rarely reddish. **Leaves** alternate, rarely opposite or in whorls, usually simple, sometimes rudimentary; stipules present or absent. **Flowers**: unisexual or bisexual, regular, often dissimilar in the two sexes; in terminal or axillary, cymes; solitary or in glomerules, these often grouped into spiciform or capitate thyrses or pseudanthia, sometimes in cyathia (*Euphorbia*); bracts often glandular; perianth present or absent in 1 or both sexes, usually of 5 segments, sometimes sepals and petals present, petals rarely united at base; male flowers with stamens 1 to many, filaments free or connate, ovary rudimentary or absent; female flowers with ovary superior, styles as many as carpels, free or ± connate; disc present or absent. **Fruit** a capsule or indehiscent, drupaceous, occasionally a nut. **Seeds** with or without caruncle. *Rubber, milkweed or Euphorbia family*.

## Key to genera

[after Archer: 250 (2000)]

1a Plant with apparent flower a cyathium, reduced male flowers, stamens, and a reduced female flower, enclosed within a common cup-like involucre . . . . . **Euphorbia**
1b Plant with flowers male or female or bisexual, not borne in a cyathium . . . . 2
2a Leaves opposite . . . . . **Adenocline**
2b Leaves alternate . . . . . 3
3a Petals present, at least in male flowers. . . . . **Clutia**
3b Petals 0 . . . . . 4
4a Female flowers subtended by accrescent bracts; styles laciniate with filiform segments, usually red . . . . . **Acalypha**
4b Female flowers not subtended by accrescent bracts; styles not laciniate with filiform segments . . . . . **Seidelia**

## **Acalypha** L. (sthn Afr.: 21 spp.)

### Key to species:

[after Prain: 466 (1920)]

1a Spikes bisexual . . . . . **A. segetalis**
1b Spikes unisexual . . . . . 2
2a Stems procumbent. . . . . **A. peduncularis**
2b Stems erect. . . . . 3
3a Leaves glandular . . . . . 4
3b Leaves eglandular . . . . . 5
4a Glands on upper leaf surface and outside of female bracts sessile. . . . . **A. punctata** var. **punctata**
4b Glands on upper leaf surface and outside of female bracts stipitate . . . . . **A. wilmsii**
5a Leaf blade with margins entire . . . . . **A. schinzii**
5b Leaf blade with margins serrate . . . . . 6
6a Leaf blade narrowly ovate . . . . . **A. angustata**
6b Leaf blade ovate. . . . . **A. caperonioides** var. **caperonioides**

### **angustata** Sond.

*A. angustata* Sond. var. *glabra*

Perennial herb or shrub, up to 0.9 m high; sparsely setulose; dioecious. **Stems** erect, slender, firm, virgately branched, sparsely, patently setulose or glabrous. **Leaves** eglandular; subsessile; blade linear to narrowly ovate, 24–60 × 4–5 mm, apex acute, base cuneate, margins distantly serrate, lower surface with midrib and secondary nerves conspicuous, sparsely hairy. **Flowers**: male spikes erect, axillary, solitary, bracts narrowly linear-ovate; female spikes terminal, solitary, bracts subsessile, foliaceous, narrowly ovate, apex acuminate, base rounded, margins sharply serrate, glandular-hairy; styles united in lower fourth, laciniate, feathery forming a brush above bracts; Sep.–Dec. Grassland, hillsides. *Copper leaf*; *katpisbossie* (A).

VreDm | DrGr

### **caperonioides** Baill. var. **caperonioides**

Perennial herb, up to 0.4 m high; dioecious. **Stems** annual from a woody rootstock, erect, striate; sparsely to much branched; sparsely to densely setulose. **Leaves** eglandular;

subsessile; blade ovate, 40–90 × 13–50 mm, apex acute, base cordate, margins sharply serrate-dentate, subglabrous to hirsute, drying reddish brown, veins conspicuous; petiole up to 2 mm long. **Flowers**: male spikes axillary, solitary, bracts narrowly ovate, margins ciliate; female flowers terminal, solitary, bracts sessile, leafy, narrowly ovate, apex acuminate, margins strongly toothed, outer surface shaggy with bulbous-based hairs; styles united in lower third, slightly or not at all laciniate, red; Sep.–Nov. Grassland. *False-nettle bush*; *valsnetelbos* (A).

VreDm | AcGr | DrGr | MsGr

**peduncularis** E.Mey. ex Meisn.

Perennial herb, up to 450 mm high; densely, patently setulose; dioecious, sometimes monoecious. **Stems** procumbent or semi-erect, sparsely branched. **Leaves** sessile; blade ovate to narrowly ovate, 36–60 × 18–30 mm, apex acute or obtuse, base cuneate or rounded, margin serrate. **Flowers**: male flowers axillary, solitary; female spikes terminal, solitary; bracts subsessile, leafy, broadly ovate, apex subacute or obtuse, base cuneate, coarsely serrate, terminal tooth exceeding 2–4 lateral ones, setulose on margins, glandular; styles united in lower third, spirally twisted and markedly laciniate, red; Sep.–Jan. Grassland, rocky hillsides. *Usununundu*, *ikhothe* (Z).

DrGr | MsGr

**punctata** Meisn. var. **punctata**

Perennial herb, up to 0.9 m high; dioecious. **Stems** erect, stout; sparsely to densely hairy. **Leaves** shortly petiolate; blade ovate or narrowly ovate, ± 70 × 30 mm, apex obtuse or acute, base rounded, margins sharply, coarsely serrulate, both surfaces strigose on veins, glandular-punctate; petiole 2–3 mm long. **Flowers**: male spikes axillary, solitary, bracts narrowly ovate; female spikes terminal, solitary, sessile, bracts subsessile, leafy, narrowly ovate, apex acuminate, margins deeply toothed, with sessile glands; styles united in lower third, laciniate in upper part, red; Sep.–Mar. Grassland. *Sticky brooms and brushes*; *usununundu* (Z).

MsGr

**schinzii** Pax

*A. depressinerva* (Kuntze) K.Schum.

Perennial herb, up to 0.35 m high; densely, patently setulose with white, bulbous-based hairs; dioecious. **Stems** slender, erect, simple or sparsely virgate; striate. **Leaves** eglandular; subsessile; blade narrowly ovate, ± 30 × 5 mm, apex acute, base rounded, margins entire, veins obscure. **Flowers**: male spikes axillary, solitary, cylindric; female spikes, terminal, solitary; bracts subsessile, foliaceous, blade ovate to narrowly ovate, apex acute, base rounded, margins entire to digitately 3–5-toothed; styles united at base, laciniate in upper part, red; Oct.–Mar. Grassy slopes. *Bearded-leaved brooms*, *brushes*.

MsGr

**segetalis** Müll.Arg.

Perennial herb, up to 0.55 m high. **Stems** annual, much branched from base. **Leaves** long-petioled, ovate, apex obtuse or subacute, base rounded, margin crenate; petiole 12–36 mm long. **Flowers**: spikes bisexual, solitary, axillary, short; female flowers below, male flowers above; male bracts minute; female bracts leafy, ovate, up to 13 × 15 mm, margins crenate, green; Nov.–Feb. Grassland, bushveld and woodland.

DrGr | KarSh

**wilmsii** Pax ex Prain & Hutch.

Perennial herb, up to 1 m high; shrubby, dioecious. **Stems** woody, sparsely branched; bark striate; pubescent. **Leaves** shortly petioled; blade ovate or narrowly ovate, 35–90 × 13–45 mm, apex obtuse or acute, base rounded or shallowly cordate, margins toothed, veins conspicuous, glandular-punctate between reticulations, many, stipitate glands on both surfaces also present; petiole 2 mm long, setulose. **Flowers**: male spikes axillary, solitary, cylindric, densely flowered; female spikes terminal, solitary, sessile, bracts 1-flowered, subsessile, leafy, margins toothed, puberulous or setulose, outer surface with long, stipitate glandular hairs; styles united at base, laciniate upwards, red; Aug.–Jan. Grassland.

MsGr

## **Adenocline** Turcz. (sthn Afr.: 3 spp.)

### Key to species:

Leaves opposite; blade triangular-ovate, apex acuminate . . . . . **A. acuta**
Leaves alternate; blade narrowly ovate, apex acute . . . . . **A. pauciflora**

**acuta** (Thunb.) Baill.
*A. mercurialis* Turcz.

Annual, occasionally perennial herb, up to 1 m high. **Leaves** opposite, petiolate; blade triangular-ovate, 40–85 × 25–45 mm, apex acuminate, base cordate, margins serrate; stipules 0. **Flowers**: in cymules; greenish yellow; Oct.–Apr. Forest.

MsGr

**pauciflora** Turcz.
*Mercurialis pauciflora* Baill.

Annual, occasionally perennial herb, up to 0.5 m high. **Leaves** alternate, sessile, sometimes petiolate in lower part of plant; blade narrowly ovate, 8–45 × 1–16 mm, apex acute, base cuneate to rounded, margins shallowly toothed; stipules prominent. **Flowers**: yellowish green; Oct.–Dec. Mountain grassland.

MsGr

## **Clutia** L. (sthn Afr.: 33 spp.)

### Key to species:

[after Prain: 428 (1920)]

1a Petals of male flowers each 1- or 2-glandular, glands adnate to claw . . . . . 2
1b Petals of male flowers each 3- or more glandular, glands not adnate to claw . . . . . 3
2a Twigs warted when young; leaves warted and punctate . . . . . **C. pulchella** var. **pulchella**
2b Twigs not warted when young; leaves not warted but punctate . . . . . **C. pulchella** var. **obtusata**
3a Leaf margins flat . . . . . **C. natalensis**

3b Leaf margins slightly revolute . . . . . 4
4a Stems considerably branched . . . . . **C. hirsuta** var. **hirsuta**
4b Stems simple, several from a woody base . . . . **C. monticola** var. **monticola**

### **hirsuta** (Sond.) Müll.Arg. var. **hirsuta**

Shrub, up to 1.2 m high; stems and leaves sparsely to densely, persistently pubescent. **Stems** considerably branched. **Leaves** petiolate; blade ovate to narrowly ovate, 16–24 × 6–12 mm, apex acute or acuminate, base narrow to wide-cuneate, margins slightly revolute, persistently pellucid-punctate. **Flowers**: petals of male flowers each 3- or more glandular, glands not adnate to claw; yellowish white; Nov.–Jan. **Fruit** a pubescent capsule, 5 mm in diameter, fruiting pedicel 3 mm long. Grassland, rocky slopes. *Lightning bush*; *ungwaleni*, *ubuhlungu bedila* (Z).

DrGr MsGr

### **monticola** S.Moore var. **monticola**

Perennial herb, up to 0.35 m high. **Stems** simple, erect, several from woody base; glabrous. **Leaves** sessile; blade ovate-oblong to narrowly ovate, 12–36 × 8–24 mm, apex acute or obtuse, base wide to narrowly cuneate, margins slightly recurved, pellucid-punctate, warted. **Flowers**: petals of male flowers each 3- or more glandular, glands not adnate to claw; greenish white to yellow; Jul.–Nov. **Fruit** a glabrous capsule, ± 3 mm long, strongly warted, ± on a short, 5 mm, stout, fruiting pedicel. Woodland and grassland.

MsGr

### **natalensis** Bernh.

Shrub, up to 1.5 m high. **Stems** much branched. **Leaves** petiolate; blade linear to narrowly oblong-ovate, 18–48 × 4–8 mm, apex acute, base cuneate, margin flat; pubescent when young, soon glabrescent, pellucid-punctate; petiole 6–12 mm long. **Flowers**: petals of male flowers each 3- or more glandular, glands not adnate to claw; pale yellow; Oct.–Feb. **Fruit** a glabrous capsule, 7 mm in diameter, warted-punctate. Grassland, streambanks.

DrGr MsGr

### **pulchella** L. var. **obtusata** Sond.

Similar to *C. pulchella* var. *pulchella*, but twigs not warted; leaves with blade rounded or ovate-obtuse, 8–72 × 6–36 mm, punctate, not warted, glabrous or sparsely adpressed pubescent.

DrGr MsGr

### **pulchella** L. var. **pulchella**

Shrub, up to 2.5 m high; twigs warted when young. **Leaves** distinctly petioled; blade ovate or ovate-oblong, rarely suborbicular, 36–60 × 12–30 mm, apex subacute or obtuse, base cuneate, pellucid-punctate and warted. **Flowers**: petals of male flowers each 1- or 2-glandular, glands adnate to claw; white; Dec.–Mar. **Fruit** a warted-punctate capsule. Bush clumps, woodland and grassland. *Common lightning bush*; *weerligbos*, *vratjievrug-bliksembos* (A); *ufiyo*, *umsipane*, *iqadi* (X); *ungwaleni*, *umembesa*, *ikhambi lenkosi* (Z).

VreDm DrGr KarSh

## **Euphorbia** L. (sthn Afr.: 254 spp.)

Key to species:

1a Plant herbaceous or sometimes woody at base, never succulent . . . . . 2
1b Plant succulent . . . . . 13
2a Perennial herbs; stems erect with a tuberous rootstock . . . . . 3
2a Annual or perennial herbs; stems erect or procumbent with rootstock not tuberous . . . . . 4
3a Glands of involucre with 3–7 simple or forked processes or with teeth along outer margins . . . . . **E. pseudotuberosa**
3b Glands of involucre entire or minutely crenulate . . . . . **E. gueinzii**
4a Leaves clustered at ends of branches . . . . . **E. heterophylla**
4b Leaves not clustered as above . . . . . 5
5a Leaves all opposite; inflorescences not umbels . . . . . 6
5b Leaves all alternate below umbellate inflorescence . . . . . 9
6a Inflorescences axillary, pedunculate cymes or subglobose heads . . . **E. indica**
6b Inflorescences solitary and terminal . . . . . 7
7a Stems pubescent on upper side, at least along a middle line, glabrous on lower side, always procumbent . . . . . **E. prostrata**
7b Stems glabrous, procumbent, rarely erect . . . . . 8
8a Stems tinged red; leaves green . . . . . **E. inaequilatera**
8b Stems dull white; leaves greyish green . . . . . **E. serpens**
9a Leaf blade with margins distinctly, finely serrate . . . . . **E. pubescens**
9b Leaves with margins entire or minutely scabrous, not distinctly toothed . . . 10
10a Leaf blade cuneately tapering into a conspicuous petiole . . . . . 11
10b Leaves sessile or very shortly petiolate . . . . . 12
11a Perennial herb; leaf blade narrowly linear-ovate or narrowly obovate . . . . . **E. kraussiana**
11b Annual herb; leaf blade obovate, suborbicular or ovate . . . . . **E. peplus**
12b Leaves erect or ascending, apex very acute, somewhat pungently pointed . . . . . **E. striata**
12b Leaves deflexed or upcurved or very spreading, apex obtuse or acute, mucronate, not pungently pointed . . . . . **E. epicyparissias**
13a Plants armed with hard, sharp spines . . . . . 14
13a Plants quite spineless, sometimes with dried or hard peduncles or cymes . . . . . 15
14a Stems 7-angled, angles subacute; involucral glands dark purple or brownish red . . . . . **E. pulvinata**
14b Stems 8–10-angled, angles obtuse; involucral glands greenish yellow . . . . . **E. aggregata** var. **aggregata**
15a Dwarf succulents; stem, rootstock or main body of plant much thicker than branches, globose, pear-shaped or cylindric . . . . . 16
15b Dwarf shrubs, shrubs or bush-like, branched plants . . . . . 19
16a Plants up to 50 mm high; peduncles persisting several seasons, withering, spine-like . . . . . **E. arida**
16b Plants up to 150 mm high; peduncles mostly deciduous, sometimes persisting after 1 season, not spine-like . . . . . 17
17a Main stem subterranean, with densely crowded branches, forming a dense mat or cushion up to 1 m or more in diameter . . . . . **E. clavarioides**
17b Main stem subterranean or slightly above ground, without densely crowded branches . . . . . 18
18a Main stem rising slightly (20–40 mm) above ground level; branches 150 mm long, 15–20 mm thick (when dry); peduncles sometimes persistent . . . . . **E. davyi**
18b Main stem subterranean; producing 6–9 branches at ± ground level, 40–60 mm long, 3–4 mm thick (when dry) or much thinner; peduncles deciduous . . . . . **E. duseimata**

19a Leaves, leaf scars and branches all alternate . . . . . 20
19b Leaves, leaf scars and branches all opposite . . . . . 21
20a Involucres in umbels or cymes with peduncles or rays 4–24 mm long . . . . . **E. mauritanica**
20b Involucres sessile or in subsessile cymes clustered at ends of branches . . . . . **E. gentilis**
21a Rudimentary leaves with a minute spreading point or angle on each side at base; involucres dark purple . . . . . **E. rhombifolia**
21b Rudimentary leaves not with a minute spreading point or angle on each side at base; involucres not dark purple. . . . . 22
22a Cymes or solitary involucres terminal. . . . . **E. juttae**
22b Cymes or solitary involucres arranged racemosely in pairs along branchlets . . . . . 23
23a Plants 0.5–1.0 m high, with stems 4–6 mm thick at base . . . . . **E. spartaria**
23b Plants 0.25–0.50 m high, with stems 2–4 mm thick at base . . . . **E. rhombifolia**

### **aggregata** A.Berger var. **aggregata**

Dwarf succulent, up to 75 mm high; unisexual, branched from base, forming cushion-like masses up to 2 m in diameter. **Branches** 20–30 mm wide, 8–10-angled, bright green, angles obtuse and subentire; spines hard, sharp, minutely puberulous, 6–8 mm long, reddish or purplish when young. **Leaves** rudimentary, soon deciduous. **Flowers**: cyathia solitary; peduncles up to 3 mm long; involucral glands greenish yellow. **Fruit** subsessile, subglobose. Stony hills, among rocks. *Noorsdoring* (A).

KarSh

### **arida** N.E.Br.

Dwarf succulent, ± 50 mm high, 45–50 mm wide; often tuberous, main stem subcylindric. **Branches** up to 25–37 mm long, 8–10 mm wide, finally deciduous. **Leaves** rudimentary, deciduous. **Flowers**: cyathia solitary; peduncles bearing involucre at apex, persisting several seasons, withering, spine-like, 5–13 mm long; involucral glands with 2–4 processes, dull olive-green; styles united nearly to middle into column 27–30 mm long. Stony soil, along banks of rivers, limestone outcrops, slopes.

DrGr KarSh

### **clavarioides** Boiss.

Dwarf succulent, 20–75 mm high; spineless, main stem subterranean, with tips of branches forming cushion-like mass, up to 1 m or more in diameter. **Branches** densely crowded, with spiralled tubercles, 3–4 mm in diameter, older branches becoming buried. **Leaves** rudimentary, deciduous. **Flowers**: cyathia solitary; peduncles deciduous, never persisting after 1 season; involucral glands subentire, minutely toothed or with subulate processes, yellow. Rocky slopes or sandy flats. *Lion's spoor*; *melkpol*, *vingerpol* (A); *sehloko* (SS); *isantilele*, *isihlekehleke* (Z).

VreDm DrGr MsGr KarSh

### **davyi** Pax ex N.E.Br.

*E. bergii* A.C.White, R.A.Dyer & B.Sloane

Dwarf succulent, up to 150 mm high; spineless, main stem rising 20–40 mm above ground level. **Branches** cylindric, ± 150 mm long, 15–20 mm thick when dry, branching from base, rebranching 2 × or 3 ×, forming obconic body, 200–250 mm in diameter. **Leaves** 4–6 mm, in small tufts at

apex, soon deciduous. **Flowers**: cyathia solitary; peduncles ± 4 mm long (5–17 mm long in fruit), sometimes persistent; involucre 6 mm in diameter; involucral glands 5, crescent-shaped, with 2–4 reflexed processes. Grassland, open woodland, rocky hillsides, sandy soil.




### **duseimata** R.A.Dyer

Dwarf succulent, up to 60 mm high; spineless, with distinct, tuberous main root and 1 or 2 underground stems, each producing 6–9 branches from its apex at ± ground level. **Branches** 40–60 mm long, 3–4 mm thick (when dry) or much thinner, with tubercles not very prominent. **Leaves** rudimentary, deciduous. **Flowers**: peduncles deciduous; involucral glands with raised lip and 2–4 entire or bifid teeth or processes, whitish green, faintly red-spotted; Sep. Sandy soil.




### **epicyparissias** E.Mey. ex Boiss.

Perennial herb, up to 2 m high. **Stems** erect, with branches scattered along it or clustered at intervals, densely leafy. **Leaves** sessile, alternate; deflexed or upcurved or very spreading; blade linear or oblong-linear, 10–40 mm long, apex obtuse or acute, mucronate, not pungently pointed. **Flowers**: in umbels; yellowish green; Sep.–Jan. Grassland. *Wild spurge*; *melkbos*, *pisgoedbossie* (A); *sehlakoana-se-senyenyane* (SS); *ikhanda lentuli* (Z).




### **gentilis** N.E.Br.

Dwarf succulent, 75–150 mm high; unisexual, spineless, branching at base and rebranching above. **Branches** alternate, densely crowded above, 3–6 mm wide when dry, brittle at joints, internodes not tuberculate. **Leaves** absent or rudimentary. **Flowers**: involucres sessile or in subsessile cymes, clustered at ends of branches, glabrous outside; involucral glands with 5 subquadrate, ciliate lobes. Open stony soil, slopes.




### **gueinzii** Boiss.

Perennial herb, up to 150 mm high. **Root** tuberous with underground stems from which herbaceous branches arise. **Branches** erect, thinly to thickly covered with rather long spreading hairs, sometimes glabrous. **Leaves** lax or many, shape variable, 6–30 × 2–11 mm, usually glabrous, sometimes densely white-hairy. **Flowers**: involucre 2–6 mm in diameter; involucral glands entire or minutely crenulate, green and red; Sep.–Dec. Grassland.




### ***heterophylla** L.

*E. geniculata* Ortega

Annual herb, up to 1 m high. **Stems** erect. **Leaves** clustered at ends of stems; blade linear to ovate or obovate, margin toothed; upper leaves and bracts green or often purple-spotted, never red. **Flowers**: bracts usually ovate, uniformly green; green; Nov.–Apr. Weed in cultivated land. Native to West Indies, Texas and Mexico. *Paintleaf*, *Mexican fireplant*; *wilde-poinsettia*, *gekleurde euphorbia* (A).



**inaequilatera** Sond.

*Chamaesyce inaequilatera* (Sond.) Soják

*E. sanguinea* Boiss.

Annual herb. **Stems** procumbent, rarely erect, much branched; glabrous, tinged red. **Leaves** opposite, green; blade ovate, up to 14 × 6 mm, apex obtuse, base obliquely rounded, margins serrate. **Flowers**: in solitary and terminal inflorescences; stipules ± 1.5 mm long, deeply divided into 3–5 linear teeth; greenish purple; Sep.–May. Grassland, disturbed places. *Smooth creeping milkweed*, *procumbent spurge*; *rooi-opslag*, *lipbossie*, *gladde kruipmelkkruid* (A); *hlabo* (SS).

VreDm | AcGr | DrGr | MsGr | KarSh

***indica** Lam.

*E. hypericifolia* of N.E.Brown not of L.

Annual herb, up to 0.6 m high. **Stems** erect-spreading, simple or branched. **Leaves** opposite; shortly petiolate; blade oblong to narrowly ovate-oblong, elliptic or ovate, 6–40 × 4–20 mm, apex acute to rounded, base oblique, margins minutely toothed, puberulous on lower or both surfaces; stipules fimbriate. **Flowers**: in axillary, pedunculate cymes or subglobose heads; bracts narrowly ovate, apex acuminate; involucres cup-shaped with 4 appendaged glands and 5 lobes; Dec.–Mar. Mountain grassland. Native to East Indies.

MsGr

**juttae** Dinter

*E. aequoris* N.E.Br.

Succulent, dwarf shrub, 150–220 mm high, 100–150 mm in diameter; spineless, tuberous root, with 1–few aerial stems. **Branches** soft, flexible, opposite, repeatedly forked, 1–4 mm wide when dry, internodes 4–12 mm long. **Leaves** opposite, rudimentary, soon deciduous. **Flowers**: in cymes or solitary, terminal, a flowering branchlet growing out from axil of one or both bracts; bracts under involucre spathulate; involucre glabrous outside; involucral glands with minute lobes; ovary exserted 2–4 mm. Brackish or rocky soil, slopes. *Brakmelkbossie* (A).

KarSh

**kraussiana** Bernh.

Perennial herb, up to 1 m high. **Stems** erect. **Leaves** alternate with a whorl of 4 or 5 at base of umbel; blade narrowly linear-ovate or narrowly obovate, up to 90 × 20 mm, apex obtuse or acute, apiculate, base cuneately tapering into a ± evident petiole, margins entire, glabrous. **Flowers**: in umbels; green; Dec.–Apr. Forest margins, streambanks. *Usingalwesalukazi* (Z).

MsGr

**mauritanica** L.

Succulent shrub, 1.0–1.5 m high; spineless, much branched, glabrous, yellowish green. **Branches** fairly flexible, fleshy, alternate, secondary branches up to 10 mm wide, with leaf scars, flowering branchlets 3–5 mm wide. **Leaves** alternate, soon deciduous, sessile, narrowly ovate, 5–15 × 2–5 mm. **Flowers**: in terminal cyathia, umbellate with 5–7 rays or in cymes with peduncles or rays 4–24 mm long; bracts ciliate; involucral glands 5–8, yellow; Aug.–Oct. **Fruit** a capsule, usually exserted by 3–6 mm. Sandy plains to rocky slopes. *Yellow milkbush*, *jackal's food*; *regopmelkbos*, *kaalmelkbos*, *gifmelkbos* (A).

DrGr | KarSh

### *peplus L.

Annual herb, up to 0.3 m high. **Stems** erect, branching near or at base; glabrous. **Leaves** alternate, subsessile or on slender petioles; blade obovate, suborbicular or ovate, 6–18 × 4–12 mm, apex obtuse, base tapering into petiole, margins entire. **Flowers**: in umbels; green; Oct.–Mar. **Fruit** a capsule, with fleshy ridges along angles. **Seeds** with rows of deep pits. Weed of cultivation and disturbed ground, in shade. Native to Europe, northern Africa and western Asia. *Stinging milkweed*, *petty spurge*; *wolfsmelk*, *brandmelkkruid* (A); *bolila* (SS).

KarSh

### *prostrata Aiton

*Chamaesyce prostrata* (Aiton) Small
*E. chamaesyce* not of L.

Annual herb. **Stems** always procumbent, puberulous on upper side, at least along a middle line, glabrous on lower side, often tinged purplish. **Leaves** opposite, shortly petiolate; blade oblong to elliptic, apex obtuse or rounded, margins distinctly or obscurely toothed; stipules on lower side united, deltoid-ovate. **Flowers**: solitary or in terminal inflorescences; green; Nov.–Apr. **Fruit** a capsule, with a row of hairs along each suture. Grassland, disturbed places. Native to South America.

AcGr DrGr

### pseudotuberosa Pax

Perennial herb, up to 0.25 m high. **Root** tuberous with 1 or more subterranean, erect stems. **Leaves** sessile; blade linear or narrowly ovate, 12–37 × 1.5–4.0 mm, apex acute, margins infolded or concave-channelled, glabrous, glaucous. **Flowers**: involucre > 6 mm in diameter; glands with 3–7 simple or forked processes or with teeth along outer margins, corrugated on upper surface; green; Aug.–Nov. **Fruit** a capsule with puberulous pedicel, exceeding the involucre by 3–4 mm. Grassland, bush clumps.

DrGr

### *pubescens Vahl

Perennial herb, up to 0.6 m high; glabrous. **Stems** erect, simple or with ray-like branches below. **Leaves** sessile, alternate, many, a whorl below umbel; blade narrowly obovate, apex acute, base subcordate, margins distinctly, finely serrate. **Flowers**: unisexual or bisexual; in umbels, 4–6-rayed, with or without rays in axils of leaves below it; bracts variable; involucre sessile, cup-shaped, glabrous with 4 glands and 5 oblong, ciliate lobes. **Fruit** a subglobose capsule, slightly grooved. Disturbed places. Native to Europe.

VreDm

### pulvinata Marloth

Dwarf succulent, up to 0.3 m high; unisexual, freely branched at ± ground level, with branches regularly and densely packed into cushion-like masses or mounds. **Branches** 25–33 mm thick, nearly always 7-angled, green, angles subacute, slightly crenate-tubercled; spines glabrous, 6–12 mm long, green or greenish yellow when young. **Leaves** rudimentary, soon deciduous. **Flowers**: yellow; cyathia solitary, sessile or on short peduncles; involucral glands dark purple or brownish red; Jul. **Fruit** obtusely 3-angled. Stony mountainsides, rocky outcrops. *Pincushion cactus*, *prickly heaps*; *voetangel* (A); *isihlehle*, *inkamamasane* (Z).

DrGr MsGr

**rhombifolia** Boiss.

*E. caterviflora* N.E.Br.

Succulent shrub or dwarf shrub, 0.15–0.50 m high; spineless, unisexual, branching from base or higher up. **Branches** opposite, spreading, fibrous, tough, terete or slightly 6-angled, glabrous or with blunt, minute papillae; primary branches 2–6 mm wide. **Leaves** opposite, rudimentary, blade rhomboid or deltoid-hastate, 1–2 mm long, with minute, spreading point on each side at base, blackish brown, soon deciduous. **Flowers**: solitary or in racemes on lateral branchlets, occasional terminal ones; bracts soon deciduous; involucral glands 5 with 5 toothed fringes, yellowish green or dark purple; Oct.–Apr. Among rocks, dolomite formations, limestone hills. *Springbokmelkbos* (A).

DrGr KarSh

***serpens** Kunth

*Chamaesyce serpens* (Kunth) Small

Annual herb. **Stems** procumbent; glabrous, dull white. **Leaves** opposite, greyish green; blade subcircular, 1–3 mm in diameter, base obliquely cordate, margins entire. **Flowers**: solitary; stipules broadly triangular; greenish white; Sep.–Apr. Disturbed places. Native to America.

DrGr MsGr KarSh

**spartaria** N.E.Br.

*E. rectirama* N.E.Br.

Succulent shrub, 0.5–1.0 m high; spineless, unisexual, branching from base and above. **Branches** opposite, erect, straight, smooth, terete, fibrous; primary branches 4–6 mm thick at base. **Leaves** opposite, somewhat fleshy, rudimentary, soon deciduous. **Flowers**: cyathia on terminal branches, in cymes racemosely arranged; bracts soon deciduous, similar to leaves; involucres glabrous; involucral glands toothed. Sandy or rocky soil, on plains or dolerite ridges. *Bekruipmelkbos* (A).

AcGr DrGr KarSh

**striata** Thunb.

Annual herb, up to 0.6 m high; sometimes with long, tuberous root. **Stems** erect, several, annually produced from perennial rootstock; striate, glabrous. **Leaves** alternate, erect or ascending, stem-clasping; scattered; blade linear to narrowly linear-ovate, tapering to a very acute apex, somewhat pungently pointed. **Flowers**: in a 3–5-rayed umbel or sometimes umbel is absent with rays forming a panicle bracts rhomboid-reniform or rhomboid-ovoid, involucre cup-shaped; Sep.–Feb. Grassland. *Milkweed*, *spurge*; *melkgras* (A); *mohlatsisa*, *matsoane* (SS).

VreDm DrGr MsGr

## **Seidelia** Baill. (sthn Afr.: 3 spp.)

**triandra** (E.Mey.) Pax

Annual herb. **Stems** procumbent, branching from base. **Leaves** sessile or subsessile; blade narrowly linear-ovate or linear, apex obtuse, base narrowly cuneate, margins entire or 1- or 2-toothed on each side near apex, 5–9 × 1.5 mm. **Stipules** minute, subulate. **Flowers**: axillary

in glomerules; stamens 3. **Fruit** a 2-lobed capsule, smooth. Margins of pans, disturbed places, limestone vleis, stony soil.

KarSh

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# FABACEAE

Compiled by A. Grobler, E. Retief, N.L. Meyer & T. Nkonki (*Lessertia*)

Trees, shrubs or herbs; sometimes armed with prickles and/or spines. **Leaves** usually alternate, pinnate or pinnately 3-foliolate or digitately compound, occasionally 1-foliolate; stipules usually present. **Flowers**: in a spike, raceme, panicle or head; regular or irregular, sometimes large and showy; calyx with sepals in regular flowers (3)4 or 5(6), connate or free, in irregular flowers (4)5, free or connate into a toothed or lobed calyx; corolla of irregular flowers usually of 5 unequal petals, upper one large and conspicuous (standard), the 2 side ones small and stalked (wings), the 2 basal ones united into boat-shaped structure (keel); stamens twice as many as petals, sometimes more; ovary superior. **Fruit** a pod (legume) or sometimes a burr. *Bean or pea family*.

## Key to genera

[after Germishuizen: 263 (2000)]

1a Flowers zygomorphic; petals imbricate in bud, free or some of them united; seeds usually without an areole . . . . . 2

1b Flowers regular; petals valvate in bud, often united basally; sepals usually united basally; stamens as many as petals or twice as many or numerous, free or all united into a tube or to base of petals; leaves bipinnate (pinnate in the introduced genus *Lysiloma*); seeds normally with an areole on each face or side . . . . . 3 (Mimosoideae)

2a Adaxial (uppermost) petal overlapped by adjacent lateral petals when these are present; sepals often free; stamens 10 or fewer or occasionally more, free

or less often, variously united; leaves bipinnate or pinnate, rarely simple or 1-foliolate; seeds with radicle straight. . . . . 8 (Caesalpinioideae)
2b Adaxial (uppermost) petal outside adjacent lateral petals; sepals united basally; stamens 10 or rarely fewer, sometimes free, most often adaxial free or nearly so, other 9 united, sometimes united into 2 groups of 5 or all united; leaves never bipinnate; seeds with radicle curved . . . . . 12 (Papilionoideae)
3a Plants unarmed . . . . . 4
3b Plants armed . . . . . 6
4a Leaves reduced to simple, entire phyllodes. . . . . **Acacia** (exotic species)
4b Leaves bipinnate or pinnate . . . . . 5
5a Subshrubs, shrubs or small trees; pods indehiscent . . . . . **Elephantorrhiza**
5b Medium to large-sized trees; pods dehiscent . . . . . **Lysiloma**
6a Plants armed with spine-tipped lateral shoots or with paired or solitary spines at nodes . . . . . **Prosopis**
6b Plants armed with recurved prickles or stipular spines. . . . . 7
7a Stipular spines absent, recurved prickles present; inflorescence capitate or spicate . . . . . **Senegalia**
7b Stipular spines present and paired; inflorescence capitate . . . . . **Vachellia**
8a Leaves bipinnate . . . . . 9
8b Leaves simply pinnate . . . . . 10
9a Plants armed with branched spines . . . . . **Gleditsia**
9b Plants unarmed . . . . . **Caesalpinia**
10a Plants armed with branched spines . . . . . **Gleditsia**
10b Plants unarmed . . . . . 11
11a Bracteoles absent; anther thecae naked along sutures; androecium irregular, members tending to decrease in size from the abaxial to the adaxial side of flower; woody shrubs or robust herbs . . . . . **Senna**
11b Bracteoles 2; anther thecae ciliolate along sutures; androecium virtually regular, never decreasing in size from abaxial to adaxial side of flower; slender perennial or annual herbs . . . . . **Chamaecrista**
12a Filaments all free from base upwards; anthers uniform in size and shape. . . 13
12b Filaments partly or almost wholly united to one another, either monadelphous in a closed tube, or diadelphous with vexillary (adaxial) filament free or partly so. . . . . 14
13a Pods moniliform; corolla white . . . . . **Styphnolobium**
13b Pods not moniliform, broadly linear, ± winged or margined; corolla yellow . . . . . **Calpurnia**
14a Anthers distinctly dimorphic, alternately basifixed and shorter dorsifixed. . . . . 15
14b Anthers ± uniform, at least in size . . . . . 23
15a Filaments fused into a closed tube. . . . . **Argyrolobium**
15b Filaments fused into a sheath open on upper side . . . . . 16
16a Stipules absent or inconspicuous. . . . . 17
16b Stipules conspicuous, free from each other and from leaf . . . . . 20
17a Calyx 2-lipped . . . . . **Dichilus**
17b Calyx with 4 upper lobes ± united in pairs, lowest free . . . . . 18
18a Keel and style straight; mostly herbs . . . . . **Pearsonia**
18b Keel and style curved; mostly dwarf shrubs. . . . . 19
19a Seeds 1.5–2.0 mm long . . . . . **Lotononis**
19b Seeds ± 1 mm long . . . . . **Listia**
20a Calyx equally 5-toothed or -lobed. . . . . 21
20b Calyx not equally 5-toothed or -lobed . . . . . 22
21a Stipules paired at each node. . . . . **Crotalaria**
21b Stipules single at each node . . . . . **Leobordea**
22a Calyx with 4 upper teeth ± united in pairs, lower one free . . . . . **Lotononis**
22b Calyx bilabiate . . . . . **Melolobium**
23a Leaves with pulvinus absent . . . . . 24
23b Leaves with pulvinus present . . . . . 31
24a Leaflets ± toothed; nerves extending to ± toothed margin of leaflets. . . . 25

24b Leaflets not toothed; nerves looped within margins . . . . . 28
25a Petals becoming dry, persistent after flowering; filaments mostly dilated upwards . . . . . **Trifolium**
25b Petals falling after flowering; filaments not dilated. . . . . 26
26a Flowers in slender racemes. . . . . **Melilotus**
26b Flowers in heads or short racemes. . . . . 27
27a Pod torulose, plicate . . . . . **Trigonella**
27b Pod spirally coiled, scarcely dehiscent, prickly . . . . . **Medicago**
28a Leaves paripinnate ending in a branched tendril. . . . . **Vicia**
28b Leaves trifoliolate with no tendrils (ending in a leaflet) . . . . . 29
29a Pod neither 1-seeded nor glandular; racemes simple with flower bracts only; ovules > 1. . . . . **Lessertia**
29b Pod 1-seeded, glandular; inflorescence compound, with > 1 series of bracts; ovule 1. . . . . 30
30a Perennial herb; leaves with inconspicuous black gland dots, with long petioles . . . . . **Cullen**
30b Perennial, woody shrub; leaves with conspicuous black gland dots, subsessile or very shortly petiolated. . . . . **Otholobium**
31a Petals 5, all similar, spathulate . . . . . **Dalbergia**
31b Petals differentiated, papilionoid . . . . . 32
32a Anthers apiculate or appendaged; biramous hairs present (often among others). . . . . 33
32b Anthers not appendaged; biramous hairs absent . . . . . 34
33a Upper margin of keel petal with a fringe of hairs; standard petal mostly broad at base, tapering suddenly to a short claw; keel with lateral spurs . . . . . **Indigofera**
33b Keel petal glabrous; standard petal narrow at base, tapering gradually to claw; keel with lateral pockets, spurs absent. . . . . **Indigastrum**
34a Hypanthium absent . . . . . 35
34b Hypanthium present . . . . . 43
35a Leaves with 4–many leaflets, often with closely parallel nerves extending to leaflet margins . . . . . 36
35b Leaves (1–)3-foliolate, never with closely parallel nerves . . . . . 37
36a Herbs or undershrubs; leaflets with closely parallel nerves extending to leaflet margins . . . . . **Tephrosia**
36b Shrubs or trees; leaflets densely pubescent, never with closely parallel veins extending to leaflet margins . . . . . **Mundulea**
37a Leaflets and calyx with yellowish gland dots . . . . . 38
37b Leaflets and calyx eglandular . . . . . 39
38a Stems twining or trailing; funicle of seed attached in middle of hilum . . . . . **Rhynchosia**
38b Stems stiff, erect; funicle of seed attached at end of linear hilum. . . . **Eriosema**
39a Woody shrub or suffrutex with bright red flowers . . . . . **Erythrina**
39b Herbaceous perennials with pink or purple flowers, never bright red . . . . 40
40a Stigma lateral, oblique; style filiform, coiled with 3–5 or more revolutions . . . . . **Vigna**
40b Stigma terminal . . . . . 41
41a Style conspicuously flattened throughout and blade-like. . . . . **Lablab**
41b Style not conspicuously flattened throughout . . . . . 42
42a Style with a distinct, bulging, eccentric callus at its junction with ovary . . . . . **Neorautanenia**
42b Style without prominent callus at junction with ovary . . . . . **Dolichos**
43a Pod jointed . . . . . **Zornia**
43b Pod not jointed . . . . . 44
44a Hard-wooded tree or shrub; stipules spinescent, usually paired; seeds not in distinct compartments. . . . . **Robinia**
44b Upright herb, rarely high and subshrubby; stipules not spinescent; seeds in distinct compartments. . . . . **Sesbania**

## **Acacia** Mill. *s.s.* (sthn Afr.: 22 spp.)

### Key to species:

[adapted from Ross: 26 (1975)]

1a Leaflets 6–15 mm long . . . . . **A. decurrens**
1b Leaflets 1.5–5.5 mm long. . . . . 2
2a Rachis with a gland at junction of each pinna pair with additional glands between pinnae pairs. . . . . **A. mearnsii**
2b Rachis with a gland between each pinna pair but not between pinnae pairs . . . . . **A. dealbata**

### ***dealbata** Link

*A. decurrens* Willd. var. *mollis* Lindl.

Shrub or tree, up to 15 m high; with a rounded crown; unarmed. **Leaves** with leaf rachis with gland at junction of all or most pairs of pinnae but not between pinnae pairs; leaflets 1.5–5.5 mm long. **Flowers**: inflorescence capitate; corolla bright yellow; Jul.–May. **Pods** not or slightly moniliform, dehiscing longitudinally along one margin only. Riverbanks, roadsides. Native to Australia. *Blue wattle*, *silver wattle*; *bloubasboom*, *silwerwattel* (A).




### ***decurrens** (J.C.Wendl.) Willd.

*Mimosa decurrens* J.C.Wendl.

Tree, up to 20 m high; with a rounded crown; young branches prominently angled, sometimes with wing-like ridges 1–2 mm high; unarmed. **Leaves** with central midrib; leaflets 6–15 × 0.30–0.75 mm. **Flowers**: in an axillary raceme or panicle; corolla bright golden-yellow; Aug. **Pods** not or slightly moniliform, dehiscing longitudinally along one margin only. Roadsides. Native to Australia. *Green wattle*; *groenwattel* (A).




### ***mearnsii** De Wild.

Tree, up to 15 m high; unarmed. **Leaves** with gland at junction of each pinna pair, usually also with additional glands between pinnae pairs; leaflets 1.5–5.5 mm long. **Flowers**: inflorescence capitate; corolla pale yellow; Sep.–Dec. **Pods** ± moniliform, dehiscing longitudinally along one margin only. Grassland, plantations, roadsides. Native to Australia. *Black wattle*; *swartwattel* (A).




## **Argyrolobium** Eckl. & Zeyh. (sthn Afr.: 55 spp.)

### Key to species:

[after Edwards: 381 (2005)]

1a Stipules fused for > $^1/_2$ their length. . . . . 2
1b Stipules free or fused for < $^1/_2$ their length. . . . . 4
2a Bracts as long as, or slightly longer than calyx . . . . . **A. amplexicaule**
2b Bracts shorter than calyx. . . . . 3

| | | |
|---|---|---|
| 3a | Inflorescence pedunculate | **A. campicola** |
| 3b | Inflorescence subsessile | **A. candicans** |
| 4a | Flowers produced in masses; inflorescences terminal and axillary | **A. robustum** |
| 4b | Flowers seldom produced in masses; inflorescences mostly leaf-opposed | 5 |
| 5a | Leaves strongly dimorphic, upper leaflets filiform | 6 |
| 5b | Leaves monomorphic or slightly dimorphic | 8 |
| 6a | Corolla reddish brown and yellow | **A. tuberosum** |
| 6b | Corolla uniformly yellow, sometimes becoming reddish brown with age | 7 |
| 7a | Inflorescences sessile or very shortly pedunculate | **A. harveyanum** |
| 7b | Inflorescences pedunculate | **A. pauciflorum** |
| 8a | Xeric shrubs | **A. argenteum** |
| 8b | Herbs | 9 |
| 9a | Flowers sessile or very shortly pedunculate | **A. nigrescens** |
| 9b | Flowers pedunculate | 10 |
| 10a | Abaxial leaflet veins prominent | **A. molle** |
| 10b | Abaxial leaflet veins obscure | 11 |
| 11a | Stipules as large as or larger than leaflets | **A. stipulaceum** |
| 11b | Stipules smaller than leaflets | 12 |
| 12a | Petioles of upper leaves shorter than stipules | 13 |
| 12b | Petioles of upper leaves longer than stipules | 14 |
| 13a | Young flowers with corolla reddish brown and yellow | **A. tuberosum** |
| 13b | Young flowers with corolla uniformly yellow, sometimes becoming reddish brown with age | **A. marginatum** |
| 14a | Stipules < 6 mm long | **A. rupestre** subsp. **rupestre** |
| 14b | Stipules > 6 mm long | 15 |
| 15a | Bracts < 4 mm long; bracteoles minute | **A. lotoides** |
| 15b | Bracts > 6 mm long; bracteoles 4–7 mm long | **A. marginatum** |

## **amplexicaule** (E.Mey.) Dummer

Dwarf shrub, often growing as a climber, up to 1 m high; suffruticose; clothed with scattered, long, white, patent hairs. **Leaves** trifoliolate with upright hairs; stipules distinctly leaf-like, large and connate, (1)2-tipped. **Flowers**: inflorescence subracemose, 7–9-flowered; bracts as long as, or slightly longer than calyx; peduncles short; lower lip of calyx 3-toothed; corolla yellow; Oct.–Mar. **Pods** patently hairy. Grassland.




## **argenteum** Eckl. & Zeyh.

Xeric shrub, up to 1 m high; with densely sericeous stems and petioles. **Leaves** trifoliolate; leaflets obovate, sometimes slightly dimorphic. **Flowers**: solitary, sessile; corolla yellow fading to reddish brown with age; mainly Apr. **Pods** appressed-hairy. Karroid scrub, dry grassland.




## **campicola** Harms

Perennial herb, up to 300 mm high. **Leaves** trifoliolate; leaflets obovate to elliptic, pilose on both surfaces; stipules leaf-like, fused in lower half. **Flowers**: solitary, initially terminal, but becoming leaf-opposed; pedunculate; bracts shorter than calyx; corolla bright yellow fading to reddish brown with age; Sep.–Feb. **Pods** sparsely pilose. Grassland, often in rocky or dry areas.



**candicans** Eckl. & Zeyh.

*A. summomontanum* Hilliard & B.L.Burtt

Perennial herb, 0.1–0.3 m high. **Leaves** with blade prominently ovate, apex acuminate; leaflets small, strongly conduplicate; stipules 2, often larger than leaflets. **Flowers**: inflorescence subsessile; bracts shorter than calyx; corolla bright yellow; Jun.–Dec. **Pods** turgid. Grassland.

MsGr

**harveyanum** Oliv.

*A. uniflorum* Harv.

Perennial herb from tuberous rootstock, up to 300 mm high; slender. **Leaves** trifoliolate, dimorphic with upper leaflets filiform; leaflets appressed pubescent; stipules decurrent on stem as a ridge. **Flowers**: inflorescence leaf-opposed, sessile or very shortly pedunculate, 1- or 2-flowered; corolla bright yellow; Sep.–Feb. **Pods** compressed, pubescent. Grassland, woodland. *Tsoetla-e-kholo* (SS).

DrGr MsGr

**lotoides** Harv.

Perennial herb, displaying considerable variation, up to 0.25 m high. **Leaves** trifoliolate, velvety hairy abaxially; stipules leaf-like, ovate, > 6 mm long. **Flowers**: peduncle longer than petioles, 1–3-flowered; bracts < 4 mm long, bracteoles minute; calyx hairy; corolla bright yellow; Dec.–Feb. **Pods** hairy. Grassland, often moist places.

DrGr MsGr

**marginatum** Bolus

Perennial herb, 0.1–1.8 m high; robust. **Leaves** trifoliolate; leaflets with lower surface veins obscure; stipules foliaceous, broadly narrowly ovate, often distinctly partially fused, > 6 mm long. **Flowers**: inflorescence a well-developed, many-flowered, congested, terminal raceme; bracts > 6 mm long, bracteoles 4–7 mm long; corolla bright yellow, young flowers with corolla uniformly yellow, sometimes becoming reddish brown with age; Nov.–Feb. **Pods** densely hairy. Grassland, often moist places.

MsGr

**molle** Eckl. & Zeyh.

Perennial herb, up to 0.2 m high. **Leaves** trifoliolate; leaflets with broadly obovate-oblong blades, lower surfaces prominently veined; stipules linear or subulate, longer than petioles. **Flowers**: peduncles longer than leaves; umbellately 3–5-flowered; corolla with standard silky, yellow; Aug.–Feb. **Pods** densely hairy. Rocky grasslands.

DrGr

**nigrescens** Dummer

Short, stoloniferous herb, up to 200 mm high; forming low density, clonal patches, up to 1 m in diameter; with robust tap roots. **Leaves** trifoliolate, monomorphic, leaflets linear. **Flowers**: inflorescence leaf-opposed, sessile or very shortly pedunculate, 1- or 2-flowered; corolla bright yellow; Sep.–Feb. **Pods** straight, narrow, sparsely pubescent. Moist grassland.

MsGr

**pauciflorum** Eckl. & Zeyh.

Perennial herb, up to 0.45 m high; densely silky with long, soft hairs; decumbent. **Leaves** trifoliolate with long petioles, dimorphic with upper leaflets filiform, silky and pilose. **Flowers**: peduncles 1- or 2-flowered, longer than leaf; corolla with standard silky, yellow; Sep.–Mar. **Pods** silky. Rocky and moist grassland, savanna.

DrGr MsGr KarSh

**robustum** T.J.Edwards

Perennial herb, up to 0.4 m high; erect, robust. **Leaves** trifoliolate, strongly dimorphic with basal leaves up to 500 mm long; stipules large, ovate. **Flowers**: in erect, many-flowered racemes, terminal and axillary; corolla bright yellow with red veins; Aug.–Dec. **Pods** erect, conspicuously black. Grassland in highlands.

MsGr

**rupestre** (E.Mey.) Walp. subsp. **rupestre**

Perennial herb, up to 0.2 m high; decumbent or scandent. **Leaves** trifoliolate with relatively long petioles; leaflets with lower surface veins obscure; stipules < 6 mm long. **Flowers**: inflorescences usually 1- or 2-flowered, with short weak peduncles; calyx with a dense spreading indumentum obscuring surface; corolla with standard densely pubescent, yellow, becoming reddish brown; Sep.–Feb. **Pods** silky. Grassland, usually among rocks, common in highlands.

MsGr

**stipulaceum** Eckl. & Zeyh.

Geophytic herb, up to 300 mm high, densely silky-villous. **Leaves** trifoliolate with leaflets elliptic-oblong or cuneate, lower surface veins obscure; stipules broad, ovate, as large as or larger than leaflets, much longer than short petioles. **Flowers**: peduncles short, subumbellately 1–5-flowered; standard and calyx densely silky; corolla dull yellow; Sep.–Jan. **Pods** inflated, densely silky. Grassland, woodland.

MsGr

**tuberosum** Eckl. & Zeyh.
*A. angustifolium* Eckl. & Zeyh.

Herbaceous, geophytic herb, up to 0.9 m high. **Stems** slender, poorly branched. **Leaves** trifoliolate, dimorphic or monomorphic with lower leaflets narrowly elliptic, upper leaflets narrowly ovate to linear, lower surface veins obscure; petioles of upper leaves shorter than stipules. **Flowers**: inflorescence mostly leaf-opposed; standard brown behind, yellow in front; wings at base yellow, distinctly reddish brown, keel yellow; Oct.–Mar. **Pods** appressed-hairy. Grassland, woodland. *Lekolomache*, *lebesa* (SS); *uvemvane olubomvu* (Z).

DrGr MsGr

## **Caesalpinia** L. (sthn Afr.: 8 spp.)

***gilliesii** (Wall. ex Hook.) Benth.
*Poinciana gilliesii* Wall. ex Hook.

Woody shrub, up to 5 m high; stalked glands covering young stems and inflorescences; unarmed. **Leaves** bipinnate; blade 60–200 mm long, pinna pairs 7–15 opposite, subopposite or

alternate, 7–12 leaflet pairs per pinna, leaflet blade elliptic-oblong, 2–8 × 1.0–2.5 mm. **Flowers**: in terminal racemes; stamens 50–105 mm long, scarlet; petals 17–32 mm long, yellow; Oct.–Dec. **Pods** light brown, compressed, pubescent, glandular when young, becoming glabrescent with age, dehiscent. Dry grassland, bush clumps. Native to South America.

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| | AcGr | DrGr | | | |

## **Calpurnia** E.Mey. (sthn Afr.: 7 spp.)

### Key to species:

[after Beaumont *et al*.: 9 (1999)]

1a Inflorescence a panicle . . . . . .**C. sericea**
1b Inflorescence a raceme . . . . . 2
2a Calyx lobes reflexed; filament bases densely hairy . . . . . **C. reflexus**
2b Calyx lobes straight; filament bases glabrous . . . . . **C. aurea** subsp. **aurea**

### **aurea** (Aiton) Benth. subsp. **aurea**

Shrub or slender tree, up to 15 m high. **Leaves** with blade 40–250 mm long; leaflets 8–30, 10–55 × 5–25 mm. **Flowers**: in a pendulous raceme, 40–250 mm long, 8–40-flowered; bracts broadly triangular; hypanthium 2–5 mm long; filament bases glabrous; calyx lobes straight; corolla yellow; Sep.–Feb. **Pods** 40–140 × 9–23 mm. Grassland, forest margins.

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### **reflexus** A.J.Beaumont

Shrub or small tree, up to 4 m high. **Leaves** with blade 30–100 mm long; leaflets 4–12, 4–40 × 4–20 mm. **Flowers**: in a raceme, 40–80 mm long, 10–30-flowered; bracts narrowly ovate-triangular; hypanthium 1–2 mm long; filament bases densely hairy; calyx lobes reflexed; corolla bright yellow; Oct.–Jan. **Pods** 30–45 × 8–10 mm (immature). Grassland, mountainsides.

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### **sericea** Harv.

*C. mucronulata* Harms ex Kuntze
*C. obovata* Schinz

Shrub, up to 1 m high; appressed silky in all parts. **Leaves** with blade 30–150 mm long; leaflets 8–24, 3–25 × 3–17 mm. **Flowers**: in a panicle, 30–200 mm long, 10–100-flowered; bracts oblong-ovate to triangular; hypanthium 1.0–1.5 mm long; calyx lobes straight; filaments glabrous; corolla < 10 mm long when dried, yellow; Nov.–Apr. **Pods** 20–50 × 5–9 mm. Riverbanks, streambanks. *Mountain wild laburnum*; *berg-geelkeur* (A); *tloele* (SS).

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## **Chamaecrista** Moench (sthn Afr.: 8 spp.)

### Key to species:

[after Gordon-Gray: 70 (1977)]

1a Leaf rachis crested adaxially . . . . . **C. mimosoides**
1b Leaf rachis channelled adaxially . . . . . 2

2a Petiolar gland sessile, projecting from petioles . . . . . **C. stricta**
2b Petiolar gland stalked or subsessile . . . . . 3
3a Petals 4–8 mm long . . . . . **C. biensis**
3b Petals 9–17 mm long . . . . . **C. capensis**

## **biensis** (Steyaert) Lock

*Cassia biensis* (Steyaert) Mendonça & Torre
*Cassia katangensis* (Ghesq.) Steyaert var. *biensis* Steyaert

Perennial herb, up to 0.45 m high. **Stems** with several procumbent or decumbent, occasionally semi-erect to erect. **Leaves** with blade linear or oblong-linear, 25–44 × 7–15 mm, leaflets in 13–24 pairs, obliquely linear, 4–10 × 0.7–1.8 mm; petiolar gland subsessile or raised on an indistinct stalk; rachis channelled adaxially. **Flowers**: inflorescence 1-flowered; petals 4–8 mm long, bright yellow; Oct.–Apr. **Pods** 30–45 × 4–5 mm. Grassland, sandy soil.

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## **capensis** (Thunb.) E.Mey.

*Cassia capensis* Thunb.

Perennial herb, up to 0.9 m high. **Stems** several from a woody rootstock, procumbent to erect, ridged. **Leaves** with blade linear or oblong-linear, 17–52 × 7–18, leaflets 10–24 pairs, obliquely-linear, 4–14 × 1.2–2.8 mm; petiolar gland subsessile or raised on an indistinct stalk; rachis channelled adaxially. **Flowers**: inflorescence 2–5-flowered; petals 9–17 mm long, bright yellow; Nov.–Mar. **Pods** 30–50 × 3–6 mm. Grassland.

| | | | MsGr | | |
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## **mimosoides** (L.) Greene

*Cassia mimosoides* L.

Annual or short-lived, perennial herb, up to 0.75 m high. **Stems** erect, slender, rootstock absent. **Leaves** with blade linear, 40–80 × 3–12 mm, leaflets in 35–65 pairs, linear, 3–8 × 0.3–1.3 mm; petiolar gland variable, either sessile or subsessile; rachis crested adaxially. **Flowers**: inflorescence 1–3-flowered; petals 5–7 mm long, pale cream-coloured or yellow to bright yellow; Jan.–Mar. **Pods** 35–45 × 3–4 mm. Grassland, may become a weed of disturbed areas. *Boesmanstee* (A); *umnyama*, *unobothungwana* (X); *imbubu*, *umbosinela* (Z).

| | AcGr | DrGr | | | |
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## **stricta** E.Mey.

*Cassia quarrei* (Ghesq.) Steyaert
*Cassia stricta* (E. Mey.) Steud.

Annual herb, up to 0.9 m high. **Stems** erect, rootstock absent. **Leaves** with blade linear to linear-oblong, 40–70 × 8–15 mm, leaflets in 20–37 pairs, linear-oblong, 4–10 × 0.9–2.3 mm; petiolar gland sessile, projecting from petioles; rachis channelled adaxially with margins of channel ciliate. **Flowers**: inflorescences 1–4-flowered; petals pale yellow; Dec.–Mar. **Pods** 30–60 × 4.0–5.5 mm. Grassland.

| VreDm | | | | | |
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## **Crotalaria** L. (sthn Afr.: 65 spp.)

### Key to species:

[after Polhill: 63 (1982)]

1a Leaves 1-foliolate or simple . . . . . 2
1b Leaves 3(–5)-foliolate . . . . . 3
2a Petioles and pedicels up to 6 mm long; branches persistently finely pubescent . . . . . **C. virgultalis**
2b Petioles and pedicels > 6 mm long; branches glabrous except on young parts . . . . . **C. orientalis** subsp. **orientalis**
3a Beak of keel spirally twisted . . . . . 4
3b Beak of keel untwisted or circumflexed no > 90° . . . . . 7
4a Inflorescences all or partly (then inflorescences of 2 distinct types) 1–6-flowered on short determinate axes ending in a spine or bristle . . . . . 5
4b Inflorescences elongate indeterminate racemes ending in a bud . . . . . 6
5a Inflorescences not markedly dimorphic, tips bluntly pungent to spiny; pod 2–4-seeded. . . . . **C. griquensis**
5b Inflorescences of 2 sorts, primary racemes leaf-opposed, 3–8-flowered, supplementary inflorescences 1- or 2-flowered on a filiform axis, 10–20 mm long from near base of short shoots, ending in a bristle; pod 6–10-seeded . . . . . **C. virgulata** subsp. **grantiana**
6a Stems many, erect from a woody rootstock. . . . . **C. brachycarpa**
6b Stems single from a taproot . . . . . **C. distans** subsp. **distans**
7a Calyx as long as or nearly as long as keel . . . . . **C. burkeana**
7b Calyx ± half as long as keel . . . . . **C. sphaerocarpa** subsp. **sphaerocarpa**

### **brachycarpa** (Benth.) Burtt Davy ex I.Verd.

Annual, occasionally perennial herb, up to 0.5 m high. **Stems** erect, many from a woody rootstock. **Leaves** trifoliolate; leaflets narrowly obovate or narrowly elliptic to obovate, 8–20 × 3–8 mm. **Flowers**: in racemes 50–100 mm long, subdensely 16–24-flowered, ending in a bud; beak of keel spirally twisted; corolla bright yellow; Nov., Dec. **Pods** subglobose, 5–7 × 4–5 mm. Grassland, bush clumps.

VreDm

### **burkeana** Benth.

*C. burkeana* Benth. var. *sparsipila* Harv.

Perennial herb, up to 0.7 m high. **Stems** erect or decumbent from a woody rootstock. **Leaves** 3–5-foliolate, leaflets narrowly linear-ovate to narrowly ovate, 25–55 × 4–16 mm. **Flowers**: in lax racemes, 5–12-flowered; calyx as long as or nearly as long as keel; corolla pale lemon-yellow or white with purple or red veins; Oct.–May. **Pods** broadly oblong-clavate, 40–55 mm long. Wooded grassland. *Rattle bush*, *stiffsickness crotalaria*; *klapperbossie*, *stywesiektebossie* (A).

DrGr

### **distans** Benth. subsp. **distans**

Annual herb, up to 0.6 m high. **Stems** single, from a taproot, erect or often rather spreading, **Leaves** trifoliolate; leaflets linear to narrowly oblong-obovate or oblong-elliptic, 15–65 × 3–15 mm. **Flowers**: in racemes 60–300 mm long, 8–16-flowered, ending in a bud; beak of keel spirally twisted; corolla yellow; Feb.–Apr. **Pods** oblong-ellipsoid, scarcely broadened apically,

12–16 × 6–8 mm. Wooded and open grassland, sometimes in damp places. *Vuurbossie* (A); *thotsana*, *mookana* (SS).

DrGr MsGr

## **griquensis** L.Bolus

Dwarf shrub, up to 400 mm high; branchlets densely white appressed puberulous. **Leaves** trifoliolate; leaflets narrowly obovate to obovate, 5–10 × 1.5–4.0 mm. **Flowers**: (2–)4–6 on ± bluntly pungent to spiny, leaf-opposed axes; inflorescences not markedly dimorphic, branching divaricately; beak of keel spirally twisted; corolla yellow; Jan.–Mar. **Pods** ellipsoid to subglobose, appressed puberulous, 5–8 × 4.5–6.0 mm, 2–4-seeded. Grassland, bush clumps.

AcGr

## **orientalis** Burtt Davy ex I.Verd. subsp. **orientalis**

Erect, virgate herb, up to 1 m high; with branches glabrous except on young parts. **Leaves** 1-foliolate; leaflets linear to narrowly linear-ovate or narrowly linear-obovate, 7–50 × 0.8–2.5 mm; petioles and pedicels > 6 mm long. **Flowers**: in lax racemes, 6–12-flowered; corolla yellow; Jan. **Pods** oblong-ellipsoid to shortly cylindrical, 10–16 × 6–7 mm, glabrous. Grassland. *Besembossie* (A).

DrGr

## **sphaerocarpa** Perr. ex DC. subsp. **sphaerocarpa**

*C. nubica* Benth.

Annual herb, up to 1 m high. **Stems** erect. **Leaves** trifoliolate; leaflets very variable, mostly 20–60 × 2–20 mm. **Flowers**: in lax racemes, 12–many-flowered; calyx ± half as long as keel; corolla yellow; Oct.–Apr. **Pods** oblong-ellipsoid, 5–7 × 3.5–4.5 mm. Disturbed woodland, grassland, riverbanks. *Mealie crotalaria*, *wild lucerne*; *mielie crotalaria* (A).

AcGr DrGr

## **virgulata** Klotzsch subsp. **grantiana** (Harv.) Polhill

*C. grantiana* Harv.

Annual or short-lived, perennial herb, up to 1.8 m high; hairs whitish. **Stems** decumbent to erect. **Leaves** trifoliolate; leaflets narrowly obovate to elliptic-obovate, 5–20 × 2–8 mm. **Flowers**: in primary racemes, 3–8-flowered; supplementary inflorescences 1- or 2-flowered on a filiform axis, 10–20 mm long from near base of short shoots, ending in a bristle; beak of keel spirally twisted; corolla yellow; Oct.–Apr. **Pods** ± oblong-obovoid, 8–16 × 5–9 mm, 6–10-seeded. Grassland, riverbanks.

VreDm DrGr MsGr

## **virgultalis** Burch. ex DC.

Erect, virgate shrub, up to 1.5 m high, with ribbed, finely pubescent branches. **Leaves** 1-foliolate; leaflets linear, mostly 30(–40) × (1.5–)2.5–4.0 mm; petioles and pedicels up to 6 mm long. **Flowers**: in lax racemes, 6–16-flowered; standard whitish, lined reddish brown to purple; wings yellow; keel with a long straight beak, darker coloured at tip; Sep.–Mar. **Pods** oblong-ellipsoid to shortly cylindrical, 12–16 × 5–8 mm. Sandy flats, dry grassland.

DrGr

## **Cullen** Medik. (sthn Afr.: 4 spp.)

### **tomentosum** (Thunb.) J.W.Grimes

Perennial herb. **Stems** procumbent, branches up to 1 m long. **Leaves** of lateral branches usually smaller than primary leaves; trifoliolate; leaflet blade obovate, margins dentate; stipules triangular. **Flowers**: small, corolla 5.5–7.5 mm long, pink; flowering and fruiting all year round following sufficient rains. **Pods** elliptic with dense white hairs, base of style persistent as a beak, up to 0.5 mm long. Grassland, dry areas, riverbanks, often disturbed places.

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## **Dalbergia** L.f. (sthn Afr.: 7 spp.)

### ***sissoo** Roxb. ex DC.

Shrub or small tree, up to 5 m high. **Leaves** with 3–5 leaflets; leaflets ovate to nearly orbicular, 40–55 × 30–40 mm, apex abruptly acuminate. **Flowers**: in rather lax, axillary panicles, 100–150 mm long; calyx and peduncles sparsely pubescent; standard 9 mm long, longer than other petals; corolla pale yellow; Oct. **Pods** glabrescent, 60–70 × 8 mm. Sandveld, disturbed places. Native to India. *Sissoo*.

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## **Dichilus** DC. (sthn Afr.: 5 spp.)

### Key to species:

[after Schutte & Van Wyk: 182 (1988)]

1a Inflorescence terminal on lateral branches; peduncles with leaves at their bases; stipules absent . . . . . **D. strictus**
1b Inflorescence leaf-opposed on lateral branches; peduncles leafless; stipules present . . . . . 2
2a Leaves of flowering branches opposite . . . . . **D. gracilis**
2b Leaves of flowering branches alternate . . . . . **D. lebeckioides**

### **gracilis** Eckl. & Zeyh.

Dwarf shrub or perennial herb, up to 1 m high; erect, many stemmed. **Leaves** trifoliolate; leaflets obovate, minutely pubescent; stipules always present. **Flowers**: inflorescence 1-flowered, leaf-opposed on lateral branches, leaves of flowering branches opposite; peduncles leafless; calyx relatively long (at least half length of keel), deeply bilabiate; corolla yellow; Apr.–Nov. **Pods** broadly linear, 4.0–5.5 mm in diameter. Grassland, streambanks.

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### **lebeckioides** DC.

Dwarf shrub or perennial herb, up to 1.5 m high; many stemmed, erect. **Leaves** trifoliolate; leaflets narrowly obovate; appressed-pubescent; stipules present. **Flowers**: inflorescence 1- or 2(–4)-flowered, leaf-opposed on lateral branches, leaves of flowering branches alternate;

peduncles leafless; calyx relatively long (at least half length of keel), deeply bilabiate; corolla yellow; Oct.–Apr. **Pods** linear, 3–4 mm in diameter. Grassland, vleis, riverbanks. *Silver bullet*; *wildelusern*, *geellusern* (A).

DrGr MsGr

### **strictus** E.Mey.

Shrub, dwarf shrub or perennial herb, up to 2 m high. **Leaves** 3–5-digitate; leaflets narrowly obovate, appressed-pubescent; stipules 0. **Flowers**: inflorescence 2–5(–10)-flowered, terminal on lateral branches; peduncles with leaves at their bases; calyx short (< half length of keel), with short, acute lobes; corolla with standard pubescent at apex, yellow; Nov.–Mar. **Pods** linear, 2.5–4.0 mm in diameter. Grassland, streambanks.

DrGr MsGr

## **Dolichos** L. (sthn Afr.: 13 spp.)

### Key to species:

[after Harvey: 243 (1862)]

1a Plants robust; leaflets large, at least 40 mm wide, but usually much wider . . . . . **D. pratensis**
1b Plants gracile; leaflets small, long and narrow, never > 20 mm wide. . . . . 2
2a Leaflets short and broad, 32–77 × 10–20 mm . . . . . **D. linearis**
2b Leaflets long and narrow, 50–100 × 2–6 mm. . . . . **D. angustifolius**

### **angustifolius** Eckl. & Zeyh.

Suffrutex, with herbaceous aerial parts, up to 0.6 m high, sparsely branched. **Leaves** trifoliolate; leaflets narrowly linear-ovate, complicate, 50–100 × 2–6 mm. **Flowers**: corolla bright pink or mauve; Aug.–Apr. **Pods** 4–6 mm broad, subacute. Grassland, bush clumps. *Wilde-ertjie* (A).

DrGr MsGr

### **linearis** E.Mey.

Perennial herb, up to 0.5 m high; twining, sparsely branched. **Leaves** trifoliolate; leaflets linear or narrowly ovate, those of lower leaves often broadly ovate, not complicate, 32–77 × 10–20 mm. **Flowers**: corolla bright pink or mauve; Nov.–Jan. **Pods** > 6 mm broad, blunt. Grassland, bush clumps. *Wilde-ertjie* (A).

DrGr MsGr Zastr

### **pratensis** (E.Mey.) Taub.

Perennial herb, up to 1.5 m high; robust, twining. **Leaves** trifoliolate; leaflets slightly lobed, lateral leaflets asymmetric, terminal leaflet 45–55 × 40–45 mm, base cuneate. **Flowers**: corolla bright pink or mauve; Nov. **Pods** at least 10 mm broad, somewhat falcate. Grassland, bush clumps.

DrGr MsGr

## **Elephantorrhiza** Benth. (sthn Afr.: 9 spp.)

### **elephantina** (Burch.) Skeels

*Acacia elephantina* Burch.
*E. burchellii* Benth.

Suffrutex, up to 0.75 m high. **Leaves** with 8–17 pinnae pairs per leaf; leaflets 12–45 pairs per pinna, linear to linear-oblong, 0.5–2.0(–2.5) mm wide. **Flowers**: in an axillary, solitary or clustered raceme; corolla yellowish white; Sep.–Nov. **Pods** oblong, 95–150 × 30–57 mm, dark brown. Grassland, sandy soil. *Elephant's root*, *eland's wattle*; *elandsboontjie*, *looiersboontjie* (A); *mositsane* (SS); *intolwane* (X); *ugweje* (Z).

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## **Eriosema** (DC.) G.Don (sthn Afr.: 36 spp.)

### Key to species:

[after Burtt Davy: 411 (1932)]

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| 1a | Leaflets distinctly silky white below | **E. salignum** |
| 1b | Leaflets not silky white below | 2 |
| 2a | Leaflets large, up to twice as long as broad | 3 |
| 2b | Leaflets smaller, obovate, > twice as long as broad | 4 |
| 3a | Stipules connate; leaves mostly trifoliolate | **E. cordatum** |
| 3b | Stipules free; leaves mostly unifoliolate | **E. lucipetum** |
| 4a | High, slender plants; stems distinctly ribbed; hairs on calyx and back of standard petal grey-white | **E. kraussianum** |
| 4b | Short, stocky plants; stems not ribbed; hairs on calyx and back of standard petal yellow | **E. simulans** |

### **cordatum** E.Mey.

Perennial herb, up to 0.6 m high. **Stems** procumbent, densely pubescent with spreading hairs. **Leaves** (1–)3-foliolate; leaflets large, up to twice as long as broad; stipules connate. **Flowers**: corolla yellow and red or brown; Sep.–Jan. **Pods** ± 20 mm long, densely hairy. Grassland, rocky hillsides. *Leshetla*, *setloli-se-sehola* (SS); *uqontsi*, *umhlabankunzi* (Z).

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### **kraussianum** Meisn.

Perennial, slender herb, up to 400 mm high. **Stems** erect or decumbent, appressed-hairy, distinctly ribbed. **Leaves** 3-foliolate, terminal leaflet obovate to narrowly obovate, 25–50 × 7–12 mm. **Flowers**: hairs on calyx and back of standard grey-white; corolla lemon-yellow; Oct., Nov. **Pods** 10–15 mm long. Grassland, between rocks. *Pale yellow eriosema*.

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### **lucipetum** C.H.Stirt.

Perennial herb, up to 300 mm high. **Stems** erect or decumbent. **Leaves** 1(3)-foliolate, if 3-foliolate then basal leaves always 1-foliolate; leaflets ovate to obovate, up to 120 × 90 mm;

stipules free. **Flowers**: corolla yellow; Nov.–Feb. **Pods** 10–15 mm long. Grassland, rocky banks, roadsides.

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### **salignum** E.Mey.

Suffrutex, up to 0.6 m high. **Stems** erect; stems, petioles and peduncles cano-sericeous. **Leaves** 3-foliolate; leaflets linear to narrowly ovate, up to 100 mm long, upper surface green, lower surface silky white, penninerved; stipules free. **Flowers**: corolla yellow and red; Oct.–Mar. **Pods** 10–15 mm long. Grassland, sandstone hillsides. *Lesapo* (SS); *uqonsi*, *ubangalala* (Z).

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### **simulans** C.H.Stirt.

Perennial, stocky herb, up to 0.25 m high. **Stems** erect or decumbent, not ribbed; stems and peduncles with white hairs. **Leaves** 3-foliolate; leaflets obovate to narrowly obovate, up to 50 × 8 mm; stipules free. **Flowers**: hairs on calyx and back of standard yellow; corolla yellow; Oct., Nov. **Pods** 10–15 mm long. Grassland.

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## **Erythrina** L. (sthn Afr.: 11 spp.)

### Key to species:

[after Hennessy: 4 (1991)]

Calyx narrowly campanulate, distinctly 5-toothed; standard petal red; pod unarmed; seeds red . . . . . **E. zeyheri**
Calyx broadly campanulate, obscurely 5-toothed; standard petal tricoloured; pod aculeate; seeds brown . . . . . **E. acanthocarpa**

### #**acanthocarpa** E.Mey

Perennial shrub, up to 2 m high; rootstock enlarged. **Stems** succulent, much branched. **Leaves** with lateral leaflets 25–47 × 20–45 mm; terminal leaflet 30–48 × 25–55 mm. **Flowers**: inflorescence erect, appearing with leaves; calyx broadly campanulate, obscurely 5-toothed, green with purple flush; standard tricoloured, red proximally grading to yellow distally with green tip; Sep.–Jan. **Pods** subligneous, aculeate; seeds brown.

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#Introduced from the Eastern Cape by French missionaries.

### **zeyheri** Harv.

Suffrutex, up to 0.5 m high. **Stems** branched, perennial, subterranean from an enlarged rootstock, **Leaves** with lateral leaflets 40–150 × 20–170 mm; terminal leaflet 55–320 × 35–250 mm, armed with prickles on veins of upper and lower surfaces; stipules triangular. **Flowers**: peduncles longer than aerial stems; calyx narrowly campanulate, distinctly 5-toothed; corolla bright red; Oct.–Dec. **Pods** subligneous, falcate, smooth, unarmed; seeds red. Grassland. *Ploegbreker*, *kurkwortel* (A); *khungoane*, *motumo* (SS); *umnsinsana* (Z). Figure 8C, p. 4.

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## **Gleditsia** L. (sthn Afr.: 1 sp.)

### ***triacanthos** L.

Tree or shrub, up to 6 m high; armed with stout or branched spines. **Leaves** usually simply pinnate and bipinnate on same shoot; leaflets 10–35 mm long, with crenate or crenulate-denticulate margins. **Flowers**: in a slender, drooping, axillary raceme; flowers small, greenish; Sep., Oct. **Pods** 150–300 mm long, slightly falcate, twisting with age. Along riverbanks and in grassland. Native to North America. *Honey locust*, *sweet locust*; *sprinkaanboom*, *driedoringboom* (A); *leoka* (SS).

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## **Indigastrum** Jaub & Spach (sthn Afr.: 7 spp.)

### Key to species:

1a Plants procumbent, short, usually mat-forming; inflorescence very short, peduncle not exceeding subtending leaf . . . . . **I. argyraeum**
1b Plants distinctly upright, slender; inflorescence very long, peduncle much exceeding subtending leaf . . . . . 2
2a Perennial herb; stems distinctly angled; leaves usually with up to 5 leaflets; corolla reddish pink . . . . . **I. fastigiatum**
2b Annual herb; stems not distinctly angled; leaves usually with up to 9 leaflets; corolla purple . . . . . **I. costatum** subsp. **macrum**

### **argyraeum** (Eckl. & Zeyh.) Schrire

*Indigofera argyraea* Eckl. & Zeyh.

Perennial herb, up to 50 mm high. **Stems** procumbent, usually mat-forming. **Leaves** with up to 5 leaflets per leaf; terminal leaflet up to 3 mm long; lower surface of leaflets greyish tomentose. **Flowers**: inflorescence very short; peduncle not exceeding subtending leaf; petals completely glabrous; corolla bright purple; Mar. **Pods** short, straight, covered with appressed greyish hairs. Grassland. *Seeroogbossie* (A).

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### **costatum** (Guill. & Perr.) Schrire subsp. **macrum** (E.Mey.) Schrire

Annual herb, up to 0.7 m high. **Stems** erect, sometimes with procumbent branches, not distinctly angled. **Leaves** usually with 7–9 leaflets per leaf, leaflets narrowly obovate to oblong, up to 20 mm long. **Flowers**: in long-stalked inflorescences; calyx lobes 1.5–2.0 mm long; petals completely glabrous; corolla mauve; Oct.–Mar. **Pods** reflexed. Bush clumps, grassland.

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### **fastigiatum** (E.Mey.) Schrire

*Indigofera fastigiata* E.Mey.

Perennial herb, up to 0.8 m high. **Stems** erect, slender, distinctly angled. **Leaves** with up to 5 leaflets per leaf, leaflets linear, up to 30 mm long. **Flowers**: inflorescence very long; peduncle up to 150 mm long; petals completely glabrous; corolla reddish pink; Oct.–Mar. **Pods** long,

straight and narrow except for apex curving upwards. Montane and dry grassland. *Slender indigo*; *leta-laphofu*, *phehleloane* (SS); *uluhlomantethe* (Z).

DrGr MsGr

## **Indigofera** L. (sthn Afr.: 201 spp.)

### Key to species:

[after Brown: 360 (1932)]

1a Leaves with 1–3 leaflets . . . . . 2
1b Leaves pinnate with 5–many leaflets . . . . . 6
2a Plants rigid and woody; axis of racemes becoming spine-like . . . . . 3
2b Plants slender, herbaceous; spineless . . . . . 4
3a Leaves petiolate; pods terete, straight . . . . . **I. nigromontana**
3b Leaves sessile; pods flat, falcate . . . . . **I. sessilifolia**
4a Stipules large and foliar . . . . . **I. dimidiata**
4b Stipules narrowly linear . . . . . 5
5a Leaflets large, elliptic to obovate, one lateral leaflet often lacking; whole plant densely covered with soft, yellowish hairs; pods patent, slightly constricted between seeds . . . . . **I. flavicans**
5b Leaflets narrowly ovate; rigid, white hairs sparsely covering leaves and stems; pods flat, reflexed . . . . . **I. rhytidocarpa** subsp. **rhytidocarpa**
6a Young stems and leaves with gland-tipped hairs; stems with scattered sessile glands . . . . . **I. heterotricha**
6b All parts without gland-tipped hairs, however, some species with clumps of sessile glands between leaflets . . . . . 7
7a Leaves with alternating leaflets . . . . . 8
7b Leaves with opposite leaflets . . . . . 9
8a Pubescence on stems and peduncles spreading or tomentose; upright herb, sometimes with trailing stems, but never procumbent; terminal leaflet up to 12 mm long; pods up to 15 mm long . . . . . **I. daleoides** var. **daleoides**
8b Pubescence on all parts of closely appressed hairs; procumbent herb; terminal leaflet up to 10 mm long; pods up to 10 mm long . . . . . **I. alternans** var. **alternans**
9a Plant either with hairs on young stems, petioles and peduncles spreading or at least with their ends distinctly raised above surface and fixed by their base, or, if pubescence appressed, then tufts of minute glands in axils of leaflets, on upper side of petioles or in axil of petioles of some or all of the leaves . . . . 10
9b Plant with hairs on young stems, petioles and peduncles closely appressed and usually fixed by their centre, or stems and peduncles nearly glabrous; no gland tufts in axils of leaflets or petioles . . . . . 13
10a Corolla 10–15 mm long . . . . . **I. sanguinea**
10b Corolla 3–7 mm long . . . . . 11
11a Leaflets glabrous on upper surface . . . . . **I. comosa**
11b Leaflets pubescent on both surfaces . . . . . 12
12a Leaflets 10–13 mm long, with clumps of glands between them; pubescence greyish white . . . . . **I. melanadenia**
12b Leaflets 8–10 mm long, without clumps of glands; pubescence long and spreading . . . . . **I. longibarbata**
13a Young stems white or whitish from a dense appressed pubescence of white hairs . . . . . **I. torulosa** var. **angustiloba**
13b Young stems brown, green or slightly canescent, or drying blackish, never white . . . . . 14

14a Peduncles equal or shorter than leaves . . . . . 15
14b Peduncles much longer than leaves. . . . . 16
15a Leaves < 30 mm long . . . . . **I. obscura**
15b Leaves much > 30 mm, up to 90 mm long. . . . **I. cryptantha** var. **cryptantha**
16a Racemes 3–6-flowered; leaflets 0.5–1.5 mm wide; peduncles hair-like . . . . . **I. filipes**
16b Racemes > 6-flowered, if less, then leaflets > 2 mm wide; peduncles not hair-like . . . . . 17
17a Upper surface of leaflets with closely appressed, centrally affixed hairs . . . 18
17b Upper surface of leaflets glabrous or nearly so . . . . . 19
18a Peduncles below lowest scar of fallen flowers longer than petiolar axis and usually longer than entire leaf . . . . . **I. zeyheri**
18b Peduncles below lowest scar of fallen flowers shorter than leaves, often shorter than petiolar axis. . . . . **I. hilaris** var. **hilaris**
19a Peduncles below lowest scar of fallen flowers much shorter than leaves and often shorter than petiolar axis . . . . . 20
19b Peduncles below lowest scar of fallen flowers slightly to much longer than petiolar axis and mostly longer than entire leaf . . . . . 21
20a Corolla white or pink; leaves with 5–9 leaflets per leaf . . . . . **I. vicioides** var. **vicioides**
20b Corolla red . . . . . **I. evansiana**
21a Corolla 12–15 mm long; calyx lobes 1.5–3.0 mm long . . . . . **I. rostrata**
21b Corolla 8–10 mm long; calyx lobes 1.0–1.5 mm long. . . . . 22
22a Stems bearing only 1–5 racemes each . . . . . **I. hedyantha**
22b Stems bearing 9–30 racemes each . . . . . 23
23a Calyx canescent, bluntly 5-toothed; inflorescences 3–4 × as long as leaves . . . . . **I. tristis**
23b Calyx glabrous or nearly so, sharply 5-toothed; inflorescences up to twice as long as leaves. . . . . **I. frondosa**

### **alternans** DC. var. **alternans**

Perennial herb, up to 20 mm high; pubescence on all parts of closely appressed hairs. **Stems** procumbent. **Leaves** pinnate with alternating leaflets; terminal leaflet obovate, up to 10 mm long. **Flowers**: in racemes 20–25 mm long; corolla purple or pink; Dec.–Mar. **Pods** reflexed, up to 10 mm long. Bush clumps, red sandy soil, disturbed places. *Skaap-ertjie* (A).




### **comosa** N.E.Br.

Small shrub, up to 0.6 m high. **Leaves** pinnate with red clumps of glands between leaflets; leaflets with lateral ones in 7 or 8 pairs, usually folded, upper surface glabrous. **Flowers**: in 20–70 mm long racemes, exceeding leaves; bracts long; corolla 3–7 mm long, red; Aug.–Apr. **Pods** short and hairy, not reflexed. Grassland.




### **cryptantha** Benth. ex Harv. var. **cryptantha**

Dwarf shrub, up to 1 m high. **Leaves** pinnate; 40–90 mm long, leaflets narrow, 3 mm broad. **Flowers**: standard with brown hairs on back; corolla pinkish red; Nov.–Feb. **Pods** reflexed, sickle-shaped, deeply constricted between seeds. Grassland.



**daleoides** Benth. ex Harv. var. **daleoides**

*I. dodecaphylla* Ficalho & Hiern

Perennial herb, up to 400 mm high; pubescence on stems and peduncles spreading or tomentose. **Stems** erect, sometimes trailing, never procumbent. **Leaves** pinnate with alternating leaflets, greyish green, coarsely hairy; terminal leaflet up to 12 mm long. **Flowers**: inflorescence dense; corolla red; Sep.–Feb. **Pods** reflexed, up to 15 mm long. Grassland, rocky slopes, sandy soil.

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**dimidiata** Vogel ex Walp.

Perennial herb, up to 300 mm high; semi-erect, spineless, whole plant sparsely to densely pubescent. **Leaves** trifoliolate with large, foliar stipules up to 15 mm long; terminal leaflet obovate to narrowly obovate, up to 30 mm long. **Flowers**: inflorescence twice as long as leaves; corolla red; Oct.–Feb. **Pods** straight, narrow, glabrous. Grassland. *Trifoliolate indigofera*; *musa-peloa-oa-thaba*, *qoi-qoi* (SS).

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**evansiana** Burtt Davy

Perennial herb, up to 200 mm high. **Stems** procumbent, woody. **Leaves** pinnate with 11–21 leaflets per leaf; leaflets greyish, small, 5–7 mm long, 6 or 7 pairs along rachis, upper surface ± glabrous. **Flowers**: inflorescence short; peduncles below lowest scar of fallen flowers shorter than leaves and often shorter than petiolar axis; staminal sheath < 6 mm long; standard with brown hairs on back; corolla red; Nov.–Mar. **Pods** few per inflorescence, short with pointed apex. Dense grassland in vleis and other wetland areas on black clay soil.

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**filipes** Benth. ex Harv.

Dwarf shrub or perennial herb, up to 1 m high. **Leaves** pinnate; leaflets very narrow, ± 6–15 × as long as wide, 0.5–1.5 mm wide; pedicels ± 3 mm long. **Flowers**: inflorescence twice as long as leaves; peduncles hair-like, 3–6-flowered, staminal sheath < 6 mm long; standard with brown hairs on back; corolla pinkish red; Dec.–Apr. **Pods** somewhat cylindrical, sparsely covered with hairs. Grassland, woodland.

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**flavicans** Baker

Perennial herb, up to 200 mm high; densely covered with soft, yellowish hairs; spineless. **Stems** procumbent. **Leaves** trifoliolate with large leaflets, elliptic to obovate, one lateral leaflet often lacking; terminal leaflet blade elliptic, up to 55 mm long; stipules narrowly linear. **Flowers**: 35–45(–70) mm long; corolla pink or red; Nov.–Apr. **Pods** patent, up to 10 mm long, slightly constricted between seeds. Bush clumps, woodland.

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**frondosa** N.E.Br.

Perennial shrub, up to 1 m high. **Leaves** pinnate; leaflets narrowly obovate, 10–12 × 2 mm long. **Flowers**: inflorescence up to twice as long as leaves; stems bearing 9–30 racemes each; calyx

± glabrous, sharply 5-toothed; staminal sheath 7–10 mm long; standard with brown hairs on back; corolla red; Dec.–Feb. **Pods** slender, ± 25 mm long, patent to erect. Grassland, streambanks.

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**hedyantha** Eckl. & Zeyh.
*I. secunda* E.Mey.

Perennial herb, up to 400 mm high; branches many, from woody rootstock. **Leaves** pinnate; leaflets linear-oblong or sublanceolate. **Flowers**: in many-flowered racemes on long, slender peduncles; peduncles much longer than leaves; stems bearing 1–5 racemes each; calyx lobes 1.0–1.5 mm long; standard with brown hairs on back; corolla 8–10 mm long, crimson-red; Aug.–Dec. **Pods** cylindrical. Dense grassland, rocky slopes. *Black-bud indigo*; *aambeibossie* (A); *musa-pelo-oa-mafika* (SS); *ilidolo-lendoda*, *uluhlomantethe* (Z).

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**heterotricha** DC.
*I. rudis* N.E.Br.

Dwarf shrub or perennial herb, up to 400 mm high; gland-tipped hairs on stem, leaf rachis and sometimes on leaflets, hairs in between. **Stems** with scattered sessile glands. **Leaves** pinnate; leaflets small, up to 6 mm long, obovate. **Flowers**: inflorescence longer than leaves; corolla 7–9 mm long, red or pink; Nov.–Mar. **Pods** patent. Grassland.

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**hilaris** Eckl. & Zeyh. var. **hilaris**
*I. similis* N.E. Br.
*I. wentzeliana* Harms

Perennial herb, up to 300 mm high; densely hairy, with many stems from woody rootstock. **Leaves** pinnate; leaflets lanceolate-oblong or obovate, rigid, midribbed beneath, > 2 mm wide, upper surface with closely appressed, centrally affixed hairs. **Flowers**: inflorescence shorter than leaves or slightly longer; peduncles below lowest scar of fallen flowers shorter than leaves, often shorter than petiolar axis; calyx teeth longer than tube; corolla deep pink; Aug.–Dec. **Pods** patent. Grassland. *Igqokisi*, *isikhubabende* (Z).

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**longibarbata** Engl.
*I. schlechteri* Baker f.

Dwarf shrub, up to 300 mm high; hairy. **Leaves** pinnate; leaflets elliptic to obovate, 8–10 mm long, without clumps of glands, pubescence long and spreading on both surfaces. **Flowers**: corolla 3–7 mm long, red; Jan., Feb. **Pods** relatively short, hairy, reflexed. Grassland.

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**melanadenia** Benth. ex Harv.
*I. malacostachys* Benth. ex Harv.

Perennial herb, up to 1.8 m high; densely greyish white-pubescent, short-flowered. **Stems** erect, woody. **Leaves** pinnate; leaflets 10–13 × 4–6 mm, with clumps of glands between them;

pubescence white on both surfaces. **Flowers**: corolla 3–7 mm long, red; Oct.–Feb. **Pods** hairy, 6–8 mm long. Riverine bush, rocky slopes, grassland.

MsGr

**nigromontana** Eckl. & Zeyh.
*I. spinescens* E.Mey.

Shrub or dwarf shrub, up to 1.5 m high; rigid, divaricately much branched. **Leaves** trifoliolate; leaflets cuneate-oblong, obovate or linear-oblong; terminal leaflet sometimes petiolate. **Flowers**: racemes canescent, subsessile, few-flowered, axis becoming spine-like; calyx bluntly 5-toothed; corolla pubescent, reddish pink; Jul.–Sep. **Pods** terete, straight, minutely pubescent. Riverbanks, open grassland, mountain and hillsides. Figure 50.

DrGr MsGr

**obscura** N.E.Br.

Perennial herb, up to 300 mm high, with several stems from a woody rootstock. **Leaves** pinnate; < 30 mm long; leaflets narrow, up to 2 mm broad. **Flowers**: inflorescence few-flowered; pedicels long, peduncle short; standard with brown hairs on back; corolla pink; Dec., Jan. **Pods** few, up to 30 mm long, with short appressed hairs. Grassland.

AcGr DrGr MsGr

**rhytidocarpa** Benth. ex Harv. subsp. **rhytidocarpa**

Annual herb, up to 300 mm high; rigid, white hairs sparsely covering leaves and stems. **Stems** decumbent. **Leaves** trifoliolate; leaflets narrowly ovate, up to 40 mm long; stipules narrowly linear. **Flowers**: racemes spicate, subsessile, shorter than leaf; standard pubescent; corolla orange or pink; Dec.–Apr. **Pods** flat, reflexed, broad, brown, curving upwards, venation obvious. Bush clumps and lowveld, disturbed places, open grassland.

DrGr KarSh

**rostrata** Bolus

Perennial dwarf shrub or herb, up to 450 mm high. **Leaves** pinnate; leaflets narrow, 2–3 mm broad. **Flowers**: racemes long-flowered, usually at ends of branches; peduncles below lowest scar of fallen flowers much longer than leaves; calyx lobes 1.5–3.0 mm long; standard with brown hairs on back; staminal sheath 12–15 mm long; corolla 12–15 mm long, deep pink; Nov.–Jan. **Pods** up to 30 mm long. Grassland, rocky slopes.

DrGr MsGr

**sanguinea** N.E.Br.

Perennial herb, up to 0.6 m high; semi-erect. **Leaves** pinnate, with red clumps of glands between leaflets. **Flowers**: long-flowered; staminal sheath 7–10 mm long; calyx and pod with black hairs; corolla 10–15 mm long, red; Apr.–Dec. **Pods** ± 18 mm long. Grassland.

MsGr




**Figure 50.** *Indigofera nigromontana* (Fabaceae). Artist: G. Condy.

**sessilifolia** DC.
*I. falcata* E.Mey.
*I. patens* Eckl. & Zeyh.

Dwarf shrub, up to 0.5 m high; rigid, divaricately branched; twigs canescent. **Leaves** trifoliolate; sessile; leaflets cuneate-obovate, thinly silky on one or both sides. **Flowers**: racemes subsessile, few-flowered; peduncle ± spinescent, usually > 20 mm long in fruit; corolla red; Sep.–Jan. **Pods** flat, falcate, thinly pubescent; seeds often bulging. Grassland. *Boontjiekaroobossie*, *maagbossie* (A).

AcGr DrGr MsGr KarSh

**torulosa** E.Mey. var. **angustiloba** (Baker f.) J.B.Gillett

Annual herb, up to 300 mm high; young stems white or whitish from a dense appressed pubescence of white hairs. **Leaves** pinnate; leaflets oblong to elliptic-oblong. **Flowers**: racemes subspicate, when fruiting 20–60 mm long, longer than leaves; flowers minute; corolla red; Nov.–Mar. **Pods** flattened, curved upwards, mostly 3- or 4-seeded. Open, mixed thornveld, grassland.

AcGr DrGr MsGr KarSh

**tristis** E.Mey.

Dwarf shrub or perennial herb, up to 0.8 m high. **Stems** virgate, subangular, thinly strigulose. **Leaves** pinnate; leaflets cuneate-oblong, retuse. **Flowers**: inflorescences 3–4 × longer than leaves, racemes elongate, many-flowered; stems bearing 9–30 racemes each; calyx canescent, bluntly 5-toothed; petals densely silky with dark brown hairs; corolla reddish pink; Dec.–Feb. **Pods** slender, 35 × 2 mm. Grassland. *Mothimo-kholo*, *musa-pelo* (SS).

DrGr MsGr

**vicioides** Jaub. & Spach var. **vicioides**

Perennial herb, up to 0.6 m high; weedy; greyish green. **Stems** decumbent. **Leaves** pinnate with 5–9 leaflets per leaf; leaflets with short hairs never exceeding margins, upper surface ± glabrous. **Flowers**: peduncles below lowest scar of fallen flowers shorter than leaves and often shorter than petiolar axis; corolla white or pink; Dec.–Jun. **Pods** short, patent, with rounded apices, hairy. Disturbed areas, overgrazed grassland, bush clumps.

DrGr

**zeyheri** Spreng. ex Eckl. & Zeyh.
*I. acutisepala* Conrath ex Baker f.

Dwarf shrub or perennial herb, up to 1 m high. **Leaves** pinnate, greyish green, clustered along stems; leaflets > 2 mm wide, upper surface with closely appressed, centrally affixed hairs. **Flowers**: inflorescence much longer than leaves; peduncles below lowest scar of fallen flowers longer than petiolar axis and usually longer than entire leaf; pedicels 3 mm long or more; staminal sheath > 6 mm long; standard with brown hairs on back; corolla white or pink; Oct.–Mar. **Pods** straight, narrow with short appressed hairs. Grassland, clay soil. *Leeuhout* (A).

AcGr DrGr

## **Lablab** Adans. (sthn Afr.: 1 sp.)

**purpureus** (L.) Sweet subsp. **uncinatus** Verdc.
*Dolichos uncinatus* Schweinf.

Perennial, herbaceous climber. **Leaves** trifoliolate, terminal leaflet deltoid. **Flowers**: corolla mauve; Nov.–May. **Pods** obliquely oblong-falcate, beaked by style, verrucose along margins. Stony grassland, streambanks, roadsides.




## **Leobordea** Del. (sthn Afr.: 51 spp.)

*Leobordea* is here reinstated and its concept greatly broadened to include *Lotononis* sections: *Digitata*, *Leptis*, *Leobordea*, *Lipozygis* and *Synclistus*.

### Key to species:

[after Van Wyk: 95 (1991) & Boatwright *et al*.: 172–176 (2011)]

1a Leaves of flowering nodes opposite . . . . . **L. platycarpa**
1b Leaves of flowering nodes alternate . . . . . 2
2a Bracts inserted on pedicel (some distance above base); flowers 4–many per inflorescence . . . . . 3
2b Bracts inserted at base of pedicel (if slightly above base, then flowers < 4 per inflorescence) . . . . . 6
3a Bracts broadly obovate, > 4 mm wide; paired bracteoles invariably present, relatively large and conspicuous, > 2 mm long. . . . . **L. procumbens**
3b Bracts linear to narrowly lanceolate, < 1 mm wide; paired bracteoles absent . . . . . 4
4a Leaves (and flowers) not turning black when dried . . . . . **L. eriantha**
4b Leaves (and usually also flowers) turning black when dried . . . . . 5
5a Standard petal < 3 mm wide; flowering branches > 300 mm long . . . . . **L. lanceolata**
5b Standard petal > 3 mm wide; flowering branches < 200 mm long . . . . . **L. foliosa**
6a Keel petals totally glabrous . . . . . **L. divaricata**
6b Keel petals pubescent, at least with a few hairs along lower margin . . . . . 7
7a Upper surface of leaflets densely hairy . . . . . **L. adpressa** subsp. **adpressa**
7b Upper surface of leaflets sparsely pilose or glabrous . . . . . 8
8a Flowers relatively large, > 9 mm long . . . . . **L. decumbens** subsp. **rehmannii**
8b Flowers relatively small, up to 8 mm long. . . . . 9
9a Standard petal with a line of hairs along middle only; keel nearly glabrous; pods much longer than calyx . . . . . **L. mucronata**
9b Standard petal hairy for a large part of surface; keel densely hairy; pods as long or only slightly longer than calyx . . . . . **L. pusilla**

**adpressa** (N.E.Br.) B.-E.van Wyk & Boatwr. subsp. **adpressa**
*Lotononis adpressa* N.E.Br. subsp. *adpressa*

Annual, occasionally perennial herb, up to 200 mm high. **Stems** procumbent. **Leaves** trifoliolate; leaflets with upper surface densely hairy. **Flowers**: 9–10 mm long; bracteoles 0;

standard and wings as long as or shorter than keel; keel pubescent; corolla yellow; Oct.–Apr. **Pods** exceeding calyx, 9–10 mm long. Grassland, often disturbed places.

DrGr MsGr

**decumbens** (Thunb.) B.-E.van Wyk & Boatwr. subsp. **rehmannii** (Dummer) B.-E.van Wyk
*Lotononis decumbens* subsp. *rehmannii* (Dümmer) B.-E.van Wyk
*L. rehmannii* Dummer

Perennial herb, up to 200 mm high; suffrutescent, procumbent. **Leaves** trifoliolate; leaflets broadly obovate, upper surface glabrous. **Flowers**: inflorescences terminal on short lateral branches; bracteoles 0; flowers relatively large, > 9 mm long, lateral sinuses of calyx very shallow; keel pubescent; corolla longer than calyx, yellow (apex of keel purple); Dec.–May. **Pods** narrowly oblong-obovate, glabrous except near apex, 11–12 × 3.0–3.5 mm. Open grassland, at high altitudes.

DrGr

**divaricata** Eckl. & Zeyh.
*Lipozygis calycina* E.Mey.
*Lotononis calycina* (E.Mey.) Benth.
*Lotononis divaricata* (Eckl. & Zeyh.) Benth.

Dwarf shrub; scraggy, divaricately, densely branched, somewhat spiny; thinly canescent with short appressed hairs. **Leaves** trifoliolate; leaflets cuneate-oblong, appressed-pubescent, upper surface of leaflets sparsely hairy, surface of blade visible; stipules solitary, shorter than petioles. **Flowers**: peduncles 1-flowered, opposite leaves; bracteoles 0; keel obtuse or rounded, glabrous; corolla yellow and purplish blue; Oct.–Apr. **Pods** linear, narrow, softly hairy. Grassland, dry areas.

DrGr KarSh

**eriantha** (Benth.) B.-E.van Wyk & Boatwr.
*Lotononis eriantha* Benth.

Perennial herb, with annual shoots from woody rootstock, up to 300 mm high; erect. **Leaves** trifoliolate; leaflets narrowly obovate to elliptic, not turning black when dried; stipules similar to leaflets in size. **Flowers**: flowering twigs unbranched; 8 or less per inflorescence; bracts linear to narrowly lanceolate, < 1 mm wide; paired bracteoles 0; standard hairy; corolla yellow; Aug.–Feb. **Pods** spreading, shortly exserted, elliptic-oblong, glabrescent, 8–10 × 3.0–3.5 mm, few-seeded. Grassland. *Russet lotononis*; *molomo-monate*, *lefehloane* (SS).

DrGr MsGr KarSh

**foliosa** (Bolus) B.-E.van Wyk & Boatwr.
*Lotononis foliosa* Bolus

Perennial herb, with annual shoots from woody rootstock, up to 200 mm high; erect. **Leaves** trifoliolate; turning black when dried. **Flowers**: flowering branches < 200 mm long; bracts linear to narrowly lanceolate, < 1 mm wide; paired bracteoles 0; standard ± glabrous, > 3 mm wide; corolla yellow; Jul.–Mar. **Pods** glabrous, except for long hairs along sutures and apex. Grassland, often in rocky or gravelly areas. *Isisinini sentaba* (Z).

MsGr

**lanceolata** (E.Mey.) B.-E.van Wyk & Boatwr.
*Aspalathus lanceolatus* E.Mey.
*Lotononis lanceolata* (E.Mey.) Benth.

Perennial herb, with annual shoots from woody rootstock, up to 400 mm high; erect. **Leaves** trifoliolate, turning black when dried. **Flowers**: 4–many per inflorescence, turning black when dried; flowering branches > 300 mm long; bracts linear to narrowly ovate, < 1 mm wide; paired bracteoles 0; standard and keel ± glabrous, standard < 3 mm wide; corolla yellow; Oct.–Feb. **Pods** glabrous, except for long hairs along sutures and apex. Grassland.

MsGr

**mucronata** (Conrath) B.-E.van Wyk & Boatwr.
*Lotononis mucronata* Conrath

Perennial herb, forming dense mats, up to ± 50 mm high; suffrutescent; procumbent. **Leaves** trifoliolate; leaflets very small, mucronate, upper surface glabrous; stipules single at each node. **Flowers**: inflorescence terminal on short lateral branches; bracteoles 0; flowers relatively small, up to 8 mm long; calyx often reddish; standard with a line of hairs along middle only, keel nearly glabrous; corolla longer than calyx, yellow; Sep.–Mar. **Pods** broadly oblong, glabrescent, much longer than calyx. Grassland, often in rocky or sandy areas.

MsGr

**platycarpa** (Viv.) B.-E.van Wyk & Boatwr.
*Lotononis platycarpa* (Viv.) Pic-Serm.
*Lotus platycarpos* Viv.

Annual herb, up to 200 mm high; procumbent. **Leaves** of flowering twigs opposite, trifoliolate; stipules small, < 5 × 3 mm. **Flowers**: corolla yellow; Aug.–May. **Pods** included in calyx or slightly longer. Open grassland, often disturbed areas.

AcGr DrGr MsGr

**procumbens** (Bolus) B.-E.van Wyk & Boatwr.
*Lotononis procumbens* Bolus

Dwarf shrub, with annual shoots from woody base, up to 300 mm high; procumbent. **Leaves** trifoliolate, with upper surface of mature leaflets glabrous; stipules much smaller than leaflets. **Flowers**: 4–many per inflorescence; bracts congested at apex of peduncle, broadly obovate, > 4 mm wide; paired bracteoles invariably present, relatively large and conspicuous, > 2 mm long; corolla yellow; Nov.–Jan. **Pods** small, scarcely longer than calyx. Open grassland, often rocky areas.

DrGr MsGr

**pusilla** (Dummer) B.-E.van Wyk & Boatwr.
*Lotononis pusilla* Dummer

Perennial herb, very small in habit. **Leaves** trifoliolate; leaflets obovate, upper surface glabrous, lower surface hairy; stipules single at each node; leaves of vigorous shoots with petioles as long or shorter than leaflets. **Flowers**: inflorescence terminal on short lateral branches, 1–4-flowered; bracteoles 0; flowers relatively small, up to 8 mm long; standard hairy for a large part of surface, keel densely hairy; corolla pubescent, yellow; Dec.–Mar. **Pods** slightly inflated, as long or only slightly longer than calyx. Grassland, dry areas.

DrGr Zastr

## **Lessertia** DC. (sthn Afr.: 55 spp.)

*Sutherlandia* R.Br. ex Aiton f.

### Key to species:

[after Bolus: 93 (1915) & Schutte (2012)]

1a Pods suborbicular, elliptic-oblong, obliquely obovate, or obliquely obovate-oblong; usually < twice as long as broad, or very rarely slightly longer . . . . . 2
1b Pods linear or oblong, > twice as long as broad. . . . . 12
2a Pods glabrous or sparsely hairy . . . . . 3
2b Pods prominently hairy pubescent. . . . . 10
3a Pods conspicuously inflated, membranous. . . . . 4
3b Pods more or less compressed, not membranous . . . . . 6
4a Herbs up to 0.6 m, leaflets few, up to 6 pairs of leaflets. . . . . **L. depressa**
4b Shrubs up to 3 m high, up to 12 pairs of leaflets . . . . . 5
5a Mature pods 2.5–4.0 × as long as broad, upper suture forming almost a straight line with stipe . . . . . **L. frutescens** subsp. **microphylla**
5b Mature pods < 2.5 × as long as broad, upper suture either concave or convex . . . . . **L. frutescens** subsp. **frutescens**
6a Stems and leaves glabrous or with short strigose pubescence . . . . . 7
6b Stems and leaves with pubescence of long spreading hairs . . . . . 8
7a Plants rigid; stems erect . . . . . **L. stricta**
7b Plants herbaceous; stems decumbent. . . . . **L. affinis**
8a Plants herbaceous; stems decumbent. . . . . **L. capitata**
8b Plants shrubby; stems erect . . . . . 9
9a Plants thinly silky . . . . . **L. perennans** var. **perennans**
9b Plants villoso-canescent . . . . . **L. perennans** var. **polystachya**
10a Style bearded ventrally for half its length. . . . . **L. dykei**
10b Style bearded round base of stigma. . . . . .11
11a Racemes longer than leaf; stems erect . . . . . **L. perennans** var. **sericea**
11b Racemes shorter than leaf; stems procumbent. . . . . **L. prostrata**
12a Pods glabrous or only sutures ciliate with silky hairs . . . . . **L. stipulata**
12b Pods densely silky hairy . . . . . 13
13a Peduncles much longer than leaf . . . . . **L. stenoloba**
13b Peduncles much shorter than or scarcely longer than leaf. . . . . 14
14a Slender, annual herb; pod strongly arched, annular, or spirally twisted . . . . . **L. annularis**
14b Suffruticose, perennial herb; pod falcate or nearly straight . . . . . **L. pauciflora** var. **pauciflora**

### **affinis** Burtt Davy

Perennial herb, up to 300 mm high; sparsely strigose-pubescent. **Stems** decumbent. **Leaves** pinnate with 14–26 leaflets. **Flowers**: 5–7 mm long, corolla purple; Oct., Nov. **Pods** obliquely oblong, ± compressed to slightly inflated, 15 × 5 mm. Grassland.

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### **annularis** Burch.

Annual, occasionally perennial herb, up to 0.8 m high; slender. **Leaves** with 12–20 leaflets. **Flowers**: peduncles much shorter than or scarcely longer than leaf; pedicels shorter than calyx; corolla purplish red and white; Jun.–Aug. **Pods** compressed, strongly arched, annular, or spirally twisted, obtuse, mucronate, densely silky hairy. Grassland. *Krimpsiektebos* (A).

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**capitata** E.Mey.

Perennial herb, up to 250 mm high. **Stems** decumbent. **Leaves** pinnate with 14–18 leaflets, oblong, obtuse or retuse, patently pubescent on one or both sides; stipules ovate-acute. **Flowers**: raceme capitate, 5–8-flowered; peduncles much longer than leaf; calyx with black hairs; corolla purplish red and white; Jul.–Sep. **Pods** glabrous, many-seeded, ± compressed. Grassland.

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**depressa** Harv.

Perennial herb, up to 0.6 m high. **Stems** procumbent. **Leaves** 3–6-foliolate. **Flowers**: peduncles short; corolla pink; Sep.–Feb. **Pods** membranous, glabrous, conspicuously inflated. Grassland.

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**dykei** L.Bolus

Perennial herb, up to 1.2 m high. **Stems** sparsely pubescent with greyish white hairs. **Leaves** pinnate with 6–18 leaflets; leaflets upper surface glabrous, lower surface hairy; stipules small, ovate-lanceolate, 2–3 mm long. **Flowers**: style ventrally densely bearded for half its length; corolla red; Dec., Jan. **Pods** inflated, obliquely obovate-oblong, prominently hairy pubescent. Grassland.

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**frutescens** (L.) Goldblatt & J.C.Manning subsp. **frutescens**
*Sutherlandia humilis* E.Phillips & R.A.Dyer
*Sutherlandia montana* E.Phillips & R.A.Dyer

Perennial shrub, semidecumbent or upright, up to 3 m high. **Branches** slightly ridged. **Leaves** imparipinnate, greyish green; leaflets ± 18 × 5 mm. **Flowers**: in a short 2–7-flowered raceme; calyx campanulate; corolla 28–52 mm long, bright red; Sep., Oct. **Pods** when mature < 2.5 × as long as broad, membranous, inflated, upper suture either concave or convex. Grassland, often in disturbed areas, like roadsides. *Camphor bush*, *balloon pea*, *cancer bush*; *kankerbossie*, *kalkoenbelletjiebos*, *Jantjie-bêrend*, *gansbossie* (A).

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**frutescens** (L.) Goldblatt & J.C.Manning subsp. **microphylla** (Burch. ex DC.) J.C.Manning & Boatwr.
*L. microphylla* (Burch. ex DC.) Goldblatt & J.C.Manning
*Sutherlandia microphylla* Burch. ex DC.

Shrub, up to 1.3 m high. **Branches** often strigose when young, becoming smooth and hard. **Leaves** imparipinnate; leaflets alternate, 8–10 on either side of rachis, 50–190 mm long. **Flowers**: in a raceme, 2–8-flowered; corolla 25–37 mm long, bright red; Jun.–Mar. **Pods** when mature 2.5–4.0 × as long as broad, membranous, inflated, upper suture forming almost a straight line with stipe. Bush clumps and grassland. *Bitterblaar*, *grootgansies*, *grootkankerbos* (A).

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**pauciflora** Harv. var. **pauciflora**

Perennial herb, up to 1.2 m high; suffruticose, many stemmed. **Stems** erect or procumbent. **Leaves** with distally 16–24 leaflets; leaflets with involute margins. **Flowers**: peduncles shorter than leaves; corolla purple; Feb. **Pods** compressed, linear, 3–4 × as long as broad, obtuse, mucronate, falcate or nearly straight, densely silky hairy. Grassland.

AcGr DrGr MsGr KarSh

**perennans** (Jacq.) DC. var. **perennans**

Dwarf shrub or perennial herb, up to 1.6 m high; thinly silky with soft, appressed, whitish hairs. **Stems** erect. **Branches** long and virgate. **Leaves** 40–75 mm long; leaflets 3–10 on each side of rachis, opposite or subopposite. **Flowers**: corolla mauve-pink or red; Jan. **Pods** obliquely obovate, subcompressed, glabrous. Riverbanks. *Blaasertjie* (A); *musa-pelo* (SS).

DrGr MsGr

**perennans** (Jacq.) DC. var. **polystachya** (Harv.) L.Bolus

*L. polystachya* Harv.

Dwarf shrub or perennial herb, up to 1.5 m high; densely villous with soft, white, loose hairs. **Stems** erect. **Branches** long and virgate. **Leaves** 40–75 mm long; leaflets 3–10 on each side of rachis, opposite or subopposite. **Flowers**: corolla mauve-pink or red; Dec., Jan. **Pods** obliquely obovate, subcompressed, glabrous. Riverbanks.

MsGr

**perennans** (Jacq.) DC. var. **sericea** L.Bolus

Dwarf shrub, up to 1.5 m high; silvery hairy. **Stems** erect. **Leaves** 40–75 mm long; leaflets 3–10 on each side of rachis, opposite or subopposite. **Flowers**: racemes longer than leaf; style bearded round base of stigma; corolla scarlet, mauve or white; Dec. **Pods** obliquely obovate, softly hairy, subcompressed.

MsGr

**prostrata** DC.

*Colutea prostrata* Thunb.

Perennial herb, sparsely hispid. **Stems** procumbent. **Leaves** pinnate with linear-lanceolate, 8–12 leaflets, upper surface glabrous, lower surface sparsely hispid. **Flowers**: racemes shorter than leaf, 2- or 3-flowered; peduncles much shorter than subtending leaves; style bearded round base of stigma; calyx with black hairs; corolla purplish pink; Nov.–Apr. **Pods** inflated, pubescent. Grassland.

DrGr

**stenoloba** E.Mey.

Perennial herb, up to 300 mm high; erect or diffuse. **Leaves** with 5–10 pairs of leaflets; leaflets linear-oblong or narrowly ovate. **Flowers**: inflorescence shortly racemose at summit, 10–30-flowered; peduncles much longer than subtending leaves, 25–120 mm; May–Dec. **Pods** linear, obtuse, 46 × 9 mm, densely silky hairy, many seeded. Dry grassland.

DrGr

**stipulata** Baker f.

Dwarf shrub. **Stems** sparsely pubescent with greyish white hairs. **Leaves** pinnate with 16–24 leaflets; leaflets opposite with mucronate apices; stipules large, ovate. **Flowers**: bracts linear; raceme 12–20-flowered; corolla purple; Aug., Sep. **Pods** linear or oblong, compressed, glabrous or only sutures ciliate with silky hairs. Grassland.

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**stricta** L.Bolus

Perennial herb, up to 1 m high, rigid. **Stems** erect, prominently ribbed, glabrous. **Leaves** 40–75 mm long, with 4–8 pairs of leaflets, glabrous. **Flowers**: inflorescence loosely racemose, 10–20-flowered; peduncle much longer than leaves, 55–95 mm long; Dec.–Mar. **Pods** obliquely obovate-oblong, 20–30 mm long, slightly falcate, glabrous. Grassland, wetland areas. *Blaasertjie* (A).

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## **Listia** E.Mey. (sthn Afr.: 7 spp.)

The concept of *Listia* proposed here conforms to that of *Lotononis* sect. *Listia* subsect. *Listia* described by Van Wyk (1991), which includes seven species.

### Key to species:

[after Van Wyk: 95 (1991), Boatwright *et al*.: 171 (2011)]

Flowers 8–10 mm long; calyx 4–6 mm long; leaves and calyx pubescent; pod folded like a concertina, pubescent all over . . . . . **L. subulata**
Flowers up to 8 mm long; calyx up to 3.5 mm long; leaves and calyx ± glabrous; pod not folded like a concertina, ± glabrous . . . . . **L. marlothii**

**marlothii** (Engl.) B.-E.van Wyk & Boatwr.
*Lotononis marlothii* Engl.

Procumbent, herbaceous perennial, up to 250 mm high. **Leaves** trifoliolate, glabrous. **Flowers**: bracteoles present; petals up to 8 mm long; calyx with lobes long and narrow, up to 3.5 mm long, glabrous; corolla yellow with prominent veins on standard; Jan.–Oct. **Pods** very small, slightly sickle-shaped, not folded like a concertina, ± glabrous. Grassland, seasonally wet areas in very dry habitats. *Pan-ertjie* (A).

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**subulata** (B.-E.van Wyk) B.-E.van Wyk & Boatwr.
*Lotononis subulata* B.-E.van Wyk

Perennial herb; suffrutescent, often rooting at nodes; procumbent, up to 100 mm high. **Leaves** trifoliolate, pubescent. **Flowers**: up to 4 per inflorescence, 8–10 mm long; bracteoles present; calyx pubescent, lateral lobes long and narrow, 4–6 mm long; corolla yellow; Sep.–Mar. **Pods** folded like a concertina, distinctly pubescent all over. Disturbed riverbanks.

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## **Lotononis** (DC.) Eckl. & Zeyh. (sthn Afr.: 84 spp.)

### Key to species:

[after Van Wyk: 95 (1991), Boatwright *et al*.: 161 (2011)]

| | | |
|---|---|---|
| 1a | Bracteoles present | **L. listii** |
| 1b | Bracteoles absent | 2 |
| 2a | Standard and wing petals much longer than keel | 3 |
| 2b | Standard and wing petals as long as or shorter than keel | 4 |
| 3a | Wing and keel petals glabrous | **L. lotononoides** |
| 3b | Wing and keel petals pubescent | **L. pulchella** |
| 4a | Keel acute or somewhat beaked | 5 |
| 4b | Keel obtuse or rounded | 10 |
| 5a | Basal leaves opposite | **L. lenticula** |
| 5b | Basal leaves alternate | 6 |
| 6a | Pods oblong, much longer than calyx | **L. laxa** |
| 6b | Pods short and ovate, scarcely longer than calyx | 7 |
| 7a | Stems brittle; pods circular in transverse section; hairs on pods neatly orientated; seeds > 15 per pod, on exceptionally long funicles | **L. sparsiflora** |
| 7b | Stems not brittle; pods oval in transverse section; hairs on pods not neatly orientated; seeds < 15 per pod, on relatively short funicles | 8 |
| 8a | Bracts large, foliaceous, broadly ovate | **L. burchellii** |
| 8b | Bracts small, inconspicuous, linear to narrowly ovate | 9 |
| 9a | Flowers 3 or 4 per flowering node | **L. crumanina** |
| 9b | Flowers usually 1 per flowering node, rarely up to 3 | **L. brachyantha** |
| 10a | Flowers only yellow, never blue; herbaceous perennials; inflorescences invariably 1-flowered, inserted in a leaf-opposed position | **L. pungens** |
| 10b | Flowers at least partly blue; rigid or upright shrubs or dwarf shrubs | **L. sericophylla** |

### **brachyantha** Harms

Annual or short-lived perennial, with undivided taproot. **Stems** short, soon developing many, slender, radiating, procumbent branches. **Leaves** trifoliolate; leaflets oblanceolate to narrowly elliptic-oblanceolate, ± bluntly pointed, densely strigose-pubescent on both surfaces, 4–20 × 1.5–8.0 mm. **Flowers**: usually 1 per flowering node, rarely up to 3, leaf-opposed with short peduncle when paired; bracts small, inconspicuous, linear to narrowly ovate; bracteoles 0; corolla yellow; Mar., Apr. **Pods** slightly widened medially, somewhat turgid, with distinct rib along upper suture, finely pubescent; seeds < 15 per pod, on relatively short funicles. Grassland, dry areas.

DrGr

### **burchellii** Benth.

Perennial herb, up to 150 mm high. **Stems** procumbent, not brittle. **Leaves** trifoliolate, basal leaves alternate. **Flowers**: congested into dense heads; bracts large, foliaceous, broadly ovate; bracteoles 0; corolla yellow; Aug.–Feb. **Pods** small, ovoid, almost hidden by calyx; hairs on pods not neatly orientated; seeds < 15 per pod, on relatively short funicles. Open grassland.

DrGr

**crumanina** Burch. ex Benth.

Perennial herb, up to 200 mm high; procumbent. **Leaves** trifoliolate; single stipules at each node. **Flowers**: 3 or 4 per flowering node, in subsessile fascicles; bracts small, inconspicuous, linear to narrowly ovate; bracteoles 0; petals scarcely longer than calyx; corolla yellow, fading orange; all year, mainly Dec., Jan. **Pods** short, ovoid; hairs on pods not neatly orientated; seeds < 15 per pod, on relatively short funicles. Limestone or lime-rich soils.

KarSh

**laxa** Eckl. & Zeyh.

Perennial herb, with annual branches from woody base, up to 400 mm high; procumbent. **Leaves** trifoliolate, but with basal leaves usually unifoliolate, especially in resprouting specimens, alternate; leaflets small, < 10 mm wide. **Flowers**: bracteoles 0; keel acute, petals < 9 mm long, corolla yellow; Jan.–Dec. **Pods** linear-oblong, much longer than calyx, slightly tapered towards apex, strigose-pubescent, (12)15–20 × 4.0–4.5 mm, 10–20-seeded. Open grassland, often disturbed areas. *Musa-pelo-oa-matlapa-o-monyenyane* (SS).

DrGr MsGr KarSh

**lenticula** (E.Mey.) Benth.

Annual herb, up to 250 mm high; procumbent; silky. **Leaves** trifoliolate with small, obovate leaflets; basal leaves opposite; stipules single at each node, small. **Flowers**: solitary, opposite leaves, subsessile; bracteoles 0; calyx silky; keel acute or somewhat beaked, glabrous; corolla yellow; Aug.–Oct. **Pods** turgid, slightly curved, silky. Dry areas.

KarSh

**listii** Polhill

Perennial, creeping herb. **Stems** many, radiating from a strong perennial taproot, usually forming a mat, rooting at nodes. **Leaves** trifoliolate; terminal leaflet somewhat larger than lateral ones, narrowly elliptic-oblong to slightly obovate, subglabrous, 8–40 × 3–12 mm; stipules paired, one smaller than the other. **Flowers**: inflorescences leaf-opposed, often on short shoots, erect, 8–24-flowered; bracteoles present; lateral calyx lobes broadly triangular, short, obtuse; corolla bright yellowish orange. **Pods** plicate, with 3–5 lateral folds, 7–10 × 2.5–4.0 mm. Grassland, bush clumps.

VreDm DrGr MsGr KarSh

**lotononoides** (Scott-Elliot) B.-E.van Wyk

Dwarf shrub, up to 0.5 m high. **Leaves** trifoliolate; leaflets obovate, sparsely pubescent with recurved apices. **Flowers**: inflorescence racemose; bracteoles 0; calyx lobes narrowly triangular; standard and wings much longer than keel, wings and keel glabrous; corolla blue and yellow; Oct.–Feb. Grassland, especially mountainsides. *Mosita-tlali* (SS).

MsGr

**pulchella** (E.Mey.) B.-E.van Wyk

Shrub or dwarf shrub, up to 300 mm high; much branched, closely silky. **Leaves** trifoliolate with leaflets narrowly cuneate or linear. **Flowers**: bracts lanceolate, shorter than calyx; bracteoles

0; standard and wings much longer than keel, wings and keel pubescent; corolla purplish blue; Nov.–Mar. Grassland, on sunny mountain slopes.

DrGr

### **pungens** Eckl. & Zeyh.

Perennial herb, up to 1 m high; slender, suberect or diffuse; stems silky. **Leaves** trifoliolate with solitary stipules; leaflets narrowly ovate, apex acute. **Flowers**: inflorescences invariably 1-flowered, opposite leaves; bracteoles 0; calyx deeply divided, silky, its lobes subequal; keel obtuse or rounded, glabrous; corolla yellow, never blue; Nov.–Feb. **Pods** hairy, turgid, twice as long as calyx. Grassland, dry areas.

KarSh

### **sericophylla** Benth.

Shrub, up to 2.4 m high; covered with silky, white, closely appressed hairs. **Leaves** trifoliolate; leaflets small, cuneate or linear; stipules single or, if rarely paired, then 2 of each pair markedly dissimilar, upper surface of leaflets densely sericeous, surface of blade not visible. **Flowers**: solitary; bracteoles 0; calyx with lateral and upper lobes on either side close together, forming a pair on either side of calyx; keel obtuse or rounded, glabrous; corolla purplish blue and yellow; Dec.–Mar. **Pods** sessile, oblong, only slightly inflated. Grassland. *Khonyana-tšooana*, *motoaitoai* (SS).

AcGr MsGr

### **sparsiflora** (E.Mey.) B.-E.van Wyk

Annual herb, up to 200 mm high; procumbent; branches distinctly brittle. **Leaves** trifoliolate, basal leaves alternate. **Flowers**: single; bracteoles 0; calyx lobes valvate; keel distinctly beaked; corolla yellow and white; Mar.–May. **Pods** short and ovate, scarcely longer than calyx, circular in transverse section, much inflated, with neatly orientated strigillose hairs; seeds > 15 per pod, on exceptionally long funicles. Dry grassland.

DrGr

## **Lysiloma** Benth. (sthn Afr.: 1 sp.)

### ***latisiliquum** (L.) Benth.

*Leucaena latisiliqua* (L.) Gillis

Shrub or small tree, up to 2.5 m high. **Leaves** pinnate; with petioles 20–45 mm long; leaflets 7–20 pairs. **Flowers**: in heads, up to 18 mm in diameter; stamens 10, free; anthers with scattered hairs; white to pale yellowish white; Feb.–May. **Pods** light to dark brown, with a stipe up to 25 mm long, oblong, compressed, 100–180 × 14–18 mm, raised over seeds and dehiscing into 2 non-recurving valves. Grassland, usually disturbed places. Native to the Americas.

KarSh

## **Medicago** L. (sthn Afr.: 7 spp.)

### Key to species:

[after Stirton: 27 (1982)]

1a Stipules entire or basally toothed; corolla purple, mauve or pale lilac; burrs smooth . . . . . .**M. sativa** subsp. **sativa**
1b Stipules deeply incised or laciniate; corolla yellow or golden; burrs spiny . . . . . 2
2a Calyx teeth longer than tube; wing petals longer than keel; burrs with partitions between seeds . . . . . **M. polymorpha**
2b Calyx teeth shorter than tube; wing petals shorter than keel; burrs without partitions between seeds . . . . . **M. laciniata**

***laciniata** (L.) Mill.
*M. aschersoniana* Urb.
*M. polymorpha* L. var. *laciniata* L.

Annual herb. **Stems** procumbent, up to 350 mm long. **Leaves** with central leaflets 4–15 × 2–7 mm; stipules laciniate or incised. **Flowers**: calyx teeth shorter than tube; wings shorter than keel; corolla yellow; Aug.–Nov. **Burrs** with 5–7 coils turning clockwise; spiny, without partitions between seeds. Dry dams, salt pans, cultivated land. Native to northern Africa, the Middle East and Asia. *Burr clover*, *veld shamrock*; *karooklits*, *klawergras* (A).

VreDm | AcGr | DrGr | MsGr | KarSh

***polymorpha** L.
*M. denticulata* Willd.
*M. hispida* Gaertn.

Annual herb. **Stems** procumbent, up to 0.6 m long. **Leaves** with central leaflets 9–20 × 7–20 mm; stipules laciniate. **Flowers**: raceme 1–5-flowered, peduncle < twice the length of petiole of subtending leaf; calyx teeth longer than tube; corolla with wings longer than keel, yellow; Aug.–Oct. **Burrs** with 1.5–7 coils turning clockwise; spiny, with partitions between seeds. Cultivated land. Native to northern Africa, Europe, Middle East and Asia. *Rough medic*, *burr medic*; *wildeklawer*, *stekelklawer* (A).

DrGr

***sativa** L. subsp. **sativa**

Perennial herb. **Stems** 1–many, procumbent to erect, up to 0.8 m high. **Leaves** with margins of leaflets serrate in upper part, 10–25 × 3–15 mm; stipules entire or basally toothed. **Flowers**: florets 6–12 mm long; corolla purple, mauve or pale lilac; Oct.–Apr. **Burrs** smooth, 5–9 mm in diameter, concealing calyx, coiled along full length; seeds 2.2–2.5 mm long. Grassland, riverbanks. Native to Europe and Asia. *Alfalfa*, *lucern*; *makklawer*, *lusern* (A).

DrGr | KarSh | Zastr

## **Melilotus** Mill. (sthn Afr.: 3 spp.)

### Key to species:

Corolla white; style 1.7–2.3 mm long; pod weakly reticulate-veined . . . . . **M. albus**
Corolla yellow; style 0.9–1.2 mm long; pod predominantly reticulate-veined. . . . . **M. indicus**

### ***albus** Medik.

Annual herb, up to 1.8 m high; much branched. **Leaves** with rachis of larger leaves, excluding terminal petiolule, often prolonged > 4 mm beyond lateral leaflets. **Flowers**: in many-flowered racemes; style 1.7–2.3 mm long; corolla white; Oct.–Apr. **Pods** with a weak, irregular network of veins, 3 mm long. Grassland, riverbanks, vleis, disturbed areas. Native to Europe and Asia. *Sweet clover*, *white melilot*; *bokhaargras*, *witstinkklawer* (A).




### ***indicus** (L.) All.

*M. parviflora* Desf.
*Trifolium melilotus-indica* L.

Annual herb, up to 1.2 m high; much branched. **Leaves** with finely toothed leaflets, rounded at apex; stipules often with a small tooth near base. **Flowers**: in many-flowered racemes; style 0.9–1.2 mm long; corolla yellow; Aug.–Nov. **Pods** predominantly reticulate-veined with a prominent, irregular network of veins, 2–3 mm long. Along watercourses, disturbed areas. Native to Europe and Asia. *Yellow sweet clover*, *hexham scent*; *bitterklawer*, *eenjarige geelstinkklawer* (A).




## **Melolobium** Eckl. & Zeyh. (sthn Afr.: 15 spp.)

### Key to species:

[after Moteetee & Van Wyk: 57 (2006)]

1a Stalked glands present, at least on calyces . . . . . 2
1b Stalked glands absent . . . . . 5
2a Stalked glands on calyces only. . . . . 3
2b Stalked glands on stems, leaves and calyces . . . . . 4
3a Pods straight . . . . . **M. candicans** (glandular forms)
3b Pods falcate . . . . . **M. canescens** (glandular forms)
4a Plants unarmed or slightly spinescent . . . . . **M. obcordatum**
4b Plants distinctly spiny . . . . . **M. microphyllum**
5a Sessile glands present, at least on calyces . . . . . 6
5b Sessile glands absent . . . . . 9
6a Plants distinctly spiny; main stems divaricate, much branched . . . . . 7
6b Plants unarmed; main stems erect, often virgate and sparsely branched . . . 8
7a Pods straight . . . . . **M. candicans**
7b Pods falcate . . . . . **M. canescens**
8a Sessile glands on leaves and calyces . . . . . **M. alpinum**
8b Sessile glands on calyces only . . . . . **M. wilmsii**
9a Plants distinctly spiny . . . . . **M. calycinum**

9b Plants unarmed . . . . . 10
10a Leaves and calyces densely silky; pods short, scarcely exceeding calyx. . . . . **M. macrocalyx** var. **macrocalyx**
10b Leaves and calyces pubescent, pods several times longer than calyx . . . . . **M. aethiopicum**

## **aethiopicum** (L.) Druce

Dwarf shrub, up to 0.7 m high; ascending; unarmed; stalked and sessile glands 0. **Leaves** with leaflets narrowly obovate to obovate, pubescent, apex mucronate. **Flowers**: inflorescence terminal; calyx densely pubescent; keel shorter than wings; corolla yellow; Jun.–Sep. **Pods** several times longer than calyx, oblong, straight to somewhat falcate, hairy. Grassland.

MsGr

## **alpinum** Eckl. & Zeyh.

Dwarf shrub, up to 0.5 m high; virgate; unarmed; branches curved, simple, ending in inflorescences. **Leaves** with leaflets linear-oblong to narrowly obovate, 12–13 × 2–4 mm, with sessile glands, sparsely hairy. **Flowers**: inflorescence terminal; calyx shortly bilabiate, with sessile glands, pubescent; corolla bright yellow; Nov., Dec. **Pods** narrowly oblong-ovate, somewhat falcate, hairy. Grassland. *Motšoehla*, *'musa-pelo-o-moholo-oa-thaba* (SS).

MsGr

## **calycinum** Benth.

Shrub, up to 0.6 m high; divaricately branched; distinctly spiny; densely covered with brownish hairs, stalked and sessile glands 0. **Leaves** with leaflets oblong to broadly obovate, densely hairy. **Flowers**: inflorescence terminal, 1–3-flowered; keel shorter than wings; corolla yellow; Jun.–Aug. **Pods** oblong, very short, straight to somewhat falcate, densely hairy. Open grassland, on riverbanks, and on calcrete bedrock. *Heuningbossie*, *gifgeelseerbossie* (A).

VreDm DrGr MsGr KarSh

## **candicans** (E.Mey.) Eckl. & Zeyh.

*Dichilus candicans* E.Mey.

Dwarf shrub, up to 0.5 m high; divaricately branched; spiny; woody; covered with white hairs. **Leaves** with leaflets oblong to broadly obovate, with sessile glands. **Flowers**: inflorescence terminal; calyx shorter than corolla, with sessile and stalked glands present in glandular forms; corolla yellow; May. **Pods** narrowly oblong, straight, very hairy. Grassland, mountain slopes, riverbanks. *Honey bush*; *stroopbossie*, *voëltjie-kan-nie-sit-nie* (A); *sehlabane* (SS).

AcGr DrGr MsGr KarSh Zastr

## **canescens** Benth.

Dwarf shrub, up to 1 m high, divaricately much branched; armed with spines; twigs velvety canescent. **Leaves** with leaflets oblong to broadly obovate, with sessile glands. **Flowers**: inflorescence terminal; calyx with sessile and stalked glands present in glandular forms, silky canescent; corolla yellow; Sep.–May. **Pods** narrowly oblong, falcate, silky canescent. Grassland, dry rocky slopes. *Heuningbossie* (A).

DrGr

**macrocalyx** Dummer var. **macrocalyx**

Dwarf shrub, up to 0.8 m high; unarmed or slightly spinescent; stalked and sessile glands 0. **Leaves** with leaflets elliptical to obovate-oblong, densely silky; stipules large. **Flowers**: inflorescence terminal; bracts cordate; calyx shortly bilabiate, densely silky; corolla yellow; Jun.–Aug. **Pods** ovate, short, scarcely exceeding calyx, 1- or 2-seeded. Grassland.

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**microphyllum** (L.f.) Eckl. & Zeyh.

*Dichilus microphyllus* E.Mey.
*M. burchelli* N.E.Br.

Dwarf shrub, up to 1 m high; divaricately much branched; distinctly spiny. **Leaves** with leaflets oblong to broadly obovate, glandular, hairy. **Flowers**: inflorescence terminal; calyx glandular, hairy, shorter than corolla; corolla yellow; Jul.–Sep. **Pods** narrowly oblong, slightly curved, glandular, hairy. Grassland, on slopes.

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**obcordatum** Harv.

Dwarf shrub, up to 0.5 m high; divaricately branched, decumbent, forming clumps or mats; unarmed or slightly spinescent. **Leaves** stipulate; leaflets obovate, glandular, sparsely hairy, apex sharply emarginate. **Flowers**: inflorescence terminal, with 5–8 flowers; calyx glandular, hairy; keel shorter than wings; corolla yellow; Dec., Jan. **Pods** falcate, glandular, hairy. Grassland, streambanks. *Lethokho*, *linaoana-tsa-thaba*, *seakha* (SS).

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**wilmsii** Harms

Shrub, up to 0.6 m high; a virgate suffrutex; stems and rachis glabrous or thinly pilose with spreading hairs. **Leaves** with leaflets linear to narrowly ovate, apex acute. **Flowers**: inflorescence terminal; sessile glands on calyces only; corolla yellow; Nov.–Feb. **Pods** narrowly oblong, hairy, 3–5-seeded. Grassland. *Heuningbossie* (A).

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## **Mundulea** (DC.) Benth.

**sericea** (Willd.) A.Chev.

*M. suberosa* (DC.) Benth.

Shrub or small tree, up to 5 m high; bark corky, deeply fissured. **Leaves** pinnate with 6–8 pairs of leaflets, 50–75 mm long; leaflets narrowly ovate, 12–18 × 3–4 mm, apex obtuse, densely silvery pubescent on both surfaces. **Flowers** in short racemes; calyx densely pubescent; corolla purplish blue; Sep.–Jan. Wooded grassland, bush clumps. *Cork bush*; *blou-ertjiebos*, *kurkbos* (A).

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## **Neorautanenia** Schinz (sthn Afr.: 2 spp.)

**ficifolia** (Benth.) C.A.Sm.
*Pueraria ficifolia* (Benth.) L.Bolus
*Rhynchosia ficifolia* Benth.

Perennial herb, up to 1.5 m long. **Stems** procumbent or trailing; hairy. **Leaves** with leaflets deeply 3-lobed, apices acute, mucronulate; terminal leaflet broadly ovate or obovate in outline, always 3–5-lobed, central lobe narrowly oblong to ovate; lateral leaflets smaller; venation strongly reticulate beneath. **Flowers**: in a raceme, compactly 6–20-flowered, often densely woolly; corolla purple; Nov.–Jan. **Pods** oblong-cylindric, velvety pubescent, 1- or 2-seeded; seeds black. Grassland, wooded grasslands. *Blou-ertjie* (A).

VreDm | | DrGr | | | |

## **Otholobium** C.H.Stirt. (sthn Afr.: 47 spp.)

### Key to species:

[based on Stirton: 142 (1989)]

Lateral leaflets symmetrical . . . . . **O. wilmsii**
Lateral leaflets asymmetrical . . . . . **O. polystictum**

**polystictum** (Benth. ex Harv.) C.H.Stirt.
*Psoralea polysticta* Benth. ex Harv.

Perennial shrub, up to 1 m high. **Leaves** trifoliolate, subsessile or very shortly petiolate; leaflets narrowly obovate, cuneate, dotted with black glands, glabrescent; lateral leaflets asymmetrical. **Flowers**: in axillary clusters, peduncles 2–4 mm long; calyx dotted with black glands; lateral leaflets asymmetrical; corolla purplish pink; Jul.–Jun. Grassland, edges of forest, often in moist places. *Kite hook-leaved pea*; *vlieër-vlieëkeurtjie*, *vlieëbos* (A); *mohlonecha*, *mohlonepshoa* (SS).

| | | DrGr | MsGr | | |

**wilmsii** (Harms) C.H.Stirt.
*Psoralea wilmsii* Harms

Perennial shrub, up to 3 m high. **Leaves** trifoliolate; leaflets narrowly obovate to narrowly obovate-ovate, recurved mucronate, black-dotted; lateral leaflets symmetrical. **Flowers**: in terminal and axillary spikes; peduncles up to 30 mm long; corolla white and purple or purplish blue; Oct.–May. Grassland.

| | | DrGr | | | |

## **Pearsonia** Dummer (sthn Afr.: 11 spp.)

### Key to species:

[after Campbell-Young & Balkwill: 554 (2000)]

Stems erect; corolla yellow, standard petal 8–13 mm long . . . . . .
. . . . . **P. cajanifolia** subsp. **cajanifolia**

Stems procumbent; corolla white or cream-coloured with a purple centre, standard petal 13–22 mm long. . . . . .**P. grandifolia** subsp. **grandifolia**

### **cajanifolia** (Harv.) Polhill subsp. **cajanifolia**

*Pleiospora cajanifolia* Harv.
*Pleiospora gracilior* Dummer

Perennial herb or shrub, up to 1.5 m high. **Stems** erect. **Leaves** thinly pubescent to silvery sericeous-tomentose, with reticulation rather prominent; stipules linear-subulate. **Flowers**: (3)8–30(40) in heads or short dense racemes, often aggregated into panicles by suppression of upper leaves; calyx 6–8 mm long; standard 8–13 mm long; corolla yellow; Nov.–Mar. **Pods** little exserted from calyx, oblong-ellipsoid, pubescent, usually only 2-seeded. Bush clumps, grassland.

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### **grandifolia** (Bolus) Polhill subsp. **grandifolia**

*Lotononis grandifolia* Bolus
*Pleiospora grandifolia* (Bolus) Dummer

Perennial herb. **Stems** procumbent, from a strong taproot or branched rootstock. **Leaves** with conspicuous lateral nerves; stipules broadly ovate-acuminate. **Flowers**: (8)16–30 in subdense to lax, pedunculate racemes; standard 13–22 mm long; corolla white or cream-coloured with a purple centre; Dec.–Apr. **Pods** shortly exserted from calyx, oblong-pointed, rather densely hairy. Grassland. *Mauve frilly pea*.

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## **Prosopis** L. (sthn Afr.: 5 spp.)

### Key to species:

[Burkart: 235 (1976)]

1a Pods broad and thick, not constricted around seeds; leaflets yellow-green . . . . . **P. chilensis**
1b Pods narrow and thin, usually constricted around seeds; leaflets green. . . 2
2a Leaflets (25–)30–45(–62) mm long, 8–15 × as long as broad, 6–13(–15) pairs per pinna. . . . . .**P. glandulosa** var. **glandulosa**
2b Leaflets (10–)15–25(–30) mm long, 5–8 × as long as broad, (8–)10–15(–20) pairs per pinna . . . . . **P. glandulosa** var. **torreyana**

### *__chilensis__ (Molina) Stuntz

Multi-stemmed shrub or tree, up to 4 m high. **Spines** straight, paired at nodes. **Leaves** drooping; leaflets long and slender, widely spaced, 7–22 per pinna, yellow-green. **Flowers**: in axillary spikes; only 10 stamens per flower; corolla bright yellow; Oct.–Feb. **Pods** broad and thick, not constricted around seeds. Disturbed sites around human habitation. Native to South America. *Southwest thorn*.

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### *__glandulosa__ Torr. var. __glandulosa__

Multi-stemmed shrub or tree, up to 4 m high. **Spines** straight and paired or solitary at nodes. **Leaves** with leaflets (25–)30–45(–62) mm long, 8–15 × as long as broad, 6–13(–15) pairs per

pinna; leaflets green. **Flowers**: in an axillary spike; flowers sessile; yellow; only 10 stamens per flower; Jan. **Pods** straight or almost so, 100–220 mm long, ± 8 mm in diameter, usually constricted around seeds. White, stony, calcrete soils, roadsides. Native to North, Central and South America. *Honey mesquite*; *Duitswesdoring*, *muskietboom* (A).

AcGr DrGr

***glandulosa** Torr. var. **torreyana** (Benson) Johnst.

Multi-stemmed shrub or tree, up to 4 m high. **Spines** straight and paired or solitary at nodes. **Leaves** with leaflets (10–)15–25(–30) mm long, 5–8 × as long as broad, (8–)10–15(–20) pairs per pinna; leaflets green. **Flowers**: in an axillary spike, sessile; only 10 stamens per flower; corolla yellow; Jan. **Pods** straight or almost so, 100–220 mm long, ± 8 mm in diameter, usually constricted around seeds. White, stony, calcrete soils, roadsides. Native to North, Central and South America. *Velvet mesquite*; *fluweelboontjie* (A). Figure 14A, p. 11.

DrGr

## **Rhynchosia** Lour. (sthn Afr.: 67 spp.)

### Key to species:

[after Burtt Davy: 406 (1932)]

1a Leaves with leaflets linear to narrowly ovate to oblong, glabrous, strongly reticulate; 1–3-flowered . . . . . **R. totta** var. **totta**
1b Leaves with leaflets suborbicular to ovate; inflorescences usually racemose . . . . . 2
2a Leaflets ± ovate-orbicular or very broadly ovate (not rhomboid), sides ± symmetrical . . . . . 3
2b Leaflets rhombic-ovate or narrowly ovate, sides asymmetrical . . . . . 8
3a Petioles nearly as long or longer than leaflets . . . . . 4
3b Petioles very short . . . . . 7
4a Stipules linear or narrowly ovate, small and inconspicuous . . . . . **R. pentheri** var. **pentheri**
4b Stipules ovate to narrowly ovate or triangular, large, striate . . . . . 5
5a Stipules triangular, up to 5 mm long; leaflets (especially young ones) densely velvety pubescent . . . . . **R. holosericea**
5b Stipules ovate to narrowly ovate, up to 10 mm long; leaflets with some hairs, particularly on nerves below, but never densely pubescent . . . . . 6
6a Flowers subsessile; leaflets shortly cuneate at base, apex not acute, midrib hirsute on lower surface . . . . . **R. hirsuta**
6b Flowers pedicellate; leaflets cordate at base, apex acute, pubescent on all veins on lower surface . . . . . **R. reptabunda**
7a Leaflets as broad as long, apex rounded; calyx distinctly glandular-pubescent . . . . . **R. pentheri** var. **hutchinsoniana**
7b Leaflets longer than broad, apex subacute; calyx not markedly glandular . . . . . **R. nervosa** var. **nervosa**
8a Leaflets ± broadly rhombic . . . . . 9
8b Leaflets not rhombic, ± narrowly ovate to elliptic . . . . . 12
9a Stems not twining . . . . . 10
9b Stems twining . . . . . 11
10a Leaflets with veins glabrous on lower surface; flowers not reflexed . . . . . **R. adenodes**
10b Leaflets with veins pubescent on lower surface; flowers becoming reflexed soon after anthesis . . . . . **R. minima** var. **prostrata**

11a Corolla large, up to 15 mm long; stipules ovate to narrowly ovate, up to 6 mm long . . . . . **R. caribaea**
11b Corolla small, up to 6 mm long; stipules linear to narrowly ovate, up to 3 mm long . . . . . **R. minima** var. **minima**
12a Racemes shorter than leaves, only 2–4-flowered . . . . . **R. confusa**
12b Racemes much longer than leaves, several-flowered . . . . . **R. venulosa**

## **adenodes** Eckl. & Zeyh.

*R. amatymbica* Eckl. & Zeyh.

Perennial herb, climbing up to 0.6 m high. **Stems** procumbent, not twining. **Leaves** trifoliolate; terminal leaflet ovate-orbicular or subrhomboid, resinous-dotted, with veins glabrous on lower surface; stipules narrowly ovate. **Flowers**: not reflexed; peduncles longer than leaves; calyx pubescent, segments narrowly ovate; corolla yellow; Sep.–Jan. Grassland. *Monya-mali* (SS); *ungazini* (Z).

| VreDm | | DrGr | MsGr | | Zastr |
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## **caribaea** (Jacq.) DC.

*Glycine caribaea* Jacq.
*R. congestiflora* Schinz

Perennial, herb, climbing up to 1 m high. **Stems** twining or procumbent; pubescent. **Leaves** trifoliolate; terminal leaflets thin, ovate-rhomboid; stipules ovate to narrowly ovate, up to 6 mm long. **Flowers**: in laxly, several-flowered racemes, longer than leaves; corolla large, up to 15 mm long, yellow and purplish brown; Oct.–Dec. Bush clumps, grassland, forest margins. *Thara*, *morarana-oa-liphepa* (SS).

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## **confusa** Burtt Davy

*R. nervosa* Benth. var. *pauciflora* Harv.

Perennial, herb, up to 400 mm high. **Stems** twining or procumbent; hairy. **Leaves** with terminal leaflets ovate or obovate, 13–20 × 12–16 mm, cano-pubescent. **Flowers**: racemes shorter than leaves, only 2–4-flowered on slender peduncles; corolla yellow; Sep.–Mar. **Pods** covered with soft yellowish hairs. Bush clumps, grassland.

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## **hirsuta** Eckl. & Zeyh.

Perennial herb, up to 200 mm high. **Stems** procumbent or climbing. **Leaves** with terminal leaflets broadly ovate-orbicular, rigid, hispid-pubescent, 20–50 × 25–40 mm; shortly cuneate at base, apex not acute, midrib hirsute on lower surface; petioles longer than or nearly as long as leaflets; stipules ovate to narrowly ovate, up to 10 mm long, striate. **Flowers**: subsessile, peduncle elongate, laxly flowered; standard densely pubescent, ± 10 mm long; corolla yellow; Oct., Nov. **Pods** sessile, villous. Grassland, streambanks.

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## **holosericea** Schinz

Perennial herb, up to 0.5 m high. **Stems** procumbent or climbing. **Leaves** with terminal leaflet circular to broadly circular or broadly obovate, 10–35 × 12–46 mm, leaflets (especially young

ones) densely velvety pubescent; petioles 10–50 mm long; stipules triangular, up to 5 mm long, striate. **Flowers**: calyx ± 7 mm long; corolla pale yellow with rusty red lines on back; Dec.–Mar. **Pods** pale brown, obovate-oblong, 20–50 × 10 mm, finely puberulous and with scattered yellow glandular-based hairs; seeds shiny, purplish. Grassland, sandy soil.

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### **minima** (L.) DC. var. **minima**

Perennial herb. **Stems** twining or creeping. **Leaves** trifoliolate; leaflets sharply acute to acuminate at apex, glabrescent or sparsely puberulous; venation mostly paler and raised on upper surface; stipules linear to narrowly ovate, up to 3 mm long. **Flowers**: calyx teeth triangular, as long as or scarcely longer than tube, together 3–4 mm long; corolla small, up to 6 mm long, standard 5–6 × 3 mm, yellow; Dec.–Feb. **Pods** up to 20 × 4–5 mm, narrowed at base, very finely puberulous and glandular or almost glabrous. Grassland, woodland, grassy valley bottoms.

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### **minima** (L.) DC. var. **prostrata** (Harv.) Meikle

*R. memnonia* (Delile) DC. var. *prostrata* Harv.

Perennial herb, climbing up to 1.5 m high. **Stems** procumbent or climbing, not twining; puberulous or pubescent. **Leaves** trifoliolate; leaflets mostly rounded at apex, pubescent to velvety on both surfaces, veins prominently pubescent on lower surface. **Flowers**: becoming reflexed soon after anthesis; standard 7–10 × 5–7 mm; corolla yellow; Aug.–Mar. Grassland.

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### **nervosa** Benth. & Harv. var. **nervosa**

Perennial herb. **Stems** procumbent. **Leaves** trifoliolate; leaflets longer than broad, apex subacute, terminal leaflets elliptic-oblong or subrhomboid, 30–60 × 15–35 mm, 3-nerved at base, hispid-pubescent; petioles short. **Flowers**: calyx not markedly glandular; corolla yellow, striped with red or orange; Sep.–Mar. **Pods** ± oblong, 18–22 × 7–8 mm, covered with short and long hairs; seeds orange-brown to dark red-brown. Grassland. *Rankboontjie* (A); *umadilika* (Z).

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### **pentheri** Schltr. ex Zahlbr. var. **hutchinsoniana** Burtt Davy

Perennial herb. **Stems** procumbent; thinly pubescent to glabrescent. **Leaves** trifoliolate; leaflets as broad as long, apex rounded; petioles very short. **Flowers**: calyx distinctly glandular-pubescent; corolla yellowish orange; Feb., Mar. Grassland.

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### **pentheri** Schltr. ex Zahlbr. var. **pentheri**

Perennial herb, climbing up to 0.7 m high. **Stems** procumbent or climbing. **Leaves** with terminal leaflets suborbicular or ovate, 15–25 × 12–25 mm; petioles longer than or nearly as long as leaflets; stipules linear or narrowly ovate, small and inconspicuous. **Flowers**: calyx glandular; standard glabrous; corolla yellow and brown; Dec.–Feb. Grassland and woodland.

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**reptabunda** N.E.Br.

Perennial herb, climbing up to 300 mm high. **Stems** procumbent or climbing; pubescent. **Leaves** trifoliolate; terminal leaflets ovate or broadly ovate, 30–45 × 25–40 mm, cordate at base, apex acute, pubescent on all veins on lower surface; petioles longer than or nearly as long as leaflets; stipules ovate to narrowly ovate, up to 10 mm long, striate. **Flowers**: inflorescence terminal, laxly 2–6-flowered; peduncle 50–175 mm long; pedicellate; corolla yellow; Oct.–Feb. Grassland.

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**totta** (Thunb.) DC. var. **totta**

*Glycine totta* Thunb.

Perennial herb, climbing up to 1 m high. **Stems** procumbent. **Leaves** trifoliolate; leaflets distinctly linear to narrowly ovate to oblong, mostly twice as long as wide, glabrous, strongly reticulate. **Flowers**: inflorescence lax, 1–3-flowered, glabrescent to hairy; corolla yellow; all year. **Pods** with long silky hairs ± 2 mm long. Grassland and woodland. *Yellow carpet bean*; *sebalibetloa*, *malintsoetla* (SS); *ingqungqumbe*, *isikhonde* (Z).

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**venulosa** (Hiern) K.Schum.

*Dolichos venulosus* Hiern

*R. hirsuta* Schinz

Perennial herb, climbing up to 0.5 m high. **Stems** slender, densely pubescent to velvety with greyish or ferruginous hairs. **Leaves** trifoliolate; leaflets ± narrowly ovate to elliptic, pubescent to densely velvety, venation raised and usually markedly reticulate beneath. **Flowers**: racemes much longer than leaves, several-flowered; corolla yellow; Oct.–Jun. Grassland, rocky slopes and woodland.

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## **Robinia** L. (sthn Afr.: 1 sp.)

***pseudoacacia** L.

Shrub or tree, up to 10 m high; robust, hard-wooded; bark thick, deeply furrowed, blackish. **Leaves** imparipinnate; stipules usually paired; spinescent. **Flowers**: intensely fragrant; in many-flowered racemes; corolla 15–20 mm long, white; Sep. **Pods** 50–100 mm long, with 4–10 seeds, not in distinct compartments. Roadsides, disturbed places. Native to the southeastern parts of North America. *False acacia*, *locust tree*; *vals-akasia* (A). Figure 14C, p. 11.

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## **Senegalia** Raf. (sthn Afr.: 18 spp.)

### Key to species:

[adapted from Ross: 26 (1975), Kyalangalilwa *et al*.: 5, 8–10 (2013)]

1a Leaves with up to 4 pairs of pinnae. . . . . **S. mellifera** subsp. **detinens**

1b Leaves with > 4 pairs of pinnae . . . . . 2

2a Prickles inconspicuous, few; petioles 13–15 mm with rachis > 60 mm long . . . . . **S. caffra**

2b Prickles many, conspicuous; petioles up to 13 mm with rachis up to 60 mm long . . . . . **S. hereroensis**

**caffra** (Thunb.) P.J.H.Hurter & Mabb.

*Acacia caffra* (Thunb.) Willd.

*A. caffra* Willd. var. *transvaalensis* P.E.Glover

*A. multijuga* Meisn.

Tree or shrub, up to 14 m high; prickles in pairs just below each node, few, inconspicuous. **Leaves** with pinnae > 4 mm apart, giving leaf an open appearance; leaflets 0.70–2.31(–3.80) mm wide, 16–64 pairs per pinna; petioles 13–15 mm with rachis > 60 mm long. **Flowers**: inflorescence spicate; corolla yellowish white; Aug.–Dec. **Pods** linear, 45–197 × 7–15 mm, light to dark brown. Thornveld, river valley scrub, bush clumps, tall grassland. *Common hook-thorn*; *gewone haakdoring*, *katdoring*, *wag-'n-bietjie-doring* (A); *umnyamanzi* (X); *umtholo (Z)*.

VreDm

**hereroensis** (Engl.) Kyal. & Boatwr.

*Acacia gansbergensis* Schinz

*A. hereroensis* Engl.

*A. mellei* I.Verd.

Tree or shrub, up to 10 m high; prickles many, conspicuous in pairs just below nodes, strongly recurved. **Leaves** with pinnae < 4 mm apart, giving leaf a compact appearance; leaflets 0.5–1.1 mm wide; petioles up to 13 mm with rachis up to 60 mm long. **Flowers**: inflorescence spicate; corolla yellowish white; Nov.–Feb. **Pods** 12–23 mm wide, puberulous to densely pubescent, margins often irregularly constricted between seeds. Grassland, woodland, thornveld, rocky slopes, flats. *Coffee mimosa*, *mountain thorn*; *rooihaak*, *bergdoringboom* (A); *mooka* (SS).

DrGr

**mellifera** (Vahl) Seigler & Ebinger subsp. **detinens** (Burch.) Kyal. & Boatwr.

*Acacia detinens* Burch.

*A. mellifera* (Vahl) Benth. subsp. *detinens* (Burch.) Brenan

*A. tenax* Marloth

Shrub or tree, up to 6 m high; much branched, dense; prickles in pairs just below each node, strongly recurved. **Leaves** normally with 3(4) pinnae pairs; leaflets 2–12 mm wide; rachillae 1–16 mm long. **Flowers**: inflorescence short, ± subglobose to ellipsoid, but the axes clearly elongate, or in elongated spikes; corolla yellowish white or cream-coloured; Aug.–Nov. **Pods** oblong, straight, 25–80(–95) × 15–25(–32) mm glabrous, longitudinally dehiscent. Dry thornveld, bush clumps, wooded grassland. *Noebush*, *black thorn*; *swarthaak*, *wynruit-wag-'n-bietjie* (A).

KarSh

## **Senna** Mill. (sthn Afr.: 15 spp.)

### Key to species:

[after Gordon-Gray: 70 (1977)]

Rachis glandular with a sessile, cylindric, finger-like, acuminate, dark gland . . . . . **S. multiglandulosa**

Rachis eglandular without a conspicuous, solitary gland . . . . . .
. . . . . **S. italica** subsp. **arachoides**

### **italica** Mill. subsp. **arachoides** (Burch.) Lock

*Cassia italica* (Mill.) Lam. ex F.W.Andrews subsp. *arachoides* (Burch.) Brenan

Perennial herb, up to 400 mm high. **Stems** procumbent, branched. **Leaves** with petioles 3–12 mm long; stipules linear to ovate-triangular; rachis eglandular without a conspicuous, solitary gland. **Flowers**: petals 9–12 × 5–7 mm; corolla bright yellow and brown-veined; Sep.–May. **Pods** 20–60 mm long, with a ridge of crests along middle of each valve. Grassland. *Eland's pea*, *wild senna*; *wilde-ertjies*, *swartstorm* (A).

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### ***multiglandulosa** (Jacq.) Irwin & Barneby

*Cassia tomentosa* L.f.

Shrub, up to 4 m high. **Stems** woody. **Leaves** discolorous; (30–)90–120 mm long; rachis glandular with a sessile, cylindric, finger-like, acuminate, dark gland; stipules linear, densely pubescent and caducous. **Flowers**: inflorescences distal pseudo-panicles, in axils of upper leaves, 37–70 mm long; corolla deep yellow; May. **Pods** linear to slightly curved, 70–110 mm long, compressed; seeds many, compressed against each other along length of pod. Grassland. Native to South America.

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## **Sesbania** Scop. (sthn Afr.: 17 spp.)

### Key to species:

[after Phillips & Hutchinson: 41 (1921)]

1a Trees or shrubs; corolla large, standard petal 16–20 mm long, orange to red; pods 4-winged . . . . . **S. punicea**
1b Herbs; corolla small, standard petal up to 15 mm long, yellow with purple veins; pods not winged . . . . . 2
2a Plant armed with prickles; pods slightly torulose. . . . . .**S. notialis**
2b Plant not armed with prickles; pods markedly torulose. . . **S. transvaalensis**

### **notialis** J.B.Gillett

Erect, annual herb, up to 1 m high, armed with prickles. **Leaves** pinnate with several leaflets along rachis; leaflets oblong, glabrous, 5(–9) × 2(–3) mm. **Flowers**: raceme 1–5-flowered; axis of inflorescence > 20 mm long; corolla with standard up to 15 mm long, yellow with continuously dark purple veins; Feb., Mar. **Pods** ± 80–100 × 2.5 mm, septa 4–5 mm apart, slightly torulose, not winged. Vlei areas.

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### ***punicea** (Cav.) Benth.

Tree or shrub, up to 4 m high. **Leaves** drooping; pinnate with leaflets in 5–20 pairs, up to 25 mm long. **Flowers**: in a dense raceme, up to 250 mm long; corolla with standard 16–20 mm long, bright orange to red; Oct.–April. **Pods** oblong, 4-winged, up to 100 mm long. Roadsides,

streambanks. Native to South America. *Brazilian glory pea*, *coffee weed*, *rattlepod*, *red sesbania*; *Brasiliaanse glorie-ertjie*, *rooi sesbania* (A).

| VreDm | AcGr | DrGr | MsGr | | Zastr |
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### **transvaalensis** J.B.Gillett

Annual herb, up to 2.5 m high, not armed with prickles. **Leaves** 8–20-foliolate, glabrous, leaflets 9.0 × 2.5 mm. **Flowers**: in a raceme, 5–7-flowered; axis of inflorescence > 20 mm long, including peduncle of over 5 mm long; corolla with standard up to 15 mm long, yellowish green with continuously dark purple veins; Jan.–Mar. **Pods** ± 40–60 × 25 mm across seeds, markedly torulose, not winged. Riverbanks, roadsides, thornveld.

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## **Styphnolobium** Schott (sthn Afr.: 1 sp.)

### *__japonicum__ (L.) Schott

*Sophora japonica* L.

Deciduous tree, up to 6 m high. **Leaves** with leaflets in 3–8 pairs; leaflets ovate to narrowly ovate, glaucous on lower surface. **Flowers**: in a fragrant, upright panicle; corolla white; Dec.–Feb. **Pods** resembling a string of beads, glabrous. Riverbanks. Native to China and Korea. *Chinese scholar tree*, *Japanese pagoda tree*.

| | | DrGr | | | |
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## **Tephrosia** Pers. (sthn Afr.: 52 spp.)

### Key to species:

[after Forbes: 953 (1948)]

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| 1a | Leaves palmate or digitate | **T. lupinifolia** |
| 1b | Leaves pinnate | 2 |
| 2a | Stems erect | 3 |
| 2b | Stems procumbent, spreading or ascending | 5 |
| 3a | Stipules subulate | **T. polystachya** var. **hirta** |
| 3b | Stipules linear, setaceous or narrowly ovate | 4 |
| 4a | Style glabrous | **T. rhodesica** var. **rhodesica** |
| 4b | Style bearded at apex | **T. purpurea** subsp. **leptostachya** var. **leptostachya** |
| 5a | Stipules subulate | **T. capensis** |
| 5b | Stipules setaceous, linear or narrowly linear-ovate | 6 |
| 6a | Stems ascending | **T. longipes** subsp. **longipes** var. **longipes** |
| 6b | Stems procumbent or trailing | 7 |
| 7a | Style bearded at apex; veining dark, reddish brown on lower surface of leaflets | **T. multijuga** |
| 7b | Style glabrous; veining not dark on leaflets | 8 |
| 8a | Whole plant ± densely rufo-tomentose; upper surface of leaflets glabrous | **T. semiglabra** |
| 8b | Plant hirsute with long, whitish hairs; upper surface of leaflets with a pale bloom | **T. burchellii** |

**burchellii** Burtt Davy

Annual, occasionally perennial herb, up to 0.7 m high; hirsute with long, whitish hairs. **Stems** slender, procumbent. **Leaves** shortly petiolate; pinnate, with 10–16 leaflets; leaflets obovate, 8–14 × 4–8 mm, upper surface glabrous with a pale bloom, lower surface sparsely hirsute, veining not dark; rachis hirsute with long hairs; stipules setaceous. **Flowers**: style glabrous; calyx hirsute with long white hairs; corolla pink; Nov.–Feb. **Pods** 30–40 mm long, slightly falcate, appressed-puberulous. Grassland, bush clumps.

AcGr DrGr MsGr KarSh

**capensis** (Jacq.) Pers. *s.l.*

Perennial herb or dwarf shrub, up to 0.5 m high. **Stems** spreading or ascending, glabrous. **Leaves** pinnate, with 4–8 leaflets; leaflets subcuneate, oblong or narrowly ovate, 10–30 × 5–14 mm, apex obtuse or acute, upper surface glabrescent, lower surface glabrous or hirsute; stipules subulate. **Flowers**: corolla reddish purple; Sep.–Mar. **Pods** pubescent. Grassland.

VreDm AcGr DrGr MsGr KarSh

**longipes** Meisn. subsp. **longipes** var. **longipes**

Annual herb, occasionally a dwarf shrub, up to 1 m high. **Stems** ascending. **Leaves** pinnate, with 4–16 leaflets; leaflets narrowly linear to linear-elliptic, (20–)30–100 × (1–)2–7(–14) mm; stipules setaceous, subulate. **Flowers**: few-flowered in remote fascicles; style bearded; corolla purple; Nov.–May. **Pods** flat, linear. Grassland.

DrGr KarSh

**lupinifolia** DC.
*Cracca lupinifolia* Kuntze
*Galega lupinifolia* Burch.

Annual, occasionally perennial herb, up to 1 m high. **Leaves** 4- or 5-foliolate, palmate or digitate; leaflets narrowly obovate, 15–85 × 4–18 mm, margins thickened, often with yellowish veins. **Flowers**: in a lax, few-flowered raceme; corolla mauve; Dec.–Apr. **Pods** linear, 25–35 × 3–5 mm, flat, pubescent. Grassland, particularly disturbed places.

DrGr

**multijuga** R.G.N.Young
*T. woodii* Burtt Davy

Shrub, dwarf shrub or scrambling herb with decumbent stems, up to 1.5 m high. **Leaves** pinnate, with 6–20 leaflets; leaflets narrow oblong-elliptic, 7–20 × 1.5–4.5 mm, apex acuminate, mucronate, veining dark, reddish brown on lower surface of leaflets; stipules linear, setaceous. **Flowers**: in a lax, few-flowered raceme; peduncles 150–160 mm long; style bearded at apex; corolla pink or reddish purple; Nov.–Apr. **Pods** linear, 35 × 3 mm, subfalcate, appressed-pubescent. Bush clumps, grassland.

DrGr

**polystachya** E.Mey. var. **hirta** Harv.

Perennial herb or shrub, up to 1.4 m high; stems, branches and inflorescences roughly rusty-pubescent. **Stems** erect. **Leaves** shortly petioled; pinnate, with 6–18 leaflets; leaflets cuneate-

oblong, mucronate, upper surface thinly pubescent, lower surface more densely hairy; stipules subulate. **Flowers**: racemes short, densely flowered; pedicels 4–6 mm long; corolla purplish pink; Feb., Mar. **Pods** narrow, linear or slightly curved, pubescent. Edge of forest and moist grassland.

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**purpurea** (L.) Pers. subsp. **leptostachya** (DC.) Brummitt var. **leptostachya**

*T. leptostachya* DC.

*T. lineata* Schumach. & Thonn.

Annual, occasionally perennial herb, up to 3 m high. **Stems** erect; subglabrous or with closely appressed hairs. **Leaves** pinnate, with 14–18 leaflets; leaflets broad, narrowly obovate, apex blunt, mucronate; stipules linear. **Flowers**: peduncles terminal and leaf-opposed; laxly 6–20-flowered; style bearded at apex; calyx silky; corolla reddish purple; Dec.–Apr. **Pods** linear, slightly recurved, glabrous or softly pubescent. Bush clumps, grassland.

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**rhodesica** Baker f. var. **rhodesica**

*T. polystachyoides sensu* Burtt Davy

Dwarf shrub or perennial herb, up to 1 m high. **Stems** erect; rufo-tomentose. **Leaves** pinnate, with 10–18 leaflets; broad oblong or elliptic, 15–30 × 5–12 mm, upper surface thinly, lower surface densely pubescent; stipules linear, setaceous or narrowly ovate. **Flowers**: style glabrous; calyx with lobes narrowly linear-ovate, much longer than tube, densely long pilose; corolla mauve; Jan.–Apr. **Pods** falcate, 30–38 × 3–4 mm, densely tawny pubescent. Bush clumps, disturbed places.

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**semiglabra** Sond.

*Cracca semiglabra* Kuntze

Perennial herb, up to 400 mm high; densely rufo-tomentose. **Stems** procumbent. **Leaves** pinnate, with 6–12 leaflets; leaflets narrowly oblong-ovate, 10–25 × 5–10 mm, apex recurved-mucronate, upper surface glabrous, lower surface rufo-tomentose below, veining not dark; stipules subulate, acuminate. **Flowers**: style glabrous; corolla purplish pink; Nov.–Apr. **Pods** pubescent. Grassland.

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## **Trifolium** L. (sthn Afr.: 18 spp.)

### Key to species:

[after Gillett: 377 (1952)]

1a Leaflets at least twice as long as wide . . . . . 2
1b Leaflets < twice as long as wide. . . . . 4
2a Leaflets 4–10 × as long as wide . . . . . **T. africanum** var. **lydenburgense**
2b Leaflets 2–4 × as long as wide . . . . . 3
3a Calyx tube pubescent; leaflets 10–20(–40) × 4–8 mm . . . . . .
. . . . . **T. africanum** var. **africanum**

3b Calyx tube glabrous; leaflets 15(–50) × 8–20 mm. . **T. medium** var. **medium**
4a Calyx 6 mm long; pods ovoid, 1- or 2-seeded . . . . . **T. burchellianum** subsp. **burchellianum**
4b Calyx 3–5 mm long; pods constricted between seeds, 3- or 4-seeded. . . . . **T. repens**

### **africanum** Ser. var. **africanum**

Perennial herb, up to 0.5 m high. **Leaves** with leaflets 10–20(–40) × 4–8 mm, 2–4 × as long as wide, rounded, truncate or emarginate at apex, often pubescent; stipules with free portion well developed, narrowly triangular-ovate with many parallel veins. **Flowers**: inflorescence typically 20 mm in diameter; bracts up to 3 mm long, subulate; calyx tube densely hirsute; corolla crimson purple; Oct.–Apr. Grassland. *Wildeklawer* (A).

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### **africanum** Ser. var. **lydenburgense** J.B.Gillett

Perennial herb, up to 400 mm high. **Leaves** with leaflets 4–10 × as long as wide, apex rounded or acute, rarely truncate at apex; stipules with free portion well developed, narrowly triangular-ovate with many parallel nerves. **Flowers**: inflorescence typically 20 mm in diameter; bracts up to 3 mm long, subulate; calyx densely hirsute; corolla crimson purple; Oct.–Apr. Grassland.

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### **burchellianum** Ser. subsp. **burchellianum**

*T. repens* Thunb.

Perennial herb, up to 250 mm high. **Stems** procumbent. **Leaves** with leaflets up to 10 mm broad; stipules with free portion long and many-nerved. **Flowers**: inflorescences rarely > 20 mm in diameter; calyx 6 mm long, teeth subulate from base, twice as long as tube; corolla purple; Sep.–Nov. **Pods** ovoid, 1- or 2-seeded. Streambanks. *Wild clover*; *wildeklawer* (A); *moroko*, *moqophi* (SS); *usithathi* (Z).

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### ***medium** L. var. **medium**

Perennial herb, up to 0.5 m high. **Stems** procumbent, zigzag in appearance. **Leaves** with leaflets long and narrow, 15(–50) × 8–20 mm; stipules narrowly triangular, without a bristle-point. **Flowers**: inflorescence typically 20 mm in diameter; calyx tube glabrous; corolla crimson purple and white; May–Aug. Grasslands and roadsides. Native to Europe and Middle East.

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### ***repens** L.

Perennial herb, up to 300 mm high. **Stems** procumbent. **Leaves** long-petioled; leaflets < twice as long as wide, cuneate-obovate, lateral nerves straight, pale; stipules small, obovate-lanceolate, with short, subulate points. **Flowers**: with slender pedicels, reflexed after flowering; calyx 3–5 mm long; corolla white to pinkish; Mar.–Dec. **Pod** linear-oblong; constricted between seeds, 3- or 4- seeded. Grassland, especially disturbed places. Native to Europe and northern Asia.

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## **Trigonella** L. (sthn Afr.: 3 spp.)

### ***anguina** Delile

Annual herb. **Stems** decumbent; branched from base, up to 300 mm long; often with strong smell when crushed. **Leaves** with obtriangular leaflets, toothed in upper part, upper surface glabrous, lower surface sparsely pubescent. **Flowers**: small, yellow, 2–7-fasciculate, subumbellate, sessile or subsessile; calyx campanulate, sparsely pubescent, teeth equalling or exceeding tube; Mar. **Pods** torulose and plicate, 7–10 × 1.5–2.0 mm. Edges of dams and other disturbed places. Native to North Africa, Middle East and western Asia. *Wildeklawer* (A).

DrGr KarSh

## **Vachellia** Wight & Arn. (sthn Afr.: 31 spp.)

### Key to species:

[adapted from Ross: 26 (1975), Kyalangalilwa *et al*. (2013)]

1a Flowers bright or golden-yellow . . . . . 2
1b Flowers yellowish white or cream-coloured, very rarely pale pink . . . . . 3
2a Petioles without a gland on the upper side; pods broad, short, thickened, curved, densely covered with a creamy grey indumentum. . . . . **V. erioloba**
2b Petioles with a conspicuous gland on the upper side; pods curved, constricted between seeds. . . . . .**V. karroo**
3a Leaves usually borne on distinct cushions; pinnae 3–5(–7) pairs . . . . . **V. robusta** subsp. **robusta**
3b Leaves not borne on distinct cushions; pinnae 2–10 pairs . . . . . 4
4a Spines straight, hooked, or straight with tips curved down; pods straight, upright, hard, woody . . . . . **V. hebeclada** subsp. **hebeclada**
4b Spines both straight and hooked on the same branch or pair; pods twisted, contorted or curled in a spiral . . . . . **V. tortilis** subsp. **heteracantha**

### **erioloba** (E.Mey.) P.J.H.Hurter

*Acacia erioloba* E.Mey.
*A. giraffae sensu auct. mult.*, *non A. giraffae* Willd.
*A. giraffae* Willd. var. *espinosa* Kuntze

Tree, up to 15 m high. **Leaves** blue-green, with pinnae 1–6 pairs per leaf; leaflets 4.0–11.5 mm long, glabrous or subglabrous; stipules spinescent, in pairs, often stout, thickened and fused basally. **Flowers**: inflorescence capitate; corolla yellow; Sep., Oct. **Pods** broad, short, thickened, curved, frequently semilunate to suborbicular, 25–50 mm wide, densely covered with a creamy grey indumentum with many dark reddish brown glands particularly when young, frequently semilunate to suborbicular. Woodland, bush or thornveld. *Camel thorn*, *giraffe thorn*; *kameeldoringboom*, *grootdoring* (A); *mopatsaka* (SS).

AcGr

### **hebeclada** (DC.) Kyal. & Boatwr. subsp. **hebeclada**

*Acacia hebeclada* DC. subsp. *hebeclada*
*A. hebeclada* DC. var. *stolonifera* (Burch.) Dinter
*A. stolonifera* Burch.

Low, spreading shrub or tree, up to 9 m high. **Leaves** with pinnae 4–9 pairs per leaf; leaflets 7–18 pairs per pinna; stipules spinescent, in pairs, straight to hooked or straight with tips curved

down. **Flowers**: inflorescence capitate; corolla yellowish white or cream-coloured; Sep.–Nov. **Pods** straight or almost so, erect or sometimes pendulous, hard, woody, often conspicuously longitudinally nerved. Thornveld, bush clumps, grassland, dry watercourses. *Candle acacia*, *mouse bush*; *kersdoring*, *trassiebos* (A); *mohae* (SS).

AcGr DrGr KarSh

**karroo** (Hayne) Banfi & Galasso
*Acacia karroo* Hayne

Tree or shrub, up to 22 m high; young branchlets glabrous. **Leaves** green or dark green, with leaflets 6–15(–22) pairs per pinna, 1–5 mm wide; stipules spinescent, 40–70(–100) mm long, sometimes greatly elongated up to 250 mm long; conspicuous gland present on petioles. **Flowers**: inflorescences capitate; corolla bright yellow; Nov.–Mar. **Pods** slightly to strongly falcate, constricted between seeds, but not jointed, longitudinally dehiscent, reddish to grey-brown, glabrous. Thornveld, scrub, bush clumps, woodland, grassland, riverbanks. *Sweet thorn*, *white thorn*; *soetdoringboom*, *pendoringboom* (A); *leoka* (SS); *umnga-mpunzi* (X); *umunga* (Z). Figure 20, p. 23.

VreDm AcGr DrGr MsGr KarSh

**robusta** (Burch.) Kyal. & Boatwr. subsp. **robusta**
*Acacia robusta* Burch. subsp. *robusta*

Tree, up to 20 m high; young branchlets robust, usually with well-developed cushions at nodes. **Leaves** green or dark green, with 3–5(–7) pinnae pairs; leaflets 1.5–3.5 mm wide; rachillae usually 25–60 mm long, glabrous; stipules spinescent, mostly short, straight or slightly curved; petioles without a gland. **Flowers**: inflorescence globose; corolla white; Sep. **Pods** ± straight to falcate, not constricted between seeds, valves thinly woody, brittle, reddish to grey-brown, glabrous. Wooded slopes, woodland, thornveld, river valley scrub. *Broadpod robust thorn*; *enkeldoring* (A).

VreDm

**tortilis** (Forssk.) Galasso & Banfi subsp. **heteracantha** (Burch.) Kyal. & Boatwr.
*Acacia heteracantha* Burch.
*A. litakunensis* Burch.
*A. tortilis* (Forssk.) Hayne subsp. *heteracantha* (Burch.) Brenan

Tree, up to 15 m high. **Leaves** with 2–10 pinnae pairs; leaflets 0.6–1.0 mm wide; stipules spinescent, short, strongly recurved or hooked, usually intermixed with some long straight spines; spines both straight and hooked on the same branch or pair. **Flowers**: inflorescence capitate; corolla white or yellowish white; Nov.–Jan. **Pods** contorted or spirally twisted, glabrous. Woodland, thornveld, scrub, bush clumps. *Umbrella thorn*, *curly-pod acacia*; *withaakdoring*, *haak-en-steek*, *sambreeldoring* (A); *isishoba*, *isisthwethwe* (Z).

AcGr DrGr KarSh

## **Vicia** L. (sthn Afr.: 6 spp.)

### Key to species:

[after Gunn: 6 (1979)]

1a Stipules bearing nectary patches . . . . . **V. sativa** subsp. **sativa**
1b Stipules without nectary patches . . . . . 2

2a Flowers small, up to 7 mm long; corolla not black at tip; slender, sprawling plant . . . . . **V. hirsuta**
2b Flowers large, up to 18 mm long; corolla black at tip; robust climber . . . . . **V. benghalensis**

### *benghalensis L.

*V. atropurpurea* Desf.

Annual or short-lived, perennial climber, up to 0.8 m high; robust, herbaceous. **Leaves** 4–16-foliolate; rachis usually terminating in a branched tendril; stipules without nectary patches. **Flowers**: racemes shorter than or equalling leaves; calyx tube strongly gibbous at base; corolla up to 18 mm long, black at tip; limb of standard ± as long as claw, dark red; Nov. Grassland, disturbed places. Native to Europe and Asia. *Narrow-leaved purple vetch*, *wild purple vetch*; *wilde-ertjie*, *smalblaar-perswieke* (A).

MsGr KarSh

### *hirsuta (L.) Gray

Annual climber, up to 1 m high; herbaceous. **Stems** slender, sprawling. **Leaves** 4–16-foliolate; leaflets linear, margins entire; rachis usually terminating in a branched tendril; stipules without nectary patches. **Flowers**: racemes elongate with 2–6(–8) closely spaced flowers, slightly shorter than subtending leaf; corolla up to 7 mm long, whitish blue; May–Aug. **Pods** oblong, flattened. Roadsides and waste areas. Native to Europe. *Hairy tare*, *tiny purple vetch*; *ringelwieke*, *klein-perswieke* (A).

DrGr

### *sativa L. subsp. sativa

Annual herb, up to 0.8 m high. **Stems** angular. **Leaves** 6–16-foliolate, lower ones 2–4-foliolate; rachis usually terminating in a branched tendril; stipules bearing nectary patches; petioles up to 8 mm long. **Flowers**: style dorsally compressed, pubescent all round towards apex; calyx slightly asymmetrical at base; corolla reddish to mauve; Oct.–Apr. **Pods** narrowly oblong, brownish black. Grassland, cultivated land, roadsides. Native to western Europe. *Common wild vetch*, *broad-leaved purple vetch*, *tare*; *breëblaarperswieke*, *wilde-ertjie* (A).

DrGr MsGr

## **Vigna** Savi (sthn Afr.: 15 spp.)

### Key to species:

[after Pienaar: 47 (1992)]

1a Corolla mauve . . . . . **V. unguiculata** subsp. **stenophylla**
1b Corolla yellow . . . . . 2
2a Leaflets 30–36 mm long; standard petal oblate; style prolongation short and flat; pods cylindrical or distally broadened . . . . . **V. comosa** subsp. **comosa**
2b Leaflets 15–120 mm long; standard petal narrow; style prolongation a long beak; pods compressed . . . . . **V. oblongifolia** var. **parviflora**

### *comosa Baker subsp. comosa

Annual climber; herbaceous. **Leaves** trifoliolate; leaflets ovate, 30–36 mm long, base rounded, apex acute, slightly pilose on both surfaces, lateral leaflets asymmetric. **Flowers**: in a close

raceme at apex of peduncle; style prolongation short and flat; calyx campanulate, subglabrous; standard oblate; corolla yellow; Mar. **Pods** cylindrical or distinctly broadened, oblong-falcate, 15–40 × 4–5 mm, with a short, curved beak, sparsely pubescent. Cultivated maize fields. Native to tropical Africa.

DrGr

**oblongifolia** A.Rich. var. **parviflora** (Baker) Verdc.
*V. parviflora* Baker

Annual herb. **Stems** procumbent or twining. **Leaves** trifoliolate; leaflets ovate to narrowly ovate, 15–120 × 3–5 mm, base obtuse, apex acute. **Flowers**: in a short, dense raceme of up to 10, almost opposite, small flowers; style prolongation a long beak, 0.7–0.8 mm long; standard narrow, scarcely emarginate, 10–12 mm long; corolla yellow; Feb.–Apr. **Pods** compressed, 40–65 mm long; seeds yellowish to brown-grey. Grassland.

VreDm

**unguiculata** (L.) Walp. subsp. **stenophylla** (Harv.) Maréchal, Mascherpa & Stainier

Perennial climber, up to 0.6 m high; herbaceous. **Leaves** trifoliolate; leaflets leathery, narrowly ovate to linear, much longer than broad, seldom basally lobed, apex acuminate; stipules narrowly ovate, usually slender-spurred. **Flowers**: in a contracted raceme, usually 2-flowered; style elongation rounded; standard ± 13 × 15 mm; corolla mauve; Jan.–Mar. **Pods** ± 100 mm long, grey to black, pubescent. Grassland.

VreDm

## **Zornia** J.F.Gmel. (sthn Afr.: 4 spp.)

### Key to species:

[after Mohlenbrock: 9 (1961)]

Articles of pods covered with bristles; stems hairy. . . . . **Z. milneana**
Articles of pod devoid of bristles; stems glabrous . . . . . .
. . . . . **Z. capensis** subsp. **capensis**

**capensis** Pers. subsp. **capensis**
*Z. tetraphylla* Michx. var. *capensis* (Pers.) Harv.

Perennial herb, up to 3 m high. **Stems** procumbent; glabrous. **Leaves** 4-foliolate; leaflets glandular-hairy. **Flowers**: bracts ovate, punctuate; standard yellow, often lined with red or purple, 8.5–10.0 × 9–10 mm; wings yellow; keel yellow or greenish; Oct.–Mar. **Pods** 15–23 mm long, with 4–7 articles; articles 2.0–2.5 mm long, devoid of bristles, glabrous and glandular; seeds pale brown, ellipsoid-reniform, slightly beaked at one end beyond small, eccentric hilum. Grassland. *Caterpillar bean*; *umkhondo* (Z).

DrGr MsGr

**milneana** Mohlenbr.

Perennial herb. **Stems** procumbent, up to 0.75 m long; hairy. **Leaves** 4-foliolate; leaflets; glandular-hairy. **Flowers**: bracts ovate, punctate; standard yellow or orange, often lined with

red or purple; wings yellow; keel greenish and yellow; Oct.–Mar. **Pods** 13–18 mm long, with 4–7 articles; articles 3.0–3.5 × 2.5–3.0 mm, covered with retrorse bristles up to 1 mm long; seeds chestnut-brown, semicircular-reniform; hilum small, very eccentric. Grassland, woodland.

VreDm | DrGr | MsGr

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# FAGACEAE

Deciduous or evergreen trees or shrubs; buds with imbricate scales; monoecious. **Leaves** alternate; simple; blade thin or leathery, margins entire, dentate, sinuate or pinnately lobed; with stipules. **Flowers**: in axils of leaves or bud scales; male inflorescences lax, solitary or 1–3 together in pendulous spikes or catkins; female inflorescences solitary, in erect, stiff dichasia, usually 1–5-flowered, with a terminal cupule; male flowers with perianth tube campanulate; lobes 3–6, subtended by small bracteoles; stamens 2–12, surrounded by tufts of silky hairs; female flowers with smaller calyx, surrounded by an involucre of many imbricate or annular scales; ovary inferior, styles usually 3, short, recurved; stigmas broad, lining inner faces of styles. **Fruit** a nut (acorn) arising on or partly enclosed by a cup-shaped or saucer-shaped cupule, involucral scales hardened into teeth or tubercles or annular lamellae. **Seed** 1. *Beech family*.

## *__Quercus__ L. (sthn Afr.: 1 sp.)

### __robur__ L.

Perennial, deciduous tree, 15–30 m high. **Leaves** petiolate; bright green turning dark green, paler below, blade obovate to oblong, margins wavy, 3–6-lobed on each side, with 2 small lobes or auricles at base; petioles 3–8 mm long. **Flowers**: in unisexual catkins; male catkins ± 5 mm in diameter, greenish yellow; female catkins 2.5 mm in diameter, brownish purple; Aug., Sep. **Fruit** brown, ovoid acorns, 18–30 mm long, 1–4 on long, slender stalks 50–100 mm long. Forest margins, woodland, and riverbanks in grassland. Native to Europe and North Africa. *English oak*; *steeleik* (A).



# FLACOURTIACEAE

Trees or shrubs; armed or unarmed; monoecious or dioecious. **Leaves** simple, alternate; blade with margins entire to crenate or serrate, teeth sometimes glandular; often with stipules. **Flowers**: bisexual or unisexual, regular; sepals 4–7(–15), free or fused at base, usually not clearly distinguishable from petals; petals 4–8(–15), free, often inserted on a disc, sometimes absent; stamens 8–10 or many, free or in bundles opposite petals; ovary superior, style short. **Fruit** usually a berry, sometimes a capsule or drupe. *Wild peach family*.

[after Brummitt (2007)]

Recent molecular studies found the Salicaceae to be nested within the Flacourtiaceae, leading to the sinking of the 2 families together. At the same time in the above family the traditional Flacourtiaceae has been divided into two parts, the other part uniting with the Achariaceae. However, the Achariaceae forms a well-distinguished family with herbaceous habit; the Salicaceae is characterised by catkinate inflorescences and the Flacourtiaceae is a family of trees and shrubs with regular flowers with many conspicuous stamens. See notes under Achariaceae and Salicaceae.

## Key to genera

1a Petals with fleshy glands adnate at base of petal . . . . . **Kiggelaria**
1b Petals without glands. . . . . 2
2a Leaf blade elliptic, ovate or obovate; stamens many, not collected in bundles opposite petals; fruit a berry . . . . . .**Scolopia**
2b Leaf blade ± circular or broadly obovate; stamens in bundles of 3's or 4's opposite petals; fruit a capsule . . . . . **Trimeria**

## **Kiggelaria** L. (sthn Afr.: 1 sp.)

### **africana** L.

Shrub or tree, up to 17 m high, unarmed, dioecious. **Bark** pale grey, smooth. **Leaves** petiolate; blade glabrous or white or rusty stellate, with hairy pockets in axils of veins below. **Flowers**: male flowers in axillary cymes on long pedicels, female flowers solitary on long pedicels; sepals 5-parted; petals 5, often very similar to sepals, elliptic, each with a fleshy gland at base, yellowish green; Sep.–Dec., Apr.–Jun. **Fruit** globose, woody, rough; seeds bright orange-red. Fairly open forest, kloofs, along streams and in scrub. *Wild peach*, *spokewood*; *wilde-perske*, *spekhout* (A); *lekhatsi* (SS); *umkhokhokho* (X); *isiklalu* (Z).

DrGr MsGr Zastr

## **Scolopia** Schreb. (sthn Afr.: 5 spp.)

### Key to species:

[after Killick: 63 (1976)]

Leaf blade obovate, apex acute, margins entire except for a few, distantly spaced teeth in upper half, upper surface usually with a flaky, waxy covering. . . **S. zeyheri**

Leaf blade elliptic or ovate, apex acuminate, margins closely and regularly serrated throughout whole length of blade, upper surface without a flaky, waxy covering . . . . . **S. mundii**

**mundii** (Eckl. & Zeyh.) Warb.

Shrub or tree, up to 16 m high; unarmed. **Leaves** petiolate, petioles reddish; blade elliptic or ovate, 40–70 × 20–40 mm, base cuneate, apex acuminate, margins closely and regularly serrated throughout whole length of blade, upper surface without a flaky, waxy covering. **Flowers**: small, sepals ± 2 mm long; inflorescence racemose; perianth greenish white; May–Aug. **Fruit** a globose berry, 7–10 mm in diameter; glabrous, red, style persistent. Forest, grassy mountain slopes. *Red pear*; *klipdoring*, *rooipeer* (A); *qoqolosi* (SS); *umnqanqa* (X); *ingqumuza* (Z).

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**zeyheri** (Nees) Harv.
*S. ecklonii* (Nees) Harv.

Shrub or tree, up to 13 m high; armed, spines sometimes form large, branched masses on main trunk. **Leaves** petiolate; blade narrowly to broadly obovate, sometimes elliptic or ovate, 20–80 × 10–35 mm, base narrowly cuneate, apex acute, margins entire except for a few distantly spaced teeth in upper half of blade, upper surface with a flaky, waxy covering. **Flowers**: small, sepals ± 1.3–1.5 mm long; inflorescence racemose; perianth white or cream-coloured to yellow, fading to brown; Jun.–Nov., Mar. **Fruit** a globose berry, up to 9 mm in diameter, red, style persistent. Bush clumps, termite mounds, scrub and forest. *Thorn pear*; *doringpeer* (A); *morêtlhêtle* (T); *iqumza* (X); *umahlambahlale*(Z).

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## **Trimeria** Harv. (sthn Afr.: 2 spp.)

**grandifolia** (Hochst.) Warb. subsp. **grandifolia**
*T. alnifolia* (Hook.) Harv.
*T. rotundifolia* (Hochst.) Gilg

Scrambling shrub or tree, 3–10 m high. **Leaves** petiolate; blade circular or broadly obovate, 40–110 × 40–100 mm,, apex rounded notched, margins finely toothed, digitately 5–7-nerved, veins conspicuous on lower surface. **Flowers**: dioecious, small, in axillary racemes; sepals and petals 4- or 5-merous; corolla white, green or greenish white; Nov.–Feb. **Fruit** an obovoid capsule, ± 5 mm long; seeds ellipsoid, testa minutely tessellated, with a red aril on one side. Forest. *Wild mulberry*; *wildemoerbei* (A); *idlebenlendlovu* (X, Z).

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## References

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# FRANKENIACEAE

Low, spreading, woody dwarf shrubs, rarely annuals, often hairy and richly endowed with salt secreting glands (halophytes). **Leaves** opposite, decussate below or in verticils of 4 above or clustered, sessile or petiolate. **Flowers**: regular, usually bisexual, in forks of branches, sessile, small; calyx tubular, 4- or 5-fid, ribbed; petals 5, free, imbricate, with an adnate scale or ligule attached to inside of claw; stamens usually 6; filaments expanded below, filiform above; ovary superior, style terete, with 3 stigmatic lobes. **Fruit** a capsule enclosed in calyx, seeds small, ellipsoid-fusiform, papillate or smooth. *Frankenia family*.

## **Frankenia** L. (sthn Afr.: 3 spp.)

### **pulverulenta** L.

Annual, rarely perennial herb, 0.02–0.35 m high, with branches. **Stems** with internodes usually long, glabrous or puberulous with short curly hairs; branchlets usually contracted, forming leafy fascicles at nodes; branches spreading, often reddish. **Leaves** with short petioles fused below to stipular, amplexicaul, ciliate sheath; blade ovate to narrowly ovate, 3–5 mm long, flat or with margins recurved to tightly revolute. **Flowers**: many, solitary in forks of branches; petals ± 5 mm long, pink, mauve or white; Jan.–Dec. Salt pans, banks of brackish streams.




# GENTIANACEAE

Annual, biennial or perennial herbs, rarely dwarf shrubs or trees. **Leaves** usually opposite, occasionally alternate or in a basal rosette; without stipules. **Flowers**: solitary, usually in cymes, often corymbose or head-like, rarely in racemes; regular; usually 4- or 5-merous, calyx united at base, sepals rarely free; corolla with lobes usually contorted in bud; stamens as many as corolla lobes and arising from them; ovary superior, 1-locular. **Fruit** a capsule. *Gentian family*.

## Key to genera

[after Marais & Verdoorn: 171(1963)]

Corolla pink . . . . . **Chironia**
Corolla mainly yellow, sometimes cream-coloured or white . . . . . **Sebaea**

## **Chironia** L. (sthn Afr.: 16 spp.)

### Key to species:

[after Marais & Verdoorn: 213 (1963)]

1a Flower fastigiate; inflorescence thyrsoid . . . . . **C. krebsii**
1b Flower not fastigiate; inflorescence cymose . . . . . 2

2a Corolla deep magenta-pink; calyx longer than corolla tube . . . . . **C. purpurascens** subsp. **humilis**
2b Corolla rose-pink; calyx ± as long as corolla tube . . . . . 3
3a Basal leaves in a rosette, persistent, cauline leaves much reduced . . . . . **C. palustris** subsp. **palustris**
3b Basal leaves not persistent, cauline leaves well developed . . . . . **C. palustris** subsp. **transvaalensis**

**krebsii** Griseb.

Annual herb, 0.4–0.7 m high. **Leaves** with basal ones long and persistent, up to 300 mm long; cauline leaves none or reduced to 1–3 distant pairs. **Flowers**: inflorescence thyrsoid, usually narrowly oblong in outline; flowers strictly erect; anthers twisted; calyx shorter than or as long as corolla tube; corolla red-purple, pink, red, occasionally white; Sep.–Mar. **Fruit** ovoid. Marshy ground usually at high altitudes. *Kreb's chironia*; *khomo-ea-sephatla*, *lehlapahali*, *mamorulane*, *mosia* (SS); *umbangwangwa*, *umanqunduswazi* (Z).




**palustris** Burch. subsp. **palustris**

Annual herb, 0.3–0.6 m high. **Leaves** with basal ones in a rosette, persistent, cauline leaves much reduced, usually in 1–3 pairs. **Flowers**: inflorescence of open 2- or 3-flowered cymes; not strictly erect; anthers strongly twisted; calyx ± as long as corolla tube; corolla rose-pink, occasionally bleached white; Nov.–Jul. **Fruit** oblong-elliptic. Marshy, usually turfy ground or near water. *Cerise stars*; *bitterwortel* (A); *mosia*, *thatjane*, *khomo-ea-sephatla*, *lepshetlane*, *lehlapahali* (SS).




**palustris** Burch. subsp. **transvaalensis** (Gilg) I.Verd.
*C. transvaalensis* Gilg

Annual herb, ± 0.7 m high. **Leaves** with basal leaves usually not persistent; cauline leaves well developed, up to 7 mm broad, glaucous. **Flowers**: inflorescence of open 2- or 3-flowered cymes; flowers not strictly erect; anthers slightly to strongly twisted; calyx ± as long as corolla tube; corolla rose-pink, occasionally bleached white; Oct.–Jun. **Fruit** oblong-elliptic. Marshy places usually at water's edge, on banks of streams, dams and rivers. *Transvaal chironia*; *bitterwortel* (A).




**purpurascens** (E.Mey.) Benth. & Hook.f. subsp. **humilis** (Gilg) I.Verd.
*C. humilis* Gilg

Biennial or perennial herb, 200–500 mm high. **Leaves** with basal ones often disappearing; cauline leaves usually remote or 3 or more pairs to stem. **Flowers**: inflorescence of open 2- or 3-flowered cymes, central flower in each cyme subsessile; not strictly erect; calyx longer than corolla tube, lobes attenuate into a long point; corolla deep magenta-pink; Oct.–Jun. **Fruit** subcylindric. Damp or marshy places on mountain tops, hillsides, low-lying ground, old lands, vleis and dongas. *Dwarf chironia*.



## **Sebaea** Sol. ex R.Br. (sthn Afr.: 45 spp.)

### Key to species:

[after Marais & Verdoorn: 173–177 (1963)]

1a Perennial, creeping, mat-forming or rosulate herbs . . . . . 2
1b Annual, biennial or perennial, erect, never creeping or mat-forming herbs . . . . . 6
2a Apical anther glands yellow or orange . . . . . 3
2b Apical anther glands reddish brown or black. . . . . 4
3a Stems creeping, rooting at nodes; filaments inserted in corolla sinuses. . . . . **S. repens**
3b Stems not rooting at nodes, procumbent or erect with leaves densely crowded in lower half; filaments inserted in or just below corolla sinuses. . . . . **S. procumbens**
4a Style without a stigmatic swelling; corolla tube > 12 mm long. . .**S. thomasii**
4b Style with a stigmatic swelling; corolla tube < 12 mm long . . . . . 5
5a Stigmatic swelling above middle; style and stigma 2.0–3.5 mm long . . . . . **S. spathulata**
5b Stigmatic swelling below middle; style and stigma 3.5–6.5 mm long . . . . . **S. thodeana**
6a Perennial or biennial herbs, slender or stout, leaves in many pairs along stems. . . . . 7
6b Annual or biennial herbs, very slender, usually with reduced leaves or leaves in relatively few pairs . . . . . 13
7a Inflorescences lax with long branches . . . . . **S. rehmannii**
7b Inflorescences compact, head-like or corymbose. . . . . 8
8a Calyx very wide, markedly 5-angled. . . . . **S. macrophylla**
8b Calyx not very wide or markedly 5-angled . . . . . 9
9a Style with a relatively large swelling, usually well below middle. . . . . 10
9b Style with a small or medium swelling below middle. . . . . .11
10a Keel wing up to 0.75 mm broad. . . . . .**S. leiostyla**
10b Keel wing 0.75–1.50 mm broad . . . . . **S. natalensis**
11a Inflorescence paniculate-corymbose . . . . . **S. sedoides** var. **sedoides**
11b Inflorescence densely corymbose and head-like . . . . . 12
12a Filaments inserted below corolla sinuses . . .**S. sedoides** var. **schoenlandii**
12b Filaments inserted in corolla sinuses . . . . . **S. sedoides** var. **confertiflora**
13a Flowers solitary . . . . . 14
13b Flowers in few- to many-flowered inflorescences . . . . . 15
14a Filaments inserted below corolla sinuses . . . . . **S. grandis**
14b Filaments inserted in corolla sinuses . . . . . **S. filiformis**
15a Leaves with blade ovate-orbicular, rhombic or ovate . . . . . 16
15b Leaves with blade linear, narrowly ovate or narrowly elliptic. . . . . 19
16a Filaments inserted in corolla sinuses . . . . . 17
16b Filaments inserted below corolla sinuses . . . . . 18
17a Style with stigmatic swelling below stigma or in middle . . . . **S. minutissima**
17b Style with stigmatic swelling above middle or without . . . . . **S. pentandra** var. **burchellii**
18a Calyx segments winged . . . . . **S. pentandra** var. **pentandra**
18b Calyx segments keeled . . . . . **S. erosa**
19a Style and stigma 3–4 mm long . . . . . **S. junodii**
19b Style and stigma 5–7 mm long . . . . . 20
20a Calyx winged; style without a stigmatic swelling or a large one below middle . . . . . **S. bojeri**
20b Calyx keeled; style with a small stigmatic swelling near base or a large one below middle, but then inflorescence densely flowered . . . . . 21

21a Style with small stigmatic swelling near base; inflorescence 1–few-flowered . . . . . **S. exigua**
21b Style with large stigmatic swelling below middle; inflorescence densely flowered . . . . . **S. compacta**

## **bojeri** Griseb.

*S. saccata* Schinz

Annual herb, 50–200 mm high. **Stems** slender, erect. **Leaves** with lower ones reduced, in relatively few pairs, internodes prominent; blade linear, up to 10 × 3 mm. **Flowers**: in lax 1–few-flowered cymes; filaments inserted in corolla sinuses; anthers with a very small sessile apical gland or sometimes apparently eglandular; style without stigmatic swelling or with large swelling below middle, style and stigma 5–7 mm long; calyx winged; corolla with tube 5–6 mm long, yellow; Feb.–May. Grassland.

DrGr MsGr

## **compacta** A.W.Hill

Annual herb, up to 150 mm high. **Stems** much branched. **Leaves** in relatively few pairs, internodes prominent; blade ovate to narrowly ovate or elliptic, 60–140 × 3–4 mm; lower ones scale-like. **Flowers**: in dense, many-flowered inflorescences; filaments very short; anthers with a small stipitate apical gland; style with large stigmatic swelling below middle, style and stigma 5–7 mm long; calyx keeled; corolla with tube 7–11 mm long, yellow; Jun.–Sep. Grassland, disturbed places.

DrGr KarSh

## **erosa** Schinz

*S. pygmaea* Schinz

Annual herb, 50–150 mm high. **Stems** slender, erect. **Leaves** in relatively few pairs, internodes prominent; blade ovate-orbicular, ± 10 × 10 mm. **Flowers**: in lax, few-flowered cymes, pedicels long; filaments inserted 0.5–1.0 mm below corolla sinuses; style with a small stigmatic swelling, usually below middle, but sometimes above middle; calyx segments keeled; corolla with tube 4.5–7.0 mm long, yellow; Oct.–Jul. Marshy areas in grassland.

MsGr

## **exigua** (Oliv.) Schinz

Annual or biennial herb, up to 200 mm high. **Stems** slender, erect. **Leaves** in relatively few pairs, internodes prominent; blade linear to narrowly ovate, 12 × 1.0–1.5 mm. **Flowers**: in 1–few-flowered cymes; filaments inserted in corolla sinuses; anthers with a minute apical gland; style with small stigmatic swelling near base, style and stigma 5–7 mm long; calyx keeled or very narrowly winged, joined for 2–4 mm at base; corolla with tube 5.0–7.5 mm long, yellow or pale yellow; Oct., Feb.–Jun. Grassland.

DrGr

## **filiformis** Schinz

Annual herb, 40–150 mm high. **Stems** very slender, erect. **Leaves** in relatively few pairs, internodes prominent; blade linear to narrowly ovate, 1–5 mm long. **Flowers**: usually solitary, terminal; filaments inserted in corolla sinuses; anthers with a stipitate apical gland; style with

large stigmatic swelling below middle; corolla with tube 5–8 mm long, yellow or pale yellow; Aug., Feb.–Apr. Grassland.

DrGr MsGr

**grandis** (E.Mey.) Steud.

*Belmontia grandis* E.Mey.
*Exochaenium grande* (E.Mey.) Griseb.

Annual or biennial herb, up to 350 mm high. **Stems** erect. **Leaves** in relatively few pairs, internodes prominent; blade narrowly ovate to ovate, up to 40 × 15 mm. **Flowers**: solitary, terminal; filaments inserted below corolla sinuses; anthers with a large apical gland; style without stigmatic swelling; stigma clavate or linear-oblong, 2.25–5.00 mm long; corolla with tube 10–23 mm long, white, cream-coloured, yellow or salmon-pink; Oct.–Jun. In open grassland or moist situations. *Liphalana*, *mipa petle*, *phalana* (SS); *umalopha omncane* (Z).

AcGr DrGr MsGr

**junodii** Schinz

Annual herb, 35–200 mm high. **Stems** slender, erect. **Leaves** in relatively few pairs, internodes prominent; blade narrowly ovate, 1–5 mm long. **Flowers**: in few- to many-flowered inflorescences; filaments inserted in corolla sinuses; anthers with a small stipitate apical gland; style without stigmatic swelling, style and stigma 3–4 mm long; corolla with tube 3.75–5.00 mm long, yellow or lemon-coloured; Jan.–Apr. Under trees or shrubs in rich mould or in humus pockets among rocks.

MsGr

**leiostyla** Gilg

*S. polyantha* Gilg

Annual or perennial herb, up to 1 m high. **Stems** erect or spreading. **Leaves** in many pairs scattered along stems; blade ovate to ovate-orbicular, up to 25 × 30 mm. **Flowers**: in dense corymbose, head-like cymes; filaments inserted in corolla sinuses; anthers with a small apical gland and sometimes 2 minute basal glands; style with large stigmatic swelling below middle or near base; corolla with tube 3.25–7.00 mm, keel wing up to 0.75 mm broad, yellow or rich yellow; Jul.–Jun. Grassland.

DrGr MsGr KarSh

**macrophylla** Gilg

*S. brehmeri* Schinz
*S. fastigiata* A.W.Hill

Perennial herb, up to 0.75 m high. **Stems** erect, decumbent, procumbent or straggly. **Leaves** in many pairs scattered along stems; blade broadly ovate, base cordate, 6–21 × 4–22 mm. **Flowers**: in leafy, dense, many-flowered, corymbose cymes, branches long; filaments inserted in corolla sinuses; anthers with a small to big apical gland and 2 smaller basal glands; style with small to large stigmatic swelling below middle; calyx very wide, markedly 5-angled; corolla with tube 5–9 mm long, yellow; Feb.–Jul. Moist situations.

MsGr

**minutissima** Hilliard & B.L.Burtt

Annual herb, 3–35 mm high. **Stems** erect. **Leaves** in relatively few pairs, internodes prominent; blade rhombic, broadly elliptic to suborbicular, 2.5–7.0 × 2.5–5.0 mm. **Flowers**: in 1–3-flowered cymes; filaments inserted in corolla sinuses; anthers with an apical gland; style with a stigmatic swelling below stigma or in middle; corolla with tube 3–4 mm long, yellow; May. Damp, marshy areas, rock crevices.

| | | | MsGr | | |
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**natalensis** Schinz

*S. imbricata* A.W.Hill

*S. rudolfii* Schinz

Herb, up to 250 mm high. **Stems** erect or decumbent. **Leaves** in many pairs scattered along stems; blade broadly ovate to suborbicular, up to 13 × 15 mm. **Flowers**: in dense, corymbose, few- to many-flowered cymes; filaments inserted in or up to 1 mm below corolla sinuses; anthers with a small apical and sometimes 2 minute basal glands; style with large swelling below middle; corolla with tube 5.5–7.5 mm, keel wing 0.75–1.50 mm broad, yellow; Jan. Grassland.

| | | DrGr | MsGr | KarSh | |
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**pentandra** E.Mey. var. **burchellii** (Gilg) Marais

*S. burchellii* Gilg

*S. conrathii* Schinz

Annual herb, 50–300 mm high. **Stems** erect, sometimes almost leafless. **Leaves** in relatively few pairs, internodes prominent; blade broadly ovate to elliptic. **Flowers**: in few- to many-flowered, corymbose, compact cymes; filaments up to 0.5 mm long, inserted in corolla sinuses; anthers with a conspicuous apical and 2 small basal glands; style with swelling above middle or without; corolla with tube 3–10 mm long, yellow; Sep.–Dec., Mar. Damp situations, along dry watercourses, low-lying ground.

| | | DrGr | | KarSh | |
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**pentandra** E.Mey. var. **pentandra**

*S. primulina* A.W.Hill

Annual herb, 50–300 mm high. **Stems** sometimes almost leafless. **Leaves** in relatively few pairs in upper part, basal ones in a firm, subsucculent rosette; blade broadly ovate to elliptic, up to 40 × 20 mm. **Flowers**: in few- to many-flowered, corymbose, compact cymes; filaments up to 2.5 mm long, inserted in or below corolla sinuses; anthers with 3 glands; style with small to large swelling below middle; calyx segments winged; corolla with tube 3–10 mm long, yellow; Aug., Sep. Damp situations, along dry watercourses; in low-lying ground.

| | AcGr | DrGr | | KarSh | |
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**procumbens** A.W.Hill

*S. conspicua* A.W.Hill

*S. rotundifolia* A.W.Hill

Procumbent or erect, mat-forming, perennial herb, up to 220 mm high. **Stems** not rooting at nodes. **Leaves** densely crowded in lower half; blade suborbicular to obovate-elliptic, up to 35 × 28 mm, upper leaves smaller. **Flowers**: in few- to several-flowered cymes in a lax corymb; filaments 0.30–1.75 mm long, inserted in or just below corolla sinuses; anthers with apical

glands pale yellow; style with swelling below middle or without; corolla with tube 4.5–8.0 mm long, yellow; Nov.–Jan. Mountain grassland.

DrGr MsGr

**rehmannii** Schinz

*S. macrantha* Gilg

Annual or biennial herb, up to 0.65 m high. **Stems** erect. **Leaves** in many pairs scattered along stems; ovate to ovate-orbicular, up to 18 × 18 mm. **Flowers**: in lax; many-flowered, corymbose panicles or a few cymes, branches long; filaments inserted in or shortly below corolla sinuses; anthers with a small apical gland or occasionally eglandular; style with swelling below middle; corolla with tube 5–10 mm long, yellow; Jan.–May, Aug., Sep. Mountain grassland.

MsGr

**repens** Schinz

Procumbent, mat-forming, perennial herb, up to 60 mm high. **Stems** rooting at nodes. **Leaves** suborbicular, reniform or ovate-cordate. **Flowers**: in terminal few-flowered cymes or solitary; filaments inserted in corolla-sinuses; anthers with apical gland small, round and yellow, or big and orange; style with swelling below middle; corolla with tube 5–8 mm long, yellow; Jul.–Jan. Moist, high-altitude situations.

MsGr

**sedoides** Gilg var. **confertiflora** (Schinz) Marais

*S. confertiflora* Schinz

Perennial herb, up to 0.65 m high. **Stems** erect or decumbent. **Leaves** in many pairs scattered along stems; blade reniform-orbicular, up to 18 × 20 mm. **Flowers**: inflorescence densely corymbose and head-like; filaments inserted in corolla sinuses; anthers with a small or medium stipitate apical gland; style with swelling below middle; corolla with tube 3.0–7.5 mm long, yellow, butter-yellow or white; Jan.–Mar. Marshy areas in grassland.

MsGr

**sedoides** Gilg var. **schoenlandii** (Schinz) Marais

*S. schoenlandii* Schinz

Perennial herb, up to 0.65 m high. **Stems** erect or decumbent. **Leaves** in many pairs scattered along stems, variable; blade reniform-orbicular, up to 15 × 18 mm, or rhomboid-ovate, 15 × 6 mm. **Flowers**: inflorescence densely corymbose and head-like; filaments inserted below corolla sinuses; anthers with a small or medium stipitate apical gland; style with small or medium swelling below middle; corolla with tube 4.5–7.5 mm, yellow, butter-yellow or white; Jan.–Mar. Marshy areas in grassland.

VreDm

**sedoides** Gilg var. **sedoides**

Perennial herb, up to 0.65 m high. **Stems** erect or decumbent. **Leaves** in many pairs scattered along stems; blade reniform-orbicular to broadly ovate, up to 25 × 25 mm. **Flowers**: in dense, many-flowered, paniculate-corymbose cymes; filaments inserted in corolla sinuses; anthers

with a small or medium stipitate apical gland; style with swelling below middle; corolla with tube 5–8 mm long, yellow, butter-yellow or white; Dec.–Mar. Grassland. *Isivumelwane esikhulu*, *umanqweyana*, *umsolo* (Z).




**spathulata** (E.Mey.) Steud.
*Belmontia spathulata* E.Mey.

Procumbent, mat-forming, perennial herb, up to 0.6 m high. **Leaves** in basal rosette, elongate-spathulate, up to 140 × 20 mm, fleshy, stem leaves smaller. **Flowers**: in compact cymes; peduncle erect; filaments up to 0.5 mm long; anthers with conspicuous dark, red-brown, apical glands; style with swelling above middle or confluent with stigma, style and stigma 2.0–3.5 mm long; corolla with tube 7.5–10.5 mm long, white, sweetly scented; Sep.–Jan. Damp, grassy slopes, in shade, on streambanks. *Fukuthoane-ea-loti* (SS).




**thodeana** Gilg

Procumbent, mat-forming, perennial herb, up to 0.6 m high. **Leaves** crowded in a basal rosette; blade narrowly obovate or spathulate, up to 40 × 15 mm, stem leaves smaller. **Flowers**: in 1–several, few-flowered cymes; filaments up to 1 mm long; anthers with conspicuous dark, red-brown, apical glands; style with swelling below middle or near base, style and stigma 3.5–6.5 mm long; corolla with tube 6–7 mm long, white or yellow; Oct.–Jan. Moist places along watercourses.




**thomasii** (S. Moore) Schinz
*Exochaenium thomasii* (S.Moore) Schinz
*S. jasminiflora* Schinz

Procumbent, mat-forming, perennial herb, with ascending flowering branches. **Leaves** with blade elliptic to ovate, up to 20 × 14 mm. **Flowers**: in 1–few-flowered cymes; filaments inserted below corolla sinuses; anthers with an oblong-conical, dark (red-brown) apical gland; style without stigmatic swelling; corolla with tube 13–21 mm long, bright yellow; Aug. Moist situations on high mountain ranges.




## Reference

MARAIS, W. & VERDOORN, I.C. 1963. Gentianaceae. *Flora of southern Africa* 26: 171–243.

# GERANIACEAE

Compiled by T.T. Masupa, E. Retief & N.L. Meyer

Annual or perennial herbs, or dwarf shrubs; often succulent, often aromatic; variously hairy. **Leaves** alternate or in a basal rosette; simple or compound, margins entire, pinnately or palmately lobed; with stipules. **Flowers**: in few- to many-flowered cymose or umbellate inflorescences, rarely peduncle 1-flowered; bracts present or absent; bisexual, regular or irregular; sepals 4 or 5, free or connate to middle, some genera with a tubular, nectariferous spur fused with pedicel; petals 2–5, free, equal or unequal; disc of nectar glands outside stamens alternating with petals; stamens usually twice as many as petals, sometimes reduced to 2, fertile or sterile, filaments free or connate at base, anthers versatile; ovary superior; styles free at top. **Fruit** a 3–5(8)-lobed schizocarp, breaking up into 1(2)-seeded mericarps, mericarps rostrate, tapering from apex to base, ending in a spirally twisted awn when ripe. *Geranium family*.

## Key to genera

[after Dyer: 277 (1975)]

1a Flowers irregular; stamens 10, usually only 2–7 with anthers . . . . **Pelargonium**
1b Flowers regular or very nearly so; stamens 5–15, all perfect or alternate ones without anthers. . . . . 2
2a Stamens, 5 fertile and 5 staminodes . . . . . **Erodium**
2b Stamens 10–15, all fertile. . . . . 3
3a Stamens 10. . . . . **Geranium**
3b Stamens 15. . . . . **Monsonia**

## **Erodium** L'Hér. (sthn Afr.: 6 spp.)

### ***cicutarium** (L.) L'Hér.

Annual herb; pubescent. **Stems** procumbent, up to 0.5 m long. **Leaves** rosulate and caulescent; compound; alternate or opposite; petiolate; blade ovate to elliptic, 45–115 × 15–35 mm, pinnate, pinnae deeply lobed, margins serrate to dentate; petioles up to 150 mm long. **Flowers**: in umbels with up to 10 flowers; peduncles 17–20 mm long, pedicels 5–7 mm long, reddish purple; fertile stamens 5, staminodes 5; petals 4–10 × 2–3 mm, purplish pink to whitish; Jan.–Dec. **Fruit** 4–7 mm long. Roadside ditches, cultivated fields, sandy soil. Native to the Mediterranean Basin. *Wild musk*, *herons-bill*; *horlosiewysterbos*, *muskuskruid*, *turksenaels*, *naaldegras* (A); *makorotsoane* (SS).

DrGr | KarSh | Zastr

## **Geranium** L. (sthn Afr.: 31 spp.)

### Key to species:

[after Hilliard & Burtt: 177 (1985)]

1a Leaves with median primary lobe of blade shallowly to deeply cut, but not to base of leaf. . . . . 2
1b Leaves with median primary lobe of blade cut to base of leaf . . . . . 4

2a Petals deeply notched . . . . . **G. wakkerstroomianum**
2b Petals either entire or shallowly notched . . . . . 3
3a Leaves with lower surface of blade clad in closely matted white hairs between veins, long coarse spreading hairs over veins . . . . . **G. brycei**
3b Leaves with lower surface of blade variously hairy, but not with matted white hairs between veins . . . . . **G. schlechteri**
4a Leaves with primary lobes once or twice pinnate, pinnae usually linear, sometimes oblong on well-grown plants . . . . . 5
4b Leaves with primary lobes somewhat irregularly lobed and toothed, ultimate segments oblong or narrowly ovate . . . . . 6
5a Leaves with lobes of blade once pinnate, lowermost pair of pinnae on each lobe sometimes toothed or lobed . . . . . **G. magniflorum**
5b Leaves with lobes of blade twice pinnate . . . . . **G. multisectum**
6a Leaves silvery, with dense appressed hairs on upper surface of blade, or if rather densely so, hairy on both surfaces . . . . . **G. robustum**
6b Leaves thinly clad with appressed hairs on upper surface of blade, or if rather densely so, then hairs on the lower surface coarse and spreading . . . **G. dregei**

## **brycei** N.E.Br.

*G. thodei* R.Knuth

Dwarf shrub, 0.3–1.5 m high. **Stems** erect or decumbent, upper parts thinly pilose. **Leaves** with median primary lobe of blade cut nearly to base of leaf; blade closely matted with white hairs within veins, long coarse hairs on veins; petioles 30–300 mm long. **Flowers**: inflorescence mostly 2–flowered, peduncles terminal and opposite in upper leaf axils; pedicels 15–55 mm long, hairy; petals obovate, 14–20 × 10–13 mm, shallowly notched, pale, purple-blue or light magenta-violet; Nov.–Apr. Damp and rocky areas, streambanks, drainage lines, open mountainsides.

MsGr

## **dregei** Hilliard & B.L.Burtt

Perennial herb, 0.9–1.2 m high. **Stems** slender, sprawling; rooting at nodes. **Leaves** with median primary lobe of blade shallow or deeply cut, but not to base of leaf; blade up to 35 mm in diameter, digitately (3–)5-lobed, each lobe deeply pinnatifid, these segments oblong, 2 mm broad, upper surface with coarse hairs, lower surface with coarse spreading hairs; petioles long, the uppermost much exceeding the blade in length. **Flowers**: inflorescence 1- or 2-flowered; peduncles opposite, pedicels up to 20 mm long, hairy; petals 7.0–8.5 × 3–4 mm, margins serrate, pale pink. Nov.–Apr. Streambanks, bushes.

DrGr

## **magniflorum** R.Knuth

Perennial herb. **Stems** decumbent, herbaceous, pubescent. **Leaves** densely tufted at base of stem, stipulate bases of petioles congested in obconic masses; blade usually < 50 mm in diameter, digitately cut to base into 5 lobes, lower segments pinnatisect divided, linear, usually 1–2 mm broad, margins revolute, discolorous, glabrous or sparsely appressed-hairy on upper surface, densely white appressed-hairy on lower surface; petioles several times longer than blade. **Flowers**: inflorescence usually 2-flowered; peduncles opposite upper leaves, much exceeding them, with appressed, retrorse hairs; pedicels > 50 mm long, hairy; petals obovate, 11–20 × 8–14 mm, pink to blue-purple or white with coloured veins; Dec.–Feb. Damp grass, drainage lines.

MsGr

**multisectum** N.E.Br.

*G. incanum* Burm.f. var. *glabrius* R.Knuth

*G. incanum* Burm.f. var. *purpureum* Burtt Davy

Perennial herb, up to 150 mm high. **Stems** spreading, decumbent or ± erect. **Leaves** in tufts at base of stem; blade seldom > 50 mm in diameter, lobes twice-pinnate, margins revolute, glabrous to sparsely hairy on upper surface or more densely on lower surface, hairs often retrorse, strongly appressed to ± spreading; petioles up to 300 mm long. **Flowers**: inflorescence usually 2-flowered; peduncles opposite with gland-tipped hairs, pedicels > 40 mm long, hairy; petals obovate, 15–19 × 10–16 mm, margins usually serrate, shallowly notched, violet, purple or magenta; Nov.–Jan. Open marshy places. *Hlapi-e-kholo*, *ngope-ea-setšoha*, *tlako* (SS).

DrGr MsGr Zastr

**robustum** Kuntze

*G. incanum* Burm.f. var. *pottiae* Burtt Davy

Dwarf shrub, 0.2–1.8 m high; robust. **Stems** erect, silky canescent and leafy above. **Leaves** all cauline, silvery, twice pinnatifid; blade up to 50–100 mm in diameter, segments narrowly ovate, margins entire, occasional toothed, upper surface with silvery appressed hairs, lower surface thick silvery tomentose; petioles 2–3 × longer than blade. **Flowers**: inflorescence usually 2-flowered; peduncles opposite on upper surface and terminal, pedicels up to 60 mm long, with fine appressed retrorse hairs and few to many, spreading, gland-tipped ones; petals 13–20 × 11–15 mm, light purple; Nov.–Mar. Streamsides, moist, shrub-covered mountainsides.

DrGr MsGr

**schlechteri** R.Knuth

*G. ornithopodon* Eckl. & Zeyh. var. *lilacinum* Kuntze

Perennial herb. **Stems** straggling, up to ± 1 m long. **Leaves** with blade up to 60 mm wide, digitately 5-lobed, lobes elliptic in outline, hairy on lower surface, but not with matted white hairs between veins; petioles up to 180 mm long, diminishing upwards, uppermost leaves subsessile. **Flowers**: inflorescence usually 2-flowered, peduncles opposite with a unilateral band of fine retrorse and spreading gland-tipped hairs; pedicels up to 40 mm long; petals obovate, 9–12 × 4–7 mm, margins entire or shallowly notched, white, fading to pink, or white with pink or rosy pink venation; Dec.–Apr. Moist grassland, sometimes in shelter of rocks. *Schlechter's geranium*.

DrGr MsGr

**wakkerstroomianum** R.Knuth

*G. ornithopodon* Eckl. & Zeyh. var. *album* Kuntze

Perennial herb, up to 1 m high. **Stems** straggling. **Leaves** with median primary leaf lobe of blade shallowly to deeply cut, but not to base of leaf; petioles up to 300 mm long, diminishing upwards, upper leaves with very short petioles, clad in spreading hairs, usually eglandular. **Flowers**: inflorescence usually 2-flowered, peduncles opposite, pedicels 10–40 mm long; petals narrow, 7–17 × 2.5–5.5 mm, deeply notched; Jul.–Apr. Mountainsides, forest margins, in damp sheltered or marshy, grassy places. *White geranium*.

MsGr

## **Monsonia** L. (sthn Afr.: 35 spp.)

### Key to species:

[after Venter: 79 (1979)]

1a Stems thick, succulent; petioles becoming spinescent . . . . **M. salmoniflora**
1b Stems herbaceous or slightly woody, rarely subsucculent; without spines . . . . . 2
2a Leaves all alternate, becoming crowded to almost whorled at stem apices; blade linear . . . . . **M. attenuata**
2b Leaves with lower ones rosulate or alternate, upper ones opposite or all opposite; blade variously shaped . . . . . 3
3a Leaf blade glabrous on upper surface; sepals < 5 mm long; fruit beak > 25 mm long. . . . . **M. brevirostrata**
3b Leaf blade hairy on upper surface, if glabrous, sepals > 5 mm long; fruit beak > 30 mm long. . . . . 4
4a Annual herbs; leaf margins serrate and sinuate; petals 6–13 × 3–6 mm, 1.0–1.5 × as long as sepals . . . . . **M. angustifolia**
4b Perennial herbs; leaf margins only serrate; petals 12–22 × 6–16 mm, 1.6–2.5 × as long as sepals . . . . . **M. burkeana**

### **angustifolia** E.Mey. ex A.Rich.

Annual herb, up to 0.5 m high. **Stems** erect or decumbent; indumentum double with curved and straight hairs. **Leaves** alternate, subopposite or opposite; blade linear, narrowly elliptic or narrowly ovate, 8–55 × 2–15 mm, apex emarginate, mucronate, margins serrate and sinuate; petioles with same indumentum as stem, 0.2–0.6 × as long as blade. **Flowers**: inflorescence 1–3-flowered, lateral, axillary; peduncle and pedicel slender with same indumentum as stem; sepals > 5 mm long; petals 6–13 × 3–6 mm, white, mauve, pink, blue, purplish or rarely yellow, venation dark blue or greyish; Nov.–Feb. **Fruit** with beak > 30 mm long. Grassland. *Crane's bill*; *angelbossie*, *teebossie* (A); *malengoana* (SS).




### **attenuata** Harv.

*M. belfastensis* R.Knuth

Perennial herb, up to 500 mm high. **Stems** erect, herbaceous to sublignose; indumentum double with curved and long, erect, straight hairs, often stalked and sessile glands also present. **Leaves** alternate, becoming crowded to almost whorled at stem apices; blade simple, linear, 25–75 × 3–10 mm, apex acute or acuminate; petioles with same indumentum as stem, 0.1–0.5 × as long as blade. **Flowers**: inflorescence usually 1–3-flowered, terminal or lateral, when lateral then axillary; peduncles and pedicels slender, peduncle obsolete; petals with venation conspicuously reticulate, white to yellow, venation greyish blue to green or blackish; Dec.–Mar. Mountainsides or rocky ridges. *Malengoana* (SS).




### **brevirostrata** R.Knuth

Annual herb, 0.1–0.5 m high. **Stems** procumbent or decumbent; indumentum double with curved hairs and scattered, long, straight hairs, often stalked glands present too. **Leaves** rosulate, opposite or subopposite; blade narrowly ovate to broadly ovate, glabrous on upper surface, 8–30 × 3–20 mm, apex obtuse to acute, 3-toothed; petioles 1.0–2.5 × as long as blade. **Flowers**: inflorescence 1- or 2-flowered, lateral, leaf-opposed or axillary; peduncles

and pedicels slender, with same indumentum and glands as stem; peduncles 9–20 mm long, pedicels 4–10 mm long; sepals < 5 mm long; petals narrowly obtriangular, 8–30 × 3–20 mm, white, mauve, blue or purplish blue, venation dark blue or purplish; Dec.–Mar. **Fruit** with beak > 25 mm long. Rocky, turf or sandy grassland and on bare ground in mountainous habitats.

DrGr MsGr

**burkeana** Planch. ex Harv.
*M. glandulosissima* Schinz
*M. malvaeflora* Schinz

Perennial herb, 0.3–0.4 m high. **Stems** herbaceous to woody; terete; pubescent. **Leaves** with lower ones alternate, upper subopposite to opposite; blade narrowly elliptic or narrowly ovate, 1.5–7.5 × as long as wide, margins serrate. **Flowers**: inflorescence 1–5-flowered, lateral, axillary or not, 50–110 mm long; peduncle up to 50 mm long; pedicel 30 mm long; sepals > 5 mm long; petals 12–22 × 6–16 mm, obtriangular to narrowly obtriangular, white, pink, mauve or purplish blue, venation purplish grey; Sep.–Feb. **Fruit** with beak > 30 mm long. Grassland. *Crane's bill*; *teebossie*, *assegaaibossie*, *naaldebossie* (A).

AcGr

**salmoniflora** (Moffett) F.Albers
*Sarcocaulon salmoniflorum* Moffett
[description after Moffett: 590 (1979)]

Dwarf shrub, 0.1–0.5 m high; succulent. **Stems** much branched, branching repeatedly 15–40 mm above ground; spines straight or curved with a decurrent base, tufts of short stalks in axils of spines. **Leaves** petiolate; blade narrowly to broadly elliptic, occasionally broadly ovate, 4–7 × 3–5 mm, glabrous; petioles long or short, ciliate, persistent, hardened into thin spines. **Flowers**: peduncle sessile, pedicels glabrous; stamens with long filaments 7–9 mm long, short ones 4–6 mm long; petals narrowly obovate, 9–17 × 4–8 mm, twice as long as broad, salmon-pink; Jan.–Dec. Outcrops, deep red sand, plains, grasslands, ridges. *Bushman's candle*; *kleinkersbossie*, *t'noena-doring* (A).

KarSh

## **Pelargonium** L'Hér. (sthn Afr.: 218 spp.)

### Key to species:

1a Inflorescence stalk unbranched, with > 1 pseudo-umbel; leaf blade deeply lobed . . . . . **P. schlechteri**
1b Inflorescence stalk with 1 pseudo-umbel or inflorescence a branched system with 2 or more pseudo-umbels; leaf blade simple, lobed or deeply lobed . . . . . 2
2a Petals fimbriate . . . . . **P. bowkeri**
2b Petals not fimbriate . . . . . 3
3a Leaf blade roundish in outline, shallowly lobed, margins finely toothed . . . 4
3b Leaf blade with large lobes or pinnatisect, margins not finely toothed . . . . 5
4a Petals almost black . . . . . **P. sidoides**
4b Petals purple or pink . . . . . **P. leucophyllum**
5a Leaf blade with large lobes . . . . . 6
5b Leaf blade pinnatisect . . . . . 8

6a Leaf blade ovate in outline . . . . . **P. luridum**
6b Leaf blade roundish in outline . . . . . 7
7a Leaf blade with irregular segments . . . . . **P. alchemilloides**
7b Leaf blade with regular segments, segments 3-lobed at apices . . . . . **P. ranunculophyllum**
8a Leaf blade roundish in outline . . . . . 9
8b Leaf blade narrowly to broadly ovate in outline . . . . . 10
9a Leaf blade digitately pinnate . . . . . **P. aridum**
9b Leaf blade 3 or 5 segmented, each segment again being subdivided into 3 or more linear lobes . . . . . **P. abrotanifolium**
10a Leaf blade narrowly ovate in outline . . . . . **P. tragacanthoides**
10b Leaf blade ovate to broadly ovate in outline . . . . . 11
11a Leaf blade broadly ovate in outline, segments linear, apices acute . . . . . **P. luridum**
11b Leaf blade ovate in outline, segments not linear, apices prominently lobed . . . . . 12
12a Apices of segments acutely 3-lobed . . . . . **P. dolomiticum**
12b Apices of segments obtusely 2- or 3-lobed . . . . . 13
13a Petals white or pale purple, without markings . . . . . **P. minimum**
13b Petals dark purplish pink, with markings . . . . **P. multicaule** subsp. **multicaule**

[descriptions after Van der Walt (1977); Van der Walt & Vorster (1981, 1988)]

## **abrotanifolium** (L.f.) Jacq.

Shrub or dwarf shrub, 0.4–1.0 m high. **Stems** with branches slender, glandular, woody, often covered with remains of petiole bases. **Leaves** petiolate; canescent; grey-green; blade roundish in outline, 5–17 × 5–19 mm, with 3 or 5 segments, each segment again being subdivided into 3 or more linear lobes, lobes channelled on upper surface along midribs; petioles up to 10 mm long. **Flowers**: peduncle with 1–5 flowers in a pseudo-umbel; petals 5, spathulate or obovate, 10–15 × 2–3 mm, white to pink or mauve, posterior two with red or purple markings; Jan.–Dec. Arid, rocky outcrops.

DrGr KarSh

## **alchemilloides** (L.) L'Hér.

*P. malvaefolium* Jacq.

Perennial herb, up to 200 mm high. **Stems** herbaceous, slender, straggling, pubescent. **Leaves** silky; blade roundish in outline, palmately lobed, with irregular segments, usually 20–70 mm in diameter, base cordate, margins of segments irregularly toothed; zonal marking horseshoe-shaped, purple, brown, even dark red. **Flowers**: peduncle with 3–6(–15) flowers in a pseudo-umbel; petals pale to deep pink with darker markings; Oct.–Mar. Usually found in disturbed areas. *Pink trailing pelargonium*; *wildemalva* (A); *bolila-ba-litšoene* (SS); *inkubele (X,Z)*; *ishwaqa umangqengqe* (Z).

DrGr MsGr KarSh

## **aridum** R.A.Dyer

Dwarf shrub, 0.1–0.5 m high. **Stems** woody, glabrous; covered in remains of petioles. **Leaves** digitate-pinnately compound, membranous with silky or glandular hairs; blade roundish in outline, up to 70 mm in diameter, pinnae pinnatisect with linear segments, 1–2 mm in diameter, apices acute, margins ± revolute; petioles up to 170 mm long. **Flowers**: peduncle with 2–5 flowers in a pseudo-umbel; pedicels 2–5 mm long; petals 5, base cuneate, posterior two petals

15–25 × 1.5–2.5 mm, anterior petals 10–22 × 2.5–4.0 mm, white or cream-coloured, with or without a few wine-red longitudinal lines near bases; Jan.–Dec. Karroid veld, rocky hills, dolerite, shale, limestone.

DrGr KarSh

**bowkeri** Harv.

Dwarf shrub, up to 0.4 m high. **Stems** hard and tuberous. **Leaves** petiolate; tripinnately compound; pubescent; blade narrowly ovate in outline, 150–250 × 25–50 mm, segments linear, usually < 1 mm wide, apices of segments acute; petioles 60–130 mm long. **Flowers**: peduncle with 4–12 flowers in a pseudo-umbel, 150–350 mm long; pedicels 4–16 mm long; petals 5, fimbriate, posterior petals 25–29 × 17–23 mm, light yellow, veins light purple, anterior petals 25–29 × 20–25 mm, dark purple; Sep.–Nov. Grassland and savanna, rocky places, dolerite ridges. *Carrot-leaved pelargonium*, *cat's tail pelargonium*, *frilled pelargonium*; *khoara* (SS).

MsGr

**dolomiticum** R.Knuth

*P. bechuanicum* Burtt Davy

*P. juttae* Dinter

Dwarf shrub, up to 0.5 m high. **Stems** herbaceous, pubescent. **Leaves** bipinnate; pubescent; blade ovate to narrowly ovate in outline, 80–100 × 40–60 mm, pinnae irregular lobed to incised, segments narrowly ovate, apices acutely 3-lobed, lower pinnae with petiolules, upper pinnae sessile; petioles 60–110 mm long. **Flowers**: inflorescence a branched system, peduncle with small foliar leaves, bearing several pseudo-umbels, each with 3–6 flowers, peduncle 25–100 mm long, pedicels 2–4 mm long; petals 4, spathulate, posterior petals 11–20 × 3 mm, anterior petals 7–10 × 3–5 mm, white or cream-coloured to pink or light purple with red to dark markings; Aug.–May. Sandy, dolomite, outcrops, quartzite, granite, limestone.

AcGr DrGr MsGr

**leucophyllum** Turcz.

Perennial herb, 0.01–0.30 m high. **Stems** herbaceous, erect or decumbent, variously hairy. **Leaves** simple, alternate; blade ovate in outline, up to 48 × 40 mm, apex rounded, base cordate, margins crenate and dentate, discolorous, lower surface densely hairy with prominent veins. **Flowers**: peduncle with 3–8 flowers in a pseudo-umbel; petals 5, narrowly obovate, ± 7 × 1 mm, purple or pink with dark markings; Nov.–Mar. Grassland, mountain slopes, sandy soil.

MsGr Zastr

**luridum** (Andrews) Sweet

*P. aconitophyllum* (Eckl. & Zeyh.) Steud.

*P. flabellifolium* Harv.

Perennial herb, up to 1 m high, with a tuberous, woody rootstock. **Leaves** radical; petiolate; blade ovate to broadly ovate in outline, 70–150 × 70–140 mm, shallowly lobed to pinnatisect, segments linear, entire to serrate or crenate towards apex, apex acute, variously hairy; petioles 30–200 mm long. **Flowers**: peduncle with 5–60 flowers in a pseudo-umbel, erect; long, patently hairy; petals 5, narrowly obovate, 12–24 × 5–12 mm, white, yellow, salmon-pink or shades of pink, Sep.–Apr. Grassland, damp places. *Waving pelargonium*; *wildemalva* (A); *inyonkulu*, *isandla sonwabu*, *umsongelo*, *unyawo-lwenkuku*, *uvendle* (Z). Figure 51.

VreDm DrGr MsGr




**Figure 51.** *Pelargonium luridum* (Geraniaceae). Artist: G. Condy.

**minimum** (Cav.) Willd.

*P. capnoides* L'Hér.

*P. fumarioides* L'Hér. ex Harv.

Perennial herb, up 0.1 m high; profusely branched. **Stems** procumbent, spreading glabrous, herbaceous. **Leaves** opposite; pinnately compound with leaflets deeply cleft into narrow segments or simple, blade ovate in outline, up to 20 mm in diameter, apices of lobes rounded, margins entire, greyish green; petioles up to 60 mm long. **Flowers**: peduncle with 3–5 flowers in a pseudo-umbel, peduncle 5–10 mm long; petals 5, narrowly obovate, posterior two 3–5 × 1 mm, anterior three 3–5 × 0.7–1.0 mm long, white or very pale purple or rarely pink, without markings; Oct.–Mar. Open sunny places on hard stony grounds.

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**multicaule** Jacq. subsp. **multicaule**

Dwarf shrub, 0.1–0.3 m high. **Stems** herbaceous, glabrous, trailing; glandular-hairy. **Leaves** petiolate; glabrous; irregular pinnately to bipinnately incised; blade narrowly ovate in outline, 30–40 × 20–30 mm, base cordately incised, apices of segments obtusely 2- or 3-lobed, margins of segments glabrous; petioles 30–130 mm long. **Flowers**: peduncle with 3–5 flowers in a pseudo-umbel, pedicel 1–2 mm long, densely hirsute; petals 4, posterior petals spathulate 18 × 8 mm, anterior two petals narrowly spathulate, 18 × 4 mm, dark pinkish purple with light coloured claws, posterior petals with dark purple markings and a white blotch at base; Dec.–Apr. Grassland, hill slopes.

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**ranunculophyllum** (Eckl.& Zeyh.) Baker

Dwarf shrub, 0.15–0.3 m high. **Stems** ± procumbent to semi-erect. **Leaves** petiolate; blade palmately lobed, regular segments, segments 3-lobed at apices, with deep red or purple horseshoe markings. **Flowers**: peduncle with 2 or 3 flowers in a pseudo-umbel; petals with upper surface broad, apex notched, 12 × 3 mm, white or flesh-coloured, posterior petals with a carmine spot; Oct.–Mar. Sandstone, hillsides, dolerite, damps.

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**schlechteri** R. Knuth

Perennial herb, up to 1 m high. **Stems** procumbent, decumbent, spreading. **Leaves** alternate; petiolate; blade broadly ovate in outline, 120–190 × 140–280 mm, deeply lobed, base truncate, apex of lobes dentate, margins of lobes toothed, ciliate; petioles up to 240 mm long. **Flowers**: peduncle unbranched, with 2(–4) pseudo-umbels of flowers; flowers pendulous; petals 5, obovate, 8–12 × 4–10 mm, bicoloured, mauve, maroon, or purple in centre with yellow, dull yellow or white edges; Oct.–Dec. Steep, hillside, rocky grassland.

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**sidoides** DC.

*P. sidaefolium* (Thunb.) R.Knuth

Dwarf shrub, up to 0.5 m high; woody rootstock reddish brown inside. **Leaves** rosulate; petiolate; blade ovate in outline, base cordate, apex rounded, margins finely toothed, silvery green, densely pubescent, veins prominent on lower surface; petioles 70–250 mm long. **Flower**: peduncle digitately branched at apex with 2 branches each with a pseudo-umbel, 3–14 flowers

in an umbel; petals 5, apices ± rounded, gradually recurving, posterior two ribbon-shaped, 12–14 × 2–3 mm, anterior lobes obovate, 10–14 × 2.0–3.5 mm, dark reddish purple, almost black; Oct.–Jan. Dolerite ridges, rocky hillsides, along watercourses, sandy soil. *Kalwerbossie* (A); *khoara-e-nyenyane* (SS).

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**tragacanthoides** Burch

Dwarf shrub, 0.2–0.4 m high. **Stems** woody, pubescent. **Leaves** petiolate; pinnately to bipinnately compound, pinnae divided into linear segments; blade narrowly ovate in outline, 25–80 × 8–25 mm, apex acute; petioles 12–30 mm long. **Flowers**: in a terminal bracteate system, with pseudo-umbel 2–4-flowered; petals 4, prominently unguiculate, claws inrolled to form a false tube at base of each petal, posterior petals with limb rectangular, apex retuse, 15–20 × 2.0–2.5 mm, anterior two petals with limb obliquely obovate, apex rounded, 8–10 × 2.0–2.5 mm, white, posterior petals with wine-red reticulation markings at base; Jan.–Dec. Hillsides, dolerite, sandy.

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# GESNERIACEAE

Annual, perennial or monocarpic herbs of moist, usually shady places. **Leaves** usually solitary, occasionally a few, then opposite, often rosulate; without stipules. **Flowers**: in open pedunculate cymes, sometimes reduced to 1 or 2 flowers; bisexual, irregular; calyx tubular, 5-lobed or divided to base; corolla tubular, 5-lobed; stamens (2)4, two of which are longer than the others, attached to corolla; anthers coherent (but not fused) in pairs; ovary superior. **Fruit** a capsule, spirally twisted (*Streptocarpus*), with many seeds.

## **Streptocarpus** Lindl. (sthn Afr.: 45 spp.)

Key to species:

1a Leaves narrowly oblong, 300 × 70 mm; inflorescence 1- or 2-flowered. . . . . **S. gardenii**
1b Leaves oblong, 220–240 × 160–170 mm; inflorescence with > 2 flowers . . . 2
2a Corolla tube sharply deflexed then directed forwards, mouth laterally compressed . . . . . **S. polyanthus** subsp. **dracomontanus**
2b Corolla tube cylindric, slightly curved, mouth not laterally compressed . . . . . **S. pusillus**

### **gardenii** Hook.

Perennial herb, up to 0.2 m high. **Leaves** 2 or more, in a basal rosette; blade narrowly oblong, 300 × 70 mm. **Flowers**: inflorescence usually 1- or 2-flowered; corolla ± 50 mm long; tube greenish, limb lilac, lower lip patterned with interrupted lines; Nov.–Apr. **Fruit** up to 128 × 1.5 mm. Damp forest places or on rocks; often an epiphyte.

MsGr

### **polyanthus** Hook. subsp. **dracomontanus** Hilliard

Perennial herb. **Leaves** 2 or 3; blade oblong, ± 240 × 170 mm. **Flowers**: inflorescence few-flowered; corolla ± 20 mm long; tube sharply deflexed then directed forwards, mouth laterally compressed, pale violet, throat white, greenish or yellow, limb pale violet to medium violet, no colour patterning; Oct.–Jan. **Fruit** 16–40 mm long. Rock outcrops.

MsGr

### **pusillus** Harv. ex C.B.Clarke

Monocarpic herb. **Leaves** 1; oblong, ± 220 × 160 mm. **Flowers**: inflorescence many-flowered; corolla ± 18 mm long, tube cylindric, slightly curved, mouth not laterally compressed, white; Nov.–Jan. **Fruit** 15–25 mm long. Damp crevices of sandstone cliffs; also banks and mossy rocks of kloof forest.

MsGr

# GISEKIACEAE

Annual or perennial herbs. **Stems** much branched. **Leaves** opposite, shortly petiolate; blade linear to narrowly obovate or elliptic, margins entire; without stipules. **Flowers**: in axillary umbel-like cymes or diffuse terminal cymes; regular, bisexual; sepals 5, free; petals (staminodes) 0; stamens 5–15(–20), arising just below ovary, filaments free, widening below; anthers 2-thecous, opening by longitudinal slits; ovary superior with (3)4 or 5 (–15) carpels, joined only at base. **Fruit** a cluster of 3–15 heterocarpic mericarps, either muricate or almost smooth. **Seeds** thickly lens-shaped, black. *Gisekia family*.

## **Gisekia** L. (sthn Afr.: 2 spp.)

Key to species:

Perianth pink to red; stamens 10–15 . . . . . .**G. africana** var. **africana**
Perianth white or yellow; stamens 5. . . . . .**G. pharnacioides** var. **pharnacioides**

### **africana** (Lour.) Kuntze var. **africana**

*G. pentadecandra* Moq.

Annual, occasionally perennial herb. **Stems** slender, procumbent or semi-erect; 0.05–0.50 m long. **Leaves**: with blade narrowly oblong to narrowly obovate, up to ± 20 × 3 mm. **Flowers**: in axillary umbel-like cymes; opening in succession; stamens 10–15; pedicels lengthening at anthesis; perianth 2–3 mm long, pink to red; Nov.–Jun. Woodland, sandy soil. *Rooi-rankopslag*, *volstruisdruiwe* (A).

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### **pharnacioides** L. var. **pharnacioides**

Annual herb. **Stems** procumbent; 0.1–0.8 m long. **Leaves**: with blade obovate to narrowly obovate, up to ± 40 × 5 mm. **Flowers**: in axillary, sessile, many-flowered, umbel-like cymes; pedicels equal, not lengthening at anthesis, opening simultaneously; stamens 5; sepals with membranous edges; perianth white or yellow; Sep.–Apr. Woodland, dry streambeds, sandy soil.

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# GUNNERACEAE

Herbs of moist places. **Leaves** simple, with long petioles, in a basal rosette; blade large and rounded, palmately veined. **Flowers**: in a tall, erect spike; small, unisexual or bisexual; calyx (0)2 or 3; petals (0)2; stamens (0)2; ovary inferior, 1-locular; styles 2. **Fruit** a small drupe. *Gunnera family*.

## **Gunnera** L. (sthn Afr.: 1 sp.)

### **perpensa** L.

Rhizomatous herb, up to 1 m high. **Leaves** robust; blade 40–130(–250) × 60–170(–380) mm, reniform to subcircular, palmately nerved, margins irregularly dentate, teeth glandular at apices; petioles 150–750 mm long. **Flowers**: spikes (5–)20–70(–100) mm long; corolla green to reddish; Oct.–Mar. In cold or cool, continually moist localities, mainly along upland streambanks. *Wild rhubarb*, *river pumpkin*; *wilderabarber*, *rivierpampoen* (A); *qobo* (SS); *iphuzi lomlambo* (X); *ugobho*, *imfeyesele*, *uklenya*, *uxobo* (X, Z).

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# HALORAGACEAE

Aquatic plants, floating, or herbs in marshes, rooted. **Leaves** simple or with filiform segments, alternate, opposite or whorled; stipules present or absent. **Flowers**: often minute and imperfect, unisexual or bisexual; calyx (0–)2–4-lobed; petals (0–)2–4, free, deciduous; stamens (1)2–8; ovary inferior, 1–4-locular. **Fruit** usually minute, nut-like or drupaceous. *Water milfoil family*.

## Key to genera

Leaves sessile or shortly petiolate, alternate or opposite, blade entire or shallowly dentate; flowers clustered in leaf axils . . . . . **Laurembergia**
Leaves sessile, in whorls, blade pinnately divided into linear segments; flowers arranged in terminal spikes or solitary and axillary . . . . . **Myriophyllum**

## **Laurembergia** P.J.Bergius (sthn Afr.: 1 sp.)

**repens** (L.) P.J.Bergius subsp. **brachypoda** (Welw. ex Hiern) Oberm.
*L. tetrandra* (Schott) Kanitz subsp. *brachypoda* (Hiern) A.Raynal

Semidecumbent or ± erect herb, 100–200 mm high. **Leaves** opposite or alternate, sessile or shortly petiolate, slightly fleshy; blade linear, linear-oblong or narrowly ovate, elliptic or obovate, entire or slightly to distinctly 1–4-toothed towards apex. **Flowers**: female and bisexual, bisexual flowers borne on up to 2 mm long pedicels; petals hooded, white or pink; Sep.–Mar. **Fruit** a barrel-shaped nut, ribbed, tuberculate. Grassy edges of swamps, sandy lake margins, on mud in grassland areas, moist path sides.

DrGr

## **Myriophyllum** L. (sthn Afr.: 2 spp.)

### Key to species:

[after Henderson: 22 (2001)]

Plant with terminal, leafy shoots emerging above water surface; flowers inconspicuous, solitary in axils of leaves. . . . . **M. aquaticum**
Plant usually completely submerged except for leafless flowering shoots; flowers in whorls. . . . . **M. spicatum**

***aquaticum** (Vell.) Verdc.
*M. brasiliense* Cambess.

Hydrophyte, usually submerged with upper part floating at surface. **Leaf** segments linear, leaf bases accompanied by deciduous stipule-like outgrowths, mostly recurved, apex mucronulate, densely glandular, glands sessile, minute. **Flowers**: solitary in median and upper leaf axils of stems, usually floating at surface; corolla cream-coloured; May–Sep. **Fruits** none, propagation occurs vegetatively. Still shallow waters near banks of rivers, lakes, ponds. Native to South America. *Milfoil*, *parrot's feather*; *waterduisendblaar* (A).

VreDm DrGr

***spicatum** L.

Submerged hydrophyte. **Leaf** segments finely divided, not glandular, apex not mucronulate, stipule-like outgrowths absent or inconspicuous. **Flowers**: in terminal emergent spikes, 50–100 mm long; corolla cream-coloured; Mar.–May. **Fruit** a nut, ± 3 mm in diameter. Still, shallow waters near banks of rivers, lakes and ponds. Native to North America, Europe, Asia and North Africa. *Water milfoil*, *spiked water milfoil*.

VreDm

## Reference

HENDERSON, L. 2001. *Alien weeds and invasive plants*: *a complete guide to declared weeds and invaders in South Africa*. Plant Protection Research Institute Handbook No. 12, Agricultural Research Council, Paarl Printers, Cape Town.

# HYPERICACEAE

Small trees, shrubs or herbs. **Leaves** opposite or in whorls of 3; simple; sessile or shortly petiolate; blade leathery or if herbaceous then mostly pellucid-dotted, frequently with dark, sessile, submarginal, glandular hairs; without stipules. **Flowers**: solitary or in terminal cymes; bisexual or unisexual, regular; sepals 5; petals 5; stamens usually indefinite, free, or connate in bundles; ovary superior, 1–many-locular. **Fruit** a capsule or a berry. *Mangosteen family*.

## **Hypericum** L. (sthn Afr.: 9 spp.)

Key to species:

1a Stems quadrangular; sepals not with dark sessile glands, glands translucent . . . . . **H. lalandii**
1b Stems terete; sepals usually with dark sessile glands. . . . . 2
2a Sepals with apices acute . . . . . **H. aethiopicum** subsp. **sonderi**
2b Sepals with apices obtuse to rounded . . . . . **H. wilmsii**

**aethiopicum** Thunb. subsp. **sonderi** (Bredell) N.Robson
*H. sonderi* Bredell

Perennial herb, up to 0.3 m high. **Stems** terete, glandular. **Leaves** sessile; blade ovate to broadly ovate, 8–23 × 4–15 mm. **Flowers**: in a lax or compact terminal few- to many-flowered cyme; sepals unequal, apices acute, usually with dark, sessile glands; petals 10–13 mm long, primrose-yellow, red-tinged; Oct.–Jan. Grassland. *St. John's wort*; *vlieëpisbossie* (A); *bohohoana*, *ho-ila*, *leilane-bohohoana*, *leilane-la-bale*, *tabane* (SS). Figure 8F, p. 4.

DrGr MsGr

## HALORAGACEAE

### **lalandii** Choisy

Perennial herb, up to 0.4 m high. **Stems** quadrangular, erect or decumbent, glabrous, glandular or eglandular. **Leaves** sessile; blade variable in shape and size, 3–36 × 0.5–6.0 mm. **Flowers**: solitary or in a loose dichasial cyme; sepals ± equal, long-acute, dotted with translucent glands; corolla 5–10 mm long, yellow or orange, sometimes marked with red; Nov.–Feb. In or near water, swampy areas, vleis, river- or streambanks. *Spindly hypericum*, *Laland's St John's wort*; *Laland-se-Sint-Janskruid* (A); *bohlokoana*, *bohlokoanyana* (SS).

DrGr MsGr

### **wilmsii** R.Keller

Perennial herb, up to 0.2 m high. **Stems** terete, procumbent. **Leaves** sessile or shortly petiolate, blade elliptic, ovate or obovate, 6–10 × 2–6 mm long. **Flowers**: in a few-flowered cyme; sepals unequal, apices obtuse to rounded, yellow gland-dotted, usually a few dark glands along margins; corolla 5–8 mm long, yellow or orange, dark gland-dotted along margins; Nov.–Apr. Moist areas, mountain slopes.

DrGr

# ICACINACEAE

Trees or shrubs, rarely climbers, sometimes spinescent. **Leaves** simple, alternate or opposite; without stipules. **Flowers**: in terminal or axillary cymes, corymbs or panicles; bisexual or unisexual by abortion, small, regular, calyx (3)4- or 5-lobed or -toothed; petals and stamens as many as sepals, free; stamens alternating with petals, filaments often hairy; ovary superior, style simple or absent, stigma small or consisting of a number of radiating tubes. **Fruit** a drupe. *White pear family*.

## **Cassinopsis** Sond. (sthn Afr.: 2 spp.)

### **ilicifolia** (Hochst.) Kuntze

*Cassine ilicifolia* Hochst.
*Cassinopsis capensis* Sond.

Spiny, scrambling shrub, up to 5 m high. **Spines** straight, very acute, ± 25 mm long. **Branches** alternate; young ones zigzagging. **Leaves** opposite; blade elliptic to ovate, 35–60 × 13–26 mm, apex acute, margins with scattered sharp-tipped teeth. **Flowers**: small; in axillary, dichotomously branched panicles, ± 7 mm wide; bisexual; disc 0; calyx 5-lobed; petals 5, white; Nov.–Jan. **Fruit** an ovoid or subglobose drupe, ± 12 mm long, with persistent style, yellowish orange when ripe. Wooded kloofs, streambanks. *Lemon thorn*; *lemoentjiedoring* (A); *motale* (SS); *icegceya* (X); *ikhumalo* (X, Z); *imamba eluhlaza*, *isihlokolozane* (Z).

DrGr MsGr

# LAMIACEAE

Compiled by J. Meyer, E. Retief & N.L. Meyer

Herbs or shrubs; aromatic. **Stems** usually 4-angled, especially when young. **Leaves** opposite or whorled; blade simple rarely compound, margins entire or toothed; gland-dotted; without stipules. **Flowers**: solitary and opposite or aggregated in cymes or verticils, arranged in terminal racemes, panicles or spikes; bisexual, rarely unisexual; irregular; calyx tubular, campanulate or funnel-shaped, persistent; corolla (1)2-lipped, bell-shaped or 4- or 5-lobed; stamens 2–4, attached to corolla; ovary superior, deeply 4-lobed, style terminal or arising from between lobes (gynobasic). **Fruit** composed of 4, or by abortion fewer nutlets, nutlets variously ornamented, 1-seeded, or fruit a drupe with 1–4 pyrenes. *Mint or sage family*.

## Key to genera

[after Codd: 1 (1985), Leistner: 227 (2005)]

1a Fruit a drupe, remaining undivided or dividing very late in development; style terminal . . . . . **Rotheca**
1b Fruit composed of 4, or by abortion fewer nutlets; style gynobasic. . . . . 2
2a Corolla 1-lipped or very unequally 2-lipped, with upper lip small or absent; nutlet surface reticulate . . . . . 3
2b Corolla 2-lipped or nearly regularly lobed; nutlet surface smooth . . . . . 4
3a Inflorescence a spike-like raceme arising from a basal rosette of leaves; corolla bluish . . . . . **Ajuga**
3b Inflorescence racemose or paniculate with no basal rosette of leaves; corolla white . . . . . **Teucrium**
4a Stamens ascending or spreading, never all directed downwards upon lower side of tube of lower lip of corolla . . . . . 5
4b Stamens directed downwards upon lower side of corolla tube or lower lip of corolla . . . . . 13
5a Fertile stamens 2, anther thecae separated by long connective; calyx 2-lipped. . . . . **Salvia**
5b Fertile stamens 4; anther thecae not widely separated; calyx 2-lipped or 5–many-toothed . . . . . 6
6a Stamens spreading, filaments straight, with 2 directed upwards and 2 downwards; corolla small, 2–5 mm long, subequally 4- or 5-lobed . . . .**Mentha**
6b Stamens all directed to upper side of tube or upper lip of corolla; corolla 5 mm long or longer. . . . . 7
7a Corolla orange or yellow, rarely cream-coloured; upper lobe 12–30 mm long; calyx 8–10-toothed. . . . . .**Leonotis**
7b Corolla not orange or yellow; upper lobe < 10 mm long. . . . . 8
8a Stamens included in corolla tube . . . . . 9
8b Stamens reaching mouth of corolla tube or exserted (stamens included in cleistogamous flowers of *Lamium amplexicaule* but then bracts amplexicaul) . . . . . 10
9a Anthers and style held together by intermingling hairs; calyx glabrous within; teeth not hooked at apex . . . . . .**Acrotome**
9b Anthers and style not held together by intermingling hairs; calyx hairy within; teeth hooked at apex . . . . . .**Marrubium**
10a Calyx 6–many-toothed, often very unequal in size . . . . . .11
10b Calyx subequally 5-toothed. . . . . 12

11a Calyx glabrous within, 6–10-toothed, often oblique at mouth but limb not spreading . . . . . **Leucas**
11b Calyx hairy within, 10- or more toothed, limb eventually spreading . . . **Ballota**
12a Bracts large, amplexicaul (in naturalised species); upper corolla lip longer than the lower; lower corolla lip with lateral lobes absent or reduced to small acute teeth . . . . . **Lamium**
12b Bracts leaf-like or reduced, not amplexicaul; corolla lips subequal or lower lip the longer with distinct ± obtuse lateral lobes. . . . . **Stachys**
13a Calyx falling away by a clean break above base in fruit . . . . . **Aeollanthus**
13b Calyx persistent in fruit, 3–5-toothed or 2-lipped. . . . . 14
14a Calyx with 5 equal rigid spine-like teeth; flowers in dense terminal spike-like inflorescence . . . . . **Pycnostachys**
14b Calyx not rigidly spinescent . . . . . 15
15a Calyx equally or subequally 5-toothed, uppermost tooth sometimes slightly larger than other 4 . . . . . 16
15b Calyx 2-lipped . . . . . 17
16a Lower pair of stamens united for most of their length, upper pair attached in corolla tube, free . . . . . **Syncolostemon**
16b Lower and upper pairs of stamens attached at corolla throat, free or all shortly united at base . . . . . **Plectranthus**
17a Upper pair of filaments with a crested or hairy knee bend near base . . . . . **Ocimum**
17b Upper pair of filaments without a crested or hairy knee bend near base . . . 18
18a Filaments of lower pair of stamens connate for part of their length; upper pair attached in corolla tube and free . . . . . **Syncolostemon**
18b Filaments all free . . . . . **Plectranthus**

[Descriptions of most taxa after Codd (1985)]

## **Acrotome** Benth. (sthn Afr.: 6 spp.)

### Key to species:

[after Codd: 19 (1985)]

Plants annual; verticils 15–many-flowered; bracteoles well developed . . . . **A. inflata**
Plants perennial; verticils 6–10-flowered; bracteoles few, linear . . . . . **A. hispida**

### **hispida** Benth.

Perennial herb, 100–250 mm high, branching at base from woody rootstock, densely hispid-villous. **Stems** ascending to spreading. **Leaves** subsessile; blade obovate to elliptic, 8–25 × 5–14 mm, apex obtuse to rounded, base cuneate, margins few-toothed at apex or entire, densely hispid. **Flowers**: verticils 6–10-flowered; bracteoles poorly developed, linear; calyx 5–7 mm long, enlarging slightly at maturity, mouth symmetrical, 7–10-toothed, teeth deltoid-subulate, spine tipped, 1–2 mm long, densely hispid; corolla white; Aug.–May. Grassy places, often among rocks.

VreDm

### **inflata** Benth.

*A. amboensis* Briq.
*Lasiocorys eenii* (Hiern) Baker

Annual herb, 0.15–0.70(–1.00) m high. **Stems** erect, unbranched or branched shortly above base; appressed-retrorse pubescent. **Leaves** subsessile to petiolate; blade ovate to narrowly ovate,

30–100 × 10–25 mm, apex acute, base cuneate, margins remotely and sparsely crenate-serrate above middle, villous; petioles ± 15 mm long. **Flowers**: verticils many-flowered, in dense, globose clusters; bracteoles well developed; calyx widest about the middle, 7 mm long at flowering, enlarging 12–15 mm, symmetrical at the mouth, subequally 5-toothed, teeth deltoid-subulate, spine tipped, eventually 3 mm long; corolla with upper lip 3–4 mm long, lower lip 4–5 mm long, white or pale mauve; Nov.–May. Open woodland, especially under trees and disturbed places in grassland, weed of roadsides and cultivation. *Tumble weed*; *perdeskrikbossie* (A).

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## **Aeollanthus** Mart. ex Spreng. (sthn Afr.: 6 spp.)

### **buchnerianus** Briq.

*A. canescens* Gürke

Perennial herb or shrub, 150–500 mm high; spreading, semisucculent. **Stems** and bracts usually hirsute to canescent. **Leaves** petiolate; blade ovate to broadly ovate, 20–45 × 18–14 mm, apex obtuse to rounded, base truncate, margins crenate-dentate. **Flowers**: bracts broadly ovate, obtuse, usually imbricate; calyx 1 mm long at flowering enlarging to 3 mm, falling away by a clean break above base in fruit; corolla 4–5 mm long, pale mauve to rosy pink; Dec.–Jul. Shallow soil among rocks in semishady places.

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## **Ajuga** L. (sthn Afr.: 1 spp.)

### **ophrydis** Burch. ex Benth.

Perennial herb, 60–250 mm high. **Leaves** sessile, thick-textured; blade obovate to narrowly ovate-obovate, 30–80 × 15–40 mm, apex obtuse to rounded, base cuneate, margins coarsely few-toothed to repand or almost entire; subglabrous to sparsely pilose. **Flowers**: verticils 2–many-flowered, often starting shortly above basal leaves, spaced below, crowded towards apex; calyx 6–7 mm long, tube 3–4 mm long, teeth deltoid, 3 mm long, hispid; corolla with tube 7–8 mm long, upper lip 2 mm long, emarginated, lower lip 7–10 mm long, median lobe broadly obovate, 5–7 mm long and broad, deeply emarginated, blue to mauve, rarely white; Sep.–Apr. Mainly grassland. *Bugle plant*; *senyarela* (SS).

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## **Ballota** L.

### **africana** (L.) Benth.

Shrub, 0.3–1.2 m high; greyish. **Stems** erect or spreading. **Leaves** petiolate; blade orbicular to ovate, 15–50 × 15–45 mm, apex rounded to subacute, base cordate to rounded, margins irregularly crenate-dentate; petioles villous, 10–40 mm long. **Flowers**: verticils many-flowered; calyx glandular, densely hispid-villous, 10- or more toothed, limb eventually spreading, tube 6–8 mm long at flowering; corolla purple or pinkish to pale mauve; Jul.–Sep. Along watercourses, in the shelter of rocks and bushes, semiweed of disturbed places. *Catmint*; *kattekruid* (A).

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## **Lamium** L. (sthn Afr.: 1 sp.)

### ***amplexicaule** L.

Annual herb, 100–400 mm high. **Leaves** petiolate; blade subrotund to reniform, 10–25 mm long, apex rounded, base cordate to truncate, margins coarsely and deeply crenate or lobed; petioles 15–40 mm long. **Flowers**: in 2–6 verticillasters, spaced below, crowded above, verticillasters 3–10-flowered; bracts clasping, resembling leaves; calyx 6 mm long, 5-toothed, teeth narrowly ovate-subulate, 2.5 mm long, not spinescent, villous; corolla 15–16 mm long, purple to whitish; Mar.–Sep. Widespread weed in gardens and waste places. Native to Europe and Asia. *Turksenael* (A).

DrGr

## **Leonotis** (Pers.) R.Br. (sthn Afr.: 3 spp.)

### Key to species:

1a Calyx 10-toothed, teeth subequal; lower lip of corolla reflexed on tube, lip with 3 separate lobes . . . . . **L. leonurus**
1b Calyx 8-toothed, dorsal tooth supported by 3 veins; lower lip of corolla spreading, lip with 3 lobes united at base, shrivelled and twisted . . . . . 2
2a Leaf blade obovate. . . . . **L. randii**
2b Leaf blade narrowly ovate, ovate to broadly ovate. . . . . 3
3a Inflorescences of compact verticils in axils of foliage leaves; plant glabrescent . . . . . **L. dubia**
3b Inflorescences of compact verticils terminal, not in axils of foliage leaves; plant densely pubescent . . . . . **L. intermedia**

### **dubia** E.Mey.

Shrub, 1.5–3.0 mm high; glabrescent. **Stems** much branched. **Leaves** petiolate; blade ovate, up to 30 × 8 mm, apex acute, base truncate, margins coarsely toothed, glabrescent; petioles up to 60 mm long. **Flowers**: inflorescence of compact verticils in axils of foliage leaves; calyx 8-toothed, dorsal tooth supported by 3 veins; corolla with lower lip spreading, lip with 3 lobes united at base, shrivelled and twisted, orange-red; Feb., Mar. Forest margins, mountain slopes, disturbed places. *Rooidagga* (A); *bolila-ba-linonyana* (SS).

DrGr MsGr

### **intermedia** Lindl.

Shrub, 0.5–1.5 m high; velvety pubescent. **Stems** branching from a woody base. **Leaves** petiolate; blade ovate to narrowly ovate, 30–90 × 10–50 mm, apex acute, base obtuse, margins coarsely toothed, lower surface silvery to yellowish hairy; petioles up to 50 mm long. **Flowers**: inflorescences of compact verticils, terminal, not in axils of foliage leaves; calyx 8-toothed, dorsal tooth supported by 3 veins; corolla ± 25 mm long, lower lip spreading with 3 lobes united at base, shrivelled and twisted, densely hairy, dull orange; Jan.–May. Mountain slopes, forest margins, rocky hillsides. *Broad-leaved leonotis*, *minaret-flower*; *klipdagga* (A); *joala-ba-li-nonyana*, *moseneke* (SS); *imunyane* (Z).

DrGr MsGr

**leonurus** (L.) R.Br.
*Phlomis leonurus* L.

Shrub, 2–5 m high. **Stems** erect, densely pubescent, striate by elongated lenticels. **Leaves** petiolate; blade linear, 50–100 × 10–20 mm, apex and base acute, margins serrate in upper part of blade, upper surface green and rough, lower surface more densely pubescent; petioles up to 10 mm long, densely hairy. **Flowers**: in terminal, axillary, subspherical inflorescences of 3–11 verticils; bracts 40–80 mm long; calyx 10-toothed, teeth subequal, < 15 mm long; corolla 40–49 mm long, lower lip reflexed on tube, lip with 3 separate lobes, densely pubescent, orange; Feb.–May. Grassland, forest margins, along watercourses, rocky hillsides. *Leonotis*, *wild dagga*, *narrow-leaved minaret flower*; *wildedagga*, *duiwelstabak* (A); *umfincafincane* (X, Z); *imunyane* (Z).

DrGr MsGr

**randii** S. Moore
*L. microphylla* Skan

Shrub, up to 0.3–0.8(–1.5) m high. **Stems** erect, slender. **Leaves** petiolate; usually with young shoots in leaf axils; blade obovate, apex acute, base cuneate, margins toothed in upper part of blade, often folded along midrib, hairy; petioles up to 20 mm long. **Flowers**: in terminal, compact verticils; calyx 8-toothed, dorsal tooth supported by 3 veins; corolla with lower lip spreading, lip 3 lobes united at base, shrivelled and twisted, densely hairy, orange; Dec.–Apr. Rocky grassland. *Rock dagga*; *klipdagga* (A).

VreDm

## **Leucas** Burm. ex R.Br. (sthn Afr.: 8 spp.)

### Key to species:

[after Codd: 39 (1985)]

Verticils 2–6-flowered, usually closely placed; bracteoles minute; calyx tube straight . . . . . **L. capensis**
Verticils many-flowered; distantly spaced; bracteoles linear; calyx tube abruptly curved near apex. . . . . **L. martinicensis**

**capensis** (Benth.) Engl.
*Lasiocorys capensis* Benth.

Dwarf shrub, up to 1.5 m high; often rather twiggy. **Stems** erect, whitish buff-coloured, canescent-tomentose. **Leaves** shortly petiolate; blade linear-spathulate or narrowly obovate, elliptic or narrowly ovate, 8–20 × 2–5 mm, apex rounded to obtuse, base cuneate, margins entire, rarely few-toothed near apex. **Flowers**: verticils 2–6-flowered, usually closely placed; bracteoles minute; anthers orange-red; calyx 6–7 mm long, tube straight, 5–8-toothed, teeth ovate-deltoid, 1.5–2.5 mm long; corolla 12–14 mm long, tube 5–7 mm long, annular pilose about the middle, upper lip 6–7 mm long with a dense, short brush-like fringe in upper half, lower lip 6–7 mm long, white; Nov.–Mar. Grassland, on surface limestone.

DrGr KarSh

**martinicensis** (Jacq.) R.Br.
*Clinopodium martinicense* Jacq.

Annual herb, 0.15–1.20 m high. **Stems** erect. **Leaves** petiolate; blade ovate to narrowly ovate, 25–80 × 12–45 mm, apex long-acute, base cuneate to obtuse, margins coarsely crenate-

serrate; petioles 5–20 mm long. **Flowers**: in many-flowered verticils, verticils glomerate, distantly spaced; bracteoles linear, 5–12 mm long; calyx tube abruptly curved near apex, somewhat inflated at base, ± 7–8 mm long at flowering stage, enlarging to 15 mm long in fruit, oblique at mouth, 10-toothed, upper tooth the longest, narrowly ovate-subulate, 2.5–3.0 mm long, remaining 9 teeth subequal, deltoid-subulate, 1 mm long, hispid; corolla 6 mm long, upper lip 2 mm long, lacking a fringe of hairs, white; Oct.–Jun. Weed of cultivated land and disturbed places. *Bobbin weed*; *kleintolbossie* (A); *amandetshi* (Z).

VreDm | DrGr

## **Marrubium** L.

### ***vulgare** L.

Perennial herb, 0.3–0.6 m high. **Stems** few to several from a perennial rhizome. **Leaves** petiolate; blade broadly ovate to subrotund, 20–45 × 18–45 mm, apex rounded to obtuse, base cuneate, margins crenate-dentate; petioles 5–14 mm long. **Flowers**: in dense, many-flowered verticils; calyx 5–8 mm long, stellate-pubescent, teeth 10, spine-tipped, bent or hooked at apex; corolla with tube included in calyx, 7–8 mm long, white to purplish; Nov.–Mar. Grassland, disturbed places, riverbanks. Native to Europe and Asia. *White horehound*.

MsGr

## **Mentha** L. (sthn Afr.: 3 spp.)

### Key to species:

[after Codd: 107 (1985)]

1a Inflorescence of ± globose clusters . . . . . **M. aquatica**
1b Inflorescence cylindrical, tapering towards apex. . . . . 2
2a Rachis, pedicels and calyx pubescent . . . . . 3
2b Rachis, pedicels and calyx glabrous, though teeth may be ciliate . . . . . 4
3a Leaves fairly densely to densely pubescent on one or both surfaces . . . . . **M. longifolia** subsp. **capensis**
3b Leaves glabrous or blade with a few scattered hairs on lower surface . . . . . **M. longifolia** subsp. **polyadena**
4a Leaf blade narrowly ovate to narrowly ovate-elliptic, apex acuminate . . . . . **M. longifolia** subsp. **polyadena**
4b Leaf blade oblong to ovate-elliptic, apex acute . . . . . **M. spicata**

### **aquatica** L.

Perennial herb, up to 0.8 m high. **Stems** ascending or trailing in water, up to 1.5 m long, sparsely to densely pubescent. **Leaves** petiolate; blade narrowly ovate to broadly ovate, 20–55 × 5–26 mm, apex acute to acuminate, base cuneate to rounded, margins obscurely to distinctly toothed; petioles up to 4 mm long. **Flowers**: in globose clusters, 1–3 clusters terminal, subtended by bracts, lower clusters in axils of normal leaves; calyx tubular, 3–4 mm long, sparsely to densely pubescent; corolla 5 mm long, pale to deep mauve, pinkish or purple; Jan.–Mar. Wet places.

DrGr | MsGr

**longifolia** (L.) Huds. subsp. **capensis** (Thunb.) Briq.

*M. capensis* Thunb.

*M. longifolia* (L.) Huds. subsp. *bouvieri* (Briq.) Briq.

Perennial herb, up to 1.5 m high; rachis, pedicels and calyx pubescent. **Stems** erect to straggling. **Leaves** sessile or subsessile, narrowly linear-ovate to narrowly ovate, > 5 mm broad, apex acuminate, base truncate, margins entire to shortly and distantly toothed, fairly densely to densely pubescent on one or both surfaces. **Flowers**: inflorescence cylindrical, tapering towards apex, of many verticils; calyx tubular-campanulate, 2.0–2.5 mm long; corolla 3–5 mm long, white to mauve; Dec., Jan., Apr. Wet places. *Horsemint*, *pennyroyal*; *wildekruisemunt*, *balderjan* (A); *kuena-ea-thaba* (SS).

DrGr | MsGr | KarSh

**longifolia** (L.) Huds. subsp. **polyadena** (Briq.) Briq.

*M. sylvestris* L. subsp. *polyadena* Briq.

Perennial herb, up to 1.5 m high; rachis, pedicels and calyx pubescent or glabrous. **Stems** erect to straggling. **Leaves** and inflorescence as in subsp. *capensis* but leaves glabrous or with a few scattered hairs on lower surface. **Flowers**: corolla 3–5 mm long, white to mauve; Nov.–Apr. Along watercourses, on riverbanks and in moist places.

VreDm | DrGr | MsGr

***spicata** L.

Perennial herb, up to 0.6 m high; rachis, pedicels and calyx glabrous, though teeth may be ciliate. **Stems** ascending; glabrous or sparsely pubescent. **Leaves** sessile to shortly petiolate; blade oblong to ovate-elliptic, 30–50 × 13–20 mm, apex acute, base obtuse to truncate, margins serrate, glabrous or with a few scattered hairs on lower surface, both surfaces gland-dotted. **Flowers**: inflorescence a spike of densely arranged verticils; calyx tubular-campanulate, 2.0–2.5 mm long; corolla ± 4 mm long, mauve to whitish; Jan., Feb. Garden escape in moist places. Native to Europe. *Spearmint*.

DrGr

## **Ocimum** L. (sthn Afr.: 15 spp.)

[after Codd: 223 (1985)]

### Key to species:

1a Lower pair of calyx teeth fused but not ending in a small pair of upcurved, spinescent teeth; lateral teeth small, deltoid-subulate . . . . . **O. americanum** var. **americanum**

1b Lower pair of calyx teeth fused into a lip ending in a small pair of upcurved, spinescent teeth; lateral teeth suppressed and replaced by a wide shoulder-like and occasionally fimbriate sinus . . . . . 2

2a Inflorescence with verticils crowded near apex, only 1–3 of lower ones separate . . . . . **O. obovatum** subsp. **obovatum** var. **obovatum**

2b Inflorescence elongate with 5–20 verticils ± evenly spaced, 5–15 mm apart . . . . . **O. angustifolium**

**americanum** L. var. **americanum**

*O. canum* Sims

*O. fruticulosum* Burch.

Perennial herb or soft shrub, 0.15–0.50(–0.80) m high. **Stems** freely branched; sparsely pubescent to villous. **Leaves** petiolate; blade narrowly linear-ovate to narrowly ovate, 15–50 × 5–15 mm, apex acute, base cuneate, margins entire to obscurely few-toothed; petioles up to 20 mm long. **Flowers**: inflorescence simple or sparsely branched with verticils, 6-flowered, 8–20 mm apart, bracts elliptic to ovate, 3–6 mm long; calyx with outer surface pilose, upper lip subrotund, lateral teeth broad-based, subulate, lower lip deeply 2-toothed, spreading, longer than upper lip; corolla 4–6 mm long, lilac to mauve or white; Nov.–May. Disturbed places, overgrazed areas.




**angustifolium** (Benth.) N.E.Br.

*O. filiforme* Gürke

Perennial herb, 0.15–0.75 m high. **Stems** several, arising from a woody rootstock. **Leaves** sessile; blade linear or narrowly obovate, 5–40 × 1–24 mm, always with fascicles of younger leaves in axils, apex subacute, base cuneate, margins entire. **Flowers**: inflorescence elongate with 5–20 verticils ± evenly spaced, 5–15 mm apart, verticils usually 6-flowered; calyx 2.5 mm long at flowering, enlarging to 5 mm long, lower pair of teeth fused into a lip ending in a small pair of upcurved, spinescent teeth, lateral teeth suppressed and replaced by a wide shoulder-like sinus, puberulous, gland-dotted and often with white globular glands; corolla < 9 mm long, upper lip < 5 mm long, lobes of upper lip denticulate or entire, white; Oct.–May. Open woodland among rocks, along watercourses.




**obovatum** E.Mey. ex Benth. subsp. **obovatum** var. **obovatum**

*Becium grandiflorum* (Lam.) Pic.Serm. var. *obovatum* (E.Mey. ex Benth.) Sebald

Perennial herb, 0.1–0.3 m high. **Stems** several, arising annually from a woody rootstock, sparsely branched above. **Leaves** sessile or petiolate; blade variously shaped, mostly > 3 × longer than broad, apex acute to rounded, base cuneate to obtuse, margins entire, glabrous to densely pubescent, apex acute to rounded; petioles up to 10 mm long. **Flowers**: inflorescence with verticils crowded near apex, only 1–3 of lower ones separate; calyx 4–5 mm long at flowering, enlarging to 7–10 mm long, lower pair of calyx teeth fused into a lip ending in a small pair of upcurved, spinescent teeth; lateral teeth suppressed and replaced by a wide shoulder-like sinus; corolla with lobes of upper lip toothed or fimbriate or at least sinuate, white to pale mauve; Dec.–Feb. Dense grassland. *Cat's whiskers*; *idada*, *umatanjane*, *iziba* (Z).




## **Plectranthus** L'Hér. (sthn Afr.: 45 spp.)

### Key to species:

[after Codd: 138 (1985)]

1a Bracts leaf-like, becoming gradually smaller towards apex of inflorescence or towards ends of flower-bearing stems; flowers in dichasia arranged in a terminal panicle . . . . . **P. calycinus**

1b Bracts differentiated from and smaller than leaves; inflorescence paniculate or subspicate with flowers in verticils of 3–many-flowered cymes or dichasia . . . . . 2
2a Flowers in 6-flowered verticils; bracts persistent beyond flowering stage; fruiting calyx enlarged but not gibbous at base. . . . . .**P. grallatus**
2b Flowers in 6–16-flowered verticils; bracts deciduous before flowers open; fruiting calyx gibbous at base . . . . . **P. madagascariensis** var. **ramosior**

**calycinus** Benth.
*Rabdosia calycina* (Benth.) Codd
*Rabdosiella calycina* (Benth.) Codd

Shrub, 0.6–1.5 m high. **Leaves** subsessile; often ternate; blade narrowly ovate to broadly ovate, 40–100 × 20–45 mm, apex acute to obtuse, base cuneate to rounded, margins crenate-dentate, upper surface subglabrous to strigose, lower surface reticulately veined, subglabrous to densely tomentose, sessile glands orange. **Flowers**: in dichasia arranged in a terminal panicle; bracts leaf-like, becoming progressively smaller towards apex of inflorescence; mature calyx 7–8 mm long and erect at fruiting stage; tubular and distinctly 10-nerved; corolla saccate at base, white to cream-coloured, flushed with mauve on lips; Nov.–Jun. Mountain grassland; often along streams. *Upland fly bush*; *spoorblom* (A).




**grallatus** Briq.
*P. transvaalensis* Briq.

Perennial herb, 0.4–1.5 m high. **Stems** arising annual from a tuberous rootstock. **Leaves** petiolate; blade broadly ovate, 50–160 × 35–140 mm, apex acute, base abruptly cuneate, margins with coarse teeth often bearing small secondary teeth, lower surface dotted with minute, red to brownish, sessile glands, thin textured; petioles 20–100 mm long. **Flowers**: in sessile 3-flowered cymes, forming 6-flowered verticils 6–20 mm apart; bracts persistent beyond flowering stage; fruiting calyx enlarged but not gibbous at base, glandular-hispid; corolla 9–13 mm long, white with a flush of pink and a few spots on upper lip; Nov.–Apr. In forest and scrub forest and among rocks in shady places. *Tuberous spur-flower*; *knolspoorsalie* (A); *umnyama-wempunzi* (Z).




**madagascariensis** (Pers.) Benth. var. **ramosior** Benth.

Perennial herb, 200–350 mm high; semisucculent. **Stems** erect to decumbent; fairly densely to densely hairy. **Leaves** petiolate; blade ovate to broadly ovate, 20–35 × 15–30 mm, apex obtuse, base truncate to cuneate, margins coarsely crenate-dentate, lower surface dotted with minute, red to brownish, sessile glands, medium to thick in texture; petioles 5–35 mm long. **Flowers**: in 6–16-flowered verticils; bracts deciduous before flowers open; fruiting calyx gibbous at base; corolla 8–12 mm long, mauve or bluish, rarely white; Nov.–May. In grass among rocks.




## **Pycnostachys** Hook. (sthn Afr.: 3 spp.)

**reticulata** (E.Mey.) Benth.
*P. purpurascens* Briq.

Perennial herb, 0.2–2.0 m high. **Stems** erect, solitary or a few from base. **Leaves** sessile or subsessile; blade linear to narrowly ovate or elliptic, 40–110 × 8–25 mm, apex acute to

acuminate, base cuneate, margins obscurely to sharply and regularly toothed; petioles up to 5 mm long. **Flowers**: inflorescence solitary or several borne on branches produced on upper part of stem, central one largest; bracts linear, ciliate, 4 mm long; calyx teeth 4–6 mm long, puberulous, purple; corolla 8–18 mm long, pale blue or sky blue to pale mauve or pinkish or almost white; Nov.–Jun. Moist grassy places. *Slender pycnostachys*, *blue soldier*; *uhlalwane*, *umvuthuza* (Z).

MsGr

## **Rotheca** Raf. (sthn Afr.: 9 spp.)

### **hirsuta** (Hochst.) R.Fern.

*Clerodendrum triphyllum* (Harv.) H.Pearson var. *triphyllum*
*Cyclonema hirsutum* Hochst.

Perennial herb, 0.15–0.60 m high. **Stems** annual, many from rootstock, **Leaves** sessile; in whorls of 3 or 4 or opposite; blade narrowly obovate to obovate, narrowly elliptic to elliptic, up to 50 × 8 mm, apex acute, base cuneate, margins entire, lower surface profusely gland-dotted with peltate hairs. **Flowers**: in 1–3-flowered, axillary cymes; 4 stamens and terminal style inserted in corolla throat opposite lip, long exserted and curved; calyx 3–4 mm long, persistent; corolla irregular, tube 3–6 mm long, with 4 lateral lobes, 2 on each side, and a lower lip, purplish blue with a Y-shaped pattern on lip; Jul.–Mar. **Fruit** a drupe, remaining undivided or dividing very late in development, deeply 2-lobed or by abortion 1, ± 15 mm long, black when ripe. Grassland, rocky places, disturbed areas. *Butterfly bush*, *wild violet*.

DrGr MsGr

## **Salvia** L. (sthn Afr.: 27 spp.)

### Key to species:

[after Codd: 79 (1985)]

| | | |
|---|---|---|
| 1a | Dwarf shrub with woody stems | **S. namaensis** |
| 1b | Annual or perennial herbs with herbaceous to softly woody stems | 2 |
| 2a | Bracts conspicuous with blade broadly ovate, apex cuspidate, purplish pink | **S. sclarea** |
| 2b | Bracts not conspicuous or coloured | 3 |
| 3a | Calyx with white, silky hairs in throat | **S. verbenaca** |
| 3b | Calyx not as above | 4 |
| 4a | Upper lip of calyx entire, consisting of a single, ovate tooth | **S. reflexa** |
| 4b | Upper lip of calyx 2- or 3-toothed | 5 |
| 5a | Upper lip of corolla distinctly falcate | **S. disermas** |
| 5b | Upper lip of corolla straight | 6 |
| 6a | Fruiting calyces 7–13 mm long; corolla 10–26 mm long; plants rhizomatous | **S. repens** |
| 6b | Fruiting calyces 4–7 mm long; corolla 7–14 mm long; plants not rhizomatous | 7 |
| 7a | Stems with a distinct indumentum of short to long eglandular hairs; leaf blade narrowly oblong-ovate to obovate | **S. runcinata** |
| 7b | Stems almost glabrous, only a few, scattered, eglandular hairs present; leaf blade linear-oblong to narrowly ovate-oblong | **S. stenophylla** |

**disermas** L.

*S. rugosa* Aiton

Perennial herb, 0.3–1.0 m high. **Stems** erect, annual; lower stem with indumentum of many, capitate, glandular hairs. **Leaves** petiolate and sessile; blade broadly ovate to narrowly ovate-oblong, 40–160 × 15–70 mm, margins irregularly crenate to erose-dentate, lower surface markedly reticulate, rugose, scabrid, glandular-pubescent. **Flowers**: verticils 6–8-flowered; upper lip of calyx 2- or 3-toothed, mature calyx 10–15 mm long, glandular-hispid to villous; corolla 15–30 mm long, upper lip falcate, whitish, pale blue or mauve; Nov.–May. Sandy soil in watercourses, limestone formations and rocky hillsides, along roadsides and waste places. *Grootblousalie*, *dassiebos* (A).

VreDm | AcGr | DrGr | | KarSh |

**namaensis** Schinz

Shrub, 0.3–1.2 m high. **Stems** erect, much branched, herbaceous above, woody below; yellowish or greyish green, shortly tomentose to glabrescent, gland dotted. **Leaves** petiolate; blade obovate, 15–40 × 10–20 mm, margins irregularly lyrate-pinnatifid, upper surface rugose, hispid, lower surface prominently reticulate, hispid, gland dotted. **Flowers**: verticils up to 6-flowered; calyx up to 8 mm long, glandular-hispidulous; corolla with tube 5–8 mm long, upper lip straight, 3–6 mm long, lower lip longer than upper one, white, mauve or blue; Dec.–May. Rocky slopes, along watercourses.

| AcGr | | | KarSh |

***reflexa** Hornem.

Annual herb, 0.50–0.75 m high. **Stems** erect, glabrous. **Leaves** spreading or reflexed; blade narrowly ovate to linear-ovate, 30–60 × 5–10 mm, margins entire and irregularly serrate. **Flowers**: inflorescence spike-like, upper lip of calyx entire, consisting of a single, ovate tooth, ribbed, enlarging to 6 mm long in fruit; corolla up to 8 mm long, blue; Dec.–Mar. Weed of waste places. Native to North America. *Mintweed*.

| | DrGr | MsGr | |

**repens** Burch. ex Benth. var. **repens**

*S. woodii* Gürke

Perennial herb, 0.25–0.60(–0.80) m high, rhizomatous. **Stems** decumbent; pilose to tomentose. **Leaves** petiolate and sessile, crowded; blade elliptic to obovate, 30–100 × 8–48 mm, margins entire to runcinate, sparsely to freely gland dotted. **Flowers**: in verticils, upper lip of calyx 2- or 3-toothed, spreading, fruiting calyces 7–13 mm long; corolla 14–20 mm long, upper lip of corolla straight; pale blue or mauve to purple, rarely white; Oct.–Feb., May. Mountain grassland, riverbanks, in open woodland, sometimes a weed in gardens or disturbed places. *Kruipsalie* (A).

| | DrGr | MsGr | KarSh | Zastr |

**repens** Burch. ex Benth. var. **transvaalensis** Hedge

Perennial herb, 0.25–0.60(–0.80) m high. **Leaves** narrowly oblong, simple, densely gland-dotted. **Flowers**: calyx and corolla as in var. *repens* but corolla 10–15 mm long; Oct.–Apr. Grassland.

| | DrGr | MsGr | |

**runcinata** L.f.

*S. sisymbrifolia* Skan

Perennial herb, 0.15–0.50 m high. **Stems** 1–several stems from a taproot, occasionally from a creeping rootstock; indumentum of short to long eglandular hairs. **Leaves** narrowly oblong-ovate to obovate, 30–90 × 15–30 mm, margins runcinate-pinnatipartite to lyrate. **Flowers**: in verticils, upper lip of calyx 2- or 3-toothed, spreading; fruiting calyces 4–7 mm long; calyx gland dotted, 5–8 mm long, hispid-scabrid; corolla 7–14 mm long, upper lip of corolla straight; corolla white or pale blue to mauve or purplish; Aug.–Apr. On heavy soils, sometimes disturbed places or overgrazed veld. *Hardesalie* (A); *setlepetlepe* (SS).

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***sclarea** L.

Annual or biennial herb, up to 0.9 m high. **Stems** erect, herbaceous, hairy. **Leaves** basal in a rosette; petiolate; blade conspicuous, broadly ovate, up to 140 × 120 mm, densely hairy, upper surface rugose, apex cuspidate, purplish pink; petioles up to 50 mm long. **Flowers**: verticils 4–6-flowered; bracts ovate, persistent, longer than calyx, blade broadly ovate, apex cuspidate, purplish pink; calyx white or lilac, teeth spinose; corolla ± 20 mm long, upper lip curved, whitish mauve. Garden escape. Native to Europe and Asia. *Clary*.

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**stenophylla** Burch. ex Benth.

*S. chlorophylla* Briq.

*S. pallida* Dinter ex Engl.

Perennial herb, 200–400 mm high. **Stems** almost glabrous, with few, scattered, eglandular hairs. **Leaves** with blade linear-oblong to narrowly ovate-oblong, 25–80 × 6–20 mm, margins pinnatifid or pinnatisect, occasionally entire. **Flowers**: verticils 6–8-flowered; fruiting calyces 4–7 mm long, upper lip 2- or 3-toothed, spreading, gland dotted, minutely hispidulous; upper lip of corolla straight, 7–14 mm long; corolla pale blue or mauve; Oct.–Apr. Grassland, open woodland, semi-arid shrub, sometimes weed of disturbed places. *Wild sage*; *fynblaarsalie* (A); *mosisili* (SS).

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**verbenaca** L.

*S. clandestina* L. var. *angustifolia* Benth.

*S. clandestina* L. var. *clandestina*

Perennial herb, 0.15–0.40 m high. **Stems** erect, densely glandular-villous with long, spreading hairs and shorter gland-tipped hairs. **Leaves** in a dense, basal rosette; blade oblong to ovate-oblong, 40–130 × 10–30 mm, margins irregularly to deeply pinnatifid, sometimes almost entire. **Flowers**: verticils 6-flowered; calyx 7–9 mm long, upper lip with 3 closely connivent, short teeth, pilose and gland dotted, densely villous in throat; corolla 8–12 mm long, upper lip of corolla straight or slightly falcate, light blue to purple; Sep.–Mar. Disturbed places. *Wild clary*; *wildesalie* (A).

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## **Stachys** L. (sthn Afr.: 42 spp.)

### Key to species:

[after Codd: 51 (1985)]

1a Pubescence of stellate or branched hairs, often forming a dense velvety or felt-like tomentum or ± floccose, rarely plants subglabrous, but then some branched hairs on calyx or corolla . . . . . 2
1b Pubescence of simple hairs or plants subglabrous with no branched hairs on calyx or corolla . . . . . 5
2a Calyx very thinly and minutely stellate-tomentulose or sometimes glabrescent . . . . . **S. hyssopoides**
2b Calyx markedly stellate-hispid or densely covered with a felt-like or wool-like indumentum . . . . . 3
3a Leaves sparsely to fairly densely stellate-pilose with leaf surfaces visible through tomentum on both surfaces . . . . . **S. dregeana**
3b Leaves with a dense felt-like tomentum at least on lower surface . . . . . 4
4a Leaf blade linear-spathulate to narrowly ovate-spathulate, rounded and broadest at or near apex . . . . . **S. spathulata**
4b Leaf blade narrowly linear, usually narrowed towards apex . . . . . **S. linearis**
5a Leaf blade ovate, 35–100 × 25–70 mm . . . . . 6
5b Leaf blade narrowly oblong-ovate, linear-oblong to linear, rarely up to 35 × 25 mm . . . . . 9
6a Leaf blade with lower surface sparsely hispid or pilose . . . . . **S. aethiopica**
6b Leaf blade with lower surface densely, softly hairy . . . . . 7
7a Calyx teeth spreading, broad-based . . . . . **S. albiflora**
7b Calyx teeth not spreading, narrow . . . . . 8
8a All leaves distinctly petiolate; calyx teeth > 2 mm long. . . . . **S. grandifolia**
8b Upper leaves sessile or subsessile; calyx teeth up to 2 mm long. . . . **S. kuntzei**
9a Stems with interpetiolar ridges . . . . . **S. sessilis**
9b Stems without interpetiolar ridges . . . . . 10
10a Leaf base rounded to subcordate. . . . . **S. simplex**
10b Leaf base distinctly cordate. . . . . 11
11a Leaf blade thin-textured, lower surface glandular or sparsely pubescent; stems slender, decumbent to spreading . . . . . **S. aethiopica**
11b Leaf thick-textured, lower surface glandular-pubescent; stems erect, stout . . . . . **S. tysonii**

### **aethiopica** L.

Perennial herb. **Stems** decumbent or ascending, slender, up to 0.5 m long. **Leaves** petiolate; blade broadly ovate to ovate-deltoid, 8–35 × 6–25 mm, base deeply to shallowly cordate, apex acute to obtuse, margins regularly crenate to crenate-serrate, thin-textured, lower surface sparsely hispid or pilose, glandular. **Flowers**: inflorescence lax below, dense above, verticils (2–)4–6-flowered; calyx 5–8 mm long, sparsely to densely hispid, often glandular; corolla with tube 7–10 mm long, upper lip 2–5 mm long, lower lip 5–8 mm long, white or pink to deep mauve, purplish flecks on lower lip; Oct.–Apr. Grassland.

DrGr | MsGr | Zastr

### **albiflora** N.E.Br.

Perennial herb, up to 1.3 m high. **Stems** erect or ascending, stout; densely pubescent. **Leaves** petiolate; blade broadly ovate, 80–110 × 50–70 mm, base deeply cordate, apex acute, margins finely and regularly crenate, lower surface densely, softly hairy. **Flowers**: inflorescence with

spaced verticils, verticils 6-flowered, rachis densely glandular-pubescent; calyx 7 mm long, teeth broad-based, distinctly spreading, 3 mm long, deltoid-subulate and spine-tipped, hispidulous and freely gland dotted; corolla with tube 6–7 mm long, upper and lower lip 6 mm long, white; Jan.–Mar. Mountain grassland.

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**dregeana** Benth.

Perennial herb. **Stems** 1–several, arising annually, up to 0.4 m high; sparsely to densely floccose-tomentose. **Leaves** sessile; blade oblong-linear or spathulate to elliptic-ovate, 15–60 × 3–17 mm, base obtuse, apex obtuse to rounded, margins entire or shallowly crenate, sparsely to fairly densely stellate-pilose with leaf surfaces visible through tomentum on both surfaces. **Flowers**: verticils 2–4-flowered; calyx 6–8 mm long, densely and finely stellate-tomentose to floccose; corolla with tube 6 mm long, upper lip 3–4 mm long, lower lip 6–8 mm long, pink to mauve or purple; Nov.–Jan. Grassland.

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**grandifolia** E.Mey. ex Benth.

Perennial herb, up to 1 m high. **Stems** straggling or much branched; densely and softly pubescent with prominent, often crisped hairs. **Leaves** all distinctly petiolate; blade broadly ovate, 35–80 × 28–65 mm; base deeply cordate, apex acute, margins regularly finely crenate, lower surface densely, softly hairy. **Flowers**: inflorescence of 3 or several verticils, verticils 4–6-flowered; calyx 6 mm long, teeth > 2 mm long, softly pilose; corolla with tube 7–11 mm long, upper lip 4–6 mm long, lower lip 6–7 mm long, white with mauve spots on lower lip; Oct.–Apr. Forest margins, along watercourses.

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**hyssopoides** Burch. ex Benth.

Perennial herb, 0.2–0.6 m high. **Stems** erect or decumbent. **Leaves** sessile; blade linear to narrowly oblong-ovate, 20–55 × 2–8 mm, base cuneate, apex obtuse, margins entire or sparsely toothed towards apex, glabrous to thinly stellate-pubescent. **Flowers**: verticils 2-flowered, occasionally 4- or 6-flowered; calyx 6–7 mm long, very thinly and minutely stellate-tomentulose, sometimes glabrescent; corolla with tube 6–7 mm long, upper lip 5 mm long, lower lip 7 mm long, pink or mauve to purple, often with darker flecks; Jul.–Jan. In depressions or along riverbanks in clay. *Pienksalie* (A); *selaoane* (SS).

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**kuntzei** Gürke

*S. petrogenes* Briq.

Perennial herb, 0.45–1.00 m high. **Stems** decumbent or ascending. **Leaves** sessile in upper part of stem, petiolate below; blade broadly ovate, 35–70 × 25–50 mm base cordate, apex obtuse to rounded, margins finely and regularly crenate, densely appressed-tomentose on both surfaces. **Flowers**: verticils 6-flowered, fairly closely spaced; calyx 6–7 mm long, teeth up to 2 mm long, densely glandular-pubescent; corolla white or tinged with mauve; Nov.–Feb. In grass among rocks and on sandstone ledges in mountain grassland.

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**linearis** Burch. ex Benth.

Dwarf shrub, up to 0.4 m high. **Stems** decumbent or erect; whitish stellate-felted. **Leaves** sessile forming an interpetiolar ridge; blade narrowly linear, 15–45 × 1.5–2.5, narrowing gradually to base and apex, margins entire, both surfaces densely and finely yellowish grey stellate-felted. **Flowers**: verticils 2-flowered; calyx 5–8 mm long, densely and shortly grey stellate-felted; corolla with tube 6–8 mm long, upper lip 4 mm long, lower lip 6–7 mm long, pink to mauve or purple; Oct.–Jun. Grassland, flats, dolerite hills.




**sessilis** Gürke

Perennial herb, 0.15–1.00 m high. **Stems** erect, with interpetiolar ridges. **Leaves** sessile or lower ones shortly petiolate; blade narrowly deltoid-ovate or narrowly oblong-ovate to oblong or ovate-deltoid, 20–50 × 6–18 mm, base rounded to subtruncate, apex rounded to obtuse, margins crenate, strigose. **Flowers**: verticils 4–8-flowered; calyx densely hispid-villous; corolla with tube 5–6 mm long, upper lip 2.5–3.0 mm long, lower lip 7–8 mm long; white usually with purplish spots on lower lip; Nov.–Jan. Dense grassland, usually subjected to frequent burning.




**simplex** Schltr.
*S. chrysotrichos* Gürke
*S. pascuicola* Briq.

Perennial herb, up to 0.4 m high. **Stems** decumbent to procumbent. **Leaves** subsessile in upper part of stem, petiolate below; blade ovate, ovate-oblong to narrowly ovate, 30–55 × 12–25 mm, apex obtuse to rounded, base rounded to subcordate, margins regularly serrate-crenate, thick-textured, densely appressed villous above. **Flowers**: verticils 4–6-flowered; calyx 6–7 mm long, densely villous; corolla with tube 5–6 mm long, upper lip 2.5 mm long, lower lip 4–5 mm long, white to mauve; Nov.–Mar. Mountain grassland subject to frequent burning, usually on stony slopes.




**spathulata** Burch. ex Benth.
*S. minima* Gürke
*S. pachycalamna* Briq.

Perennial herb or dwarf shrub, 0.08–0.30 m high. **Stems** erect or spreading, often decumbent at base. **Leaves** sessile, often crowded; blade linear, linear-spathulate or narrowly linear-obovate to rarely obovate-elliptic, broadest at or near apex, 15–50 × 2–12 mm, apex rounded, base cuneate, margins entire, densely greyish white stellate-felted. **Flowers**: verticils 2(–4)-flowered; calyx 4–7 mm long, densely and shortly grey stellate-tomentose; corolla pink, mauve or rosy mauve; Oct.–Apr. On heavy soils in depressions, on riverbanks or in watercourses under arid to semi-arid conditions.




**tysonii** Skan

Perennial herb, up to 0.3 m high. **Stems** erect, stout, often from a decumbent base, glandular-pilose with long, slender hairs and short gland-tipped hairs. **Leaves** petiolate; blade ovate to narrowly ovate or ovate-oblong, 15–35 × 8–20 mm, apex rounded, base deeply cordate,

margins regularly crenate-serrate, thick-textured, lower surface glandular-pubescent; petioles 4–12 mm long. **Flowers**: verticils 4–6-flowered; calyx 6–7 mm long, shortly glandular-pubescent to glandular-pilose; corolla whitish to mauve with darker flecks on lower lip, upper lip ascending, lower lip deflexed, 5–7 mm long; Nov.–Mar. Mountain grassland.

MsGr

## **Syncolostemon** E.Mey. ex Benth. (sthn Afr.: 44 spp.)

Key to species:

1a Calyx 2-lipped . . . . . **S. cinereus**
1b Calyx 5-toothed . . . . . 2
2a Corolla white, tube 8–9 mm long . . . . . **S. concinnus**
2b Corolla pink to pale mauve or purple, tube 20–25 mm long . . . .**S. macranthus**

### **cinereus** (Codd) D.F.Otieno & Retief

*Hemizygia cinerea* Codd

Shrub, 0.4–1.5 m high. **Stems** greyish tomentose. **Leaves** petiolate; blade narrowly ovate-elliptic, narrowly obovate-elliptic or linear-elliptic, 7–20 × 2–7 mm, apex obtuse to rounded, base cuneate, margins entire or minutely crenate-dentate above middle, densely stellate-tomentose on both surfaces, upper surface darker grey than lower surface. **Flowers**: verticils 4–6-flowered; calyx 2-lipped; 5–7 mm long; villous and freely gland-dotted; corolla 8–11 mm long, pinkish to mauve; Dec.–Mar. Grassland, mountain slopes, foot of cliffs, along streambanks.

MsGr

### **concinnus** N.E.Br.

Perennial herb, up to 0.6 m high. **Stems** several arising annually from a woody rootstock; slender, sparsely branched, hispidulous. **Leaves** tufted, subsessile; blade obovate-oblong to narrowly elliptic, 10–18 × 2–8 mm, apex rounded, base acute, margins often with a few teeth near apex, stellate-pubescent on both surfaces. **Flowers**: in a lax panicle, verticils 2-flowered; calyx 5-toothed, glandular-hispid, tube setose in throat; corolla 12–13 mm long, white, tube 8–9 mm long; Nov.–Mar. Grassland, mountain plateaus, hill slopes, among rocks.

MsGr

### **macranthus** (Gürke) M.Ashby

*Orthosiphon macranthus* Gürke

Shrub, 1.0–2.5 m high; straggling. **Stems** several from base; hispidulous. **Leaves** petiolate; blade ovate to narrowly ovate, 20–45 × 12–20 mm, apex acute to obtuse, base obtuse to cuneate, margins obscurely crenate-dentate, scabrid with stiff, appressed hairs mainly on veins, lower surface prominently veined. **Flowers**: in fairly dense to lax panicles, verticils 3–7-flowered; calyx 9–10 mm long, densely glandular-puberulous, upper obovate-elliptic tooth distinctly larger than lower 4 narrowly deltoid teeth; corolla 25–30 mm long, tube 20–25 mm long, pink to pale mauve or purple; Oct.–May. Along streams, forest margins. Figure 52.

MsGr




**Figure 52.** *Syncolostemon macranthus* (Lamiaceae). Artist: G. Condy.

## **Teucrium** L. (sthn Afr.: 3 spp.)

**trifidum** Retz.

*T. capense* Thunb.

Shrub, 0.3–1.1 m high. **Leaves** 20–60 mm long; blade ± deeply 3-fid or 3-lobed, lobes linear to narrowly ovate, 10–35 × 3–8 mm, basal portion of leaf with midrib winged narrowing to a short petiole. **Flowers**: peduncles 3–7-flowered, cymes often as long as or longer than internode; calyx 2.5–4.0 mm long, teeth 2 mm long, greyish; corolla with tube 2 mm long, lower lip obovate, 3–4 mm long, remaining 4 lobes oblong, rounded, 2 mm long, white; Oct.–Apr. In dry woodland under thorn trees or in bush groups, particularly on overgrazed or disturbed areas. *Koorsbossie*, *aambeibossie*, *akkedispootjie* (A).

VreDm | AcGr | DrGr | MsGr

## References

CODD, L.E. 1985. Lamiaceae. *Flora of southern Africa* 28: 1–247.

LEISTNER, O.A. 2005. Lamiaceae. *Seed plants of southern tropical Africa: families and genera*. Southern African Botanical Diversity Network Report No. 26. SABONET, Pretoria.

# LENTIBULARIACEAE

Annual or perennial, terrestrial herbs, rooted or free-floating; mostly insectivorous. **Rhizoids** and stolons thread-like. **Leaves** alternate or in rosettes, submerged leaves modified into bladder- or bottle-like pitchers with trap doors for catching insects. **Flowers**: in bracteate, racemose inflorescences; bisexual, irregular; sepals 2, rarely 4; corolla with petals 5, united, 2-lipped and spurred; stamens 2, arising from base of corolla; ovary superior, style absent or short, stigma 2-lobed. **Traps** (utricles) globose or ovoid with a wide variety of external appendages, mostly near mouth, inside of trap glandular. **Fruit** a many-seeded capsule. *Bladderwort family*.

## **Utricularia** L. (sthn Afr.: 18 spp.)

### Key to species:

[after Taylor: 9 (1988); Cook: 161 (2004)]

1a Terrestrial herbs; leaves with blade linear, narrowly obovate to spathulate, or absent; bracteoles present . . . . . 2

1b Aquatic herbs; leaves divided into filiform segments; bracteoles absent . . . . 3

2a Spur ± twice as long as lower petal lip; base of peduncle usually papillose . . . . . **U. arenaria**

2b Spur ± equal to or at most one and a half times as long as lower petal lip; base of peduncle glabrous . . . . . **U. livida**

3a Peduncle with whorl of inflated leaf-like organs . . . . . **U. stellaris**

3b Peduncle without whorl of inflated leaf-like organs . . . . . 4
4a Leaf segments many . . . . . **U. australis**
4b Leaf segments few . . . . . **U. gibba**

## **arenaria** A.DC.

*U. exilis* Oliv.
*U. kirkii* Stapf

Terrestrial herb. **Leaves** with blade linear, narrowly obovate to spathulate, 2–15 mm long, 1-veined. **Flowers**: bracteoles present, bracts not > twice as wide as bracteoles and similar in shape; base of peduncle usually papillose; corolla with spur ± twice as long as lower petal lip, 3–9 mm long, white or lilac with a yellow spot on palate; Jan.–May. **Traps** ovoid, 0.6–1.0 mm long. Marshes and swampy grassland and shallow sandy or peaty soil overlying rocks.




## **australis** R.Br.

Aquatic herb. **Leaves** divided into many segments, up to 30 mm long. **Flowers**: bracteoles 0, bracts basifixed, circular, decurrent; corolla with spur ± as long as lower petal lip, 7–10 mm long, ± densely covered with glandular hairs, yellow, usually with reddish lines on palate. **Traps** dimorphic, ovoid, 5–25 mm long. In rivers, pools and ditches.




## **gibba** L.

*U. exoleta* R.Br.
*U. gibba* L. subsp. *exoleta* (R.Br.) P.Taylor
*U. gibba* L. subsp. *gibba*

Aquatic or subaquatic herb. **Leaves** with a few segments, 5–15 mm long. **Flowers**: bracteoles 0, inflorescence 1–4-flowered, without whorl of inflated leaf-like organs; corolla with spur well developed, 4–25 mm long, not hairy outside; yellow, often with brown or reddish nerves; Oct.–Jun. **Traps** ovoid, 1.0–1.5 mm long. Shallow water and mud by ditches, streams and lakes.




## **livida** E.Mey.

*U. transrugosa* Stapf

Terrestrial herb. **Leaves** narrowly obovate to spathulate, 2–70 mm long, several to many veined. **Flowers**: bracteoles present, bracts not > twice as wide as bracteoles and similar in shape; base of peduncle glabrous; corolla with spur ± equal to or at most one and a half times as long as lower petal lip; 6–15 mm long, violet, mauve or white with yellow spot on palate or more rarely wholly yellow or cream-coloured; Jul.–Jun. **Traps** ovoid, 1–2 mm long. Permanently or seasonally wet boggy grassland and shallow wet soil over rocks. *Bladderwort*; *blaaskruid* (A); *tlamana-sa-metsi* (SS); *intambo* (Z).




## **stellaris** L.f.

*U. inflexa* Forssk. var. *stellaris* (L.f.) P.Taylor

Aquatic herb. **Leaves** divided into many segments. **Flowers**: bracteoles 0; peduncle with whorl of inflated, narrowly ellipsoid, leaf-like organs, 2–4 × as long as broad; corolla with spur ± as

long as lower petal lip, 7–10 mm long, yellow, usually with reddish lines on palate; Feb.–Aug. **Traps** obliquely ovoid, 1–3 mm long. Still and slow-flowing water in dams, rivers and marshes. *Bladderwort*, *star bladderwort*; *sterblasiekruid* (A); *thlamana-sa-metsi* (SS).

DrGr

## References

COOK, C.D.K. 2004. *Aquatic and wetland plants of southern Africa*. Backhuys, The Netherlands.
TAYLOR, P. 1988. Lentibulariaceae. *Flora zambesiaca* 8,3: 9–42.

# LIMEACEAE

Annual or perennial herbs or subshrubs; glabrous or glandular-pubescent. **Leaves** spirally arranged, simple; blade linear, elliptic, ovate or obovate; without stipules. **Flowers**: in terminal and axillary, cymose inflorescences; small; bisexual, regular; sepals 5, greenish and/or white; petals 5, white or cream-coloured, alternating with sepals or absent; stamens 8, in 2 whorls; ovary superior; styles 3, simple. **Fruit** separating into 2 indehiscent mericarps, mericarps reniform or orbicular, variously ornamented. *Limeum family*.

## **Limeum** L. (sthn Afr.: 17 spp.)

### Key to species:

[after Gonçalves: 526 (1978)]

1a Mericarps compressed-orbicular, winged . . . . . 2
1b Mericarps hemispheric-reniform or truncate-turbinate, never winged . . . . . 3
2a Leaves linear to narrowly ovate; flowers in a congested pseudo-umbel . . . . . **L. pterocarpum** var. **pterocarpum**
2b Leaves filiform; flowers in a lax, paniculate cyme . . . . . **L. fenestratum** var. **fenestratum**
3a Plants glabrous, never glandular-pubescent . . . . . 4
3b Plants viscid, glandular-pubescent . . . . . 7
4a Mericarps auriculate, surface pitted, tuberculate-spinescent . . . . . **L. sulcatum** var. **sulcatum**
4b Mericarps not auriculate, surface rough to reticulate-pitted . . . . . 5
5a Perennial herb or subshrub . . . . . **L. aethiopicum** var. **aethiopicum**
5b Annual herb . . . . . 6
6a Lateral inflorescences sessile or peduncles short, dense flowering . . . . . **L. argute-carinatum** var. **argute-carinatum**
6b Lateral inflorescences with peduncles up to 14 mm long, though more strongly ramified, flower-head laxer . . . . **L. argute-carinatum** var. **kwebense**

7a Mericarps truncate-turbinate, with furrowed auricles . . . . . **L. arenicolum**
7b Mericarps hemispheric-reniform, with smooth auricles . . . . . 8
8a Plants perennial . . . . . **L. pauciflorum**
8b Plants annual . . . . . 9
9a Inflorescences sessile . . . . **L. viscosum** subsp. **viscosum** var. **glomeratum**
9b Inflorescences with a peduncle. . . . . 10
10a Fruit 2–3 mm in diameter . . . . **L. viscosum** subsp. **viscosum** var**. viscosum**
10b Fruit 4–5 mm in diameter . . . . . **L. viscosum** subsp. **viscosum** var**. macrocarpum**

### **aethiopicum** Burm.f. var. **aethiopicum**

Perennial herb or subshrub, up to 0.4 m high; glabrous. **Stems** erect; striate. **Leaves** sessile or petiolate; blade linear to narrowly linear-ovate, 5–27 × 1–4 mm; petioles up to 3 mm long, enlarged at base. **Flowers**: inflorescences mostly terminal, few- to many-flowered; perianth white; Oct.–Mar. **Fruit** with mericarps hemispheric-reniform, with a honeycomb-like network of ridges; without auricles at base. Grassland, hills, edges of pans, dams, roadsides.




### **arenicolum** G.Schellenb.

Annual herb; viscid, glandular-pubescent. **Stems** procumbent, spreading. **Leaves** petiolate; blade obovate to broadly ovate, 5–28 × 4–18 mm; petioles up to 12 mm long, enlarged at base. **Flowers**: inflorescences axillary, subsessile, many-flowered; perianth greenish white; Oct–Apr. **Fruit** with mericarps truncate-turbinate, auricles furrowed. Grassland, edges of pans, sandy soil.




### **argute-carinatum** Wawra ex Wawra & Peyr. var. **argute-carinatum**

Annual herb; glabrous. **Stems** procumbent. **Leaves** petiolate; blade oblong or linear-oblong, 9–40 × 2–9 mm; petioles up to 4 mm long. **Flowers**: lateral inflorescences sessile or with short peduncles, densely many-flowered; perianth white; Jan. **Fruit** with mericarps hemispheric-reniform, pitted and furrowed, without auricles at base. Calcrete ridges.




### **argute-carinatum** Wawra ex Wawra & Peyr. var. **kwebense** (N.E.Br.) Friedrich

Annual herb; glabrous. **Stems** widely spreading. **Leaves** petiolate; blade oblong, narrowly oblong-ovate, 9–40 × 2–9 mm; petioles up to 4 mm long. **Flowers**: inflorescences terminal and subaxillary, axillary ones with peduncles up to 14 mm long, flower heads, though more strongly ramified, laxer than in var. *argute-carinatum*; perianth white; Oct.–Mar. **Fruit** with mericarps hemispheric-reniform, pitted and furrowed, without auricles at base. Grassland, karroid grassland, edges of pans.




### **fenestratum** (Fenzl) Heimerl var. **fenestratum**

*Semonvillea fenestrata* Fenzl

Annual herb, up to 0.4 mm high; glabrous. **Stems** slender, erect, procumbent or decumbent. **Leaves** petiolate; blade filiform, 10–70 × 0.5–5.0 mm; petioles up to 4 mm long. **Flowers**: in

a lax, terminal, panicled cyme; perianth white; Dec.–Mar. **Fruit** with mericarps compressed-orbicular, tuberculate, circular winged, membranous and transparent. Grassland, sandy soil.

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**pauciflorum** Moq.

Perennial herb; viscid, glandular-pubescent. **Stems** procumbent or decumbent. **Leaves** petiolate; blade broadly obovate to ovate, up to 12 mm long, margins undulate; petioles up to 3 mm long. **Flowers**: inflorescences 3–5-flowered; sessile or shortly stalked; perianth green; Jan. **Fruit** with mericarps hemispheric-reniform, deeply pitted and furrowed; auricles smooth. Grassland, rocky sheets, sandy soil.

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**pterocarpum** (J.Gay) Heimerl var. **pterocarpum**

*L. neglectum* Dinter

Annual herb, up to 0.3 m high; glabrous. **Stems** erect, repeatedly branched. **Leaves** petiolate; blade linear to narrowly ovate, 8–45 × 2–8 mm; petioles up to 5 mm long. **Flowers**: in a congested pseudo-umbel; perianth white; Nov.–Apr. **Fruit** with mericarps compressed-orbicular, puberulous, broadly winged, circular, light brown, usually opaque. Grassland.

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**sulcatum** (Klotzsch) Hutch. var. **sulcatum**

*L. sulcatum* (Klotzsch) Hutch. var. *robustum* Friedrich

Annual herb, up to 150 mm high; glabrous. **Stems** erect or procumbent. **Leaves** petiolate; blade narrowly linear-ovate, 5–50 × 0.5–4.0 mm; petioles short, bases swollen. **Flowers**: inflorescences terminal and lateral, few- to many-flowered; perianth white; Nov., Dec. **Fruit** with mericarps hemispheric-reniform, tuberculate-spinescent, pitted, auricles smooth. Disturbed places, sandy soil.

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**viscosum** (J.Gay) Fenzl subsp. **viscosum** var. **glomeratum** (Eckl. & Zeyh.) Friedrich

*L. glomeratum* Eckl. & Zeyh.

*L. viscosum* Sond. var. *kotschyi* Burtt Davy

Annual herb; viscid, glandular-pubescent. **Stems** procumbent. **Leaves** narrowly obovate to elliptic, up to ± 25 × 6 mm; petioles up to 5 mm long. **Flowers**: inflorescences sessile; perianth white; Jan.–Apr. **Fruit** with mericarps hemispheric-reniform, net-depressed, auricles smooth. Grassland, disturbed places.

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**viscosum** (J.Gay) Fenzl subsp. **viscosum** var. **macrocarpum** Friedrich

Annual herb; viscid, glandular-pubescent. **Stems** procumbent, up to 1 m long; viscid. **Leaves** petiolate; blade obovate to broadly obovate, up to ± 25 × 13 mm; petioles 5–6 mm long. **Flowers**: inflorescences terminal and lateral, few- to many-flowered, with a peduncle; perianth white;

Dec.–May. **Fruit** with mericarps hemispheric-reniform, 4–5 mm in diameter, net-depressed; auricles smooth. Sandy places between rocks in grassland.

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**viscosum** (J.Gay) Fenzl subsp. **viscosum** var. **viscosum**

Annual herb; viscid, glandular-pubescent. **Stems** procumbent, up to 1 m long. **Leaves** petiolate; blade obovate to broadly obovate, up to ± 25 × 13 mm; petioles 5–10 mm long. **Flowers**: inflorescences terminal and lateral, few- to many-flowered, with a peduncle; perianth white; Dec.–May. **Fruit** with mericarps hemispheric-reniform, 2–3 mm in diameter, net-depressed, auricles smooth. Sandy places between rocks in grassland.

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GONÇALVES, M.L. 1978. Molluginaceae. *Flora zambesiaca* 4: 522–548.

# LINACEAE

Herbs or dwarf shrubs, rarely shrubs or small trees. **Leaves** simple, opposite; stipules present, often gland-like, interpetiolar or absent. **Flowers**: in panicles or cymes; regular; calyx 4- or 5-partite or sepals free; petals 5, free, twisted in bud; stamens the same number or twice as many as petals, filaments united at base; ovary superior, usually with 5 free styles. **Fruit** a capsule or drupe. *Flax family*.

## **Linum** L. (sthn Afr.: 14 spp.)

**thunbergii** Eckl. & Zeyh.

Perennial herb, up to 500 mm high. **Stems** slender, branching above. **Leaves** sessile, opposite at base of stem, becoming alternate higher up; blade linear to narrowly elliptic or ovate, 10–20 × 1–4(–8) mm, apex acute; dark brown stipular glands present at base. **Flowers**: in an open, terminal, many-flowered cyme; short-pedicelled, pedicels glabrous; outer sepals entire or serrate; styles free; corolla ± 15 mm wide, yellow; Nov.–Mar. **Fruit** an ovoid capsule, dehiscing into 10 1-seeded segments. Moist grassland, hillsides. *Wild flax*; *wildevlas* (A); *bohlokoana* (SS); *ithalelimpofu* (Z).

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# LINDERNIACEAE

Compiled by S.P. Bester, E. Retief & N.L. Meyer

Annual or perennial, terrestrial or aquatic herbs; roots sometimes red, yellow or orange. **Stems** quadrangular or a short rhizome. **Leaves** opposite or rosulate, simple, mostly entire, without stipules; venation palmate, sometimes obscure. **Flowers**: solitary, axillary or in terminal racemes, irregular, often bilabiate; corolla 4 or 5, united; calyx united or free to base, 5-lobed or 5-toothed; stamens mostly 4, 2 of which are usually longer than the others, sometimes 2 modified into staminodes, attached to petals; nectary present or absent; ovary superior, 2-locular. **Fruit** a many-seeded, septicidal capsule. **Seeds** small to minute, 1-many per locule, variously shaped, alveolate or sometimes smooth, furrowed or ridged. *False pimpernel family*.

## Key to genera

1a Nectary present; stamens usually 2 plus 2 staminodes, rarely 4 fertile . . . . . **Lindernia**
1b Nectary absent; stamens 4, fertile . . . . . 2
2a Calyx fused with only apical 1/3 free; staminodes thickened . . . . **Linderniella**
2b Calyx free to base; staminodes coiled . . . . . **Craterostigma**

## **Craterostigma** Hochst. (sthn Afr.: 3 spp.)

### **wilmsii** Engl. ex Diels

Perennial herb, 0.20–0.38 m high; succulent, acaulescent. **Stems** usually solitary, erect. **Leaves** in a rosette; fleshy; narrowing into a petiolate base; blade narrowly ovate or spathulate, 25–40 × 5–14 mm, apex obtuse, upper surface glabrous, lower surface pubescent. **Flowers**: in a scape 120–170 mm high; corolla bilabiate with lower lip 3-lobed, dark red, upper lip and tube white; Oct.–Feb. Rocky grassland, in shallow, damp or wet soil over rocks. *Mole's spectacles*; *molbril* (A). Figure 53.




## **Lindernia** All. (sthn Afr.: 4 spp.)

### Key to species:

[partly after Cook: 253 (2004)]

Flowers arising from floating rosettes; calyx lobes narrowly ovate to ovate, apices subacute, glandular-hairy . . . . . **L. conferta**
Flowers arising from axils of remote leaves or bracts; calyx lobes narrowly linear-ovate, apices acute, glabrous . . . . . **L. parviflora**

### **conferta** (Hiern) Philcox

*Ilysanthes conferta* Hiern

Aquatic herb. **Stems** 0.1–0.5 m high, lower parts submerged and rooted. **Leaves** crowded at or near top of stem in floating rosettes, minutely dotted, fleshy; blade rotund or obovate, 4–16 ×




**Figure 53.** *Craterostigma wilmsii* (Lindernicaceae). Artist: C. Letty.

1–6 mm, apex rounded. **Flowers**: axillary, subterminal; stamens 2; staminodes 2, coiled; calyx free to base, lobes narrowly ovate to ovate, apices subacute, glandular-hairy; corolla 8 mm in diameter, white with maroon to purple blotches on lower lip and throat; Jan.–Apr. Streambanks, permanent pools on rock table land.

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**parviflora** (Roxb.) Haines

*Ilysanthes parviflora* (Roxb.) Benth.

Annual herb, 150–300 mm high, terrestrial. **Stems** simple to much branched, erect, decumbent or ascending, leafy throughout. **Leaves** opposite, ± sessile, 10(–30) × 3 mm, shape variable, ± linear to ovate or acute, entire. **Flowers**: single, axillary; stamens 2; staminodes 2, thickened and coiled; calyx free to base, lobes narrowly linear-ovate, apices acute, glabrous; corolla bilabiate, ± 7 mm long, upper lip ovate, lower lip longer, 3-lobed; white, pale blue, or mauve to violet with 2 yellow spots in throat; Dec.–Apr. Jan. River- or streambanks, damp areas, swamps, rivers, pans and ephemeral rock pool edges, or aquatic in such pools.

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## **Linderniella** Eb.Fisch., Schäferh. & Kai Müll. (sthn Afr.: 4 spp.)

**nana** (Engl.) Eb.Fisch., Schäferh. & Kai Müll.

Dwarf herb, up to 60 mm high. **Leaves** opposite, sessile or subsessile; blade elliptic, obovate or oblong, apex obtuse, base ± narrowed, connate, rather thick. **Flowers**: subsessile, solitary in each axil; stamens 2; staminodes 2, thickened; calyx fused with only apical 1/3 free; corolla cream-coloured or light pink; Jan.–May. Edges of pans.

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| VreDm | | DrGr | | | |

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# LOBELIACEAE

Herbs or dwarf shrubs, rarely entirely woody, often with sparse milky latex. **Leaves** usually alternate, simple; without stipules. **Flowers**: bisexual rarely unisexual; irregular; solitary, and axillary, in spikes or racemes; calyx 5-lobed, adnate to ovary; corolla 1-

or 2-lipped, lips reversed by twisting of pedicel, petals 5, united or separate; stamens 5, alternating with corolla lobes, filaments free or arising on base of corolla, anthers cohering into a tube around style, rarely free (*Cyphia*); ovary inferior; style simple or 2-lobed, with ring of hairs. **Fruit** a capsule, often crowned with persistent calyx lobes, variably dehiscent. *Lobelia family*.

## Key to genera

1a Corolla bilabiate, unequally 5-lobed, usually with 3 petals cohering and 2 free, rarely all free. . . . . **Cyphia**
1b Corolla tube cleft down one side to base . . . . . 2
2a Stigma subglobose, 2-lobed, hairy. . . . . **Lobelia**
2b Stigma divided into 2, lobes filiform, elongate, hairy at base . . . . . **Monopsis**

## **Cyphia** P.J.Bergius (sthn Afr.: 33 spp.)

### Key to species:

1a Leaf blade 3-lobed, lobes linear . . . . . **C. triphylla**
1b Leaf blade simple . . . . . 2
2a Plants twiners . . . . . 3
2b Plants erect. . . . . 5
3a Leaves petiolate; blade ovate . . . . . **C. aspergilloides** var. **brevipes**
3b Leaves sessile or subsessile; blade narrowly elliptic or narrowly ovate. . . . 4
4a Leaf blade narrowly elliptic . . . . . **C. assimilis** var. **assimilis**
4b Leaf blade narrowly ovate . . . . . **C. stenopetala**
5a Corolla cream-coloured to yellow or mauve. . . . . 6
5b Corolla lilac or white. . . . . 7
6a Leaf blade narrowly ovate . . . . . **C. elata** var. **elata**
6b Leaf blade oblong . . . . . **C. oblongifolia**
7a Corolla lilac. . . . . **C. ramosa**
7b Corolla white and rose-pink or lilac in throat . . . . . **C. stenophylla**

### **aspergilloides** E.Wimm. var. **brevipes** E.Wimm.

Perennial herb. **Stems** twining. **Leaves** petiolate; blade simple, ovate, apex acute, base cuneate, margins dentate. **Flowers**: in lax, pedunculate, axillary racemes, 3- flowered; corolla ± 10 mm long, white or pink; Dec.–Mar. Scrub, in shade, rocky soil.

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### **assimilis** Sond. var. **assimilis**

Perennial herb. **Stems** twining, simple, leafy in lower and middle part, leafless above. **Leaves** sessile; blade simple, narrowly elliptic, 25–70 × 0.8–2.5 mm, apex acute, base cuneate, margins shallowly toothed, glabrous. **Flowers**: in lax, pedunculate, terminal racemes, few- or many-flowered; pedicels 2–7 mm long, with 2 bracteoles above middle, shorter than linear bract, entire or denticulate, 3–10 mm long; calyx tube turbinate, glabrous or puberulous, 1.5 mm long, lobes narrowly triangular, 1–2 mm long, entire or obsoletely 1-toothed, erect, at length subreflexed, glabrous; corolla 11–15 mm long, white suffused reddish or lilac, outer surface glabrous or subglabrous, inner surface puberulous towards base, 2-lipped; upper lip trifid, lower one with 2 petals, lobes sublinear, acute, corolla pale rosy or mauve-lilac; Feb.–Apr. Grassland.

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**elata** Harv. var. **elata**

*C. gerrardii* Harv.

*C. wilmsiana* Diels

Perennial herb, up to 1 m high. **Stems** erect; hairy. **Leaves** sessile; blade simple, narrowly ovate, 40–80 × 14–20 mm, apex acute, base rounded, margins serrate. **Flowers**: in a dense, terminal spike, sometimes with axillary flowering branches; corolla yellow to white; Jan.–May. Grassland, rocky slopes. *Ibutha lentaba*, *igela*, *ingonsi* (Z).

MsGr

**oblongifolia** Sond. & Harv.

*C. elata* Harv. var. *oblongifolia* (Sond. & Harv.) E.Phillips

Perennial herb, up to 0.5 m high. **Stems** erect; minutely hairy. **Leaves** sessile; blade simple, oblong, up to 60 × 7 mm, apex obtuse, apiculate, base rounded, margins crenulate-toothed. **Flowers**: in a dense, terminal spike; corolla yellow, pink or mauve; Dec.–Feb. Montane grassland, mountain sourveld.

MsGr

**ramosa** E.Wimm.

Perennial herb, up to 0.5 m high. **Stems** erect, striate, puberulous, leafy, not far from base, branched. **Leaves** sessile; blade simple, narrowly ovate to linear, 35–50 × 3–10 mm, apex acute, base cuneate, margins denticulate, glabrous. **Flowers**: in a lax raceme, up to 70 mm long; calyx lobes linear, 4 mm long, 2 long teeth on both sides, glabrous; corolla panduriforme, recurved-caudate at apex, 7 mm long, outer surface glabrous, inner surface puberulous, lilac; Feb.–Apr. Grassland.

MsGr

**stenopetala** Diels

Perennial herb. **Stems** twining. **Leaves** sessile; blade simple, narrowly ovate, up to 60 × 7 mm, apex acute to acuminate, base cuneate, margins entire or shallowly dentate. **Flowers**: in a lax raceme; calyx deeply lobed, tube shortly campanulate; corolla pale mauve with dark purple markings inside; Nov.–Apr. Open woodland, stony soil.

VreDm

**stenophylla** E.Wimm.

Perennial herb, up to 0.3 m high. **Stems** erect, unbranched. **Leaves** sessile; blade simple, linear, 26–60 × 4–5 mm, apex acute, hardly attenuate at base, margins revolute, remotely denticulate, lower surface with midrib whitish and prominent, veins invisible, sparsely hairy, scabrid. **Flowers**: solitary in a spike-like raceme, bracts 7 mm long; calyx tube turbinate, glabrous, lobes 5 mm long, lobes sublinear; corolla bilabiate, 8–9 mm long, outer surface glabrous, inner surface pubescent; white and rose-coloured or lilac in throat Dec.–Feb. Grassland.

DrGr MsGr KarSh Zastr

**triphylla** E.Phillips

Perennial herb. **Stems** erect or twining, glabrous, up to 0.5 m high, with scale-like cataphylls below. **Leaves** distant on stem, sessile; blade divided into 3 lobes, lobes narrowly linear, entire

or sparsely dentate, 30–60 mm long, middle lobes often longer. **Flowers**: in distinct racemes, many-flowered; bracts entire, linear, sometimes bidentate at base, 3–5 mm long; pedicels 2–5 mm long, glabrous, with 2 bracteoles; calyx tube shortly turbinate, lobes tooth-shaped, ± 1 mm long; corolla 5–10 mm long, glabrous, pink or lilac, obscurely spotted at base of lower petals; Jan.–May. **Fruit** a subglobose capsule. Grassland. *Baroe* (A).

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## **Lobelia** L. (sthn Afr.: 71 spp.)

### Key to species:

1a Leaves all sessile or subsessile on stems . . . . . 2
1b Leaves all petiolate or at base of stem petiolate, upper stem leaves sessile . . . . . 4
2a Corolla white, rarely mauve . . . . . **L. angolensis**
2b Corolla blue, throat yellow or violet . . . . . 3
3a Leaf blade elliptic to oblong . . . . . **L. thermalis**
3b Leaf blade basally obovate to spathulate . . . . . **L. dregeana**
4a Leaves all petiolate . . . . . 5
4b Leaves at base of stem petiolate, upper stem leaves sessile . . . . . 6
5a Corolla blue and violet or pale violet-white; leaf blade decurrent, prominently so in upper part of petiole, ovate, base cordate with basal lobes often overlapping . . . . . **L. preslii**
5b Corolla white; leaf blade decurrent. not prominently so in upper part of petiole, ovate, base cordate to subcordate with basal lobes not overlapping . . . . . **L. vanreenensis**
6a Flowering stems decumbent with upper leaves prominently diminishing in size . . . . . **L. laxa**
6b Flowering stems with upper leaves present . . . . . 7
7a Stems ribbed not winged . . . . . **L. erinus**
7b Stems narrowly winged . . . . . 8
8a Calyx lobes dentate . . . . . **L. flaccida** subsp. **flaccida**
8b Calyx lobes entire . . . . . **L. flaccida** subsp. **mossiana**

### **angolensis** Engl. & Diels

Annual or short-lived perennial herb; rhizomatous, mat-forming, glabrous. **Flowering stems** up to 0.1 m high, procumbent, many, leafy. **Leaves** subsessile; blade ovate to obovate-elliptic, 4–5 × 2–3 mm, apex obtuse or subacute, base narrowing into a very short petiole, margins entire, rarely minutely denticulate. **Flowers**: solitary in axils of leaves, forming a corymbose-like structure; pedicels 6–12 mm long, with 2 bracteoles ± in middle, pedicels longer than leaves; calyx lobes triangular; corolla 2.5–5.0 mm long, upper lobes free, 3 lower lobes fused into a trifid lip with a crescent-shaped gland at base; white, rarely mauve; Oct.–Feb. Grassland, vleis, river- or streambanks.

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### **dregeana** (C.Presl) A.DC.

*L. omphalodoides* Schltr.
*Rapuntium dregeanum* C.Presl

Annual herb, up to 150 mm high; glabrous. **Flowering stems** erect or ascending, leafy. **Leaves** with short petioles to sessile; blade basally obovate to spathulate, 5–20 × 3–8 mm,

apex obtuse or acute, base cuneate, margins mostly dentate towards apex, upper leaf blades narrowly ovate. **Flowers**: solitary in leaf axils, arranged in a terminal raceme; bracts leaf-like, narrowly ovate; pedicels 7–12 mm long; calyx tube as long as lobes, lobes ovate, acute, entire; corolla 8 mm long, upper lobes narrowly ovate, lower lobes oblong; blue, base with yellowish spots; Oct.–Dec. Grassland, vleis.

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**erinus** L.

*L. filiformis* Lam. var. *natalensis* (A.DC.) E.Wimm.
*L. lavendulacea* Klotzsch
*L. nuda* Hemsl.
*L. rosulata* S.Moore

Annual or perennial herb, up to 0.85 m high. **Flowering stems** erect, ribbed; sparsely leafy, hairy at base. **Leaves** petiolate; basal leaves with blade spathulate to narrowly obovate, 12–13 × 4–8 mm, apex rounded to obtuse, base subrotund or gradually narrowing into a petiole, margins subentire, inconspicuously dentate, petioles 5–50 mm long; upper leaves narrowly ovate or linear, sessile. **Flowers**: in terminal, lax racemes, on long peduncles, 4–6-flowered; bracts linear, up to 5 mm long, adnate to pedicel, 7–15 mm long; calyx tube shorter than lobes, lobes linear, 2.5–3.0 mm long, acuminate; corolla ± 11 mm long, glabrous, upper 2 lobes narrowly obovate, erect, lower 3 lobes obovate-oblong, 5 × 2 mm, base with 2 gibbosities; blue, white-eyed, indistinctly blue-spotted, or blue with white and yellow in throat; Jul.–Apr. Grassland, woodland, streambanks, riverbeds, moist areas. *Edging lobelia*; *mahlo-a-konyana*, *napjane-ea-phiri*, *tsoinyane* (SS); *impenjana*, *incamathela*, *isidala esiluhlaza* (Z).

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**flaccida** (C.Presl) A.DC. subsp. **flaccida**

*L. filiformis* Lam. var. *krebsiana* (A.DC.) E.Wimm.
*L. krebsiana* A.DC.

Annual or perennial herb, up to 1 m high; weak stemmed, diffused. **Flowering stems** decumbent or ascending, narrowly winged; glabrous or sparsely hirsute in lower parts, distantly leafy. **Leaves** subsessile or with short petiole; blade linear to narrowly ovate (cauline), 20–30 × 2–6 mm, basal ones elliptic to ovate, acute on both sides, margins remotely dentate, glabrous or lower surface sometimes slightly hirsute. **Flowers**: in lax racemes; pedicels 10–30 mm long, glabrous, spreading, base with 2 minute bracts; bracts foliaceous, half as long as pedicels; calyx tube oblong-obconical, lobes sublinear, acute, on both sides with 1(2) strong, hardened teeth; corolla up to 15 mm long; upper lobes narrowly ovate, lower lobes elliptic or subobovate, glabrous; deep blue, white-spotted with 2 pleats towards throat; Sep.–May. Marshy grassland, edges of pans, margins of streams. *Wild lobelia*; *motlapa-tsoinjane* (SS); *itshilizi*, *ubulawu* (X); *isidala esiluhlaza* (Z).

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**flaccida** (C.Presl) A.DC. subsp. **mossiana** (R.D.Good) Thulin

Annual or perennial herb. **Flowering stems** decumbent or ascending, narrowly winged. **Leaves** with blade linear to narrowly ovate (cauline), basal ones elliptic to ovate, upper stem leaves sessile. **Flowers**: calyx lobes entire; corolla blue; Sep.–May. Marshy grassland, edges of pans, margins of streams. *Wild lobelia*; *motlapa-tsoinjane* (SS); *itshilizi*, *ubulawu* (X); *isidala esiluhlaza* (Z).

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**laxa** MacOwan

Perennial herb, up to 0.4 m high; ± glabrous. **Flowering stems** decumbent, leafless or slightly leafy. **Leaves** mainly in a basal rosette, petiolate; blade spathulate or obovate-oblong, 20–50 × 10–20 mm, apex rounded or obtuse, stem leaves narrowly ovate, narrowly obovate or linear, 30–60 × 2–8 mm, margins faintly crenate or dentate or very obtusely dentate, upper stem leaves diminishing in size, sessile. **Flowers**: in a lax, 5–11-flowered raceme; bracts linear, 2–3 mm long; pedicels 6–18 mm long, at length elongating to 35 mm, upright; calyx tube oblong-obconic, lobes subulate, entire, somewhat spreading, 3 mm long; corolla 11–13 mm long, upper lobes sublinear, lower ones obovate-oblong; blue; Sep.–Mar. Mountain grassland.

MsGr

**preslii** A.DC.

Perennial herb, up to 0.6 m high; diffuse. **Flowering stems** procumbent-ascending; branches with horizontally spreading hairs or becoming glabrous. **Leaves** petiolate; blade decurrent, prominently so in upper part of petiole, ovate, up to 35 × 30 mm, apex obtuse, base cordate, basal lobes often overlapping, margins shallowly lobed, both surfaces sparsely hairy; petioles 20–50 mm long, hairy or patent-pubescent, prominently winged in upper part. **Flowers**: in terminal, few-flowered racemes; on long peduncles, ± 200 mm, rarely leafy at base, leafless further on, hairy or ± glabrous; pedicels 3–10 mm long; calyx with tube turbinate, finely adpressed hairy, lobes subulate, 2 mm long; corolla 16 mm long, inner surface pubescent, lobes hairy outside, 2 upper lobes narrowly ovate, erect-reclinate, short, lower lip tripartite with oblong-obovate lobes; blue and violet or pale violet-white; Nov.–Mar. Damp, partially shady places, rocky gullies, on cliffs.

MsGr

**thermalis** Thunb.

*L. leptocarpa* Griess.

*L. mundtiana* Cham.

Perennial herb. **Flowering stems** procumbent, rooting at nodes, simple or branched, hispid, sparsely hairy or ± glabrous; branches often densely leafy. **Leaves** sessile or subsessile; blade elliptic to oblong, 5–12 × 3–6 mm, apex acute or obtuse, base cuneate, margins sharply serrate, lower surface hairy or glabrous, somewhat succulent. **Flowers**: solitary, axillary; pedicels 2–3 mm long with 2 bracteoles; calyx with tube narrowly obconical, hairy, ± 4 mm long, lobes narrowly triangular, 4 mm long, slightly hairy to ± glabrous on main vein; corolla 16–18 mm long, outer surface hairy, upper 2 lobes triangular-oblong, hairy on back, erect, lower lip 3-lobed, ± 9 mm long, lobes obovate, finely mucronate; blue, throat yellow or violet; Nov.–Mar. Grassland, vleis, edges of pans.

AcGr DrGr MsGr KarSh Zastr

**vanreenensis** (Kuntze) K.Schum.

Perennial herb, up to 0.6 m high; multi-stemmed. **Flowering stems** erect or scrambling, slender, branched, usually distantly leafy, glabrous. **Leaves** petiolate; blade ovate, 50 × 45 mm long, apex acute to obtuse, often drawn out in a terminal lobe, base cordate to subcordate, margins unequally lobed, lobes triangular, obtuse or subacute, with small mucro, glabrous or sparsely fine-hairy on veins of lower surface. **Flowers** in lax, terminal, few-flowered racemes; bracts linear, small; pedicels 5 mm long, adpressed hairy, with 2 bracteoles at base; calyx tube turbinate, adpressed hairy, lobes subulate, 1.5 mm long; corolla 8–10 mm long, glabrous, tube slender, becoming pale, upper lobe narrowly ovate, recurved, 2 mm long, lower lip tripartite with 2 spots at base, lobes obovate; white; Dec.–May. Grassland, damp and shady rock crevices.

MsGr

### **Monopsis** Salisb. (sthn Afr.: 15 spp.)

**decipiens** (Sond.) Thulin
*Lobelia decipiens* Sond.

Annual or perennial herb, up to 0.2 m high. **Stems** erect or ascending, wiry, branched. **Leaves** alternate, fairly many and densely set; blade linear, 8–15(–25) × 0.8–1.5(–2.5) mm. **Flowers**: solitary; stigma divided into 2, lobes filiform, elongate, hairy at base; corolla > 10 mm long, tube cleft down one side to base, upper lip violet, lower lip blue, yellow in throat; Oct.–Mar. Grassland, bogs, vleis. *Butterfly lobelia*; *skoenlapperplant* (A); *isidala somkhuhlane* (Z).

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## LOPHIOCARPACEAE

Herbs, sometimes suffrutescent at base. **Leaves** alternate or fascicled; petiolate; simple; blade linear with margins entire; without stipules. **Flowers**: in slender spikes, in clusters of (2)3; small, regular, sepals 4 or 5, free; petals absent; stamens 4, filaments free; ovary superior, ovule solitary on short, basal funicle; styles 4, connate below. **Fruit** a subglobose achene, enclosed in persistent perianth, muricate, warty, or ridged.

### **Lophiocarpus** Turcz. (sthn Afr.: 3 spp.)

**polystachyus** Turcz.

Dwarf shrub, up to 0.5 m high. **Leaves** fascicled; blade filiform, 5–30 × 0.4–2.0 mm, apex mucronate, glabrous. **Flowers**: clustered in threes; inflorescence terminal, ± 250 mm long; perianth greenish yellow; Sep.–May. **Fruit** an achene, subglobose, 1.0–1.5 mm in diameter, enclosed in persistent perianth, ridged, sometimes muricate or warty between ridges. Savanna, along dry riverbeds, sandy soil. *Sandaarbossie* (A).

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## LORANTHACEAE

Aerial hemiparasitic shrubs on other dicotyledons; branches brittle, often with swollen nodes. Leaves opposite, alternate or whorled; simple; evergreen; blade with margins entire; without stipules. Flowers: in few-flowered umbels or heads, or 1–several in fascicles; regular or irregular, usually large and brightly coloured; calyx reduced to a low rim; corolla tubular, often split down one side, glabrous or variously hairy, hairs simple, dendritic or stellate; petals 5 (rarely 4), united; stamens 5 (rarely 4) attached to petals; ovary inferior. Fruit a berry, usually 1-seeded, with an inner sticky layer. *Mistletoe family*.

## **Tapinanthus** (Blume) Rchb. (sthn Afr.: 20 spp.)

### Key to species:

[after Wiens & Toelken: 3 (1979)]

1a Corolla glabrous, tube dark red to purplish at base and apex, often variegated with whitish spots . . . . . **T. rubromarginatus**
1b Corolla lightly puberulent to densely pubescent . . . . . 2
2a Corolla tube pale pink with whitish, irregular spots . . . . . **T. oleifolius**
2b Corolla tube reddish purple, villous-pilose . . . . . **T. quequensis**

**oleifolius** (J.C.Wendl.) Danser
*Loranthus namaquensis* Harv.
*L. oleifolius* (J.C.Wendl.) Cham. & Schltdl.

Shrub, up to 1 m high, hemiparasitic. **Leaves** at maturity shortly petiolate; blade ovate-elliptic, 30–45 × 10–20 mm; petioles up to 3 mm long. **Flowers**: in 3- or 4-flowered umbels solitary in leaf axils; corolla 35–40 mm long, puberulent, dull pink with whitish spots, light green at apex and base; Aug.–Dec. **Fruit** ellipsoid, 10–12 mm long, reddish orange. Woodland. *Mistletoe*, *bird-lime*; *voëlent* (A).

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**quequensis** (Weim.) Polhill & Wiens
*Loranthus oleifolius* (J.C.Wendl.) Cham. & Schltdl. var. *leendertziae* Sprague
*T. leendertziae* (Sprague) Wiens

Shrub, up to 1.5 m high, hemiparasitic. **Leaves** at maturity shortly petiolate; blade narrowly ovate-oblong, 30–40 × 10–20 mm; petioles 2–4 mm long. **Flowers**: in 4–6-flowered umbels solitary in leaf axils; corolla 35–40 mm long, villous-pilose, swollen base green, tube reddish purple, apex green; Aug.–Jan. **Fruit** ellipsoid, 10–12 mm long, red, slightly warty. Woodland.

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**rubromarginatus** (Engl.) Danser
*Loranthus rubromarginatus* Engl.

Shrub up to 1 m or more, hemiparasitic on *Acacia*, *Dombeya*, *Faurea* etc. **Leaves** in crowded fascicles; petiolate; blade elliptic to elliptic-oblong, 30–40 × 10–15 mm; petioles 3–5 mm long. **Flowers**: in 2–4-flowered umbels densely clustered on swollen nodes of older stems; corolla 40–50 mm long, glabrous, tube dark red to purplish at base and apex, often variegated with whitish spots; Sep.–Nov. **Fruit** globose, ± 10 mm long, red. Woodland.

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## Reference

WIENS, D. & TOELKEN, H. 1979. Loranthaceae. *Flora of southern Africa* 10,1: 1–41.

# LYTHRACEAE

Annual or perennial herbs, shrubs or trees, often in marshy or aquatic habitats. **Leaves** simple, opposite, alternate or spirally arranged; blade with margins entire; with or without stipules. **Flowers**: solitary, in cymes or panicles; bisexual, regular; calyx with sepals united into a tube, often with appendages between lobes; petals absent or 4–8 arising from calyx tube, usually crumpled in bud, wrinkled when expanded, sessile or clawed; stamens twice the number of petals or many, arising at different levels below them, bent inward in bud; ovary superior or inferior, 7–9-locular, ovules many per locule; style 1, stigma 1. **Fruit** a capsule included in persistent calyx tube or berry-like, indehiscent, leathery, crowned by calyx with seeds embedded in pulp (*pomegranate*). *Pride-of-India family*.

## Key to genera

[partly after Cook: 173 (2004)]

1a Fruit indehiscent, berry-like; stamens many . . . . . **Punica**
1b Fruit dehiscent, a capsule; stamens twice the number of petals . . . . . 2
2a Flowers solitary in leaf axils; capsules opening by valves . . . . . **Rotala**
2b Flowers in axillary cymes; capsules opening with an operculum or split. . . 3
3a Fruit opening transversely by irregular split; flowers in dense or lax cymes, never aggregated into heads . . . . . **Ammannia**
3b Fruit opening by small operculum and then splitting irregularly; some species with flowers aggregated into heads . . . . . **Nesaea**

## **Ammannia** L. (sthn Afr.: 4 spp.)

### ***baccifera** L.

*A. aegyptiaca* Willd.
*A. wormskioldii* Fisch. & C.A.Mey.

Annual herb, 3–45 mm high. **Leaves** with blade linear to elliptic, 10–40 mm long, bases cuneate or cuneate at base of plant and auriculate at top of plant, rarely all auriculate; pedicels 0.5(–2.0) mm long. **Flowers**: sessile in compact cymes, petals 0 or very small, white (if present); Oct.–Apr. **Fruit** bright red to purple, spherical, 1.0–1.5 mm in diameter. Growing in moist soil near water bodies or in water. Native to tropical Asia, America and Africa.

DrGr

## **Nesaea** Comm. ex A.Juss. (sthn Afr.: 28 spp.)

### Key to species:

Leaf blade with bases of larger leaves cuneate or cordate; stamens included or shortly exserted. . . . . **N. anagalloides**
Leaf blade with bases of larger leaves sagittate; stamens well exserted . . . . . **N. sagittifolia** var. **sagittifolia**

### **anagalloides** (Sond.) Koehne

*Ammannia anagalloides* Sond.

Erect, probably annual herb, up to 15(–25) mm high. **Leaves** with bases of larger leaves cuneate or cordate. **Flowers**: subsessile or shortly pedunculate, 1–few in leaf axils; bracts < $^1/_2$

as long as calyx; calyx 4-lobed, with long acute spreading appendages; petals 0; stamens 4, included or shortly exserted; Mar., Apr. Rock pools, moist areas and pans in grassland and on margins of streams.

DrGr | KarSh

**sagittifolia** (Sond.) Koehne var. **sagittifolia**

*N. sagittifolia* (Sond.) Koehne var. *glabrescens* Koehne

Small, erect, woody perennial shrub, up to 500 mm high. **Stems** terete. **Leaves** with bases of larger leaves sagittate. **Flowers**: subsessile; calyx 3–4 mm long, 4-lobed; stamens 8, at least some > 5 mm long, exserted; style > 3.5 mm long; petals mauve to lilac; Sep.–Apr. Damp open grassland.

DrGr? | MsGr

## **Punica** L. (sthn Afr.: 1 sp.)

***granatum** L.

*P. malus* L.

Shrub, up to 2–6 m high; deciduous. **Stems** sometimes spiny. **Leaves** opposite or subopposite; blade narrowly oblong-ovate to obovate, 30–70 × 20 mm, margins entire, glabrous. **Flowers**: 30–40 mm in diameter; many stamens inserted on corolla tube; petals 4- or 5-merous, red; Aug.–Jan. **Fruit** a ± globose berry, 50–80 mm in diameter, reddish brown, leathery when ripe; each seed surrounded by an edible aril, white to deep red or purple in colour, seeds embedded in a white, spongy, acid or sweet pulp. Disturbed places, roadsides. Native to Iran. *Pomegranate*; *granaat* (A).

DrGr

## **Rotala** L. (sthn Afr.: 7 spp.)

**capensis** (Harv.) A.Fern. & Diniz

Amphibious, tufted or turf-forming, annual herb. **Leaves** decussate or rarely in whorls of 3, sessile; blade linear to narrowly ovate, up to 8 mm long. **Flowers**: minute, subsessile, solitary in axils of bracts; sepal with tube cup-shaped; petals 0; stamens 2; Apr.–Jun. **Fruit** bright red, ellipsoidal, ± twice as long as calyx tube. Pans and rock pools, in standing water; often submerged.

DrGr | MsGr

## Reference

COOK, C.D.K. 2004. *Aquatic and wetland plants of southern Africa*. Backhuys, The Netherlands.

# MALPIGHIACEAE

Scramblers, climbers or shrubs, often covered with T-shaped hairs. **Leaves** simple, opposite, alternate or whorled, petiolate; blade with margins entire, glands often present on petioles or base of blade; stipules present or absent. **Flowers**: in axillary umbels, corymbs or terminal racemes; bisexual, slightly irregular; sepals 5, free, often with 2 glands on outer surface; petals 5, free, stalked, with fringed margins; stamens 10, free or fused at base; ovary superior with 3 separate styles. **Fruit** winged samaras. *Barbados cherry family*.

## **Sphedamnocarpus** Planch. ex Benth. & Hook.f. (sthn Afr.: 1 sp.)

**pruriens** (A.Juss.) Szyszyl. subsp. **galphimiifolius** (A.Juss.) P.D.de Villiers & D.J.Botha

*Acridocarpus galphimiifolius* A.Juss.

Tall climbing shrub with twining stems. **Leaves** opposite whorled, glabrous or nearly so, never sericeous; blade elliptic to ovate, 75 × 50 mm, apex mucronulate, hairs restricted to margins, mid- and lateral veins; petioles with 2 stalked glands. **Flowers**: in few-flowered, axillary umbels; corolla up to 25 mm wide; petals yellow to orange; Jan.–Apr. **Fruit** with winged mericarps (samaras), pubescent, hairs rusty brown. Woodland.

VreDm DrGr

# MALVACEAE

Herbs, dwarf shrubs, shrubs, trees or climbers; mainly stellately hairy. **Leaves** alternate; petiolate, simple or palmately compound; blade pinnately or palmately veined, margins entire, variously lobed and toothed; with stipules. **Flowers**: regular, bisexual; inflorescence axillary or terminal, a thyrse, leaf-opposed cyme or solitary; epicalyx present or absent; calyx deeply divided into 5 sepals or tubular, often accrescent; petals 5, free, flat, often narrowed into a claw at base, slightly to very strongly spirally twisted in bud, sometimes with a glandular appendage at base; androgynophore present or absent; stamens 5 or many, opposite petals, free or united into a tube, staminodes absent or present; ovary superior, 2–5-locular, style simple or branched at apex. **Fruit** indehiscent or dehiscent, dry, fleshy or fibrous, a capsule or schizocarp. **Seeds** reniform, subglobose or obovoid.

## Key to subfamilies

1a Stamen filaments free or connate at base . . . . . 2
1a Stamen filaments fused into a tube or funnel-shaped structure surrounding the style . . . . . 3
2a Styles 5; stamens 5, not raised on an androgynophore, opposite petals; staminodes absent. . . . . **Byttnerioideae** (*Hermannia*) (p. 632)
2b Stamens > 5 or 5 with 1 style; androgynophore absent or present; staminodes absent or present . . . . . **Grewioideae** (p. 641)

3a Staminodes absent; sepals fused > 1/3 . . . . . **Malvoideae** (p. 643)
3b Staminodes conspicuous; sepals fused < 1/3 . . . . . **Dombeyoideae** (p. 639)

# Subfamily Byttnerioideae

Herbs, dwarf shrubs, small trees or climbers; mainly stellately hairy. **Leaves** alternate, simple or palmately compound; blade pinnately or palmately veined, margins serrate; with stipules. **Flowers**: inflorescences axillary or terminal, a bracteate thyrse or sometimes solitary; regular, bisexual; sepals 5; petals 5, free, flat, often narrowed into a claw at base, slightly to very strongly spirally twisted; stamens 5, staminodes 5, united or staminodes absent (*Hermannia*); ovary superior. **Fruit** a loculicidally dehiscent capsule or mericarps present. *Chocolate subfamily*.

## **Hermannia** L. (sthn Afr.: 149 spp.)

Key to species:

1a Calyx globose, inflated in fruit . . . . . 2
1b Calyx campanulate, urceolate or deeply lobed, not strongly inflated . . . . . 3
2a Bracts with margins palmatifid, segments linear . . . . . **H. grandistipula**
2b Bracts with margins entire . . . . . **H. comosa**
3a Capsule crested, fringed on angles with filiform processes . . . . . **H. cristata**
3b Capsule not as above . . . . . 4
4a Leaves fascicled . . . . . 5
4b Leaves not fascicled . . . . . 6
5a Leaves very narrowly obovate, plicate, appearing linear. . . . . **H. linearifolia**
5b Leaves filiform to subulate . . . . . **H. filifolia** var. **filifolia**
6a Leaf blade with margins lobed . . . . . 7
6b Leaf blade with margins entire, dentate or crenate . . . . . 12
7a Margins shallowly lobed . . . . . 8
7b Margins deeply lobed . . . . . 9
8a Leaf blade with margins in basal part of blade entire . . . . . **H. coccocarpa**
8b Leaf blade with margins in basal part of blade lobed . . . . . **H. erodioides**
9a Petals bicoloured . . . . . 10
9b Petals mono-coloured . . . . . 11
10a Petals white with red lines . . . . . **H. jacobeifolia**
10b Petals white with purple, pink or red margins . . . . . **H. bicolor**
11a Leaves silvery . . . . . **H. pulverata**
11b Leaves green . . . . . **H. pulchella**
12a Leaf blade densely stellate-pubescent on both surfaces . . . . . 13
12b Leaf blade glabrescent on both surfaces or upper surface glabrescent lower surface densely hairy . . . . . 19
13a Leaf blade linear or much longer than broad . . . . . 14
13b Leaf blade ovate . . . . . 16
14a Plants ± 0.4 m high; leaves yellowish green or yellowish brown . . . . . **H. staurostemon**
14b Plants < 0.2 m high; leaves greyish green . . . . . 15
15a Petals dark pink . . . . . **H. oblongifolia**
15a Petals yellow to orange-yellow . . . . . **H. lancifolia**
16a Petals orange to lemon-coloured or pink, mauve, off-white with pink base . . . . . 17
16b Petals pale yellow or wine-red . . . . . 18

17a Petals as long as calyx . . . . . **H. vestita**
17b Petals much shorter than calyx. . . . . **H. tomentosa**
18a Petals pale yellow; stems procumbent to suberect, sprawling. . . . **H. burkei**
18b Petals yellow; stems erect . . . . . **H. bryoniifolia**
19a Leaf blade upper surface with spaces between hairs, lower surface densely pubescent. . . . . 20
19b Leaf blade upper and lower surfaces glabrescent. . . . . 22
20a Petals wine-red. . . . . **H. burchellii**
20b Petals yellow or white. . . . . 21
21a Stems erect; petals white or yellow. . . . . **H. geniculata**
21b Stems procumbent or with upward rising branches; petals yellow . . . . . **H. cordata**
22a Leaf blade obovate, base cuneate . . . . . **H. cuneifolia** var. **glabrescens**
22b Leaf blade not as above. . . . . 23
23a Flowers solitary in axils of leaves . . . . . **H. modesta**
23b Flowers in 2- or several-flowered cymes . . . . . 24
24a Petals all yellow . . . . . 25
24b Petals shades of pink, orange, red, blue, purple or yellow turning red. . . . . 26
25a Leaves sessile or subsessile, blade ovate to ovate-oblong, not folding. . . . . **H. transvaalensis**
25b Leaves petiolate, blade ovate to elliptic, tending to fold . . . . **H. oligosperma**
26a Dwarf shrubs . . . . . 27
26b Perennial herbs . . . . . 28
27a Petals yellow turning red . . . . . **H. althaeoides**
27b Petals reddish purple. . . . . **H. parviflora**
28a Leaf blade broadly ovate to suborbicular; leaves closely set . . . **H. linnaeoides**
28b Leaf blade and leaves not as above . . . . . 29
29a Leaf blade narrowly ovate to narrowly oblong-ovate. . . . . **H. quartiniana**
29b Leaf blade not narrowly ovate to narrowly oblong-ovate. . . . . 30
30a Leaf blade narrowly oblong, margins finely serrate. . . . . **H. stellulata**
30b Leaf blade ovate, oblong to broadly ovate, margins crenate-serrate . . . . . 31
31a Leaf blade ovate, usually tinged reddish brown to purplish; leaves flat on ground . . . . . **H. depressa**
31b Leaf blade oblong to broadly ovate, green; leaves not flat on ground . . . . . **H. woodii**

## **althaeoides** Link

Dwarf shrub, up to 0.6 m high. **Stems** erect or suberect; densely tomentose to glabrescent. **Leaves** petiolate; blade variable, ovate-oblong to narrowly oblong, margins crenate, upper and lower surfaces with glabrescent hairs. **Flowers**: in 2-flowered cymes in axils of upper leaves, forming terminal, leafless, paniculate cymes; calyx campanulate; petals yellow turning red at maturity; Sep.–Mar. Rocky slopes, hillside scrub, along watercourses.




## **bicolor** Engl. & Dinter

Perennial herb, up to 0.3 m high; young parts with conspicuous sessile glands, older parts glabrous. **Stems** procumbent, decumbent or erect. **Leaves** shortly petiolate; blade narrowly elliptic, margins shallowly to deeply, irregularly lobed. **Flowers**: in 2-flowered cymes; calyx campanulate, deeply lobed; petals white with purple, pink or red margins; Aug.–Mar. Grassland, under bushes, roadsides, red sand.



**bryoniifolia** Burch.

Perennial herb, up to 0.15 m high. **Stems** erect. **Leaves** petiolate; blade ovate-oblong, margins lobed and crenate, fairly coarsely stellate-pubescent. **Flowers**: in 1- or 2-flowered cymes in axils of crowded upper leaves; calyx lobed; petals yellow; Nov.–Feb. Loamy soil on hills, among rocks, rocky ledges.

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**burchellii** (Sweet) I.Verd.

Shrub or dwarf shrub, up to 1.15 m high. **Stems** erect, divaricately branched. **Leaves** petiolate; blade narrowly obovate, margins dentate, upper surface with spaces between hairs, lower surface densely pubescent. **Flowers**: in 2-flowered cymes; calyx lobed; petals red to wine-red; Sep.–Dec. Roadsides, sandy soil.

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**burkei** Burtt Davy

Perennial herb, up to 700 mm high; yellowish green. **Stems** procumbent to suberect, sprawling. **Leaves** petiolate; blade ovate-oblong, margins serrate in upper half. **Flowers**: in clusters of 2-flowered cymes concentrated towards ends of branches, leaves diminishing in size thus forming pseudo-panicles; calyx deeply lobed; petals pale yellow to orange; Feb.–Aug. Bush clumps, rocky, stony or disturbed places.

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**coccocarpa** (Eckl. & Zeyh.) Kuntze (30)
*Mahernia coccocarpa* Eckl. & Zeyh.

Perennial herb, up to 0.15 m high, very variable; stalked glands present. **Stems** creeping to suberect. **Leaves** sessile; blade narrowly ovate, > 4 × as long as broad, often reddish brown to purplish along margins, margins shallowly lobed. **Flowers**: in 2-flowered cymes on long peduncles; calyx > $^1/_2$ as long as petals, segments broadly subulate, acute; petals pink, mauve, purplish to blue; Sep.–Mar. Grassland, disturbed places, edges of vleis. *Moederkappie* (A).

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**comosa** Burch. ex DC.
*H. ausana* Dinter
*H. leucophylla* C.Presl

Perennial herb, up to 0.2 m high. **Leaves** with long petioles; blade oblong to oblong-obovate, pubescent with fine stellate hairs on both surfaces, but more often densely tomentose on lower surface. **Flowers**: usually in 2-flowered cymes, 2 or 3 developing at apices of branches and in axils of upper leaves; bracts with margins entire; calyx inflated, narrowed at mouth; petals 10 mm long, lemon-yellow; Oct.–Jan. Grassland, disturbed areas.

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**cordata** (E.Mey. ex E.Phillips) De Winter

Perennial herb, ± 0.1 m high. **Stems** procumbent or with upward rising branches. **Leaves** petiolate; blade ovate to suborbicular, base cordate, margins finely toothed, upper surface dark

green, rough with sparse, coarse, stellate hairs and very deeply sunken veins, lower surface whitish tomentose. **Flowers**: in clusters of 2-flowered cymes, concentrated towards ends of branches with leaves usually almost reduced to bract size, thus forming cymose panicles; calyx urceolate; petals yellow; Oct.–Apr. Grassland.

DrGr | MsGr

### **cristata** Bolus

Dwarf shrub, up to 0.3 m high. **Stems** erect. **Leaves** subsessile; blade narrowly elliptic-oblong to narrowly ovate, margins deeply toothed. **Flowers**: solitary on long peduncles; calyx lobed to midway or just beyond, 8–14 mm long; petals crimson, red or orange-red; Aug.–Jan. **Fruit** a capsule, fringed on angles with crowded tentacle-like processes up to 7 mm long. Grassland, on rocky slopes, in gorges, along rivers.

DrGr

### **cuneifolia** Jacq. var. **glabrescens** (Harv.) I.Verd.

Dwarf shrub, up to 0.6 m high; glabrescent. **Stems** erect or spreading. **Leaves** shortly petiolate; blade obovate, base strongly cuneate, margins coarsely crenate in upper half, dull, greyish green to silvery grey, upper and lower surfaces with glabrescent hairs. **Flowers**: in 3–5-flowered cymes, congested at apices of many short, lateral branchlets; calyx narrowly campanulate; petals bright yellow to dark orange-red. Stony soil.

DrGr | KarSh | Zastr

### **depressa** N.E.Br.

*Mahernia erodioides* Burch. ex DC. var. *latifolia* Harv.

Perennial herb, 0.03–0.40 m high. **Stems** procumbent. **Leaves** flat on ground; blade ± ovate, < 4 × as long as broad, green, usually tinged reddish brown to purplish, margins crenate-serrate, upper and lower surfaces with glabrescent hairs. **Flowers**: in 2-flowered cymes with long flowering axes and pedicels; calyx campanulate, deeply lobed; petals salmon-pink to red or yellow, often with darker veins; Sep.–Mar. Grassland. *Rooi-opslag* (A).

VreDm | DrGr | MsGr | KarSh | Zastr

### **erodioides** (Burch. ex DC.) Kuntze

Annual, occasionally perennial, up to 0.5 m high; non-glandular. **Stems** decumbent. **Leaves** shortly petiolate; blade ovate-oblong, margins crenate or pinnatifid, lobes obtuse. **Flowers**: in 2-flowered cymes; calyx half as long as petals, lobes deltoid-acuminate; petals orange, pink, wine-red; Oct.–Apr. Grassland.

AcGr | DrGr | MsGr | KarSh

### **filifolia** L.f. var. **filifolia**

Dwarf shrub, up to 1 m high. **Stems** straggling, thin; branchlets rough with minute scales or tubercles. **Leaves** sessile, fascicled; blade filiform to subulate, margins entire, ericoid. **Flowers**: solitary in axils of upper leaf fascicles at apices of branchlets; calyx 5–6 mm long; petals dark red, strongly twisted; Sep.–Dec. *Broodblom*, *rooilootpleister* (A).

KarSh

**geniculata** Eckl. & Zeyh.
*Mahernia chrysantha* Turcz.

Perennial herb, up to 0.15 m high. **Stems** erect. **Leaves** petiolate; blade ovate to ovate-oblong, margins finely crenate, softly greyish tomentose beneath, veins obvious, rugose and glabrescent above. **Flowers**: in 2-flowered cymes; calyx campanulate, deeply lobed; petals longer than calyx, white or yellow; Jan.–Apr. Grassland.

DrGr MsGr

**grandistipula** (Buchinger ex Hochst.) K.Schum.
*Mahernia grandistipula* Buchinger ex Hochst.

Perennial herb, up to 0.3 m high; fairly dense to sparse stellately hairy. **Stems** erect. **Leaves** shortly petiolate; blade narrowly obovate to oblong. **Flowers**: in 2-flowered cymes borne towards ends of branches with supporting leaves diminishing in size near apices of branches; bracts with margins palmatifid, segments linear; calyx almost globose with short lobes; petals yellow; Oct.–Mar. Open, often disturbed, grassland. *Yellow granny bonnets*; *ishongwe* (Z).

VreDm

**jacobeifolia** (Turcz.) R.A.Dyer

Dwarf shrub, up to 0.5 m high. **Stems** procumbent, filiform. **Leaves** petiolate; blade narrowly ovate, margins pinnatifid or bipinnatifid, lobes linear, apices obtuse. **Flowers**: in 2-flowered cymes; calyx campanulate; petals white with red lines; Sep.–Mar. Grassland.

DrGr

**lancifolia** Szyszyl.
*Mahernia tomentosa* Harv. in part, not of Turcz.

Perennial herb, up to 0.2 m high; greyish green. **Stems** erect. **Leaves** petiolate; close to ground; blade narrowly oblong to obovate, margins toothed in upper half, lower leaf surface greyish with much denser stellate hairs than darker upper surface with sparser stellate hairs. **Flowers**: in 2-flowered cymes; calyx campanulate, deeply lobed; petals yellow to orange-yellow; Sep.–Mar. Mixed grassland, rocky or open, disturbed sites on poor soil.

KarSh

**linearifolia** Harv.

Shrub or dwarf shrub, up to 1 m high. **Leaves** fascicled; sessile or shortly petiolate; blade narrowly obovate, plicate, appearing linear. **Flowers**: 1-flowered cymes in pseudo-racemes at ends of slender, ultimate branchlets; calyx lobed to middle or just beyond, lobes deltoid-acuminate, ± 6 mm long; petals wine-red, red or yellow; Oct.–Feb. Grassland. *Rooipleisterbos* (A).

AcGr DrGr KarSh

**linnaeoides** (Burch.) K.Schum.
*Mahernia linnaeoides* Burch.

Perennial herb, ± 0.1 m high. **Stems** procumbent. **Leaves** shortly petiolate; close set; blade broadly ovate to suborbicular, green with red margins, margins 5–7-crenate-lobulate, upper

and lower surfaces with glabrescent hairs. **Flowers**: in 2-flowered cymes; calyx campanulate; petals pink to orange-red; Feb., Mar. Grassland, vleis, limestone.

DrGr

**modesta** (Ehrenb.) Mast.

*H. filipes* Harv.

*H. holubii* Burtt Davy

Bi- or triennial herb, up to 0.3 m high; gland-tipped hairs sometimes obvious. **Leaves** shortly petiolate; blade oblong, margins toothed, upper and lower surfaces with glabrescent hairs. **Flowers**: in 1-flowered cymes, solitary in axils of leaves, or in short, not very distinct pseudo-racemes; calyx lobed to ± or just below midway, ± 4.5 mm long; petals pink to red, orange or purple; Oct.–Jun. Dry, warm, sandy regions, mostly in open, sparse vegetation, often along roads, dry riverbeds, old lands.

AcGr KarSh

**oblongifolia** (Harv.) Hochr.

*H. natalensis* Szyszyl.

*Mahernia oblongifolia* Harv.

Perennial herb, ± 0.07 m high. **Stems** procumbent or decumbent. **Leaves** petiolate, greyish green; blade linear to narrowly ovate-oblong, margins serrulate in upper part, entire below, both surfaces densely stellate-pubescent, lower surface prominently reticulate. **Flowers**: in 2- or 3-flowered cymes; calyx deeply cut, segments broadly subulate, half as long as petals; petals dark pink; Sep., Oct. Grassland.

DrGr MsGr

**oligosperma** K.Schum.

Perennial herb, up to 1.2 m high; tufted. **Stems** erect. **Leaves** petiolate; blade ovate to elliptic, tending to fold, upper and lower surfaces with glabrescent hairs. **Flowers:** in 2- or 3-flowered cymes; cymes forming pseudo-panicles on short, lateral branches, interspersed with reduced but recognisable leaves; calyx deeply lobed; petals yellow, pale yellow; Jul.–Apr. Grassland, along streams, among dolerite boulders.

MsGr

**parviflora** Eckl. & Zeyh.

Dwarf shrub, up to 0.25 m high; minutely stellately pubescent. **Stems** procumbent, decumbent or erect. **Leaves** shortly petiolate; blade ovate or oblong, margins dentate, upper and lower surfaces with glabrescent hairs. **Flowers**: in 2-flowered cymes, peduncles equal to leaves; calyx campanulate, semi-5-fid, segments deltoid; petals reddish purple; Sep.–Jan. Grassland.

MsGr Zastr

**pulchella** L.f.

Dwarf shrub, up to 0.5 m high; glabrous, but resinous and clammy. **Stems** erect. **Leaves** petiolate; blade narrowly oblong, margins pinnatifid, lobes entire, green. **Flowers**: in 2-flowered

cymes, peduncles shorter than leaves; calyx semi-5-fid, segments deltoid, acute, half as long as petals; petals yellow turning brown; Aug.–Dec. Karroid veld.

DrGr KarSh

**pulverata** Andrews

Perennial herb, ± 0.3 m high. **Stems** erect or spreading-ascending; silvery canescent. **Leaves** petiolate; blade broadly to narrowly ovate-oblong, margins coarsely lobed to pinnatipartite, bipinnatipartite or palmitipartite, silvery. **Flowers**: in 1- or 2-flowered, terminal or axillary cymes, forming racemose cymes; calyx campanulate; petals tightly curled, dull yellow turning golden-brown; Oct.–Dec. Karroid scrub, vleis, rocky kloofs.

DrGr KarSh

**quartiniana** A.Rich.

Perennial herb, up to 0.2 m high; stems and leaves with crisped multicellular hairs, young growth also with stellate hairs. **Stems** procumbent, spreading. **Leaves** petiolate; blade narrowly ovate, to narrowly oblong-ovate, margins serrate or crenate, upper and lower surfaces with glabrescent hairs. **Flowers**: paired on axillary peduncles; calyx campanulate; petals yellow, pink or red; Oct.–May. Grassland, along vleis.

DrGr

**staurostemon** K.Schum.

Dwarf shrub, up to 0.4 m high; densely stellate-tomentose. **Stems** erect, much branched. **Leaves** petiolate, yellowish brown; blade narrowly oblong-elliptic to narrowly ovate, margins entire or serrate, tomentellous on both surfaces. **Flowers**: 1–5 in axillary pseudo-umbels; calyx campanulate; petals yellow; Mar.–Jun. Mountain slopes, along watercourses.

MsGr

**stellulata** (Harv.) K.Schum.

Perennial herb, up to 0.3 m high. **Stems** decumbent or procumbent. **Leaves** with blade narrowly oblong, margins finely serrate, upper and lower surfaces glabrescent, hairs stellate. **Flowers**: in 2-flowered cymes; calyx deeply 5-cleft, lobes broadly subulate, not much shorter than petals; petals red, pink, mauve, purplish to blue; Sep.–Apr. Open grassland, disturbed places, edges of vleis.

AcGr DrGr

**tomentosa** (Turcz.) Schinz ex Engl.

*H. brachypetala* Harv.

Perennial herb, up to 0.6 m high; albo-tomentose. **Stems** suberect, with at least outer branches long and trailing. **Leaves** shortly petiolate; blade oblong to narrowly oblong-elliptic finely and densely stellate-tomentose. **Flowers**: in 1-flowered cymes; calyx deeply lobed; petals much shorter than calyx, pink, mauve, off-white with pink base; Oct.–Mar. Grassland, mountainsides and hillsides.

VreDm AcGr DrGr KarSh

**transvaalensis** Schinz

Perennial herb, up to 0.22 m high; tawny with long, yellowish stellate hairs. **Stems** procumbent. **Leaves** subsessile; blade ovate to ovate-oblong, margins crenate, upper and lower surface glabrescent. **Flowers**: in 2-flowered cymes, sometimes concentrated towards ends of branches to form pseudo-panicles; calyx campanulate; petals yellow; Sep.–Mar. Grassland.

DrGr

**vestita** Thunb.

Perennial herb, up to 0.6 m high. **Stems** erect, branches and branchlets often zigzag; densely tomentose. **Leaves** petiolate; blade broadly ovate to suborbicular, base truncate to broadly cuneate, margins obscurely 3-lobed, crenate, strongly corrugated, both surfaces stellate-tomentose, lower surface with veins prominent. **Flowers**: in 1–3-flowered cymes in axils of upper leaves; calyx 5–6 mm long, urceolate to campanulate, lobed almost to middle; petals 5–6 mm long, oblong in upper third, then narrowed into a waist with infolded margins and produced below into a claw, stellate-pubescent in parts, especially in waist, orange to lemon-coloured; Sep.–Mar. Hillsides, riverbanks, open veld.

DrGr

**woodii** Schinz

Perennial herb, up to 0.15 m high, glabrescent. **Stems** procumbent or decumbent. **Leaves** petiolate; blade oblong to broadly ovate, lower surface prominently veined, upper and lower surfaces with glabrescent hairs. **Flowers**: pendulous in lateral, 2- or 3-flowered cymes; calyx campanulate, deeply lobed; petals 8–10 mm long, red, orange-red, reddish with fine dark veins; Sep.–Feb. Montane grassland, hill slopes, amongst rocks.

DrGr

# Subfamily Dombeyoideae

Shrubs, trees or herbs. **Leaves** alternate; simple, usually with stellate hairs, often palmately veined; with stipules. **Flowers**: in an axillary thyrse, rarely cymose; regular; epicalyx usually present; calyx deeply divided into 5 sepals; 5 petals free, twisted in bud; stamens 5 and opposite petals, or up to 15, free or united into short tube; staminodes sometimes present; ovary superior, 2–5-locular; style with 5 branches at apex. **Fruit** a capsule. *Dombeya family*.

## Key to genera

Small tree or shrub; petals becoming papery, persistent; fertile stamens 10–12 . . . . . **Dombeya**
Fibrous herbs or dwarf shrubs; petals becoming detached and twisted above ovary; fertile stamens 5. . . . . **Melhania**

## **Dombeya** Cav. (sthn Afr.: 8 spp.)

**rotundifolia** (Hochst.) Planch. var. **rotundifolia**

Tree or shrub, up to 10 m high. **Bark** rough and deeply fissured. **Leaves** with blade broadly ovate to suborbicular, 30–150 mm wide, base cordate, apex acute to rounded, margins

irregularly toothed, coarse, 5–7-veined from base, prominent reticulately veined on lower surface. **Flowers**: in many-flowered, branched heads; ovary tomentellous with stellately pubescent scales as well as setose with tufted bristle-like suberect hairs; petals 7–10 mm long; white, turning light cinnamon-brown when old; Aug.– Nov. **Fruit** a globose capsule, ± 6 mm wide, densely hairy. Savanna. *Wild-pear*; *drolpeer*, *bruid-van-die-bosveld* (A); *mokgofa* (T); *unhliziyonkulu*(Z).

VreDm

## **Melhania** Forssk. (sthn Afr.: 13 spp.)

### Key to species:

1a Leaves with blade ovate-oblong, oblong or obovate-oblong **M. rehmannii**
1b Leaves with blade narrowly ovate . . . . . 2
2a Leaves with blade discolorous . . . . . **M. prostrata**
2b Leaves with both surfaces of blade greyish tomentose, margins shallowly toothed . . . . . **M. burchellii**

### **burchellii** DC.

*M. albicans* Baker f.

Perennial herb, up to 0.9 m high. **Stems** erect; greyish green stellate-pubescent. **Leaves** with blade narrowly oblong, 30–100 × 4–20 mm, base and apex rounded, margins shallowly toothed, main vein ending in a sharp point, upper and lower surfaces greyish tomentose. **Flowers**: epicalyx bracts and calyx lobes narrowly ovate; corolla with petals ± 5 mm long, yellow; Sep.–Feb. Savanna.

AcGr

### **prostrata** DC.

*M. linearifolia* Sond.

Dwarf shrub, up to 0.6 m high, usually branching near base. **Stems** erect, decumbent or procumbent; stellate-pubescent, interspersed in parts with scattered reddish brown, bunched hairs. **Leaves** with blade discolorous, narrowly ovate or narrowly obovate-oblong, 24–120 × 4–20 mm, base rounded, apex mucronate, margins entire, upper surface sparsely pubescent, veins impressed above, lower surface greyish tomentose. **Flowers**: axillary, 1- or 2-flowered; epicalyx bracts and calyx sepals narrowly ovate; corolla with petals obovate, ± 12 mm long, yellow; Oct.–May. Grassland, bushveld, rocky slopes, sandy flats.

DrGr

### **rehmannii** Szyszyl.

*M. rupestris* Schinz

Much-branched subshrub, up to 300 mm high. **Stems** erect; greyish pubescent with stellate and simple hairs. **Leaves** with blade ovate-oblong, oblong or obovate-oblong, 10–40 × 8–23 mm, base rounded to broadly cuneate, apex truncate, margins coarsely crenate-dentate, both surfaces thickly greyish stellate-pubescent. **Flowers**: solitary on slender pedicles; corolla < 10 mm long; orange-yellow; Jul.–Jun. Savanna, sandy flats, rocky ridges.

VreDm

# Subfamily Grewioideae

Shrubs, small trees, occasionally herbs. **Bark** fibrous. **Indumentum** mainly of stellate hairs. **Leaves** alternate, petiolate; blade often serrate and triplinerved, sometimes palmately nerved; with stipules. **Flowers**: in leaf-opposed cymes; regular; sepals 5; petals 5, free, often with glandular appendage at base; androgynophore present or absent; stamens many, free, staminodes sometimes present; ovary superior, style simple. **Fruit** fleshy or fibrous, indehiscent or dehiscent. *Grewia family*.

## Key to genera

[after Wild: 1 (1984)]

1a Fruit indehiscent, without bristles, drupaceous, 1–4-lobed . . . . . **Grewia**
1b Fruit usually dehiscent, if indehiscent then densely bristly; a glabrous, hairy or bristly capsule or schizocarp . . . . . 2
2a Petals 4, white or yellowish white; some stamens sterile with no anthers, or if sterile, then stamens very few or apparently absent, filaments nodose. . . . . **Sparrmannia**
2b Petals 5, sometimes 4, but then capsule pod-like, yellow; all stamens fertile, filaments never nodose . . . . . 3
3a Fruit globose, bristly, spiny or with conical, spine-tipped tubercles. . . . . **Triumfetta**
3b Fruit usually long and pod-like, rarely ellipsoid or ovoid . . . . . **Corchorus**

## **Corchorus** L. (sthn Afr.: 15 spp.)

### Key to species:

Annual herb; fruit 3-angled with angles muricate or sharply toothed . . . . . **C. schimperi**
Perennial herb with procumbent or suberect, annual stems from a woody rootstock; fruit not 3-angled, sparsely setulose-scabrid . . . . . **C. asplenifolius**

### **asplenifolius** Burch.

*C. serrifolius* Burch.

Perennial herb. **Stems** procumbent or suberect. **Leaves** with blade linear to narrowly oblong-ovate, 15–80 × 2–15 mm, base rounded or broadly cuneate, margins coarsely crenate-dentate. **Flowers**: in single 1–3-flowered cymes; sepals 6–10 mm long; petals as long as sepals, yellow; Sep.–May. **Fruit** often on rather twisted or curved pedicels, capsule 20–30 mm long, sparsely setulose-scabrid. Open woodland or bushveld and margins of vleis. *Gusha*; *igusha*, *uBangalala* (Z).

AcGr DrGr KarSh

### **schimperi** Cufod.

Annual herb. **Stems** erect or procumbent, **Leaves** with blade narrowly ovate or oblong, 10–50 × 7–15 mm, base rounded or broadly cuneate, margins crenate. **Flowers**: in 1–3-flowered extra-axillary fascicles; sepals ± 3–5 mm long; petals as long as sepals, yellow; Nov.–May. **Fruit** up to 25 mm long usually curved, not held erect, 3-angled, angles muricate or sharply toothed. Vlei margins.

AcGr DrGr KarSh

## **Grewia** L. (sthn Afr.: 26 spp.)

### Key to species:

1a Petals yellow; fruit entire or 2-lobed . . . . . **G. flava**
1b Petals purple, mauve, lilac or pink; fruit deeply 4-lobed . . . . . 2
2a Leaf blade glabrescent, thin-textured, margins crenate or crenate-dentate . . . . . **G. occidentalis** var. **occidentalis**
2b Leaf blade harshly stellate-pubescent on both surfaces, margins coarsely serrate . . . . . **G. hispida**

### **flava** DC.

*G. cana* Sond.
*G. hermannioides* Harv.

Compact shrub, ± 2 m high. **Branchlets** greyish tomentose. **Leaves** with blade elliptic or narrowly obovate, 14–70 × 7.5–25 mm, base cuneate**,** symmetrical, margins finely serrulate, nerves raised and reticulate on densely tomentellous lower surface. **Flowers**: axillary; sepals ± 8 mm long; petals shorter than sepals, yellow; Aug.–May. **Fruit** globose or bilobed-globose. Dry deciduous woodland. *Wild raisin*, *brandybush*; *wilderosyntjie*, *rosyntjiebessie* (A).

AcGr DrGr KarSh

### **hispida** Harv.

Shrub, up to 1 m high. **Branchlets** coarsely pubescent with a purplish bark. **Leaves** with blade ovate to broadly obovate, 35 × 23 mm, base rounded, ± symmetrical, margins coarsely serrate, harshly stellate-pubescent on both surfaces, venation prominent on lower surface. **Flowers**: leaf-opposed; sepals up to 15 mm long; petals about as long as sepals, pink or lilac; Nov. **Fruit** deeply 4-lobed. Thornveld and mixed scrubland.

DrGr MsGr

### **occidentalis** L. var. **occidentalis**

Small tree or shrub, 3 m high. **Branchlets** slender, glabrescent. **Leaves** with blade thin-textured, 20–40 × 10–20 mm, base subcuneate, ± symmetrical, margins finely crenate-dentate. **Flowers**: purple, mauve, pinkish or rarely white; Sep.–Mar. **Fruit** 4-lobed. Forest edges and in forest clearings. *Cross-berry*, *four-corners*; *kruisbessie*, *rosyntjiebos* (A); *morretla* (SS). Figure 8D, p. 4.

DrGr MsGr KarSh Zastr

## **Sparrmannia** L.f. (sthn Afr.: 2 spp.)

### **ricinocarpa** (Eckl. & Zeyh.) Kuntze

*S. palmata* E.Mey. ex Harv.

Slender, much-branched shrub or scrambler, up to 7 m high. **Branches**, when young, patently hairy. **Leaves** with blade ovate to broadly ovate, up to 130 × 100 mm, 5–9-lobed, apices of lobes long-acuminate, acute or blunt, base cordate, margins irregularly crenate; petioles up to 150 mm long, patently hairy. **Flowers**: in ± 20-flowered extra-axillary pedunculate umbels towards the ends of branches, peduncles and pedicels patently hairy; sepals narrowly ovate,

10–15 mm long; petals 4, obovate, ± 25 × 15 mm, white or yellowish white; Nov.–Jul. Forest edges or in forest clearings. *Sparrmannia bush*; *senkuruti* (SS); *isibundane* (Z).

MsGr

## **Triumfetta** L. (sthn Afr.: 12 spp.)

### **sonderi** Ficalho & Hiern

*T. trichocarpa* Sond.

Erect subshrub, ± 0.5 m high. **Leaves** with blade elliptic, narrowly oblong, up to 40 × 20 mm, roughly stellately pubescent on both surfaces. **Flowers**: in axillary, 2–4-flowered, sub-umbellate cymes; petals yellow; Nov.–Apr. **Fruit** globose, 30–40 mm in diameter, indehiscent with weak, slender plumose bristles. Open grassland, woodland or roadsides.

VreDm

# Subfamily Malvoideae

Herbs or shrubs; usually with stellate hairs. **Leaves** alternate, simple or deeply lobed, margins entire, variously lobed and toothed, blade often palmately veined; petiolate; with stipules. **Flowers**: regular; bisexual; with or without an epicalyx; calyx tubular or lobes free, sometimes subtended by epicalyx, often accrescent; petals 5, obovate to broadly obovate, free; stamens many, united into a tube around style, joined to petals at base; anthers free; ovary superior, with 5 or more locules; style simple or branched. **Fruit** a capsule or schizocarp; dry, rarely fleshy; seeds reniform, subglobose or obovoid. *Hibiscus subfamily*.

## Key to genera

| | | |
|---|---|---|
| 1a | Fruit a capsule or indehiscent and woody to ± fleshy | 2 |
| 1b | Fruit a schizocarp with mericarps eventually separating | 3 |
| 2a | Annual or perennial herb or shrubs; style divided into distinct branches | **Hibiscus** |
| 2b | Perennial herb with procumbent stems; style simple | **Radyera** |
| 3a | Epicalyx absent | 4 |
| 3b | Epicalyx present | 5 |
| 4a | Schizocarp with 5–12 mericarps; seeds ± 3-angled, 1 per mericarp | **Sida** |
| 4b | Schizocarp with 5–40 mericarps; seeds reniform, 2 or more per mericarp | **Abutilon** |
| 5a | Epicalyx 5–16 segments | **Pavonia** |
| 5b | Epicalyx 3 segments | 6 |
| 6a | Mericarps with 2 awns | **Modiola** |
| 6b | Mericarps without awns | 7 |
| 7a | Mericarps beaked | **Sphaeralcea** |
| 7b | Mericarps not beaked | 8 |
| 8a | Epicalyx 3 foliaceous bracts; fruit crowned in centre by a persistent conical style base | **Lavatera** |
| 8b | Epicalyx and fruit not as above | 9 |
| 9a | Calyx campanulate | **Anisodontea** |
| 9b | Calyx cupular | **Malva** |

## **Abutilon** Mill. (sthn Afr.: 21 spp.)

### Key to species:

1a Young stems with very dense, short stellate pubescence mixed with many, patent, simple hairs; apex of mericarps drawn out into an awn up to 2 mm long . . . . . **A. piloso-cinereum**
1b Young stems without many, patent, simple hairs; apex of mericarps awned to obtusely angled . . . . . 2
2a Mericarps < 14 × 8 mm. . . . . **A. galpinii**
2b Mericarps > 14 × 8 mm. . . . . **A. sonneratianum**

### **galpinii** A.Meeuse

Shrub, up to 0.75 m high; young stems without many, patent, simple hairs. **Leaves** with blade broadly ovate, 30–160 × 20–120, narrowly triangular in apical portion, base cordate, apex long acuminate, upper leaf surface often slightly scabrid. **Flowers**: petals 10–15 mm long, orange-yellow and buff-coloured; Nov., Dec. **Fruit** with mericarps < 14 × 8 mm, apex of mericarps awned to obtusely angled, dark straw-coloured to purplish. Light shade.

DrGr

### **piloso-cinereum** A.Meeuse

Soft shrub or herb, up to 1.5 m high; young stems with very dense, very short stellate pubescence mixed with many, patent, simple hairs. **Leaves** suborbicular, 20–70 × 13–50 mm, upper surface dark green, lower surface canescent. **Flowers**: petals yellow; Aug.–May. **Fruit** with apex of mericarps drawn out into an awn up to 2 mm long. Rocky slopes.

DrGr KarSh

### **sonneratianum** (Cav.) Sweet

*A. umtaliense* Baker f.

Perennial shrub, 0.5–1.5(–2.0) m high; young stems without many, patent, simple hairs. **Leaves** ovate to triangular, 20–70 × 10–50 mm, base cordate. **Flowers**: petals ± 10 mm long, yellow or orange-yellow; Jul., Nov.–Apr. **Fruit** with mericarps subrectangular in outline, much compressed, nearly glabrous and papery when mature; upper dorsal angle acute, ventral tooth usually conspicuously curved at tip, > 14 × 8 mm, apex of mericarps awned to obtusely angled. Typical forest-edge plant on mountainsides, rocky or loamy soils, in light shade. *Wild hibiscus*; *wildemalva* (A); *lecheane* (SS).

DrGr

## **Anisodontea** C.Presl. (sthn Afr.: 19 spp.)

### Key to species:

[after Bates: 304 (1969)]

Leaves with blade linear to ovate, margins entire or lobed at base only; involucral bracts thin . . . . . **A. julii** subsp. **prostrata**
Leaves with blade nearly as broad as long, palmately 3–5- or 7-lobed; involucral bracts thickish . . . . . **A. julii** subsp. **julii**

**julii** (Burch. ex DC.) Bates subsp. **julii**

Shrub, up to 2 m high; pubescent. **Leaves** with blade nearly as broad as long, 40–150 mm long, margins palmately 3–5- or 7-lobed, coarsely serrate to dentate. **Flowers**: involucral bracts thickish; petals 15–30 mm long, pinkish to rose-magenta; Dec.–Feb. Grassland, kloofs, sandy, rocky places. *Mountain mallow*; *bergroos* (A).

| | | DrGr | MsGr | | |
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**julii** (Burch. ex DC.) Bates subsp. **prostrata** (E.Mey. ex Turcz.) Bates

Shrub, up to 1.25 m high; appressed-pubescent. **Leaves** with blade linear to ovate, 20 –70 mm long, margins entire or lobed at base only, toothed, discolorous with lower surface whitish. **Flowers**: involucral bracts thin; petals 15–30 mm long, pinkish to rose-magenta; Dec.–Mar. Grassland, hillsides. *Mountain mallow*; *bergroos* (A).

| | | DrGr | | | |
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## **Hibiscus** L. (sthn Afr.: 58 spp.)

### Key to species:

[partly after Exell: 435 (1960)]

1a Calyx inflated or lobes much enlarged in fruit . . . . . **H. trionum**
1b Calyx neither inflated nor with much-enlarged lobes in fruit . . . . . 2
2a Epicalyx with 5 segments . . . . . **H. calyphyllus**
2b Epicalyx with > 5 segments . . . . . 3
3a Seeds nearly glabrous, pubescent or tomentose . . . . . 4
3b Seeds with a silky or cottony floss at maturity . . . . . 5
4a Leaf blade ovate to oblong, 4 × as long as broad . . . . . **H. aethiopicus** var. **ovatus**
4b Leaf blade linear to narrowly oblong, 5–11 × as long as broad . . . . . **H. microcarpus**
5a Petals yellow . . . . . **H. pusillus**
5b Petals white or pink . . . . . **H. marlothianus**

**aethiopicus** L. var. **ovatus** Harv.

*H. leiospermus* Harv.
*H. ovatus* Cav.

Perennial herb, 140–350 mm high. **Leaves** with blade ovate to oblong, 10–80 × 6–45 mm long, margins entire. **Flowers**: epicalyx with > 5 segments, linear to narrowly linear-elliptic, > 10 mm long, up to 3 mm broad; petals up to 35 mm long, yellowish, cream-coloured or white; Oct.–Mar. **Seeds** nearly glabrous, pubescent or tomentose. Grassland. *Dwarf yellow hibiscus*; *lereletsane-le-leholo*, *motaung*, *naletsana*, *sefala-bohoho* (SS); *ibanda elimpofu*, *ihlalanyosi elimhlophe*, *uvemvane* (Z).

| VreDm | | DrGr | MsGr | | Zastr |
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**calyphyllus** Cav.

Perennial herb or shrub, up to 3 m high. **Leaves** with blade suborbicular to broadly ovate, 3–5-lobed, up to 120 × 120 mm. **Flowers**: calyx lobes ovate to narrowly ovate; 5 segments of epicalyx variously shaped but usually broadened somewhere near middle; petals up to 60 mm

long, yellow with brownish or dark red centre; Nov.–Apr. In thickets and grassland. *Large yellow wild hibiscus*; *wildestokroos* (A).

VreDm | | DrGr | | | |

### **marlothianus** K.Schum.

Perennial herb, up to 0.5 m high. **Leaves** with blade deeply 5-lobed, terminal lobe up to 30 mm long, finely (often 3 ×) divided, hispid; petioles ± same length as central lobe of leaf. **Flowers**: epicalyx with > 5 segments, usually > $^1/_2$ length of calyx; petals 30–35 mm long, white or pink with dark purple centre; Dec.–Apr. **Seeds** with a silky or cottony floss at maturity. Grassland.

| AcGr | DrGr | | KarSh | |

### **microcarpus** Garcke

*H. malacospermus* (Turcz.) E.Mey.

Annual, occasionally perennial herb, up to 0.35 m high. **Leaves** with blade linear to very narrowly oblong or linear-elliptic, 5–11 × as long as broad, up to 75 × 5 mm, margins with a few sharp teeth or deeply incised with narrow lobes. **Flowers**: segments of epicalyx > 10 mm long; petals up to 35 mm long, yellowish, cream-coloured, white or purple; Sep.–Apr. **Seeds** nearly glabrous, pubescent or tomentose. Grassland or as weed. Figure 8E, p. 4.

VreDm | AcGr | DrGr | MsGr | | Zastr?

### **pusillus** Thunb.

*H. atromarginatus* Eckl. & Zeyh.

Perennial herb, 50–300 mm high. **Leaves** with blade undivided to deeply 3–5 palmatisect, 50–60 × 20–45 mm, nearly glabrous to hispid, lobes narrowly elliptic to sharply toothed or pinnatifid. **Flowers**: epicalyx with > 5 segments; petals 10–45 mm long, yellow (rarely pink) with purple or crimson centre; Sep.–May. **Seeds** with a silky or cottony floss at maturity. Mopane woods and among rocks. *Dark-eyed dwarf hibiscus*, *bladderweed*; *terblansbossie* (A); *uguqukile uvuma* (Z).

VreDm | AcGr | DrGr | | KarSh |

### **trionum** L.

Annual herb, up to 1.5 m high. **Stems** straggling; sparsely hairy. **Leaves** with blade usually deeply 3–5-lobed, ± 70 × 60 mm, margins toothed to lobed. **Flowers**: solitary; epicalyx with 12 segments; calyx papery, veins green to purple; corolla 20–40 mm in diameter; petals 20–30 mm long, white to cream-coloured with a deep red centre, closing by early afternoon; Oct.–Jun. **Fruit** with calyx becoming inflated, enclosing fruit. Grassland, weed of cultivated land and waste places. *Bladderweed*, *bladder hibiscus*; *terblansbossie*(A); *lefefane*, *lereletsane-le-leholo*, *motaung*, *naletsana* (SS); *iyesa lentshulube* (X); *uvemvane olukhulu* (Z).

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## **Lavatera** L. (sthn Afr.: 4 spp.)

### ***arborea** L.

Annual, biennial or perennial herb, up to 2 m high; stellately pubescent. **Leaves** with blade orbicular, up to 90 × 120 mm, margins 5–7-lobed. **Flowers**: in clusters, 2–7-flowered; epicalyx

segments fused at base, longer than sepals, broadly ovate, 8–10 mm long, apices obtuse, strongly accrescent in fruit; sepals ± 4 mm long; petals 15–20 mm long, dark pink to lilac with purple veins at base; Oct.–Jan. **Fruit** with 6–8 mericarps, mericarps ridged. Native to western Europe and Mediterranean. *Tree mallow*; *mak kiessieblaar* (A).

MsGr

## **Malva** L. (sthn Afr.: 7 spp.)

### Key to species:

1a Leaves with blade lobed to beyond middle . . . . . **M. aegyptia**
1b Leaves with blade undivided or lobed, but not beyond middle . . . . . 2
2a Petals scarcely longer than sepals . . . . . **M. parviflora** var. **parviflora**
2b Petals longer than sepals . . . . . 3
3a Leaves undivided to very shallowly lobed . . . . . 4
3b Leaves distinctly (3–)5(7)-lobed . . . . . 5
4a Mericarps pilose. . . . . **M. neglecta**
4b Mericarps glabrous . . . . . **M. pusilla**
5a Leaf blade with margins strongly crisped. . . . . **M. verticillata** var. **crispa**
5b Leaf blade with margins not strongly crisped. . . . **M. verticillata** var. **verticillata**

### ***aegyptia** L.

Annual herb, up to 1 m high. **Stems** erect to decumbent. **Leaves** with blade suborbicular, deeply lobed into segments. **Flowers**: in terminal clusters; petals glabrous, ± equalling sepals, lilac. **Fruit** with mericarps glabrous. Native to Mediterranean and southwest Asia.

VreDm

### ***neglecta** Wallr.

Perennial herb. **Stems** decumbent. **Leaves** with blade orbicular-reniform, slightly lobed, 10–60 × 10–60 mm. **Flowers**: petals longer than sepals, petals with claws bearded, white with mauve or purplish veins; Oct.–Jan. **Fruit** with mericarps pilose. Open woodland or disturbed sites. Native to the Old World. *Dwarf mallow*.

DrGr MsGr

### ***parviflora** L.var. **parviflora**

Annual, occasionally perennial herb. **Stems** procumbent or decumbent, up to 0.4 m long. **Leaves** with blade reniform, suborbicular, 10–15 × 10–15 mm. **Flowers**: calyx accrescent; petals scarcely exceeding calyx, 20–50 mm long, with glabrous claws, mauve or pale pink to white; Oct.–Apr. **Fruit** with mericarps usually glabrous, enclosed by calyx. Waste places, disturbed areas. Native to Europe and Asia. *Small-flowered mallow*, *bread-and-cheese*; *kiesieblaar* (A); *mo-ora-tsatsi* (SS); *unomolwana* (X).

DrGr KarSh

### ***pusilla** Sm.

Annual, occasionally perennial herb. **Stems** decumbent, up to 0.5 m long. **Leaves** undivided to very shallowly lobed, ± 20 × 25 mm. **Flowers**: petals < 15 mm long, usually not > twice

as long as calyx. **Fruit** with mericarps usually glabrous. Native to Europe and Asia. *Small mallow*.

DrGr KarSh Zastr

### *__verticillata__ L. var. __crispa__ L.

Biennial herb, 0.5–1.0 m high. Like var. *verticillata* but margins of blade strongly crisped.

MsGr

### *__verticillata__ L. var. __verticillata__

Biennial herb, 0.5–1.0 m high. **Leaves** with blade reniform to suborbicular, 5-lobed with rounded lobes, 70 × 80 mm, margins not strongly crisped. **Flowers**: in axillary clusters; petals ± 5 mm long, white or purplish; Oct.–Jan. **Fruit** with mericarps usually glabrous. Damp, shady places. Native to Asia. *Chinese mallow*.

DrGr MsGr

## __Modiola__ Moench (sthn Afr.: 1 sp.)

### *__caroliniana__ (L.) G.Don

*M. multifida* Moench

Annual herb; scabrous. **Stems** procumbent, rooting at nodes. **Leaves** with blade suborbicular, palmately 3–7-lobed, 50–80 mm long, margins crenate. **Flowers**: epicalyx segments narrowly ovate; sepals broadly triangular-ovate; petals 3–5 mm long, slightly exceeding sepals, red; Sep.–Jan. **Fruit** with mericarps black, 2-awned. Disturbed sites; in wet shady places. Native to America. *Red-flowered mallow*.

MsGr

## __Pavonia__ Cav. (sthn Afr.: 13 spp.)

### Key to species:

Epicalyx with lobes mostly > 2 mm wide; petals yellow, rarely white; mericarps with convex lateral sides . . . . . **P. burchellii**
Epicalyx with lobes < 1.5 mm wide; petals pink to mauve or white; mericarps with flat lateral veins . . . . . **P. columella**

### __burchellii__ (DC.) R.A.Dyer

Biennial or perennial, herb or shrub, up to 1 m high. **Leaves** broadly ovate to suborbicular, 65–70 × 60–70 mm, base deeply cordate, margins shallowly lobed. **Flowers**: epicalyx with ovate segments mostly > 2 mm wide, segments veined; calyx accrescent, enclosing fruit; petals 8–10 mm long, white, pale yellow, cream-coloured or orange with or without reddish centre; Oct.–Apr. **Fruit** with epicalyx segments persisting as a star-shaped structure under fruit; mericarps with convex lateral sides. In light shade on a variety of soils. *Dainty pavonia*; *indola empofu* (Z).

VreDm AcGr DrGr MsGr KarSh

**columella** Cav.

Perennial herb or shrub, up to 2.4 m high. **Leaves** with blade broadly ovate to suborbicular, 25–120 × 20–150 mm, margins finely toothed. **Flowers**: epicalyx with linear segments, < 1.5 mm wide; calyx accrescent; petals 20–25 mm long, pink to mauve or white; Mar.–Jun. **Fruit** enclosed by a prominently veined calyx, mericarps with flat lateral veins. Forest edges, clearings, riverine bush. *Pink pavonia*; *indola ebomvu* (Z).

MsGr

## **Radyera** Bullock (sthn Afr.: 1 sp.)

**urens** (L.f.) Bullock

*Allenia urens* (L.f.) E.Phillips

*Hibiscus urens* L.f.

Perennial herb; densely stellate-tomentose. **Stems** procumbent. **Leaves** with blade broadly ovate to orbicular, 120–140 × 120–140, base deeply cordate, margins toothed, 7–9-nerved. **Flowers**: in cymes; epicalyx of 12 linear, tomentose segments, connate at base to form a shallow basin; calyx with tube 20 mm long, lobes shorter, accrescent; petals 20–30 mm long, slightly longer than calyx, claret-red. **Fruit** enclosed by persistent calyx. Dry, semikaroo areas. *Wildepampoen*, *wildekalbas* (A).

VreDm DrGr KarSh

## **Sida** L. (sthn Afr.: 11 spp.)

### Key to species:

1a Leaf blade deeply 3-lobed . . . . . **S. ternata**
1a Leaf blade undivided . . . . . 2
2a Mericarps 5, dehiscing at base . . . . . **S. alba**
2b Mericarps not dehiscing at base . . . . . 3
3a Plant sparsely and finely stellate-pubescent on vegetative parts and calyx; mericarps 5–8. . . . . **S. dregei**
3b Plant ± tomentose; mericarps 7–12 . . . . . 4
4a Mericarps distinctly birostrate with suberect or connivent awns, nearly glabrous . . . . . **S. rhombifolia** subsp. **rhombifolia**
4b Mericarps not birostrate with suberect or connivent awns, stellate-pubescent . . . . . **S. chrysantha**

**alba** L.

*S. spinosa* L. var. *spinosa*

Annual or weak perennial herb, up to 1 m high. **Leaves** with blade usually narrowly ovate, 20–50 × 5–30 mm, base truncate to rounded, apex acute or rounded, margins of petiole armed at base with a hooked spur. **Flowers**: petals 5–6 mm long, pale yellow; Nov.–Mar. **Fruit** with 5 mericarps, dehiscing at base. Disturbed areas.

DrGr

**chrysantha** Ulbr.

Perennial herb or shrub, up to 0.3(–0.6) m high; ± tomentose. **Leaves** with blade ± oblong, 20–40 × 10–25 mm, apex rounded to subacute, distinctly discolorous. **Flowers**: petals

± 10 mm long, deep yellow to orange, occasionally paler; Aug.–May. **Fruit** with 7–12 mericarps without 2 awns, stellate-pubescent. On acid rocky slopes and soils derived from acid rocks, among grasses and low growing plants or in woodland in light shade.

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**dregei** Burtt Davy
*S. lancifolia* Burtt Davy
*S. longipes* E.Mey. ex Harv.

Annual or biennial herb, up to 1 m high; sparsely and finely stellate-pubescent on vegetative parts. **Leaves** narrowly ovate to ovate, often somewhat rhombic, 20–70 × 5–35 mm. **Flowers**: calyx sparsely and finely stellate-pubescent; petals 9–11 mm long, yellow to orange; Nov.–May. **Fruit** with 5–8 smooth mericarps, usually without awns; pericarp thin and papery, ± stellate-pubescent. Forest margins, along watercourses, on rocky and acid soils. *Sutherland's curse*, *spider-leg*; *umdiza wethafa* (Z).

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**rhombifolia** L. subsp. **rhombifolia**

Annual or biennial herb or shrub, up to 1 m high; often ± virgate, ± tomentose. **Leaves** discolorous, rhomboid, oblong to narrowly oblong, 20–60 × 5–25 mm. **Flowers**: petals ± 8 mm long, pale yellow to cream-coloured; Oct.–Jun. **Fruit** nearly glabrous; with 7–12 mericarps each with 2 distinct, suberect, connivent awns. Pantropical, ruderal. *Pretoria sida*, *arrowleaf sida*; *smalblaartaaiman* (A).

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**ternata** L.f.
*S. triloba* Cav.

Annual herb, up to 0.75 m high. **Leaves** with blade deeply 3-lobed, terminal lobe up to 50 mm long. **Flowers**: solitary on long slender pedicels; petals ± 6 mm long, white; Aug.–May. Forest, streambanks, shady, wet places.

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## **Sphaeralcea** A.St.-Hil. (sthn Afr.: 1 sp.)

***bonariensis** (Cav.) Griseb.

Perennial herb, 1.0–1.5 m high. **Leaves** with blade ovate, 30–45 × 15–25 mm, 3-lobed, lobes acute to rounded, margins entire, both surfaces densely pubescent. **Flowers**: in axillary clusters; petals ± 7 mm long, slightly longer than calyx, purplish pink to red, claw dark coloured; Oct.–Mar. **Fruit** with mericarps oblong, short-beaked. Disturbed areas. Native to Argentina. *Latin globemallow*.

VreDm | | DrGr | | | |

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# MELIACEAE

Trees, shrubs or dwarf shrubs; monoecious or dioecious. **Leaves** simple or mostly pinnately compound, pari- or imparipinnate, 2- or 3-pinnate, usually alternate; without stipules. **Flowers**: in panicles or solitary; bisexual or unisexual, regular; calyx 4- or 5-fid or -partite; petals free; stamens 8–10, united into a cylindrical tube around style; disc present, variable, rarely absent; ovary superior; stigma often disc- or head-shaped. **Fruit** a capsule or drupe. *Mahogany family*.

## **Melia** L. (sthn Afr.: 1 sp.)

### ***azedarach** L.

Deciduous tree, up to 15 m high. **Leaves** 2- or 3-pinnate, imparipinnate; leaflet blade narrowly ovate, up to 55 × 25 mm, base asymmetrical, apex acuminate, margins serrate. **Flowers**: inflorescence a panicle, sprays heavily scented; staminal tube purplish; petals ± 10 mm long, pale lilac to dark purple; Aug.–Feb. **Fruit** a drupe, thinly fleshy, turning yellow and wrinkled with age. Disturbed places. Native to India. *Seringa*, *Persian lilac*; *sering*, *maksering* (A). Figure 13C, p. 10.

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# MELIANTHACEAE

Dwarf shrubs, shrubs or small trees with soft wood. **Leaves** alternate; simple or compound**;** petiolate; with or without stipules. **Flowers**: in lax to dense terminal racemes or spikes with pedicels spreading widely; bisexual, regular or occasionally irregular; calyx 4 or 5 sepals, often unequal; petals 4 or 5, free, clawed; disc present; stamens equal petals or twice as many, inserted on or within disc, free or connate; ovary superior; style simple. **Fruit** a capsule. *White ash family*.

## Key to genera

Leaves simple with blade broadly ovate to almost orbicular . . . . . .**Greyia**
Leaves compound with blade pinnate, rachis winged . . . . . .**Melianthus**

## **Greyia** Hook. & Harv. (sthn Afr.: 3 spp.)

### **sutherlandii** Hook. & Harv.

Shrub or small tree, up to 7 m high. **Leaves** simple; blade broadly ovate to almost circular, up to 100 × 110 mm, prominently palmately veined, glabrous or minutely hairy, upper surface green, lower surface paler. **Flowers**: petals broadly oblong, 3 × as long as calyx, up to 10 mm long, spreading, red; Aug.–Oct. **Fruit** cylindrical. Mountainsides, crests of broken, rocky ridges. *Glossy berg bottlebrush*, *beacon tree*, *Natal bottlebrush*; *blinkblaarbaakhout*, *Natalse baakhout* (A); *indulo*, *umbande* (Z).

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## **Melianthus** L. (sthn Afr.: 6 spp.)

### Key to species:

1a Inflorescence with 2–4 flowers at each node . . . . . **M. villosus**
1b Inflorescence with a single flower at each node . . . . . 2
2a Petals shorter than odd sepal . . . . . **M. dregeanus** subsp. **insignis**
2b Petals equalling odd sepal . . . . . **M. comosus**

### **comosus** Vahl

Shrub, up to 2.5 m high. **Leaves** pinnate, 60–160 mm long; rachis winged, leaflets 4 or 5 pairs, blade elliptic, margins deeply and coarsely toothed, teeth acute-acuminate, upper surface sparsely stellately pubescent, lower surface canescent. **Flowers**: inflorescence with a single flower at each node; calyx 16–20 mm long, orange-red with a black dot at base; petals equalling odd sepal, dark red. **Fruit** 30–50 mm long. Along watercourses, dongas, roadsides. *Touch-me-not*; *kruidjie-roer-my-nie* (A).

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### **dregeanus** Sond. subsp. **insignis** (Kuntze) S.A.Tansley

*M. insignis* Kuntze

Shrub, up to 2 m high; densely villous. **Leaves** pinnate, 100–240 mm long, rachis winged; leaflets 5 or 6 pairs, margins deeply toothed, teeth ovate-acute, ascending, upper surface stellately pubescent, lower surface whitish tomentose. **Flowers**: inflorescence with a single flower at each node; calyx ± 30 mm long, scarlet, veined green; petals shorter than odd sepal, maroon; Nov.–Jan. **Fruit** 10–20 mm long. Forest margins.

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### **villosus** Bolus

Shrub, up to 2 m high. **Leaves** pinnate**,** up to 300 mm long, rachis slightly winged, leaflets 3–7 pairs, blade narrowly ovate, apex acute, margins coarsely serrate, upper surface moderately stellately hairy, lower surface densely so. **Flowers**: inflorescence with 2–4 flowers at each node; calyx 20–25 mm long, brownish purple or mauve, veined green; petals shorter than sepals, pink to purplish brown; Dec.–Mar. **Fruit** ± 40 mm long. Forest margins, damp places. *Maroon honey-flower*; *kruidjie-roer-my-nie* (A); *ibhonya* (Z).

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# MENISPERMACEAE

Scandent shrubs, woody climbers or herbaceous twiners, dioecious. **Leaves** alternate, simple, sometimes peltate, rarely trifoliolate; petiolate; without stipules. **Flowers**: usually small and inconspicuous; in panicles, racemes or cymes; sepals 3–12, free; petals 1–6, free or connate; stamens 3–6(–many), free or united; carpels 1–6(–more), free. **Fruit** with each carpel drupaceous. *Moonseed family*.

## Key to genera

Leaf blade broadly ovate to triangular, peltate . . . . . **Stephania**
Leaf blade narrowly elliptic, not peltate . . . . . **Antizoma**

## **Antizoma** Miers (sthn Afr.: 2 spp.)

**angustifolia** (Burch.) Miers ex Harv.
*A. harveyana* Miers ex Harv.

Spiny, dwarf shrub, branches often scandent. **Leaves** glabrous or hairy; blade narrowly elliptic to oblong, 25–27(–50) × 4–6(–10) mm, apex rounded, mucronate; petioles short, armed with a short, obtuse, reflexed spine at base. **Flowers**: in few-flowered cymes (male), paired or solitary (female); petals yellowish green; Dec.–Apr. Open woodland, sandy soil. *Bitterwortel*, *maagbitterwortel* (A).

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## **Stephania** Lour. (sthn Afr.: 1 sp.)

**abyssinica** (Quart.-Dill. & A.Rich.) Walp. var. **tomentella** (Oliv.) Diels
*Cissampelos umbellata* E.Mey. ex Miers
*S. hernandifolia* (Willd.) Walp. var. *tomentella* Oliv.

Herbaceous, climber; young branchlets, petioles, lower surfaces of leaves, inflorescences and sepals ± densely pubescent to tomentose. **Leaves** peltate; blade broadly ovate to suborbicular, ± 70 mm long, ± 100 mm in diameter, apex acute; petioles up to 150 mm long. **Flowers**: in umbel-like cymes; petals cream-coloured; Nov.–Jan. Forest, bush clumps, streambanks.

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# MOLLUGINACEAE

Annual or perennial herbs or subshrubs, scarcely or nonsucculent, glabrous, or rarely with stellate or glandular hairs, branching monopodially or often sympodially; containing anthocyanin pigments. **Leaves** alternate or rarely opposite, often crowded into basal rosettes and false whorls on stem, simple, entire; stipules membranous or 0. **Flowers**: in mostly terminal or in seemingly, rarely truly, axillary cymes, or solitary; bisexual, regular,

hypogynous, very rarely perigynous, sessile or pedicellate, mostly inconspicuous, usually greenish white, sometimes pink or red; sepals (4)5, free, imbricate or quincuncial, persistent, membranous; petals 0 or 5–many (small, staminodial in origin); stamens (3)4 or 5(–many), alternisepalous, or if > 5, then in alterni- and episepalous whorls, hypogynous; filaments ± free, but usually connate at base, forming very short cupular tube; anthers tetrasporangiate, dehiscing by longitudinal slits; ovary superior, (1)2–5-carpellate and with as many locules as carpels; styles or sessile stigmas as many as carpels, free or rarely united at base; placentation axile, but seemingly basal in some uni-ovulate carpels; ovules 1–many per locule, anatropous to anacampylotropous, bitegmic. **Fruit** a loculicidally dehiscent capsule, rarely separating into 2 indehiscent mericarps or a nutlet, often with persistent calyx. **Seeds** generally reniform, sometimes with a small funicular aril; embryo peripheral, curving around hard, starchy perisperm; endosperm scanty or 0. *Mollugo family*.

## Key to genera

| | | |
|---|---|---|
| 1a | Stipules adnate to leaf base; leaves fleshy, glaucous | **Hypertelis** |
| 1b | Stipules and leaves not as above | 2 |
| 2a | Leaf blade elliptic, obovate to broadly obovate | **Glinus** |
| 2b | Leaf blade filiform, linear or spathulate | 3 |
| 3a | Annual herb | **Mollugo** |
| 3b | Perennial herbs | 4 |
| 4a | Stipules persistent | **Pharnaceum** |
| 4b | Stipules caducous | **Psammotropha** |

[Descriptions after Adamson (1958, 1959, 1961)]

## **Glinus** L. (sthn Afr.: 3 spp.)

### Key to species:

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|---|---|
| Stems densely whitish tomentose, hairs stellate | **G. lotoides** var. **lotoides** |
| Stems glabrous or pubescent, hairs straight, appressed | **G. oppositifolius** var. **oppositifolius** |

### ***lotoides** L. var. **lotoides**

Perennial herb. **Stems** procumbent or decumbent, 150–500 mm long, densely whitish tomentose, hairs stellate. **Leaves** petiolate; blade broadly obovate to subrotund, 5–30 × 5–20 mm, base cuneate, apex rounded, margins entire; petioles up to 30 mm long. **Flowers**: perianth segments up to 8 mm long, greenish white; Nov.–May. Savanna, along watercourses, dry stream beds, roadsides, sandy soil. Native to Eurasia and Africa. *Lotus sweetjuice*.




### **oppositifolius** (L.) DC. var. **oppositifolius**

*Mollugo serrulata* Sond.

Perennial herb. **Stems** procumbent or decumbent; glabrous or pubescent, hairs straight, appressed. **Leaves** petiolate; opposite or in whorls of 4–6; blade elliptic, obovate to broadly obovate, 10–30 × 4–10 mm; petioles up to 3 mm long. **Flowers**: perianth segments 3–5 mm long, white; Mar.–May. Grassland, floodbed of rivers.



## **Hypertelis** E.Mey. ex Fenzl (sthn Afr.: 7 spp.)

Key to species:

Peduncles, pedicels and perianth smooth, only leaves with wart-like glands . . . . . **H. bowkeriana**
Peduncles, pedicels and perianth with wart-like glands, leaves smooth . . . . . **H. salsoloides** subsp. **salsoloides**

### **bowkeriana** Sond.

*Mollugo suffruticosa* A.Peter

Perennial herb; glaucous, in loose bundles, up to 150 mm high. **Stems** ascending or decumbent, branched, 30–120 mm long. **Leaves** alternate, fascicled, fleshy; blade linear, 30–60 mm long, with wart-like glands; stipules persistent. **Flowers**: peduncles slender, smooth, 50–90 mm long, umbels 4–8-flowered; pedicels smooth; stamens 5; perianth segments without glands, ± 3 mm long, white; Dec.–Apr. Grassland, brackish soil.

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### **salsoloides** (Burch.) Adamson var. **salsoloides**

*H. verrucosa* Fenzl
*Pharnaceum salsoloides* Burch.

Perennial herb; glandular pubescent, in small or large bunches, up to 150 mm high. **Stems** procumbent or ascending, 20–200 mm long, usually with many short, erect branchlets. **Leaves** alternate, crowded, linear, 15–40 mm long, smooth; stipules persistent. **Flowers**: peduncles, pedicels and perianth with projecting wart-like glands; peduncles stout, 30–150 mm long, umbels 3–12-flowered; perianth segments white or pink; Aug.–May. Grassland, margins of salt pans.

VreDm | | DrGr | MsGr | KarSh |

## **Mollugo** L. (sthn Afr.: 6 spp.)

### **cerviana** (L.) Ser. ex DC. var. **cerviana**

Annual herb, up to 200 mm high; many stemmed. **Stems** slender, erect or ascending. **Leaves** sessile; basal ones, linear or spathulate, 2–25 mm long, often withered away by flowering time, cauline leaves linear, 3–18 mm long, in whorls of ± 6 per node. **Flowers**: inflorescence terminal and axillary; pedicels straight, rigid, longer than leaves; perianth segments greenish white; Nov.–Apr. Rocky ridges, cultivated land, roadsides.

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## **Pharnaceum** L. (sthn Afr.: 25 spp.)

Key to species:

1a Leaves in a basal rosette, blade flat, rigid; stipules caducous . . . **P. alpinum**
1b Leaves not in a basal rosette, blade linear or filiform; stipules persistent . . 2
2a Stipules entire or with 1 or 2 lateral points . . . . . **P. detonsum**

2b Stipules hair-like or with narrow lobes at apices or margins . . . . . 3
3a Stipules persistent after leaf-fall, covering stem or surrounding older leaves . . . . . **P. brevicaule**
3b Stipules not persistent after leaf-fall, not covering stem or surrounding older leaves . . . . . **P. dichotomum**

### **alpinum** Adamson

Perennial herb; small, dense tufts, solitary or a few together. **Leaves** in a compact, basal rosette, many; blade flat, slightly widened towards apex, 10–30 mm long, sheathing at base, rigid, erect; stipules caducous. **Flowers**: in a few-flowered raceme, up to 0.15 m high; perianth segments 3.0–3.5 mm long, white; Oct.–Dec. Grassland, among rocks.




### **brevicaule** (DC.) Bartl.

Perennial herb; low-growing with stems < 50 mm above ground. **Leaves** crowded; blade linear, 10–30 mm long, margins revolute; stipules hair-like or with narrow lobes at apices or margins, persistent after leaf-fall, covering stem or surrounding older leaves. **Flowers**: in a compound raceme; perianth segments ± 3 mm long, with broad, white margins; Dec.–Feb. Grassland, rocky places.




### **detonsum** Fenzl

Perennial herb; in small tufts with stems woody, branched, suberect. **Leaves** crowded; blade linear or filiform, 10–15 mm long; stipules persistent, entire or with 1 or 2 lateral points. **Flowers**: in an umbel-like inflorescence; peduncles 40–60 mm long with 1 or 2 leaves and stipules at top; pedicels slender, 5–10 mm long; perianth segments 3.5–5.0 mm long, white, often yellowish inside and at edges; Dec.–Apr. Sandy or rocky places.




### **dichotomum** L.f.

Perennial herb; stems erect or sprawling, woody only at very base. **Leaves** linear or filiform, 5–30 mm long; stipules hair-like or with narrow lobes at apices or margins, not persistent after leaf-fall, not covering stem or surrounding older leaves. **Flowers**: inflorescences dichotomously branched; peduncles 30–80 mm long, usually with a whirl of leaves at top; pedicels very slender, 10–20 mm long; perianth segments 2.5–3.0 mm long, white; Nov.–Apr. Grassland, disturbed places, rocky soil.




## **Psammotropha** Eckl. & Zeyh. (sthn Afr.: 12 spp.)

### Key to species:

[Adamson: 56, 61 (1959)]

1a Leaf blade linear, strap-shaped; leaf tufts depressed in centre . . . **P. myriantha**
1b Leaf blade linear-oblong to linear-spathulate; not depressed in centre . . . . 2

2a Leaf blade with margins thickened; inflorescence with few or no nodes without flowers . . . . . **P. mucronata** var. **marginata**
2b Leaf blade with margins not thickened; inflorescence with a few sterile nodes or inflorescence with 2–8 nodes without flowers . . . . . 3
3a Leaf tufts compact; leaves translucent; inflorescence with a few sterile nodes . . . . . **P. mucronata** var. **mucronata**
3b Leaf tufts not dense; leaves opaque; inflorescence 4–10 nodes without flowers. . . . . **P. mucronata** var. **foliosa**

### **mucronata** (Thunb.) Fenzl var. **foliosa** Adamson

Perennial herb; short stemmed in lax patches not cushions. **Leaves** with tufts not dense; erect, opaque; blade 20–30 mm long, margins involute when dry, not thickened, dark green, uniformly coloured. **Flowers**: inflorescence erect or spreading, 30–250 mm high, 4–10 nodes at base with leaves but no flowers; perianth segments 1.0–1.5 mm long, green; Nov.–Apr. Grassland.

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### **mucronata** (Thunb.) Fenzl var. **marginata** Adamson

Perennial herb. **Leaves** with tufts small, erect, aristate; blade linear-oblong, 10–20 mm long, with margins thickened at least in upper half, apex with a rigid bristle. **Flowers**: inflorescence simple or branched, 5–10 mm high, with few or no nodes without flowers; perianth segments 1.0–1.5 mm long, greenish; Jan. Edges of pans.

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### **mucronata** (Thunb.) Fenzl var. **mucronata**

*Pharnaceum mucronatum* Thunb.
*Psammotropha androsacea* Fenzl

Perennial herb; short stemmed with basal leaves in compact cushions. **Leaves** in few or many compact, crowded tufts, semitranslucent, often white-edged in upper half; blade linear-oblong, 5–10 mm long, acute, hair-pointed, lower half colourless, margins not thickened. **Flowers**: inflorescence simple or branched, 30–250 mm high, with no > 1 or 2 nodes without flowers; perianth segments 1.0–1.5 mm long, yellowish green; Sep.–Apr. Grassland.

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### **myriantha** Sond.

*P. breviscapa* Burtt Davy

Perennial herb; with basal leaves in single or in multiple tufts or small cushions. **Leaves** with tufts depressed in centre, spreading or ascending; blade linear, strap-shaped, 6–11 mm long, midrib projecting, apex with a bristle 1–2 mm long. **Flowers**: inflorescence simple or branched, 30–300 mm high; peduncle stout, 20–100 mm long, ending in a whorl of leaves or stipules, with 0–6 branches, flowers crowded on pedicels 2–5 mm long; perianth segments ± 1 mm long, yellowish green; Sep.–Mar. Grassland, rocky or stony places.

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# MORACEAE

Trees or shrubs, with milky sap containing latex. **Leaves** alternate, simple; blade 3-nerved, pinnately or palmately veined, margins entire, lobed or toothed; with stipules. **Flowers**: tiny, unisexual, enclosed in hollow, vase-like receptacle (a fig) or in dense heads or spikes; male flowers with (1–)4(–6) stamens, filaments straight or reflexed, free or connated; female flowers with ovary superior to inferior, styles 2 or style bifid at apex. **Fruit** a small nut or drupe borne inside (e.g. fig) or outside (e.g. mulberry) receptacle. *Mulberry and fig family*.

### **Morus** L. (sthn Afr.: 3 spp.)

***alba** L. var. **alba**
*M. bombycis* Koidz.

Tree, up to 10 m high. **Branches** grey or greyish yellow. **Leaves** thin; blade ovate, 50–300 × 50–150 mm, base truncate to cordate, apex acute to acuminate, margins toothed. **Flowers**: in spikes; perianth greenish; Sep., Oct. **Fruit** white, pink or black. Savanna, grassland, roadsides, near watercourses, disturbed areas. Native to Asia. *White or common mulberry*; *wit/gewone moerbei* (A).




# MYRICACEAE

Trees or shrubs, often ± aromatic and dotted with golden-yellow glandular hairs; monoecious or dioecious. **Leaves** simple, alternate, petiolate; blade entire, serrate, dentate or pinnately lobed, usually leathery; without stipules. **Flowers**: unisexual, male and female on same or separate plants, stalkless and borne in spikes; perianth absent, male and female flowers subtended by solitary bract; stamens with very short filaments; ovary superior, 1-locular, with single ovule; stigmas 2. **Fruit** a globose or ovoid drupe, surface of drupe often rough or warty, covered with layer of wax. *Waxberry family*.

## MOLLUGINACEAE

## **Morella** Lour. (sthn Afr.: 10 spp.)

**serrata** (Lam.) Killick
*Myrica mossii* Burtt Davy
*Myrica serrata* Lam.

Tree or shrub, up to 6 m high. **Leaves** petiolate; blade elliptic, 50–100 mm long, narrowly attenuate at base, margins entire or remotely serrate, gland-dotted; petioles ± 10 mm long. **Flowers**: inconspicuous, in axillary, ± erect catkin-like spikes, subtended by bracts; bracts light green; spikes with male flowers dense; sometimes spikes with male flowers below and female flowers above; Jul.–Jun. **Fruits** globose, ± 2 mm in diameter, warted. Streambanks. *Lance-leaved waxberry*; *smalblaarwasbessie* (A); *maleleka* (SS); *isibhara* (X); *umakhuthula* (X, Z); *ulethi*, *iyethi* (Z).

MsGr

# MYROTHAMNACEAE

Woody dwarf shrubs, resinous; plant dries out when unfavourable climatic conditions prevail, but revives within hours after rain. **Leaves** opposite, petioles sheathing at base, forming a joint with blade; with stipules. **Flowers**: unisexual, male and female on separate plants, densely clustered in erect spikes; calyx and corolla absent; stamens usually 5, filaments united at base; ovary superior, 3-lobed with 3 free styles. **Fruit** a capsule. *Resurrection plant family*.

## **Myrothamnus** Welw. (sthn Afr.: 1 sp.)

**flabellifolius** Welw.
*Cliffortia flabellifolia* Sond.

Woody dwarf shrub, up to 0.6 m high, dioecious. **Leaves** opposite, sessile, cuneate, flabelliform (fan-shaped) but plaited when dried out, 6 or 7 crenate on subtruncate apex. **Flowers**: clustered in terminal spikes; green to deep pink; Nov.–May. Amongst granite or sandstone rocky outcrops, crevices with shallow soil. *Resurrection plant*; *opstandingsplant* (A). Figure 54.

VreDm

# MYRSINACEAE

Trees or shrubs. **Leaves** simple, alternate, often crowded near ends of branches, petioled or subsessile; blade with margins entire or toothed, ± gland-dotted; without stipules. **Flowers**: 4- or 5-merous, small, regular, borne in clusters; calyx deeply divided or sepals free; petals usually united towards base; stamens as many as and opposite petals, filaments attached to corolla; ovary superior, 1-locular. **Fruit** a berry or drupe. *Cape myrtle family*.




**Figure 54.** *Myrothamnus flabellifolius* (Myrothamnaceae). Artist: G. Condy.

MYRSINACEAE

## **Myrsine** L. (sthn Afr.: 2 spp.)

### **africana** L.

Erect, much-branched, evergreen shrub, 1–2(–3) m high. **Leaves** shortly petiolate; blade variable in outline, 5–20 × 5–10 mm, apex usually obtuse, margins toothed from about middle to apex, glossy, glabrous, gland-dotted, tapering into a petiole 0.5–1.5 mm long. **Flowers**: in small, axillary fascicles; anthers exserted beyond corolla lobes, pink or red; sepals 4-partite, gland-dotted, ciliate; petals shortly united, 4-lobed, lobes oblong, gland-dotted, ciliate; Apr.–Dec. **Fruit** a 1-seeded, globose drupe, slightly fleshy, 3–4 mm in diameter. In bush groups, on mountains. *Cape myrtle*, *wild myrtle*; *vlieëbos*, *wildemirt* (A); *moroka-pheleu*, *semapo*, *sethakhisa*, *thakisa* (SS).

DrGr MsGr

# MYRTACEAE

Trees, shrubs or dwarf shrubs. **Leaves** opposite or alternate, simple, gland-dotted; without stipules. **Flowers**: in various types of inflorescences, rarely solitary; regular, usually with showy stamens; calyx 3–5-lobed; petals 4 or 5, free, or united with calyx to form a lid (operculum) covering flower in bud; stamens many, free; ovary inferior. **Fruit** a capsule or berry. *Myrtle family*.

## **Eucalyptus** L'Hér. (sthn Afr.: 7 spp.)

### Key to species:

[after Henderson: 3 (2009)]

Bark shed in various pieces, leaving a smooth or granular texture on under layer . . . . . **E. camaldulensis**
Bark persistent, entirely covering main trunk . . . . . **E. sideroxylon**

### ***camaldulensis** Dehnh.

Evergreen tree, 18–40 m high, with a spreading crown. **Bark** shed in various pieces from entire length of trunk, leaving a smooth or granular texture on under layer, white or grey, mottled, streaked with red, sometimes with rough, reddish brown or black bark accumulating at base of trunk. **Leaves** alternate or opposite; drooping; petioles and twigs red; blade narrowly ovate, 120–220 mm long, apex acute, margins entire, concolorous, distinctly veined. **Flowers**: in simple umbels; buds conical, ovoid or beaked, 6–9 mm long; stamens exserted; perianth dull yellow; Sep.–Jan. **Fruit** a capsule with a prominent rim and protruding valves. Along watercourses. Invader. Native to Australia. *Red river gum*; *rooibloekom* (A).

VreDm DrGr

### ***sideroxylon** A.Cunn. ex Woolls

Evergreen tree, 15–26 m high, with a moderately spreading crown. **Bark** persistent, entirely covering main trunk, dark grey to black, hard, corky, non-fibrous, deeply furrowed. **Leaves**

opposite; drooping; blade narrowly ovate to broadly ovate, 60–110 mm long, apex acute, margins entire, greyish green, usually falcate. **Flowers**: in simple umbels; buds pendulous with conical or beaked lids, up to 12 mm long; stamens exserted; perianth cream-coloured, pink or deep rose-red; May–Oct. **Fruit** a round to oval capsule, valves deeply included, 8–10 mm long; often covered by a sub-persistent staminal ring. Along watercourses. Invader. Native to Australia. *Black ironbark*; *swartysterbasbloekom* (A).

VreDm | | DrGr | | | |

## Reference

HENDERSON, L. 2009. Eucalypts in South Africa. *Sapia News* 12: 1–7.

# NYCTAGINACEAE

Herbs, shrubs or trees, sometimes scandent. **Leaves** usually opposite, petiolate; without stipules. **Flowers**: regular, surrounded by green or coloured bracts often resembling a calyx; calyx tubular, petal-like; true petals absent; stamens usually 5, rarely up to 30; ovary superior, style long and slender. **Fruit** indehiscent, usually an anthocarp formed by persistent, accrescent basal part of perianth enclosing an achene, sometimes winged or variously ribbed, occasionally glandular. *'Four o'clock' family*.

## Key to genera

[after Dyer: 74 (1975)]

1a Bracts large, connate. . . . . **Mirabilis**
1b Bracts small, free . . . . . 2
2a Shrubs with spinescent branches and branchlets. . . . . **Phaeoptilum**
2b Herbs, sometimes woody at base, unarmed . . . . . 3
3a Perianth relatively conspicuous, funnel-shaped, slightly lobed; stamens well exserted . . . . . **Commicarpus**
3b Perianth relatively small and inconspicuous, cylindrical; stamens ± exserted . . . . . **Boerhavia**

## **Boerhavia** L. (sthn Afr.: 6 spp.)

### Key to species:

Fruit 3- or 4-winged. . . . . **B. cordobensis**
Fruit 5-ribbed. . . . . **B. erecta**

### ***cordobensis** Kuntze

Annual herb, up to 0.4 m high; plants unarmed. **Leaves** with blade ovate, 30–35 × 15–25 mm, veining on lower surface prominent. **Flowers**: stamens ± exserted; perianth cylindrical,

relatively small and inconspicuous; purple, red; Nov.–Apr. **Fruit** obconical-clavate, 3- or 4-winged, eglandular. Stony hillside slopes, disturbed places. Native to South America.

KarSh

### *erecta L.

Semi-erect, soft herb, up to 0.35 mm high; plants unarmed**. Leaves** with blade broadly ovate, 13–65 × 4–60 mm, distinctly reddish brown punctate. **Flowers**: in terminal cymes, ultimately diffusely paniculate; stamens ± exserted; perianth cylindrical, relatively small and inconspicuous, purple; Oct.–Jan. **Fruit** eglandular, 5-ribbed, truncate at apex. Woodland, disturbed places. Native to North Africa. *Erect spiderling*, *upright spiderling*.

DrGr

## **Commicarpus** Standl. (sthn Afr.: 9 spp.)

### Key to species:

Perianth white; fruit with glandular hairs concentrated mainly around apex. . . . . **C. plumbagineus** var. **plumbagineus**

Perianth pink, reddish, mauve or purple; fruit with glandular hairs not concentrated mainly around apex. . . . . **C. pentandrus**

### **pentandrus** (Burch.) Heimerl

*Boerhavia pentandra* Burch.

Sprawling, perennial herb with long procumbent or trailing branches forming mats 2 m in diameter; plants unarmed. **Leaves** with blade ovate to broadly ovate, 10–40 × 7–35 mm, base cordate to rounded, apex acute to obtuse, margins irregularly toothed; petioles up to 120 mm. **Flowers**: stamens 5, well exserted; perianth 9–15 mm long, lower portion with 5 prominent glandular hairs at apex, purple, pink, reddish; Nov.–May. **Fruit** with 5 large stalked, viscid glandular hairs around apex and smaller less conspicuous glands over rest of surface. Grassland and bush clumps. *Veldpatats* (A). Figure 7C, p. 3; Figure 55.

VreDm AcGr DrGr KarSh

### **plumbagineus** (Cav.) Standl. var. **plumbagineus**

*C. africanus auct. non* (Lour.) Dandy

Dwarf shrub with procumbent and trailing branches, up to 4 m long; plants unarmed. **Leaves** petiolate; blade ovate, 15–120 × 7–80 mm, base cordate, truncate or rounded, apex acute, margins entire; petioles up to 40 mm. **Flowers**: stamens 3, well exserted; perianth 8–15 mm long, lower portion glandular hairy, white to pale purple; Jul.–Jun. **Fruit** with stalked, viscid glandular hairs concentrated mainly around apex. Bush clumps, along watercourses.

DrGr

## **Mirabilis** L. (sthn Afr.: 2 spp.)

### *jalapa L.

Perennial herb, up to 1.3 m high; with stems erect, much branched, branches soft and brittle; unarmed. **Leaves** petiolate; blade ovate, 35–130 × 20–80 mm, margins entire, often ciliate,



**Figure 55.** *Commicarpus pentandrus* (Nyctaginaceae). Artist: G. Condy.

NYCTAGINACEAE

dark green with pinkish veins. **Flowers**: in terminal cymes, 1–many-flowered; involucre calyx-like; perianth with tube ± 50 mm long, cylindric below, funnel-shaped at top, purple, red, yellow or white; Jan.–Apr. Garden weed, disturbed places, road verges. Native to India, introduced from tropical America. *Four o'clocks*, *marvel-of Peru*, *false jalap*; *vieruurblom*, *vieruurtjies* (A).

DrGr

## **Phaeoptilum** Radlk. (sthn Afr.: 1 sp.)

### **spinosum** Radlk.

Shrub, up to 4 m high; with branches terminating in spines with alternate, crowded, spine-like, lateral branchlets. **Leaves** sessile or subsessile, fascicled; blade linear, 5–35 × 1–4 mm, greyish green. **Flowers**: solitary or in fascicles; perianth 6–8 mm long, pubescent on outside, yellowish green; Aug., Sep. **Fruit** 15–25 × 12–20 mm, winged, papery, yellowish green turning pink, brownish red or purple with age. Grassland, along watercourses, rocky or sandy soil. *Brittle thorn*; *brosdoring*, *bloudoringbos* (A).

KarSh

## Reference

DYER, R.A. 1975. Nyctaginaceae. *The genera of southern African flowering plants* 1. Botanical Research Institute, Pretoria.

# NYMPHAEACEAE

Aquatic herbs, with submerged rhizomes. **Leaves** floating, peltate; blade usually round or oval; with stipules. **Flowers**: solitary, bisexual, regular, floating; sepals 4, adnate to base of disc; petals many, adnate to disc, innermost petals petaloid staminodia; stamens many, free, with petaloid filaments and small anthers; gynoecium of 8–many free or partly united carpels; carpels sunk in fleshy disc, crowned by furrowed stigmas. **Fruit** a berry, fleshy or spongy, ripening under water, eventually splitting. *Waterlily family*.

## **Nymphaea** L. (sthn Afr.: 4 spp.)

### Key to species:

[after Cook: 187 (2004) – see p. 1121]

1a Petals bright yellow; plants developing long stolons. . . . . .**N. mexicana**
1b Petals white to blue, red or purple; plants not developing long stolons. . . . 2
2a Margins of leaf blade entire, slightly wavy or bluntly toothed in lower half of blade . . . . . .**N. nouchali** var. **caerulea**
2b Margins of leaf blade with blunt teeth or lobes from base to apex . . . . . .**N. nouchali** var. **zanzibariensis**

***mexicana** Zucc.

Floating aquatic herb. **Leaves** with blade ± orbicular, 80–150 mm in diameter. **Flowers**: sepals 25–50 mm long, outer surface green, often suffused with purple, yellowish on inside; petals as long as sepals, bright yellow; Nov.–Jan. Slow-flowing rivers, pools, sometimes also in brackish water. Native to southern USA and Mexico. *Yellow waterlily*; *geelwaterlelie* (A).

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**nouchali** Burm.f. var. **caerulea** (Savigny) Verdc.
*N. caerulea* Savigny
*N. calliantha* Conard

Aquatic herb. **Leaves** with blade orbicular to elliptic, 250–400 mm in diameter, green, red or purple beneath, primary nerves 5–8 on each side of midrib, margins entire. **Flowers**: sepals 30–80 mm long, the outer surface green or whitish with pink apices; petals as long as sepals, blue or bluish purple, sometimes pink, mauve or white; Nov.–May. Streams, pools, dams. *Blue waterlily*, *Cape waterlily*; *blouwaterlelie*, *paddapreekstoel* (A); *amazibu*, *izeleba* (Z).

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**nouchali** Burm.f. var. **zanzibariensis** (Casp.) Verdc.
*N. capensis* Thunb. var. *zanzibariensis* (Casp.) Conard

Aquatic herb. **Leaves** with blade orbicular, ± 200–230 mm in diameter, margins with blunt teeth or lobes. **Flowers**: sepals 30–80 mm long, usually blue or purple outside; petals as long as sepals, blue to violet-blue or reddish. Slow-flowing rivers, dams.

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# OCHNACEAE

Trees, shrubs or dwarf shrubs. **Bark** rough or smooth, sometimes flaking. **Leaves** alternate, simple; blade often with many side veins, margins entire or serrate; stipules present, early caducous or persistent, often united, occurring between petiole and stem. **Flowers**: bisexual; regular; in terminal or axillary panicles, racemes, cymes, or solitary; pedicels articulated at or near base; sepals usually 5, free, usually persistent and accrescent, often red in fruit; petals 5, free; stamens few to many, free; ovary superior, deeply lobed into 5–15 free segments united by a common style. **Fruit** several drupes corresponding to segments of ovary; borne on enlarged and often red receptacle. *Lekkerbreek family*.

## **Ochna** L. (sthn Afr.: 12 spp.)

**serrulata** (Hochst.) Walp.
*O. atropurpurea sensu auct. non* DC.

Evergreen shrub or rarely a small tree, 0.6–2.0 m high. **Branches** densely mottled with lenticels. **Leaves** with blade narrowly elliptic, 25–50 mm long, margins sharply and closely serrulate. **Flowers**: solitary or rarely two, on short lateral spurs; pedicels erect or spreading, articulated 1–2 mm above base; carpels 5, oblong-globose, basally attached to receptacle;

sepals 5, 10–15 mm long and deep wine-red in fruit; petals yellow, 10 mm long; Aug.–Jan. Grassland. *Small-leaved plane*; *fynblaarrooihout* (A); *iLitiye* (X); *umBomvo* (Z).

Zastr

## Reference

DU TOIT, P.C.V. & OBERMEYER, A.A. 1976. Ochnaceae. *Flora of southern Africa* 22: 1–12.

# OLEACEAE

Compiled by P.C. Zietsman, E. Retief & N.L. Meyer

Trees, shrubs, climbers or rarely herbaceous dwarf shrubs. **Leaves** usually opposite, simple or compound; acarodomatia sometimes present; without stipules. **Flowers**: in cymose panicles or solitary; regular, hermaphrodite or occasionally unisexual; calyx shortly or deeply 2–15-lobed; corolla with petals united, usually 4- or 5-lobed; stamens 2, arising from corolla; ovary superior. **Fruit** a drupe, berry or capsule. *Olive family*.

## Key to genera

1a Low virgate dwarf shrub or herbaceous plant with a woody base; fruit a membranous capsule . . . . . **Menodora**
1b Trees or shrubs; fruit a drupe or berry . . . . . 2
2a Fruit a berry . . . . . **Ligustrum**
2b Fruit a drupe . . . . . **Olea**

## **Ligustrum** L. (sthn Afr.: 3 spp.)

### ***lucidum** Aiton f.

Large, evergreen shrub, 4.5–6.0 m high. **Leaves** simple, petiolate; blade leathery, glossy, dark green, ovate, 35–100 mm long, apex acuminate, margins entire. **Flowers**: many, in terminal panicles; corolla 3–5 mm long, dull yellow; Oct.–Feb. **Fruit** a black, shiny berry. Spreading along roadsides and watercourses. Native to eastern Asia. *Chinese wax-leaved privet*; *Chinese liguster*, *glansige mondhout* (A).

VreDm MsGr

## **Menodora** Humb. & Bonpl. (sthn Afr.: 3 spp.)

### **africana** Hook.

Undershrub, 50–250 mm high. **Stems** ridged. **Leaves** deeply divided; segments awl-shaped, margins revolute, roughly hairy. **Flowers**: solitary; calyx lobes multipartite; corolla red in bud,



**Figure 56.** *Olea europea* subsp. *africana* (Oleaceae). Artist: G. Condy.

tube ± 4 mm long, lobes 5, ± 10 × 4.5 mm, apex rounded, yellow, tinged with red when open; Aug.–Apr. **Fruit a** globose, membranous capsule. Grassland, often on rocky sides of small depressions. *Balbossie* (A).

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## **Olea** L. (sthn Afr.: 4 spp.)

### **europaea** L. subsp. **africana** (Mill.) P.S.Green

*O. africana* Mill.
*O. verrucosa* Link

Tree, 3–14 m high. **Leaves** simple; blade narrowly ovate to narrowly oblong-elliptic, 20–85 × 7–15 mm, usually dark green above, paler and densely covered with small scales below, sides tend to curl downwards as well as marginal rim being reflexed. **Flowers**: many-flowered, mainly in axillary panicles; calyx cupular, up to 1 mm long, 4-toothed; corolla ± 3 mm long, white; Oct.–Feb. **Fruit** a subglobose to oblong drupe, up to 10 × 9 mm, green with whitish spots turning black or prune-coloured. From forest and riverside bush to open grassland, flats, stony ground, mountain kloofs and rocky ledges. *Wild olive*; *olienhout*, *swart-olienhout* (A); *motlhware* (T). Figure 56.

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# OLINIACEAE

Trees or shrubs. **Branches** 4-angled. **Leaves** simple, opposite; stipules rudimentary. **Flowers**: in short, axillary, trichotomous cymes, arranged in lax racemes, shorter than subtending leaf; bisexual, regular; calyx truncate or obscurely 4- or 5-lobed, fused with ovary; petals (4)5, free, inserted in throat of calyx tube; stamens 4(5), inserted in calyx tube; ovary inferior, stigma thickened. **Fruit** a globose, false drupe. *Hard pear family*.

## **Olinia** Thunb. (sthn Afr.: 6 spp.)

### **emarginata** Burtt Davy

Small tree or shrub, 2–12 m high. **Leaves** with blade glossy dark green above, paler green and dull below, oblong, 20–40 × 10–25 mm, apex emarginate, lateral vein loops form a continuous line within margins on lower surface. **Flowers**: in loose clusters; petals 3.0–3.5 mm long, pink; Nov.–Jan. **Fruit** ± 10 mm in diameter, red to reddish brown, thinly fleshy, marked by a circular scar left by deciduous calyx tube. In mountain ravines, forest patches and wooded streambanks. *Mountain olinia*, *mountain hard pear*; *berghardepeer*, *rooibessieboom* (A); *umnganalahla*, *iqudu* (X); *unquthu* (Z).

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# ONAGRACEAE

Annual, biennial or perennial herbs, sometimes aquatic. **Leaves** alternate or opposite, simple; blade with margins entire, toothed and lobed; usually with stipules. **Flowers**:

solitary, axillary, subtending leaves sometimes greatly reduced or absent; bisexual, regular; floral tube (hypanthium) usually present; sepals (2–)4 or 5(–7), lobes valvate; petals as many as sepals or absent, free, caducous; stamens as many or twice as many as sepals, free; ovary inferior, style single, stigma entire or deeply lobed. **Fruit** usually a capsule. *Evening primrose family*.

## Key to genera

[Goldblatt & Raven: 149 (1997)]

1a Floral tube absent; sepals persistent in fruit; petals yellow. . . . . **Ludwigia**
1b Floral tube present; sepals not persistent in fruit; petals yellow, rose-purple or white . . . . . 2
2a Seeds with an evident tuft of hairs, the coma; petals rose-purple or white; capsule slender, elongate; basal leaves opposite . . . . . **Epilobium**
2b Seeds lacking a coma; petals yellow, rose-purple or white; capsule clavate or elongate; all leaves alternate . . . . . **Oenothera**

[Descriptions after Goldblatt & Raven: 149–165 (1997)]

## **Epilobium** L. (sthn Afr.: 4 spp.)

### Key to species:

[Goldblatt & Raven: 153 (1997)]

1a Stigma deeply 4-cleft. . . . . 2
1b Stigma entire, clavate. . . . . 3
2a Stems clothed with long, spreading pubescence; leaves subsessile, distinctly clasping base . . . . . **E. hirsutum**
2b Stems clothed with strigillose pubescence; leaves distinctly petiolate . . . . . **E. capense**
3a Leaves subsessile, blade strongly decurrent, narrow, 15–75 × 3–15 mm; petals pale lilac to pink, 2.5–5.0 mm long . . . . . **E. tetragonum** subsp. **tetragonum**
3b Leaves distinctly petiolate, blade narrowly cuneate to attenuate at base, broader, 20–80 × 3–20 mm; petals at first white or cream-coloured, rose-pink following pollination, 5–15 mm long . . . . . **E. salignum**

### **capense** Buchinger ex Hochst.

*E. flavescens* E.Mey. ex Harv.

Perennial herb, 0.1–1.2 m high. **Stems** strigillose pubescent. **Leaves** petiolate; blade narrowly ovate, 20–50 × 0.4–2.5 mm, margins serrate with prominent forward-directed teeth; petioles up to 2.5 mm long. **Flowers**: stigma deeply 4-cleft; petals 6–16 × 3.0–10.5 mm, bright rose-purple, paler purplish, creamy or white; Nov.–Apr. **Fruit** 30–90 mm long, pedicel 10–60 mm long. Moist places.




### **hirsutum** L.

Robust, perennial herb, 0.2–2.5 m high. **Stems** patently pubescent. **Leaves** subsessile, distinctly clasping base; blade narrowly obovate-oblong, 20–120 × 4–30 mm, margins coarsely toothed. **Flowers**: stigma deeply 4-cleft; petals 6–16 × 6–15 mm, bright purplish rose;

Oct.–May. **Fruit** 30–80 mm long, pedicel 2–12 mm long. Moist places. *Salt-of-the-shepherds*; *mosika-nokana*, *noha* (SS); *itswayi lentaba* (Z).




**salignum** Hausskn.

*E. neriophyllum* Hausskn.

Perennial herb, 0.2–1.6 m high. **Stems** glabrous. **Leaves** petiolate; blade narrowly ovate to elliptic, 20–80 × 3–20 mm, base cuneate to attenuate, margins weakly serrulate. **Flowers**: stigma entire; petals 5–15 × 2–7 mm, white or cream-coloured at first, then rose-pink after pollination; Dec.–May. **Fruit** 30–70 mm long, pedicel 8–45 mm long. Moist places.




**tetragonum** L. subsp. **tetragonum**

Perennial herb, 0.1–1.0 m high. **Stem** pubescence entirely strigose or with a copious mixture of glandular trichomes. **Leaves** subsessile; blade narrowly ovate to elliptic, 15–75 × 3–15 mm, strongly decurrent, margins evenly and strongly denticulate. **Flowers**: stigma entire; petals 2.5–5.0 × 2.0–3.5 mm, pale lilac to rich rose-purple; Nov.–Mar. **Fruit** 50–110 mm long, pedicel 1.2–3.0 mm long. Moist places.




## **Ludwigia** L. (sthn Afr.: 7 spp.)

**adscendens** (L.) Hara subsp. **diffusa** (Forssk.) P.H.Raven

*L. stolonifera* (Guill. & Perr.) P.H.Raven

*Jussiaea diffusa* Forssk.

Annual herb. **Stems** procumbent or ascending, rooting at nodes, pubescent. **Leaves** petiolate; blade narrowly ovate to narrowly elliptic, 20–90 × 5–17 mm, 6–12 main veins on each side of midrib; petioles 2–20 mm long. **Flowers**: stamens twice as many as sepals; petals 7–18 × 4–10 mm, lemon-yellow with darker spot at base; Jul.–Jun. **Fruit** 10–30 mm long, ribbed, terete, with bulges. Moist places. *Willow-herb*; *wilgerkruid* (A).




## **Oenothera** L. (sthn. Afr.: 14 spp.)

### Key to species:

[Goldblatt & Raven: 157 (1997)]

1a Petals white or rose-purple; flowers opening near sunrise or sunset . . . . . 2
1b Petals yellow; flowers opening near sunset . . . . . 3
2a Petals rose-purple, 5–10 mm long . . . . . **O. rosea**
2b Petals white, fading purplish, 20–30 mm long . . . . . **O. tetraptera**
3a Floral tube > 60 mm long . . . . . **O. affinis**
3b Floral tube < 60 mm long . . . . . 4

4a Capsules broad at base; open flowers ± reaching apex of stem . . . . . 5
4b Capsules cylindrical or tapering at base; open flowers well spaced down stem . . . . . 6
5a Petals 35–50 mm long . . . . . **O. glazioviana**
5b Petals 7–25 mm long . . . . . **O. biennis**
6a Leaf blades usually deeply and coarsely toothed; buds curved upward . . . . . **O. laciniata**
6b Leaf blades with ± blunt, shallow teeth or margins entire to remotely dentate; buds various . . . . . 7
7a Petals 15–45 mm long . . . . . **O. stricta** subsp. **stricta**
7b Petals 3–12 mm long . . . . . 8
8a Plants appearing glabrous, but with very short, erect hairs; capsules 1.5–2.0 mm thick . . . . . **O. indecora**
8b Plants evidently erect-pubescent; capsules 2–3 mm thick . . . . . **O. parodiana** subsp. **parodiana**

## ***affinis** Cambess.

Annual herb, 0.4–1.5 m high, densely to sparsely long-villous and densely glandular-pubescent. **Stems** erect. **Leaves** sessile; blade cultrate to narrowly ovate, 50–150 × 5–15 mm, margins shallowly toothed. **Flowers**: up to 70 mm in diameter; floral tube 80–110(–130) mm long; sepals 20–35 mm long; petals 20–40 mm long, yellow; Oct. **Fruit** cylindrical, 30–40 mm long. Disturbed places. Native to South America. *Common evening primrose*, *german rampion*; *gewone nagblom* (A).

DrGr

## ***biennis** L.

Biennial herb, 0.3–2.0 m high. **Stems** erect; pubescent with short appressed hairs and longer curved or spreading hairs, some arising from red papillae. **Leaves** sessile or petioles very short; blade narrowly ovate, 80–170 × 20–50 mm, margins strongly dentate, venation prominent. **Flowers**: floral tube 25–40 mm long; calyx with tube 25 mm long, sepals 8–25 mm long; petals 7–25 mm long, yellow, not fading red; Jan.–Mar. **Fruit** cylindrical, 14–40 mm long. Disturbed and waste places. Native to North America.

MsGr

## ***glazioviana** Micheli

*O. erythrosepala* (Borbás) Borbás

Biennial or short-lived perennial herb, 0.8–1.2 m high. **Stems** erect; conspicuously muricate with red bulbous bases on longer hairs. **Leaves** petiolate; blade ovate to ovate-oblong, 50–100 × 25–40 mm, margins strongly crinkled. **Flowers**: floral tube 35–50 mm long; sepals 20–60 mm long, petals 35–50 mm long, golden-yellow, fading red-orange; Nov.–Apr. **Fruit** cylindrical, 20–25 mm long. Disturbed places. Probably native to Europe.

DrGr MsGr

## ***indecora** Cambess

*O. indecora* Cambess. subsp. *bonariensis* W.Dietr.

Annual herb, 0.2–0.6 m high; villous. **Leaves** sessile; blade narrowly ovate, 10–60 mm long, margins entire to dentate, undulate. **Flowers**: < 20 mm in diameter; floral tube 8–15 mm long; sepals 5–6 mm long, often flecked with dark red; petals 3–6 mm long, yellow or bright yellow;

Oct.–Dec., Apr. **Fruit** cylindric, 15–22 mm long, 1.5–2.0 mm thick. Disturbed places. Native to South America. *Evening primrose*; *nagblom* (A).

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### *__laciniata__ Hill

Annual herb, up to 300 mm high; strigillose, densely villous and glandular-pubescent. **Stems** erect. **Leaves** petiolate and sessile; narrowly ovate, 10–80 mm long, margins sinuate-dentate or sinuate-pinnatifid, or rarely subentire. **Flowers**: buds curved upward; floral tube 12–35 mm long; sepals 6–8 mm long; petals 5–7 mm long, bright yellow, fading reddish; Oct., Nov., Feb. **Fruit** cylindrical, 15–50 mm long; seeds coarsely and conspicuously pitted. Disturbed places near water. Native to North America. *Evening primrose*, *cutleaf evening primrose*; *boer-in-die-nag* (A); *lesoma* (SS).

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### *__parodiana__ Munz subsp. __parodiana__

Annual or biennial herb, 0.3–0.7 m high; pubescence villous and glandular-pubescent, often also strigulose. **Stems** erect or somewhat decumbent. **Leaves** sessile; blade narrowly oblong to narrowly ovate or obovate, 25–125 × 5–10 mm, margins shallowly toothed. **Flowers**: floral tube 10–20 mm long; sepals 5–9 mm long; petals 7–12 mm long, light yellow, sometimes with red basal spot; Sep.–Feb. **Fruit** cylindric, 20–30 mm long, 2–3 mm thick. Disturbed places. Native to South America.

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### *__rosea__ L'Hér. ex Aiton

Perennial herb, 200–500 mm high, mostly strigulose. **Stems** erect. **Leaves** petiolate; blade narrowly obovate, 20–50 mm long, margins entire to somewhat pinnatifid at base; petioles 4–30 mm long. **Flowers**: < 20 mm in diameter; floral tube 4–8 mm long; sepals 5–8 mm long; petals 5–10 mm long, bright purplish rose; Sep.–Apr. **Fruit** clavate, 8–10 mm long. In gardens and waste places. Native to South America. *Evening primrose*, *rose evening primrose*; *aandblom*, *rooskleurige nagblom* (A); *moopeli-o-mofubelu* (SS).

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### *__stricta__ Ledeb. ex Link subsp. __stricta__

*O. nocturna sensu* Harv.

Annual or short-lived perennial herb, 0.3–1.0 m high, branched from base with a conspicuous rosette of leaves; villous and glandular-pubescent. **Leaves** sessile; blade narrowly obovate, 20–80 mm long, with prominent pale yellow midribs, margins sparsely serrulate. **Flowers**: floral tube 20–45 mm long; sepals 15–22 mm long; petals 15–45 mm long; bright yellow, fading reddish; Mar.–Dec. **Fruit** cylindrical, 20–40 mm long. Disturbed places. Native to South America. *Evening primrose*; *aandblom*, *nagblom* (A).

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### *__tetraptera__ Cav.

Perennial herb, 0.15–0.40 m high; covered with long spreading and shorter appressed hairs. **Leaves** petiolate; blade narrowly obovate or elliptic, 30–100 mm long, margins irregularly

sinuate-pinnatifid to entire; petioles < 10 mm long. **Flowers**: up to 60 mm in diameter; floral tube 8–10 mm long; sepals 20–30 mm long; petals 20–30 mm long, white, fading purplish; Sep.–Apr. **Fruit** clavate, 10–15 mm long. Roadsides and waste places. Native to South America. *White evening primrose*; *witaandblom*, *witnagblom* (A); *moopeli-o-mosoeu* (SS).

| VreDm | AcGr | DrGr | MsGr | | Zastr |
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# OROBANCHACEAE

Parasitic herbs; often drying black. **Stems** simple or branched, fleshy, usually covered with gland-tipped, papillose hairs. **Leaves** scale-like or well developed, usually opposite; stipules absent. **Flowers**: bisexual; irregular; solitary in axils of upper leaves, spikes or racemes few- to many-flowered; sessile or pedicellate; usually bracteate; calyx tubular with 2–5 lobes or teeth; corolla bilabiate, with tube usually ± funnel-shaped; stamens 4; filaments usually thickened; nectary present at base of ovary; ovary superior, bilocular, many ovules per locule; style terete, stigma thickened. **Fruit** a capsule, enclosed in calyx. **Seeds** many, linear, obovoid or clavate, straight or curved. *Broomrape family*.

## Key to genera

[after Smithies: 509 (2000)]

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| 1a | Plants holoparasitic; leaves scale- or bract-like or aborted | 2 |
| 1b | Plants hemiparasitic; leaves with chlorophyll | 5 |
| 2a | Flowers in dense spikes; corolla limb 3-lobed | **Hyobanche** |
| 2b | Flowers usually in more lax racemes or spikes; corolla limb 4- or 5-lobed | 3 |
| 3a | Corolla tube bent abruptly above middle | **Striga** |
| 3b | Corolla tube straight | 4 |
| 4a | Corolla yellow or orange with red or markedly darker veins | **Alectra** |
| 4b | Corolla variously coloured, if yellow, without darker veins | **Harveya** |
| 5a | Anthers with 2 fertile, equal, to somewhat unequal thecae | 6 |
| 5b | Anthers unithecate or with 1 fertile theca and 1 variously modified theca | 7 |
| 6a | Calyx distinctly inflated in fruit | **Melasma** |
| 6b | Calyx not inflated in fruit | **Alectra** |
| 7a | Corolla subcampanulate | **Sopubia** |
| 7b | Corolla tubular | 8 |
| 8a | Corolla tube sharply curved at or above the middle | **Striga** |
| 8b | Corolla tube straight or sometimes slightly curved | 9 |
| 9a | Flowers small, usually sessile, in spikes or globose clusters; corolla lobes subequal | **Buchnera** |
| 9b | Flowers large, usually with a pedicel, in racemes; corolla lobes unequal | **Cycnium** |

## **Alectra** Thunb. (sthn Afr.: 20 spp.)

Key to species:

1a Leaves rudimentary, scale-like . . . . . 2
1b Leaves well developed, blade linear or ovate. . . . . 3
2a Plants slender, up to 0.60 m high . . . . . **A. orobanchoides**
2b Plants tufted, up to 0.12 m high. . . . . **A. pumila**
3a Leaf blade with margins prominently dentate at base. . . . . **A. sessiliflora** var. **sessiliflora**
3b Leaf blade with margins entire . . . . . 4
4a Leaf blade 30 × 15 mm . . . . . **A. thyrsoidea**
4b Leaf blade 15 × 5 mm . . . . . 5
5a Stems and leaves covered with bulbous hairs; flowers in a spike . . . . . **A. basutica**
5b Stems and leaves pubescent, bulbous hairs absent; flowers subsessile in upper leaf axils . . . . . **A. capensis**

### **basutica** (E.Phillips) Melch.

Annual, hemiparasitic herb, up to 0.3 m high. **Stems** erect; stems and leaves covered with bulbous hairs;. **Leaves** sessile, overlapping; blade ovate, 15 × 5 mm, margins entire. **Flowers**: in a spike; bracts dentate; corolla dull yellow with red veins; Jan.–Mar. Mountain slopes. *Moema-osi*, *seona* (SS).

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### **capensis** Thunb.

*Melasma capensis* (Thunb.) Hiern)

Annual or perennial, hemiparasitic herb, up to 0.35 m high. **Stems** erect, unbranched; stems and leaves whitish pubescent, bulbous hairs absent; leafy. **Leaves** sessile; blade ovate or narrowly ovate, margins entire. **Flowers**: subsessile in upper leaf axils; corolla up to 25 mm long, yellow or orange with brown lines; Nov.–Mar. Rocky, montane grassland.

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### **orobanchoides** Benth.

*Melasma orobanchoides* (Benth.) Engl.

Annual, holoparasitic herb, up to 0.6 m high. **Stems** slender, simple, or branched only from base, base of stem orange. **Leaves** rudimentary; blade scale-like, 2–5 mm long, margins entire, greyish green. **Flowers**: in false whorls, opposite or solitary; corolla 20 mm in diameter when expanded, yellow or orange; Jan.–Jun. Grassland, moist, shady streambanks, rocky slopes, kloofs.

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### **pumila** Benth.

Annual, holoparasitic herb, up to 0.15 m high; uniformly dwarf and tufted. **Stems** erect. **Leaves** with blade scale-like. **Flowers**: in a dense spike; corolla yellow or yellowish orange; Jan., Feb. Edges of pans, sandy soil in fallow lands.

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**sessiliflora** (Vahl) Kuntze var. **sessiliflora**

*A. melampyroides* Benth.

*Melasma sessiliflorum* (Vahl) Hiern

Annual or perennial, hemiparasitic herb, up to 0.7 m high. **Stems** erect, branched; densely pubescent with erect white hairs. **Leaves** sessile; blade ovate to narrowly ovate, broadly cuneate at point of insertion, margins deeply toothed in lower part. **Flowers**: in a lax, terminal spike; corolla yellow; Jan.–Apr. Wet grassland, marshes, along riverbanks. *Verfblommetjie* (A); *mokhele*, *seona* (SS).

VreDm | | DrGr | MsGr | | |

**thyrsoidea** Melch.

Annual herb, hemiparasitic, up to 0.4 m high. **Stems** erect, unbranched; hispid. **Leaves** sessile; blade ovate to narrowly ovate, ± 30 × 15 mm, base clasping, margins entire. **Flowers**: in a dense spike; corolla 18–25 mm long; Nov.–Feb. Montane grassland.

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## **Buchnera** L. (sthn Afr.: 9 spp.)

### Key to species:

1a Flowers with corolla tube outer surface glabrous or nearly so . . . **B. simplex**
1b Flowers with corolla tube outer surface pubescent . . . . . 2
2a Corolla tube with outer surface softly hairy . . . . . **B. dura**
2b Corolla tube with outer surface hispid . . . . . **B. reducta**

**dura** Benth.

Annual or perennial hemiparasitic herb, up to 0.3 m high. **Stems** erect, slender, much branched from base; leafy; drying black. **Leaves** sessile; blade narrowly ovate-obovate or sublinear, 12–35 mm long, hispidulous-scabrid. **Flowers**: many in a spike; corolla with tube softly hairy, purple or blue; Nov.–Jan. Grassland, hillsides.

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**reducta** Hiern

Annual, hemiparasitic herb, up to 0.3 m high; stems and leaves hairy, ranging from patent to appressed. **Stems** erect. **Leaves** with blade linear or narrowly obovate. **Flowers**: small, up to 5 mm long; in a spike; corolla tube with outer surface hispid, blue-mauve; Feb.–May. Grassland, edges of pans, along streams.

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**simplex** (Thunb.) Druce

Annual or perennial, hemiparasitic herb, up to 0.35 m high. **Stems** slender. **Leaves** ± basal; blade ovate, oblong or obovate, 70 × 15 mm, 3-veined. **Flowers**: in congested, terminal inflorescences; calyx glabrous except on margins; corolla tube glabrous or nearly so on outer surface, white; Sep.–Apr. Grassland, moist places, vleis, streambanks. *Umusa omkhulu* (Z).

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## **Cycnium** Benth. emend. Engl. (sthn Afr.: 3 spp.)

### Key to species:

Leaf blade dentate; flowers subsessile . . . . . .**C. racemosum**
Leaf blade entire; flowers pedicellate . . . . . .**C. tubulosum** subsp. **tubulosum**

### **racemosum** Benth.

Perennial, hemiparasitic herb, up to 0.7 m high; dusky when dry. **Stems** erect, unbranched, ribbed. **Leaves** sessile, opposite; blade narrowly ovate, oblong or elliptic, 80 × 20 mm, margins denticulate in upper half and purplish red. **Flowers**: in terminal racemes; corolla 16–30 mm long, pink; Nov.–Apr. Grassland. *Large pink ink plant*; *berginkplant* (A); *injanga* (X); *uhlabahlangane* (Z).

MsGr

### **tubulosum** (L.f.) Engl. subsp. **tubulosum**

*Gerardia tubulosa* L.f.
*Rhamphicarpa tubulosa* (L.f.) Benth.

Perennial, hemiparasitic herb, up to 0.6 m high; dusky when dry. **Stems** erect to semi-erect, slender, glabrous. **Leaves** sessile, opposite; blade linear, margins entire. **Flowers**: in terminal racemes; corolla 10–15 mm long, purple, pale rosy, blue or white with a white spot at throat; Oct.–May. Grassland, vleis, along watercourses.

VreDm DrGr KarSh

## **Harveya** Hook. (sthn Afr.: 25 spp.)

### Key to species:

[after Randle: 16 (2006)]

1a Plant up to 0.1 m high, appearing as a tuft of flowers arising from surface of soil. . . . . **H. pumila**
1b Plant 0.15–1.00 m high . . . . . 2
2a Stems, bracts and calyces glabrous. . . . . **H. speciosa**
2b Stems, bracts and calyces variously pubescent . . . . . 3
3a Plant 0.20–0.65 m high; stems, scales and calyces dull red to dusky purple . . . . . **H. pauciflora**
3b Plant 0.15–0.40 m high; stems, scales and calyces usually greenish yellow, sometimes with dull red or crimson markings . . . . . **H. huttonii**

### **huttonii** Hiern

*H. pulchra* Hilliard & B.L.Burtt

Erect, holoparasitic herb, 0.15–0.40 m high; stems, scales and calyces pubescent, usually greenish yellow, sometimes with dull red or crimson markings. **Flowers**: inflorescence racemose; calyx divided to 1/3 of its length or less, lobes deltate; corolla with tube 28–44 mm long and white or pale yellow, throat 30–45 mm wide and white, pale yellow or bright yellow, limb pale pink to mauve or lilac; Nov.–Feb. Grassland, forest margins.

MsGr

**pauciflora** (Benth.) Hiern
*H. coccinea* (Harv.) Schltr.

Erect, holoparasitic herb, 0.20–0.65 m high; stems, scales and calyces pubescent, dull red to dusky purple. **Flowers**: inflorescence racemose; calyx divided to 1/3 of its length or less, lobes deltate; corolla with tube 20–30 mm long, creamy white, pale pink or yellow, throat 18–25 mm wide, pink to purple; Oct.–Jan. Grassland.

DrGr

**pumila** Schltr.
*H. randii* Hiern

Perennial, dwarf, holoparasitic herb, up to 0.1 m high; only a tuft of flowers appears above ground. **Leaves** scale-like. **Flowers**: inflorescence corymbose, abbreviated; calyx ± campanulate, glabrescent, lobes subacute; corolla with tube ± 35 mm long, dull white to pink, throat ± 12 mm wide, yellow; Aug.–Oct. Grassland. *Geelinkblom* (A).

DrGr MsGr

**speciosa** Bernh.

Perennial, holoparasitic herb, up to 1 m high; stems, bracts and calyces glabrous. **Stems** erect. **Leaves** scale-like. **Flowers**: inflorescence racemose; calyx cylindrical, strongly 10-nerved; corolla with tube ± 70 mm long, tube and limb creamy white, throat ± 70 mm wide, pale lemon-yellow; Nov.–Mar. Grassland, along streambanks. *Inkblom* (A); *mokunye*, *seona* (SS); *isinama* (X); *umshelezana omhlophe* (Z).

MsGr Zastr

## **Hyobanche** L. (sthn Afr.: 8 spp.)

**rubra** N.E.Br.
*H. sanguinea sens. auct.*

Perennial, holoparasitic herb, up to 0.15 m high. **Stems** mostly buried. **Leaves** scale-like. **Flowers**: in a thick, flat-topped spike; corolla tube ± 60 mm long, hairy, throat ± 6 mm long, pale to dark salmon-pink, almost red; Oct.–Dec. *Snail flower*; *rooipop*, *soetpop*, *skilpadkos*, *inkplant* (A).

MsGr

## **Melasma** P.J.Bergius (sthn Afr.: 1 sp.)

**scabrum** P.J.Bergius var. **scabrum**

Perennial, hemiparasitic herb, up to 0.1 m high; hispid-scabrid with short rough tubercles. **Stems** erect, leafy. **Leaves** sessile; blade narrowly ovate, 10–50(–70) × 2–5(–10) mm, apex obtuse, margins subentire to dentate. **Flowers**: in lax racemes at ends of branches; pedicels 25–100 mm long; bracts leaf-like; calyx campanulate-oblong, 10-nerved, 5-angled, inflated in fruit; corolla 20–38 mm long, tube purple or maroon, lobes and throat white, brown or pale yellow; Jan.–Mar. Grassland, streambanks, marshes. *Seona*, *tika-letša* (SS).

MsGr

## **Sopubia** Buch.-Ham. ex D.Don (sthn Afr.: 4 spp.)

### **cana** Harv. var. **cana**

Perennial, hemiparasitic herb, up to 0.3 m high; all parts, except flowers and capsules, usually densely clothed with short, white felt. **Stems** erect. **Leaves** scattered or fasciculate; blade narrowly linear, ± 25 × 2 mm, short, leafy shoots in axils. **Flowers**: in leafy, terminal, simple racemes; corolla ± 20 mm in diameter, tube short within calyx, lobes crinkly, mauve-pink; Nov.–Apr. Grassland, grassy hillsides, edges of vleis. *Silvery sopubia*; *leilane*, *pulumo-tšoeu* (SS).

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## **Striga** Lour.(sthn Afr.: 7 spp.)

### Key to species:

[after Hepper: 127 (1990)]

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| 1a | Calyx with 4 or 5 ribs, each ending in a calyx tooth | 2 |
| 1b | Calyx with 10 or more ribs (nerves), at least 1 between each calyx tooth | 3 |
| 2a | Stems glabrous or slightly pubescent, ± succulent | **S. gesnerioides** |
| 2b | Stems conspicuously harshly pubescent. | **S. bilabiata** subsp. **bilabiata** |
| 3a | Flowers alternate, 2 or 3 out at a time | **S. asiatica** |
| 3b | Flowers in opposite pairs, many out at a time | **S. elegans** |

### **asiatica** (L.) Kuntze

*Buchnera asiatica* L.
*S. lutea* Lour.

Annual, hemiparasitic herb, up to 0.3 m high; hispidulous-scabrid. **Stems** harshly pubescent. **Leaves** with blade linear, ± 20 × 3 mm. **Flowers**: alternate, 2 or 3 out at a time, in slender spikes; calyx with 10 or more ribs (nerves), at least 1 between each calyx tooth; corolla tube minutely glandular-puberulous outside, upper lip much shorter than lower, red; Dec.–May. Grassland. *Witchweed*, *mealie poison*; *rooiblom*, *vuurbossie* (A); *seona* (SS); *isona* (Z).

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### **bilabiata** (Thunb.) Kuntze subsp. **bilabiata**

*Buchnera bilabiata* Thunb.
*S. thunbergii* Benth.

Annual or perennial, hemiparasitic herb, up to 0.3 m high; grey-green when dry, scabrid, hispid. **Stems** conspicuously harshly pubescent. **Leaves** foliaceous with blade linear to narrowly ovate, floral leaves exceeding calyx. **Flowers**: in dense spikes; calyx with 4 or 5 ribs, each ending in a calyx tooth; corolla purple-pink, mauve or white; Nov.–Mar. Grassland. *Small witchweed*; *seona* (SS); *isinone esimhlophe*, *isona* (Z).

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### **elegans** Benth.

Annual, hemiparasitic herb, up to 0.33 m high; green when dry, hispid-scabrid. **Stems** conspicuously harshly pubescent**. Leaves** with blade narrowly linear-ovate, ± 20 × 2 mm.

**Flowers**: in opposite pairs, many out at a time; calyx with 10 or more ribs (nerves), at least 1 between each calyx tooth; corolla with tube glandular-puberulous outside, upper lip not much shorter than lower, red; Nov.–May. Grassland. *Large witchweed*; *groot-rooiblom*, *kopseerblommetjie* (A); *lethibela*, *seona* (SS); *umnaka* (X); *isona* (Z).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

**gesnerioides** (Willd.) Vatke ex Engl.
*Buchnera gesnerioides* Willd.
*S. orobanchoides* (R.Br.) Benth.

Perennial, holoparasitic herb, up to 0.3 m high; dusky when dry, puberulous or nearly glabrous. **Stems** glabrous or slightly pubescent, ± succulent. **Leaves** all scale-like. **Flowers**: many in spikes; calyx 5-ribbed, each ending in a calyx tooth; corolla pink, reddish purple, mauve, purple or white; Jan.–Apr. Bushveld and grassland. *Purple witchweed*, *tobacco witchweed*; *bloublom*, *rooiblom* (A); *seona* (SS); *igalo* (X).

VreDm | AcGr | MsGr | KarSh

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# OXALIDACEAE

Stemless or caulescent herbs; usually with bulbs, sometimes with contractile roots. **Leaves** alternate or in a basal rosette, palmately or pinnately compound, rarely 1-foliolate leaflets often folded together at night; with or without stipules. **Flowers**: in cymose inflorescences; peduncles 1- or more-flowered; bracts present or absent; bisexual, regular; sepals and petals 5, free, twisted in bud; stamens 10: 5 long and 5 short; united at base; ovary superior, 5-locular with 5 free styles. **Fruit** a 5-lobed capsule, ejecting seeds explosively. *Sorrel family*.

## **Oxalis** L. (sthn Afr.: 195 spp.)

### Key to species:

[after Salter: 53(1944)]

1a Peduncle > 1-flowered . . . . . 2
1b Peduncle 1-flowered . . . . . 5
2a Corolla yellow . . . . . 3

2b Corolla pink or violet . . . . . 4
3a Plant without a bulb . . . . . **O. corniculata**
3b Plant with bulbs . . . . . **O. haedulipes**
4a Underground stem reduced to a disc; leaf and peduncle bases modified to form scales . . . . . **O. latifolia**
4b Underground stem or rhizome present; petioles and peduncles arising at apex or from exserted stem . . . . . **O. semiloba** subsp. **semiloba**
5a Bracts 2, opposite, arising from an upper articulation on peduncle . . . . . **O. smithiana**
5b Bracts 0–2, alternate, or if subopposite, not at an articulation . . . . . 6
6a Leaflets longer than broad . . . . . **O. lawsonii**
6b Leaflets as broad or broader than long . . . . . 7
7a Sepals with apices acute, pilose . . . . . **O. obliquifolia**
7b Sepals with apices obtuse, glabrous . . . . . **O. depressa**

## ***corniculata** L.

*O. repens* Thunb.

Creeping, much-branched, annual herb, up to 200 mm high. **Roots** fibrous, without a bulb. **Leaflets** broadly obovate, bilobed, 6–20 × 10–25 mm, ecallose. **Flowers**: peduncle > 1-flowered; sepals ecallose; corolla yellow, ± 7 mm long; Sep.–Apr. Sandy soil in shade of grasses, well drained. Native to Europe and Asia. *Yellow oxalis*, *creeping lady's sorrel*; *tuinsuring*, *ranksuring* (A); *bolila* (SS); *isithathe* (Z).

DrGr | MsGr | KarSh | Zastr

## **depressa** Eckl. & Zeyh.

*O. dammeriana* Schltr.
*O. inops* Eckl. & Zeyh.

Stemless, perennial herb, up to 120 mm high. **Tunics** hard, sometimes prominently nerved. **Leaflets** broadly obovate, 3–7 × 5–10 mm, apex slightly bilobed, ecallose or with small black calli. **Flowers**: peduncle 1-flowered; sepals usually with 2 (rarely more) apical calli, obtuse, glabrous; corolla white, rosy or violaceous with yellow tube, 15–30 mm long; Oct.–Apr. Grassland, sandy soils, moist places or near water. *Sorrel*; *suring* (A); *bolila* (SS).

VreDm | DrGr | KarSh

## **haedulipes** T.M.Salter

Perennial herb, up to 200 mm high. **Tunics** conspicuously longitudinally ridged. **Leaflets** broadly obovate, 5–10 × 7–17 mm, bilobed, ecallose. **Flowers**: peduncle > 1-flowered; sepals with orange apical calli; corolla yellow, tube concolorous, 10–15 mm long; Jan.–Apr. Rocky places. *Bergsuring* (A).

AcGr | DrGr | KarSh

## ***latifolia** Kunth

Perennial herb, up to 250 mm high. **Bulbs** giving rise to many runners which develop their own bulbils. **Leaflets** broadly obdeltoid, 10–25 × 2–45 mm, ecallose. **Flowers**: peduncle > 1-flowered; sepals with 2 conspicuous orange-brown apical calli; corolla violet, tube greenish; Dec.–May. Granite outcrops, disturbed areas, in moist and shady places. Native to South America. *Red garden sorrel*, *garden sorrel*; *rooituinsuring*, *tuinsuring* (A).

DrGr

**lawsonii** F.Bolus
*O. seineri* R.Knuth

Perennial herb, up to 50 mm high; densely pubescent. **Tunics** with outer ones linear, undulate, crispate and interwoven. **Leaflets** ovate-orbicular, up to 14 × 10 mm, conduplicate-falcate. **Flowers**: peduncle 1-flowered; sepals ecallose; petals pink, tube yellow; 18–25 mm long; Feb.–Apr. Rocky places. Woodland, pans, depressions. *Vlaktesuring* (A).

KarSh

**obliquifolia** Steud. ex Rich.

Perennial herb, up to 200 mm high. **Tunics** roughly veined. **Leaflets** broadly obovate, 8–18 × 12–25 mm, often with obscure calli. **Flowers**: peduncle 1-flowered; sepals ecallose, with apices acute, pilose; petals rosy or rosy-violaceous, rarely white, tube yellow, 14–23 mm long; Nov.–Mar. Grassland, sandy soil. *Oblique-leaved sorrel*; *skuinsblaarsuring* (A); *bolila* (SS).

VreDm AcGr MsGr KarSh

**semiloba** Sond. subsp. **semiloba**

Perennial herb, up to 400 mm high. **Tunics** smooth. **Leaflets** obovate, 9–20 × 16–26 mm, ecallose. **Flowers**: peduncle > 1-flowered; sepals with rusty apical calli; petals purplish pink, tube yellow, 10–15 mm long; Dec.–Mar. Grassland, wet and sandy soil, shady places. *Transvaal sorrel*; *Transvaal-suring*, *suring* (A); *bolila* (SS); *isimuncwane* (Z).

Zastr

**smithiana** Eckl. & Zeyh.
*O. galpinii* Schltr.
*O. gracilicaulis* Eckl. & Zeyh.

Stemless, perennial herb, up to 200 mm high. **Tunics** a few, thin. **Leaflets** bifurcate to middle or below, lobes linear, 10–45 mm long, ecallose. **Flowers**: peduncle 1-flowered; bracts 2, arising from an upper articulation on peduncle; sepals with 2 orange-red apical calli; petals pale lilac or white, tube greenish, 17–25 mm long; Aug.–Apr. Grassland, on dolomite outcrops. *Narrow-leaved sorrel*; *klawersuring* (A); *bolila*, *bolila-ba-lipoli* (SS); *inkolowane* (X, Z).

DrGr MsGr KarSh

## Reference

SALTER, T.M. 1944. The genus *Oxalis* in South Africa. *Journal of South African Botany*, Supplementary volume 1: 1–355.

# PAPAVERACEAE

Annual or perennial herbs, scramblers or climbers; often with milky or yellow latex. **Leaves** alternate; basal and/or cauline; simple or compound; blade often deeply lobed or pinnate, sometimes prickly; without stipules. **Flowers**: mostly solitary, axillary or terminal racemes; bisexual, regular; sepals 2 or 3, often falling quickly; petals 4–6, free or ± connated, crumpled in bud; stamens 4–many, free; ovary superior; style absent; stigma disc-shaped. **Fruit** a capsule or nut, opening by pores or slits. *Poppy family*.

## Key to genera

1a Petals free . . . . . 2
1b Petals ± connated . . . . . 3
2a Corolla pale yellow to white; capsule opening by slits . . . . . **Argemone**
2b Corolla salmon-pink or orange-red; capsule opening by pores beneath stigmas . . . . . **Papaver**
3a Fruit a narrowly ovoid, compressed capsule . . . . . **Cysticapnos**
3b Fruit a small, ± globose, turgid nut. . . . . **Fumaria**

## **Argemone** L. (sthn Afr.: 3 spp.)

### ***ochroleuca** Sweet subsp. **ochroleuca**

*A. subfusiformis* G.B.Ownbey

Robust, spiny, annual herb, up to 0.9 m high; pioneer plant. **Stems** exude a yellow sap when cut. **Leaves** thick-textured, blade deeply lobed, bluish green with prominent white veins. **Flowers**: corolla pale yellow to white; Aug.–May. **Fruit** an oblong capsule with many stout spines, opening by slits. Cultivated land. Native to Mexico. *Mexican poppy*, *yellow poppy*; *bloudissel*, *geelpoppie* (A).

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## **Cysticapnos** Mill. (sthn Afr.: 5 spp.)

### **pruinosa** (Bernh.) Lidén

*Phacocapnos pruinosus* (E.Mey.) Bernh.

Climbing herb. **Leaves** bluish green; blade pinnate, margins deeply lobed. **Flowers**: uppermost petal with magenta base internally; corolla pink; Nov.–Jan. **Fruit** a narrowly ovoid, compressed capsule. Scrub.

| | | | MsGr | | |
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## **Fumaria** L. (sthn Afr.: 2 sp.)

### ***muralis** Sond. ex W.D.J.Koch subsp. **muralis**

*F. officinalis* L. var. *capensis* Harv.

Erect to sprawling, annual herb, up to 0.6 m high. **Leaves** petiolate; blade bipinnate, pinnae deeply lobed. **Flowers**: corolla ± 10 mm long, produced into a spur; pink with purple

tips; Jul.–Oct. **Fruit** a small, ± globose, turgid nut. Weed in cultivated lands. Native to Europe.

DrGr

## **Papaver** L. (sthn Afr.: 3 spp.)

### **aculeatum** Thunb.

*P. gariepinum* Burch.

Erect, annual herb, up to 0.9 m high. **Leaves** with blade, bluish green, shallowly to deeply pinnately lobed, dentations with apical yellowish spines, midrib and veins densely spiny beneath, up to 250 × 60 mm. **Flowers**: peduncles drooping; corolla, ± 40 mm in diameter, petals fall off quickly, salmon-pink or orange-red; Nov.–Jan. **Fruit** a capsule opening by pores, glabrous. Old cultivated lands and waste places, riverbeds, vleis. *Wild poppy*, *orange poppy*; *doringpapawer*, *koringpapawer*, *wildepapawer* (A); *sehlohlo* (SS).

VreDm AcGr DrGr MsGr KarSh

# PEDALIACEAE

Compiled by P.C. Zietsman, E. Retief & N.L. Meyer

Annual or perennial herbs, rarely small trees or shrubs. **Leaves** opposite or upper ones sometimes alternate to apparently fascicled, blade simple, margins entire to pinnatilobed, often hairy and glandular (sticky), without stipules. **Flowers**: usually axillary and solitary, rarely in terminal racemose inflorescences; bisexual, irregular, weakly 2-lipped; usually petiolate, nectarial glands present at base of petiole; petals 5, united; stamens 4, fertile (2 shorter than the others) and 1 sterile, arising from corolla tube; anthers often coherent in pairs; ovary superior. **Fruit** a capsule or nut, often 2-horned or with spines. *Sesame family*.

## Key to genera

[after Ihlenfeldt: 86 (1988)]

1a Fruit with a 1–20 mm-broad parchment-like wing on each of the 4 edges . . . . . **Pterodiscus**

1b Fruit without parchment-like wings . . . . . 2

2a Fruit woody, either indehiscent or tardily dehiscent only at apex; armed with spines or hooks; procumbent, perennial herb . . . . . **Harpagophytum**

2b Fruit a dehiscent, non-woody capsule; erect annual or perennial herb . . . . 3

3a Capsule obtuse or truncate at apex, with 2 lateral horns at angles of apex (sometimes not very conspicuous); seeds never winged; largest leaves usually sagittate or 3-lobed . . . . . **Ceratotheca**

3b Capsule without lateral horns at apex; seeds sometimes with conspicuous wings; leaves very variable . . . . . **Sesamum**

## **Ceratotheca** Endl. (sthn Afr.: 4 spp.)

**triloba** (Bernh.) Hook.f.
*C. lamiifolia* (Engl.) Engl.
*Sporledera triloba* Bernh.

Annual or perennial herb, up to 2.5 m high. **Leaves** (in middle portion of stem) broadly cordate to trilobed, sometimes tripartite or digitate, margins coarsely crenate. **Flowers**: solitary, axillary, on short pedicels; corolla 20–60 mm long, lilac to cream-coloured with purple stripes on anterior lobe, running down into throat. **Fruit** a capsule, 15–28 × 5–7 mm, with 2 lateral horns ± 8 mm long, each with broad triangular base. Sandy soils, often in disturbed vegetation.

DrGr

## **Harpagophytum** DC. ex Meisn. (sthn Afr.: 2 spp.)

**procumbens** (Burch.) DC. ex Meisn. subsp. **procumbens**
*H. burchellii* Decne.
*Uncaria procumbens* Burch.

Procumbent, perennial herb. **Leaves** petiolate; blade narrowly ovate, pinnatilobed with 5 main lobes, up to 65 × 40 mm; petioles 30–45 mm long. **Flowers**: solitary; shortly pedicelled, corolla with tube cylindrical, constricted at base, 50–60 mm long, limb 25–40 mm in diameter, light purple or pink, limb purple, lobes purple, yellow or occasionally white outside, yellow inside; Nov.–Mar. **Fruit** woody, laterally compressed, ovate or oblong in lateral view, with 2 obtuse protuberances on each face, and in addition either with 2 rows of curved arms along both edges, each bearing recurved spines, or edges with 2 rigid wings bearing recurved spines. Deep red or brown sand in bush savanna, especially in overgrazed places. *Devil's claw*, *grapple thorn*; *duiwelsklou*, *Kalahari-skaapklou* (A); *kanako* (T).

AcGr DrGr KarSh

## **Pterodiscus** Hook. (sthn Afr.: 4 spp.)

**speciosus** Hook.

Perennial herb, up to 200 mm high; basal organ a short woody stem, not distinctly swollen, arising from a subterranean, usually pyriform, tuber. **Branches** from stem annual and erect. **Leaves** linear to lorate, sinuate to pinnatilobed. **Flowers**: solitary, axillary, on short pedicels; corolla with tube cylindrical, 25–50 mm long, somewhat gibbous at base, limb 30–45 mm long, yellowish to purplish red, lobes with darker stripes leading to dark red throat; Oct.–May. **Fruit** ovate to rotund in lateral view, a separate beak not discernible, up to 35 mm × 41 mm, with 4 parchment-like wings, veins of wings indistinct. Alluvial soil in grassland. Figure 21, p. 25.

AcGr DrGr MsGr KarSh

## **Sesamum** L. (sthn Afr.: 11 spp.)

Key to species:

Leaves with blade mostly 5–7-lobed in lower part, upper ones 3-lobed; seeds with wings all round or on 3 sides . . . . . **S. capense**
Leaves all 3-lobed; seeds with short, sometimes minute, wings . . . . . **S. triphyllum** subsp. **triphyllum**

**capense** Burm.f.

Annual herb, up to 1.5 m high. **Leaves** with blade mostly 5–7-lobed in lower part, upper ones 3-lobed, terminal leaflet up to 70 mm long. **Flowers**: solitary, axillary, shortly pedicellate; corolla 25–45 mm long; purple with dark purple throat; Dec.–Apr. **Fruit** a capsule, erect, ± 30 mm long, glabrous. **Seeds** with wings all round or on 3 sides. Grassland; disturbed areas. *Aprilbaadjie*, *brandogie* (A).

DrGr KarSh

**triphyllum** Welw. ex Asch. var. **triphyllum**

*S. gibbosum* Bremek. & Oberm.

Annual herb, 0.25–2.00 m high. **Leaves** all 3-lobed, terminal leaflet up to 70 mm long. **Flowers**: solitary, axillary, shortly pedicellate; corolla 30–50 mm long, inferior lip of flower not or slightly prominent; corolla mauve or purple; Dec.–Jul. **Fruit** a capsule, ± 40 mm long, erect, hairy. **Seeds** with short, sometimes minute, wings. Grassland, roadsides, growing in limestone gravel and calcareous soil. *Wild sesame*; *wildesesam* (A).

DrGr KarSh

## Reference

IHLENFELDT, H.-D. 1988. Pedaliaceae. *Flora zambesiaca* 8,3: 86–113.

# PHYLLANTHACEAE

Herbs, shrubs or trees; unisexual; latex absent. **Leaves** simple; alternate, subopposite or sometimes whorled; blade with base symmetrical, rarely asymmetrical, margins usually entire; with stipules. **Flowers**: in axillary inflorescences, inflorescences fasciculate, capitate, spicate or racemose; regular; sepals 3–8; petals (2–)4–6 or absent; disc usually present, intra- or extrastaminal; stamens 3–10(–19), filaments free or fused; ovary superior; style usually bifid, stigma terete. **Fruit** a schizocarp, drupe or berry.

## **Phyllanthus** L. (sthn Afr.: 24 spp.)

### Key to species:

[after Radcliffe-Smith: 38 (1996)]

1b Stems and branches undifferentiated . . . . . 2
1a Stems and branches differentiated into 2 types . . . . . 3
2a Leaves with blade linear, apex spinous, margins involute. . . . . **P. incurvus**
2b Leaves with blade variously shaped, apex obtuse or rounded, margins flat . . . . . **P. maderaspatensis**
3a Lateral shoots smooth, glabrous . . . . . **P. parvulus** var. **garipensis**
3b Lateral shoots finely scabrid to papillose-puberulous. . . . . **P. parvulus** var. **parvulus**

**incurvus** Thunb.

Perennial herb, up to 0.3 m high. **Stems** erect, slender; several from a woody rootstock. **Leaves** with blade linear, up to 25 × 5 mm, apex spinous, margins involute, without visible veins. **Flowers**: female pedicels 2–6 mm long; perianth yellowish red; Oct.–Mar. **Fruit** stalked. Grassland.

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**maderaspatensis** L.

Perennial herb, up to 0.3 m high. **Leaves** with blade variously shaped, ± 30 × 7 mm, apex obtuse or rounded, margins flat, lateral veins prominent below. **Flowers**: perianth yellowish green; Nov.–Jun. **Fruit** sessile. Woodland, grassland, among rocks. *Skilpadbossie* (A); *leetsane* (T).

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**parvulus** Sond. var. **garipensis** (E.Mey. ex Drège) Radcl.-Sm.

Annual, occasionally perennial herb, up to 0.5 m high. Like var. *parvulus* but lateral shoots smooth, glabrous.

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| | | DrGr | | | |

**parvulus** Sond. var. **parvulus**

Annual, occasionally perennial herb, up to 0.5 m high. **Stems** with lead shoots smooth, lateral shoots finely scabrid to papillose-puberulous. **Leaves** with blade elliptic to narrowly ovate-elliptic, 3–15 × 1–4 mm, apex acute, obtuse or rounded, margins entire, flat. **Flowers**: perianth creamy red; Nov.–May. **Fruit** shortly stalked. Bush clumps, grassy slopes. *Dye bush*; *kleurbossie* (A).

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| | | DrGr | | KarSh | |

## Reference

RADCLIFFE-SMITH, A. 1996. *Phyllanthus*. *Flora zambesiaca* 9,4: 36–85.

# PHYTOLACCACEAE

Herbs or dwarf shrubs, rarely trees, sometimes scandent. **Leaves** sometimes succulent; alternate, occasionally opposite; petiolate; simple; blade with margins entire; without stipules. **Flowers**: in terminal spikes, opposite leaves or in axils; small, regular, perianth segments 5, rarely 4, free or connate; petals absent; stamens 5–many, borne on a disc, filaments subulate, anthers oblong; ovary superior, comprising 3–17 free or ± united carpels; styles free, as many as carpels. **Fruit** an aggregation of 1-seeded, lobed berries or a syncarpous, lobed berry, rounded or depressed-globose, fleshy. *Inkberry family*.

## **Phytolacca** L. (sthn Afr.: 5 spp.)

Key to species:

Fruit a berry with 5–7 segments, orange when ripe . . . . . **P. heptandra**
Fruit a berry with 7–10 ribs, purplish black when ripe. . . . . **P. octandra**

### **heptandra** Retz.

*P. stricta* O.Hoffm.

Slender, soft-stemmed herb, up to 1 m high. **Leaves** alternate; blade narrowly to broadly elliptic, up to 110 × 43 mm, apex acute; petioles up to 15 mm long. **Flowers**: in a few-flowered spike; carpels completely free; perianth green; Oct.–Jan. **Fruit** a berry with 5–7 segments, each 2–3 mm long, orange when ripe. Grassland, vleis. *Wild sweet potato*, *inkberry*; *inkbessiebos* (A); *monatja* (SS); *umnyanja* (X).

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### ***octandra** L.

*P. americana* L. var. *mexicana* L.

Herb, up to 2 m high. **Leaves** alternate; blade narrowly to broadly elliptic, up to 150 × 80 mm; petioles up to 20 mm long. **Flowers**: in a terminal or lateral, leaf-opposed raceme; carpels completely united; perianth white to yellowish green; Nov.–Apr. **Fruit** a berry with 7–10 ribs, purplish black when ripe. Grassland, forest, riverbanks. Native to tropical America. *Inkberry*; *bobbejaandruif* (A); *umnanja*, *ayatsala*, *amahashe* (X); *umnyandla* (Z).

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## Reference

JORDAAN, M. 2000. Phytolaccaceae. In O.A. Leistner, Seed plants of southern Africa: families and genera. *Strelitzia* 10: 442–444. National Botanical Institute, Pretoria.

# PIPERACEAE

Erect or scandent herbs or shrubs. **Branches** terete, jointed at nodes. **Leaves** alternate, simple; blade with base occasionally asymmetric, margins entire; with stipules. **Flowers**: inflorescence usually a dense spike; flowers minute, bisexual or unisexual, without perianth; stamens 2–6, free; ovary superior, stigmas 1–5. **Fruit** baccate, with a succulent, thin or dry pericarp. *Pepper family*.

## **Peperomia** Ruiz & Pav. (sthn Afr.: 4 spp.)

Key to species:

Leaves 1 or 2 at nodes; blade obovate to elliptic . . . . . **P. retusa** var. **bachmannii**
Leaves in whorls of 3 or 4 at nodes; blade elliptic to ovate . . . . . **P. tetraphylla**

**retusa** (L.f.) A.Dietr. var. **bachmannii** (C.DC.) Düll
*P. bachmannii* C.DC.

Mat-forming, succulent herb, up to 200 mm high; epiphyte. **Leaves** 1 or 2 at nodes, glabrous, succulent; blade obovate to elliptic, 7–20 × 5–12 mm, base cuneate, apex acute or retuse; petioles up to 2 mm long. **Flowers**: in slender, light green, terminal or axillary spikes; widely spaced; Dec.–Apr. On tree trunks or rocks in shade. *Wild peperomia*.

MsGr

**tetraphylla** (G.Forst.) Hook. & Arn.

Perennial, decumbent herb, up to 150 mm high; epiphyte or lithophyte. **Leaves** in whorls of 3 or 4 at nodes, glabrous, succulent, greyish green; blade elliptic to ovate, ± 10–13 × 8–9 mm, base rounded, apex acute to rounded; petioles up to 7 mm long. **Flowers**: in yellowish, terminal spikes; densely crowded on rachis; Aug.–Mar. Forest, on moss in shade of rocks or against trunks.

DrGr MsGr

# PITTOSPORACEAE

Shrubs, trees or climbers, resinous. **Leaves** alternate, simple, petiolate; without stipules. **Flowers**: bisexual; regular; sepals 5, free or slightly connate; petals 5, free, with a ± erect basal portion and reflexed tips; stamens free; anthers opening by means of pores; ovary superior; style simple. **Fruit** a globose or ovoid capsule, opening by means of 2 valves. **Seeds** mostly covered with a sticky, slow-drying resin. *Cheesewood family*.

## **Pittosporum** Banks ex Gaertn. (sthn Afr.: 3 spp.)

**viridiflorum** Sims

Shrub or small tree, up to 10 m high. **Leaves** with blade obovate to narrowly obovate, very variable in size, apex rounded to acute, margins entire, upper surface shiny dark green, lower surface paler green with conspicuous net-veining, clearly visible against the light. **Flowers**: in branched terminal heads; corolla lobes creamy yellow or greenish yellow, 6–7 mm long; Sep.–Jan. **Fruit** a globose, yellowish brown, woody capsule, 5–10 mm in diameter, with bright orange-red, sticky seeds. Woodland, river bush, bush clumps, stony ridges. *Cheesewood*, *white Cape beech*; *kasuur*, *witboekenhout* (A); *mohatollo*, *mofusafa*, *monkhanku*, *phuku-e-nyenyane*, *seteatea* (SS).

DrGr MsGr

# PLANTAGINACEAE

Annual or perennial herbs. **Leaves** alternate, clustered in a basal rosette, often forming a sheath at base; blade parallel-veined; without stipules. **Flowers**: arranged in dense spikes, stalk long, erect, leafless; small, regular; petals 4, united, papery; stamens 4,

arising from corolla tube, anthers protruding on long filaments; ovary superior. **Fruit** a capsule, opening by means of a lid. **Seeds** often mucilaginous when wet. *Plantain family*.

## Key to genera

1a Leaves in a basal rosette, blade parallel-veined . . . . . **Plantago**
1b Leaf characters not as above . . . . . 2
2b Lobes of upper corolla lip interior in bud, covered by lobes of lower lip . . . . . **Veronica**
2b Lobes of upper corolla lip exterior in bud, covering lobes of lower lip . . . . . **Linaria**

## **Linaria** Mill. (sthn Afr.: 3 spp.)

### Key to species:

1a Leaves sublinear . . . . . **L. vulgaris**
1b Leaves linear to ovate . . . . . 2
2a Leaves 2–4 × as long as wide; corolla 20–50 mm long, 6–12 mm wide at mouth . . . . . **L. dalmatica**
2b Leaves 6–12 × as long as wide; corolla up to 22 mm long, > 6 mm wide at mouth . . . . . **L. genistifolia**

### ***dalmatica** (L.) Mill.

*L. genistifolia* (L.) Mill. subsp. *dalmatica* (L.) Maire & Petitm.

Perennial herb, 0.2–0.9 m high. **Stems** erect, branched, glabrous. **Leaves** opposite below, becoming alternate towards apex; sessile, clasping at base, suberect, rigid; blade ovate to lanceolate, up to 25–45 × 15–40 mm, 2–4× as long as wide, apex acute, base truncate, margins entire. **Flowers**: in terminal racemes, up to 0.2 m long; bracts and petioles ± equal in length; spur straight, up to 20–50 mm long, acute, corolla tube 20–50 mm long, 6–12 mm wide at mouth; corolla yellow, palate usually orange, bearded; Nov. **Seeds** not winged. Disturbed places, garden escape. Native to Europe and Asia.




### ***genistifolia** (L.) Mill.

Perennial herb, 0.2–0.9 m high. **Stems** erect, branched, glabrous. **Leaves** opposite below, becoming alternate towards apex; sessile, clasping at base; blade linear to ovate, up to 25–45 × 15–32 mm, 6–12 × as long as wide, apex acute, base truncate, margins entire. **Flowers**: in terminal racemes, up to 0.2 m long; bracts and petioles ± equal in length; spur straight, up to 25 mm long, acute, corolla tube up to 22 mm long, > 6 mm wide at mouth; corolla yellow, palate usually orange, bearded; Nov.–Mar. **Seeds** not winged. Disturbed places, garden escape. Native to Europe and Asia (Italy to Russia).




### ***vulgaris** Mill.

Perennial herb, 0.25–0.92 m high. **Stems** erect, simple or branched at base or above in racemes, glabrous, sometimes glandular-pubescent in inflorescence. **Leaves** opposite, verticillate or mostly alternate; sessile; blade sublinear, narrowly elliptical or oblanceolate,

20–60 × 1–5(–15) mm, apex acute, margins entire. **Flowers**: in dense, terminal racemes; spur conical, 10–13 mm long, acute, corolla tube 19–33 mm long, 10 mm wide at mouth; corolla yellow, palate usually orange, bearded; Oct.–Dec. Disturbed places, garden escape. Native to Europe and Asia. *Butter-and-egg*, *common toadflax*, *wild snapdragon*.

DrGr

## **Plantago** L. (sthn Afr.: 14 spp.)

### Key to species:

[after Glen: 151 (1998)]

1a Leaves amplexicaul (stem-clasping). . . . . **P. aristata**
1b Leaves petiolate, or at least narrowed towards base. . . . . 2
2a Leaf blade broad (up to 4 × as long as wide) . . . . . **P. major**
2b Leaf blade narrow (> 4 × as long as wide) . . . . . 3
3a Spike < $^1/_2$ as long as peduncle . . . . . **P. lanceolata**
3b Spike > $^1/_2$ as long as peduncle . . . . . 4
4a Corolla white or blue; leaves densely shaggy . . . . . **P. virginica**
4b Corolla greenish; leaves with scattered hairs. . . . . **P. myosuros**

### ***aristata** Michx.

Perennial herb; scape up to 0.45 m high. **Leaves** amplexicaul, cauline; blade linear, 100–142 × 2–7 mm, thinly hirsute to glabrous. **Flowers**: spikes 100–150 mm long; bracts long, conspicuous, projecting well beyond flowers; Nov.–Feb. Weed of disturbed places. Native to the United States of America.

MsGr

### ***lanceolata** L.

Perennial herb; scape up to 0.8 m high. **Leaves** in a basal rosette, petiolate; blade linear to narrowly ovate or obovate, 65–370 × 6–35 mm, glabrous or pubescent. **Flowers**: spike < $^1/_2$ as long as peduncle, 15–70 mm long; corolla green, cream-coloured or white; Sep.–Apr. Weed of cultivation and disturbed places. Native to Europe and Asia. *English plantain*, *narrow-leaved ribwort*, *buckhorn plantain*; *oorpynwortel*, *ribgras* (A); *bolila-nyana*, *setla-bocha* (SS).

VreDm DrGr MsGr KarSh Zastr?

### ***major** L.

*P. dregeana* Decne.

Perennial herb; scape up to 0.45 m high. **Leaves** in a basal rosette, petiolate; blade elliptic, ovate or obovate, 70–400 × 24–125 mm, glabrous or with scattered hairs. **Flowers**: spikes 40–135 mm long; corolla greenish; Oct.–Jun. **Seeds** 15–25 per capsule. Weed of moist, sunny places. Native to Europe and Asia. *Larger ribwort plantain*, *rippleseed plantain*; *tongblaar*, *weegbredieblaar* (A); *bolila* (SS); *indlebe-kathekwane* (Z).

VreDm DrGr

### *myosuros Lam.

Annual or perennial herbs; scape up to 0.25 m high. **Leaves** in a basal rosette, petiolate; blade linear or narrowly ovate or obovate, 90–120 × 7.0–12.5 mm, with scattered hairs; petioles flattened. **Flowers**: spikes 20–66 mm long; corolla greenish; Oct.–Jan. Grassland, sandy soil. Native to South America.

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### *virginica L.

Perennial herb; scape up to 0.55 m high. **Leaves** in a basal rosette, petiolate; blade obovate or narrowly spathulate, 33–220 × 9–40 mm, densely woolly. **Flowers**: spike > $^1/_2$ as long as peduncle; corolla white or blue; Sep.–Apr. Weed along roadsides or in grassland. Native to America. *Sand plantain*, *dwarf plantain*, *pale-seed plantain*.

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## **Veronica** L. (sthn Afr.: 7 spp., 1 sp. indigenous)

### Key to species:

Leaves narrowly ovate to lanceolate, 50–100 mm long, vaguely toothed, mostly sessile or subsessile and clasping; bracts reduced, lanceolate; pedicels < 10 mm long . . . . . **V. anagallis-aquatica**
Leaves broadly ovate, 5–25 mm long, distinctly toothed or lobed, mostly shortly petiolate; bracts large and leaf-like, broadly ovate; pedicels > 20 mm long . . . . . **V. persica**

### **anagallis-aquatica** L.

Annual or short-lived perennial herb, up to 1.2 m high; hydrophytic. **Stems** creeping, rooting at basal nodes, then abruptly erect, hollow, branched at base or above. **Leaves** with upper ones sessile, somewhat clasping, narrowly ovate to lanceolate, 50–100 × 5–20 mm; at least in distal half, lower ones petiolate, blade ovate or lanceolate-oblong, apex obtuse, margins ± entire or serrulate. **Flowers**: in axillary racemes up to 100 mm long; bracts reduced, lanceolate; pedicels < 10 mm long; calyx tube short, 4-lobed; corolla with tube short, 4-lobed, lower lobe shorter than others, blue-mauve or purple, rarely pink; Oct.–Feb., Apr. **Fruit** an ovate to orbicular capsule. Vleis, streams, riverbanks. Damp to wet places or in water, also dry riverbeds. *Water speedwell*; *water-ereprys* (A); *moqhoboqhobo-o-monyenyane* (SS).

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### *persica Poir

Annual herb. **Stems** procumbent, 0.1–0.6 m long. **Leaves** sessile or shortly petiolate; blade broadly ovate, 5–25 mm long, apex obtuse, base truncate, margins distinctly toothed or lobed. **Flowers**: solitary in leaf axils; bracts large, leaf-like; pedicels > 20 mm long; corolla 8–12 mm in diameter, blue and white; Jul.–Oct. **Fruit** with capsules keeled with divergent lobes. Cultivated ground. Native to Europe and Asia. *Bird's eye speedwell*, *field speedwell*; *akker-ereprys* (A).

| | | DrGr | | KarSh | |
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# PLUMBAGINACEAE

Herbs, shrubs or lianes. **Leaves** simple, alternate, often in a basal rosette, foliage usually with scattered chalk glands exuding water and calcium salts; without stipules. **Flowers**: inflorescence usually a spike, bracteate; bisexual, regular; sepals fused into cylindrical tube, ribbed, often with glandular hairs; petals 5, connate or free; stamens opposite and fused to petals or free; ovary superior, 1-locular; 5 distinct styles or style divided into 5 branches in upper part. **Fruit** a dry 1-seeded achene, enclosed by a persistent calyx tube. *Leadwort family.*

### Key to genera

[after Dyer: 16 (1963)]

Calyx puberulous with long, usually unbranched, glandular-tipped setae . . . . . **Plumbago**

Calyx scarious, without setae. . . . . **Limonium**

## **Limonium** Mill. (sthn Afr.: 11 spp.)

### **dregeanum** (C.Presl) Kuntze

*Statice dregeana* C.Presl

Dwarf shrub, 0.18–0.30 m high. **Leaves** stem-clasping; blade linear-spathulate, 10–40 × 1.5–5.0 mm, apex obtuse, mucronate. **Flowers**: in 3–8-flowered spikelets with flowers developing successively; bracts 3.0–3.5 mm long, margins membranous; pedicellate, pedicels 0.75–1.50 mm long; calyx with limb obtusely 5-lobed, tube ribbed with some hairs between ribs; petals longer than calyx, lilac to pale pink; Sep.–Apr. Grassland, along streambanks, edges of pans, sandy soil.




## **Plumbago** L. (sthn Afr.: 5 spp.)

### Key to species:

Corolla white, up to ± 30 mm long . . . . . **P. auriculata**

Corolla blue, 40–50 mm long . . . . . **P. zeylanica**

**auriculata** Lam.

*P. capensis* Thunb.

Shrub or scrambler, up to 2 m or more high. **Leaves** with blade oblong or oblong-spathulate, up to 50 × 20–25 mm, sometimes lepidote on lower surface. **Flowers**: axis of spike generally puberulous; calyx setae glandular-capitate, absent from basal third; corolla 40–50 mm long, pale blue; Jun.–Mar. In bush groups and scrub. *Plumbago*, *Cape leadwort*; *syselbos* (A); *umabophe*, *umatshwilitshwili* (Z).

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**zeylanica** L.

Shrub, ± 1(–2) m high. **Leaves** with blade ovate or oblong-ovate to narrowly ovate, ± 100 × 60 mm, lepidote. **Flowers**: axis of spike glandular; calyx with glandular-capitate setae from base to apex; corolla up to 30 mm long, white; Jul.–Jun. Under trees or shrubs on flats or hillsides, sometimes open grassland. *White flowered leadwort*.

| VreDm | | DrGr | | | |
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## Reference

DYER, R.A. 1963. Plumbaginaceae. *Flora of southern Africa* 26: 15–31.

# POLYGALACEAE

Herbs, shrubs or small trees. **Leaves** alternate, sometimes fascicled; simple, margins entire; without stipules. **Flowers**: superficially resembling flowers of papilionaceous Fabaceae; bisexual, irregular; solitary, in racemes or spikes; inflorescences axillary or terminal; sepals 5, free, 2 lateral ones larger or wing- and petal-like; petals ± reduced, 3–5, united at base, adnate to staminal tube, one often with a brush-like appendage; stamens 8, united into a tube, split above, fused to petals; anthers opening by means of apical pores; ovary superior, 2-locular; style simple, often dilated and 2-lobed at apex. **Fruit** a capsule, samara or drupe. **Seeds** often silky hairy (*Polygala*), often with a caruncle. *Milkwort family*; *bloukappiefamilie* (A).

## Key to genera

[after Bredenkamp: 450 (2000)]

Sepal lobes subequal, 2 lateral ones larger than the others; capsule with 4 horns or tubercles . . . . . **Muraltia**
Sepal lobes unequal, lateral ones larger than the others, wing-like, coloured; capsule compressed . . . . . **Polygala**

## PLUMBAGINACEAE

## **Muraltia** Juss. (sthn Afr.: 116 spp.)

### Key to species:

[after Levyns: 21 (1954)]

1a Leaves solitary; flowers with distinct pedicels . . . . . **M. flanaganii**
1b Leaves fascicled; flowers sessile or with short pedicels . . . . . 2
2a Sepals all ciliate; horns shorter than capsule. . . . . **M. saxicola**
2b Sepals quite glabrous or inner minutely ciliate; horns ± as long as capsule . . . . . **M. alticola**

### **alticola** Schltr.

Shrub or dwarf shrub, up to 0.15 m high. **Leaves** fascicled; blade linear, oblong or narrowly obovate, primary leaf 4–7 mm long, apex shortly apiculate. **Flowers**: axillary, pedicels very short; sepals quite glabrous or inner minutely ciliate; side petals ± as long as carina; corolla 4.0–5.5 mm long, pink or white; Dec.–Apr. **Fruit** sparsely hispid, horns ± as long as capsule. **Seeds** broadly ellipsoid, caruncle with broad membranous lobes. Grassland, kloofs, mountain plateaus, soil pockets and crevices.

DrGr MsGr Zastr

### **flanaganii** Bolus

*M. ecornuta* N.E.Br.

Dwarf shrub, up to 1 m high. **Leaves** solitary; blade acicular or linear, 5–10 × 2 mm, apex obtuse or acute, margins sometimes revolute. **Flowers**: axillary, with distinct pedicels; sepals ciliate or not; side petals as long as carina; corolla 4.0–5.0 mm long, white and mauve; Aug.–May. **Fruit** glabrous, apical projections short or very short. **Seeds** oblong, caruncle with 2 narrow, membranous flaps. Plateaus on mountain tops.

MsGr

### **saxicola** Chodat

Dwarf shrub, up to 0.6 m high. **Leaves** fascicled, close-set; blade narrowly ovate to ovate, primary leaf 7–10 mm long, apex hooked backwards, ending in a sharp point, margins with scattered, long whitish hairs. **Flowers**: hidden among leaves, sessile or with short pedicels; sepals all ciliate; corolla ± 5 mm long, magenta; Sep.–Mar. **Fruit** hispid; horns shorter than capsule. **Seed**s ± globose, caruncle with 2 small oblique, membranous lobes.

MsGr

## **Polygala** L. (sthn Afr.: 79 spp.)

### Key to species:

1a Plants spinescent . . . . . **P. pungens**
1b Plants not spinescent. . . . . 2
2a Flowers in lateral racemes. . . . . 3
2b Flowers in terminal racemes, occasionally with lateral ones also . . . . . 7
3a Shrubs, virgately branched . . . . . **P. myrtifolia**
3b Perennial herbs or dwarf shrubs . . . . . 4

4a Leaf blade obovate. . . . . **P. asbestina**
4b Leaf blade elliptic or ovate. . . . . 5
5a Leaf blade conspicuously reticulate-veined on both surfaces . . . **P. gerrardii**
5b Leaf blade not conspicuously reticulate-veined on both surfaces . . . . . 6
6a Leaf blade narrowly elliptic, apex acuminate, mucronate . . . . **P. amatymbica**
6b Leaf blade broadly elliptic, apex acute, mucronate . . . . . **P. transvaalensis** subsp. **transvaalensis**
7a Stems procumbent or spreading, densely leafy . . . . . 8
7b Stems erect, densely leafy or distantly arranged with long internodes . . . . 12
8a Upper leaf blades obovate or linear-spathulate . . . . . **P. uncinata**
8b Upper leaf blades ovate or elliptic. . . . . 9
9a Upper leaf blades ovate. . . . . **P. ohlendorfiana**
9b Upper leaf blades elliptic to narrowly ovate . . . . . 10
10a Inflorescence densely flowered; stems procumbent. . . . . **P. erubescens**
10b Inflorescence lax; stems spreading . . . . . 11
11a Wings 4.0–5.0 × 2.5–3.0 mm long . . . . . **P. hispida**
11b Wings 6.5–7.0 × 3.5–4.0 mm . . . . . **P. rhinostigma**
12a Shrubs, virgately branched . . . . . 13
12a Perennial herbs or dwarf shrubs up to 0.5 m high . . . . . 14
13a Leaves distantly arranged . . . . . **P. ephedroides**
13b Leaves dense in upper branches . . . . . **P. virgata** var. **decora**
14a Stems erect, densely leafy . . . . . 15
14b Stems erect, leaves distantly arranged, internodes long . . . . . 17
15a Wings narrowly ovate, apices acute to acuminate. . . . . **P. retiefiana**
15b Wings elliptic-oblong or obovate, apices acute, rounded or obtuse . . . . . 16
16a Wings obovate, apices acute to obtuse . . . . . **P. gracilenta**
16b Wings elliptic-oblong, apices rounded. . . . . **P. rehmannii**
17a Stems greyish. . . . . 18
17b Stems green . . . . . 19
18a Plants up to 1 m high, with very few branches at base . . . . . **P. leptophylla** var. **leptophylla**
18b Plants up to 0.5 m high, much branched at base . . . . . **P. seminuda**
19a Wings green, petals dark yellowish green . . . . . **P. leendertziae**
19b Wings coloured, petals purple or pink . . . . . 19
20a Wings obovate, 6–7 × 3–4 mm, apex rounded, pale purple; petals purple or pink . . . . . **P. hottentotta**
20b Wings oblong, ± 7–8 × 5 mm, apex rounded, purplish pink; petals dark purplish pink . . . . . **P. gymnoclada**

## **amatymbica** Eckl. & Zeyh.

Perennial herb, up to 0.2 m high; not spinescent. **Stems** annual, several from rootstock, densely leafy; finely crisped pubescent. **Leaves** sessile; blade narrowly elliptic, up to 17 × 7 mm, apex acuminate, mucronate, midrib prominent. **Flowers**: in lateral racemes; wings ovate, ± 5 × 2.5 mm, mucronate, pale pink; petals purple; Oct.–Apr. Grassland, rocky hillsides, loamy soil. *Nkokolotsane*, *mohlabeho-o-monye-nyane* (SS).




## **asbestina** Burch.

Dwarf shrub, up to 0.3 m high; not spinescent. **Stems** spreading, divaricately much branched, woody; appressed pubescent. **Leaves** subsessile; blade obovate to broadly obovate, up to 10 × 4 mm, apex retuse or obtuse. **Flowers**: in lateral racemes, 2- or 3-flowered; wings narrowly obovate, ± 4 × 1 mm, apex acute, falcate, mucronate, mauve; petals purplish blue; Nov.–Apr. *Skaap-ertjie* (A).



**ephedroides** Burch.

*P. virgata* Thunb. var. *genistoides* (Poir.) Harv.

Dwarf shrub or shrub, up to 2 m high; not spinescent. **Stems** virgately branched; glabrous or with a few scattered hairs. **Leaves** few and distant, appressed; blade narrowly linear, 7–20 × 1–5 mm, apex acute or obtuse, sometimes subulate, mucronulate. **Flowers**: in lax, many-flowered, terminal racemes; wings broadly obovate, ± 9 × 7 mm, greenish white with many, spreading, forked reddish brown veins; petals purple; Nov.–Apr. Hill slopes, plains.

DrGr KarSh

**erubescens** E.Mey ex Chodat

Perennial herb; not spinescent. **Stems** procumbent, densely leafy; pubescent. **Leaves** subsessile; smaller towards base of stem; blade of lower leaves ± suborbicular, blade of upper ones elliptic to narrowly ovate. **Flowers**: in compact, terminal racemes; wings suborbicular, 3–5 × 2.5–3.0 mm, apex rounded; wings and petals light mauve; Dec.–Feb. Grassland, mountain slopes. *Skaap-ertjie* (A).

DrGr KarSh

**gerrardii** Chodat

Perennial herb, up to 0.2 m high; not spinescent. **Stems** erect or spreading, many annual from woody rootstock, densely leafy; crisped pubescent. **Leaves** sessile; blade elliptic, 9–11 × 6 mm, apex acute, conspicuously reticulate-veined on both surfaces, coriaceous. **Flowers**: in lateral racemes; wings narrowly obovate, 5–6 × 3 mm, apex acute, green; petals purple; Oct.–Feb. Grassland, bush clumps. *Ungqengendlela* (Z).

MsGr

**gracilenta** Burtt Davy

*P. tenuifolia* Link

Perennial herb, up to 0.3 m high; not spinescent. **Stems** erect, many from woody rootstock, densely leafy. **Leaves** narrowly linear to narrowly ovate, up to 20 × 3 mm, apex acute. **Flowers**: in few-flowered, terminal racemes; wings obovate, 6 × 3 mm, apex acute to obtuse, yellowish green with dark green veins; petals deep mauve; Oct.–Jan. Grassland.

DrGr MsGr

**gymnoclada** MacOwan

Perennial herb, up to 1 m high; not spinescent. **Stems** erect, slender, virgate, green; glabrous. **Leaves** distant, sessile; blade linear, 12–18 mm × 1–2 mm, apex acute. **Flowers**: in lax, many-flowered, terminal racemes; wings oblong, ± 7–8 × 5 mm, apex rounded, purplish pink; petals dark purplish pink; Dec.–Mar. Grassland, rocky hill slopes.

DrGr MsGr

**hispida** Burch. ex DC.

Perennial herb or dwarf shrub, up to 0.3 m high; cushion-forming, not spinescent. **Stems** spreading, branching towards ends, leafy; crisped pubescent. **Leaves** subsessile; blade elliptic to narrowly ovate, ± 18 × 5 mm, apex acute to acuminate. **Flowers**: in lax, terminal

inflorescences, compact to elongating; wings obovate, 4.0–5.0 × 2.5–3.0 mm, apex rounded; wings and petals pink; Sep.–Dec. Mountain slopes.




### **hottentotta** C.Presl

Perennial herb, up to 0.9 m high; not spinescent. **Stems** erect, slender, wiry, green; glabrous. **Leaves** distant, sessile; blade linear, 10–40 × 0.5–2.0 mm, apex acute. **Flowers**: in terminal racemes; wings obovate, 6–7 × 3–4 mm, apex rounded, pale purple; petals purple or pink; Oct.–Mar. Grassland, rocky hillsides, woodland. *Small purple broom*; *lehlokoa-la-tseala* (SS); *umanqandi*, *uzekane* (Z).




### **leendertziae** Burtt Davy

Perennial herb, up to 1 m high; not spinescent. **Stems** erect, slender, glabrous, green. **Leaves** distant, sessile; blade narrowly linear-ovate, 30–40 × 4 mm, apex acute to acuminate, lower surface with midrib narrowly winged. **Flowers**: in terminal racemes; wings obovate, 7–8 × 4.0–5.5 mm, apex rounded, greenish; petals dark yellowish green; Dec., Jan. Grassland, hillsides.




### **leptophylla** Burch. var. **leptophylla**

*P. armata* Chodat

Perennial herb, up to 1 m high; not spinescent. **Stems** erect, divaricately much branched, few branches at base, greyish; densely appressed, crisped pubescent. **Leaves** few and distant; blade linear-obovate, up to 15 × 2 mm, apex obtuse or mucronulate. **Flowers**: in many-flowered, terminal racemes; wings obovate, ± 6 × 3 mm, apex rounded, whitish with green veins; petals purple to white; Sep.–Mar. *Skaap-ertjie* (A).




### **myrtifolia** L. *s.l.*

Shrub, up to 1.3 m high; not spinescent. **Stems** virgately branched, sparsely to densely appressed; crisped pubescent. **Leaves** petiolate; blade oblong-elliptic, ± 25 × 5 mm, apex obtuse; petioles 1–2 mm long. **Flowers**: in lateral racemes; wings suborbicular, ± 10 × 9 mm, apex rounded, base asymmetric; wings and petals purplish pink; Sep.–Nov. Grassland, steep slopes, moist streambanks. *September bush*; *Septemberbossie* (A); *moomang-la-thaba* (SS). A very variable species. Description alludes to specimens occurring in a mountainous area.




### **ohlendorfiana** Eckl. & Zeyh.

Perennial herb, up to 0.25 m high; not spinescent. **Stems** procumbent or spreading, slender, densely leafy; crisped pubescent and sparsely pilose. **Leaves** subsessile; blade ovate, 5–15 × 3–9 mm, apex acute, base rounded. **Flowers**: in terminal racemes; wings obovate, ± 7 × 5 mm, apex obtuse, base prominently asymmetric; wings and petals purple or pink; Sep.–Feb. Montane grassland. *Mahlaka-hlaka* (SS); *ungqengendlela* (Z).



### **pungens** Burch.

Dwarf shrub or shrub, up to 0.75 m high; spinescent. **Stems** divaricately much branched, glaucous; branchlets rigid, spine-tipped; glabrous. **Leaves** petiolate; few; blade narrowly obovate, 6–8 mm long, apex obtuse, base cuneate; petioles ± 0.5 mm long. **Flowers**: in 2–4-flowered, lateral racemes; wings suborbicular, 6–8 × 5–7 mm, lilac with dark veins; petals purple; Sep.–May. Calcrete pans, stony hillsides, dry watercourses. *Doring-ertjie* (A).




### **rehmannii** Chodat

Perennial herb, up to 0.3 m high; not spinescent. **Stems** slender, erect, densely leafy; pubescent, hairs minute, appressed. **Leaves** sessile; blade narrowly linear-ovate or linear-elliptic, ± 20 × 1 mm, apex acute. **Flowers**: in terminal racemes; wings elliptic-oblong, 6–8 × 3–4 mm, apex rounded, 3-veined, purplish blue; petals purplish pink; Nov.–Jan. Grassland. *Bolao-bo-boholo*, *setetea*, *lesira*, *mohale-oa-bopeli* (SS).




### **retiefiana** Paiva & Figueredo

Perennial herb, up to 0.3 m high; not spinescent. **Stems** erect, slender, several from a woody rootstock, densely leafy; glabrous. **Leaves** sessile, ± appressed to stem; blade linear, up to 20 × 2 mm, apex acute. **Flowers**: in few-flowered, terminal or lateral racemes; wings narrowly ovate, 5 mm long, apices acute to acuminate, greenish; petals purplish pink; Oct.–Mar. Montane grassland.




### **rhinostigma** Chodat

Annual herb, up to 0.2 m high; tufted, not spinescent. **Stems** spreading, many, slightly branched, leafy; crisped pubescent. **Leaves** sessile or subsessile, overlapping; blade elliptic to narrowly ovate, 10–15 × 4–8 mm, apex acute, base rounded, softly hairy. **Flowers**: in terminal racemes; wings obovate, 6.5–7.0 × 3.5–4.0 mm, apex rounded, pink; petals pale magenta-pink; Oct.–Feb. Grassland, along watercourses.




### **seminuda** Harv.

Perennial herb or dwarf shrub, up to 0.5 m high; not spinescent. **Stems** erect, much branched at base, greyish; glaucous. **Leaves** subsessile, few and distant; blade linear-obovate, 10–13 × 1.0–1.5 mm, apex recurved, mucronate. **Flowers**: in terminal racemes; wings obovate-elliptic, 6–8 × 2.5–3.5 mm, apex acute, green midrib prominent; petals deep purple-mauve; Nov.–Feb. Rocky hillsides, disturbed places, edges of dongas.




### **transvaalensis** Chodat subsp. **transvaalensis**

Perennial herb, up to 0.15 m high; not spinescent. **Stems** spreading; crisped pubescent. **Leaves** subsessile; blade broadly elliptic, 8–23 × 3–14 mm, apex acute, mucronate. **Flowers**:

in a lateral raceme; wings narrowly obovate, ± 5.5 × 2.5–3.0 mm, with 3 veins from base, apex obtuse, pinkish purple; petals purple; Nov.–Jan. Grassland, in shade.

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**uncinata** E.Mey. ex Meisn.
*P. hamata* Burtt Davy

Perennial herb or dwarf shrub, up to 0.3 m high; not spinescent. **Stems** spreading, densely leafy; glabrous or sparsely pubescent. **Leaves** sessile or subsessile, often fascicled; blade obovate or linear-spathulate, up to 15 × 5 mm, apex rounded, terminating in a hooked point. **Flowers**: in terminal racemes; wings broadly ovate, ± 6 × 4 mm, apex acute, greenish white with green veins; petals purplish blue; Nov.–Apr. Grassland, near watercourses. *Wild violet*; *wilde-viooltjie* (A).

| | | DrGr | MsGr | KarSh | |
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**virgata** Thunb. var. **decora** (Sond.) Harv.
*P. virgata* Thunb. var. *speciosa* (Sims) Harv.

Shrub, up to 3 m high; not spinescent. **Stems** virgately branched; finely crisped pubescent. **Leaves** dense in upper branches, subsessile or shortly petiolate; blade linear, narrowly obovate, up to 48 × 8 mm, apex truncate; petioles up to 2 mm long. **Flowers**: in terminal, arching racemes; wings suborbicular, ± 12 × 10 mm, apices rounded, conspicuously veined, mauve; petals deep purple to pale lilac; Dec.–Jun. Grassland, woodland, forest margins, mountain slopes. *Purple broom*, *moth-fruit*; *persbesem* (A); *umthenenenda* (X); *umabopha* (X, Z).

| | | | MsGr | | |
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# POLYGONACEAE

Annual or perennial herbs, shrubs or climbers; dioecious or monoecious. **Stems** often with ± swollen nodes. **Leaves** alternate; stipules ± papery, forming an ocrea (a tube) around stem and above node. **Flowers**: in a terminal or axillary, simple or branched thyrse; small, subtended by a sheathing, membranous tube of fused bracteoles; regular; sepals usually petal-like; petals absent; stamens 6–9, free; ovary superior with 2–4 fused carpels, 1-locular; styles 2–4, free. **Fruit** a lens-shaped or triangular nut, sometimes attached to, or enclosed in a fleshy expanded perianth. *Buckwheat*, *Rhubarb or Dock family*.

## POLYGALACEAE

## Key to genera

[after Germishuizen pers. comm.]

1a Outer perianth segments bearing short spines . . . . . 2
1b Outer perianth segments without spines . . . . . 3
2a Spines forming at tip of outer perianth segments; flowers monoecious; female flowers sessile in axillary clusters . . . . . **Emex**
2b Spines forming at base of outer perianth segments; flowers bisexual, in fascicles forming a lax raceme . . . . . **Oxygonum**
3a Perianth segments usually 6, inner 3 accrescent with entire, dentate or wavy margins . . . . . **Rumex**
3b Perianth segments 4 or 5, not accrescent . . . . . 4
4a Soft, annual herbs; nut at least twice as long as perianth. . . . . **Fagopyrum**
4b Coarse herbs, climbers or rhizomatous perennials; nut included in perianth or protruding for < $^1/_2$ its length . . . . . 5
5a Perianth constricted above ovary and persistent at apex of fruit; heterostylous . . . . . **Oxygonum**
5b Perianth not constricted above ovary, enclosing fruit; not heterostylous . . . . 6
6a Outer perianth segments winged or keeled in fruit; leaves conspicuously cordate; twining annuals . . . . . **Fallopia**
6b Outer perianth segments not winged or keeled in fruit; leaves distinctly longer than wide, rarely cordate . . . . . 7
7a Ocrea silvery hyaline, lacerating . . . . . **Polygonum**
7b Ocrea brown, membranous truncate, fringed with cilia or bristles or entire . . . . . **Persicaria**

## **Emex** Neck. (sthn Afr.: 1 sp.)

### **australis** Steinh.

*E. centropodium* Meisn.
*E. podocentrum* Meisn.

Perennial herb, up to 0.6 m high; monoecious. **Stems** annual, erect or procumbent, much branched; green or tinged red. **Leaves** with blade oblong-ovate to ovate, 35–60 × 20–30 mm, base truncate or somewhat cordate, apex obtuse, slightly decurrent. **Ocrea** lacerate. **Flowers**: male flowers in terminal and axillary, pedunculate clusters; female flowers sessile in axillary clusters; perianth with spines at tips of outer segments, surface of tube perforated, green to whitish; May–Oct. Waste places and disturbed areas. *Devil's thorn*, *three-cornered jack*, *prickly jack*; *duiweldoring*, *dubbeltjiedoring*, *breëblaardubbeltjie* (A).

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## **Fagopyrum** Mill. (sthn Afr.: 1 sp.)

### ***esculentum** Moench

*Polygonum fagopyrum* L.

Annual herb, up to 0.6 m high. **Stems** erect. **Leaves** with blade triangular-sagittate, 40–100 × 20–100 mm, base cordate, apex acute. **Ocrea** 3–5 mm long, striate. **Flowers**: in bracteate, terminal or axillary, raceme-like panicles; perianth greenish white, tipped pink; Dec.–May. **Fruit** accrescent, nut at least twice as long as perianth, pale brown, matt, sharply trigonous. Disturbed areas. Native to Central Asia. *Common buckwheat*; *boekwiet* (A).

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## **Fallopia** Adans. (sthn Afr.: 1 sp.)

***convolvulus** (L.) Holub
*Bilderdykia convolvulus* (L.) Dumort.
*Polygonum convolvulus* L.

Annual herb, up to 10 m high. **Stems** twining, climbing. **Leaves** with blade ovate-cordate, 20–70 × 25–50 mm, base sagittate, apex acuminate, margins entire. **Ocrea** membranous. **Flowers**: in a slender, lateral cyme; outer perianth segments winged or keeled in fruit, green with white margins; Oct.–May. **Fruit** with nut trigonous, enclosed in persistent perianth. Disturbed soils and cultivated ground. Native to Europe and Asia.

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## **Oxygonum** Burch. ex Campd. (sthn Afr.: 6 spp.)

Key to species:

Leaves with blade deeply 3–9-lobed, only lower lobes shallowly divided again . . . . . **O. dregeanum** subsp. **canescens** var. **canescens**
Leaves linear, rarely with 1 or 2 short teeth at base of blade . . . . . **O. dregeanum** subsp. **canescens** var. **linearifolium**

**dregeanum** Meisn. subsp. **canescens** (Sond.) Germish. var. **canescens**
*O. calcaratum* Meisn.
*O. zeyheri* Sond.

Annual herb, up to 500 mm high. **Leaves** with blade deeply 3–9-lobed, only lower lobes shallowly divided again. **Flowers**: perianth white; Oct.–Mar. Grassland, thornveld, on red sands.

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**dregeanum** Meisn. subsp. **canescens** (Sond.) Germish. var. **linearifolium** Germish.

Annual herb, up to 500 mm high. **Leaves** linear, rarely with 1 or 2 short teeth at base of blade of lower leaves. **Flowers**: perianth white, tinged pink; Oct.–Mar. Grassland, disturbed areas.

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## **Persicaria** Mill. (sthn Afr.: 9 spp.)

Key to species:

1a Ocrea with a spreading or recurved, herbaceous limb . . . . . **P. limbata**
1b Ocrea without a spreading herbaceous limb . . . . . 2
2a Leaf blade narrowly ovate, blade with base cordate or rounded, apex acute . . . . . **P. amphibia**
2b Leaf blade narrowly ovate to elliptic, blade with base narrowing into petiole, apex acute or acuminate . . . . . 3

3a Leaf blade with upper surface glabrous, lower surface with appressed hairs on midrib and margins only. . . . . 4
3b Leaf blade with appressed hairs over upper and lower surfaces, or lower surface with appressed hairs on midrib and margins only . . . . . 5
4a Flowers in a spike-like raceme . . . . . **P. lapathifolia**
4b Flowers in a lax, dichotomously branched panicle . . . . . **P. meisneriana**
5a Peduncles with stalked glands . . . . . **P. hystricula**
5b Peduncles without stalked glands . . . . . 6
6a Inflorescence branches densely and evenly villous . . . **P. madagascariensis**
6b Inflorescence branches glabrous . . . . . **P. decipiens**

## *amphibia (L.) Gray

*Polygonum amphibium* L.

Perennial herb. **Leaves** floating; petiolate; blade narrowly ovate, base cordate or rounded, apex acute; glabrous; petioles > 5 mm long. **Ocrea** without a spreading herbaceous limb; without a fringe of bristles. **Flowers**: perianth red to deep pink; Sep.–May. **Fruit** a biconvex nut. In ponds, ditches, dams, waterways. Native to North America, Europe and Asia.

VreDm | | DrGr | MsGr | KarSh | |

## decipiens (R.Br.) K.L.Wilson

Perennial herb; stems decumbent or erect. **Leaves** sessile or subsessile; blade narrowly linear-ovate to linear-elliptic, base narrowing into petiole, apex acute; lower surface with appressed hairs on midrib and margins only. **Ocrea** without a spreading herbaceous limb; with a terminal fringe of bristles; hairy. **Flowers**: peduncles without stalked glands; inflorescence branches glabrous; perianth white or pink; Dec.–Mar. **Fruit** a trigonous or biconvex nut, smooth. Along watercourses, vleis.

| | | DrGr | MsGr | | |

## hystricula (J.Schust.) Soják

Perennial herb; straggling with stems procumbent or erect. **Leaves** sessile or subsessile; blade narrowly ovate to elliptic, base narrowing into petiole, apex acute; upper and lower surface with appressed hairs. **Ocrea** without a spreading herbaceous limb; with appressed bristles. **Flowers**: peduncles with stalked glands; perianth pink in bud, white to rusty-brown; Nov.–Mar. **Fruit** a biconvex nut, slightly rugose. Along watercourses.

| AcGr | DrGr | | | |

## *lapathifolia (L.) Gray

*Polygonum lapathifolium* L. subsp. *maculatum* (Gray) Dyer & Trimen

Annual herb, up to 1 m high. **Leaves** with blade ovate to narrowly ovate, base narrowing into petiole, apex acuminate; upper surface glabrous, petioles and main vein on lower surface yellow strigose-hairy. **Ocrea** without a spreading herbaceous limb; glabrous; with or without terminal cilia. **Flowers**: in a spike-like raceme; perianth red, pink, white or greenish; Sep.–May. **Fruit** with nut biconvex, smooth. Waste places, along roadsides, rivers and streams. Native to Europe. *Spotted knotweed*; *hanekam* (A); *khamane-ea-noka*, *tolo-la-khongoana* (SS); *umancibikela*, *umancibilika* (Z).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

**limbata** (Meisn.) H.Hara

*Polygonum limbatum* Meisn.

*Polygonum schinzii* C.H.Wright

Perennial herb, up to 1.2 m high. **Leaves** with blade narrowly linear-ovate, upper and lower surface pubescent. **Ocrea** with a spreading green, leaf-like limb; fringed with bristles. **Flowers**: perianth pink; Sep.–May. **Fruit** a convex nut with persistent style base forming a beak. **Fruit** a convex or biconvex nut, smooth. Vleis and marshy areas, in ditches, edges of dams, in water.

DrGr MsGr

**madagascariensis** (Meisn.) S.Ortiz & Paiva

*Persicaria attenuata* (R.Br.) Soják subsp. *africana* K.L.Wilson

Perennial herb, up to 2 m high, strigose hairy throughout. **Leaves** sessile to subsessile; blade elliptic to narrowly ovate, base narrowing into petiole, apex acute to acuminate, venation prominent; with appressed hairs on upper and lower surfaces. **Ocrea** without a spreading herbaceous limb; fringed with bristles. **Flowers**: peduncles without stalked glands; inflorescence branches densely and evenly villous; perianth white to pale pink; Nov.–Mar. **Fruit** a biconvex nut. Grassland, damp places, along rivers and streams, marshy areas.

VreDm DrGr

**meisneriana** (Cham. & Schltdl.) M.Gómez

Perennial herb. **Leaves** sessile or subsessile; blade narrowly ovate to elliptic, base cuneate, apex acuminate; upper surface glabrous, lower surface with appressed hairs on midrib and margins. **Ocrea** without a spreading herbaceous limb; fringed with short bristles. **Flowers**: in a lax, dichotomously branched panicle; perianth pale pink; Jan.–Apr. **Fruit** a trigonous nut, smooth. Along watercourses, in deep water.

MsGr

## **Polygonum** L. (sthn Afr.: 7 spp.)

### Key to species:

[after Nogueira *et al*.: 20 (2006)]

Leaves dissimilar, those subtending flowering clusters 2–3 × smaller than those on vegetative shoots; nut dull brown . . . . . **P. aviculare**
Leaves all similar; nut dark brown or black . . . . . **P. plebeium**

***aviculare** L.

Annual herb; mat-forming. **Stems** decumbent to procumbent, up to 1 m long. **Leaves** subsessile; blade narrowly ovate or elliptic, 10–40 × 4–8 mm, those subtending flowering clusters 2–3 × smaller than those on vegetative shoots. **Ocrea** silvery hyaline, 5–8 mm long, lacerate, with brownish veins. **Flowers**: in sessile or subsessile, axillary fascicles; perianth pink, white or greenish; Oct.–Apr. **Fruit** dull brown, 2.5–3.5 × 1.0–1.5 mm. Roadsides, on disturbed soils, lawns, waste ground. Native to Europe and Asia.

DrGr MsGr KarSh

**plebeium** R.Br.

Annual herb; mat-forming; leafy. **Stems** procumbent, up to 1 m long. **Leaves** subsessile; blade oblong or linear-oblong to elliptic, 5–13 × 2–5 mm, all similar in size. **Ocrea** silvery hyaline, ± 5 mm long, deeply lacerate, veins inconspicuous. **Flowers**: in many, axillary fascicles; perianth lobes greenish with creamy-white or pinkish margins; Oct.–May. **Fruit** shiny dark brown or black. Riverbeds, on drying mud and turf flats, along pans.

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## **Rumex** L. (sthn Afr.: 18 spp.)

### Key to species:

[after Germishuizen pers. comm.]

1a Ocrea silvery hyaline, lacerating; fruit valves small, not longer than nut . . . . . **R. acetosella** subsp. **angiocarpus**
1b Ocrea brown, membranous, usually caducous, occasionally persistent; fruit valves distinctly overtopping nut. . . . . 2
2a Fruit valves ovate-orbicular to suborbicular, prominently reticulately veined, entire, without a well-developed callosity. . . . . 3
2b Fruit valves narrowly and broadly ovate, entire or toothed, with or without a large well-developed callosity. . . . . 5
3a Leaf blade without lobes . . . . . **R. woodii**
3b Leaf blade with lobes . . . . . 4
4a Perennial climber; leaf blade sagittate . . . . . **R. sagittatus**
4b Plants erect, never scandent; leaf blade hastate from a truncate base . . . . . **R. dregeanus** subsp. **montanus**
5a Inner perianth segments without a large, well-developed callosity . . . . . **R. nepalensis**
5b Inner perianth segments with a small to large callosity. . . . . 6
6a Callosity small, covering a small part of inner perianth segments. . . . . **R. crispus**
6b Callosity large, covering a large part of inner perianth segments . . . . . 7
7a Panicle open with divaricate branches, flower whorls distant, nearly all subtended by a leaf . . . . . **R. conglomeratus**
7b Panicle ± condensed, only lower flower whorls or none subtended by a leaf . . . . . **R. lanceolatus**

***acetosella** L. subsp. **angiocarpus** (Murb.) Murb.

*R. angiocarpus* Murb.

Perennial herb, up to 500 mm high. **Stems** erect or decumbent. **Leaves** petiolate; blade linear-ovate to ovate, 15–60 × 5–25 mm, base hastate, lobes acute, apex acute; petioles up to 12 mm long. **Ocrea** silvery hyaline, lacerating. **Flowers**: male flowers greenish brown, becoming tinged with red; female flowers greenish, with a membranous margin; Oct.–Mar. **Fruit** valves small, not longer than nut. Grassland, disturbed areas. Native to Europe and Asia.

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***conglomeratus** Murb.

Perennial herb, up to 0.8 m high. **Stems** erect. **Leaves** petiolate; blade narrowly oblong, up to 160 × 50 mm, base cordate or truncate, apex acute. **Ocrea** brown, membranous, usually caducous. **Flowers**: inflorescence an open panicle with flower whorls subtended by a leaf; callosity large, covering large part of inner perianth segments; perianth white or greenish;

Nov.–Jan. Grassland, disturbed areas, along watercourses, pastures. Native to Europe and Asia. *Dock*; *maksuring*, *tongblaar* (A).

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***crispus** L.

Perennial herb, up to 1.5 m high. **Stems** erect, stout, striate. **Leaves** petiolate; blade of lower leaves narrowly ovate, 60–260 × 50–140 mm, decurrent, upper leaves linear, apex acute, margins crisped, undulate. **Ocrea** brown, membranous, usually caducous**. Flowers**: perianth with inner segment entire, callosity small, covering a small part of inner perianth segments, white or pale green; Oct.–Mar. Grassland, disturbed areas, along watercourses. Native to Europe and Asia. *Curly dock*, *narrow dock*; *wildespinasie*, *tongblaar*, *krulsuring* (A); *ubuklunga* (X); *idololenkonyane* (X, Z).

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**dregeanus** Meisn. subsp. **montanus** B.L.Burtt

Annual herb, up to 1 m high. **Stems** erect. **Leaves** petiolate or sessile; blade narrowly ovate or elliptic, up to 130 × 50 mm, base hastate from a truncate base, apex acute to acuminate. **Ocrea** brown, membranous, usually caducous. **Flowers**: basal callus retrorse, green; Oct.–Feb. Grassland, among rocks, alongside streams.

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**lanceolatus** Thunb.

*R. ecklonianus* Meisn.
*R. linearis* Campd.

Perennial herb, up to 500 mm high. **Stems** erect. **Leaves** petiolate; blade narrowly obovate to elliptic, up to 180 × 30 mm, base cuneate, apex acute or obtuse. **Ocrea** entire. **Flowers**: only lower flower whorls or none subtended by a leaf; panicle ± condensed; callosity large, covering a large part of inner perianth segments; perianth green; Oct.–Mar. Grassland, moist areas, in vleis, along rivers and dams. *Smooth dock*; *gladdetongblaar* (A); *khamane*, *molokoli*, *potaka-leleme* (SS); *idolonyana* (X); *iDolo lenkonyane* (Z).

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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**nepalensis** Spreng.

*R. bequaertii* De Wild.
*R. quarrei* De Wild.

Perennial herb, up to 1.5 m high. **Stems** straggling. **Leaves** petiolate; blade narrowly oblong-ovate to narrowly linear-ovate, up to 450 × 90 mm, base cuneate, apex obtuse; petioles of basal leaves up to 300 mm long. **Ocrea** entire. **Flowers**: borne in whorls in terminal, racemose panicles; pendulous; perianth with margins of inner segments with 5 or more hooked teeth on each side, yellow or greenish; Oct.–Jan. Grassland, bush clumps, along watercourses.

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**sagittatus** Thunb.

*R. burchellii* Campd.
*R. luxurians* L.f.

Perennial herb. **Stems** annual, scrambling or scandent, up to 2 m long. **Leaves** petiolate; blade ovate-triangular, up to 100 × 50 mm, base sagittate, lobes acute or obtuse; petioles as long

as or shorter than blade. **Ocrea** entire. **Flowers**: borne in few-flowered whorls; perianth green, pink or red; Sep.–Mar. **Fruit** with valves suborbicular, reddish brown, without well-developed callosity. Grassland, in bush clumps, along forest margins, streambanks. *Red sorrel*, *climbing dock*; *klimsuring*, *ranksuring* (A); *bolila-bo-boholo* (SS); *umdende* (Z).

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**woodii** N.E.Br.

*R. natalensis* Dammer ex J.M.Wood

Perennial herb, up to 0.7 m high. **Stems** erect, usually solitary. **Leaves** sessile; blade narrowly ovate, decurrent, base without lobes, apex acute to acuminate. **Ocrea** brown, membranous, usually caducous. **Flowers**: perianth green with deep red to purple edges; Oct.–Feb. **Fruit** with valves suborbicular, coppery red, longer than nut, without well-developed callosity. Grassland, rocky slopes, disturbed areas. *Paper hearts*, *Wood's rumex*; *tongblaar* (A); *bolila-ba-likhomo* (SS).

| | | DrGr | MsGr | | |

## Reference

NOGUEIRA, I., ORTIZ, S & PAIVA, J.A.R. 2006. Polygonaceae. *Flora zambesiaca* 9,3: 1–49.

# PORTULACACEAE

Annual or perennial herbs, dwarf or large shrubs; succulent, especially leaves. **Stems** occasionally reddish. **Leaves** alternate or subopposite, simple; stipules scarious or reduced to fascicles of setae. **Flowers**: inflorescences terminal, variously cymose; usually bisexual; regular; sepals 2; petals 4–6, free; stamens as many as and opposite petals, free; ovary superior or half inferior, 1-locular; style short or absent, with 2–9 stigmatic lobes. **Fruit** a capsule, opening by means of valves or a lid, or a 3-winged nut. *Purslane family*; *spekboomfamilie* (A).

## **Portulaca** L. (sthn Afr.: 9 spp.)

Key to species:

1a Leaves with blade elliptic; corolla white or purplish. . . . . **P. hereroensis**
1b Leaves with blade linear to narrowly ovate or obovate to narrowly obovate; corolla yellow or bright carmine . . . . . 2
2a Leaf blade obovate to narrowly obovate; corolla yellow . . . . . 3
2b Leaf blade linear to narrowly ovate or narrowly obovate; corolla bright carmine. . . . . 4
3a Stipular hairs very few, inconspicuous and caducous . . . . . **P. oleracea**
3b Stipular hairs present. . . . . **P. quadrifida**

4a Leaf blade obovate-spathulate . . . . . **P. quadrifida**
4b Leaf blade linear to narrowly ovate . . . . . **P. kermesina**

### **hereroensis** Schinz

Annual herb, up to 0.01 m high. **Stems** decumbent, herbaceous, reddish mauve, up to ± 70 mm long. **Leaves** with blade elliptic, 5 × 0.8 mm, stipular hairs fairly many. **Flowers**: corolla 1.0 × 1.5 mm long, purplish or white; Nov.–Feb. Rocky outcrops, open patches between grass, sandy soil. *Herero-vygie* (A).

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### **kermesina** N.E.Br.

*P. crocodilorum* Poelln.

Annual, occasionally perennial herb, up to 0.3 m high. **Stems** procumbent or erect. **Leaves** with blade linear to narrowly ovate, 30 × 3 mm; stipular hairs many, up to 7 mm long. **Flowers**: corolla bright carmine; Oct.–Mar. Bush clumps, grassland, old cultivated lands. *Haaskos*, *vygiebossie* (A).

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### ***oleracea** L.

*P. oleracea* L. subsp. *sylvestris* (DC.) Thell.
*P. oleracea* L. var. *opposita* Poelln.

Annual herb, up to 0.05 m high. **Stems** procumbent, reddish. **Leaves** with shiny; blade obovate, up to 20 × 10 mm, stipular hairs very few, inconspicuous and caducous, ± 1 mm long. **Flowers**: corolla yellow; Nov.–Feb. Disturbed places, sandy soil. Native to Europe. *Common purslane*, *purslane*, *kitchen-garden purslane*; *gewone porslein*, *varkkos*, *misbredie* (A).

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### ***quadrifida** L.

*P. walteriana* Poelln.

Annual herb, up to 0.01 m high. **Stems** procumbent, with branches up to 0.25 m long succulent **Leaves** with blade obovate to narrowly obovate, 8–12 × 2–3 mm, stipular hairs many. **Flowers**: terminal; solitary; corolla deep pink, purple to red or yellow; Nov.–Mar. Bush clumps, disturbed places, roadsides. Origin uncertain. *Pusley*, *chickenweed*, *wild purslane*; *kanniedood*, *porselein* (A).

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## PRIMULACEAE

Annual or perennial herbs, sometimes with soft or wiry flowering branches. **Stems** procumbent or erect. **Leaves** simple, alternate, opposite or whorled; blade with margins entire. **Flowers**: bisexual, usually regular; calyx 5-fid or -partite, free or ± adnate to ovary; corolla with tube subcylindrical or campanulate, lobes 4- or 5-fid or -partite, or corolla hypocrateriform; stamens as many as corolla lobes; ovary superior or half inferior. **Fruit** a capsule. *Primula family*.

## PORTULACACEAE

## Key to genera

[after Dyer: 9 (1963)]

Inflorescence reduced to solitary, axillary flowers; filaments bearded. . . **Anagallis**
Inflorescence a raceme or panicle; filaments glabrous . . . . . **Lysimachia**

## **Anagallis** L. (sthn Afr.: 4 spp.)

### Key to species:

Annual, erect herbs; corolla blue or red, lobes fringed with glands . . . . . **A. arvensis** subsp. **arvensis**
Perennial, procumbent herbs; corolla white or pink, lobes not fringed with glands . . . . . **A. huttonii**

### ***arvensis** L. subsp. **arvensis**

Annual herb, up to 100 mm high. **Stems** erect or decumbent, much branched from base. **Branches** quadrangular with narrow wings. **Leaves** opposite or verticillate; sessile and almost stem-clasping at times; blade ovate, 5–20 × 5–15 mm. **Flowers**: solitary, axillary, pedicel longer than leaves; calyx lobes narrowly ovate, acuminate, keeled, nearly as long as corolla; corolla 5–7 mm long, lobes usually fringed with glands, blue or red; Jul.–Oct. **Fruit** circumscissile, not on a recurving pedicel. Weed, in moist situations. Native to Europe and Asia. *Scarlet pimpernel*, *shepherd's weatherglass*; *blouselblommetjie*, *rooimuur* (A).




### **huttonii** Harv.

Perennial herb, with branches up to 0.6 m long. **Stems** procumbent, rarely branched, 4-angled. **Leaves** opposite or occasionally 3 together; blade broadly orbicular-ovate, up to 25 mm long, about the same in width; petioles 1–3 mm long. **Flowers**: solitary, axillary, pedicel longer than leaves; calyx lobes narrowly ovate, somewhat keeled, shorter than corolla; corolla 6–8 mm long, lobes not fringed with glands, white or pink; Nov.–Feb. **Fruit** circumscissile, on a recurving pedicel. Marshes, vleis, along small streams. *White pimpernel*.




## **Lysimachia** L. (sthn Afr.: 2 spp.)

### **ruhmeriana** Vatke

Perennial herb, sparsely branched, up to 1 m high. **Leaves** alternate or opposite; sessile or subsessile; blade narrowly ovate to obovate, up to ± 7 mm long, 8–22 mm broad. **Flowers**: in racemes up to 200 mm long; bracts linear to narrowly ovate; stamens inserted on corolla at base of lobes, filaments glabrous; calyx divided almost to base; corolla dull white, 3–4 mm long; Dec.–Mar. **Fruit** surrounded by a persistent calyx and style. Mainly in cool mountainous situations, grassland.



## Reference

DYER, R.A. 1963. Primulaceae. *Flora of southern Africa* 26: 9–15.

# PROTEACEAE

Trees or shrubs. **Stems** sometimes procumbent. **Leaves** alternate, simple, leathery; blade with margins usually entire; without stipules. **Flowers**: in heads, spikes or racemes, often surrounded by showy involucral bracts; bisexual, irregular; sepals 4, petal-like, petals absent or reduced to scales; stamens 4, opposite and fused to sepals, often with only anthers free or with very short filaments; ovary superior with a long style. **Fruit** a small nut (*Protea*), drupe or follicle. *Protea family*.

## **Protea** L. (sthn Afr.: 83 spp.)

### Key to species:

[after Beard: 44 (1958)]

1a Inner bracts spathulate; heads conical. . . . . **P. roupelliae** subsp. **roupelliae**
1b Inner bracts oblong; heads campanulate, oblong, globose or turbinate . . . 2
2a Inner bracts pubescent, curved outwards away from flowers; heads oblong to campanulate. . . . . **P. subvestita**
2b Inner bracts glabrous, curved inwards to enfold flowers; heads globose, oblong or turbinate. . . . . 3
3a Perianth 40 mm long, tube glabrous within; heads broadly globose . . . . . **P. caffra** subsp. **caffra**
3b Perianth 50–60 mm long, tube fulvously hairy within; heads oblong to turbinate . . . . . **P. dracomontana**

### **caffra** Meisn. subsp. **caffra**

*P. bolusii* E.Phillips
*P. multibracteata* E.Phillips
*P. rhodantha* Hook.f.

Erect shrub or small evergreen tree, up to 8 m high. **Leaves** glabrous; blade narrowly oblong, up to 250 × 45 mm. **Flowers**: head broadly globose, up to 80 mm in diameter; involucral bracts pink or carmine with green at base, inner bracts glabrous, curved inwards to enfold flowers; perianth 40 mm long, tube glabrous within, glabrous to sparsely villous on abaxial limbs and apices with tawny to whitish indumentum; Jul.–Jun. Rocky slopes in grassland. *Common sugarbush*, *Highveld protea*; *suikerbos* (A); *sehila* (SS); *isiqalaba* (X, Z).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### **dracomontana** Beard

Dwarf shrub, up to 1.5 m high. **Leaves** glabrous; blade oblong to narrowly obovate, 80–140 × 20–45 mm, leathery, bluish green. **Flowers**: head oblong or turbinate, 50–60 mm long;




**Figure 57.** *Protea subvestita* (Proteaceae). Artist: A. van der Merwe.

involucral bracts cream-coloured to carmine, inner bracts glabrous, curved inwards to enfold flowers; perianth 40 mm long, tube fulvously hairy within, glabrous at base, tips with tufts of white to pink hairs; Jan.–Mar. Grassland, on basalt. *Drakensberg dwarf protea*/*sugarbush*; *Drakensbergse dwergsuikerbos* (A); *qaphatsi* (SS).

MsGr

**roupelliae** Meisn. subsp. **roupelliae**

*P. incana* Hort. ex Meisn.
*P. lanuginosa* (Kuntze) K.Schum.
*P. rudatisii* Engl.

Small, erect tree, evergreen, up to 8 m high. **Leaves** densely silvery pubescent; blade narrowly ovate to obovate, up to 170 × 50 mm. **Flowers**: head conical, up to 120 × 100 mm; involucral bracts creamy yellow to deep pink, inner bracts spathulate; perianth 70 mm long, tube fulvously hairy within, awns pale pink to deep purple, black, rusty red or brown; Jul.–Jan. Woodland, rocky slopes and ridges. *Silver sugarbush*, *Drakensberg protea*; *silwerblaar-suikerbos* (A); *seqalaba* (SS); *isiqalaba* (X, Z).

VreDm AcGr DrGr MsGr KarSh Zastr

**subvestita** N.E.Br.

*P. lacticolor* Salisb. var. *angustata* E.Phillips
*P. lacticolor* Salisb. var. *orientalis* (Sim) E.Phillips

Large, upright, bushy shrub or small tree, up to 5 m high. **Leaves** pubescent when young; blade elliptic to narrowly ovate, 50–110 × 15–35 mm. **Flowers**: head oblong to campanulate, 30–40 × 55–70 mm; involucral bracts carmine, pink or creamy white, inner bracts oblong, pubescent, innermost bracts with tips bending outwards; perianth 50 mm long, tube fulvously hairy within, apices prominently crinite with silky wavy hairs; Jan., Feb. Montane grassland. *Waterlily sugarbush*, *lip-flower sugarbush*; *lippeblom-suikerbos* (A); *seqalabase-se-soeu* (SS); *isiqalaba* (X, Z). Figure 57.

VreDm AcGr DrGr MsGr KarSh Zastr

## Reference

BEARD, J.S. 1958. The *Protea* species of the summer rainfall area of South Africa. *Bothalia* 7: 41–65.

# PUTRANJIVACEAE

Trees or shrubs; dioecious. **Leaves** simple, distichous or opposite; petiolate; blade with base asymmetrical, margins entire or toothed; with small stipules. **Flowers**: in axillary fascicles; regular; sepals 3–7, often unequal; petals absent; male flowers with stamens free, 2–20, a central disc, sometimes enveloping stamens from inside; female flowers

with an annular disc, ovary superior, styles short, stigmas flattened, entire or bifid. **Fruit** a globose, ellipsoidal or fusiform drupe.

## **Drypetes** Vahl (sthn Afr.: 5 spp.)

### **gerrardii** Hutch. var**. gerrardii**

Shrub or tree, up to 6(–30) m high. **Bark** grey or brownish. **Branches** horizontal to trunk; branchlets with dense, rusty hairs when young. **Leaves** distichous; blade ovate, narrowly ovate or elliptic, 20–120 × 10–60 mm, base asymmetrical, tapering, apex acute to acuminate, margins entire and shallowly toothed, upper surface dark, shiny green, lower surface paler green with net-veining prominent, dense, brown hairs on petiole and base of midrib; petioles up to 10 mm long; stipules triangular. **Flowers**: perianth greenish yellow; male flowers in axillary clusters; female flowers solitary in leaf axils, styles conspicuous; Sep.–Nov. **Fruit** an ovoid, fleshy drupe, ± 15 mm in diameter, yellowish orange, hairy. Forest, kloofs, along watercourses. *Forest ironplum*; *bosysterpruim* (A); *umhlawakele* (SS); *idwesa* (X); *isikhumaphuphu* (Z).

MsGr

# RANUNCULACEAE

Herbs or ± woody climbers. **Leaves** alternate or opposite, often in basal rosette, compound with bases forming a sheath. **Flowers**: regular, with parts typically arranged in spirals along a rather elongated or globular receptacle; sepals 5, often petal-like (petals then absent); petals (if present) 5, free, usually with nectar-bearing stalk; stamens many, free; ovary comprising many free carpels, superior. **Fruit** a cluster of achenes, sometimes with plumed styles. *Buttercup family*.

## Key to genera

| | | |
|---|---|---|
| 1a | Leaves opposite; achenes with persistent, feathery styles | **Clematis** |
| 1b | Leaves radical or alternate; fruit beaked | 2 |
| 2a | True petals present, clearly different from sepals | **Ranunculus** |
| 2b | True petals absent, sepals petaloid | 3 |
| 3a | Inflorescences 1–3-flowered | **Anemone** |
| 3b | Inflorescences with > 3 flowers | **Thalictrum** |

## **Anemone** L. (sthn Afr.: 3 spp.)

### **fanninii** Harv. ex Mast.

Perennial herb, with flowering stem up to 1 m high; plant densely, patently hairy. **Leaves** radical, alternate, petiolate; blade palmately lobed, 200–350 mm in diameter, margins toothed, teeth ending in a reddish gland; softly hairy; petioles up to 700 mm. **Flowers**: inflorescences 1–3-flowered, 70–90 mm in diameter; stamens yellow, anthers orange; corolla white, tinged pink or mauve; Sep.–Dec. **Fruit** beaked. Grassland, marshes, steep slopes, near streams. *Giant wild anemone*; *grootanemoon* (A); *umanzamnyama* (Z).

MsGr

## **Clematis** L. (sthn Afr.: 4 spp.)

### Key to species:

[after Exell & Milne-Redhead: 89 (1960)]

Leaves once divided . . . . . **C. brachiata**
Leaves at least twice divided with ultimate divisions deeply incised. . . **C. oweniae**

### **brachiata** Thunb.

*C. brachiata* Thunb. var. *burkei* Burtt Davy
*C. thunbergii* Steud.

Vigorous climber. **Leaves** opposite; blade once divided. **Flowers**: anthers linear, 1.5–2.5 mm long; corolla white; Jan.–Apr. **Fruit** with persistent, feathery styles. Kloofs, forest margins, hillsides. *Traveller's joy*; *klimop*, *lemoenbloeisels* (A); *morarana-oa-mafehlo* (SS); *ityolo* (X); *umdlandlathi* (Z).

| VreDm | | DrGr | MsGr | KarSh | |
|---|---|---|---|---|---|

### **oweniae** Harv.

Woody climber. **Leaves** opposite; blade at least twice divided and ultimate divisions usually deeply incised. **Flowers**: anthers ellipsoid, 1.0(–1.5) mm long; corolla white; Mar., Apr. **Fruit** with persistent, feathery styles. Grassland, hillsides.

| | AcGr | DrGr | MsGr | | |
|---|---|---|---|---|---|

## **Ranunculus** L. (sthn Afr.: 6 spp.)

### Key to species:

[after Cook: 240 (2004)]

1a Leaves peltate . . . . . **R. baurii**
1b Leaves not peltate . . . . . 2
2a Leaf blade divided into fine linear or hair-like segments; petals white with a yellow claw . . . . . **R. rionii**
2b Leaf blade simple or compound, blades of simple leaves or segments of compound leaves flattened and blade-like; petals yellow. . . . . 3
3a Leaves simple, blade suborbicular . . . . . **R. meyeri**
3b Leaves compound, blade ovate . . . . . **R. multifidus**

### **baurii** MacOwan

*R. cooperi* Oliv.

Perennial herb, with flowering stem up to 1.2 m high. **Leaves** radical, peltate; blade ± circular, up to 300 mm in diameter, serrate with red cartilaginous margins and a gland at tip of serrations, white veined; petioles up to 300 mm long. **Flowers**: solitary or in branched inflorescences; petals 8–15 mm long; yellow; Oct.–Dec. **Fruit** markedly ridged. Vleis, riverbanks, near streams, along forest margins. *Large-leaved ranunculus*; *qojoana* (SS).

| | | | MsGr | | |
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**meyeri** Harv.

*R. meyeri* Harv. var. *transvaalensis* Szylszyl.

Mat-forming herb, up to 150 mm high, creeping by runners. **Leaves** simple; rosulate, radical leaves on long petioles; blade suborbicular-cordate, 10–20 × 10–25 mm, margins crenate; petioles 50–120 mm long. **Flowers**: solitary in leaf axils; petals 4–6 mm long; yellow; Sep.–Feb. **Fruit** laterally flattened, keeled. Vleis. *Bog buttercup*; *bolila-ba-linku-ba-metsi*, *hlapi-ea-metsi-e-nyenyane* (SS).

KarSh

**multifidus** Forssk.

*R. pinnatus* Poir.

*R. pubescens* Thunb.

Robust, erect herb, up to 1 m high. **Leaves** bi- or tripinnate; blade ovate, pubescent; petioles up to 300 mm long; stipules sheath-like, fused and running into petiole. **Flowers**: in simple or compound cymes; petals 3–10 mm long, yellow; Sep.–Feb. **Fruit** ± 40–60 in a spherical to slightly elongated head; nutlet laterally flattened, glabrous. Forest, river- and streambanks, vleis.

VreDm? AcGr DrGr MsGr KarSh Zastr

**rionii** Lagger

Annual or perennial herb; tufted on land with short stems, or spreading in water with long stems. **Leaves** with blade divided into fine linear or hair-like segments; stipules ovate, partly united with petiole. **Flowers**: solitary, borne opposite a leaf; petals 3.5–5.0 mm long, white with yellow claw; Sep.–May. **Fruit** ± 60–90 in a head, nutlet glabrous.

DrGr MsGr KarSh

## **Thalictrum** L. (sthn Afr.: 2 spp.)

### Key to species:

Terminal leaflet cuneate at base, apex acute . . . . . **T. minus**
Terminal leaflet rounded at base, apex cuspidate . . . . . **T. rhynchocarpum**

**minus** L.

*T. caffrum* Eckl. & Zeyh.

Perennial herb, up to 1.5 m high. **Leaves** with terminal leaflet cuneate at base, apex acute, veins on lower surface conspicuous. **Flowers**: in much-branched panicles; stamens conspicuous, anthers on hair-like filaments, linear, yellow; carpels 6–8, strongly ribbed; perianth purplish brown; Nov.–Jan. **Fruit** ovoid with a short beak. Mountain slopes, river- and streambanks, in shade.

DrGr MsGr

**rhynchocarpum** Quart.-Dill. & A.Rich.

*T. innitens* B.Boivin

Perennial herb, up to 2.5 m high. **Leaves** terminal leaflet 3-lobed in upper part, base rounded, apex cuspidate. **Flowers**: in lax, many-flowered inflorescences; pedicels elongating up

to 110 mm, hair-like; carpels usually 1, ribbed; perianth green to purplish; Jan., Feb. **Fruit** asymmetrical with a long beak. Forest margins, in moist places.

MsGr

## References

COOK, C.D.K. 2004. *Aquatic and wetland plants of southern Africa*. Backhuys, The Netherlands.
EXELL, A.W. & MILNE-REDHEAD, E. 1960. Ranunculaceae. *Flora zambesiaca* 1: 89–101.

# RESEDACEAE

Annual or perennial herbs or shrubs. **Leaves** simple; alternate; sometimes fasciculate; blade lobed or pinnatipartite; small, glandular stipules present. **Flowers**: in many-flowered spikes or spike-like racemes; zygomorphic; bisexual; subtended by a bract; calyx 5- or 6-partite; petals 2–6, free or partly fused; disc present or not developed; stamens 3–40 or more; ovary superior. **Fruit** an indehiscent capsule, open at top. *Mignonette family*.

### Key to genera

Flowers sessile; petals usually 2 . . . . . **Oligomeris**
Flowers on long pedicels; petals usually 6 . . . . . **Reseda**

## **Oligomeris** Cambess. (sthn Afr.: 3 spp.)

### Key to species:

Bracts subtending flowers longer than flowers; petals as long as sepals . . . . . **O. dregeana**
Bracts subtending flowers shorter than flowers; petals longer than sepals . . . . . **O. dipetala** var. **dipetala**

### **dipetala** (Aiton) Turcz. var. **dipetala**

Perennial herb. **Stems** erect or procumbent, up to 0.7 m long, often ribbed. **Leaves** alternate; fascicled; blade linear or narrowly spathulate, 3–10 × 0.5–1.0 mm. **Flowers**: in spikes, 50–100 mm long; sepals with broad, white margins; petals white, sometimes tinged pink; Oct.–Apr. Riverine scrub.

KarSh

**dregeana** (Müll.Arg.) Müll.Arg.
*Reseda dregeana* Presl
*Resedella dregeana* Müll.Arg.

Perennial herb. **Stems** decumbent or procumbent, up to 0.5 m long. **Leaves** scattered or densely crowded; blade subulate-linear to narrowly spathulate, 6–15 × 0.5–1.0 mm. **Flowers**: bracts subtending adult flowers longer than flowers; petals ± as long as sepals, white; Jul.–Jun. Open or disturbed vegetation. *Sandveldbitteraarbossie*, *sandbitterhout* (A).

DrGr | KarSh

## **Reseda** L. (sthn Afr.: 1 sp.)

***lutea** L. subsp. **lutea** var. **nutans** Boiss.

Annual or perennial herb, up to 0.8 m high; plants scabrid-papillose to almost glabrous. **Leaves** trifid or pinnatifid with 2–4 pairs of pinnae, segments narrowly ovate to linear, 10–20 × 3–5 mm; basal leaves sometimes simple. **Flowers**: in many-flowered, spike-like racemes, 80–140 mm long; pedicels ascending; bracts narrowly triangular; sepals 1–3 mm, persistent, becoming twisted in fruit; petals yellow; Aug.–Jan. **Fruit** narrowly obovoid, apex before maturity with 3 pronounced horns. Disturbed grassland, dry, hard, rocky soil. Native to Eurasia and North Africa. *Wild mignonette*.

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

# RHAMNACEAE

Compiled by P.C. Zietsman, E. Retief & N.L. Meyer

Trees or shrubs, climbers, rarely herbs. **Stems** erect or scandent. **Leaves** usually alternate, simple; blade often shiny, pinnately or palmately nerved; usually with stipules, stipules often spinescent. **Flowers**: small, in cymes, umbels, spikes or heads; bisexual; regular; disc usually present, nectar-secreting; calyx (4)5-lobed, tubular; petals 5, free, often small and reduced; stamens 5, opposite to and often embraced by petals; ovary superior, sometimes sunken into disc, or inferior. **Fruit** a capsule or drupe, free, partly or wholly enclosed in persistent calyx tube. *Buffalo-thorn or buckthorn family*.

## Key to genera

1a Climber with tendrils; fruit a capsule. . . . . **Helinus**
1b Small trees, shrubs or undershrubs; fruit a capsule or drupe. . . . . 2
2a Fruit a capsule . . . . . **Phylica**
2b Fruit a fleshy or dry drupe . . . . . 3
3a Leaves alternate; blade palmately veined . . . . . **Ziziphus**
3b Leaves opposite or approximate in pairs; blade pinnately veined . . . . . **Rhamnus**

## **Helinus** E.Mey. ex Endl. (sthn Afr.: 2 spp.)

### **integrifolius** (Lam.) Kuntze

*H. ovatus* E.Mey. ex Sond.
*H. scandens* (Eckl. & Zeyh.) A.Rich.

Climbing or sprawling shrub, up to 6 m high; some branchlets reduced to unbranched, coiled tendrils. **Leaves** petiolate; blade ovate to broadly ovate or circular, 15–35 mm long, apex obtuse, mucronate, lateral veins prominent. **Flowers**: axillary, in few-flowered umbels; petals greenish yellow; Nov.–Mar. **Fruit** an obovoid, glabrous capsule. Woodland, forest, grassland. *Soap bush*; *seepbos* (A).

| VreDm | | DrGr | | | |
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## **Phylica** L. (sthn Afr.: 145 spp.)

### **thodei** E.Phillips

Much-branched, rigid shrub, 0.2–1.5 m high. **Leaves** dense, lower ones spreading, shortly petiolate; blade narrowly ovate or linear, 7–9 mm long, apex obtuse, margins strongly revolute, covering lower surface, upper surface scabrid. **Flowers**: in heads, 10–14 mm wide, surrounded by leaves and bracts; densely covered with white hairs; stipitate; calyx tube widely campanulate with an annular ring within, lobes 2 mm long; petals inserted in mouth of tube, blade rotundate, cucullate, claw cuneate-linear; Dec.–Feb. **Fruit** a rotundate capsule, 5–6 mm long, wrinkled, villous. Rocky places, loose basalt soil.

| | | | MsGr | | |
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## **Rhamnus** L. (sthn Afr.: 1 sp.)

### **prinoides** L'Hér.

Evergreen shrub or small tree, sometimes scrambling, up to 5 m high. **Leaves** with blade elliptic or elliptic-oblong, 30–100 × 15–40 mm, upper surface dark green, shiny, margins crenate or serrate, pinnately nerved. **Flowers**: small, axillary, 5-merous; corolla green; Nov.–Jun. **Fruit** a 2–or 4-locular, fleshy, shiny drupe, dark red to black when mature. Riverbanks, forest fringes. *Dogwood*; *blinkblaar* (A); *mofifi* (SS); *umnyenye* (X, Z).

| | | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

## **Ziziphus** Mill. (sthn Afr.: 5 spp.)

### Key to species:

Tree or shrub, 2–10 m high . . . . . .**Z. mucronata** subps. **mucronata**
Dwarf shrub, 0.15–0.60 m high. . . . . .**Z. zeyheriana**

### **mucronata** Willd. subsp. **mucronata**

Deciduous tree or shrub, up to 10 m high; crown drooping. **Leaves** with blade ovate, 30–80 × 20–50 mm, shiny green, 3–5-nerved from base, base markedly asymmetric, pubescent along nerves beneath, more rarely glabrous; stipules usually spinescent, 1 hooked and 1 straight

spine at each node. **Flowers**: small, in axillary clusters; corolla yellowish green; Nov.–Feb. **Fruit** a drupe, yellowish to reddish brown when mature. Open woodland. *Buffalo-thorn*; *blinkblaar-wag-'n-bietjie* (A).

VreDm | AcGr | DrGr | | KarSh |

**zeyheriana** Sond.

*Z. helvola* Sond.

Dwarf shrub, up to 0.6 m high. **Stems** erect, annual from underground rootstock. **Leaves** with blade ovate to broadly ovate, 20–50 × 10–40 mm, shiny green, 3-nerved from base, margins serrulate; stipules spinescent, 1 hooked and 1 straight spine at each node. **Flowers**: small, in axillary clusters; corolla yellowish green; Oct.–Feb. **Fruit** a drupe. Grassland (usually in colonies) and woodland. *Dwarf buffalo-thorn*; *dwerg-blinkblaar-wag-'n-bietjie* (A).

VreDm | | DrGr | | |

# ROSACEAE

Herbs, shrubs or trees. **Stems** erect, procumbent or scandent; armed or unarmed. **Leaves** alternate, rarely opposite or borne in groups of 2 or 3 at each node; simple or compound; margins often toothed; usually with stipules. **Flowers**: regular, mostly bisexual, rarely unisexual; solitary or in corymbose, racemose or paniculate inflorescences, with or without regular bracteoles; often with a large, well-developed, flat, convex or concave, often hollow receptacle/calyx tube/hypanthium; calyx with tube short or long; lobes 5, rarely (0)3–many, occasionally with outer, alternating lobes forming an epicalyx; petals 5, usually free, inserted below margin of disc, often deciduous, or absent; stamens 1–many, filaments free, filiform; disc lining calyx tube sometimes tumid or lobed; ovary inferior or superior, carpels 1–many, free or variously united; styles as many as carpels, usually free, stigmas capitate to plumose. **Fruit** various, dry or fleshy, 1–many achenes, follicles crowded on a dry or fleshy receptacle, drupe or pome. *Rose family*; *roosfamilie* (A).

## Key to genera

[after Jordaan: 471 (2000)]

| | | |
|---|---|---|
| 1a | Low or tall perennial herbs or unarmed low shrubs | 2 |
| 1b | Trees, shrubs or scramblers | 6 |
| 2a | Flowers with petals absent | 3 |
| 2b | Flowers with distinct petals | 4 |
| 3a | Flowers in leafy cymes; epicalyx present | **Alchemilla** |
| 3b | Flowers sessile in long-stalked, leafless heads or spikes; epicalyx absent | **Sanguisorba** |
| 4a | Carpels 2, rarely 3 | **Agrimonia** |
| 4b | Carpels several to many | 5 |
| 5a | Styles persistent, long, hooked at fruiting; carpels in dense, hairy cluster | **Geum** |
| 5b | Styles deciduous, short, not hooked at fruiting; carpels not forming a hairy cluster | **Potentilla** |
| 6a | Stems and/or branches and/or leaves armed with prickles or thorns | 7 |
| 6b | Stems, branches and leaves unarmed | 10 |

7a Leaves compound, imparipinnate; leaflets 3–7; shrubs or scramblers armed with prickles . . . . . 8
7b Leaves simple, not divided; shrubs with branches with thorns in axils of leaves, prickles absent . . . . . 9
8a Ovary (carpels) superior; calyx tube not becoming fleshy; fruit succulent, collection of many 1-seeded drupelets. . . . . **Rubus**
8b Ovary (carpels) usually inferior; the calyx tube becoming fleshy; fruit dry; achenes free within enlarged receptacle . . . . . **Rosa**
9a Deciduous; leaf margins irregularly serrate; seeds 1 or 2. . . . . **Crataegus**
9b Evergreen; leaf margins entire or nearly so; seeds 5. . . . . **Pyracantha**
10a Leaves imparipinnate, trifoliolate or unifoliolate, but then petals absent and flowers wind-pollinated . . . . . .11
10b Leaves simple, not divided; petals present; flowers insect-pollinated . . . . 12
11a Leaves trifoliolate or unifoliolate; ericoid shrubs; flowers solitary; petals absent; stigmas plumose . . . . . .**Cliffortia**
11b Leaves imparipinnate; flowers in erect racemes; petals present; stigmas channelled, hooked . . . . . **Leucosidea**
12a Leaf margins serrate; inflorescences racemose, fasciculate or umbellate. . . 13
12b Leaf margins entire; inflorescences cymose or flowers solitary . . . . . 14
13a Inflorescence racemose; fruit a drupe . . . . . **Prunus**
13b Inflorescence fasciculate or umbellate; fruit a pome. . . . . **Pyrus**
14a Flowers in 2–many-flowered inflorescences; petals < 5 mm long; fruit small, < 20 mm long, red or black. . . . . **Cotoneaster**
14b Flowers solitary; petals > 5 mm long; fruit large, > 30 mm long, green, yellow or brown . . . . . **Cydonia**

## **Agrimonia** L. (sthn Afr.: 2 spp.)

### Key to species:

[after Stirton: 80 (1982)]

Mature hypanthium grooved for 1/2 its length, lowest bristles distinctly deflexed; stems clothed only with long eglandular hairs . . . . . **A. procera**
Mature hypanthium grooved for 3/4 its length, lowest bristles rarely deflexed, if so only slightly; stems clothed with both long and short eglandular hairs . . . . . .**A. bracteata**

### **bracteata** E.Mey. ex C.A.Mey.

*A. eupatoria* L.

Perennial herb. **Flowering stems** up to 1 m high; sparsely hairy with short glandular hairs and long, spreading, eglandular hairs of unequal length. **Leaves** in a basal rosette; imparipinnate; leaflets of different sizes. **Flowers**: in terminal, spicate inflorescences; mature hypanthium grooved for 3/4 its length, lowest bristles rarely deflexed, if so only slightly; corolla yellow; Dec.–May. **Fruit** with achenes enclosed in a hairy, campanulate, basal part, ribbed, crowned by hooked bristles. Grassland, along watercourses.




### *__procera__ Wallr.

*A. odorata* Mill.

Perennial herb. **Flowering stems** up to 1.2 m high, with long eglandular hairs. **Leaves** imparipinnate; leaflets of different sizes. **Flowers**: in elongated, bracteate, terminal racemes; mature hypanthium grooved for 1/2 its length, lowest bristles distinctly deflexed; corolla bright yellow; Dec.–May. **Fruit** 8 mm long, basal part campanulate, ribbed, densely pubescent,

crowned by hooked bristles. Grassland, streambanks, vleis. Native to Europe and Asia. *Agrimony*; *akkermonie*, *geelklits* (A); *bohome mo-sinoana-o-monyenyane* (SS); *umakhuthula* (Z).

DrGr MsGr

## **Alchemilla** L. (sthn Afr.: 15 spp.)

### Key to species:

1a Plant appressed pilose . . . . . .**A. elongata** var. **elongata**
1b Plant patently hirsute . . . . . 2
2a Stipules ovate . . . . . **A. woodii**
2b Stipules narrowly ovate . . . . . **A. natalensis**

**elongata** Eckl. & Zeyh. var. **elongata**

*A. palmata* E.Mey.

Perennial herb; appressed pilose. **Stems** procumbent; unarmed. **Leaves** simple, petiolate; blade lobes incised to half of radius, glabrous above, pilose below; petioles 15–30 mm long; stipules ovate. **Flowers**: green; Nov. Streambanks, marshy areas.

DrGr

**natalensis** Engl.

Perennial herb; patently hirsute. **Stems** procumbent; unarmed **Leaves** simple, petiolate; blade with margins incised, lobes truncate, glabrous on both sides or sericeous below; petioles 1–3 mm long; stipules narrowly ovate. **Flowers**: petals green; Nov. Vleis.

MsGr

**woodii** Kuntze

*A. wilmsii* Engl.

Perennial herb; mat-forming; patently hirsute. **Stems** procumbent; unarmed. **Leaves** simple, petiolate; blade incised to up to $^{2}/_{3}$ of radius, upper surface glabrescent, lower surface hirsute; petioles 1–12 mm long; stipules ovate. **Flowers**: yellow; Nov.–Jan. Riverbanks, margins of vleis. *Lady's mantle*; *molalaphoka*, *morothetso*, *phokana* (SS).

DrGr MsGr

## **Cliffortia** L. (sthn Afr.: 114 spp.)

### Key to species:

[after Whitehouse: 2 (2004)]

1a Leaves petiolate; leaflets broadly obovate and at least middle leaflet toothed . . . . . 2
1b Leaves sessile, or if petiolate then leaves oblong to linear and not toothed . . . 3
2a Plants decumbent or with arching stems; leaf blade with lateral leaflets narrower than terminal leaflet, only middle leaflet margins toothed, sparsely hairy . . . . . **C. filicauloides**

2b Plants erect; leaf blade with terminal leaflet similar to lateral leaflets, all margins toothed, hairy throughout . . . . . **C. nitidula** subsp. **pilosa** (juvenile foliage)
3a Leaves unifoliolate . . . . . 4
3b Leaves trifoliolate . . . . . 5
4a Medium to tall shrub with virgate or tangled stems; young stems densely hairy; leaf blade with midrib and margins thickened so that they touch each other . . . . . **C. linearifolia**
4b Low shrub with spreading stems that ascend towards apex; young stems glabrous or sparsely, shortly hairy; leaf blade with margins minutely serrate . . . . . **C. repens**
5a Leaves sparsely hairy especially on young growth; leaf blade with margins rolled under on lower surface . . . . . **C. nitidula** subsp. **pilosa**
5b Leaves always glabrous; leaf blade with margins not inrolled although sometimes thickened . . . . . 6
6a Leaves subsessile, petioles < 1 mm long; blade narrowly oblong, apex mucronate to rounded; sepals 3 . . . . . **C. ramosissima**
6b Leaves sessile; sepals 4, rarely 3 and then leaf blade needle-shaped with apex sharply pointed . . . . . 7
7a Leaflets with blade narrowly elliptic to broadly obovate . . . . . 8
7b Leaflets with blade linear to needle-shaped . . . . . 9
8a Leaflets with blade broadly obovate, margins toothed or lobed . . . . . **C. spathulata**
8b Leaflets with blade elliptic, margins entire . . . . . **C. browniana**
9a Plants resprouting; leaflets > 10 mm long . . . . . 10
9b Plants not resprouting; mature foliage with leaflets < 13 mm long . . . . . 11
10a Stems densely, shortly hairy . . . . . **C. linearifolia** (juvenile foliage)
10b Stems glabrous or almost so . . . . . **C. repens** (juvenile foliage)
11a Midrib and margins of leaflets thickened so that they touch each other; apices obtuse to rounded . . . . . **C. linearifolia**
11b Margins not thickened; midrib slightly thickened to form a keel; apices acute to long acuminate . . . . . **C. paucistaminea** var. **paucistaminea**

## **browniana** Burtt Davy

Dwarf shrub, up to 0.5 m high. **Stems** densely divaricately branched, forming short branchlets (brachyblasts). **Leaves** sessile; trifoliolate; blade elliptic, leaflets narrowly elliptic, 1.9–4.3 × 0.6–1.3 mm, apex acute, margins entire, flat; glabrous. **Flowers**: solitary in axils of undifferentiated leaves; sepals 4; brownish; Nov.–May. Mountain grassland, in damp places, amongst rocks.

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|

## **filicauloides** Weim.

Dwarf shrub, up to 0.12 m high. **Stems** decumbent or arching, sprawling, woody. **Leaves** petiolate; blade with lateral leaflets narrower than terminal leaflet, only middle leaflet margins toothed; sparsely hairy. **Flowers**: solitary in axils of undifferentiated leaves; Nov.–Jan. Grassland, draped mats over streamside rock.

| | | | MsGr | | |
|---|---|---|---|---|---|

## **linearifolia** Eckl. & Zeyh.

*C. ericifolia* L.f. var. *acutistipula* Kuntze

Shrub, up to 2 m high; resprouting. **Stems** many, slender, erect, much branched, densely leafy; young stems densely hairy; older brown, fissured. **Leaves** sessile or subsessile; densely

clustered on short branchlets; (1–)3-foliolate, leaflets linear to very narrowly ovate, when young > 10 mm, mature < 13 mm long, apex acute, blunt or rounded, margins noticeably revolute, with no glandular hairs, midrib swollen, prominent; glabrous. **Flowers**: axillary, in a cluster; brownish white with red, protruding stamens; Nov.–Mar. Riverbanks, streambanks, marshy grassland.

MsGr

**nitidula** (Engl.) R.E.Fr. & T.C.E.Fr. subsp. **pilosa** Weim.

Shrub, up to 2 m high. **Stems** erect; young twigs pilose; old stems grey, fissured. **Leaves** clustered on short branchlets; petiolate; trifoliolate, midrib not swollen, visible but not prominent, leaflets very narrowly obovate to linear, up to 10 × 0.8–1.5 mm, lateral leaflets toothed, similar in size to terminal one, margins slightly rolled under, broadly toothed on young plants, hairy throughout, midrib with slightly prominent hairs in axils; petioles up to 3 mm long. **Flowers**: pale green; Sep.–Dec. Grassland, streambanks, forest margins. *Starry rice-bush*; *sterretjierysbos* (A); *lenyofane* (SS); *umbele*, *unwele*, *untswabantswaba* (X); *umhlahlahla* (Z).

MsGr

**paucistaminea** Weim. var. **paucistaminea**

Shrub, up to 2 m high. **Stems** erect, sprawling; old stem grey. **Leaves** sessile or subsessile; clustered on short branchlets; trifoliolate; blade needle-like, linear to narrowly ovate, up to 10 × 0.4–0.8 mm, apex acute to long acuminate, margins glandular-hairy, not thickened; midrib slightly thickened to form a keel, hair tufts in leaf axils. **Flowers**: pale green, yellow; Sep.–Feb. Rocks. *Rock rice-bush*, *tea rice-bush*; *teerysbos* (A).

DrGr Zastr

**ramosissima** Schltr.

Shrub, up to 2 m high. **Stems** erect, much branched, densely leafy. **Leaves** subsessile; clustered on short branchlets; trifoliolate; blade narrowly oblong, leaflets linear, ± 5 × 1 mm, subfalcate, apex with a sharp mucro to rounded, margins not inrolled; glabrous; petioles < 1 mm long. **Flowers**: sepals 3; olive-green; Dec. Grassland.

MsGr

**repens** Schltr.

Shrub, up to 2 m high; resprouting. **Stems** many, erect or spreading, ascending towards apex; glabrous or sparsely, shortly hairy (juvenile foliage); old stems grey-brown, may lie flat and set root. **Leaves** sessile; usually unifoliolate; blade linear, sickle-shaped, 6–15 × 0.4–1.0 mm, apex pointed, tip hair-like, margins minutely serrate, midrib prominently swollen; glabrous. **Flowers**: sepals 4; greenish; Nov.–Jan. Rocky slopes, along watercourses. *Drakensberg rice-bush*; *Drakensbergrysbos* (A).

MsGr

**spathulata** Weim.

Shrub, up to 1 m high. **Stems** densely divaricately branched, forming short branchlets. **Leaves** sessile; trifoliolate; leaflets broadly obovate, 2.4–6.1 × 1.2–3.4 mm, apex acute to rounded,

margins toothed or lobed; glabrous. **Flowers**: solitary in axils of leaves; sepals 4; brownish; Nov.–Jan. Mountain grassland.

MsGr

## **Cotoneaster** Medik. (sthn Afr.: 2 spp.)

### Key to species:

[after Henderson: 173 (2001)]

Fruit orange-red, pomes with three nutlets . . . . . .**C. franchetii**
Fruit dull deep red, pomes with two nutlets. . . . . **C. pannosus**

### *__franchetii__ Boiss.

Shrub, up to 6 m high. **Branches** arching; unarmed. **Leaves** simple, petiolate; elliptic, 20–30 mm long, apex acute, margins entire, upper surface hairy becoming glabrous and shiny, grey-green, lower surface densely white-tomentose; petioles 1–3 mm long. **Flowers**: corolla ± 10 mm in diameter, petals pink; Aug.–Jan. **Fruit** orange-red, subglobose pomes with three nutlets. Native to China. *Orange cotoneaster*; *oranje cotoneaster* (A).

DrGr MsGr

### *__pannosus__ Franch.

Semi-evergreen shrub, up to 3 m high. **Branches** spreading, drooping at ends; unarmed. **Leaves** simple; blade ovate to elliptic, 10–25 × 5–15 mm, apex acute, margins entire, upper surface dull green and glabrous, lower surface densely whitish hairy; petioles 2–7 mm long. **Flowers**: corolla ± 10 mm in diameter; petals white; Oct., Nov. **Fruit** dull deep red, subglobose pomes with two nutlets. Riverbanks, edges of dams, roadsides; invader. Native to China. *Silver-leaf-cotoneaster*; *silwerdwergmispel* (A). Figure 13A, p. 10.

DrGr MsGr

## **Crataegus** L. (sthn Afr.: 2 spp.)

### Key to species:

Leaf blade with margins deeply 3- or 5-lobed > $^1/_2$-way to midrib. . . . . .**C. monogyna**
Leaf blade with margins not lobed. . . . . .**C. × lavallei**

### *× __lavallei__ Hérincq

Tree, up to 7 m high; deciduous. **Stems** armed; glabrous. **Leaves** simple; blade ovate, margins not lobed, unevenly serrate glossy, dark green, red in autumn. **Flowers**: in clusters; petals white; Oct.–Dec. **Fruit** an orange-red, globose berry. Disturbed places. Hybrid between cultivated specimens. *Lavalle hawthorn*.

DrGr

***monogyna** Jacq.

Shrub or small tree, up to 10 m high; deciduous. **Stems** armed; glabrous. **Leaves** simple; blade deeply 3- or 5-lobed, lobed > $^1/_2$-way to midrib. **Flowers**: in broad, dense, flattened clusters; petals white, 8–15 mm long; Aug.–Nov. **Fruit** a crimson or red, globose berry. Scrub. Native to Europe, northwest Africa and western Asia. *Common hawthorn*.

MsGr

## **Cydonia** Mill. (sthn Afr.: 1 sp.)

***oblonga** Mill.

Shrub or small tree, up to 6 m high; deciduous. **Leaves** alternate, simple with blade ovate to elliptic, ± 100 × 50 mm, margins entire. **Flowers**: solitary; sepals 5, hairy on outer side; corolla ± 50 mm in diameter, petals 5, white to pink; Sep.–Nov. **Fruit** a pome, ± pear-shaped, 70–120 × 60–90 mm, with persistent sepals at top, densely appressed hairy, golden-yellow when ripe. Native to Asia. *Quince*; *kweper* (A).

Zastr

## **Geum** L. (sthn Afr.: 1 sp.)

**capense** Thunb.

Perennial herb, up to 0.5 m high in flower; softly hairy. **Leaves** compound; radical and cauline leaves; leaflets broadly ovate, ± 75 × 50 mm, terminal segment mostly larger than rest; cauline few, small or depauperate, trifid. **Flowers**: ± 35 mm in diameter, bright yellow; Oct.–Mar. **Fruit** a cluster of achenes borne on a cylindrical, dry receptacle. Mountain grassland, damp places, streambanks.

MsGr

## **Leucosidea** Eckl. & Zeyh. (sthn Afr.: 1 sp.)

**sericea** Eckl. & Zeyh.

Shrub, up to 3 m high, sometimes a tree up to 10 m high. **Stems** much branched, very leafy; bark reddish brown. **Leaves** compound; blade imparipinnate, obovate; leaflets in 3 or 4 pairs, pinnae blades with apices mucronate, margins serrate, revolute on lower surface, silky and glandular-hairy, upper surface green, lower surface greyish. **Flowers**: densely aggregated in terminal racemes; calyx with tube obconic, 3–4 mm long, constricted in throat, silky, persistent; petals 5 or 6, deciduous, yellowish green or yellow; Aug.–Feb. Forest margins, riverbanks, hillsides. *Oldwood*, *troutwood*; *broshout*, *ouhout* (A); *mosino* (SS); *cheche*, *intshitshi*, *isidwadwa* (X); *umtshitshi* (Z).

DrGr MsGr KarSh Zastr

## **Potentilla** L. (sthn Afr.: 1 spp.)

**supina** L.

*P. gariepensis* E.Mey. ex Harv.

Annual or short-lived perennial herb. **Stems** spreading; flowering stems up to 400 mm high. **Leaves** compound; blade imparipinnate; leaflets oblong or obovate, incise-dentate. **Flowers**:

petals 2.5–3.0 mm long, shorter than sepals; corolla yellow; Oct.–Jun. Disturbed areas along watercourses, riverine grassland, vleis, occasionally on dried mud left by sinking of water.

DrGr | KarSh | Zastr

## **Prunus** L. (sthn Afr.: 2 spp.)

### Key to species:

Evergreen tree; petals white . . . . . **P. africana**
Deciduous tree; petals pink . . . . . **P. persica** var. **persica**

### **africana** (Hook.f.) Kalkman

*Pygeum africanum* Hook.f.

Evergreen tree, up to 24 m high; unarmed. **Leaves** simple; blade ovate to elliptic, 50–110 × 25–40 mm, margins finely toothed, dark green and glossy above, paler below; petioles pinkish, 10–20 mm long. **Flowers**: white; Dec.–Jun. **Fruit** spherical, ± 10 mm in diameter, cherry-red. Forest, bushveld. *Red stinkwood*, *bitter almond*, *wild almond*; *rooistinkhout*, *bitteramandelboom*, *wilde-kersieboom* (A); *umkhakhazi*, *umdumizulu*, *inyazangoma*, *itywina-elikhul* (X); *ngubozinyeweni*, *inkokhokho*, *umlalume*, *umdumezulu* (Z).

MsGr

### *__persica__ (L.) Batsch var. **persica**

Deciduous tree, up to 10 m high; unarmed. **Leaves** simple; blade narrowly ovate, 45–85 × 15–25 mm, apex occasionally folded, margins finely serrulate, each tooth ends in a reddish brown gland, net-veining prominent on lower surface. **Flowers**: solitary or 2 together; corolla 25–30 mm in diameter; petals pink; Sep. **Fruit** a ± globose drupe, mesocarp fleshy-juicy, endocarp hard, wrinkled or smooth. Roadsides. Native to China. *Peach*; *perske* (A).

MsGr

## **Pyracantha** M.Roem. (sthn Afr.: 2 spp.)

### Key to species:

1a Leaf with lower surface of blade pubescent; calyx hairy. . . . . **P. angustifolia**
1b Leaf with lower surface of blade glabrous; calyx glabrous . . . . . 2
2a Inflorescence finely pubescent . . . . . **P. coccinea**
2b Inflorescence glabrous . . . . . **P. crenulata**

### *__angustifolia__ (Franch.) C.K.Schneid.

Shrub, up to 3 m high; evergreen; young shoots thickly downy; armed. **Stems** stiff, spiny; spines woody, sharp-pointed with leaves. **Leaves** simple; blade linear, oblong or narrowly obovate, 10–50 × 4–12 mm, apex obtuse, notched, margins entire or faintly toothed, upper surface dull dark green, glabrous, lower surface greyish tomentose. **Flowers**: in axillary clusters; calyx hairy; petals ± 5 mm long, dull white; Nov., Dec. **Fruit** an orange-red or orange-yellow pome, 5–8 mm in diameter. Mountain grassland, riverbanks; invader. Native to southwestern China. *Yellow/orange firethorn*; *geelvuurdoring* (A). Figure 14B, p. 11.

MsGr | Zastr

***coccinea** M.Roem.

*Cotoneaster pyracantha* (L.) Spach

*P. pauciflora* André

Shrub, up to 2 m high; evergreen; young shoots downy. **Stems** leafy; armed. **Leaves** simple; blade narrowly ovate or oblong-ovate, 13–35 × 5–10 mm, apex acute, margins serrate, surfaces glabrous. **Flowers**: in axillary clusters, inflorescences finely pubescent; calyx glabrous; petals white. **Fruit** a scarlet-red pome. Riverbanks. Native to Europe and Asia. *Red firethorn*.

MsGr

***crenulata** (D.Don) M.Roem.

Shrub, up to 3 m high; evergreen. **Stems** stiff, erect, spiny; spines woody, sharp-pointed, with leaves. **Leaves** simple; blade narrowly oblong or obovate, 15–30 × 5–10 mm, apex obtuse, margins crenulate-serrulate, surfaces glabrous, upper surface glossy green, lower duller. **Flowers**: on long, slender, glabrous, peduncles; calyx glabrous; petals ± 4 mm long, white; Sep.–Dec. **Fruit** an orange-red pome, 5–8 mm in diameter. Grassland, rocky ridges, roadsides. Native to Asia. *Himalayan firethorn*; *rooivuurdoring* (A).

MsGr

## **Pyrus L.** (sthn Afr.: 1 sp.)

***communis** L.

Shrub or tree, up to 20 m high; deciduous. **Stems** often with lower branches spiny. **Leaves** simple, petiolate; blade broadly elliptic, up to 90 mm long; apex acute, base rounded, margins serrate, glossy. **Flowers**: in umbel-like racemes or corymbs; calyx with tube turbinate or globose, accrescent; petals 5, broadly oblong or obovate, white; Sep., Oct. **Fruit** a pome, ± turbinate, up to ± 10 mm long, mesocarp fleshy-juicy with grit cells; seeds black or brownish black. Roadsides, moist places. Native to Europe and western Asia. *Pear*.

MsGr

## **Rosa** L. (sthn Afr.: 2 spp.)

***rubiginosa** L.

*R. eglanteria* L., rejected name

Shrub or scrambler, up to 3 m high; compact, deciduous. **Stems** slightly arching; thorns stout and hooked, interspersed with rusty, glandular hairs and bristles. **Leaves** compound; blade imparipinnate; leaflets 5–7, ± densely glandular beneath, margins serrate. **Flowers**: petals light pink; Oct.–Dec. **Fruit** a fleshy, orange-red to scarlet achene. Riverbanks, roadsides. Native to Europe and Asia. *Sweet briar*, *eglantine rose*. Figure 14D, p. 11.

VreDm AcGr DrGr MsGr KarSh Zastr

## **Rubus** L. (sthn Afr.: 17 spp.)

Key to species:

1a Petals ± same length or shorter than sepals; leaves pinnate, usually with 3, 5 or 7 leaflets, imparipinnate . . . . . 2

1b Petals much longer than sepals; leaves palmately compound with 3 or 5 leaflets. . . . . 3
2a Stems round, reddish with a white, powdery bloom . . . . . .R. **ludwigii** subsp. **ludwigii**
2b Stems deeply ridged, light green, velvety . . . . . **R. rigidus**
3a Stems round or angled . . . . . **R. fruticosus**
3b Stems deeply ridged . . . . . **R. cuneifolius**

## ***cuneifolius** Pursh

Shrub, up to 4 m high. **Stems** erect; deeply ridged, thorny. **Leaves** compound; blade palmately pinnate, usually with 3 leaflets; leaflets discolorous, margins strongly dentate. **Flowers**: 2–5 at ends of short leafy shoots, either axillary or terminal; petals much longer than sepals, white rarely pink; Nov., Dec. **Fruit** black, adhering to torus. Forest margins, disturbed places. Native to North America. *Sand bramble*, *Gozard's curse*, *American bramble*; *Amerikaanse braambos*, *bosbraam*, *sandbraam* (A).




## ***fruticosus** L.

Shrub, up to 2 m high. **Stems** strongly arching; round or angled, thorny. **Leaves** compound; blade palmately pinnate with 3 or 5 leaflets; leaflets discolorous, lower surface prominently veined. **Flowers**: many in much-branched, very prickly, terminal flower heads, up to 200 mm long; petals much longer than sepals, white or pink; Oct.–Dec. **Fruit** red, turning shiny black. Native to Europe. *Bramble*, *blackberry*; *braambos* (A).




## **ludwigii** Eckl. & Zeyh. subsp. **ludwigii**

*R. rhodacantha* E.Mey.

Scrambler, up to 1.5 m high. **Stems** round, reddish with a white, powdery bloom, thorny. **Leaves** compound; blade pinnate with ± 7 leaflets; leaflets with margins deeply incised, teeth with sharp apices, venation on lower surface of leaflets scarcely pubescent, brown on dried specimens, easily discernible against greenish white or cream-coloured, finely woolly blade. **Flowers**: axillary or terminal, solitary or 2 or 3 together; petals ± same length or shorter than sepals, pale pink to crimson; Nov. **Fruit** red, white downy. Grassland. *Silver bramble*, *raspberry*; *wildebraam* (A); *monoko-metsi*, *monokotsoai-oa-basali* (SS); *itshalo*, *unomhloshane*, *imencemence* (Z).




## **rigidus** Sm.

*R. atrocoeruleus* Gust.
*R. discolor* E.Mey.

Shrub, up to 3.5 m high. **Stems** deeply ridged, light green, velvety, thorny. **Leaves** compound; blade pinnate with 3 or 5 leaflets; petioles and lower surfaces densely albo-tomentose; leaflets broadly ovate, margins serrate or doubly serrate. **Flowers**: many, in inflorescences much longer than wide; petals ± same length or shorter than sepals, purplish pink; Oct.–Jan. **Fruit** red, turning black. Streambanks, kloofs, riverbanks. *White bramble*; *braambos* (A); *monokotswai-wabanna*, *monoko-metsi* (SS); *ugagane*, *ijingijolo* (Z).



## **Sanguisorba** L. (sthn Afr.: 1 sp.)

### ***minor** Scop. subsp. **muricata** Briq.

Perennial herb, up to 0.4 m high; tufted. **Stems** erect; unarmed. **Leaves** compound; blade imparipinnate; leaflets orbicular to elliptic, up to 15 × 8 mm, margins deeply toothed, terminal tooth smaller than adjacent ones. **Flowers**: in glomerate heads, the upper with red styles, the lower with yellow stamens; perianth greenish purplish pink; Nov.–Mar. **Fruit** with achenes in a persistent hypanthium. Native to Europe and Asia. Grassland, disturbed places, roadsides. *Sheep's burnet*.




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# RUBIACEAE

Compiled by E. Retief, E. Figueiredo & N.L. Meyer

Trees, shrubs, herbs or climbers; sometimes spiny or prickly; raphides present or absent. **Leaves** opposite or whorled; sessile or petiolate; stipules present, inserted between petioles (interpetiolar), sometimes leaf-like and indistinguishable from leaves. **Flowers**: regular; calyx fused to ovary; petals 4 or 5, united into a tube; mouth of tube usually hairy; disc usually present; stamens 4 or 5, arising from corolla tube; ovary inferior. **Fruit** a drupe, berry or capsule, indehiscent or schizocarp, sometimes crowned with persistent remains of calyx lobes. *Gardenia or Coffee family*; *koffiefamilie* (A).

## Key to genera (based on habit)

[after Leistner: 300 (2005)]

| | | |
|---|---|---|
| 1a | Climbing and/or scandent plants | 2 |
| 1b | Plants not climbing, but sometimes scrambling | 3 |
| 2a | Leaves petiolate; corolla 5-merous; fruit fleshy, bilobed, glabrous | **Rubia** |
| 2b | Leaves sessile; corolla 4-merous; fruit dry dehiscing into 1 or 2 mericarps, glabrous or hairy | **Galium** |

3a Herbs or subshrubs; corolla lobes always valvate; raphides present (if absent and inflorescence axillary go to Key 2) . . . . . **Key 1**
3b Plants woody or with herbaceous shoots from a woody or rhizomatous rootstock; corolla lobes valvate contorted or imbricate; raphides present or absent . . . . . 4
4a Plants subshrubby or shrubby, or with herbaceous shoots (up to 2 m high) from a woody or rhizomatous rootstock . . . . . **Key 2**
4b Shrubs or trees 0.75–20.00 m high . . . . . **Key 3**

## Key 1 – Herbaceous plants

1a Leaves and stipules similar, in whorls of 4–8; corolla rotate; ovules solitary in each locule; plants often adhesive due to prickles and harsh hairs . . . . . 2
1b Leaves clearly different from stipules, opposite or less often in whorls of 3–5; corolla mostly tubular . . . . . 3
2a Petioles developed; corolla 5-merous . . . . . **Rubia**
2b Petioles very short or absent; corolla 4-merous . . . . . **Galium**
3a Ovules (or seeds) 2–many per locule . . . . . 4
3b Ovules (or seeds) solitary in each locule or flowers male . . . . . 7
4a Anthers and stigmas included, the stigmas always overtopped by the anthers; corolla tube narrowly cylindrical . . . . . 5
4b Anthers and/or stigmas exserted or, if included, then anthers overtopped by stigmas; corolla tube cylindrical or funnel-shaped . . . . . 6
5a Stigma cylindrical or ovoid, not divided into 2 lobes; stipular sheaths in the midstem region mostly produced into 2–8 fringing, ± rigid, subulate fimbriae; corolla tube throat hairy or papillate, lobes hairy at base above . . . . . **Cordylostigma**
5b Stigma divided into 2 filiform lobes; stipular sheaths in the midstem region mostly with 1 or 2 fimbriae; corolla tube throat and lobes above always glabrous . . . . . **Kohautia**
6a Corolla tube at least 15 mm long . . . . . **Conostomium**
6b Corolla tube < 4 mm long . . . . . **Oldenlandia**
7a Style ending in a globose or cylindrical pollen presenter, often ridged and several lobed . . . . . 8
7b Style without a pollen presenter . . . . . 9
8a Ovary or fruit 2-locular . . . . . **Pygmaeothamnus**
8b Ovary or fruit with (2)3–8-locular . . . . . **Pachystigma**
9a Style absent; stigmas 2, feathery . . . . . **Anthospermum**
9b Style developed and ending in 2 arms . . . . . **Richardia**

## Key 2 – Perennial herbs, sometimes woody at base with woody rootstock

1a Style absent; stigmas 1 or 2, feathery, long exserted . . . . . 2
1b Style well developed, ending in 2 arms or a pollen presenter . . . . . 4
2a Inflorescence terminal; leaves large, petiolate . . . . . **Galopina**
2b Inflorescence of axillary, ± sessile, flower clusters; leaves smaller, often ericoid, without a distinct petiole . . . . . 3
3a Woody, many-stemmed, dioecious, dwarf shrubs; leaves needle-like, mostly decussate, inflorescence few-flowered, reduced . . . . . **Nenax**
3b Perennial herbs to tall shrubs, not as above . . . . . **Anthospermum**
4a Style divided into 2 lobes . . . . . **Pentanisia**
4b Style not divided, ending in a globose or cylindrical pollen presenter . . . . . 5
5a Ovary or fruit 2-locular . . . . . **Pygmaeothamnus**
5b Ovary or fruit (2)3–8-locular . . . . . **Pachystigma**

Key 3 – Shrubs or trees

1a Flowers in globose or capitate heads . . . . . **Pavetta**
1b Flowers solitary or in lax to compact or spike-like inflorescences . . . . . 2
2a Style absent; stigmas 1 or 2, feathery, long exserted . . . . . 3
2b Style well developed, ending in 2 arms or a pollen presenter . . . . . 4
3a Woody, many-stemmed, dioecious, dwarf shrubs; leaves needle-like, mostly decussate; inflorescence few flowered, reduced. . . . . **Nenax**
3b Perennial herbs to tall shrubs, not as above . . . . . **Anthospermum**
4a Corolla contorted . . . . . **Pavetta**
4b Corolla valvate . . . . . 5
5a Spines present . . . . . **Canthium**
5b Spines absent. . . . . **Vangueria**

## **Anthospermum** L. (sthn Afr.: 21 spp.)

### Key to species:

[after Puff: 9 (1986)]

1a Perennial herbs often scrambling, straggling or trailing . . . . . **A. herbaceum**
1b Shrubs, subshrubs or, if perennial herbs, then erect, mat- or cushion-forming . . . . . 2
2a Leaves densely covered with spreading hairs up to 0.5 mm long . . . . . 3
2b Leaves glabrous or hairs on margins and/or midvein only . . . . . 4
3a Leaves up to 6 × 1.8 mm; mericarps > 2 × 1 mm; dioecious cushion- or mat-forming dwarf shrubs of high altitudes . . . . . **A. basuticum**
3b Leaves up to 20 × 5 mm; mericarps < 2 × 1 mm; plants not dioecious; occurring up to 2 000(–2 300) m. . . . . **A. hispidulum**
4a Single- to several-stemmed, mostly erect shrubs, up to 3 m high; mericarps elongated in side view; plants dioecious . . . . . **A. monticola**
4a Rounded dwarf shrubs, low subshrubs or perennial herbs, mericarps roundish in side view, plants not dioecious . . . . . 5
5a Leaves broader, often ovate or narrowly ovate, up to 10 mm wide; mericarps glabrous, ± tuberculate or papillate, but never with hooked or curly hairs . . . . . **A. herbaceum**
5b Leaves linear to narrowly ovate, up to ± 2 mm wide; mericarps glabrous or with hooked or curly hairs . . . . . 6
6a Subshrubs with many unbranched stems; leaves up to 22 × 2 mm, linear to narrowly ovate; corolla tube up to 1.7 mm long, lobes up to 2.5 mm long. . . . . **A. rigidum** subsp. **pumilum**
6b Fairly robust dwarf shrubs; leaves up to 8 × 1.5 mm, ovate to narrowly ovate, often tough and thickish; flowers larger, corolla tube up to 1.9 mm long, lobes up to 3.2 mm long . . . . . **A. rigidum** subsp. **rigidum**

### **basuticum** Puff

Dwarf shrub, many stemmed, cushion- or mat-forming or ± erect and cylindrical, (40–)100–300(–500) mm high, dioecious. **Stems** mostly much branched, densely hairy. **Leaves** decussate; blade narrowly ovate, often appearing terete due to strongly revolute margins, 2.5–5.0(–6.0) × 0.8–1.2(–1.8) mm, with white spreading hairs 0.1–0.3(–0.5) mm long above, glabrous except for midrib below; stipular sheath with hairy seta. **Flowers**: corolla with tube up to 1 mm long, lobes up to 2.3 mm long; yellowish to yellowish green, usually hairy outside; Aug.–Jan. **Fruit** with mericarps ± obovate, 2.0–2.5 × 1.0–1.5 mm, mostly densely covered with white spreading hairs. Montane grassland, rocky places.

MsGr

**herbaceum** L.f.

*A. lanceolatum* Thunb

Erect, scrambling, trailing or sometimes rosette-like, perennial herb or subshrub, 0.75–3.00 m high, not dioecious. **Leaves** decussate; blade ovate, narrowly ovate to linear, glabrous, papillate or shortly hairy, distinctly discolorous; stipular sheath with (3–)5(–7) filiform setae, seldom with 1 triangular seta. **Flowers**: corolla with tube up to 3.7 mm long, lobes up to 3.4 mm long; greenish to yellow or yellowish, sometimes reddish purplish tinged; Oct.–Feb. **Fruit** with mericarps elliptic, oblong to obovate, covered with tuberculate structures, shortly hairy, papillate or subglabrous, mostly with broad conspicuous longitudinal grooves between mericarps. Forest edge, scrub, riverine thicket, edge of marshes, grassland, rocky slopes.

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**hispidulum** E.Mey. ex Sond.

*A. arenicolum* Greves

*A. burkei* Sond.

Dwarf shrub, (100–)150–400(–600) mm high, not dioecious. **Leaves** decussate; blade narrowly obovate to narrowly ovate, 5–12(–20) × 1.0–3.5(–5.0) mm, densely covered with spreading hairs (0.1–)0.3–0.5 mm long. **Flowers**: corolla with tube up to 2.4 mm long, lobes up to 2.7 mm long; greenish yellow to yellowish; Nov.–Apr. **Fruit** with mericarps oblong, densely covered with spreading hairs. Rocky ridges, outcrops; in cracks of rock sheets or rocky grassland.

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**monticola** Puff

Shrub, few to several stemmed, ± erect and cylindrical or roundish, low, ± cushion-forming if browsed, (0.2–)0.3–1.5(–2.0) m high, dioecious. **Stems** mostly much branched. **Leaves** decussate; blade obovate, oblong, narrowly obovate-ovate to ± narrowly ovate, glabrous, (2–)3–10(–13) × (0.7–)1.0–2.0 mm. **Flowers**: corolla with tube up to 0.5 mm long, lobes up to 2.7(–3.0) mm long; yellowish or greenish yellow, sometimes reddish purplish tinged outside; Sep.–Dec. **Fruit** with mericarps ovate or obovate, oblong or ± elliptic, glabrous. Grassland rocky places.

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**rigidum** Eckl. & Zeyh. subsp. **pumilum** (Sond.) Puff

*A. pumilum* Sond.

Dwarf or subshrub, 50–400 mm high, not dioecious. **Stems** many, mostly unbranched. **Leaves** decussate; blade linear to narrowly ovate or obovate, (4–)6–12(–22) × (0.5–)0.8–1.5(–2.0) mm, glabrous. **Flowers**: corolla with tube up to 1.7 mm long, lobes up to 2.5 mm long; greenish to yellowish; Oct.–May. **Fruit** with mericarps elliptic to obovate, mostly ± glabrous. Rocky grassland or open woodland. *Umlomomnandomncane* (Z).

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**rigidum** Eckl. & Zeyh. subsp. **rigidum**

*A. pumilum* Sond. subsp. *rigidum* (Eckl. & Zeyh.) Puff, *nom. inval.*

Robust, dwarf shrub, (100–)200–400(–550) mm high, not dioecious. **Stems** ± sparsely to much branched. **Leaves** decussate; blade ovate to narrowly ovate, 3–6(–8) × 1.0–1.5 mm, often tough and thickish, glabrous, **Flowers**: corolla with tube up to 1.9 mm long, lobes up

to 3.0 mm long; greenish; Jan. **Fruit** with mericarps ± sparsely covered with whitish, curved, ± hooked hairs. Rocky places.

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## **Canthium** Lam. (sthn Afr.: 11 spp.)

### **ciliatum** (D.Dietr.) Kuntze

*Plectronia ciliata* D.Dietr.

Shrub, up to 3 m high. **Branches** spiny. **Leaves** with blade ovate to subcordate-ovate, 5–30 × 5–20 mm, discolorous, sparsely hairy to glabrous; stipules triangular, pubescent. **Flowers**: inflorescence axillary, 1- or 2-flowered, subsessile to pedunculate; corolla 4–5 mm long, tube longer than limb, throat glabrous, greenish or yellowish; Sep.–Jan. **Fruit** subglobose, 5–7 mm long. Forest, forest margins, rocky places. *Fringed/hairy turkey-berry*; *harige bokdrol*, *skaapdrolletjie* (A); *seeqoane* (SS); *umnyulushube* (X).

DrGr | MsGr

## **Conostomium** (Stapf) Cufod. (sthn Afr.: 2 spp.)

### **natalense** (Hochst.) Bremek.

*Hedyotis natalensis* Hochst.
*Oldenlandia natalensis* (Hochst.) Kuntze

Perennial herb, 0.2–1.2 m high. **Stems** quadrangular. **Leaves** petiolate; blade narrowly ovate, 35–70 × 10–23 mm, ± rounded at base, apex acute; petioles up to 2 mm long; stipule sheath ± 2 mm long with 2 short fimbriae. **Flowers**: pedicels mostly very short; corolla with tube up to 18 mm long; pale blue, lilac or purplish pink; Oct.–Jun. **Fruit** an ovoid-globose capsule, 5–7 mm long, apex beaked. Open grassland to dense scrub.

MsGr

## **Cordylostigma** Groeninckx & Dessein (sthn Afr.: 5 spp.)

### **virgatum** (Willd.) Groeninckx & Dessein

*Kohautia virgata* (Willd.) Bremek.
*Oldenlandia virgata* (Willd.) DC.

Annual or perennial herb, (60–)150–500 mm high. **Leaves** narrowly linear, linear-ovate to narrowly ovate-elliptic, apex with a distinct crista up to 1 mm long; stipular sheaths in the midstem region mostly produced into 2–8 fringing, ± rigid, subulate fimbriae. **Flowers**: inflorescence with 2, rarely 3 or more flowers at a node, pedicellate or subsessile; stigma 1-lobed, lobe cylindrical or ovoid; corolla tube 3–7 mm long, hairy or papillate at throat inside; corolla lobes white, cream-coloured, yellowish, bluish, mauve, purple, pink or red above, back of lobes and tube paler or brownish to pinkish green or greenish white; Sep.–May. Moist localities, open, swampy or wooded grassland; disturbed places.

DrGr

## **Galium** L. (sthn Afr.: 13 spp.)

### Key to species:

[after Puff: 65 (1986)]

1a Leaves 3-nerved, strictly in whorls of 4. . . . . 2
1b Leaves 1-nerved, in whorls of 4–10. . . . . 3
2a Stems, leaves, peduncles and pedicels glabrous . . . . . **G. thunbergianum** var. **thunbergianum**
2b Stems (mainly angles), leaves, peduncles and pedicels ± densely covered with short, spreading, white hairs . . . . . **G. thunbergianum** var. **hirsutum**
3a Inflorescences very reduced, flowers in groups of 3 (occasionally 4, rarely up to 6) . . . . . **G. spurium** subsp. **africanum**
3b Inflorescences ± extensive and many-flowered . . . . . 4
4a Plant dioecious, peduncles and pedicels villous . . . . . **G. tomentosum**
4b Plant monoecious, peduncles and pedicels glabrous, scabrous or with a few, ± straight, white hairs, never villous. . . . . 5
5a Leaves with densely set recurved prickles on margins; pedicels with ± straight, white hairs or glabrous . . . . . **G. scabrelloides**
5b Leaf margins glabrous, with ± long, straight, white hairs or only very few, small, recurved prickles; pedicels glabrous or scabrous . . . . . 6
6a Leaves up to 15 mm long; mericarps glabrous . . . **G. capense** subsp. **capense**
6b Leaves up to 23 mm long; mericarps ± densely covered with short, curled, whitish hairs occasionally (sub)glabrous . . . . **G. capense** subsp. **garipense**

### **capense** Thunb. subsp. **capense**

Scrambling or climbing, perennial herb, up to 700 mm high. **Stems** at least younger parts densely covered with short, curled, whitish hairs, often purplish. **Leaves** in whorls of 6–8(–10), up to 12(–15) mm long, linear to narrowly lanceolate or oblanceolate, sessile, glabrous, sometimes with few, small, recurved prickles on margins. **Flowers**: inflorescence many flowered; peduncles and pedicels glabrous; corolla 4-merous, bright to pale yellow; Nov.–Feb. **Fruit** with glabrous, ± tuberculate or granulate mericarps. Rocky areas, along watercourses. *Tiny-tots*.

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### **capense** Thunb. subsp. **garipense** (Sond.) Puff

*G. garipense* Sond.
*G. wittebergensis* Sond.

Ascending to erect, perennial herb, up to 6 m high. **Stems** glabrous, with few, minute, recurved prickles on angles and/or with short, whitish hairs. **Leaves** in whorls of 6–8, up to 20(–23) mm long, linear, sessile, glabrous, sometimes with few, small, recurved prickles on margins. **Flowers**: inflorescence many flowered; peduncles and pedicels glabrous; corolla 4-merous, bright yellow, sometimes creamy yellow or greenish yellow; Sep.–Mar. **Fruit** with mericarps densely covered with short, curled, whitish hairs, occasionally subglabrous. Along streambanks, in vleis, on damp slopes or open grassland. *Mabone*, *lefero*, *sehorane* (SS).

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### **scabrelloides** Puff

Decumbent or climbing, perennial herb. **Stems** with white, spreading hairs, at least on angles. **Leaves** in whorls of 7–10; blade linear to narrowly ovate or obovate, up to 22 mm long, sessile, both surfaces or at least midrib below with white, straight, spreading hairs, margins with densely

set, recurved prickles. **Flowers**: inflorescence many-flowered, peduncles and pedicels hairy; corolla 4-merous, bright yellow, creamy yellow, greenish yellow or greenish; Jan.–Mar. **Fruit** with mericarps densely covered with straight, spreading, white hairs. Forest edges or scrub.

MsGr

**spurium** L. subsp. **africanum** Verdc.

Annual herb. **Stems** procumbent to semi-erect, up to 2 m long, recurved prickles on angles. **Leaves** in whorls of 6–8, narrowly linear-ovate to obovate, up to 45 mm long, sessile, upper surface glabrous or with a few, scattered, ± straight or curled hairs, midrib below and margins with coarse, recurved prickles, 1-nerved. **Flowers**: 1 or 2 per inflorescence; peduncle and pedicel up to 35 mm long in fruit with recurved prickles, seldom glabrous; corolla 4-merous, greenish, greenish white or creamy white; Nov.–Feb. **Fruit** with globose mericarps, covered with white, non-tuberculate, hooked hairs. Montane grassland, kloofs, slopes, in shade.

MsGr

**thunbergianum** Eckl. & Zeyh. var. **hirsutum** (Sond.) Verdc.

*G. rotundifolium* L. var. *hirsutum* Sond.

Perennial herb with extensive rhizome; stems suberect or procumbent; stems (mainly angles), leaves, peduncles and pedicels ± densely covered with short, spreading, white hairs. **Leaves** in whorls of 4, 3-nerved, ovate, elliptic or rhombic, up to 18(–22) × 8(–10) mm, sessile. **Flowers**: inflorescence many flowered; corolla 4-merous, greenish, greenish white to yellowish; Dec.–Apr. **Fruit** with subglobose mericarps, densely covered with hooked, white hairs. Forest margins, scrub or rocky grassland.

DrGr MsGr

**thunbergianum** Eckl. & Zeyh. var. **thunbergianum**

*G. rotundifolium* non L.

Suberect or procumbent perennial herb with extensive rhizome; stems, leaves, peduncles and pedicels glabrous or nearly so. **Leaves** in whorls of 4, 3-nerved, ovate, elliptic or rhombic, up to 18(–22) × 8(–10) mm, sessile. **Flowers**: inflorescence many flowered; corolla 4-merous, greenish, greenish white to yellowish; Dec.–May. **Fruit** with subglobose mericarps densely covered with hooked, white hairs. Forest margins, scrub or rocky grassland.

DrGr MsGr

**tomentosum** Thunb.

Perennial herb with woody rootstock; stems climbing or scrambling, up to 2.5(–3.0) m long, with recurved prickles on angles or rarely subglabrous. **Leaves** in whorls of 6–8, 1-nerved, narrowly to broadly obovate, broadly ovate or ± narrowly ovate, 25(–30) × 8(–10) mm, sessile, midrib below with densely set, recurved prickles. **Flowers**: inflorescence many flowered; peduncles and pedicels villous; corolla 4-merous, greenish, greenish yellow to pale yellow; Sep.–Nov. **Fruit** with ± reniform mericarps, mostly with 3 grooves dorsally, glabrous or sometimes with a few whitish hairs. In scrub on slopes, along watercourses. *Old man's beard*; *kleefgras*, *rooivergeet* (A).

DrGr

## **Galopina** Thunb. (sthn Afr.: 4 spp.)

### **circaeoides** Thunb.

Erect or occasionally decumbent, perennial herb, (0.3–)0.4–1.2(–1.5) m high. **Stems** often with short shoots; leaves of short shoots smaller than long-shoot leaves. **Leaves** glabrous or sparsely hairy, narrowly ovate. **Flowers**: inflorescence lax, broadly pyramidal to ± spheroidal; peduncles and pedicels (7–)12–26(–37) mm long in fruit, filiform, slender; ovary and fruit warty, glabrous; corolla whitish, creamy white, yellowish or greenish; occasionally reddish purplish tinged outside; Dec.–Mar. **Fruit** with mericarps oblong to ± obovate, ± densely warty. Kloof or gallery forest; scrub along streams or bush clumps.

MsGr

## **Kohautia** Cham. & Schltdl. (sthn Afr.: 9 spp.)

### Key to species:

[after Mantell: 86 (1989)]

1a Partial inflorescences distinctly capitate; roots fibrous, often with bead-like nodules . . . . . **K. amatymbica**

1b Partial inflorescences not capitate, 1 or 2 flowers per node; roots different from above . . . . . 2

2a Flowers mostly small; corolla tube up to 6 mm long; stigma lobes held just below or touching the anthers; annuals . . . . . **K. subverticillata** subsp. **subverticillata**

2b Flowers larger; corolla tube > 6 mm long; stigma lobes held well below the anthers; perennials sometimes flowering in first season. . . . . 3

3a Calyx tubes and capsules ± distinctly hemispherical-obconic, glabrous or minutely verrucose; leaves mostly filiform to very narrowly linear, up to 2 mm wide; plants often turning black(ish) on drying . . . . . **K. cynanchica**

3b Calyx tubes ovoid-ellipsoid; capsules subglobose, sparsely to densely beset with coarse rounded, conical or flattened, triangular, white papillae or hairs; leaves mostly narrowly linear-lanceolate to lanceolate-elliptic, rarely linear, up to 9.5 mm wide; plants mostly a whitish green on drying . . . . . **K. caespitosa** subsp. **brachyloba**

### **amatymbica** Eckl. & Zeyh.

*Hedyotis amatymbica* (Eckl. & Zeyh.) Steud.
*Oldenlandia amatymbica* (Eckl. & Zeyh.) Kuntze

Annual or perennial herb, 0.15–0.60 m high; roots fibrous, often with bead-like nodules. **Leaves** with blade narrowly linear to narrowly linear-ovate; stipular sheaths in the midstem region mostly produced into 1 or 2, ± fimbriated, triangular lobes. **Flowers**: partial inflorescences distinctly capitate; stigma comprised of 2, free, ± filiform lobes; corolla with tube 10–20 mm long, lobes white, pinky white, cream-coloured, pale yellow or khaki-yellow above, tube and lobes darker below; Sep.–Jan. Burnt grassland, rocky slopes and koppies, moist depressions, disturbed or cultivated ground on roadsides. *Tremble tops*; *mongoakoane*, *mohlatsisa*, *lehlokoana* (SS); *ikhubalo elimnyama*, *labantwana* (X); *umfana-ozacile*, *umhungulo*, *umqanda* (Z).

DrGr MsGr

**caespitosa** Schnizl. subsp. **brachyloba** (Sond.) D.Mantell

*K. brachyloba* (Sond.) Bremek.
*K. lasiocarpa* Klotzsch
*K. latibrachiata* Bremek.

Annual or perennial herb, 0.1–0.8 m high; mostly a whitish green on drying. **Leaves** with blade narrowly linear-ovate to narrowly ovate-elliptic, rarely linear, up to 9.5 mm wide; stipular sheaths in the midstem region mostly produced into 1 or 2, ± fimbriated, triangular lobes. **Flowers**: inflorescence with 1 or 2 flowers at a node; stigma comprised of 2, free, ± filiform lobes, held well below the anthers; calyx tubes ovoid-ellipsoid; corolla with tube 7–14 mm long, white, cream-coloured, greyish or yellowish above, darker beneath, tube brownish, reddish or greenish; Oct.–Jun. Sandy areas, bushland, rocky or stony areas, grassland, disturbed places.

DrGr

**cynanchica** DC.

*K. gracilifolia* Bremek.
*K. omahekensis* (K.Krause) Bremek.
*K. raphidophylla* Bremek.

Annual or perennial herb or shrub, (0.06–)0.10–0.60(–1.00) m high; often turning black(ish) on drying. **Leaves** with blade mostly filiform to very narrowly linear, up to 2 mm wide; stipular sheaths in the midstem region mostly produced into 1 or 2, ± fimbriated, triangular lobes. **Flowers**: 1 or mostly 2 at a node, 1 subsessile, the other pseudopedicellate, pedicels up to 12(–20) mm long; stigma comprised of 2, free, ± filiform lobes, held well below the anthers; calyx tube and capsules ± distinctly hemispherical-obconic, glabrous or minutely verrucose; corolla with tube 9–15 mm long, lobes white, cream-coloured, rarely pinkish mauve above, tube and lobes darker below, brown, reddish brown, olive-green, olive-brown; Nov.–Mar. In arid areas along riverbanks; in more moist areas, open or wooded grassland, bushveld, disturbed places. *Aandblommetjie* (A).

DrGr KarSh

**subverticillata** (K.Schum.) D.Mantell subsp. **subverticillata**

*Oldenlandia sordida* K.Krause
*O. subverticillata* K.Schum.

Annual herb, 0.11–0.60 m high. **Leaves** with blade narrowly linear-ovate to narrowly ovate-elliptic; stipular sheaths in the midstem region mostly produced into 1 or 2, ± fimbriated, triangular lobes. **Flowers**: in subsessile or sessile pairs at nodes; stigma comprised of 2, free, ± filiform lobes, held just below or touching the anthers; calyx with tube densely beset with long papillae or hirsute, lobes ± $^1/_4$ the length of the narrow part; corolla with tube 3–6 mm long, dilated part $^1/_4$–$^1/_3$ the length of narrow part; narrow part glabrous, dilated part and back of lobes scabrid, lobes white, off-white, grey, yellowish green, bluish white or brownish, tube darker; Nov.–Apr. Open areas in grassland, open mixed woodland, in sandveld, in rocky areas.

DrGr

## **Nenax** Gaertn. (sthn Afr.: 9 spp.)

**microphylla** (Sond.) T.M.Salter

Dwarf shrub, rounded to ± cylindrical, cushion- to mat-forming if browsed, 100–300(–400) mm high. **Leaves** decussate; blade ovate to ± elliptic, ± linear-lanceolate or lanceolate in new

growth, (1.5–)2.0–4.0(–5.4) × 0.7–1.2 mm, glabrous or sometimes with papillose margins. **Flowers**: in axillary clusters of 2(–6); corolla tube up to 0.7 mm long, lobes up to 2.2 mm long; corolla pale yellow to greenish yellow, sometimes reddish purplish tinged outside; Oct.–Feb. **Fruit** inflated, subglobose to ± ellipsoidal, dehiscent, 1.7–3.2 mm in diameter, glabrescent or papillose. Grassland, hill slopes, stony and loam soil. *Donkieganna*, *daggabossie*, *granaatbossie* (A).

DrGr KarSh

## **Oldenlandia** L. (sthn Afr.: 14 spp.)

### Key to species:

Annual or perennial, erect, decumbent or spreading branched herb, up to 0.6 m high; stems glabrous; flowers solitary or paired at nodes; leaves not dimorphic, rosulate basal leaves absent . . . . . **O. herbacea** var. **herbacea**
Slender, erect, annual herb, up to 0.35 m high; stems glabrous or basally scabrid pubescent; flowers terminal or axillary, solitary or in groups of 2 or 3, sometimes paniculate; leaves dimorphic, basal leaves rosulate (disappearing at maturity), spathulate to elliptic . . . . . **O. rosulata** var. **rosulata**

### **herbacea** (L.) Roxb. var. **herbacea**

*Hedyotis herbacea* L.
*H. heynii* (G.Don) Sond.

Annual or perennial herb, 0.15–0.60 m high. **Stems** erect, decumbent or spreading, branched. **Leaves** with blade linear to narrowly linear-ovate, up to 55 × 3.5(–5.0) mm long. **Flowers**: solitary or paired at nodes; distinctly pedicellate; calyx with tube glabrous, lobes 4; corolla with tube 2.0–3.7 mm long, white, lilac or mauve, tube green; Sep.–Jun. **Fruit** a subglobose capsule, markedly beaked, glabrous. Woodland, rocky areas, marshy grassland; disturbed places. *False spurry*; *seobi* (SS).

AcGr

### **rosulata** K.Schum. var. **rosulata**

Annual herb, 25–350 mm high. **Stems** erect, slender, glabrous or basally scabrid pubescent. **Leaves** dimorphic, blade up to 30 × 2.2 mm; basal ones rosulate, blade spathulate to elliptic, stem leaves filiform to narrowly linear-ovate. **Flowers**: terminal or axillary, solitary or in groups of 2 or 3, sometimes paniculate; pedicels very slender, 4–38 mm long; calyx with lobes 4; corolla with tube 1.2–3.6 mm long, somewhat hairy at throat, white to pale purple; Feb., Mar. **Fruit** a subglobose capsule, beaked, glabrous. Grassland, wet situations.

DrGr

## **Pachystigma** Hochst. (sthn Afr.: 10 spp.)

### Key to species:

Leaves with blade linear-oblong, fulvous-pubescent . . . . . **P. pygmaeum**
Leaves with blade narrowly ovate-elliptic, glabrous . . . . . **P. thamnus**

**pygmaeum** (Schltr.) Robyns
*Vangueria pygmaea* Schltr.
*V. setosa* Conrath

Perennial herb or dwarf shrub, up to 0.4 m high. **Leaves** with blade linear-oblong, fulvous-pubescent, ± 40–80 × 30 mm. **Flowers**: in cymes, peduncles 5–6 mm long; calyx lobes 4–5 mm long; corolla greenish yellow; Aug.–Feb. Grassland in rocky/stony soil. *Hairy gousiektebossie*; *gousiektebossie*, *witappeltjie* (A).

| VreDm | | DrGr | | | |
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**thamnus** Robyns

Perennial herb or dwarf shrub, 50–70 mm high. **Leaves** with blade narrowly ovate-elliptic, ± 50–80 × 15–30 mm, glabrous. **Flowers**: in cymes, peduncles 4–8 mm long; calyx lobes 4–5 mm long; corolla greenish, cream-coloured; Oct.–Jan. Grassland. *Smooth gousiektebossie*; *gladde-gousiektebossie* (A).

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## **Pavetta** L. (sthn Afr.: 21 spp.)

### Key to species:

Leaves sessile; blade narrowly obovate or narrowly linear-ovate, up to 45 × 9 mm . . . . . **P. zeyheri** subsp. **zeyheri**
Leaves distinctly petiolate; blade broadly elliptic, up to 60 × 45 mm . . . **P. cooperi**

**cooperi** Harv. & Sond.

Large shrub or tree, up to 6 m high; branches terete, very shortly pubescent. **Leaves** petiolate; blade broadly elliptic, up to 60 × 45 mm, apex acute, upper surface hairy-scabrous. **Flowers**: in dense, globose corymbs; calyx teeth setaceous, at least twice as long as tube; corolla with lobes contorted, white; Nov., Dec. **Fruit** globose, black when ripe, crowned by calyx limb. Grassland, forest, rocky outcrops.

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**zeyheri** Sond. subsp. **zeyheri**
*P. pseudo-zeyheri* Bremek.

Small tree or large shrub, 2–3 m high. **Leaves** sessile; blade narrowly obovate or narrowly linear-ovate, up to 45 × 9 mm, apex acute to obtuse, glabrous to pubescent; sessile, dot-shaped bacterial nodules, scattered. **Flowers**: in clusters on short, lateral branches; calyx lobes triangular, ½ to equalling the tube; corolla with tube up to 10 mm long, lobes contorted, white; Aug.–Feb. **Fruit** globose, black when ripe, crowned by calyx lobes. Rocky outcrops or open flats.

| VreDm | | DrGr | | | |
|---|---|---|---|---|---|

## **Pentanisia** Harv. (sthn Afr.: 3 spp.)

### Key to species:

[after Verdcourt: 58 (1989)]

1a Leaves with blade linear to narrowly ovate or oblong, glabrous or margins ciliate; inflorescence often spicate in fruit . . . . . **P. angustifolia**
1b Leaves orbicular, ovate to oblong, densely hairy or sparsely hairy along veins, rarely glabrous; inflorescence often capitate in fruit. . . . . 2
2a Leaves with blade broadly ovate to round, or less often oblong, 16–85 × 11–35 mm, usually densely hairy; leaf blade ratio (length/width) 0.8–2.8 . . . . . **P. prunelloides** subsp. **latifolia**
2b Leaves with blade oblong, 17–75 × 3–28 mm, glabrous sometimes slightly hairy; leaf blade ratio 2.35–5.35 . . . . . **P. prunelloides** subsp. **prunelloides**

**angustifolia** (Hochst.) Hochst.
*P. variabilis* Harv. var. *glaucescens* Cruse ex Sond.

Perennial herb, 0.2–0.6 m high. **Stems** erect, straggling or procumbent. **Leaves** with blade linear to narrowly ovate or oblong, 19–150 × 2.0–9.5 mm, base rounded, apex acute, veins prominent on lower surface, glabrous or margins ciliate. **Flowers**: main inflorescence terminal, spicate in fruit; corolla blue or violet-blue; Aug.–Apr. Herb layer of woodland.

DrGr MsGr

**prunelloides** (Klotzsch ex Eckl. & Zeyh.) Walp. subsp. **latifolia** (Hochst.) Verdc.
*P. variabilis* Harv. var. *latifolia* (Hochst.) Sond.

Erect or semiprocumbent, perennial herb, 0.07–0.60 m high. **Stems** patently hairy. **Leaves** with blade broadly ovate to round, or less often oblong, ratio (length/width) 0.8–2.8, 16–85 × 11–35 mm, base rounded or slightly cordate, apex acute, usually densely hairy. **Flowers**: inflorescence as in subsp. *prunelloides*; ovary 2-locular; corolla bright blue; Aug.–Jan., Apr. Woodland, grassy places.

DrGr MsGr

**prunelloides** (Klotzsch ex Eckl. & Zeyh.) Walp. subsp. **prunelloides**
*P. variabilis* Harv. var. *intermedia* Sond.

Perennial herb, up to 0.6 m high. **Stems** erect or semiprocumbent. **Leaves** with blade elliptic to narrowly ovate or oblong, ratio (length/width) 2.35–5.35, 17–75 × 3–28 mm, lower surface prominently veined, glabrous sometimes slightly hairy. **Flowers**: main inflorescence terminal, capitate; corolla bright blue; Sep.–Mar. Grassland, rocky soil. *Wild verbena*; *wilde-verbena*, *sooibrandbossie* (A); *khatoane*, *setima-mollo*, *icishamlilo* (X, Z); *isibunde*, *umakuphole* (Z).

DrGr MsGr

## **Pygmaeothamnus** Robyns (sthn Afr.: 2 spp.)

### Key to species:

Leaves sessile; blade glabrous, up to 120 × 45 mm . . . . . **P. chamaedendrum** var. **setulosus**
Leaves petiolate; blade white-setulose, up to 80 × 20 mm . . . . . **P. zeyheri** var. **zeyheri**

**chamaedendrum** (Kuntze) Robyns var. **setulosus** Robyns

Dwarf shrub, up to 100 mm high. **Leaves** opposite; sessile; blade narrowly ovate to ovate, up to 120 × 45 mm, apex rounded, white setulose. **Flowers**: inflorescences borne in lower axils, few to many flowered; corolla tube ± 5 mm long, densely villous at throat, lobes slightly longer than tube, greenish; Sep.–Nov. **Fruit** subglobose or pyriform, up to 12 × 12 mm. Grassland, between rocks. *Klein-goorappel* (A).

DrGr

**zeyheri** (Sond.) Robyns var. **zeyheri**

*Pachystigma zeyheri* Sond.

Dwarf shrub with 3–6 slender stems, up to 300 mm high. **Leaves** opposite, or mostly in whorls of 3 or 4, petiolate; blade obovate to obovate-oblong or elliptic, up to 120 × 45 mm, apex rounded or acute, glabrous. **Flowers**: inflorescences borne in the lower axils, few to many flowered; corolla with tube 3–4 mm long, lobes narrowly oblong-ovate, 4–5 mm long, white or greenish; Sep.–Nov. **Fruit** oblong, subglobose or pyriform, up to 30 × 20 mm. Riverbanks, roadsides, sandy soil. *Goorappel* (A).

DrGr

## **Richardia** L. (sthn Afr.: 4 spp.)

***brasiliensis** Gomes

*Richardsonia brasiliensis* (Gomes) Hayne

Annual or perennial herb. **Stems** procumbent. **Leaves** with blade elliptic, base narrowly cuneate, apex acute, upper surface hairy; stipular sheath 1.0–3.5 mm long, with 3–5 fimbriae 1–4 mm long, usually with long hairs. **Flowers**: (5)6-merous; style with 2 arms; corolla white, often tinged pink; Sep.–Jun. **Fruit** oblong-obovoid mericarps with depressed area of inner face almost as broad as face, outer surface papillose and ± strigose. Grassy roadsides, weed in gardens and cultivations. Native to South America. *Mexican richardia*, *tropical richardia*, *Mexican clover*; *Meksikaanse klawer*, *tropiese richardia* (A).

DrGr

## **Rubia** L. (sthn Afr.: 3 spp.)

### Key to species:

[after Puff: 193 (1986)]

1a Leaves in whorls of 4 (very rarely 3 or 5); blade with 5 (7, very rarely 3) prominent veins . . . . . .**R. cordifolia** subsp. **conotricha**

1b Leaves in whorls of 6–8(–12); blade with 3 prominent veins or only midvein prominent . . . . . 2

2a Leaf blade length/width ratio < 3:1; blade narrowly ovate to broadly ovate, up to 30 × 15 mm, base rounded to cordate, 3 veins prominent . . . **R. petiolaris**

2b Leaf blade length/width ratio > 3:1; blade narrowly ovate to linear, up to 70 × 10 mm, base cuneate, only midvein prominent . . . . . .**R. horrida**

**cordifolia** L. subsp. **conotricha** (Gand.) Verdc.

*R. conotricha* Gand.

Perennial herb, climber or scrambler. **Stems** up to 5 m long. **Leaves** in whorls of 4 (very rarely 3 or 5), petiolate; blade narrowly ovate to broadly ovate, 27–55 × (3–)6–32 mm, base rounded to cordate, 5 (7, very rarely 3) veins prominent. **Flowers**: several to many per inflorescence; corolla mostly 5-merous, 3.0–5.7 mm in diameter, greenish, yellowish green to yellow; Dec.–May. **Fruit** with mericarps up to 3.9 mm in diameter, fleshy, dark purple to black, glabrous. Forest edges, in clearings and scrub. *Vaskloubossie*, *rooihoutjie*, *bruidskrans* (A); *seharane*, *mahlatsoa-meno* (SS); *umalibombo*, *inTwalalubombo*, *impundisa* (Z).

DrGr KarSh

**horrida** (Thunb.) Puff

*Galium horridum* Thunb.

*R. petiolaris* DC. var. *heterophylla* Sond.

Perennial herb, climber or scrambler. **Stems** up to 3 m long. **Leaves** in whorls of 6–8(–12), petiolate; blade length/width ratio > 3:1; blade narrowly ovate to linear, up to 70 × 10 mm, base cuneate, only midvein prominent. **Flowers**: several to many per inflorescence; corolla mostly 5-merous, 3.0–5.9 mm in diameter, greenish, yellowish green to yellow; Nov.–Apr. **Fruit** with mericarps up to 3.7 mm in diameter, fleshy, blackish or dark purple, glabrous. Bush clumps, scrub, open woodland or riverbanks. *Kleefgras* (A).

MsGr

**petiolaris** DC.

Perennial herb, climber or scrambler. **Stems** up to 3 m long. **Leaves** in whorls of 6–8(9), petiolate; blade length/width ratio < 3:1; blade narrowly ovate to broadly ovate, up to 30 × 15 mm, base rounded to cordate, 3 veins prominent. **Flowers**: few to several per inflorescence; corolla mostly 5-merous, greenish, yellowish green to yellow, 3–5 mm in diameter; Dec.–Feb. **Fruit** with mericarps 2.4–3.0 mm in diameter, fleshy, blackish, glabrous. Bush clumps, along watercourses. *Kleefgras*, *rooistam* (A).

VreDm DrGr MsGr KarSh

## **Vangueria** Juss. (sthn Afr.: 6 spp.)

**infausta** Burch. subsp. **infausta**

*V. tomentosa* Hochst.

Large shrub or tree, up to 5 m high. **Leaves** petiolate; blade elliptic to ovate, 40–300 × 25–180 mm, base cuneate, apex acute to rounded, both surfaces densely pubescent to velvety; petioles 3–10 mm long. **Flowers**: in shortly pedunculate inflorescence > 10 mm long, buds rounded at apex; calyx lobes triangular-oblong to narrowly oblong, 1.5(–2.0) mm long; corolla lobes valvate; corolla greenish to greenish white, cream-coloured or yellowish, densely spreading hairy outside; Sep.–Apr. **Fruit** globose, up to 35 mm in diameter, yellowish to brown, crowned with a circular scar left by calyx. Rocky outcrops on hillsides; riverine bush, bushveld. *Wild medlar*; *wildemispel*, *grootmispel* (A); *ntswila* (T).

AcGr DrGr

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# RUTACEAE

Trees, shrubs or subshrubs, rarely herbs, most parts gland-dotted, aromatic when crushed. **Leaves** simple, digitately 1–5-foliolate or pinnately compound; alternate or opposite; without stipules. **Flowers**: in various terminal or axillary inflorescences, occasionally solitary; bisexual or unisexual, regular; sepals (2–)5, usually free; petals 4 or 5, free; disc present between stamens and ovary; stamens equalling number of petals or twice as many; ovary superior, with 4 or 5 lobes. **Fruit** a berry, drupe or capsule. *Citrus family*.

## Key to genera

| | | |
|---|---|---|
| 1a | Leaves simple; corolla pink | **Calodendrum** |
| 1b | Leaves compound; corolla dull white, greenish yellow | 2 |
| 2a | Plant armed with spines; fruit a globose capsule | **Zanthoxylum** |
| 2b | Plant unarmed; fruit a berry | **Clausena** |

## **Calodendrum** Thunb. (sthn Afr.: 1 sp)

**capense** (L.f.) Thunb.
*Dictamnus capensis* L.f.

Tree, up to 20 m high; deciduous to semideciduous; bark smooth. **Leaves** opposite; blade elliptic to broadly elliptic, 60–130(–180) × 35–75(–110) mm; apex acute, gland-dotted. **Flowers**: in large clusters at ends of branches; stamens 5, alternating with 5 petaloid staminodes, staminodes narrowly obovate, caudate, dotted with bright crimson glands; corolla pink; Sep.–Mar. **Fruit** a 5-angled, rugose, warty capsule. Wooded ridges and kloofs. *Cape chestnut*; *wildekastaiing* (A).

VreDm

## **Clausena** Burm.f. (sthn Afr.: 1 sp.)

**anisata** (Willd.) Hook.f. ex Benth. var. **anisata**
*C. inaequalis* (DC.) Benth.

Shrub or small tree, up to 10 m high. **Leaves** pinnately compound, imparipinnate; leaflets alternate, blade ovate or elliptic, base asymmetric, apex emarginate, margins crenulate,

densely gland-dotted, unpleasantly scented when crushed. **Flowers**: in axillary, cymose panicles; petals dull white; Aug.–Nov. **Fruit** baccate, fleshy, ripening red, purple-black to black. In the under canopy or along margins of forests, often near streams. *Horsewood*; *perdepis* (A); *isifudu* (X, Z); *umnukambiba*, *umsaga* (Z).

MsGr

## **Zanthoxylum** L. (sthn Afr.: 6 spp.)

**capense** (Thunb.) Harv.
*Fagara capensis* Thunb.
*F. magalismontana* Engl.

Tree or shrub, up to 13 m high; trunk and stems usually with spine-tipped corky knobs. **Leaves** pinnately compound, paripinnate, alternate; leaflets opposite, blade ovate to elliptic or obovate, 10–40 × 10–20 mm, apex usually obtuse or rounded, main vein may bear small sharp spines, 4–8 pairs of primary lateral nerves present, strongly lemon-scented when crushed. **Flowers**: in panicles; unisexual; calyx of 4 small, ciliate sepals; petals greenish yellow; Sep.–Mar. **Fruit** a globose, brownish red, prominently gland-dotted capsule. **Seed** shiny and black. Bush clumps, grassland, woodland, sandy soil, rocky places. *Small knobwood*; *klein-perdepram* (A); *monokomabêlê* (T); *umnungumabele*, *unNungwane* (Z).

VreDm DrGr

# SALICACEAE

Deciduous trees or shrubs. **Leaves** alternate; with stipules. **Flowers**: small, clustered into erect or pendulous spikes; male and female on separate plants; each flower subtended by a bract; sepals and petals absent, represented by a cup-shaped or annular disc, scales or glands; male flowers with 2 or more stamens, filaments filiform; female flowers with ovary superior, 1-locular; stigmas usually forked. **Fruit** a capsule. **Seeds** with white silky hairs. *Willow family*.

[after Brummitt: 290 (2007)]

Although in early times the family was usually placed with other catkinate families lacking a perianth, it has been widely recognised that its affinities are with the Parietales, especially with the Flacourtiaceae, which has been divided into 2 parts. To avoid a paraphyletic family, authors have combined the Salicaceae *s.s.*, with the larger part of the Flacourtiaceae, and since the name Salicaceae has priority over Flacourtiaceae, the enlarged group has been called Salicaceae. This has resulted in more than half of the genera formerly referred to Flacourtiaceae being referred instead to Salicaceae, causing much confusion (*cf.* Achariaceae). The traditional Salicaceae have then become the tribe Saliceae nest within the Flacourtiaceae, so paraphyly is still present – changing the rank of taxa does not remove it. The new taxonomy is not followed here.

## Key to genera

[after Jordaan: 7 (2005)]

Terminal buds present, winter buds with several, unequal outer scales; leaves with blade broadly deltoid, ± as wide as long; petioles > 15 mm long; catkins pendulous; floral bracts dentate or ciliate-fimbriate . . . . . **Populus**
Terminal buds absent, winter buds with 1 outer scale; leaves with blade much longer than wide; petioles < 10 mm; catkins erect; floral bracts entire. . . . . **Salix**

## **Populus** L. (sthn Afr.: 2 spp.)

### Key to species:

1a Leaf blade white- or grey-felted on lower surface; catkin scales shortly toothed . . . . . 2
1b Leaf blade glabrous or thinly downy on both surfaces; catkin scales fringed . . . . . 3
2a Leaves with blades of leading shoots deeply palmately lobed, persistently white-felted . . . . . **P. alba** var. **alba**
2b Leaves with blades irregularly lobed or coarsely and bluntly toothed, becoming glabrous with age . . . . . **P. × canescens**
3a Leaves with margins of blade bluntly and often obscurely toothed, without glands at junction of petiole and blade. . . . . **P. nigra** var. **italica**
3b Leaves with margins of blade conspicuously toothed, glands always present at junction of petiole and blade. . . . . **P. deltoides** subsp. **deltoides**

### *__alba__ L. var. __alba__

Deciduous tree, up to 30 m high. **Bark** greyish green to whitish grey. **Leaves** with blades of leading shoots deeply palmately lobed, persistently white-felted on lower surface, blades of leaves on lateral shoots ovate, margins toothed, thinly tomentose or glabrous. **Flowers**: in catkins 80–100 mm long; catkin-scales shortly toothed. Roadsides, edge of streams in forest. Native to Europe and Asia. *White poplar*; *witpopulier* (A).




### *× __canescens__ (Aiton) Sm.

Tree, up to 25 m high. **Bark** on young stems white. **Leaves** with blade irregularly lobed or coarsely and bluntly toothed, becoming glabrous with age, white- or grey-felted on lower surface. **Flowers**: in catkins 60–100 mm long; catkin-scales shortly toothed. Native to Europe and western Asia. *Grey poplar*; *vaalpopulier* (A). Figure 13E, p. 10.




### *__deltoides__ W.Bartram ex Marshall subsp. __deltoides__

Tree, up to 30 m high. **Bark** ash grey. **Leaves** with glands always present at junction of petiole and blade; blade triangular-ovate, base truncate to cordate, margins conspicuously toothed, glabrous or thinly downy on both surfaces. **Flowers**: in catkins 70–100 mm long; catkin scales fringed. Native to North America. *Match poplar*, *cottonwood*; *vuurhoutjiepopulier* (A).



### *nigra L. var. italica Münchh.

Tree, up to 30 m high; trunk short, branches steeply ascending, giving tree a columnar outline. **Bark** dark grey. **Leaves** without glands at junction of blade with petiole; blade rhombic to triangular-ovate, apex abruptly acute to acuminate, margins bluntly, often obscurely toothed, venation prominent on lower surface. **Flowers**: in catkins 50–70 mm long; catkin scales fringed. Along watercourses. Native to Europe. *Lombardy poplar*; *Italiaanse populier* (A).

| VreDm | | DrGr | MsGr | KarSh | Zastr |
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## **Salix** L. (sthn Afr.: 5 spp.)

### Key to species:

1a Branches hanging ± vertically; leaf blade with apex long-acuminate . . . . . **S. babylonica** var. **babylonica**

1b Branches ascending, spreading or droopy, but not hanging vertically; leaf blade with apex rounded, acute or acuminate but not long-acuminate . . . . 2

2a Spring leaves fringed with long, silky hairs; female catkins slender, 60–110 mm long . . . . . **S. fragilis** var. **fragilis**

2b Spring leaves not fringed with long, silky hairs; female catkins 20–35 mm long . . . . . 3

3a Twigs always glabrous . . . . . **S. mucronata** subsp. **mucronata**

3b Twigs grey-canescent to puberulous . . . . . **S. mucronata** subsp. **woodii**

### *babylonica L. var. babylonica

Tree, up to 9 m high. **Branches** hanging vertically; light yellowish brown. **Leaves** with blade tapering to a long-acuminate apex. **Flowers**: catkins 2–4 mm long; female flowers sessile; Aug., Sep. Spreading in marshy areas and along streams. Nativity uncertain, may be China. *Weeping willow*; *treurwilger* (A).

| VreDm | | DrGr | MsGr | KarSh | |
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### *fragilis L. var. fragilis

Tree, up to 6 m high. **Branches** not hanging vertically. **Leaves** fringed with long, silky hairs in spring, summer leaves glabrous; blade narrowly ovate, up to 150 × 40 mm, margins serrate, upper surface bright green, shiny, lower surface paler, with a blue or grey bloom. **Flowers**: female catkins slender, 60–110 mm long; perianth greenish; Sep., Oct. Along watercourses. Native to western Europe and Asia. *Crack willow*, *brittle willow*.

| | | DrGr | MsGr | | Zastr |
|---|---|---|---|---|---|

### **mucronata** Thunb. subsp. **mucronata**

*S. mucronata* Thunb. subsp. *capensis* (Thunb.) Immelman

*S. capensis* Thunb.

*S. gariepina* Burch.

Tree, up to 10 m high. **Branches** drooping; twigs slender, always glabrous, yellow or red. **Leaves** not fringed with long, silky hairs in spring, blade narrowly ovate, 40–55 × 5–11 mm, apex acuminate or acute, base cuneate, margins serrate, green on both surfaces. **Flowers**: male catkins 30–70 mm long, female catkins 20–35 mm long; Sep.–Dec. Along streams and rivers.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

**mucronata** Thunb. subsp. **woodii** (Seemen) Immelman
*S. woodii* Seemen

Shrub or small tree, up to 5 m high. **Branches** drooping; twigs grey-canescent to puberulous. **Leaves** not fringed with long, silky hairs in spring, blade narrowly ovate, 60–160 × 5–15 mm, apex long acuminate, base cuneate, margins entire or serrulate, upper surface pale green, lower surface with a greyish bloom**. Flowers**: male catkins 30–70 mm long, female catkins 20–35 mm long; Aug., Sep. Frequent along rivers and streams.

MsGr

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# SANTALACEAE (including Viscaceae)

Trees, shrubs, herbs, usually parasitic (hemiparasites) on roots of other plants; dioecious or monoecious. **Stems** often with swollen nodes. **Leaves** alternate or opposite, simple, blade often reduced to scales, margins entire, often bluish green; without stipules. **Flowers**: bisexual or unisexual, regular, epigynous; perianth 1-whorled, tube short, adnate to ovary, usually with a tuft of hairs inside back of anthers, segments 2–6; stamens 2–6, as many as and opposite segments, filaments free; disc present or obscure; ovary inferior to half-inferior, 1-locular; style short or cylindrical, simple; stigma terminal, capitate or 2–5-lobed. **Fruit** indehiscent, a nut, usually ribbed (*Thesium*), a drupe (*Osyris*) or a 1-seeded berry with sticky inner layer (*Viscum*). *Sandalwood or mistletoe family*.

## Key to genera

[after Dyer: 49 (1975)]

1a Shrub or small tree; leaves well developed; fruit a fleshy drupe . . . . . **Osyris**
1b Small-leaved parasites; fruit a nut, or berry . . . . . 2
2a Fruit a berry . . . . . **Viscum**
2b Fruit a ribbed nut . . . . . **Thesium**

## **Osyris** L. (sthn Afr.: 1 sp.)

**lanceolata** Hochst. & Steud.

Shrub or small tree, up to 6 m high. **Stems** square, greyish green. **Leaves** alternate, subsessile; blade elliptic, ± 35 × 15 mm, apex acute, base cuneate, margins entire, greyish green with a

waxy bloom. **Flowers**: in axillary clusters; perianth greenish yellow; Oct.–Apr. **Fruit** an ovoid, fleshy, bright red drupe, 8–15 × 6–10 mm. Bush clumps, slopes of hillsides, kloofs. *Bark bush*; *bergbas*, *basbos*, *looibas* (A); *intekaza* (X); *ingondotha-mpete*, *intshakasa* (Z). Figure 7E, p. 3.

DrGr MsGr KarSh

## **Thesium** L. (sthn Afr.: 169 spp.)

### Key to species:

[after Hill: 11 (1915)]

1a Perianth segments with margins entire or variously ornamented, an apical beard absent . . . . . 2
1b Perianth segments with margins hairy, an apical beard present . . . . . 12
2a Perianth segments with a marginal fringe of long papillae . . . . . 3
2b Perianth segments glabrous or fringed with minute papillae . . . . . 4
3a Plants covered with minute hairs . . . . . **T. hystricoides**
3b Plants glabrous . . . . . **T. hystrix**
4a Flowers in axillary cymules, arranged in many-flowered heads, spikes, racemes or panicles. . . . . **T. pallidum**
4b Flowers solitary in axils of bracts, arranged in simple, terminal spike- or raceme-like inflorescences . . . . . 5
5a Plants with rigid, spine-like branches . . . . . **T. lineatum**
5b Plants not spinous . . . . . 6
6a Flowers without prominent perianth tubes . . . . . 7
6b Flowers with prominent perianth tubes . . . . . 8
7a Slender, subprocumbent herb; leaves ascending, blade narrowly linear, apex acuminate . . . . . **T. acutissimum**
7b Slender dwarf shrub; leaf blade recurved, blade broadly linear, apex subacute . . . . . **T. squarrosum**
8a Plants hairy. . . . . **T. hirsutum**
8b Plants glabrous . . . . . 9
9a Plants with weak, straggling branches . . . . . **T. virens**
9b Plants with erect, spreading branches . . . . . 10
10a Flowers pedunculate; leaves hard, apex acutely acuminate. . . . **T. costatum**
10b Flowers sessile or, if shortly pedunculate, bracts wholly adnate; leaves herbaceous. . . . . 11
11a Stems 13–32 mm high; leaf blade 12–30 mm long . . . . . **T. nationae**
11b Stems 6–10 mm high; leaf blade ± 10 mm long. . . . . **T. racemosum**
12a Flowers solitary or in groups of 2 or 3 at ends of branches . . . . . **T. zeyheri**
12b Flowers in small, terminal or subterminal heads, spike- or raceme-like inflorescences . . . . . 13
13a Flowers in a head . . . . . **T. imbricatum**
13b Flowers in spike- or raceme-like inflorescences . . . . . 14
14a Flowers in spikes; bracts not adnate to peduncle . . . . . 15
14b Flowers in raceme-like inflorescences; bracts adnate to peduncles . . . . . 21
15a Flowers in elongated, lax spikes; bracts shorter than flowers . . . . . **T. magalismontanum**
15b Flowers in simple spikes, not elongated. . . . . 16
16a Stems rush-like; leaves scale-like . . . . . 17
16b Stems leafy. . . . . 19
17a Flowers in lax spikes; bracts with scurfy or hyaline margins. . . . **T. scirpioides**
17b Flowers in short, ± dense spikes; bracts with finely fringed margins . . . . 18
18a Stems slender, ascending, brown when dry . . . . . **T. spartioides**
18b Stems stout, procumbent, blackish green when dry. . . . . **T. durum**

19a Plants glabrous . . . . . **T. rasum**
19b Plants finely pubescent . . . . . 20
20a Leaves rounded on back; outer surface of perianth glabrous . . . **T. griseum**
20b Leaves ribbed; outer surface of perianth hairy. . . . . **T. transvaalense**
21a Bracts with minutely serrulate or scabrid margins. . . . . 22
21b Bracts with entire, glabrous margins . . . . . 23
22a Bracts equal in length to flowers, rounded on back, minutely serrulate . . . . . **T. macrogyne**
22b Bracts longer than flowers, margins membranous, scabridulous . . . . . **T. lobelioides**
23a Bracts keeled; leaves erect . . . . . **T. goetzeanum**
23b Bracts rounded on back; leaves spreading . . . . . **T. resedoides**

## **acutissimum** A.DC.

Herb, 0.3–0.5 m high; glaucous, without spines. **Stems** subprocumbent, slender, many, sprawling. **Leaves** ascending; blade narrowly linear, up to 15 mm long, apex acuminate, mucronate. **Flowers**: inflorescence 1–3-flowered; bracts adnate to peduncle; disc prominent; perianth with apical beard absent, without a prominent tube, segments triangular, ± 1 mm long, hooded, white; Sep.–Dec. **Fruit** ellipsoid, ± 3 mm long, ribbed, reticulate between ribs. Rocky grassland.

VreDm

## **costatum** A.W.Hill *s.l.*

Perennial herb, up to 0.3 m high; glabrous, without spines. **Stems** erect, stiff, branched in upper part, few or fairly numerous, ribbed or angular. **Leaves** densely crowded on stems; laxly arranged; blade hard, linear, 6–12 mm long, apex acutely acuminate, midrib prominent on both surfaces, glabrous. **Flowers**: solitary in axils of bracts, gathered in a raceme-like inflorescence; bracts similar to leaves; peduncle shorter or a little longer than bracts; perianth with prominent tube, with an apical beard absent, 2.6–3.0 mm long, segments narrowly triangular-ovate, ± 1.5 mm long, hooded, white; Oct.–Dec. **Fruit** campanulate-globose, ± 6 mm long, prominently ribbed, coarsely reticulate between ribs. Grassland.

DrGr

## **durum** Hilliard & B.L.Burtt

Dwarf shrub, 0.1–0.4 m high; dense, hard. **Stems** stout, procumbent, rush-like, blackish green when dry. **Leaves** reduced; blade narrowly ovate to triangular, up to 3 mm long. **Flowers**: sessile, in short, terminal, spike-like inflorescences; bracts shorter than flowers, margins finely fringed; perianth bearded, ± 2 mm long, white; Nov., Dec. **Fruit** ± 1 mm long. Mountain grassland, shallow soil around rocky outcrops.

MsGr

## **goetzeanum** Engl.

Dwarf shrub or shrub, 0.2–0.6 m high. **Stems** erect, many, branched, longitudinally grooved, glaucous. **Leaves** erect; blade linear-ovate, ± 14 mm long, strongly keeled, apex cartilaginous. **Flowers**: solitary in terminal raceme-like inflorescences; bracts adnate to pedicels, keeled, margins entire, glabrous; perianth bearded, 2–4 mm long, segments triangular-elongate, apices obtuse, 1.5–2.0 mm long, margins inflexed, dense beard of long hairs at apex and upper part of margins, white; Dec.–Apr. **Fruit** ovoid, 3–4 mm long, thick, ribbed. Rocky grassland.

MsGr

## **griseum** Sond.

Perennial herb, 0.2–0.3 m high; scabrid-puberulous. **Stems** erect, leafy, simple or branched, many. **Leaves** rounded on back; blade linear, 4–10 mm long, apex acute or subacute. **Flowers**: in dense, terminal spikes; bracts narrowly ovate, ± as long as flowers, not adnate to peduncle; perianth bearded, ± 2 mm long, outer surface glabrous, segments narrowly triangular-ovate, apices subacute with a few long, apical hairs on inside; white; Nov.–Jan. **Fruit** 1.0–1.5 mm long. Mountain grassland.




## **hirsutum** A.W.Hill

Dwarf shrub, 0.05–0.15 m high; hairy, without spines. **Stems** many, arcuate-ascending; densely puberulous. **Leaves** linear, apex sharp, whitish, acute, cartilaginous. **Flowers**: solitary in axils of bracts on short peduncles, in racemes; bracts leaf-like; perianth not bearded, with conspicuous external glands, tube ± 1 mm long, segments 2 mm long, hooded, brownish yellow; Oct.–Dec. **Fruit** broadly ellipsoid, ± 6 mm long, ribbed, reticulate between ribs. Grassland.




## **hystricoides** A.W.Hill

Dwarf shrub, 0.3–0.5 m high; covered with minute hairs. **Stems** rigid, much branched; branchlets spine-tipped, wrinkled; minutely puberulous. **Leaves** very small, triangular, rigidly coriaceous, apex acute. **Flowers**: solitary, distinctly pedicellate within bract; bracts ovate, apices subacute, glabrous; perianth not bearded, 2 mm long, segments ovate, margins with fringe of long papillae, apices obtuse, white; Dec. **Fruit** ovoid-globose, 4 mm long, stipitate, strongly ribbed, scarcely reticulate between ribs, finely puberulous. Vleis. *Ystervarkbos* (A).




## **hystrix** A.W.Hill

Dwarf shrub or shrub, 0.25–0.60 m high; glabrous. **Stems** much branched, spreading; spinescent. **Leaves** scale-like. **Flowers**: solitary, sessile; bracts very small, broadly ovate; perianth not bearded, ± 1.5 mm long, segments triangular-ovate, margins with fringe of long papillae; creamy white; Nov.–Jan. **Fruit** ovoid-globose, ± 4 mm long, ribbed, glaucous between ribs. Grassland. *Kleinswartstorm* (A).




## **imbricatum** Thunb.

Dwarf shrub or shrub, 0.2–1.4 m high. **Stems** much branched, stout, leafy. **Leaves** cymbiform; blade linear, up to 8 mm long, lower surface sharply keeled, apex acute, rigid. **Flowers**: in few-flowered, terminal heads; bracts leaf-like; perianth bearded, ± 4 mm long, segments triangular, ± 3.5 mm long, acute, bearded on inner face, white; Oct., Nov. **Fruit** oblong-ovoid, up to 6 mm long, ribbed, reticulation not strongly obvious. Grassland, rocky soil.




## **lineatum** L.f.

Shrub, 0.75–2.00 m high. **Stems** rigid, grooved, branches spine-tipped, nearly leafless. **Leaves** linear. **Flowers**: solitary in axils of bracts on short peduncles, arranged in simple, terminal

spike- or raceme-like inflorescences on spinescent branchlets; bracts scale-like, triangular; perianth not bearded, tube 1 mm long, segments triangular, 1.5 mm long, hooded, margins slightly inflexed, white; Jun.–Oct. **Fruit** oblong-ellipsoid, ± 8 mm long, not ribbed, slightly reticulate. Grassland, calcareous soil. *Witstorm*, *vaalstorm* (A).

DrGr

## **lobelioides** A.DC.

Dwarf shrub, 0.3–0.5 m high. **Stems** ascending or suberect, much branched in upper parts; sulcate, purplish or grey, dull, glabrous. **Leaves** fleshy; blade linear or narrowly linear-ovate, 12–18 mm long, apex acute, upper surface 1-nerved, glabrous. **Flowers**: solitary in raceme-like inflorescences; bracts much longer than flowers, adnate to peduncles, keeled, margins membranous, scabridulous; perianth bearded, 4.5 mm long, segments 2.6 mm long, narrowly ovate-oblong, densely bearded inside, outer surface green, inner surface white; Oct.–Feb. **Fruit** ± 1 mm long. Montane grassland, plateau.

MsGr

## **macrogyne** A.W.Hill

Dwarf shrub, 0.12–0.30 m high. **Stems** simple or forked, slender, sulcate or angular; glabrous. **Leaves** fleshy; blade linear, 8–10 × 0.7–1.0 mm, apex acute and cartilaginous, glabrous. **Flowers**: few, solitary, axillary, in raceme-like inflorescences; bracts adnate to apex of peduncle, equal or slightly longer than flowers, rounded on back, minutely serrulate; perianth bearded, 4 mm long, segments narrowly ovate-oblong, apices obtuse, 2 mm long, hooded, densely woolly bearded, white; Dec.–Mar. **Fruit** ± 2–3 mm long. Grassland.

DrGr MsGr

## **magalismontanum** Sond.

Dwarf shrub, 0.1–0.5 m high. **Stems** erect or suberect, few, slender, faintly sulcate, glabrous, glaucous; sparsely leafy; bearing scattered flowers over nearly the full length. **Leaves** often appressed to stem; blade linear, 12–18 mm long, apex subacute, glabrous, glaucous. **Flowers**: in elongated, lax spikes, solitary in axils of bracts; bracts ovate or narrowly ovate, not adnate to peduncle, apex acutely acuminate, shorter than open flowers, outer surface slightly warted, glaucous-grey; perianth bearded, with prominent external glands, 1.5–2.6 mm long, segments elliptic, apices obtuse or subacute, hooded, 1 mm long, bearded, margins hairy, white; Sep.–Feb. **Fruit** broadly ellipsoid, 5.5 mm long, prominently ribbed, reticulate, slightly glaucous. Grassland.

VreDm

## **nationae** A.W.Hill

Perennial herb, 0.1–0.3 m high; glabrous, without spines. **Stems** simple, erect, slender, spreading, ribbed, glabrous. **Leaves** with blade linear, 12–30 mm long, herbaceous, midrib on upper surface conspicuous, glabrous. **Flowers**: few, very shortly pedunculate; bracts wholly adnate to peduncle, much longer than flowers, similar to leaves; perianth with prominent tube, not bearded, ± 4 mm long, segments triangular-elliptic, 1.5 mm long, hooded, margins papillose, white; Oct.–Dec. **Fruit** ± 1 mm long. Montane grassland.

MsGr

**pallidum** A.DC.

*T. floribundum* A.W.Hill

Perennial herb, dwarf shrub or shrub, 0.05–0.60 m high. **Stems** few, erect, branched in upper part, closely sulcate, glabrous. **Leaves** somewhat fleshy; blade linear, 1.5–3.0 × 1.4 mm, coarsely verrucose. **Flowers**: in axillary cymules, arranged in many-flowered heads, spikes, racemes or panicles; bracts adnate to peduncle for half their length, leaf-like, longer than flowers; perianth not bearded, 1.5–2.0 mm long, segments 1.0–1.5 mm long, broadly ovate, hooded, margins slightly fringed, incurved, membranous, white; Oct.–Dec. **Fruit** ellipsoid, segments 5 mm long, prominently ribbed, coarsely reticulate, slightly shining. Rocky grassland. *Yellow thesium*, *red maseka*; *umahesaka-obomvu* (Z).




**racemosum** Bernh.

Perennial herb or dwarf shrub, 0.05–0.45 m high; glabrous, without spines. **Stems** erect, stiff, several, simple, conspicuously angular, glabrous. **Leaves** herbaceous; blade linear or narrowly linear-ovate, 6–10 × 1.5 mm, apex subacute, 1-nerved; margins narrowly cartilaginous. **Flowers**: sessile, solitary in axils of bracts in racemes; bracts slightly adnate to peduncle, narrowly linear-ovate, apices very acute, longer than flowers; perianth with prominent tube, not bearded, 2.6 mm long with conspicuous external glands, segments ovate or narrowly ovate, apices subacute, hooded, margins incurved, slightly papillose; greenish white; Nov.–Jan. **Fruit** ± 2 mm long. Grassland. *Bohoho* (SS).




**rasum** (A.W.Hill) N.E.Br.

*T. impeditum* A.W.Hill var. *rasum* A.W.Hill

Dwarf shrub or shrub, 0.5–0.7 m high; glabrous. **Stems** tufted, slender, simple, sparsely branched, angular, glabrous. **Leaves** thick; blade linear, 4–14 mm long, apex with acute, recurved tips. **Flowers**: solitary in axils of bracts of lax spikes; bracts slightly adnate or free from peduncle, linear with acute, recurved tips, as long as or slightly exceeding flower; perianth bearded, 2–3 mm long, segments narrowly ovate, apices subacute 1.4–2.0 mm long, densely bearded, white; Oct.–Feb. **Fruit** ellipsoid-globose, 5 mm long, prominently ribbed, distinctly reticulate between ribs, purplish. Grassland.




**resedoides** A.W.Hill

*T. burkei* A.W.Hill

Perennial herb, dwarf shrub or shrub, 0.1–1.0 m high. **Stems** erect with spreading branches. **Leaves** distant, spreading, subulate, apex acute with colourless tips, recurved. **Flowers**: either single and sessile in axils of bracts or gathered in a terminal raceme-like inflorescence; bracts narrowly ovate, rounded on back, equal in length top or half as long as flower, sessile on axis or adnate to peduncle, margins entire, glabrous; perianth bearded, ± 2.65 mm long, segments elliptic-ovate, 1.6 mm long, apex hooded, upper part of margins densely bearded, white; Sep.–Feb. **Fruit** ovoid, ± 3 mm long, ribbed. Grassland, bush clumps.




**scirpioides** A.W.Hill

Dwarf shrub or shrub, 0.3–0.6 m high. **Stems** rush-like, erect. **Leaves** scale-like; blade ovate, 1–2 mm long, apex acute. **Flowers**: in lax, erect spikes, forming a loose corymb; bracts scaly,

broadly ovate, not adnate to peduncle, apex acute or acutely acuminate, keeled, margins narrow, brown, scurfy or hyaline, glabrous; perianth bearded, 2.6 mm long, segments triangular, apex acute, flat with a dense, apical, woolly beard, margins hairy, white; Oct.–Dec. **Fruit** ellipsoid-globose, ± 3 mm long, faintly ribbed, scarcely reticulate between ribs. Grassland.

DrGr? MsGr

**spartioides** A.W.Hill

Annual herb, 0.1–0.2 m high. **Stems** slender, ascending, several, rush-like; brown when dry. **Leaves** scale-like; blade narrowly ovate, up to 3 mm long, subulate, apex acutely acuminate, abaxial convex. **Flowers**: in short, ± dense spikes, sessile in bracts; bracts with finely fringed margins; perianth bearded, ± 1.5 mm long, segments triangular, ± 1 mm long, bearded, greenish white; Sep.–Mar. **Fruit** subglobose, ± 3 mm long, ribbed, finely reticulate between ribs. Vleis.

AcGr DrGr

**squarrosum** L.f.

Dwarf shrub, 0.3–0.6 m high; slender, without spines. **Stems** densely branched, angular when young. **Leaves** succulent; blade broadly linear, apex subacute, recurved at tip. **Flowers**: solitary in axils of bracts, gathered in simple, terminal raceme-like inflorescences; bracts leaf-like; perianth not bearded, 1.5 mm long, without a prominent perianth tube, segments narrowly ovate, ± 1 mm long, hooded, glabrous, white; Jan. **Fruit** stalked, ellipsoid-globose, up to 5 mm long, prominently ribbed, reticulate between ribs. Mountain grassland.

MsGr

**transvaalense** Schltr.

Dwarf shrub or herb, up to 0.3 m high; finely, densely, shortly pubescent with spreading or slightly recurved hairs. **Stems** ascending, slender; densely leafy. **Leaves** ± parallel with stems, ribbed; blade linear, 3–4 mm long, subulate, apex very acute, minutely, conspicuously ciliate and puberulous. **Flowers**: in short spikes, overtopped by same year's leafy shoot; bracts longer than or equal to flowers, similar to leaves, often incurved; bracts not adnate to peduncle; perianth bearded, ± 2.5 mm long, outer surface hairy, segments narrowly ovate, 1.5 mm long, apices acute with dense, apical beards, white; Nov.–Jan. **Fruit** ovoid-globose, 4 mm long, strongly ribbed, reticulate between ribs, pubescent. Rocky grassland.

DrGr

**virens** E.Mey. ex A.DC.

Perennial herb, 0.1–0.3 m high; glabrous, without spines. **Stems** slender, trailing; branches straggling, sparsely leafy. **Leaves** linear, up to 22 mm long, apex acute, cartilaginous, glabrous. **Flowers**: solitary, subtended by a bract and bracteoles; bracts adnate to peduncle, equalling or up to twice as long as flower, linear, glabrous; perianth with prominent tube, not bearded, ± 2.5 mm long, glabrous, segments narrowly linear-ovate, 1 mm long, hooded, margins incurved, white; Dec. **Fruit** oblong-ellipsoid, ± 4 mm long, prominently ribbed, reticulate between ribs. Montane grassland.

MsGr

**zeyheri** A.DC.

*T. longirostre* Schltr. ex A.W.Hill

*T. schlechteri* A.W.Hill

Dwarf shrub. **Stems** procumbent, much branched; main stem stout, knotty; branches short, crowded. **Leaves** linear, up to 10 mm long, lower surface strongly keeled, margins papillate and scabrous. **Flowers**: solitary or in groups of 2 or 3 at ends of branches; perianth segments with dense, apical beard of stiff or woolly hairs, white; Mar. **Fruit** oblong, ± 6 mm long, including beak-like, persistent perianth, prominently ribbed, reticulate between ribs. Grassland.

MsGr

## **Viscum** L. (sthn Afr.: 19 spp.)

### Key to species:

1a Plant with well-developed leaves . . . . . **V. rotundifolium**
1b Plant leafless or with scale-like leaf rudiments. . . . . 2
2a Stems conspicuously flattened, especially when young, older stems becoming rounded. . . . . **V. combreticola**
2b Stems rounded at all developmental stages . . . . . **V. hoolei**

**combreticola** Engl.

Leafless, dioecious shrub, up to 2 m high; parasitic primarily on species of *Combretum*. **Stems** flattened, especially when young, older stems becoming rounded; internodes mostly 30–35 × 4–6 mm. **Flowers**: yellowish green; Jul.–Jun. **Fruit** sessile, ellipsoid, warty when young. Mixed bushveld and open woodland.

VreDm

**hoolei** Wiens

*V. capense* L.f. subsp. *hoolei* Wiens

Leafless, except for scales on younger shoots, monoecious subshrub, up to 0.5 m high; commonly parasitic on species of *Searsia (Rhus)*. **Stems** rounded; internodes 10–15 × 1–2 mm. **Flowers**: staminate and pistillate flowers borne singly and sessile in a bracteal cup; Aug.–May. **Fruit** sessile, rotund, smooth, white. Rocky soil.

KarSh

**rotundifolium** L.f.

Leafy, monoecious shrub, up to 0.5 m high; parasitic on many diverse hosts including, for example, species of *Euclea* and *Boscia*. **Stems** with internodes usually > 12 mm long. **Leaves** usually > 8 × 4 mm. **Flowers**: yellow; Jul.–Dec. **Fruit** orange, 4–5 mm long, with pedicel 3–4 mm long. Mixed bushveld and riverine scrub. *Mistletoe*; *tee*, *voëlent* (A).

VreDm DrGr KarSh

## References

HILL, A.W. 1915. Santalaceae. *Flora capensis* 5,2: 135–212.

# SAPINDACEAE

Trees, shrubs or climbers; monoecious or dioecious. **Leaves** alternate, compound or occasionally simple; without stipules. **Flowers**: small, in racemes or panicles, rarely in clusters or solitary; unisexual or bisexual; regular or irregular; calyx 4- or 5-segmented; petals 3–5 or absent; disc present, rarely rudimentary; stamens usually 8, up to 24, arising within disc, filaments often hairy; ovary superior, style usually 1, sometimes 3–6-fid. **Fruit** a drupe or capsule, or dry, indehiscent with wing-like outgrowths. **Seeds** often with arils present. *Litchi or soapberry family*.

## **Pappea** Eckl. & Zeyh. (sthn Afr.: 1 sp.)

### **capensis** Eckl. & Zeyh.

*P. capensis* Eckl. & Zeyh. var. *radkloferi* (Schweinf. ex Radlk.) Schinz

Tree, up to 10 m high. **Leaves** often crowded near ends of branches; simple; blade oblong, up to 100 × 60 mm, rounded at both ends, margins entire to sharply serrate, many lateral veins, closely together, branching and forming a 'Y' just before reaching margin, pubescent beneath, papery to leathery. **Flowers**: in fascicles along rachis; corolla yellow or cream-coloured; Aug.–Apr. **Fruit** a densely hairy, ± globose capsule, with a bright red, semi-fleshy aril covering a black seed. Riverine woodland, bushveld and grassland. *Jacket-plum*; *doppruim* (A); *mopênôeng* (T).

VreDm

# SCROPHULARIACEAE

Compiled by S.P. Bester, E. Retief & N.L. Meyer

Annual or perennial, terrestrial or aquatic herbs, sometimes dwarf shrubs or rarely shrubs and small trees. **Stems** cylindrical or quadrangular sometimes ribbed or narrowly winged. **Leaves** opposite, alternate, rarely whorled, sometimes fascicled or radical, simple, entire to deeply divided, with or without stipules, or sometimes connected at base by a stipular ridge, petiolate. **Flowers**: in many-flowered, terminal or axillary cymes or racemes; bisexual, regular or irregular, often 2-lipped; petals usually 4 or 5, sometimes up to 16, united; calyx mostly 5-lobed; stamens mostly 4, 2 of which are usually longer than the others, sometimes 2 due to 2 modified to staminodia, attached to petals; ovary superior, 2-locular, placenta mostly central sometimes parietal; stigma terminal or sometimes decurrent. **Fruit** mostly a many-seeded capsule, dehiscing by pores or fissures. **Seeds** small to minute, 1-many per locule, variously shaped, rarely smooth. *Snapdragon family*, *wild sage family*; *leeubekkiefamilie* (A).

The view to regard *Chaenostoma* as a synonym of *Sutera* is not followed here.

## Key to genera

[partly after Smithies: 509 (2000)]

1a Flowers regular, tetramerous. . . . . 2
1b Flowers ± irregular . . . . . 3

2a Suffrutex; inflorescence racemose . . . . . **Gomphostigma**
2b Trees, shrubs or stragglers; inflorescence cymose . . . . . **Buddleja**
3a Fruit consisting of (1)2 ± ovoid cocci; ovary with 1 ovule in each locule . . . 4
3b Fruit a capsule, berry or drupe; ovary with 2–many ovules in each locule . . . 6
4a Two lateral corolla lobes ascending and united with 2 upper (posterior) lobes to form a 4-lobed upper lip, lower (anterior) lobe aborted or reduced to a small tooth . . . . . **Hebenstretia**
4b Corolla limb usually with a 1- or 2-lobed upper lip and 3-lobed lower lip, occasionally upper lip 4-lobed with one well-developed lower lobe . . . . . 5
5a Corolla limb always glabrous on inner surface . . . . . **Selago**
5b Corolla limb with conspicuous 1-celled clavate hairs at base of upper lip, often all round mouth. . . . . **Cromidon**
6a Leaves alternate, very rarely opposite; corolla without pouches, pockets or spurs . . . . . 7
6b Leaves usually opposite at least near base, sometimes rosulate or verticillate, occasionally alternate above; corolla tube sometimes with pouches, pockets or spurs. . . . . 8
7a Capsules thick-walled, obovoid or ± globose to ovoid, compressed in upper part at right angles to septum, emarginate, opening only above; anthers of upper pair of stamens smaller than others, sometimes empty (caution: 2 species of *Aptosimum* have *Peliostomum*-type fruits. See note under that genus.) . . . . . **Aptosimum**
7b Capsules thin-walled, narrowly elongate-ovoid, acute, acuminate or obtusely pointed, opening ± down to base; all 4 anthers fertile and of ± equal size . . . . . **Peliostomum**
8a Corolla with pouches, pockets or spurs, usually near base (caution: in *Diascia* such inflations rarely absent or corolla throat only slightly depressed, then yellow patches or oil-secreting hairs sometimes present there and seeds usually curved) . . . . . 9
8b Corolla without pouches, pockets or spurs near base of corolla tube or limb . . . . . 11
9a Corolla tube very short or obsolete; various inflations usually present in corolla throat or at base of limb. . . . . **Diascia**
9b Corolla tube somewhat elongated with only 1 hollow pouch or spur at base . . . . . 10
10a Fruit capsule ± ovate or urceolate, laterally compressed, septicidal; upper corolla lip 4-lobed . . . . . **Nemesia**
10b Fruit capsule subglobose, loculicidal; upper corolla lip 2-lobed . . . . . **Diclis**
11a Shrubs. . . . . **Phygelius**
11b Herbs or dwarf shrubs . . . . . 12
12a Stamens 4, rarely 2; anthers synthecate; mainly dry land herbs or undershrubs . . . . . 13
12b Stamens 4, or 2, anther thecae 2, distinct or confluent; mainly water plants or in a habitat of unusual moisture conditions . . . . . 20
13a Upper filaments not decurrent down corolla tube . . . . . 14
13b Upper filaments decurrent down corolla tube, often to base, sometimes very briefly . . . . . 16
14a Upper stamens included, arising halfway up tube or higher, lower stamens either included or anthers just visible in mouth . . . . . **Manulea**
14b One or both pairs of stamens exserted at anthesis (caution: both pairs deeply included in 2 species of *Sutera*), arising near base of tube. . . . . 15
15a Flowers solitary in leaf axils; corolla lobes glabrous on upper surface . . . . . **Chaenostoma**
15b At least some cymules present in every inflorescence; mouth of corolla hairy . . . . . **Sutera**
16a Stigma very short (up to 2 mm), often minutely bifid, stigmatic surface ± terminal, either jelly-like or composed of minute papillae, these either terminal or also extending very briefly downwards . . . . . **Jamesbrittenia**
16b Stigma lingulate (tip occasionally minutely bifid), often ± equalling or longer than style, flattened, with 2 marginal bands of stigmatic papillae . . . . . 17

17a Bract adnate at least halfway up calyx tube, rarely less . . . . . **Zaluzianskya**
17b Bract either adnate to pedicel or part of pedicel only, or to pedicel and base of calyx tube, never > lower $^1/_3$ . . . . . 18
18a Inflorescence capitate, nodding in flower, erect in fruit . . . . . **Glumicalyx**
18b Inflorescence capitate or extended, not nodding in flower, always erect 19
19a Capsule beaked; orange patches, if present on corolla limb, then located on all lobes forming radial pattern . . . . . **Zaluzianskya**
19b Capsule not beaked; orange/yellow patches present on corolla limb but only on upper lip. . . . . **Melanospermum**
20a Stamens 4, only somewhat didynamous, or only 2 (lower pair) perfect and other pair reduced to staminodes or absent . . . . . **Limosella**
20b Stamens 4, didynamous, or only upper pair perfect . . . . . **Mimulus**

## **Aptosimum** Burch. ex Benth. (sthn Afr.: 18 spp.)

### Key to species:

[partly after Hiern: 125 (1904)]

1a Leaves sessile or subsessile; blade ridged, at length spinescent . . . . . 2
1b Leaves petiolate; blade with midrib not hardening into spines . . . . . 3
2a Leaves 5–9 mm long; blade linear-spathulate; spines usually as long as or shorter than leaves. . . . . **A. marlothii**
2b Leaves 11–35 mm long; blade linear; spines usually longer than leaves . . . . . **A. spinescens**
3a Petiole ± as long as leaf blade; leaf blades spathulate, crowding the flowers . . . . . **A. indivisum**
3b Petiole much shorter than leaf blade; leaf blade obovate or narrowly so, not crowding flowers . . . . . 4
4a Stems procumbent, trailing, herbaceous . . . . . **A. elongatum**
4b Stems procumbent, not trailing, base woody . . . . . **A. procumbens**

### **elongatum** Engl.

*A. depressum* Burch. ex Benth. var. *elongatum* Hiern
*A. procumbens* (Lehm.) Steud. var. *elongatum* (Hiern) Codd
*A. pubescens* F.E.Weber

Perennial herb, widely spreading, 0.25 m high, up to 1 m in diameter. **Stems** procumbent, trailing, subflexuous, densely branched; woody and leafy throughout; hirsute. **Leaves** sessile to shortly petiolate; not crowding flowers; blade narrowly ovate-obovate or narrowly obovate, 10–20 mm long, covered at least below with forwardly directed, curved, simple or gland-tipped hairs; petioles often much shorter than leaves. **Flowers**: calyx 6–8 mm long; corolla 12–19 mm long, deep blue to purple or mauve; Sep.–May. Grassland, sandy, gravel or rocky soil, common in old lands. *Carpet flower*, *carpet plant*; *kankerbos*, *karooviooltjie*, *kinkhoesbossie*, *braam-/brandbossie*, *brandblare*, *seeroogbossie* (A).

AcGr DrGr KarSh

### **indivisum** Burch. ex Benth.

*A. nanum* Engl.

Dwarf shrub or shrub, up to 0.9 m high. **Stems** erect or procumbent, often shortly and closely branched; woody. **Leaves** densely fascicled; crowding flowers; blade spathulate, 12–25 × 3–4 mm; petioles ± as long as blade. **Flowers**: calyx 7–9 mm long; corolla 16–22 mm long,

blue or purple; ± all year, mostly Oct.–Mar. Grassland, sandy and stony soil. *Karoo violet*, *wild violet*; *karooviooltjie* (A).

VreDm | AcGr | DrGr | | KarSh |

### **marlothii** (Engl.) Hiern

Dwarf shrub up to 0.6 m high. **Stems** decumbent or ± erect, much branched; branches sparsely to densely spiny; spines as long as or shorter than leaves. **Leaves** sessile; alternate, often clustered on small branches; blade linear-spathulate, 5–9 × 0.75–1.25 mm, apex apiculate. **Flowers**: axillary or on reduced side shoots, longer than leaves; calyx shortly 5-lobed, subdensely glandular-pilose, strongly nerved, especially in fruit; corolla tubular, with short lobes, 12–22 mm long, bluish violet, darker at centre, sometimes with dark spots or striae, throat sometimes white; Sep.–Apr. Sandy and stony soil, sometimes over limestone. *Koffieboontjiekaroo*, *koffiepitkaroo*, *koffiekaroo* (A).

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### **procumbens** (Lehm.) Steud.

*A. depressum* Burch. ex Benth.

Dwarf shrub. **Stems** procumbent, densely, well branched, ridged, branches ± woody at least below, leafy throughout; woolly pubescent or glabrous. **Leaves** with blade narrowly obovate to obovate, occasionally subrotund, 0.5–1.6 × 0.5–2.3 mm, apex mucronate or acuminate, not spinous at tip, narrowed to petiolate base, margins entire, pubescent or glabrous; petioles ± as long as leaves. **Flowers**: axillary, many, sessile, on upper side of branches and exceeding leaves; calyx 4–6 mm long; corolla puberulous, tube slender at base, 12–19 mm long, blue or purple; Jan.–Dec. Dry rocky to sandy karroid flats. Figure 8A, p. 4.

VreDm | AcGr | DrGr | MsGr | KarSh |

### **spinescens** (Thunb.) F.E.Weber

Dwarf shrub, up to 0.3 m high; spiny. **Stems** spreading or erect; leafy. **Leaves** sessile; blade linear, 11–35 × 0.5–3.0 mm, apex acute, ridged midrib forming spine with age. **Flowers**: axillary, usually longer than leaves; calyx shortly 5-lobed; corolla tubular, expanded above, lobes short, 10–18 mm long, blue to violet or mauve, often darker round mouth, sometimes white in throat; Oct.–Dec. Rocky to sandy karroid slopes and flats, sometimes on limestone. *Doringviooltjie*, *kankerblare*, *kankerbossie*, *koffiepit*, *rolvarkie* (A).

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## **Buddleja** L. (sthn Afr.: 7 spp.)

[Keys and descriptions after Verdoorn: 150–171 (1963)]

### Key to species:

1a Interpetiolar leafy stipules present; corolla tube long, cylindrical . . . . . 2
1b Stipules represented by interpetiolar ridges . . . . . 3
2a Leaves subsessile; blade cordate to auriculate at base, upper surface rugose . . . . . **B. salviifolia**
2b Leaves distinctly petiolate; blade broadly cuneate or rounded at base, upper surface not rugose . . . . . **B. auriculata**

3a Leaf blade ± smooth above, margins entire . . . . . **B. saligna**
3b Leaf blade deeply rugose above, margins distinctly and closely crenulate. . . . . **B. loricata**

## **auriculata** Benth.

Shrub, 2–7 m high. **Leaves** with blade narrowly ovate to ovate-oblong, 28–120 mm × 10–50 mm, apex acute to acuminate, base rounded or cuneate, margins finely serrate, upper surface dark green, shiny, glabrous, lower surface tomentose; petioles deeply channelled, 3–10 mm long, bases not prominent. **Stipules** conspicuous, auriculate. **Flowers**: in axillary and terminal cymose panicles; stamens included; corolla ± 6 mm long, white with orange throat, orange-yellow, lilac or salmon-coloured; Apr.–Aug. In rocky ravines, on mountainsides or at forest margins in mountainous country. *Weeping sagewood*; *treursaliehout* (A).

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## **loricata** Leeuwenb.

*B. corrugata* (Benth.) E.Phillips

Shrub, up to 3.5 m high. **Leaves** with blade linear or narrowly ovate to oblong, 15–90 × 2–20 mm, apex acute, base rounded or cuneate, margins crenulate, discolorous, upper surface dark green, rugose, lower surface densely rusty tomentose; petioles up to 10 mm long. **Stipules** represented by interpetiolar ridges. **Flowers**: congested in cymes; stamens exserted; corolla ± 4 mm long, dull white with an orange throat. *Mountain sagewood*; *bergsaliehout* (A); *lelora* (SS); *umngane* (Z).

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## **saligna** Willd.

*Chilianthus oleaceus* Burch.

Small tree or shrub, 0.5–7.0 m high. **Leaves** with blade linear to narrowly ovate, 15–100 × 2–15 mm, apex acute, base cuneate, margins entire, inrolled, upper surface glabrescent, veins impressed but distinct, lower surface light coloured, densely, stellately scaly, reticulate veins anastomose to form a line ± parallel to margins; petioles 2–10 mm long. **Stipules** represented by interpetiolar ridges, ridges faint or absent. **Flowers**: in many-flowered panicles; stamens clearly exserted; corolla ± 3 mm long, white, cream-coloured, cream-coloured with reddish centre; Oct.–May. Dry hillsides, mixed bushveld, mountainsides, wooded valleys, forest margins and along rivers. *Mock olive*, *bastard olive*; *witolienhout*, *witsaliehout* (A); *motlhwaretshogwana* (T); *igqeba* (Z).

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## **salviifolia** (L.) Lam.

Shrub or tree, 1–5 m high, sometimes up to 8 m high. **Leaves** sessile or subsessile; blade narrowly ovate to narrowly linear- ovate, 30–145 × 7–42 mm, apex acuminate, base cordate or auriculate, margins finely, regularly crenate, upper surface dark green, rugose, lower surface rusty or white tomentulose, reticulate. **Stipules** distinct, leaf-like, apex broad, base auriculate. **Flowers**: in cymes, cymes large terminal, pyramidal bunches; stamens included; corolla 7–11 mm long, cream-coloured, lilac, lavender-blue, purple or white with deep orange throat; Jun.–Nov. Forest margins, rocky slopes, along watercourses, in dongas and isolated bushes on hillsides. *Quilted sagewood*; *saliehout* (A); *lelothoane* (SS); *igqange*, *ilothane* (X); *iloshane* (Z).

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## **Chaenostoma** Benth. (sthn Afr.: 46 spp.)

### Key to species:

[after Hilliard: 224 (1994)]

1a One pair of stamens exserted, one pair included (not visible) . . . . . 2
1b All 4 stamens exserted. . . . . 5
2a Hairs on calyx up to 0.25 mm long . . . . . **C. polelense** subsp. **polelense**
2b At least some hairs on calyx 0.3–2.0 mm long. . . . . 3
3a Flowers mostly in a mixture of 3-flowered cymules, cymose-racemes and racemes, only the lowermost sometimes solitary in axils of leaves; longest pedicels 4–10 mm long; petioles 4–9 mm long . . . . . **C. floribundum**
3b Flowers mostly solitary in axils of uppermost bracts; longest pedicels (6–) 10–30 mm long; petioles ± 0–6 mm long . . . . . 4
4a Leaf blade ± as long as broad (or broader than long), glistening glands round. . . . . **C. polelense** subsp. **polelense**
4b Leaf blade longer than broad, glistening glands clearly oblong. . . . . **C. polelense** subsp. **fraterna**
5a Stem, leaves and calyx clad in vesicular hairs (which look like tiny round scales), very rarely minute, glandular hairs present as well . . . . . **C. halimifolium**
5b Stem, leaves and calyx either glabrous or clad in manifestly stalked hairs . . . . 6
6a All four stamens exserted; corolla tube up to 6.0(–8.5) mm long . . . . . 7
6b Only one pair of stamens exserted, other pair included but visible in throat; corolla tube (5–)8–28 mm long . . . . . 9
7a Corolla tube up to 3.5 mm long, limb 5–7 mm in diameter . . . . . **C. leve**
7b Corolla tube (3–)4–9 mm long, limb 8.5–15.0 mm in diameter . . . . . 8
8a Rootstock a woody caudex of irregular shape; vegetative buds in leaf axils rarely developing . . . . . **C. neglectum**
8b Rootstock a simple woody taproot; leaves pseudofasciculate . . . . . **C. patrioticum**
9a Principal leaves ± 11–40 mm wide; ovary with broad band of glistening glands on sutures and scattered on top of ovary and up style . . . . . **C. polelense** subsp. **fraterna**
9b Principal leaves mostly up to 5 mm wide; if wider then ovaries either glabrous or with only a few glistening glands on sutures . . . . . **C. macrosiphon**

### **floribundum** Benth.

*Sutera arcuata* Hiern
*S. floribunda* (Benth.) O.Kuntze
*S. macleana* Hiern

Perennial herb, up to 1 m high. **Stems** usually branched, sometimes rooting at nodes. **Leaves** opposite; blade ovate to elliptic, 10–40 × 10–30 mm, margins shortly toothed; petioles 4–9 mm long. **Flowers**: many in a panicle, arranged in cymes or cymose racemes, only the lowermost sometimes solitary in axils of leaves; pedicels 4–10 mm long; stamens 4, anticous pair exserted; calyx with at least some hairs 0.3–2.0 mm long; corolla tube 6–11 mm long, yellow; limb 6–10 mm in diameter; lobes white or light cream-coloured to mauve, tube yellow; all year but mainly Jan.–May. Grassland, among boulders, along streambanks, forest margins. *Kerriebos* (A); *boluma* (SS); *usikisiki lwehlathi* (Z).




### **halimifolium** Benth.

*Sutera halimifolia* (Benth.) O.Kuntze
*S. laxiflora* (Benth) Kuntze

Annual or perennial herb; suffrutex, woody at base; stem, leaves and calyx clad in vesicular hairs (which look like tiny round scales). **Stems** 0.75–3.50 m high, branches wiry, slender,

lower ones elongated; glandular pubescent or sometimes almost glabrous, **Leaves** opposite; subsessile or sessile; blade elliptic-oblong, oblanceolate or linear, 6–25 × 1–6 mm, apex obtuse, narrowed towards decurrent base, margins entire or toothed. **Flowers**: in long, terminal racemes, forming a panicle; stamens exserted; calyx lacking coarse hairs; corolla tube 0.8–3.2 mm wide, funnel-shaped, yellow; limb 4–7 mm in diameter; lobes narrowly linear-ovate, pink or mauve to lilac, sometimes white; mainly Sep.–Apr. Dry rocky places

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**leve** (Hiern) Kornhall
*C. palustris* Hiern
*Sutera levis* Hiern

Perennial herb, up to 0.6 m high. **Leaves** opposite; blade linear to narrowly elliptic, 20–40 × 1–4(–9) mm, apex acute, base connately narrowed, margins entire to minutely toothed, both surfaces glandular-puberulous. **Flowers**: in a much-branched panicle with masses of small flowers on filiform pedicels; stamens 4, exserted; corolla tube 2.5–3.5 mm long, yellow or orange, 2.0–2.5 mm long in throat; limb spreading, ± 6 mm in diameter; lobes in shades of mauve or pink, often with white spots; Oct.–Apr. Stony or rocky sites on grassy hill slopes, often amongst boulders.

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**macrosiphon** Schltr.
*Sutera macrosiphon* (Schltr.) Hiern

Perennial herb or dwarf shrub, up to 0.45 m high. **Stems** terete, much branched, pale green, subglabrous or glandular-puberulous. **Leaves** opposite; subsessile or sessile; blade linear to linear-spathulate, 8–26 × 1.6–6.0 mm, apex acute, obtusely narrowed at both ends, attenuate at times narrowing into a very short petiole, margins entire, rarely with small teeth. **Flowers**: solitary, axillary, in terminal racemes or narrow panicles; if principle leaves > 5 mm wide, then ovaries either glabrous or with only a few glistening glands on sutures; stamens 4, anticous pair exserted; corolla tube 14–28 mm long, throat yellow; limb somewhat bilabiate, 8–12 mm in diameter; lobes white or pinkish to mauve; Mar.–May. Rocky places.

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**neglectum** J.M.Wood & M.S.Evans
*Sutera neglecta* (J.M.Wood & M.S.Evans) Hiern

Perennial herb, up to 0.6 m high; with irregularly shaped caudex; leaves and calyx with stalked hairs. **Stems** erect or decumbent. **Leaves** opposite, blade oblong to elliptic, ± 15–40 × 3.5–17.0 mm, apex acute to subacute, base slightly connately narrowed or not, margins subentire with up to 6 pairs of small teeth; vegetative buds in leaf axils rarely developing. **Flowers**: in long, terminal racemes, sometimes branching into corymbose panicles; stamens 4, exserted; corolla with tube 4–6 × 3–5 mm, yellow to orange, limb 6–8 mm in diameter; lobes mauve to bright purple-pink, occasionally with a white spot; Dec.–Mar. Rocky grassland.

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**patrioticum** (Hiern) Kornhall
*Diascia avasmontana* Dinter
*Sutera patriotica* Hiern

Annual herb, up to 0.45 m high; with simple taproot. **Stems** erect, much branched, glandular-pubescent. **Leaves** fascicled in axils; blade oblong to elliptic, up to 30 × 8 mm, apex ± acute,

base connately narrowed to distinctly petiolate, margins dentate, sometimes with small teeth, hairy. **Flowers**: solitary, ultimately innumerable, in leaf axils, loosely in corymbose panicles 8–14 mm in diameter, passing into bracteate racemes; stamens 4, exserted; corolla with tube yellow to orange, 3.0–4.5 mm long, limb spreading, 6–8 mm in diameter, lobes white, pink to mauve; Nov.–May., mostly in Feb. Dry or wetter grassland, between rocky outcrops, disturbed places, on sandy soil and flats, woodland and scrub or wetter grasslands.

AcGr DrGr MsGr KarSh

**polelense** (Hiern) Kornhall subsp. **fraterna** (Hilliard) Kornhall

*Sutera polelensis* Hiern subsp. *fraterna* Hilliard

Perennial herb, up to 0.6 m high. **Stems** much branched from base and above; glandular-pubescent. **Leaves** opposite; blade elliptic to ovate, 10–35 × 11–40 mm, usually longer than broad, apex base cuneately contracted into a petiolar part, margins dentate with 4–10 pairs of coarsely irregular teeth or lobes, both surfaces glandular-pubescent, glistening glands decidedly oblong. **Flowers**: solitary, ultimately innumerable, in leaf axils, passing into bracteate racemes, loosely panicled; ovary with broad band of glistening glands on sutures and scattered on top of ovary and up style; stamens 4, with one pair exserted; corolla tube yellow to orange, 7–12 mm long; limb spreading 5–6 mm in diameter, lobes usually white; Dec.–Mar. Rocky outcrops.

DrGr

**polelense** (Hiern) Kornhall subsp. **polelense**

*Sutera polelensis* Hiern subsp. *polelensis*

Perennial herb, up to 0.45 m high. **Stems** much branched. **Leaves** opposite; blade elliptic to ovate to broadly ovate, 13–35 × 9–26 mm, apex usually longer than broad, acute, base cuneately contracted into a petiolar part, base obtuse, broadly subcordate or subtruncate, mostly sessile, margins dentate, both surfaces glandular-pubescent as stems; glistening glands decidedly rounded. **Flowers**: ultimately innumerable, solitary in leaf axils, passing into bracteate racemes, loosely panicled; stamens just included or 2 partly exserted; calyx with hairs up to 0.6 mm long; limb spreading 5–6 mm in diameter; corolla lobes 6–10 mm long, usually white, tube yellow to orange; Dec.–Mar. Between rocky outcrops.

MsGr Zastr

## **Cromidon** Compton (sthn Afr.: 12 spp.)

**corrigioloides** (Rolfe) Compton

Annual herb. **Stems** ± procumbent or decumbent, up to 150 mm long, laterally branched; retrorsely pubescent. **Leaves** 1 or 2 pairs of basal ones; blade elliptic, cauline ones spathulate, 6–7 × 2–3 mm, tapering into a broad petiole, mostly glabrous. **Flowers**: in congested, terminal heads, forming narrow panicles; calyx bilabiate, 5-lobed, pubescent; corolla tube broadly funnel-shaped, 1.5–2.5 mm long, limb bilabiate, 5-lobed, lobes white or light cream-coloured, bud violet outside with orange patch at base of posticous lip and halfway down back of tube; Jul.–Oct. Damp or marshy soil.

KarSh

## **Diascia** Link & Otto (sthn Afr.: ± 70 spp.)

### Key to species:

[after Hilliard & Burtt: 283 (1984)]

1a Anthers of anticous pair of stamens (which are twisted erect into posticous position) noticeably smaller than those of posticous pair, fertile or sterile; posticous stamens projecting straight forward . . . . . **D. purpurea**
1b Anthers all alike, all 4 stamens either erect or projecting straight forward . . . 2
2a Leaves in up to 7 pairs on each stem or branch; petiole length diminishing rapidly upwards (lowermost pair of leaves on long petioles, uppermost almost sessile); annual herbs . . . . . **D. alonsooides**
2b Leaves in many pairs (rarely few and then flowering in seedling stage), either sessile or with petioles diminishing only gradual in length upwards; perennial, only a few annual . . . . . 3
3a Style ± 1.5 mm long; perennial herbs . . . . . 4
3b Styles mostly 2–3 mm long, if only 1.75 mm, then annual herb . . . . . 6
4a Leaves linear, linear-lanceolate or oblong lanceolate; length:breadth = (2–) 5–20:1 . . . . . **D. integerrima**
4b Leaves narrowly to broadly ovate; length:breadth = 1.0–1.5:1 . . . . . 5
5a Spurs 4–6 mm long (measured on inside, adjacent to opening of corolla tube) . . . . . **D. integerrima**
5b Spurs 8–9 mm long . . . . . **D. cordata**
6a Palate with 2 laterally placed patches of dark sessile glands . . . **D. barberae**
6b Palate either with centrally placed patch of dark sessile glands or glands absent . . . . . 7
7a Many of hairs on pedicel at least 0.5 mm long . . . . . **D. vigilis**
7b Hairs on pedicels scarcely 0.25 mm long or sometimes absen . . . . . 8
8a Spurs (measured on inside adjacent to opening in corolla tube) 5–7 mm long, tips markedly swollen; style 2.75–3.00 mm long . . . . . **D. tugelensis**
8b Spurs 7–11 mm long, narrowed towards tips; styles 2.0–2.5 mm long. . . . . 9
9a Leaves ovate or ovate-lanceolate, mostly 10–25 × 5–20 mm (ratio 1–2:1); style ± 2.5 mm long; usually 2 lateral patches of glands on palate . . . . . **D. barberae**
9b Leaves deltoid or deltoid-ovate, mostly 11–32 × 5–17 mm (ratio 2–3(–5):1); glands if present on centre of palate . . . . . **D. capsularis**

### **alonsooides** Benth.

Annual herb. **Stems** erect, decumbent or scrambling, up to 500 mm long, branching from base. **Leaves** in up to 7 pairs on each stem; blade ovate to narrowly ovate, upper ones 1–3 mm long, apex acute, base cordate to subtruncate, margins subentire to dentate; lower petioles up to 22 mm long, diminishing in length upwards to almost sessile. **Flowers**: many; pedicels up to 20 mm long, spreading but bent back with ends curving up in fruit; spurs and sacs absent; upper filaments densely white villous; corolla purple, almost rotate, upper lobes joined ± halfway, forming a hollow with 2 flat, yellow windows; Apr.–Dec., mostly Aug. Steep S-facing slopes, on dolerite, loamy soils.




### **barberae** Hook.f.

Perennial herb, 0.5–0.6 m high; stoloniferous. **Stems** erect or decumbent, sprawling; ± glabrous. **Leaves** petiolate to sessile; blade broadly ovate to narrowly ovate, 10–25 × 5–20 mm, apex ± acute, base obtuse, margins dentate; petioles up to 5 mm long. **Flowers**:

in loose, leafy inflorescences; pedicels with hairs < 0.25 mm long; style ± 2.5 mm long; calyx reflexed; spurs conspicuously incurved, up to 8 mm long; corolla large, 16–24 × 12–16 mm, bright pink, window yellow marked maroon with 2 patches of dark glands on palate; Nov.– Mar. In moist areas on streambanks, cliff bases, seepage areas, gravelly soil.




### **capsularis** Benth.

Perennial herb, up to 0.9 m high. **Stems** tufted, simple or basally branched, decumbent, rooting near base. **Leaves** with blade ± deltoid, 11–32 × 5–17 mm, apex acute, base cordate to auriculate, margins nearly entire but dentate to denticulate; petioles up to 6 mm long. **Flowers**: in racemes, usually simple, sometimes branched at base; pedicels up to 35 mm long, ascending, glabrous with stalked glands; style 2 mm long; spurs ± 9–11 mm long, projecting down and out, forming a wide V-shape, window hollow; corolla lobes shades of pink and red, sometimes with dark glands on centre of palate; Dec.–Jun., mainly Mar. Rocky areas with grass and shrubs.




### **cordata** N.E.Br.

Perennial herb, up to 0.5 m high. **Stems** procumbent or erect, branched, leafy, quadrangular; glabrous. **Leaves** with blade ovate, 12–32 × 8–21 mm, apex obtuse, base subtruncate or subcordate, margins sharply serrate; petioles 1.0–4.3 mm long. **Flowers**: in few- to many-flowered, terminal racemes, 50–200 mm long; pedicels filiform; style ± 1.5 mm long; spurs divergent, obtuse, 8–9 mm long; corolla 12–17 mm wide, pink with scattered black glands on back and margins; Nov.–Apr. In grassland, rarely in shrubland or on forest margins; mainly in loam to clay soils.




### **integerrima** E.Mey. ex Benth.

Perennial herb, up to 0.5 m high. **Stems** erect, slender, branching near base. **Leaves** with blade linear to narrowly ovate, 40 × 3 mm, apex acute, glabrous; petioles 1–3 mm long. **Flowers**: in racemes, heads ± 10 × 20 mm; styles ± 1.5 mm long; calyx lobes spreading; spurs incurved at tips, 4–6 mm long, held straight down; corolla with a raised keel, rounded lobes, lobes mostly pink, also purple-red and red-pink, dark gland dots cover mouth, window yellow and maroon; Nov.–Mar. In cliff crevices, rocky, hard, gritty soils, along streambanks, conspicuous along roadsides. *Twinspur*; *pensies* (A); *bolao-ba-litoeba*, *leilanenyana* (SS).




### **purpurea** N.E.Br.

Perennial herb, up to 0.45 m high; sparsely stemmed. **Stems** ascending, quadrangular, leafy below; pilose with white, shining, often minutely gland-tipped hairs. **Leaves** shortly petiolate, upper ones sessile; blade ovate to subrotund, 20–45 × 15–50 mm, apex obtuse, base subtruncate or shortly wedge-shaped, margins dentate, upper surface pilose, dark green, lower surface purple; petioles up to 2 mm long. **Flowers**: pendulous, few- to many-flowered, in terminal racemes, compact or lax, 25–40 mm long; anthers of anticous pair of stamens (which are twisted erect into posticous position) noticeably smaller than those of posticous pair, fertile or sterile; posticous stamens projecting straight forward; spurs very short and curved in under

bowl of corolla tube, ± 3 mm long; corolla ± 12 mm long, salmon-pink; Jan.–Apr. Moist, bare patches in grassland.

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### **tugelensis** Hilliard & B.L.Burtt

Perennial herb, up to 0.45 m long. **Stems** erect to semiprostrate, stoloniferous, tufted branches from base. **Leaves** with blade ovate, 8–25 × 6–15 mm, apex subacute, base subcordate, glabrous, margins serrate; petioles 3–10 mm long. **Flowers**: in lax racemes, 22–28 × 16–20 mm; pedicels with hairs < 0.25 mm long; style 2.75–3.00 mm long; calyx lobes lanceolate, reflexed; spurs 5–7 mm long, curved forward, with patch of dark, globular sessile glands at swollen tips; corolla tube 5–6 mm long, rounded lobes, lobes mostly rose-pink, dark gland dots absent from mouth, window yellow and maroon; Jan.–Apr. In cliff crevices and bases of wet basalt cliffs, along streambanks and gravelly streambeds. *Twinspur*; *horinkies* (A).

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### **vigilis** Hilliard & B.L.Burtt

Perennial herb, up to 0.5 m high. **Stems** decumbent or suberect, stoloniferous, tufted branches from base. **Leaves** with blade ovate to ovate-lanceolate, 15–50 × 10–35 mm, apex subacute, base rounded, margins serrate, glabrous to glandular-hairy; petioles 2–10 mm long. **Flowers**: in lax racemes, 14–20 × 12–18 mm; pedicels with hairs at least 0.5 mm long; styles ± 2 mm long; calyx lobes spreading; spurs lateral, 6–9 mm long, curved out, down and slightly forward; corolla tube 5–6 mm long, rounded lobes, lobes mostly pale pink to salmon-coloured, dark gland dots cover mouth, window yellow and maroon; Nov.–Apr. In closed shrubland, forest margins, and along streams in gravelly or rocky humus-rich soils; also frequently encountered along roadsides. *Twinspur*; *horinkies* (A).

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## **Diclis** Benth. (sthn Afr.: 5 spp.)

### Key to species:

[partly after Hiern: 200 (1904)]

1a Annual; leaves opposite and alternate, wedged-shaped, base shortly petiolate. . . . . **D. petiolaris**

1b Perennial or annual; leaves all opposite, subreniform or subtruncate at base . . . . . 2

2a Roots thin and fibrous roots; leaves sharper and deeply dentate with long hairs on petioles; spur long and narrow; in moist shady places . . . **D. reptans**

2b Roots fleshy and fusiform; leaves shallower and less distinctly dentate; spur short and broad; in open sunny places . . . . . **D. rotundifolia**

### **petiolaris** Benth.

Annual herb. **Stems** procumbent, 25–250 mm long, slender and wiry; glandular-pubescent with short stalked glands or subglabrous. **Leaves** opposite and alternate; blade wedge-shaped or shortly narrowed at base, margins entire or obscurely toothed; petioles up to 25 mm long. **Flowers**: axillary; spur broad; corolla white with yellow and purple spots in throat; Dec., Jan. In wet sandy clay, in sandy riverbeds and vleis.

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### **reptans** Benth.

Perennial or sometimes annual herb; roots fibrous. **Stems** procumbent, mat-forming or scrambling, up to 0.4 m long. **Leaves** all opposite; blade peltate to broadly ovate, apex obtuse, base subreniform or subtruncate, margins ± strongly dentate; petioles ± 30 mm long, long-haired. **Flowers**: axillary; spur long and narrow, 2.5–3.0 mm long; corolla white or cream-coloured to pale pink or mauve-purple speckled, palate yellow; Jan.–Dec. Grassland, moist areas, usually S aspect. *Dwarf snapdragon*, *toadflax*; *ponye*, *koenana* (SS); *isinama* (Z).

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### **rotundifolia** (Hiern) Hilliard & B.L.Burtt

Perennial herb, up to 0.1 m high; roots fleshy and fusiform. **Stems** procumbent or creeping up to 1 m long. **Leaves** opposite, shortly petiolate; blade broadly ovate or rotundate, apex rounded, margins shallowly, indistinctly crenate, sometimes ± entire, 5–7-nerved. **Flowers**: axillary; spur usually short and wide, 2.0–2.5 mm long; calyx lobes obtuse, dorsal lobe ± obovate; corolla usually white with yellow palate; Jul.–Feb., mostly Dec., Jan. Grassland and open areas, on bare soil in full sun, often N aspects.

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## **Glumicalyx** Hiern (sthn Afr.: 6 spp.)

### Key to species:

[after Hilliard: 526 (1994)]

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| 1a | Stamens all fully exserted | 2 |
| 1b | Two stamens included or just visible in mouth at anthesis | 3 |
| 2a | Calyx of 5 equal, spathulate lobes, free to base or rarely briefly connate | **G. montanus** |
| 2b | Calyx with 3–5 lobes clearly fused below | **G. apiculatus** |
| 3a | Corolla tube up to 16 mm long, lobes oblong | **G. nutans** |
| 3b | Corolla tube at least 20 mm long, lobes suborbicular | **G. goseloides** |

### **apiculatus** (E.Mey.) Hilliard & B.L.Burtt

Perennial herb, 0.06–0.25 m high; tufted, woody at base, with a thick woody rootstock. **Stems** single with acute and gland-tipped hairs. **Leaves** opposite becoming alternate; blade broadly or narrowly elliptic, 5–15 × 3–6 mm, apex subacute, base slightly narrowed with distinctive pulvinus, margins crenate to serrate in upper part. **Flowers**: in globose heads, 10 × 10 mm, solitary, elongating in fruit to 15–45 mm long; stamens all exserted, anthers equal; calyx 3–5-lobed, 3 posticous lobes free for ± $^1/_3$ of their length; corolla tube 3–4 mm long, bilabiate, cream-coloured; lobes elliptic, orange-yellow to pale cream-coloured inside, pale outside; Jan.–Mar. In gravel, on wet rock sheets or base of cliffs.

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### **goseloides** (Diels) Hilliard & B.L.Burtt

Perennial herb, 0.45 m high. **Stems** 1–several, weakly branched, closely leafy; with short gland-tipped and long acute hairs. **Leaves** initially opposite becoming alternate; basal ones elliptic, 20–65 × 4–15 mm, apex obtuse, base narrow to petiole-like half, clasping at base, becoming elliptic-oblong and sessile, apex obtuse to subacute, margins entire or obscurely toothed to

crenate or serrate. **Flowers**: in heads, obconical at first, elongating to 30–100 mm long in fruit, mostly solitary; stamens markedly unequal; corolla with tube 20–29 mm long, dilated under limb, cream-coloured, limb suborbicular, orange to orange-red outside and cream-coloured inside; Oct.–July, but mainly Jan., Feb. In boulder beds of mountain streams and bare gravelly areas. Hybridises with *G. nutans*.

MsGr

### **montanus** Hiern

Perennial herb, 0.15–0.30 m long; woody at base. **Stems** decumbent then erect, sometimes with axillary branches; pubescent, hairs acute and gland-tipped. **Leaves** opposite becoming alternate; blade oblong-elliptic to obovate, 5–20 × 2–8 mm long, apex obtuse to rounded, base rounded with distinctive pulvinus, margins dentate, leathery. **Flowers**: in globose heads, 15 × 15 mm, usually solitary, elongating in fruit; stamens all exserted; calyx of 5 equal, spathulate lobes, free to base or briefly connate; corolla with tube 4–6 mm long, cream-coloured, limb bilabiate, lobes oblong to elliptic, 4–5 mm in diameter, creamy to pale yellow above, cream-coloured below; Dec.–Mar. In gritty or gravelly places on shallow soil over rock sheets or in boulder beds of streams.

MsGr

### **nutans** (Rolfe) Hilliard & B.L.Burtt

Perennial herb, up to 0.45 m high; woody at base with woody taproot. **Stems** simple, leafy; pubescent with long acute hairs and sessile glands. **Leaves** radical; blade oblong or elliptic-oblong, 11–40 × 1.5–4.0 mm, apex, base tapering, margins crenate-serrate with hairs on lower part. **Flowers**: in turbinate inflorescences, 20–30 mm long, solitary; corolla tube 12–16 mm long, widening slightly under limb, cream-coloured; limb bilabiate with narrow, oblong lobes, strongly reflexed, orange to brick-red inside, outside dull violet; stamens subequal, posticous pair included, anticous pair exserted. Dec.–Mar. Grassy mountain slopes often at foot of cliffs among rocks in boulder beds and along streams. Hybridises with *G. goseloides*. *Khoathi*, *lebohlollo*, *theleli* (SS).

DrGr MsGr

## **Gomphostigma** Turcz. (sthn Afr.: 2 spp.)

### **virgatum** (L.f.) Baill.

Perennial herb, 0.6–2.6 m high. **Leaves** sessile, opposite; blade linear, 10–60 × 2–5 mm. **Flowers**: opposite, solitary in axils of upper leaves forming long, narrow, terminal racemes; corolla 5–10 mm long, white; Oct.–Jun. **Fruit** a capsule, oblong, ± 7 mm long. Along or near watercourses and rivers, growing in running water among boulders or on banks in sand or mud. *River stars*, *otter bush*; *besembossie*, *otterbossie* (A); *koete-le-boima*, *moema-thata*, *moluku* (SS).

DrGr MsGr KarSh

## **Hebenstretia** L. (sthn Afr.: 24 spp.)

### Key to species

[after Roessler: 21 (1979)]

1a Plants annual . . . . . **H. integrifolia**
1b Plants perennial . . . . . 2

2a Plants distinctly woody, branched shrub; leaves variable from linear, lanceolate or elliptic-lanceolate . . . . . **H. dura**
2b Perennial herb with rootstock woody and below-ground, aerial parts mostly ± herbaceous, yet often also somewhat semishrubby woody (and then frequently up to > 1 m high) . . . . . 3
3a Stem 0.2–0.3(–0.6) m high, herbaceous, simple (only rarely somewhat branched), several from thickened, ± tuberous rootstock; leaves varying in their width, mostly narrowly linear and with entire margins or broader and dentate . . . . . **H. comosa**
3b Stem 0.5–1.0(–3.0) m high, strongly branched, either all together or from near inflorescence, spikes at ends of branches, not racemose; leaves linear (to linear-lanceolate), mostly entire to weakly dentate, rarely distinctly dentate . . . . . **H. angolensis**

## **angolensis** Rolfe

*H. bequaertii* De Wild.

Perennial shrub, 0.5–1.0(–3.0) m high. **Stems** strongly branched, slightly woody. **Leaves** with blade linear to linear-lanceolate, 20–60 × 1.0–1.5 mm, apex acute, base attenuate, margins usually entire to weakly dentate; glabrous; bracts ovate to elliptic, 4–8 mm long, apex abruptly thinly elongating. **Flowers**: in spikes at ends of branches; corolla tube 8–13 mm long, lobes 1.0–1.5 mm long, white, yellow or orange with orange, red or reddish brown in throat; all year. Grassland, rocky hillsides.




## **comosa** Hochst.

*H. comosa* Hochst. var. *integrifolia* Rolfe
*H. elongata* Bolus ex Rolfe

Perennial herb, 0.2–0.3(–0.6) m high. **Stems** erect, several from ± tuberous rootstock, rarely branched. **Leaves**: blade linear, 30–60 × 1–8 mm, apex acute, base attenuate, margins entire or denticulate; bracts oblong to ovate, 6–8 mm long, apex acuminate, tapering slowly, membranous margins reaching almost to apex; glabrous. **Flowers**: in dense spikes, up to 200 mm long; corolla tube 10–13 mm long, lobes 1.0–1.5 mm long, white or yellow with orange to red fleck in throat; mostly Nov.–Feb. **Fruit** narrowly oblong, splitting into 2 equal or unequal parts. In grassland, common when recently burned, in alpine grassland and grassy slopes. *Katstert* (A); *lebohlollo*, *tsitoane* (SS).




## **dura** Choisy

*H. cooperi* Rolfe
*H. sutherlandi* Rolfe

Perennial dwarf shrub or shrub, 0.3–1.0 m high. **Stems** branched, woody. **Leaves** variable; sessile, blade linear, lanceolate, narrowly ovate or narrowly elliptic-ovate, 10–30 × 1–5 mm, apex rounded, base attenuate, margins distinctly denticulate; glabrous. **Flowers**: in dense spikes, 30–80 mm long; often with old spike present between over-topping younger ones; bracts ovate, 5–7 mm long, apex long attenuate, membranous margins often contracted abruptly; corolla tube 9–13 mm long, lobes 1.0–1.5 mm long, white, seldom yellow with an orange, red or brownish red fleck; mainly Sep.–Jan. **Fruit** narrowly oblong, two parts moderately unequal. In rocky grassland and mountain ridges.



**integrifolia** L.

Annual herb, 0.2–0.6 m high. **Stems** erect, sturdy, base sometimes woody. **Leaves** sessile; blade narrowly linear, 10–30(–50) × 0.5–1.3 mm, apex acute, base attenuate, margins entire, sometimes denticulate; rough with short, dense to scattered hairs; often with axillary leaf tufts. **Flowers**: in a dense, terminal spike, > 200 mm long; bracts ovate, acuminate, 3.5–5.0 mm long, glabrous; margins membranous, often stopping short of apex; corolla tube 10–12 mm long, lobes short, ± 1 mm long; white with orange fleck; all year round, mainly Jan. **Fruit** narrowly oblong, splitting into 2 equal or unequal parts. Sandy or grassy places; full sun.

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## **Jamesbrittenia** Kuntze (sthn Afr.: ± 76 spp.)

### Key to species:

[after Hilliard: 90 (1994)]

1a Corolla lobes shades of greenish, yellowish, orange-, red-, purple- to dark brown, thick-textured, veins invisible on upper surface, with very narrow to broad whitish to yellowish thin-textured margins, sometimes partly obscured because margins revolute . . . . . 2

1b Corolla lobes either white or variously coloured, thin-textured, veins visible on upper surface; thick-textured tissue occasionally around mouth or radiating from mouth . . . . . 3

2a Leaf blade elliptic to obovate, glandular-hispid at least on lower surface; corolla lobes rounded . . . . . **J. burkeana**

2b Leaf blade ± oblong to spathulate, often glabrous above, glistening glands only below, glands may ooze, then invisible but leaf looks varnished; corolla lobes ± truncate. . . . . **J. atropurpurea** subsp. **atropurpurea**

3a Apices of corolla lobes ± truncate to retuse . . . . . 4

3b Apices of corolla lobes rounded . . . . . 9

4a Leaves with glandular hairs up to 0.1–3.0 mm long and glistening glands on both surfaces . . . . . 5

4b Upper leaf surfaces mostly ± glabrous or with scattered glistening glands, occasionally with minute, < 0.1 mm long, glandular hairs, lower surface thickly clad in glistening glands and sometimes a few minute glandular hairs as well . . . . . 7

5a Calyx lobes spathulate, apices 2–5-toothed . . . . . **J. pristisepala**

5b Calyx lobes variously shaped, apices not 2–5-toothed. . . . . 6

6a Leaf blade narrowly obovate, lobes oblong, usually entire, occasionally larger lobes with 1 or 2 teeth . . . . . **J. tysonii**

6b Leaf blade ± ovate, lobes ± spathulate or cuneate, at least largest lobes toothed with every gradation of bipinnatisect leaves . . . . . **J. filicaulis**

7a Stems glandular-puberulous at least on upper parts (caution: hairs may be minute and are often mixed with glistening glands) . . . . . **J. albiflora**

7b Stems clad in glistening glands only . . . . . 8

8a Calyx lobes linear-oblong, acute or subspathulate, entire (or very rarely a lobe with 1 or 2 teeth); corolla tube 5.5–8.0 mm long, limb 3–5 mm in diameter, lateral lobes shades of maroon or red-purple . . . . . **J. stricta**

8b Calyx lobes spathulate, tips 2–5-toothed; corolla tube 8.0–11.5 mm long, limb 6.5–11.0 mm in diameter, lateral lobes creamy white, yellowish or lilac-pink to mauve . . . . . **J. pristisepala**

9a Stems and leaves thickly clad in glistening glands or scales; upper surface of corolla limb in shades of red or purple-red . . . . . **J. stricta**

9b Stems and leaves with mixture of glandular hairs and glistening glands; leaves bipinnatisect, upper surface clad in glistening glands only; upper surface of corolla limb bright orange to shades of red and purple-pink with main veins dark brown to purple. . . . . **J. aurantiaca**

**albiflora** (I.Verd.) Hilliard
*Sutera albiflora* I.Verd.

Dwarf shrub; twiggy; stems, inflorescence axes and pedicels minutely glandular-puberulous. **Branches** ± 100–450 mm long. **Leaves** with blade spathulate or narrowly obovate-ovate, largest primary leaves 4–16(–20) × 1–6(–10) mm, margins entire or bluntly few-toothed, lower surface thickly covered with glistening glands, upper surface glabrous or with a few scattered glands. **Flowers**: corolla lobes white, each marked at base with a dark brown or crimson median bar; Jan.–Dec. Stony soil. *Witbergheuningkaroo* (A).

AcGr | DrGr | KarSh

**atropurpurea** (Benth.) Hilliard subsp. **atropurpurea**
*Sutera atropurpurea* (Benth.) Hiern

Shrub, up to ± 1 m high. **Stems** wiry, much branched. **Leaves** with blade spathulate or spathulate-oblong, thick-textured; glabrous or with scattered glistening glands below (often oozing, then ± invisible and pedicels appearing varnished), rarely also with a few, minute, stalked glands. **Flowers**: in axils of leaves; tube 15–22 mm long, abruptly expanding into 3–8 mm long lobes, lobes truncate, thick-textured, upper surface of lobes shades of yellowish, orange-, red- or chocolate-brown, margins of lobes thin-textured creamy or yellowish; all year. Stony or rocky places. *Cape saffron*; *bruinsafraanbos*, *geelblommetjie*, *saffraanbossie*, *verfbossie* (A).

AcGr | DrGr | MsGr | KarSh

**aurantiaca** (Burch.) Hilliard
*Sutera aurantiaca* (Burch.) Hiern

Perennial herb. **Stems** many from crown, prostrate or ascending, ± 60–300(–750) mm long. **Leaves** with blade bipinnatisect, cut nearly to midrib, thinly glandular-puberulous below, upper surface clad in crowded glistening glands with very rarely a few glandular hairs as well. **Flowers**: solitary in axils of leaves; tube 5–7 mm long, corolla lobes 1.5–4.5 mm long, thin-textured, apices rounded, varying in colour from bright orange to shades of red and purple-pink, throat yellow, colour extending onto base of lower lip, main veins dark brown to purple; Oct.–Mar. Sandy or stony places, damp or even marshy. *Cape saffron*; *geelblommetjie*, *saffraanbossie* (A); *phiri-ea-hlaha-e-nyenyane* (SS).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

**burkeana** (Benth.) Hilliard
*Lyperia burkeana* Benth.
*Sutera burkeana* (Benth.)Hiern

Perennial herb; suffrutex. **Stems** 300–1 500 mm long, erect or straggling with shrubby branches, glandular-hispid hairs and glistening glands. **Leaves** with blade obovate to elliptic, tapering to petiolar part that is sometimes half its length, 1–3 pairs of bold teeth, blade folded and falcate, lower leaves may be irregularly lobed and secondary leaves with entire margins, upper surface gland-dotted, lower surface with glandular-hispid hairs as well as glistening glands. **Flowers**: solitary in few-flowered racemes; corolla tube 20–22 mm long, lobes 4–5 mm long, cuneate to broadly ovate, dark coloured and thick-textured, olive-green to rich shades of

russet-orange, deep red, brownish purple or dark brown; all year. Rocky grassy slopes in open woodland or scrub, and scrub on forest margins. *Bruinblommetjie*, *geelblommetjie* (A).

DrGr

**filicaulis** (Benth.) Hilliard
*Sutera filicaulis* (Benth.) Hiern
*S. henrici* Hiern
*S. virgulosa* Hiern

Dwarf shrub, up to 0.45 m long. **Stems** tufted from a woody caudex, often diffuse and sometimes rooting, occasionally erect, simple to loosely branched tangled masses, glandular-pubescent with scattered glistening glands; very leafy. **Leaves** pseudofasciculate, 8–25 mm long, 1/3 of petiolar length; blade ovate, margins deeply divided into obtuse lobes, lobes ± spathulate or cuneate, at least largest lobes toothed with every gradation of bipinnatisect leaves, glandular-pubescent on both sides with glistening glands especially below. **Flowers**: solitary in axils of leaves forming conspicuously leafy inflorescences; corolla tube up to 10 mm long, throat yellow to orange, limb oblique up to 12 mm in diameter, lobes thin-textured, truncate to retuse, white or creamy sometimes with dark streaks at base; Oct.–May. Rocky sites on hills and mountain slopes, often under rock outcrops and partially shaded overhangs.

DrGr MsGr KarSh Zastr

**pristisepala** (Hiern) Hilliard
*Sutera pristisepala* Hiern

Dwarf shrub, up to 0.35 m high. **Stems** erect or decumbent and well branched with glistening glands or glandular hairs, grey appearance. **Leaves** pseudofasciculate; blade ovate, elliptic or oblong with a broad petiolar part, margins divided to midrib, lobes elliptic or cuneate; surface with glandular hairs up to 3 mm long, glistening glands on both surfaces. **Flowers**: many, solitary in axils of upper leaves forming long, crowded racemes; calyx lobes spathulate, apices 2–5-toothed; corolla tube up to 12 mm long, purplish outside; limb oblique, bilabiate, up to 11 mm in diameter, lobes thin-textured, apices truncate or rounded, from creamy white or yellowish to lilac-pink and shades of mauve, throat white to pale yellow often with dark purple radiating lines at base of lobes. Cliffs and rocky places in stream gullies and boulder beds, alt 1 500–3 000 m, Nov.–Apr. *Pokaetsi*, *phiri-ea-hlaha*, *letswalo* (SS); *umahokwe* (Z). May hybridise with *J. stricta*, *J. jurassica* and *J. breviflora*.

MsGr

**stricta** (Benth.) Hilliard
*Lyperia stricta* Benth.

Dwarf shrub; rounded, virgately branched. **Stems** erect or decumbent, up to 450 mm long; leafy, both stems and leaves clad in glistening glands only. **Leaves** pseudofasciculate; blade narrowly ovate to ovate, narrowed to a broad petiolar part, margins cut to midrib (bipinnatisect), lobes linear-oblong, entire or 1- or 2-toothed or occasionally secondary lobes more pronounced, then leaves almost bipinnatisect. **Flowers**: in long, crowded racemes or panicles; calyx lobes linear-oblong, acute or subspathulate, entire (or very rarely a lobe with 1 or 2 teeth); corolla tube up to 8 mm long, limb oblique, 3–5 mm in diameter, with upper surface shades of red or purple-red, lobes oblong, retuse; lobes maroon to crimson, magenta-pink or deep purple; Feb.–May. Rocky places. May hybridise with *J. pristisepala*.

DrGr MsGr KarSh Zastr

### **tysonii** (Hiern) Hilliard

Dwarf shrub. **Stems** up to 300 mm long, often heavily browsed, erect, glandular-pubescent. **Leaves** pseudofasciculate; blade oblanceolate with petiolar part 1/3 of length, margins with 1–4 pairs of teeth, 1/3–2/3 cut to midrib with lobes mostly oblong, entire, surfaces glandular-pubescent with glistening glands especially below. **Flowers**: solitary in axils of leaves; corolla tube up to 15 mm long with oblique limb 15 mm in diameter, lobes cuneate-oblong, truncate or retuse, thin-textured, white or cream-coloured, throat yellow, sometimes with dark violet streak at base; all year. Rocky places especially on dolerite and limestone. *Witsafraanbos*, *witbergheuningkaroo* (A).

KarSh

## **Limosella** L. (sthn Afr.: 8 spp.)

### Key to species:

[after Cook: 248 (2004)]

1a Stems elongate, flexible, with well-spaced nodes; leaves petiolate, alternate, in opposite pairs, solitary or in clusters of up to 4, blades usually floating . . . . . **L. grandiflora**

1b Stems short (corm-like), rigid, with compact nodes; leaves petiolate or not, in rosettes of > 4, blades erect or floating . . . . . 2

2a Leaves sessile, all linear, terete, occasionally some with slightly flattened apices . . . . . **L. longiflora**

2b Leaves petiolate or at least spathulate, distinctly flattened towards apex . . . 3

3a Corolla lobes equal to or shorter than calyx . . . . . 4

3b Corolla lobes longer than calyx. . . . . 5

4a Sepals not > 2.5 mm long; sepal lobes not > 0.5 mm long; petioles of submerged plants thread-like with blades floating . . . **L. africana** var. **africana**

4b Calyx at least 2.5 mm long; calyx lobes not < 0.8 mm long; petioles of submerged plants robust, erect with blades erect or very rarely floating . . . . . **L. maior**

5a Calyx lobes as long as or shorter than calyx tube; corolla tube 2.5–4.0 mm long; leaf bases not inflated or cone-like . . . . . **L. grandiflora**

5b Calyx lobes longer than calyx tube; corolla tube 4.5–6.0 mm long; leaf bases inflated, cone-like . . . . . **L. inflata**

### **africana** Glück var. **africana**

Perennial or annual herb; submerged or amphibious. **Stems** short, corm-like, up to 50 mm high. **Leaves** in basal rosettes, differentiated in petiole and blade, embryonic and mature leaves similar; blade narrowly ovate, floating; petioles longer than blade, thread-like. **Flowers**: peduncles very short, 1–7 mm long, small, calyx ± 1.5 mm long, corolla lobes ± 0.5 mm long, white or mauve; Mar.–Sep. Dams, pans and mudflats.

KarSh

### **grandiflora** Benth.

Perennial or annual herb; tufted or creeping, submerged or amphibious. **Stems** elongate, flexible, with well-spaced nodes, or rigid with compact nodes, with stolons short, corm-like, up to 200 mm long. **Leaves** petiolate, alternate, in opposite pairs, solitary or in clusters of up to 4; erect on land, floating in water; blade broadly elliptic to ovate or oblong, apex obtuse to rounded, base truncate to rounded (almost heart-shaped), not inflated. **Flowers**: pedicels

shorter than leaves; calyx as long as corolla tube; corolla tube 2.5–4.0 mm long, slightly 2-lipped, lobes broadly triangular; corolla with tube 2.5–4.0 mm long, lobes oblong to obovate-rounded, 2–6 mm long, minutely hairy towards throat, white to pale blue or purple; Aug.–Nov. Shallow water, muddy or sandy edges of pools, temporary rock pools, occasionally in running water in streamlets. *Blouwaterblommetjie*, *tongblaar*, *slangkos* (A); *bolibana* (SS).

DrGr MsGr KarSh

### **inflata** Hilliard & B.L.Burtt

Perennial or annual, aquatic herb, 0.3–1.0 m high, depending on water depth. **Stems** short, corm-like. **Leaves** floating with base inflated; blade elliptic, 5–40 × 2.5–5.0 mm, base cone-shaped, appear fleshy but is inflated, floating. **Flowers**: pedicels filiform, up to 1 m long; floating, ± 11 mm in diameter; calyx lobes longer than calyx tube, tube smooth, lobes ± narrowly ovate; corolla with tube and lobes 4.5–6.0 mm long, lobes longer than calyx, white sometimes bluish around mouth, tube base orange; Nov.–Apr. Common in rock pools up to 1 m deep and marshes, rooted in mud.

DrGr

### **longiflora** Kuntze

Perennial or annual, aquatic herb, up to 70 mm high, usually in dense colonies. **Leaves** sessile, ± erect with blade linear, terete, occasionally apically slightly dilated, 20–50 mm long, erect to spreading. **Flowers**: pedicels as long as leaves or longer, up to 60 mm long; calyx with tube smooth but with 5 strong nerves continuing into lobes, lobes erect, deltate, apex ± acute; corolla 2–3 × as long as calyx, lobes erect, somewhat shorter than corolla tube, white or lilac, pale blue to pink-blue or mauve below, ± white above; all year, mainly Sep.–Mar. Dams, pans, riverbanks, in mud in shallow water. *Bolibana*, *joang-ba-metsi*, *tsika-metsi* (SS).

VreDm DrGr MsGr

### **maior** Diels

Perennial or annual herb, 10–300 mm high; tufted, amphibious or under water, rarely floating. **Stems** short, corm-like. **Leaves** with blade spathulate, 7–15 mm broad, narrowed to long stalk, gradually tapering into a robust petiole, 3-nerved. **Flowers**: pedicels shorter than petioles, up to 50 mm long; calyx usually tubular, becomes wrinkled from bladdery swellings, ± as long as corolla tube, 2.5–4.0 mm long, smooth, corolla lobes ovate to deltate, 0.8 mm long or more, shorter than calyx tube, white, mauve, pink or light blue with purple marks; Sep.–May. Marshes and vleis, in mud and shallow water of dams, streams. *Bolibana*, *tsika-metsi* (SS).

DrGr MsGr

## **Manulea** L. (sthn Afr.: 74 spp.)

### Key to species

[after Hilliard: 293 (1994)]

1a Stigma shorter than to ± equalling or just longer than style, always included (tip seldom reaching > $^1/_2$-way up tube) . . . . . **M. deserticola**

1b Stigma much longer than style, usually shortly exserted, sometimes just reaching mouth . . . . . 2

2a Corolla tube glabrous or very nearly so inside (ignore any hairs on posticous filaments) . . . . . 3
2b Corolla tube with either 3–5 longitudinal bands or a broad transverse band of clavate hairs inside upper, swollen part . . . . . 5
3a Annual herbs; calyx lobes glandular-pubescent all over, balloon-tipped hairs sparse or absent . . . . . **M. flanaganii**
3b Perennial herbs; calyx lobes pubescent, mainly on margins, balloon-tipped hairs conspicuous . . . . . 4
4a Both stem and inflorescence axis puberulous . . . .**M. parviflora** var. **parviflora**
4b Stem and inflorescence axis glabrous . . . . . **M. parviflora** var. **limonioides**
5a Inflorescences on elongate or capitate raceme with flowers solitary or occasionally paired in axil of each bract . . . . . 6
5b Inflorescence thyrsoid with a few- to many-flowered cymule in axil of each bract (the axes can be simple or branched, capitate or elongate) . . . . . 7
6a Throat of corolla bearded all round inside . . . . . **M. plurirosulata**
6b Hairs in corolla throat in 1–5 discrete longitudinal bands . . . . **M. bellidifolia**
7a Coarse, perennial herb with stems branching from base and above into large, spreading panicles . . . . . .**M. paniculata**
7b Stems ± simple below inflorescences, 1–many tufted from base . . . . . 8
8a Corolla white; flowers always apical in a ± flat-topped corymb, even when inflorescence elongates in fruit . . . . . .**M. buchneroides**
8b Corolla variously coloured; flowers never in a flat-topped corymb, usually scattered down axis in various stages of maturity. . . . . 9
9a Hairs on inflorescence axis and calyx ± 0.20–0.25 mm long. . . . . .**M. crassifolia** subsp. **crassifolia**
9b Hairs on inflorescence axis and calyx ± 0.3–1.0 mm long . . . . . .**M. crassifolia** subsp. **thodeana**

## **bellidifolia** Benth

*M. benthamiana* Hiern *p.p.*

Annual herb. **Stems** 0.15–0.45 m high, solitary, simple, taproot crowned by several loosely arranged stems, hairs balloon-tipped and glandular-puberulous, nude or remotely leafy in lower part. **Leaves** in 2–4 pairs near base of each stem, crowded, base connate; blade 25–90 × 7–30 mm, narrowly to broadly elliptic or oblanceolate, tapering to a 5–20 mm long petiolar part, margins serrate. **Flowers**: many in terminal, simple racemes; stigma much longer than style; corolla tube 7–10 mm long, 1.2–1.6 mm wide in throat, expanding in upper 1/3, distinct balloon-tipped hairs on corolla tube; corolla tube with either 3–5 longitudinal bands or a broad transverse band of clavate hairs inside upper, swollen part; on calyx and stems same hairs mixed with gland-tipped hairs, hairs in corolla throat in 1–5 discrete longitudinal bands, limb distinctly bilabiate, 7.5–10.0 mm in diameter, all elliptic, white to creamy white to dull yellow, orange or yellow around mouth and in throat; May–Oct. Sandy places often along riverbanks and hill slopes.

DrGr | MsGr | KarSh

## **buchneroides** Hilliard & B.L.Burtt

Perennial herb; rootstock conical. **Stems** up to 0.45 m high, solitary or many, simple to sparsely branched with balloon- and gland-tipped hairs. **Leaves** mainly radical in 1–few rosettes, bases connate, up to 70 mm long; blade narrowly to broadly elliptic, margins entire or obscurely toothed, both surfaces glandular-puberulous. **Flowers**: many in a long, narrow thyrse with upper cymules congested in a corymbose head; corolla tube up to 9 mm long, cylindrical and expanded in upper 1/3, limb slightly bilabiate, up to 9 mm in diameter, corolla tube with either 3–5 longitudinal bands or a broad transverse band of clavate hairs inside upper, swollen part; white; Oct.–Jan.(–Apr.). Damp grassland over Cave Sandstone.

VreDm | DrGr | MsGr | KarSh

**crassifolia** Benth. subsp. **crassifolia**

Perennial herb; rootstock narrowly obconic. **Stems** 0.3–1.0 m high, solitary to several, mostly simple or sparsely branched with balloon-tipped and minute, gland-tipped hairs. **Leaves** crowded in basal rosette; blade elliptic to oblanceolate, 60–170 × 7–30 mm, apex obtuse or acute in smaller cauline leaves, base narrowed into a short petiolar part, margins entire to serrulate, both surfaces glandular-puberulous. **Flowers**: many in a long, narrow, terminal thyrse, sometimes branching into a panicle; hairs on inflorescence axis and calyx ± 0.20–0.25 mm long; corolla tube up to 8 mm long, with either 3–5 longitudinal bands or a broad transverse band of clavate hairs inside upper, swollen part; limb distinctly bilabiate, up to 10 mm in diameter, with ± revolute margins; in shades of dull yellow, or orange-yellow with throat sometimes tinged orange, tubes and backs of lobes puberulous; (Dec.)Jan.(–Mar.). On damp, grassy slopes, in montane areas. *Fukuthoane*, *meqilane*, *nohana-metsana* (SS).




**crassifolia** Benth subsp. **thodeana** (Diels) Hilliard

As for typical subsp. but hairs on inflorescence axis and calyx ± 0.3–1.0 mm long; corolla tube up to 9 mm long, with either 3–5 longitudinal bands or a broad transverse band of clavate hairs inside upper, swollen part; limb up to 11 mm in diameter; creamy to mustard-yellow and tube violet outside and pubescent. At high altitudes on face of Drakensberg in grassland of basaltic derivation.




**deserticola** Hilliard

Annual herb. **Stems** several to many from crown, tufted in discrete rosettes, up to 110 mm long, erect or decumbent, simple, minutely puberulous with mix of many gland-tipped and few balloon-tipped hairs, leafless except at base. **Leaves** crowded at ground level; blade elliptic to oblanceolate, tapering to a flat, petiolar part, apex rounded to obtuse, margins entire to obscurely serrate or cuneate, both surfaces minutely glandular-puberulous. **Flowers**: many in terminal racemes; stigma shorter than to ± equalling or just longer than style, always included; corolla tube up to 5 mm long, expanded at apex, limb bilabiate, up to 9 mm in diameter, all lobes narrowly ovate with apex acute or retuse, margins flat to revolute; brown-yellow, back of tube orange-yellow; Jul.–Sep. Known only from 3 imprecise localities. Sandy soils.




**flanaganii** Hilliard

Annual herb, with woody taproot. **Stems** up to 0.38 m long, erect or decumbent, well branched from base and above, glandular-puberulous, laxly leafy. **Leaves** connate at base to alternate on inflorescence axes; blade narrowly elliptic, apex acute, base narrowed with short petiolar part, margins serrate below to entire upwards, both surfaces glandular-puberulous. **Flowers**: many in long, spreading, paniculate thyrses, cymules many-flowered; stigma much longer than style; calyx lobes glandular-pubescent all over, balloon-tipped hairs sparse or absent; corolla tube up to 6.5 mm long, limb bilabiate, up to 5.8 mm in diameter, tube and backs of lobes with gland- and balloon-tipped hairs; Dec. Only known from type at Bethulie.




**paniculata** Benth.

*M. elliotensis* Overkott ex Jacot Guill.
*Sutera elliotensis* Hiern

Perennial herb. **Stems** erect, branching from base, up to 1 m high, pubescent with patent eglandular and gland-tipped hairs. **Leaves** with blade elliptic or obovate, up to 85 mm long, connate at base

only becoming alternate in upper inflorescence branches, margins serrate to crenate-serrate, both surfaces pubescent with mostly gland-tipped hairs. **Flowers**: many in narrow thyrses, arranged in large, spreading panicles; stigma mush longer than style; corolla tube up to 7 mm long, corolla tube with either 3–5 longitudinal bands or a broad transverse band of clavate hairs inside upper, swollen part; limb bilabiate, up to 6.5 mm in diameter, tube and lobes pubescent outside, creamy and yellow at base or white; Jan.–Mar. Grassland, rocky hill slopes or among boulders.

DrGr | MsGr | Zastr

### **parviflora** Benth. var. **limonioides** (Conrath) Hilliard

Perennial herb, up to 0.7 m high. **Stems** glabrous and glaucous. **Leaves** in basal rosettes, except for some small, cauline, broadly linear ones. **Flowers**: corolla tube delicate, 3–5 mm long, lobes spreading, unequally long, oblong or obovate, strawberry-pink; Oct.–Dec. Grassland. As typical var. but lacking pubescence on stem and inflorescence axes.

DrGr

### **parviflora** Benth. var. **parviflora**

Perennial herb; taproot narrowly obconical. **Stem** 0.75–1.00 m high, solitary to several, simple and laxly branched in upper half, puberulous with balloon- and gland-tipped hairs. **Leaves** crowded at base; blade elliptic to oblanceolate, apex obtuse to subacute, base narrowed into short petiolar part, margins entire to serrate, both surfaces glandular-puberulous. **Flowers**: many in long, narrow, terminal thyrse, becoming panicles when stem branches; inflorescence axis puberulous; calyx lobes with conspicuous balloon-tipped hairs; stigma much longer than style; corolla tube up to 9 mm long, limb up to 7.2 mm in diameter, all with lobes oblong-elliptic, margins revolute, tubes and backs of lobes puberulous; corolla dull yellow to orange or brownish red, tube sometimes purple-tinged; Oct.–May, but can flower all year. Damp sandy places along streamsides and open grassland or open woodland and hillsides. *Isola* (Z).

VreDm | AcGr | DrGr

### **plurirosulata** Hilliard

Annual herb. S**tems** up to 180 mm high, solitary to many, crowded in a small, leafy rosette, simple or with a pair of low-branching stems, glandular-puberulous, usually nude but sometimes with balloon-tipped hairs. **Leaves** in 2 or 3 pairs at base of each stem; blade up to 35 mm long, oblanceolate to narrowly elliptic, tapering to petiolar part ± as long as blade itself. **Flowers**: many in terminal, simple racemes; stigma much longer than style; corolla tube up to 10 mm long, throat bearded all around inside, corolla tube with either 3–5 longitudinal bands or a broad transverse band of clavate hairs inside upper, swollen part; limb distinctly bilabiate, up to 12 mm in diameter, creamy white, orange/yellow around mouth and in throat; Apr.–Oct. Moist open grassland and stony ridges.

DrGr | KarSh

## **Melanospermum** Hilliard (sthn Afr.: 6 spp.)

### **transvaalense** (Hiern) Hilliard

*Phyllopodium calvum* Hiern
*Polycarena transvaalensis* Hiern

Annual herb, up to 160–220 mm high. **Stems** slender, simple and branching above and below, glandular-puberulous. **Leaves** with lower ones up to 20 mm long; blade narrowly obovate,

spathulate or elliptic, upper leaves narrowly linear-ovate, oblanceolate with few fine teeth. **Flowers**: many in congested, globose heads; calyx falling short of bract, glandular-puberulous; corolla tube up to 5.2 mm long, limb up to 6 mm in diameter, white with yellow centres; Jan.–Mar. (Sep., Oct.). Grassland, damp or wet, gritty or sandy sites associated with rock outcrops.

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## **Mimulus** L. (sthn Afr.: 2 spp.)

### Key to species:

Plants glabrous; leaves mostly sessile, if petiolate, then petioles < 2.5 mm long, blade narrowly ovate to lanceolate with truncate base. . . . . **M. gracilis**
Plants woolly tomentose; leaves shortly petiolate, petioles 3.0–6.5 mm long, blade broadly ovate with cuneate base . . . . . **M. moschatus** var. **moschatus**

### **gracilis** R.Br.

Perennial herb, up to 90–750 mm high; glabrous. **Stems** erect, simple or branched at base, narrowly winged. **Leaves** opposite; simple; sessile; blade narrowly ovate to lanceolate, 47–60 × 16 mm, base truncate, margins entire or dentate; petioles up to 2.5 mm long. **Flowers**: pedicellate in lax, leafy racemes, solitary in axils of leaves; corolla up to 12 mm long, tubular, bilabiate, white, cream-coloured or pale yellow with contrasting spots inside; Sep.–Mar. Dry grassy hillsides or moist vleis and streambanks. *Sehlapetsu* (SS).

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### *__moschatus__ Douglas var. __moschatus__

Perennial herb, up to 350 mm high. **Stems** decumbent, woolly tomentose. **Leaves** opposite; simple; blade broadly ovate, 10–30 × 9–15 mm, base cuneate, pubescent on both surfaces, margins dentate; petioles 3.0–6.5 mm long. **Flowers**: pedicellate in lax, leafy racemes, solitary in axils of leaves; corolla up to 20 mm long, tube up to 12 mm long, 5-lobed, lobes ovate, cream-coloured or pale yellow; Oct.–Mar. Dry grassy hillsides or moist vleis and streambanks. Native to western North America. *Musk flower*.

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## **Nemesia** Vent. (sthn Afr.: ± 59 spp.)

### Key to species

[mainly after Hiern: 169 (1904)]

1a Flowers racemose . . . . . 2
1b Flowers solitary in axils . . . . . 14
2a Plants annual . . . . . 3
2b Plants perennial . . . . . 8
3a Leaves all petiolate; petioles 4–13 mm long. . . . . 4
3b Leaves sessile or very shortly petiolate . . . . . 6
4a Petioles 10–13 mm long; spur 6–8 mm long . . . . . **N. cynanchifolia**
4b Petioles 4–11 mm long; spur < 3 mm long. . . . . 5

5a Spur up to 3 mm long; plants pubescent . . . **N. pubescens**. var. **pubescens**
5b Spur up to 2 mm long; plants glabrous . . . . . **N. pubescens**. var. **glabrior**
6a Bracts distinctly denticulate . . . . . **N. floribunda**
6b Bracts entire . . . . . 7
7a Leaf blade ovate . . . . . **N. caerulea**
7b Leaf blade linear-lanceolate . . . . . **N. linearis**
8a Spur 1.6–2.1 mm long . . . . . **N. caerulea**
8b Spur > 2.1 mm long . . . . . 9
9a Spur 6.4–8.5 mm long; leaves ovate or sublanceolate . . . . . **N. melissifolia**
9b Spur 2.0–6.4 mm long; leaves linear or lanceolate, rarely ovate . . . . . 10
10a Spur 2–4 mm long . . . . . 11
10b Spur 4.3–6.4 mm long . . . . . 13
11a Stems unbranched; palate yellow with orange-yellow bosses at mouth . . . . . **N. umbonata**
11b Stems well branched; palate without bosses at mouth . . . . . 12
12a Spur ± parallel to pedicel, linear; plants in elevated highland grasslands habitats . . . . . **N. rupicola**
12b Spur at 90° angle to pedicel, broadly deltate; plants in Karoo habitats . . . . . **N. hanoverica**
13a Capsules mostly > 10 mm long, lateral side of apex acute, outline rectangular . . . . . **N. foetens**
13b Capsules 9.0–10.5 mm long, lateral side of apex rounded, outline ovate . . . . . **N. fruticans**
14a Petioles 1–4 mm long. . . . . **N. albiflora**
14b Petioles up to 13 mm long . . . . . 15
15a Stems decumbent; corolla upper lobes ± 6.4 mm long . . . . . **N. hanoverica**
15b Stems erect or ascending; corolla upper lobes ± 4.3 mm long or shorter . . . . . 16
16a Spur up to 3 mm long; plants pubescent . . . . **N. pubescens** var. **pubescens**
16b Spur up to 2 mm long; plants glabrous . . . . . **N. pubescens** var. **glabrior**

## **albiflora** N.E.Br.

*N. flanaganii* Hiern

Annual or short-lived perennial herb. **Stems** 0.45–0.75 m high, erect, straggling, laxly branched, woolly throughout. **Leaves** shortly petiolate below and sessile above; blade ovate, roughly serrate, hairy with long, soft, gland-tipped hairs; petioles 1–4 mm long. **Flowers**: solitary on long pedicels in upper leaf axils or arranged in racemes; stems, pedicels and calyx lobes clothed in similar hairs; spur narrow, extended conical, ± straight, 2.5–3.5 mm long; corolla white, mauve in throat, palate and tube floor yellow; Nov.–Feb. **Fruit** a capsule, 7–14 × (4–)5–7 mm, ovate-oblong to urceolate, obliquely truncate. Semishade, slopes in kloofs, montane grassland.




## **caerulea** Hiern

Perennial herb. **Stems** 1–several from creeping underground stock, or branching near base, leafy below, passing into nude axis below flowers, hairs often only on pedicels and calyx. **Leaves** subsessile; blade ovate, 25 × 12 mm, margins serrate. **Flowers**: in lax, many-flowered, bracteate racemes, on long, bare peduncles; spur conical, 1.6–2.1 mm long; corolla 8–10 mm long, limb usually violet-blue, palate often pale yellow, sometimes white, 2 bosses inside tube at entrance to spur bright yellow; Nov.–Jan. **Fruit** an ovate or oblong capsule, 6–13 × 5.0–8.5 mm, apex emarginate, rounded. Moist grassy slopes and among rocks. *Nemesia*; *leeubekkie* (A).



**cynanchifolia** Benth.

Annual herb, up to 0.15–0.60 m high. **Stems** decumbent to ascending, much branched, shortly pilose to glabrous, leafy. **Leaves** with blade ovate or ovate-lanceolate, 12–32 × 2.5–17.0 mm apex obtuse, base rounded, denticulate; petioles 10–13 mm long. **Flowers**: few to many in corymbose, oblong, or semi-umbellate racemes, 50–155 mm long, shortly pilose; pedicels up to 30 mm long; spur cylindrical, straight or curved forward, 6–8 mm long; corolla unequally 4-lobed, upper lobes 6–10 mm long, oblong, apex rounded, lower lip 6.0–8.5 mm long, rounded, emarginated, palate papillate or with small hairs, lilac-blue, purple or white; Jul., Aug. **Fruit** an oblong capsule, up to 10 × 8 mm, hardly narrowed near apex. Open plains, rocky slopes or mountain valleys.

KarSh

**floribunda** Lehm.

Annual herb, 0.15–0.38 m high. **Stems** branched from base or simple, few above, somewhat pilose in upper parts, shining pallid. **Leaves** sessile to subsessile; blade ovate or narrowly ovate, 6–43 × 1–17 mm, apex obtuse or rounded, base subtruncate, margins entire to dentate. **Flowers**: in many-flowered, lax, corymbose or oblong racemes, 25–128 mm long, shortly pilose; bracts distinctly denticulate; spur ± 5 mm long, extended conical, straight; corolla upper lobes oblong and rounded at apex, lower lip bilobed, 5.0–6.4 mm long, mouth closed, palate shortly haired, white, sometimes with purple streaks on upper lip; mostly Aug.–Dec. **Fruit** an obovate-oblong capsule, 8.5–9.6 mm long, base obliquely ovoid, widely notched not horned, valves obliquely truncate. *Leeubekkie* (A).

DrGr MsGr KarSh

**foetens** Vent.

Perennial herb or suffrutex, 0.1–0.6 m high. **Stems** erect, well branched, tufted at base, leafy, herbaceous and glabrous above, plant with foetid smell. **Leaves** shortly petiolate to sessile; blade linear-lanceolate, 12–38 × 1.5–12.0 mm, apex acute, lower leaves with margins dentate, upper ones entire. **Flowers**: in many-flowered, capitate racemes, longer in fruit, apex obtuse, base narrowed or obtuse, covered with minute hairs, 12–230 mm long, sessile and globular or dot-like; spur 4.3–6.4 mm long, cylindric, obtuse, somewhat curved; corolla with upper lobes oblong; white, pink or mauve with purple veins, palate bi-convex, yellow-orange; Aug.–Dec. **Fruit** an oblong to ovoid capsule, 4–14 × 4.0–8.5 mm, apex slightly contracted, not horned, valves obliquely truncate; lateral side of apex acute, outline rectangular. Rocky, sandy soil, often streambeds; full sun.

KarSh

**fruticans** (Thunb.) Benth.

*N. capensis* (Spreng.) Kuntze

Perennial herb, up to 0.45–0.80 m high. **Stems** erect to ascending, much branched, glabrous or in upper part with sessile, glandular hairs, much branched at base. **Leaves** with a short petiole or sessile; blade linear-lanceolate, seldom elliptic-lanceolate, 12–38 × 1.5–11.0 mm, margins entire or dentate. **Flowers**: in lax racemes of 50 mm long, elongating to 180 mm in fruit; spur narrow, up to 4.3–6.4 mm long, cylindric, mostly straight; corolla white, light pink or mauve, orange-yellow on palate and in throat; Sep.–Mar. **Fruit** a widely oblong or ovate capsule, ± 10 × 7 mm, ± emarginate, outer corners somewhat horned; lateral side of apex rounded, outline ovate. Grassland, streambanks, disturbed ground. *White wild snapdragon*; *wildeleeubekkie*, *maagpynblommetjie* (A).

VreDm AcGr DrGr MsGr KarSh

### **hanoverica** Hiern

Perennial herb or suffrutex, up to 0.3 m high. **Stems** erect, decumbent, much branched, hairy in upper parts. **Leaves** with blade narrowly ovate to ovate, 10–32 × 4–16 mm, apex obtuse or acute, apiculate, base shortly narrowed or wedge-shaped, variously toothed, but upper ones ± entire; petioles 7–24 mm long. **Flowers**: in upper leaf axils and in terminal racemes; spur widely conical, ending with short narrow section, 3 × 3 mm, at 90° angle to pedicel; corolla ± 10 mm long, sparsely pilose, upper lobes ± 6 mm long, rounded, lower lip ± 6.4 mm long, whitish; Mar. **Fruit** an ovate or somewhat urceolate capsule**,** up to 9.0 × 7.5 mm, apex truncate, level to somewhat oblique, not horned. On riverbanks.

KarSh

### **linearis** Vent.

Annual, 0.1–0.6 m high. **Stems** erect, well branched, tufted at base, leafy, herbaceous and glabrous above; plant with foetid smell. **Leaves** shortly petiolate to sessile; blade linear-lanceolate, 12–38 × 1.5–12.0 mm, apex acute, lower leaves with margins dentate, upper ones entire. **Flowers**: in many-flowered, capitate racemes, longer in fruit, apex obtuse, base narrowed or obtuse, covered with minute hairs, 12–230 mm long, sessile and globular or dot-like; bracts entire; spur 3–4 mm long, cylindric, obtuse, somewhat curved; corolla with upper lobes oblong; white, pink or mauve with purple veins, palate bi-convex, yellow-orange; Aug.–Dec. **Fruit** an oblong to ovoid capsule, 4–14 × 4.0–8.5 mm, apex slightly contracted, not horned, valves obliquely truncate. Rocky, sandy soil, often streambeds, full sun.

KarSh

### **melissifolia** Benth

Perennial herb, 0.15–0.76 m high. **Stems** well branched, glabrous or rarely pilose, moderate leafy. **Leaves** shortly petiolate; blade ovate to sublanceolate, 12–80 × 2.5–45.0 mm, apex acute, apiculate, base 5-veined, margins serrate or incised. **Flowers** in few- to many-flowered, terminal racemes, up to 100 mm long, sometimes lax or reduced to a single, axillary flower; spur conical or conical-prolonged, 6.4–8.5 mm long; corolla upper lip 4-lobed, lobes 5.0–6.4 mm, apices rounded, pale pink to white; Oct.–Apr. **Fruit** an oblong capsule, 8.5–12.5 × 6.4–8.5 mm, apex subtruncate, base unequal and rounded to scarcely narrowed, valves obtusely angled, slightly horned. Along forest margins or in open woodland, rarely in grassland; mostly in rocky, humic-rich soils.

DrGr MsGr Zastr

### **pubescens** Benth. var. **glabrior** Benth. ex. Hiern

Annual, sometimes perennial herb, 0.15–0.30 m high; plants glabrous. **Stems** erect or ascending, sturdy, laxly much branched in inflorescence. **Leaves** opposite or alternate; blade ovate, 25–50 × 17–38 mm, apex obtuse or apiculate, floral ones acute, margins dentate to serrate, thinly pubescent; petioles 4.0–10.5 mm long. **Flowers**: in leaf axils or upper ones in leafy and bracteate, loose racemes; pilose or pubescent to glabrescent; spur extended conical, up to 2 mm long; corolla upper lobes oblong, up to 3.2 mm long, white, throat yellow; Jul.–Oct. **Fruit** an oblong capsule, up to 8 × 6 mm, slightly narrower below apex, apex truncate, emarginate. Sandy, stony and rocky mountain areas.

AcGr KarSh

### **pubescens** Benth. var. **pubescens**

Perennial, sometimes annual herb, up to 0.38 m high; plants pubescent. **Stems** erect or ascending, sturdy, laxly much branched, in inflorescence. **Leaves** opposite or alternate;

blade ovate, 25–50 × 17–38 mm, obtuse, acute, some apiculate, margins dentate to serrate, thinly pubescent; petioles 4–12 mm long. **Flowers**: in leaf axils or upper ones in leafy and bracteate, loose racemes, pilose or pubescent to glabrescent; spur extended conical, up to 3 mm long; corolla upper lobes oblong, up to 4 mm long, white, throat yellow; Jul.–Oct. **Fruit** a widely ovate-oblong capsule, up to 8 × 6 mm, slightly narrower below apex, apex truncate, emarginate. Sandy, stony and rocky mountain areas.

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### **rupicola** Hilliard

Perennial herb, up to 0.75 m high. **Stems** well branched from woody base; glandular-hairy. **Leaves** opposite; blade narrowly ovate to ovate, 20–45 × 10–20 mm, margins coarsely dentate. **Flowers**: often clustered; spur up to 3.5 mm long; calyx with lobes linear to narrowly elliptic, posticous lobes mostly 3.0–3.5 mm long at anthesis, tube ± 2 mm long; corolla white, pink or light violet, palate yellow, without bosses at mouth of spur; spur linear, 2–4 mm long, ± parallel to pedicel; Nov.–Apr. **Fruit** an ellipsoid capsule, 5–12 × 4–7 mm. In kloofs, among rocks and boulder beds, shaded places and mountain slopes.

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### **umbonata** (Hiern) Hilliard & B.L.Burtt

Perennial herb, up to 0.40–0.45 m high. **Stems** tufted, unbranched, spreading by means of underground runners, usually with long, bare axis below flowers. **Leaves** sessile or shortly petiolate; blade lanceolate or narrowly ovate, 1–6 mm wide, apex obtuse, margins entire or denticulate. **Flowers**: in thick, terminal clusters 40 mm long; spur extended conical, somewhat curved, 3–4 mm long; corolla lilac-pink, palate yellow with orange-yellow bosses at mouth of spur; Sep.–Feb., mainly Dec., Jan. **Fruit** an ± ovate capsule, up to 14 × 9 mm, obliquely truncate. Grassland and disturbed areas.

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## **Peliostomum** Benth. (sthn Afr.: 6 spp.)

### Key to species:

Leaves linear to linear-obovate, 25–52 mm long; calyx lobes linear-lanceolate, 2.0–4.5 mm long . . . . . **P. leucorrhizum** var. **leucorrhizum**
Leaves ovate to obovate-oblong, < 10 mm long; calyx linear, 3.0–6.0 mm long . . . . . **P. origanoides**

### **leucorrhizum** E.Mey. ex Benth. var. **leucorrhizum**

Dwarf shrub, up to 0.4 m high. **Stems** loosely branched, erect or ascending, covered with whitish corky layer at base, leafy. **Leaves** sessile; blade linear to linear-obovate, 25–52 mm long, margins entire, grey-green. **Flowers**: solitary in leaf axils, sessile, longer than leaves; calyx lobes linear-lanceolate, 2.0–4.5 mm long; anthers long-ciliate; corolla irregular, tube long with pale dark longitudinal lines, base narrow, widening beyond calyx, throat wide, limb spreading, small 5-lobed; deep blue or violet with darker marks round mouth blue; Sep.–Mar. Rocky to sandy soil, flood plains and dry riverbeds. *Veld violet*; *viooltjie*, *springbokbos* (A).

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**origanoides** E.Mey. ex Benth.

Dwarf shrub, up to 0.3 m high. **Stems** procumbent or procumbent with stem tips ascending and well branched, old ones white. **Leaves** shortly petiolate; blade ovate to obovate-oblong, not longer than 10 mm, margins entire. **Flowers**: solitary, axillary, longer than leaves; anthers short-ciliate or glabrous; calyx linear, 3–6 mm long; corolla with narrow basal part of tube hardly exserted from calyx; purple-blue to light purple with white stripes on lower lip; Sep.–Apr. Rocky or sandy soil.




## **Phygelius** E.Mey. ex Benth. (sthn Afr.: 2 spp.)

### Key to species:

Corolla tube straight, lobes pointed; widespread . . . . . **P. aequalis**
Corolla tube curved, lobes oblique; restricted to high mountains . . . . **P. capensis**

**aequalis** Harv. ex Hiern

Shrub, dwarf shrub or herb, up to 2 m high. **Stems** erect, woody below, branched. **Leaves** opposite; simple; petiolate; blade ovate, 50–100 × 30–80 mm, margins crenulate-serrulate. **Flowers**: in terminal cymes, 80–300 mm long; corolla with tube narrowly funnel-shaped, 33–45 mm long, very slightly curved to straight, lobes pointed; salmon-pink outside, yellow inside; Oct.–Mar. Edge of streams in damp areas and forest margins. *River bells*, *wild fuschia*; *foksia*, *rivierklokkie* (A); *mafifi-matšo*, *metsi-matšo* (SS).




**capensis** E.Mey. ex Benth.

Shrub, up to 1.5 m high. **Stems** erect, woody below, laxly branched. **Leaves** opposite; simple; petiolate; blade ovate-lanceolate, 50–100 × 30–80 mm, margins crenulate-serrulate. **Flowers**: in loosely branched, terminal cymes, up to 360 mm long, with pyramidal shape; pedicels up to 24 mm long; corolla with tube narrowly funnel-shaped, up to 36 mm long, distinctly incurved, lobes oblique; bright to pale red outside, yellow in mouth; Dec.–Mar. Streambeds, water edges, steep mountain slopes. *Cape figwort*, *Cape fuchsia*, *river bells*.




## **Selago** L. (sthn Afr.: 117 spp.)

### Key to the species:

[after Hilliard: 49 (1999)]

1a Bract adnate to pedicel only or to pedicel and extreme base of calyx tube . . . . . **S. longicalyx**
1b Bract adnate to at least half the calyx tube (ignore the occasional lowermost leaf-like bract free from calyx) . . . . . 2
2a Inflorescence composed of small glomerules (± 4–10 mm in first flower) on nude or nearly nude peduncles ± 2–26 mm long, arranged in long (± 100–155 mm) simple panicles; hooked (or at least flexuous) hairs on stems, leaves, bracts, calyces and outside of corolla tube. . . . . **S. welwitschii** var. **australis**

2b Either inflorescences not as above, or hooked hairs absent at least on corolla tube . . . . . 3
3a Leaves fascicled, often petiolate, margins often toothed, calyx mostly subequally 5-lobed, lobes longer or shorter than tube, posticous anthers in throat or mouth, anticous anthers shortly exserted, pairs of cocci either held within a common pericarp and separating tardily or fused together . . . . . 4
3b Plant differing from above in one or more characters . . . . . 5
4a Hairs on stem up to 0.6–1.0 mm long, retrorse; lowermost pedicels 0.3–1.0 mm long; corolla tube 5.5–7.2 mm long (in fully developed flowers) . . . . . **S. flanaganii**
4b Hairs on stem up to 0.1–0.8 mm long (patent when 0.5–0.8 mm long); lowermost pedicels 1.5–3.5 mm long; corolla tube 4.0–4.4 mm long . . . . . **S. innata**
5a Calyx basically deeply 3-lobed (occasionally irregularly 3–5-lobed), anticollateral lobes either clearly longer than broad; bracts with white membranous margins, or if ± as long as broad, then bracts always with white membranous margins; inflorescences in terminal racemes, solitary or loosely panicled . . . . . **S. albomarginata**
5b Calyx, bracts, and/or inflorescences not as described above . . . . . 6
6a Calyx 2- or 3-lobed, anticollateral lobes roughly as broad as long; bracts in > $^1/_2$ the species with white membranous margins; inflorescences in glomerules ± 3–5 × 3–5 mm in first flower arranged in long panicle, rarely subcorymbose . . . . . 7
6b Calyx, bracts, and/or inflorescences not as described above . . . . . 9
7a Bracts obtuse or subobtuse, sometimes cucullate, white membranous margins either absent or up to ± 0.15 mm broad . . . . . **S. paniculata**
7b Bracts acute or subacute with conspicuous white membranous margins ± 0.2 mm at their broadest . . . . . 8
8a Largest primary leaves 5–10 × 0.5–1.0 mm; racemes ± 2–3 × 3–4 mm in first flower; peduncles at least 5–15 mm long, highly branched . . . **S. densiflora**
8b Largest primary leaves 6–15 × 1.0–1.8 mm; racemes ± 4–5 × 5–6 mm in first flower; peduncles ± 2–25 mm long, simple or sparsely branched . . . **S. mixta**
9a Calyx 5-lobed up to halfway in most species, anticous lobes roughly as long as broad; inflorescences in glomerules up to ± 10 mm in diameter in first flower, arranged in long narrow panicles, lower peduncles sometimes compound . . . . . 10
9b Calyx and/or inflorescences not as described above . . . . . 13
10a Glomerules loosely panicled or sometimes ± solitary . . . . . **S. albida**
10b Glomerules crowded in long, narrow, pyramidal panicles, sometimes compound . . . . . 11
11a Bracts with eglandular hairs thinly or thickly distributed all over backs . . . . . **S. galpinii**
11b Bracts either glabrous on backs (ignore hairs on margins and globular glands) or with a few eglandular hairs at base or on keels . . . . . 12
12a Largest primary leaves 0.25–1.00 mm wide . . . . . **S. burkei**
12b Largest primary leaves (0.80–)1.00–3.00 mm wide . . . . . **S. galpinii**
13a Inflorescence a spike or raceme, mostly solitary, sometimes loosely panicled . . . . . 14
13b Inflorescence particularly not as described above . . . . . 16
14a Leaves and bracts minutely glandular-puberulous all over (hairs < 0.1 mm long) . . . . . **S. acocksii**
14b Leaves glandular-punctate otherwise glabrous, except for hairs at margins at extreme base, bracts with acute hairs on margins only . . . . . 15
15a Flowers in elongated spikes 80–150 mm long . . . . . **S. geniculata**
15b Flowers only in exceptional cases in spikes, but then never longer than 80 mm . . . . . **S. saxatilis**

16a Calyx 3- or 5-lobed, or irregularly lobed; inflorescence in large glomerules (± 7–20 mm in diameter in first flower), subsequently these in narrow, dense, terminal panicles ± 100 mm long; occasionally solitary, mostly panicled; leaves often relatively broad (largest 1–5 mm wide) . . . . . **S. speciosa**
16b Inflorescence and/or leaves not as described above . . . . . **S. saxatilis**

## **acocksii** Hilliard

*Sutera zeyheri* Rolfe

Dwarf shrub, up to 0.3 m high. **Stems** erect or decumbent, well branched, twiggy, branches ascending at 45°-angle, old bare inflorescences often persistent and subspinescent, young parts puberulous. **Leaves** fascicled; blade narrowly oblong, apex obtuse, base scarcely narrowed, margins entire, much thickened and revolute, both surfaces with scattered, glandular hairs. **Flowers**: crowded in a terminal spike up to 25 mm long, elongating in fruit; bracts adnate to ± half of calyx tube, minutely glandular-puberulous; calyx 5-lobed; corolla tube up to 3.2 mm long, broadly funnel-shaped, limb up to 5 mm in diameter, shades of violet or mauve and rarely white; Jan.–Dec. In open flats and stony or rocky areas in karroid dwarf shrubland.

KarSh

## **albida** Choisy

Dwarf shrub. **Stems** several, tufted, 0.15–0.60 m long, erect or decumbent, virgate branching, younger parts puberulous and ± retrorse. **Leaves** fascicled, sometimes to weakly so; blade oblong, narrowly elliptic or narrowly oblong-ovate, 6–15(–25) × 0.7–2.0(–2.3) mm, apex subobtuse to acute, base slightly narrowed, margins entire, revolute, both surfaces puberulous. **Flowers**: few to many-flowered spikes each terminating a twiglet 20–40 mm long, these loosely panicled or sometimes compound, individual spikes, initially elongating in fruit; pedicels absent or up to 0.2 mm long; bracts adnate to at least lower $^1/_3$ of calyx tube; calyx 5-lobed; corolla tube 3.1–3.8(–4.7) mm long, funnel-shaped, limb 4.0–5.3 mm in diameter, all lobes elliptic or oblong, shades of mauve or blue, rarely white; almost all year, mainly Dec.–Apr. *Bergwitaar*, *bergwitaarbossie*, *witaarbos*, *t'gibbiebos*, *muishondbos* (A).

DrGr MsGr KarSh

## **albomarginata** Hilliard

*Walafrida nachtigalii* (Rolfe) Rolfe *p.p.*

Perennial herb. **Stems** several, tufted, 0.15–0.50 m long, minutely puberulous, hairs strongly recurved. **Leaves** fascicled; blade narrowly oblong-elliptic, linear-oblong or linear, 10–35 × 1.0–3.5 mm, apex acute, apiculate, slightly narrowed, margins entire, very rarely with an occasional minute tooth, midrib slightly raised on lower surface. **Flowers**: crowded in a terminal raceme, becoming slightly lax in fruit, solitary or loosely panicled; pedicels 0.2–0.5 mm long; bracts adnate to pedicel and calyx tube; calyx basically 3-lobed, with white membranous margins; corolla tube 2.0–3.8 mm long, broadly funnel-shaped, limbs 3.0–4.7 mm in diameter, all lobes elliptic, white; Jan.–Apr. Limestone substrate around pans, damp depressions and near watercourses.

DrGr

## **burkei** Rolfe

Dwarf shrub. **Stems** many, tufted from woody rootstock, 0.25–0.45 m long, virgately branched from base, spreading to erect, puberulous, hairs strongly retrorse; branches canescent or minutely puberulous. **Leaves** fascicled; blade linear to narrowly elliptic, 2–8 × 0.5–1.0 mm, apex acute to obtuse, base scarcely narrowed, margins entire, thickened, revolute, 2–3 mm long, minutely puberulous. **Flowers**: inflorescence a narrow panicle, 50–110 mm long, simple or compound, very

twiggy, glomerules few-flowered, 4–7 mm long, elongating to 15 mm in fruit; bracts adnate to at least half the calyx tube, glabrous on back or with few, eglandular hairs; corolla tube 2.0–2.5 mm long, broadly funnel-shaped, limb 2.8–4.0 mm in diameter, all lobes oblong, white; Dec.–Jun. Grassland. Along drainage lines in sandy grassland and sandstone outcrops.

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## **densiflora** Rolfe

*Walafrida densiflora* (Rolfe) Rolfe *p.p.*

Perennial herb, up to 0.6 m high. **Stems** procumbent to erect, several, tufted from apex of woody taproot, loosely branched, on old plants sometimes stoloniferous. **Leaves** fascicled; blade linear or narrowly elliptic, main ones up to 10 × 1 mm, apex acute, base slightly narrowed, margins entire, thickened, revolute, midrib slightly raised on lower surface, coarsely puberulous, glandular-punctuate. **Flowers**: in globose spikes, 2–3 × 3–4 mm, elongating to 8–40 mm long in fruit, at length somewhat elongated, dense, laterally arranged on short branchlets, forming somewhat elongated panicles at summit of branches; peduncles 5–15 mm long; bracts adnate to pedicel and calyx tube, acute or subacute, white membranous margins ± 0.2 mm at broadest; calyx 2- or 3-lobed; corolla tube 1.2–1.7 mm long, funnel-shaped, limb 2.2–2.7 mm in diameter, all lobes oblong-elliptic, white; Nov.–Jul. Grassland, hillsides, roadsides, edges of marshes and lakes, on lime or dolerite soil.

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## **flanaganii** Rolfe

Dwarf shrub or shrub, up to 1.5 m high. **Stems** well branched from base, pubescent with hairs and globose glands; hairs up to 0.6–1.0 mm long, retrorse. **Leaves** fascicled; blade elliptic, 12 × 3 mm, apex acute or subacute, margins entire or with 1–3 pairs of small teeth in upper half. **Flowers**: in a large panicle, rachis 80–170 mm long, in clusters of 12 × 3 mm; bracts adnate to pedicel and calyx lobe; lowermost pedicels 0.3–1.0 mm long; corolla tube 5.5–7.2 mm long, funnel-shaped, limb 5–7 mm in diameter, all lobes elliptic to suborbicular, pale to deep mauve or occasionally white, up to 7 mm in diameter, lobes white to mauve, Nov.–Jan. In high montane grassland and shrubland, alt. 2 200–3 300 m. *Lenyofane-khono-koane*, *lehlomanyane* (SS).

| | | | MsGr | | |
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## **galpinii** Schltr.

Perennial herb, up to 0.5 m high. **Stems** usually well branched into round or flattened cushions becoming woody with age. **Leaves** fascicled; blade narrowly elliptic or linear-lanceolate, 7–23 × 1–3 mm, apex subacute or obtuse, base narrowed, margins entire, midrib channelled on upper surface, raised on lower surface. **Flowers**: in a long, narrow, terminal panicle, packed in dense, globose heads ± 10 mm in diameter; bracts adnate to pedicels and ± half the calyx tube, with few to many eglandular hairs on back; calyx 5-lobed; corolla tube 3–4 mm long, funnel-shaped, limb 4–5 mm in diameter, all lobes elliptic, violet-blue or mauve; Jan.–May. In montane areas in grassland and often in rocky places, alt. 1 500–2 600 m. *Tšitoanyane*, *tšitoanenyana* (SS).

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## **geniculata** L.f.

*Walafrida geniculata* (L.f.) Rolfe

Dwarf shrub, up to 0.5 m high. **Stems** divaricately well branched and twiggy, main stems often zigzag. **Leaves** strongly fascicled; blade linear or narrowly elliptic, 20 × 1 mm, apex

acute, base narrowed then abruptly expanding and half-clasping; margins entire, thickened, revolute, mature leaves glabrous except for few hairs on margins at base. **Flowers**: in a long, narrow spike, 80–150 × 5–7 mm; bracts adnate to ± half the calyx tube, base pouched, with acute hairs on margins only; pedicels absent; corolla tube 2.0–2.5 mm long, broadly funnel-shaped, limb 2.8–3.5 mm in diameter, all lobes oblong elliptic, in shades of mauve or violet, sometimes white; all year, mainly Nov.–May. Stony slopes and flats in karroid vegetation and open grassland. *Waterfinder bush*; *aarbossie*, *persaarbos* (A).




## **innata** Markötter

Perennial herb, 0.3–0.6 m high; bushy. **Stems** stout, sometimes decumbent, pubescent with retrorse hairs; hairs up to 0.6–1.0 mm long. **Leaves** fascicled; blade narrowly ovate, apex acute, base narrowed, petiole-like, margins mostly with 1 or 2 pairs of coarse sharp teeth in upper part. **Flowers**: inflorescence corymbose in bud becoming loosely paniculate; pedicels 1.5–3.5 mm long; bracts adnate to pedicel and part of calyx tube; corolla tube 4.0–4.4 mm long, funnel-shaped, limb 4–5 mm in diameter, all lobes oblong-elliptic, white to pale mauve; Oct.–Jan. Grassland.




## **longicalyx** Hilliard

Perennial herb, 0.3–0.9 m high; caudex small, woody. **Stems** one to a few, erect, simple or sparsely branched, sharply ascending; puberulous. **Leaves** strongly fascicled; blade linear or linear-lanceolate, apex acute, base scarcely narrowed, margins entire, glandular-punctate. **Flowers**: in small, tight glomerules, arranged into a corymb up to 70 mm in diameter; pedicels 1–4 mm long, often reddish; bracts adnate to whole or part of pedicel, free from calyx; corolla with tube 5.5–7.0 mm long, narrowly funnel-shaped, limb 4.5–7.5 mm in diameter, lobes subequal, broadly elliptic, white; Feb.–May. Rocky grassland in montane areas.




## **mixta** Hilliard

Perennial herb. **Stems** 0.1–0.4 m long, several tufted from crown of woody taproot, often procumbent, simple, floriferous mainly in upper half, pubescent, hairs strongly recurved and adpressed. **Leaves** fascicled; blade oblong-elliptic, main ones up to 15 × 1.8 mm, apex acute or subacute, base narrowed, margins entire, scarcely thickened; midrib slightly raised at base below. **Flowers**: in many-flowered racemes, 4–5 × 5–6 mm in first flower, elongating to 10–20 mm in fruit; peduncles ± 2–25 mm long, simple or sparsely branched; bracts adnate to pedicel and calyx tube, acute or subacute, with conspicuous white membranous margins; calyx 2- or 3-lobed; corolla tube 102–108 mm long, funnel-shaped, limb 2.2–3.0 mm in diameter; Jan.–Mar. Along watercourses, grassland with rocky outcrops, sandy soils.




## **paniculata** Thunb.

*Selago amboensis* Rolfe
*Walafrida paniculata* (Thunb.) Rolfe *p.p.*

Perennial herb or dwarf shrub, 0.25–0.45 m high. **Stems** several, leafy in young parts; puberulous, hairs recurved. **Leaves** fascicled, blade oblong or linear-oblong, 3–8 × 1.2–

2.1 mm, apex obtuse to subacute, margins sometimes coarsely puberulous, glandular-punctate. **Flowers**: in ovoid racemes ± 5 × 4 mm, elongating to 10–15 mm long spikes in fruit, arranged in long narrow panicles, these eventually branching towards the summit of branches; bracts obtuse or subobtuse, sometimes cucullate, without white membranous margins or exceedingly narrow ones only in uppermost bracts; calyx 2- or 3-lobed; corolla tube funnel-shaped, 1.2–2.0 mm long; lobes oblong-elliptic, 0.7–2.0 mm long; white; all year, but mostly Oct.–May. Grassland, damp areas, along roadsides, shale soils.

KarSh

**saxatilis** E.Mey.

*Walafrida basutica* E.Phillips
*W. dinteri* (Rolfe) Rolfe
*W. saxatilis* (E.Mey.) Rolfe

Dwarf shrub, up to 0.5 m high. **Stems** erect, many, simple or branched, patent- or somewhat recurved-puberulous. **Leaves** in approximate fascicles; blade linear or oblong-linear, 2–4 × 0.4–1.0 mm long, apex obtuse to apiculate, base broad, half-clasping, margins entire, flat with tiny hairs at base. **Flowers**: in small spikes, 3 × 3 mm, longer in fruit, up to 20 mm long, laterally arranged on very short, lateral branchlets in a compact panicle, long and narrow or subcorymbose, and in exceptional lax spikes up to 80 mm long; bracts ovate or ovate-lanceolate, ± acute, concave; calyx obliquely usually 3-lobed or 2-lobed by abortion; corolla tube short, up to 1.8 mm long, white, sometimes mauve; Jan.–Mar. Grassland, stony or rocky places on slopes and flats.

AcGr DrGr KarSh

**speciosa** Rolfe

Dwarf shrub, 0.30–0.45 m high. **Stems** well branched with main branches stout, erect or decumbent, nude, young branches puberulous. **Leaves** fascicled; blade linear, up to 5 mm wide, apex acute, apiculate, base narrowed then abruptly expanding, half clasping, margins entire, strongly revolute. **Flowers**: in dense racemes, subsequently these in narrow, dense, terminal panicles ± 100 mm long; pedicels up to 0.3 mm long; bracts adnate to pedicel and calyx tube; calyx 3- or 5-lobed or irregularly lobed; corolla with tube 4.0–4.8 mm long, funnel-shaped, limb 4.0–5.8 mm in diameter, all lobes elliptic, white; Aug.–Oct. Stony slopes and flats, in streambeds. *Amandelaarbossie*, *witaarbossie* (A).

DrGr KarSh Zastr

**welwitschii** Rolfe var. **australis** Hilliard

Dwarf shrub, 0.2–0.9 m high; flowering from juvenile but becoming shrubby; with hooked hairs on stems, leaves, bracts, calyces and outside of corolla tube. **Stems** erect, suberect or straggling; branches pubescent, hairs either strongly hooked, retrorse, adpressed, flexuous or patent, also with globular glands. **Leaves** opposite or alternate; fascicled or not; blade oblong to narrowly elliptic, apex obtuse, base scarcely narrowed, margins entire, strongly thickened, revolute. **Flowers**: in a narrow panicle 100–155 mm long, glomerules 4–9 × 4–8 mm elongating to 5–15 × 5–7 mm in fruit; peduncles nearly nude, ± 2–26 mm long; pedicels absent or up to 0.2 mm long; corolla tube 3.5–4.5 mm long, broadly funnel-shaped, limb 3.0–4.2 mm in diameter; Nov.–Jun. Grassland, rocky slopes, flat sandy soils.

VreDm AcGr

## **Sutera** Roth (sthn Afr.: 3 spp.)

**cooperi** Hiern
*S. cymulosa* Hiern
*S. latifolia* Hiern

Perennial herb, up to 1 m high; bushy. **Stems** glandular pubescent and with coarse patent hairs, minutely gland-tipped. **Leaves** with blade ovate, 12–40 × 10–40 mm, apex obtuse to subacute, base cordate-cuneate, abruptly contracted into petiolar part, margins coarsely toothed. **Flowers**: solitary or in 3-flowered cymules, in racemes or panicles; bracts present or absent; corolla with tube 8–14 mm long, cylindric, limb almost regular, 6–15 mm in diameter, all lobes oblong or oblong-elliptic, white, tube orange; Aug.–Mar. Base of cliffs, below rock overhangs.

MsGr | Zastr

## **Zaluzianskya** F.W.Schmidt (sthn Afr.: ± 63 spp.)

### Key to species:

[after Hilliard: 467 (1994)]

1a Corolla limb either snow-white inside (in 3 species with an orange band around mouth), pale to dark red outside, opening at dusk or in dull light, or (1 species only) creamy to greenish white inside, opening in sunshine, plants perennial with a mass of vegetative buds on crown (sect. *Nycterina*) . . . . . 2
1b Corolla limb variously coloured (white, shades of pink and mauve, or yellow) not contrasting snow-white and red, mostly opening in sunshine, if opening at dusk or in dull light, then cream-coloured to bright yellow above . . . . . 12
2a Corolla lobes inside glandular at least in lower part, mouth either not bearded or rarely a few long unicellular hairs present on posticous side . . . . . **Z. microsiphon**
2b Corolla lobes inside either glabrous or glandular, if glandular, then mouth well bearded . . . . . 3
3a Stems either glabrous or with course retrorse eglandular hairs . . . . . 4
3b Stems with course, spreading hairs with or without a glandular tip, sometimes short, fine, spreading, glandular hairs as well . . . . . 10
4a Corolla lobes glabrous inside (ignore tiny glands, which may be present near sinuses of corolla lobes adjacent to circlet) . . . . . 5
4b Corolla lobes glandular inside at least in lower part . . . . . 9
5a Corolla limb slightly zygomorphic (the anticous lobe slightly isolated from other 4), held vertically . . . . . **Z. elongata**
5b Corolla limb regular, held ± horizontal . . . . . 6
6a Plants pulvinate with many, crowded, green, leaf rosettes forming dense cushions or small mats . . . . . **Z. pulvinata**
6b Plants not pulvinate though leaf rosettes sometimes present on crown, but few, not forming cushions or mats . . . . . 7
7a Cauline leaves mostly up to 2 mm wide . . . . . **Z. schmitziae**
7b Cauline leaves mostly at least 3 mm wide . . . . . 8
8a Plant developing a thick clump of vegetative buds on crown, stem simple . . . . . **Z. spathacea**
8b Plants without a thick clump of vegetative buds on crown, at most a few small ones, stems either simple or branched (or with axillary leaf tufts) . . . . . **Z. glareosa**
9a Inflorescences remaining short and thick in fruit, not elongating to reveal axis (inside surface of corolla lobes glandular on claw) . . . . . **Z. natalensis**

9b Inflorescence elongating in fruit to reveal axis; inside surface of corolla lobes either glandular or eglandular but always eglandular where sympatric with *Z. natalensis* . . . . . **Z. spathacea**
10a Corolla lobes glandular inside at least in lower half. . . . . **Z. distans**
10b Corolla lobes glabrous inside (ignore tiny glandular hairs adjacent to circlet of long hairs). . . . . 11
11a Plant herbaceous, often flowering in seedling stage, later several stemmed from crown; leaves usually > twice as long as broad . . . . . **Z. glareosa**
11b Plant with many twiggy branches forming low interwoven clumps; leaves usually only twice as long as broad . . . . . **Z. ovata**
12a Corolla lobes cream-coloured to bright yellow inside, purple-brown below, tips rounded; flowers expanding at night or in dull light **Z. peduncularis**
12b Corolla lobes white or creamy white to various shades of pink and mauve, tips bifid or retuse, if rounded, then lobes pink or mauve or changing colour from white to pink or mauve, or sometimes white or orange, but always coppery orange outside; flowers expanding in sunshine . . . . . 13
13a Apices of corolla lobes distinctly bifid; calyx 5.0–6.5 mm long . . **Z. venusta**
13b Apices of corolla lobes rounded to slightly retuse; calyx 6.5–8.0 mm long. . . . . **Z. karrooica**

## **distans** Hiern

Perennial herb, up to 0.4 m high. **Stems** ascending or erect; solitary, simple, leafy; hairs coarse, spreading, white, gland tipped or not, also shorter gland-tipped hairs present. **Leaves** with blade elliptic to elliptic-ovate, 20–60 × 9–30 mm, gradually narrowed to petiolar part; margins obscurely and irregularly toothed, both surfaces glandular-hairy. **Flowers**: in few- to many-flowered, lax spikes; corolla with tube 24–50 mm long, mouth with circlet of long unicellular hairs, lobes deeply notched, 4–10(–13) mm long, outer surface glandular-hairy, at least in lower half, carmine or pink, inner surface white; Dec.–Apr., opening at dusk or dawn. Mountain slopes, hillsides.




## **elongata** Hilliard & B.L.Burtt

Perennial herb, up to 0.6 m high; vegetative buds, when present, small not developing into a thick clump. **Stems** several from crown of old plants; clad in retrorse white hairs. **Leaves** with blade oblong-elliptic to linear, 15–25 × 1.5 mm, margins entire or with few, small, callose teeth, glabrous with a few hairs on margins and midline. **Flowers**: slightly zygomorphic; many, arranged in lax, elongated spikes; corolla tube 30–40 mm long, limb held vertically, mouth with circlet of long unicellular hairs, lobes deeply notched, outer surface reddish pink to crimson, inner surface white; Oct.–Apr., opening at dusk or dull light. Grassland amongst rock outcrops and on rocky or stony ridges.




## **glareosa** Hilliard & B.L.Burtt

Perennial herb, up to 0.45 m high; often flowering in seedling stage. **Stems** several from crown; hairy with ± retrorse or spreading white hairs. **Leaves** spreading; blade linear to broadly elliptic, 15–50(–60) × 2–8(–15) mm, glabrescent. **Flowers**: in a dense, often few-flowered spike, lengthening in fruit; corolla 27–50 mm long, limb regular, held ± horizontal, lobes deeply notched, inner surface glabrous or with a few minute hairs near base, white, outer surface crimson; (Oct.–)Dec.–Apr., opening at dusk or in dull light. Montane areas, streambanks, rock crevices or among rocks. Figure 58.





**Figure 58.** *Zaluzianskya glareosa* (Serophulariaceae). Artist: G. Condy.

SCROPHULARIACEAE

**karrooica** Hilliard

Annual herb. **Stems** up to 130 mm long, main one, simple, erect, soon branching from base, branches decumbent; distantly leafy. **Leaves** with blade elliptic to ovate-elliptic, 7–25 × 2.5–12.0 mm, apex subacute, base tapering into a broad flat petiolar part 3–17 mm long, margins entire to obscurely or distinctly toothed in upper part. **Flowers**: in dense, terminal spikes, elongating in fruit; bracts adnate to calyx; calyx 6.5–8.0 mm long; corolla tube 22–27 mm long, limb 6.5–11.0 mm in diameter, mouth encircled by stiff, acute hairs, lobes spathulate, apex rounded to slightly retuse, white to bright mauve in upper part, yellow to red star around mouth, rays extending well into shaft of lobe, orange to dark red in lower part (Apr.–)Jul.–Oct., open in sunshine. Grassland or scrub, sandy patches.

DrGr

**microsiphon** (Kuntze) K.Schum.

*Z. maritima* (L.f.) Walp. var. *breviflora* Hiern,
*Z. maritima* (L.f.) Walp. var. *grandiflora* Hiern

Perennial herb, up to 0.4 m high. **Stems** 1–few, erect, with thick clump of vegetative buds on crown. **Leaves**: radical ones rosulate, blade oblanceolate to elliptic, 35–90 × 8–20 mm; cauline ones ascending, blade oblong or elliptic, grading into bracts; hairy. **Flowers**: many in a terminal, crowded spike, sometimes with small ones on rachis below; corolla with tube up to 52 mm long, limb zygomorphic, held vertically, a few hairs present on anticous side of mouth, lobes sometimes twice notched, upper surface of corolla lobes glandular at least in lower part, outer surface wine-red, white inside, pink or red outside, greenish or cream-coloured inside; Dec.–Mar., opening in bright light. Grassland, rocky soil.

DrGr MsGr

**natalensis** Bernh.

Perennial herb, up to 0.35 m high. **Stems** simple, erect, with a crowded group of vegetative buds on crown; pubescent with retrorse hairs. **Leaves** with blade elliptic, 60–90 × 15–25 mm, tapering at both ends, margins entire or callose-toothed, grading into bracts, upper leaves ascending, sparsely hairy. **Flowers**: in a crowded, short, terminal, bracteate spike, not elongating in fruit; bracts adnate to calyx; calyx up to 30 mm long; corolla with tube 32–50 mm long, limb held horizontal, regular, mouth ringed with long hairs, lobes deeply notched, outer surface crimson, inner surface white; Jan.–Mar., opening at dusk or dull light. Grassland.

MsGr

**ovata** (Benth.) Walp.

Dwarf shrub, up to 0.45 m high; twiggy, in loose clumps. **Stems** much branched; clad in long coarse spreading white hairs, gland-tipped or not (sometimes absent), mixed with short spreading gland-tipped hairs. **Leaves** with blade ovate or variously elliptic, 15–60 × 4–35 mm, apex obtuse to subacute, base cuneate, margins subentire, sometimes coarsely lobed or toothed, covered in long white hairs. **Flowers**: 1–several, crowded into spikes; corolla with tube up to 58 mm long, limb regular, mouth with ring of long hairs or partly so, lobes deeply notched, glabrous above, outer surface red to pink, inner surface sometimes with an orange or red band near base; Oct.–Feb., opening at dusk or dull light. Montane areas, partly shaded cliff faces, or in bare and silty patches at very high altitudes

DrGr MsGr

**peduncularis** (Benth.) Walp.

Annual herb, up to 0.25 m high. **Stems** several or single; often leafless above basal rosette or with a few leaves; pubescent, hairs retrorse, appressed. **Leaves** petiolate; blade ovate to elliptic, 3–30 × 2–15 mm, margins hairy; petioles 2–15 mm long. **Flowers**: up to 15 in terminal heads, not elongating in fruit, sometimes cleistogamous; bracts partly adnate to calyx; corolla with tube up to 25 mm long, mouth glabrous with a yellow to bright red ring extending into throat, lobes rounded at apices, outer surface maroon to purple-brown, inner surface cream-coloured to bright yellow; Sep., Oct., opening at night or in dull light. Stony or sandy places.




**pulvinata** Killick

Perennial herb, up to 0.3 m high; pulvinate with many, crowded, green, leaf rosettes forming dense cushions or small mats. **Stems** single per leaf rosette; leafy, bracteate to apex; clad in retrorse white hairs. **Leaves** with radical ones long-petiolate; blade linear, elliptic or spathulate, cauline ones similar but broad-based; sparsely hairy. **Flowers**: many in a spike, not elongating in fruit; corolla with tube up to 50 mm long, limb regular, held ± horizontal, mouth ringed by long hairs, tube flushed dark red, lobes glabrous above, with outer surface crimson, inner surface white; Oct.–Jan., opening at dusk or in dull light. Bare rocky, stony places.




**schmitziae** Hilliard & B.L.Burtt

Perennial herb, up to 0.3 m high. **Stems** mostly erect, several, not or little branched, lacking group of vegetative buds on crown, leafy, leaf tufts axillary; clad in retrorse white hairs. **Leaves** ± spreading; radical ones with blade linear to elliptic, 15–46 × 2–4 mm, cauline ones with blade linear, 20–40 × 1–2 mm, base slightly broadened, clasping, apex obtuse, margins entire or with a few callose teeth near apex, hairy. **Flowers**: up to 25 in a spike, often elongating in fruit; bracts adnate to calyx; corolla tube up to 25–39 mm long, limb regular, held ± horizontal, mouth encircled by long hairs, lobes eglandular, 3–5 mm long, deeply notched; red outside, white inside; Jan.–Mar., opening at dusk or dull light. Rocky places, scree slopes, grassland, on basalt or dolerite.




**spathacea** (Benth.) Walp.

*Z. maritima* (L.f.) Walp. var. *pubescens* Hiern

Perennial herb, up to 0.4 m high. **Stems** simple to few, ± erect with a thick clump of vegetative buds on crown; usually with retrorse white hairs, sometimes glabrous. **Leaves** strongly ascending; blade elliptic or oblanceolate, 30–70 × 5–18 mm, narrowed into a petiole-like base. **Flowers**: in a terminal spike, elongating in fruit; corolla tube (36–)40–60 mm long, mouth with thick circlet of unicellular hairs; corolla with tube up to 60 mm long, limb regular, held horizontally, mouth with thick ring, or part of ring long hairs, lobes with inner surface glabrous or glandular (especially in lower half), outer surface crimson, inner surface white inside; Oct.–Mar, opening at dusk or in dull light. Rocky grassland, edges of vleis and pans.




**venusta** Hilliard

Annual herb. **Stems** 10–150 mm high, simple with 2–6 branches from base; pubescent, hairs spreading. **Leaves** petiolate; blade elliptic, rarely ovate, 4–20 × 1.0–1.5 mm, apex subacute,

base decurrent, margins subacute, entire to obscurely toothed; both surfaces glandular-hairy; petioles 2–16 mm long. **Flowers**: up to 30 crowded in a head, elongating into a spike in fruit; calyx 5.0–6.5 mm long; corolla with tube 15–26 mm long, limb (5.5–)8.5–15.0 mm long, mouth encircled by a ring of clavate or acute hairs, lobes bifid or broadly Y-shaped, mauve to bright pink inside, orange below, with star-shaped orange centre, Jun.–Nov., open in full sunshine. Bare patches, amongst grass tufts, dry riverbeds, gravelly or sandy soils.




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# SIMAROUBACEAE

Shrubs to large trees. **Leaves** alternate, rarely opposite; pinnate with opposite or subopposite leaflet; usually without stipules. **Flowers**: in a terminal or axillary thyrse, cyme or raceme; regular, bisexual or unisexual, sepals usually 5, slightly united at base; petals 5, free; stamens twice as many as petals, occasionally 5 reduced to staminodes; disk present; ovary superior. **Fruit** a capsule, samara, drupe or berry. *Tree of heaven family*.

## *Ailanthus (sthn Afr.: 1 sp.)

### altissima (Mill.) Swingle

Tree or shrub, up to 25 m high; suckers profusely; dioecious. **Stems** with young branches reddish brown. **Leaves** imparipinnate; 300–600(–1 000) mm long; petiolate; rachis erect, but leaflets tend to droop; leaflets ovate, apices acute to acuminate, margins toothed at base, each tooth with a sessile gland. **Flowers**: male flowers in axillary cymes on long pedicels, female flowers solitary on long pedicels; calyx 5-parted, sepals 5; petals 5, often very similar to sepals, elliptic, each with a fleshy gland at base, yellowish green; Sep.–Dec., Apr.–Jun. **Fruit** a samara. Roadsides. Invader. Native to China. *Tree-of-heaven*; *hemelboom* (A).

VreDm | DrGr | MsGr | Zastr

# SOLANACEAE

Compiled by A.M. Venter (*Lycium*), E. Retief & N.L. Meyer

Herbs, shrubs, erect or climbing, rarely trees, often with branched hairs, occasionally spiny. **Leaves** usually alternate; petiolate or sessile; blade simple to lobed, pinnatisect or pinnate; stipules absent. **Flowers**: bisexual, regular or slightly irregular; rarely solitary, usually in terminal, leaf-opposed or extra-axillary cymes, sometimes appearing umbellate or fasciculate; calyx 4- or 5(6 or 7)-toothed or -lobed, usually persistent, sometimes accrescent, sometimes inflated in fruit; corolla 4- or 5(6 or 7)-lobed; tube cylindric, funnel-shaped, or campanulate or rotate; stamens as many as corolla lobes, alternating with them, rarely fewer, arising from corolla tube; filaments short or long; anthers 2-thecous, separated or conniving into a cone; disc annular, cup-shaped, entire, or lobed, rarely absent; ovary superior, mostly 2-locular with many ovules in each locule; style terminal, filiform or stout; stigma capitate, cyathiform, globose, often bifid. **Fruit** a berry or capsule. **Seeds** usually many. *Potato*, *tomato or tobacco family*.

## Key to genera

[after Leistner: 360 (2005)]

1a Fruit a capsule . . . . . 2
1b Fruit a berry . . . . . 4

2a Annual herbs; capsules armed with spike-like outgrowths . . . . . **Datura**
2b Perennial herbs, evergreen shrubs or small trees; capsules not armed with spike-like outgrowths . . . . . 3
3a Perennial herb . . . . . **Nierembergia**
3b Short-lived shrub or small tree . . . . . **Nicotiana**
4a Lateral shoots spine-tipped; leaves clustered on abbreviated branchlets . . . . . **Lycium**
4b Lateral shoots not spine-tipped; leaves not clustered on abbreviated branchlets . . . . . 5
5a Calyx accrescent, bladdery, enclosing the fruit . . . . . 6
5b Calyx not accrescent, bladdery or enclosing the fruit . . . . . 7
6a Flowers fascicled . . . . . **Withania**
6b Flowers solitary . . . . . **Physalis**
7a Corolla with a short tube and spreading lobes . . . . . **Solanum**
7b Corolla trumpet-shaped . . . . . **Cestrum**

## **Cestrum** L. (sthn Afr.: 4 spp.)

### ***laevigatum** Schltdl.

Shrub, 6–15 m high; sparsely pubescent. **Leaves** at ends of branches; subsessile; blade decurrent, elliptic to narrowly ovate, 30–100 × 10–38 mm, apex acuminate, margins entire. **Flowers**: in axillary, subspicate, cymose clusters; calyx 3 mm long; corolla trumpet-shaped, 15–20 mm long, light green with creamy yellow lobes; Jan.–Aug. **Fruit** a purplish black berry, 10 mm long. Grassland, karroid veld, disturbed places. Native to South America. *Ink berry*, *poison berry*; *inkbessie* (A).

VreDm | DrGr | KarSh

## **Datura** L. (sthn Afr.: 4 spp.)

### Key to species:

[after Henderson: 31, 33 (2001)]

Capsule ovoid, up to 70 × 60 mm, covered with stout, spreading, spine-like outgrowths up to 30 mm long . . . . . **D. ferox**
Capsule ovoid, up to 50 × 30 mm, covered with slender, spine-like outgrowths up to 10 mm long . . . . . **D. stramonium**

### ***ferox** L.

Annual herb, up to 1 m high. **Leaves** petiolate, simple; blade ovate, up to 200 mm long, margins coarsely and irregularly toothed, veins prominent, upper surface dark green, lower surface paler. **Flowers**: solitary; pedicels slender, pubescent, up to 10 mm long; calyx 25 mm long; corolla up to 65 mm long, white or cream-coloured; Aug.–Apr. **Fruit** an ovoid capsule, up to 70 × 60 mm, covered with stout, spreading, spine-like outgrowths of similar length, up to 30 mm long. Waste places and cultivated lands. Probably native to tropical America. *White stinkweed*, *long-spined thorn apple*, *large thorn apple*; *witstinkblaar*, *grootstinkblaar*, *stinkolieblaar* (A).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### *stramonium L.

*D. tatula* L.

Annual herb, up to 1.5 m high; robust. **Leaves** petiolate; blade ovate, up to 200 mm long, margins coarsely and irregularly toothed, veins prominent, upper surface dark green or purple, paler below. **Flowers**: solitary; pedicels 5 mm long; calyx up to 40 mm long; corolla up to 100 mm long, with 5 prominent teeth on rim, white, mauve or purplish; Oct.–Mar. **Fruit** an ovoid capsule, up to 50 × 30 mm, covered with slender, spine-like outgrowths of unequal length, up to 10 mm long. Disturbed places, weed. Native to tropical America. *Common thorn apple*, *goat apple*, *devil's apple*; *gewonestinkblaar*, *olieblaarneut*, *malpitte*, *persstinkblaar*, *pietjielaporte* (A); *lechoe* (SS); *umhlavuthwa*, *umvumbangwe* (X); *ijoye*, *iloqi* (Z).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

## Lycium L. (sthn Afr.: 24 spp.)

### Key to species:

1a Corolla tube > 12 mm long . . . . . 2
1b Corolla tube ≤ 10 mm long . . . . . 3
2a Leaves, young stems and calyces conspicuously hirsute; calyx deeply incised (with long lobes) and half the corolla tube length. . . . . **L. hirsutum**
2b Leaves, young stems and calyces glabrous; calyx with short lobes and much shorter than the corolla tube . . . . . **L. oxycarpum**
3a Flowers with stamens and style included or slightly exserted from corolla mouth . . . . . 4
3b Flowers with stamens and style conspicuously exserted from corolla mouth . . . . . 5
4a Shrub with young branches pendulous, sometimes with short thorns; leaves usually > 14 mm long, blade linear, narrowly ovate or obovate . . . **L. arenicola**
4b Shrub with young branches erect, conspicuously thorny; leaves usually < 13 mm long, blade obovate . . . . . **L. horridum**
5a Calyx shorter than 1/2 of corolla tube. . . . . **L. cinereum**
5b Calyx longer than 1/2 of corolla tube . . . . . 6
6a Calyx lobes ± as long as calyx tube, oblong with acute apices or narrowly triangular. . . . . 7
6b Calyx lobes shorter than calyx tube, triangular . . . . . 8
7a Leaves and young stems pilose with long, stalked glandular hairs; berries yellow . . . . . **L. pilifolium**
7b Leaves and young stems appear glabrous; berries red . . . . . **L. schizocalyx**
8a Corolla tube up to 5 mm long; stamens inserted in corolla mouth, pilose filament bases visible in corolla mouth. . . . . **L. pumilum**
8b Corolla tube > 5 mm long; stamens inserted at or below middle of corolla tube . . . . . **L. ferocissimum**

### arenicola Miers

Shrub, 3–4 m high; dioecious. **Stems** rigid but young branches pendulous, sometimes thorny, glabrous. **Leaves** clustered on branchlets, 6–15 per cluster, herbaceous, subsessile; blade linear, narrowly ovate or obovate, 14–25 × 1–3 mm, bright green, rarely dull green, glabrous. **Flowers**: unisexual; stamens (male flowers, no style) slightly exserted from corolla tube mouth, but stamens and style (female flowers) included in corolla mouth; ring-shaped nectary around ovary base red; calyx campanulate to tubular, 2.5–3.0 mm long; corolla trumpet-shaped, tube 5–6 mm long (male flowers), or tube narrowly trumpet-shaped, 4.5–5.0 mm long (female flowers), white with violet veins, glabrous outside, pilose inside at stamen insertion,

lobes 1.5–2.0 mm long, spreading; Nov.–Apr. **Fruit** an ovoid berry, 4–5 × 3–4 mm, red, rarely black. Grassland, hill slopes, along watercourses, dongas, dams and pans. *Kareebos*, *rivierkareedoring*, *kriedoring* (A).

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**cinereum** Thunb.

*L. prunus-spinosa* Dunal
*L. roridum* Miers
*L. woodii* Dammer

Shrub, 0.3–2.0 m high. **Stems** rigid, erect-spreading, densely branched and conspicuously thorny, glabrous, often purplish brown, smooth and shiny, young branches greyish white and striped. **Leaves** clustered on branchlets and thorns, 6–12 per cluster, herbaceous, subsessile or short petioles ± 0.5 mm long; clustered on branchlets and thorns; blade oblong to narrowly oblong or spathulate, 7–17 × 1–2 mm, glabrous, bright green. **Flowers**: bisexual; stamens and style conspicuously exserted from corolla mouth; ring-shaped nectary around ovary base yellowish brown; calyx shorter than $^1/_2$ the corolla tube; corolla 5–8 mm long, glabrous outside, pilose inside at stamen insertion, tube whitish, veins and lobes, violet to mauve, 2.0–3.5 mm long, recurved; Aug.–Apr., depending on seasonal rainfall. **Fruit** an ovoid to globose berry, 3–4(–5) × 3–4 mm, red. Grassland, karroid veld, dry sandy calcareous gravel plains, hills, flats, limestone slopes. *Bloukareedoring*, *douvatkareedoring*, *kriedoring* (A).

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**ferocissimum** Miers

*L. bachmannii* Schinz
*L. macrocalyx* Dammer

Shrub, 2–3 m high. **Stems** rigid, erect-spreading, thorny, glabrous, young stems dull green, older stems pale grey to pale pinkish brown. **Leaves** clustered on branchlets and thorns, 3–6 per cluster, sometimes solitary and alternate on young stems, succulent, subsessile or petioles ± 1 mm long; blade obovate to elliptic, 12–24 × 4–7 mm, bright green and shiny. **Flowers**: bisexual; stamens and style conspicuously exserted from corolla mouth, stamens inserted at or below middle of corolla tube; ring-shaped nectary around ovary base red; calyx tubular, 5–7 mm long, calyx lobes shorter than calyx tube, triangular, ± as long as corolla tube; corolla with tube 6–8 mm long, lobes 3–4 mm long, recurved, whitish with violet venation, lobes pale lilac with basal a purple spot, glabrous outside, pilose inside at stamen insertion; Nov.–Jan. **Fruit** a broadly ovoid or spherical berry, 8–10 × 8–10 mm, red. Sandy soils of arid grassland plains. *Slangbessie* (A).

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**hirsutum** Dunal

*L. glandulosissimum* Schinz
*L. pilosum* Dammer

Shrub, 2–3 m high; sprawling. **Stems** rigid and often curved, young stems ash-white to creamy white, densely hirsute, old stems dark grey and less hairy to glabrous. **Leaves** clustered on branchlets and thorns, 5–10 per cluster, solitary and alternate on young stems, herbaceous, subsessile or petioles 4–7 mm long; blade elliptic or narrowly obovate to obovate, 10–28 × 4–8 mm, yellowish to greyish green, densely hirsute. **Flowers**: bisexual; stamens and style included or very slightly exserted from corolla mouth; stamens inserted at or below middle of corolla tube; ring-shaped nectary around ovary base red; calyx funnel-shaped, 6–10 mm long, with oblong lobes > $^1/_2$ the calyx length, densely hirsute; corolla with tube cylindrical 14–20 mm

long, sparsely to densely hirsute outside, pilose inside at stamen insertion, creamy white to dirty white, rarely with purple venation; lobes semi-orbicular, 2–3 mm long, spreading; Apr.–Aug. **Fruit** a spherical to ovate berry, 5–6 × 4–5 mm, red. Along watercourses in alluvial silt, in sand along dry watercourses. *Katbos*, *rivierkareedoring*, *wolhaarbos*, *wolwedoring* (A).

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**horridum** Thunb.

*L. apiculatum* Dunal
*L. echinatum* Dunal
*L. kraussii* Dunal
*L. oxycladum* Miers

Shrub 0.2–1.8 m high; dioecious. **Stems** rigid, erect, tips of young branches soft and green before hardening into thorns, conspicuously thorny, glabrous, young stems whitish, often striped with brown, older stems dark lead-grey or rarely purplish brown. **Leaves** clustered on branchlets and thorns, 4–8 per cluster, succulent, subsessile or petioles up to 2 mm long; green to pale green; blade obovate, 7–12 × 1.5–3.0 mm. **Flowers**: unisexual; stamens (no style) very slightly exserted from corolla mouth (male flowers) or stamens and style included in corolla mouth (female flowers); ring-shaped nectary around ovary base red; calyx tubular, 3.0–3.5 mm long, shorter than half of corolla tube length; corolla narrowly trumpet-shaped, 7–9 mm long (male flowers) or 6–8 mm long (female flowers), glabrous outside, pilose inside at stamen insertion, white with purple patch at base of lilac lobes, lobes 2–3 mm, spreading; Aug.–Apr., depending on rainfall. **Fruit** an ovoid berry, 4–6 × 3.0–3.5 mm, red. Grassland, karroid veld, along watercourses, hillsides, disturbed areas. *Boksdoring*, *slangbessie(bos)*, *wolwedoring* (A).

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**oxycarpum** Dunal

*L. austrinum* Miers
*L. oxycarpum* var. *angustifolium* Dunal

Shrub, or occasionally a small tree, 0.5–5.0 m high; with a spreading crown of curved branches. **Stems** rigid, curved, sometimes erect, thickened at nodes, glabrous; young stems pendulous and often unbranched, pale grey or creamy white, older stems dark brown. **Leaves** clustered on branchlets and thorns, 6–13 per cluster, solitary and alternate on young stems, herbaceous to semisucculent, subsessile or petioles up to 5 mm long; blade obovate, narrowly obovate to oblong-elliptic, 20–30 × 3–8 mm, bright green to yellowish green, glabrous. **Flowers**: bisexual; solitary or 2 per cluster; stamens and style included or slightly exserted from corolla mouth; ring-shaped nectary around ovary base green; calyx tubular to trumpet-shaped, 3–5 mm long, with short lobes; corolla trumpet-shaped with tube narrowly tubular, occasionally curved, 20–24 mm long, glabrous outside, pilose inside at stamen insertion, dirty white or cream-coloured to greenish cream-coloured with violet lobes and purple venation, lobes 2–3 mm long, spreading; Apr.–Oct., depending on seasonal rain. **Fruit** an oblong-elliptic berry, 5–6 × 3–5 mm, red. Karroid vegetation, along watercourses. *Wolwedoring*, *kareedoring* (A).

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**pilifolium** C.H.Wright

*L. dinteri* Dammer

Dwarf shrub, up to 1 m high; forming clusters through subterranean tillering. **Stems** rigid, erect, conspicuously thorny, thorns on young stems many and awl-shaped; young stems and leaves, petioles and calyces pilose with glandular hairs. **Leaves** clustered on branchlets

and thorns, 5–8 per cluster, semisucculent; subsessile or petioles up to 2 mm long; blade obovate or narrowly obovate, 3–10 × 1–4 mm, dull green, pilose. **Flowers**: bisexual; stamens and style conspicuously exserted from corolla mouth; ring-shaped nectary around ovary base brownish yellow; calyx campanulate, 6–7 mm long, longer than half of corolla tube length, calyx lobes ± as long as calyx tube, oblong with acute apices or narrowly triangular, minutely hirsute; corolla narrowly trumpet-shaped, with tube 7–10 mm long, glabrous on outside; lobes 3–4 mm long, ovate-oblong to semi-orbicular, creamy-white, venation purple and lobes mauve, recurved, glandular hair outside, pilose inside at stamen insertion; Dec.–May, Aug., Sep. depending on rainfall. **Fruit** a spherical berry, 6–10 mm in diameter, yellow. Grassland, scrub savanna, karroid veld, depressions, dry riverbeds. *Taaikriedoring* (A).

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**pumilum** Dammer
*L. roseum* Bolus
*L. salinicola* I.Verd.

Shrub, 0.6–1.2 m high. **Stems** rigidly erect, zigzag; young stems greyish white, older stems dark purplish brown and glossy. **Leaves** clustered on branchlets and thorns, 3–8 per cluster, succulent, subsessile; clustered on stems and thorns; blade narrowly elliptic or obovate, 10–15 × 1–2 mm, bluish green; petioles ≤ 6 mm long. **Flowers**: bisexual; stamens and style conspicuously exserted from corolla mouth, stamens inserted in corolla mouth, pilose filament bases visible in corolla mouth; ring-shaped nectar at ovary base red; calyx tubular to campanulate, 2.5–4.0 mm long, calyx lobes shorter than calyx tube, triangular, ± the same length as corolla tube; corolla broadly campanulate, tube 4–5 mm long, glabrous outside, pilose inside at stamen insertion, white with lobes pale lilac, veins purple, lobes 3–4 mm long, spreading; Sep.–Apr. **Fruit** a spherical berry, ± 4 mm in diameter, orange-red. Sandy streambeds and flats, gravelly, rocky hill and mountain slopes, limestone or brackish soil. *Sweet box thorn*; *soetkriedoring* (A).

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**schizocalyx** C.H.Wright

Shrub 0.7–1.7 m high. **Stems** erect, rigid, profusely branched and conspicuously thorny; young stems pale grey and striped, older stem dark brown to purplish brown and glossy, glabrous. **Leaves** clustered on branchlets and thorns, 3–6 per cluster, semisucculent, subsessile; blade oblong-obovate or narrowly obovate, 9–15 × 1–2 mm, bright green, glabrous. **Flowers**: bisexual; stamens and style conspicuously exserted from corolla mouth; ring-shaped nectary at ovary base brownish yellow; calyx broadly trumpet-shaped, 5–7 mm long, calyx lobes as long as or longer than calyx tube, oblong with acute apices or narrowly triangular; corolla narrowly trumpet-shaped, tube 6–8 mm long, lobes 3.0–3.5 mm long, creamy white with venation and lobes purple, reflexed, glabrous outside, pilose inside at stamen insertion; Sep.–Apr. **Fruit** a spherical berry, 6–7 mm in diameter, red. Grassland, thornveld, karroid scrub. *Kareedoring* (A).

| | AcGr | DrGr | | KarSh | |
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## **Nicotiana** L. (sthn Afr.: 4 spp.)

### Key to species:

Leaves petiolate; corolla yellow . . . . . **N. glauca**
Leaves sessile; corolla white to lavender inside, purplish grey outside . . . . . .
. . . . . **N. longiflora**

### *glauca Graham

Small tree or shrub, 3–9 m high. **Stems** and leaves glabrous, bluish green. **Leaves** petiolate; blade ovate to elliptic, up to 250 × 120 mm, margins entire; petioles up to 120 mm long. **Flowers**: in drooping clusters; corolla with tube 30–45 mm long, dilated above, 10 mm in diameter, somewhat contracted at mouth, limb narrow, shallowly and acutely lobed, yellow; Aug.–May. **Fruit** a brown, 4-valved capsule, ± 15 mm long. Weed of roadsides, waste places, riverbanks and -beds. Native to South America. *Tree tobacco*, *wild tobacco*.

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### *longiflora Cav.

Annual or perennial herb, up to 1 m high; glabrescent. **Leaves** sessile; blade ovate to narrowly ovate, apex acute, base cuneate, margins entire. **Flowers**: solitary, subsessile, erect or slightly drooping; calyx tubular, toothed along rim; corolla with tube 40–115 mm long, dilated abruptly below mouth, limb ± 45 mm in diameter, deeply lobed, lobes acuminate, inner surface white to lavender, outer surface purplish; Oct.–Jan. **Fruit** a capsule, ± 15 mm long. Roadsides, disturbed places. Native to South America. *Long-flowered tobacco*.

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## **Nierembergia** (sthn Afr.: 1 sp.)

### *linariifolia Graham var. glabriuscula (Dunal) Cocucci & Hunziker

*N. hippomanica* Miers var. *violacea* Millan

Dwarf shrub, up to 0.2 m high; pubescent with short, rigid hairs, sessile and stipitate glands. **Stems** erect or decumbent, diffusely branched. **Leaves** with blade linear, 8–12 × 0.5–1.5 mm, margins entire. **Flowers**: solitary opposite a leaf; stamens borne on corolla, stipitate glands present on filaments; calyx campanulate, deeply 5-lobed, tube 5–6 mm long, strongly veined, lobes 3–6 mm long, narrowly ovate; corolla cup-shaped, limb 5-lobed, 15–20 mm in diameter, bluish purple; Sep.–Mar. **Fruit** a capsule with many seeds. Garden escape, along roadsides, waste places, abandoned land. Native to Argentina. *Dwarf cup flower*, *purple robe*, *nierembergia*.

| VreDm | | DrGr | MsGr | | |
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## **Physalis** L. (sthn Afr.: 7 spp.)

### Key to species:

1a Plants always stellately hairy . . . . . **P. viscosa**
1b Plants glabrous, if sparsely hairy, hairs not stellate . . . . . 2
2a Leaf blade with margins entire or shallowly toothed . . . . . **P. angulata**
2b Leaf blade margins deeply and irregularly incised-toothed to undulate-toothed . . . . . **P. peruviana**

### *angulata L.

Annual herb, up to 0.5 m high; glabrescent, hairs minute. **Leaves** petiolate; blade ovate, 40–60 × 20–30 mm, apex acute, base rounded to cuneate, margins entire or shallowly toothed; petioles up to 60 mm long. **Flowers**: solitary, axillary; anthers pale blue, ± 2 mm long; calyx

accrescent, 10-angled, 5 major and 5 minor veins; corolla 5–8 mm long, pale yellow with brown markings at base; Jan.–Dec. **Fruit** a globose berry, 8–14 mm in diameter, enclosed by a bladder-like calyx. Native to India. *Wild tomato*, *wild gooseberry*, *groundcherry*.

VreDm | AcGr | DrGr | MsGr | KarSh

### *peruviana L.

Annual herb, 0.25–1.00 m high; glabrous or sparsely hairy. **Leaves** petiolate; blade ovate to narrowly ovate, 50–110 × 35–80 mm, margins deeply and irregularly incised-toothed to undulate-toothed; petioles up to 40 mm long. **Flowers**: solitary; anthers 1.0–2.5 mm long, bluish or violet; fruiting calyx 10-angled or 10-ribbed and nearly terete; corolla yellowish, sometimes with indistinct spots; Jul.–Oct. **Fruit** a globose berry, 10–20 mm in diameter, bright yellow to orange, accrescent calyx papery. Weed of cultivation, in disturbed areas. Native to South America. *Inca berry*, *Cape gooseberry*.

VreDm | AcGr | DrGr | MsGr | KarSh

### *viscosa L.

Perennial herb, up to 0.3 m high; covered with stellate and variously branched hairs; sticky. **Stems** annual from rootstock. **Leaves** petiolate; blade decurrent, ovate, ± 50 × 30 mm, apex acute, base cuneate, margins distantly scalloped, yellowish green; petioles up to 20 mm long. **Flowers**: solitary, drooping; anthers yellow, ± 3 mm long; corolla yellowish, usually dark-maculate; Oct.–Mar. **Fruit** a globose berry, 10–15 mm long, dull yellowish green to orange, completely enclosed by inflated calyx. Weed in disturbed places. Native to Chile, South America. *Sticky gooseberry*; *klewerige appelliefie*, *wilde appelliefie* (A); *kusebere* (SS).

DrGr | MsGr

## **Solanum** L. (sthn Afr.: 65 spp.)

### Key to species:

1a Spines absent. . . . . 2
1b Spines present, sometimes only a few . . . . . 7
2a Leaves with blade pinnately lobed . . . . . **S. triflorum**
2b Leaves with blade lobed, < $^1/_2$-way to midrib . . . . . 3
3a Inflorescences terminal, stout, many-flowered . . . . . **S. mauritianum**
3b Inflorescences lateral, few-flowered . . . . . 4
4a Leaf blade rhombic . . . . . **S. chenopodioides**
4b Leaf blade ovate or elliptic. . . . . 5
5a Shrubs with woody stems; blade obovate-elliptic . . . . . **S. pseudocapsicum**
5b Annual or biennial herbs; blade ovate . . . . . 6
6a Leaf blade with margins sinuate-dentate or entire. . . . . **S. nigrum**
6b Leaf blade with margins prominently lobed . . . . . **S. retroflexum**
7a Inflorescences terminal, stout, many-flowered . . . . . **S. giganteum**
7b Inflorescences lateral. . . . . 8
8a Leaves with blade pinnately lobed . . . . . 9
8b Leaves with blade lobed, < $^1/_2$-way to midrib . . . . . 13
9a Fruit densely spinescent . . . . . **S. rostratum**
9b Fruit not as above . . . . . 10
10a Leaf blade with rounded lobes; stems not patently hairy . . . . . 11
10b Leaf blade with acute lobes; stems patently hairy . . . . . 12

11a Corolla yellow . . . . . **S. supinum** var. **supinum**
11b Corolla white. . . . . **S. sodomaeodes**
12a Fruit an orange-red berry, 20–24 mm in diameter, not enclosed in an enlarged, spiny calyx. . . . . **S. aculeatissimum**
12b Fruit a bright red berry, ± 15 mm in diameter, enclosed in an enlarged, spiny calyx . . . . . **S. sisymbriifolium**
13a Corolla < 15 mm in diameter. . . . . 14
13b Corolla > 15 mm in diameter. . . . . 17
14a Spines recurved or slightly recurved . . . . . 15
14b Spines mostly straight . . . . . 16
15a Leaf blade shallowly scalloped . . . . . **S. catombelense**
15b Leaf blade prominently lobed and apices of lobes ± rounded. . . . . **S. namaquense**
16a Leaf blade ovate, ± 30 × 24 mm, apex acute, base rounded. . . . . **S. tomentosum** var. **coccineum**
16b Leaf blade ovate, up to 80 × 50 mm, apex obtuse, base unequal and rounded or cordate . . . . . **S. tomentosum** var. **tomentosum**
17a Spines curved . . . . . **S. lichtensteinii**
17b Spines mainly straight, sometimes slightly curved . . . . . 18
18a Spines reddish . . . . . **S. elaeagnifolium**
18b Spines whitish yellow. . . . . 19
19a Leaf blade with base cuneate, margins wavy. . . . . **S. panduriforme**
19b Leaf blade with base rounded, margins prominently lobed . . . **S. rubetorum**

### **aculeatissimum** Jacq.

*S. ciliatum* Lam.

Shrub, up to 1.5 m high; with patently hairy stems. **Spines** straight. **Leaves** petiolate; blade broadly ovate-oblong, up to 190 mm long, ± as wide, apex acute, base cordate to rounded, margins deeply pinnately lobed, lobes acute, surfaces with scattered, simple hairs. **Flowers**: inflorescence lateral; corolla 20–30 mm in diameter, lobes narrow, white; Oct.–Feb. **Fruit** an orange-red berry, 20–24 mm in diameter. Forest. *Devil's apple*, *love apple*, *cockroach berry*, *soda apple nightshade*; *thola* (SS); *umthuma* (X, Z).

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### **catombelense** Peyr.

*S. rautanenii* Schinz
*S. sparsiflorum* Dammer

Dwarf shrub or shrub, up to 1 m high; stems hairy. **Spines** slightly recurved. **Leaves** petiolate; blade elliptic 35 × 15 mm, apex rounded, base cuneate, margins shallowly scalloped, densely stellate-hairy. **Flowers**: in a lateral cyme, corymbose; corolla 6–12 mm in diameter, white to violet; Sep.–Jun. **Fruit** a scarlet or orange berry, < 10 mm in diameter. Disturbed places.

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### **chenopodioides** Lam.

*S. gracile* Dunal

Annual or perennial herb, up to 1 m high. **Spines** absent. **Leaves** petiolate; blade rhombic, apex acute, base cuneate, margins entire or shallowly lobed, slightly undulate, pubescent with short, erect or curved hairs; up to 50 mm long. **Flowers**: inflorescence lateral, a few-flowered umbel; corolla 15–20 mm in diameter, white; Aug.–Apr. **Fruit** a black berry, 5–9 mm in diameter. In open, disturbed places.

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### *elaeagnifolium Cav.

Dwarf shrub or shrub, up to 0.6 m high. **Spines** straight, many, reddish, also so on petiole and midrib of leaf. **Leaves** petiolate; blade ovate to narrowly ovate, apex acute, base ± truncate, margins entire to slightly wavy, upper surface green, lower whitish or silvery stellate-pubescent. **Flowers**: in corymbose cymes towards tips of branches, peduncles shortly, densely pubescent; corolla > 15 mm in diameter, mauve; Oct.–Mar. **Fruit** a yellow berry, 12 mm in diameter. Weed of cultivation, disturbed land, roadsides, water furrows. Native to America. *Silverleaf bitter apple*; *satansbos* (A).

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### giganteum Jacq.

Shrub or small tree, up to 4 m high; much-branched stems and peduncles white-woolly. **Spines** straight. **Leaves** petiolate; blade elliptic to obovate, 70–300 × 40–90 mm, apex acute, base cuneate, margins entire, upper surface dark green, lower densely white-woolly; petioles up to 25 mm long. **Flowers**: in terminal, stout, branched heads; corolla ± 10 mm in diameter, white to purple; Nov.–Apr. **Fruit** an orange to red berry, up to 10 mm in diameter. Forest margins, along watercourses, bush clumps. *Goat bitter apple*, *healing-leaf tree*; *geneesblaarboom* (A); *icuba-lasendle* (X).

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### lichtensteinii Willd.

*S. incanum* of authors, not of L.

Dwarf shrub or shrub, up to 2 m high; much branched; stems with appressed hairs. **Spines** curved. **Leaves** with blade narrowly ovate to elliptic, margins shallowly lobed, sinuate; upper surface thinly hairy, green, lower surface densely hairy with short, unbranched hairs, greyish white; Oct.–Mar. **Flowers**: solitary or a few together, inflorescence lateral; corolla 18–30 mm in diameter, purple or white; Aug.–Apr. **Fruit** a yellow berry, ± 20 mm in diameter. Grassland, disturbed places. *Bitter apple*, *bitter thorn*; *bitterappel*, *gifappel*, *grysbitterappel* (A).

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### *mauritianum Scop.

Shrub or small tree, up to 4 m high; stems white-felty. **Spines** absent. **Leaves** petiolate; blade elliptic to narrowly obovate, up to 250 × 100 mm, apex acute to acuminate, base rounded, margins entire, grey-green, upper surface velvety, lower white-felty. **Flowers**: in terminal clusters, stout, many-flowered; corolla purple, ± 10 mm in diameter. **Fruit** a dull yellow berry, ± 10–15 mm in diameter. Forest margins, disturbed places, along watercourses, in bush clumps. Native to South America. *Bugweed*; *luisboom* (A); *ibongabonga*, *isigwayana* (Z), *umbangabanga* (X).

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### namaquense Dammer

Dwarf shrub or shrub, up to 0.8 m high; tomentose. **Spines** recurved. **Leaves** petiolate; blade narrowly ovate to elliptic, 10–55 × 5–20 mm, acute to obtuse, base cuneate, margins prominently lobed, lobes obtuse, discolorous. **Flowers**: in a lateral cluster; corolla 5–10 mm in diameter, violet; Nov.–Apr. **Fruit** an orange, globose berry, 8–10 mm in diameter. Rocky soil.

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### *nigrum L.

Annual or biennial herb, up to 0.85 m high. **Spines** absent. **Leaves** petiolate; blade ± broadly elliptic to ovate, ± 65 × 40 mm, apex acute, base cuneate, margins sinuate-dentate or entire, ± pubescent with simple hairs. **Flowers**: in few-flowered, umbellate cymes, randomly arranged on stem; corolla 10–14 mm in diameter, white; Oct.–Jul. **Fruit** a black, rarely red or yellow berry, 6–7 mm in diameter. Weed of open, fairly dry areas. Native to Europe. *Nightshade*; *wildenastergal*, *inkbessie* (A); *seshoa bohloko* (SS); *umsobosobo* (X, Z).

DrGr KarSh

### **panduriforme** E.Mey.

Perennial herb, dwarf shrub or shrub, up to 0.6 m high. **Spines** small, straight, whitish yellow. **Leaves** with short spines on main veins; blade narrowly oblong-ovate, base cuneate, margins wavy, stellate-pubescent, upper surface green, lower surface greyish. **Flowers**: solitary or in racemose, lateral cymes; corolla 25–30 mm in diameter, purple or mauve; Sep.–May. **Fruit** a yellow berry, ± 20 mm in diameter. Grassland, bush clumps, disturbed places. *Apple-of-Sodom*, *poison apple*, *bitter apple*; *geelapppel*, *bitterappel*, *gifappel* (A); *setlwane*, *tholane* (SS); *intuma* (Z).

DrGr MsGr

### *pseudocapsicum L.

Shrub, up to 2.5 m high; short-lived. **Spines** absent. **Leaves** subsessile; blade decurrent, obovate-elliptic, up to 140 × 20 mm, apex rounded, base cuneate, margins entire or slightly and distantly scalloped, ± glabrous. **Flowers**: in few-flowered, lateral, umbellate cymes, or sometimes solitary; corolla 10 mm in diameter, white; Oct.–May. **Fruit** a green to orange to bright red berry, ± 15 mm in diameter. Disturbed places, along roadsides, streambanks. Native to Europe and Asia. *Winter cherry*, *false capsicum*, *Jerusalem cherry*; *wilderissie*, *gifbessie*, *bosgifappel* (A).

DrGr MsGr KarSh

### **retroflexum** Dunal

Annual herb, up to 0.9 m high; straggling. **Spines** absent. **Leaves** petiolate; blade decurrent, ovate to narrowly ovate, ± 50 × 20 mm, margins prominently lobed, indumentum short, unbranched hairs. **Flowers**: in a few-flowered, drooping umbel; corolla 12–15 mm in diameter, white; Oct.–May. **Fruit** a black berry, ± 8 mm in diameter. Kloofs, along streambanks, disturbed places, often in shade. *Black nightshade*; *nastergal* (A); *limomonyane* (SS); *umsobo wesinja* (X); *ugqumugqumu* (Z).

DrGr MsGr KarSh

### *rostratum Dunal

Annual herb, up to 1.5 m high; densely spiny. **Spines** curved. **Leaves** with blade pinnatifid. **Flowers**: inflorescence lateral; calyx spiny, accrescent, enclosing berry; corolla 20–35 mm in diameter, yellow; Dec.–Mar. **Fruit** a black berry, 10–15 mm in diameter, densely spinescent. Grassland, disturbed places; a tumble weed. Native to the United States, northern and central Mexico. *Buffalo bur*, *spiny nightshade*; *ystervarkbos*, *bitterappel* (A).

DrGr

**rubetorum** Dunal

Shrub, up to 1 m high; roughly hairy, stems erect or scrambling. **Spines** straight, whitish yellow. **Leaves** with long spines on main veins; blade ovate, up to 80 mm long, apex acute, base rounded, margins prominently lobed. **Flowers**: in few-flowered clusters; inflorescence lateral; corolla > 15 mm in diameter, mauve, blue or purple; Jun.–Sep. **Fruit** a yellow to orange berry, up to 15 mm in diameter. Forest. *Wilde-lemoentjie*.

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***sisymbriifolium** Lam.

Perennial herb, dwarf shrub or shrub, up to 1.5 m high; densely spiny; sticky glandular-hairy. **Spines** straight; orange-red or reddish brown. **Leaves** with blade up to 200 mm long, deeply pinnately lobed, lobes further lobed, toothed, both surfaces stellate-pubescent and sparsely glandular. **Flowers**: in a short, lateral raceme; corolla white, cream-coloured or bluish; Jan.–Dec. **Fruit** a bright red berry, enclosed in enlarged, spiny calyx, ± 15 mm in diameter. Waste places, roadsides and trampled veld. Native to South America. *Dense-thorned bitter apple*, *wild tomato*; *digdoringbitterappel*, *doringtamatie* (A).

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**sodomaeodes** Kuntze

Dwarf shrub, up to 0.5 m high. **Spines** straight. **Leaves** petiolate; blade decurrent, narrowly obovate, up to 20 × 5 mm, apex acute to obtuse, base cuneate, margins with a few large rounded lobes. **Flowers**: inflorescence lateral; corolla white; Dec.–Feb. **Fruit** a globose, scarlet berry, ± 10 mm in diameter. Mountain grassland.

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**supinum** Dunal var. **supinum**

*S. aranoideum* Dammer

*S. lyratifolium* Dammer

Dwarf shrub, up to 0.5 m high; sprawling; densely spiny, white-woolly. **Spines** straight. **Leaves** subsessile; blade narrowly ovate, pinnatisect, deeply lobed, almost to midrib, lobes rounded, stellately hairy. **Flowers**: solitary, lateral; calyx spiny, enlarging in fruit; corolla ± 15 mm in diameter, yellow; Oct.–Feb. **Fruit** a yellow berry. Wooded grassland, riverbeds. *Snake berry*; *slangbessie*, *lemoenbossie*, *tandpynbos* (A); *moqhinyetsane* (SS).

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**tomentosum** L. var. **coccineum** (Jacq.) Willd.

Shrub, up to 0.6 m high; stems much branched, grey, velvety. **Spines** straight. **Leaves** petiolate; blade ovate, ± 30 × 24 mm, apex acute, base rounded, margins uneven with deep undulations, rarely entire, clothed with yellowish, stellate hairs, upper surface dark green, lower paler; petioles up to 20 mm long. **Flowers**: in an umbellate, few-flowered, lateral cyme; corolla < 12 mm in diameter, white, mauve; Nov.–Mar. **Fruit** a red berry, 8–9 mm in diameter. Disturbed places.

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**tomentosum** L. var. **tomentosum**

Dwarf shrub, up to 1.5 m high. **Spines** mostly straight, few; golden-brown. **Leaves** petiolate; blade ovate, up to 80 × 50 mm, apex obtuse, base unequal and rounded or cordate, margins

shallowly lobed, wavy, veins prominent on lower surface, surfaces densely stellately hairy; ± 10 mm in diameter. **Flowers**: in an umbellate few-flowered, lateral cyme; corolla 10–12 mm in diameter, white, purple or blue; Nov.–Feb. **Fruit** an orange-red berry. Woodland, stony places. *Kleingrysbitterappeltjie*, *slangappel* (A).

DrGr KarSh Zastr

***triflorum** Nutt.

Perennial herb. **Stems** annual, spreading or decumbent. **Spines** absent. **Leaves** shortly petiolate; blade narrowly ovate, margins pinnatipartite, lobes linear. **Flowers**: in 2- or 3-flowered clusters; corolla ± 10 mm wide, white, occasionally purple-tinged. **Fruit** an orange-red berry, ± 10 mm in diameter. Disturbed places. Native to Argentina. *Cutleaf nightshade*, *small nightshade*.

DrGr

## **Withania** Pauquy (sthn Afr.: 1 sp.)

**somnifera** (L.) Dunal

*Physalis somnifera* L.

*W. microphysalis* Suess.

Shrub, up to 1.5 m high. **Stems** terete, tomentose. **Leaves** shortly petiolate; blade ovate, obovate or oblong, margins entire or very slightly sinuate; petioles ± 10 mm long. **Flowers**: 4–6 in axillary fascicles; calyx with outer surface densely tomentose, enlarging and completely enclosing berry; corolla ± 5.5 mm long, divided nearly to middle into 5 triangular lobes, yellow or yellowish green; Oct.–Jul. **Fruit** a globose berry, 6–7 mm long, glabrous. Grassland, woodland, among rocks on mountain sides; often near water, tending to become weedy in disturbed places. *Winter cherry*; *wilde-appelliefie*, *vuilsiektebossie* (A); *ubuvuma* (X).

DrGr MsGr KarSh

## References

HENDERSON, L. 2001. *Alien weeds and invasive plants: a complete guide to declared weeds and invaders in South Africa*. Agricultural Research Council, Pretoria.

LEISTNER, O.A. 2005. Solanaceae. Seed plants of southern tropical Africa: families and genera. *Southern African Botanical Diversity Network Report* No. 26: 360–362. SABONET, Pretoria.

# STILBACEAE

Dwarf shrubs, shrubs or trees, often multi-stemmed. **Leaves** opposite, ternate or whorled; sessile or petiolate; blade expanded or ericoid; stipules absent. **Flowers**:

bisexual, regular or irregular and bilabiate; in terminal, thyrsoid inflorescences, either solitary on terminal branches or aggregated into compact heads or globose to cylindric spikes; calyx fused, 3–5-lobed, occasionally free; corolla tubular, tube curved or straight, 4- or 5-lobed; stamens 4, sometimes 5, exserted or included; disc small or obsolete; ovary superior, 2-or 3-locular, ovules 1–many in each locule, style terminal, stigma clavate, capitate or bilobed. **Fruit** a dehiscent capsule. **Seeds** variable in number, variously ornamented.

## Key to genera

1a Corolla regular . . . . . **Nuxia**
1b Corolla irregular . . . . . 2
2a Corolla fused into a pouch remote from axis with slit-like mouth . . . . **Bowkeria**
2b Corolla not fused into a pouch remote from axis with slit-like mouth . . . **Halleria**

## **Bowkeria** Harv. (sthn Afr.: 3 spp.)

### **verticillata** (Eckl. & Zeyh.) Schinz

Shrub or small tree, 5–6 m high. **Leaves** sessile or shortly petiolate; 3-whorled; blade narrowly ovate or elliptic, 25–130 × 6–65 mm, apex acute to acuminate, attenuate to subcordate, margins entire, upper surface corrugated with sunken veins, pubescent, bicoloured. **Flowers**: in cymose inflorescences of 1–many-flowered or in pairs, up to 20 mm long; corolla fused into pouch remote from axis with slit-like mouth, 15–20 mm long, white, purple-spotted inside; Nov.–Apr. Boulder beds along rivers and forest margins. *Southern shell-flower*; *suidelike skulpblombos* (A); *isiduli*, *igqabi-lesiduli* (X); *umbaba* (Z).




## **Halleria** L. (sthn Afr.: 3 spp.)

### **lucida** L.

Dwarf shrub, shrub or tree, up to 10 m high; glabrous. **Stems** multiple, branches drooping. **Leaves** opposite; blade ovate or elliptic, up to 90 × 50 mm, apex acute to attenuate, base asymmetrical, square or broadly tapering, margins dentate or subentire. **Flowers**: axillary, in dense clusters, on old wood; corolla with tube up to 40 mm long, orange-red, Apr.–Aug. **Fruit** oval or globose berries, black when ripe. Dense riverine forest, streambanks, mountain scrub and rocky outcrops. *Tree fuchsia*; *notsung* (A); *lebetsa* (SS); *umbinza* (X); *ininza* (Z).




## **Nuxia** Comm. ex Lam. (sthn Afr.: 5 spp.)

### **congesta** R.Br. ex Fresen.

*Lachnopylis congesta* (R.Br. ex Fresen.) C.A.Sm.

Shrub or tree, 2–20 m high. **Leaves** petiolate, 3-nate; blade variable, from elliptic-oblong, oblong, obovate-oblong to suborbicular, 10–80 × 6–38 mm; petioles short, up to 10 mm long.

**Flowers**: in corymbose cymes, broader than long and often overtopped by leaves; corolla white or creamy white, some flowers with purplish tint especially in bud; Feb.–Nov. Dry rocky crests and wooded, stony slopes, at margins of mountain forests. *Wild elder*, *bogwood*; *wildevlier*, *bergsalie* (A); *mokwêrêkwêrê* (T); *umkhobeza* (Z).

VreDm

# TAMARICACEAE

Shrubs or small trees, evergreen, often halophytic. **Leaves** reduced to scales, sessile, alternate, punctate with sunken, salt-secreting glands; without stipules. **Inflorescence** a simple, many-flowered, catkin-like raceme on old and/or on young wood; bracts ± resembling leaves, 1 per flower. **Flowers**: small and many; usually bisexual, regular; pedicels short; sepals 5, free, spreading; petals 5, free, longer than sepals; disc saucer- to cup-shaped, often fleshy, dark coloured with margins variously lobed; stamens 4–10, fused basally with disc; ovary superior, styles 3, short, incurved. **Fruit** a capsule. **Seeds** several to many, narrowly ovoid with an apical tuft of hairs and a plumose awn. *Tamarix family*.

## **Tamarix** L. (sthn Afr.: 5 spp.)

### ***chinensis** Lour.

Evergreen tree, up to 5 m high. **Bark** black or dark brown; branches feathery. **Leaves** minute, scale-like. **Flowers**: in racemes at ends of long, thin twigs; sepals entire; petals ovate, pale to purplish pink; Sep.–Dec. **Fruit** papery, 3–4 mm long. Sandy riverbanks and riverbeds. Native to China. *Chinese tamarisk*; *Chinese tamariske* (A).

AcGr DrGr

# THYMELAEACEAE

Woody dwarf shrubs, shrubs or small trees, often with fibrous bark. **Leaves** alternate or opposite, without stipules. **Flowers**: regular, long and tubular, often in dense heads; sepals 4 or 5, petal-like; petals small and scale-like, arising from mouth between calyx lobes, sometimes absent; stamens 8–10, arising from tube and opposite calyx lobes; anthers not longer than filaments; ovary superior, 1(2)-locular. **Fruit** 1-seeded, dry, remaining closed. *Fibre-bark family*.

The view to regard *Lasiosiphon* as a synonym of *Gnidia* is not followed here.

## Key to genera

[after Wright: 1 (1915)

1a Petals present, fleshy or membranous . . . . . 2
1b Petals absent . . . . . 3

2a Flowers 4-merous . . . . . **Gnidia**
2b Flowers 5-merous . . . . . **Lasiosiphon**
3a Plants herbaceous . . . . . **Gnidia**
3b Plant a shrub or small tree . . . . . 4
4a Shrub or small tree; flowers in pedunculate, bracteate heads; calyx tube pale lilac, pink or white . . . . . **Dais**
4b Shrub; flowers in clusters; calyx creamy yellow to pink, red or brown . . . . . **Passerina**

## **Dais** L. (sthn Afr.: 1 sp.)

### **cotinifolia** L.

Shrub or tree, up to 8(–15) m high. **Leaves** often at ends of branches; opposite or alternate; petiolate; blade ovate to elliptic, 30–90 × 20–50 mm, apex acute to obtuse, margins entire. **Flowers**: in a dense, pedunculate, terminal head, involucral bracts rigid, persistent, green changing to brown or black; petals absent; disc 1–2 mm high; calyx with tube silky hairy on outer surface, 10–30 mm long, lobes unequal, 4–8 × 1–2 mm, pale lilac, pink or white; Oct.–Jan. Margins of upland forests and associated bushland, riverbanks. *Pompon tree*; *kannabas*, *basboom* (A); *tohotsoane* (SS); *intozane* (X); *intozane-emnyama* (Z).




## **Gnidia** L. (sthn Afr.: 81 spp.)

### Key to species:

1a Plant a woody, dwarf shrub; with short branches; greyish silvery hairy . . . . . **G. wikstroemiana**
1b Plant not as above . . . . . 2
2a Flowers in a spike . . . . . 3
2b Flowers in a head, subtended by bracts, or in axils of upper leaves and not distinctly capitate . . . . . 4
3a Plants greyish silky, appressed hairy . . . . . **G. gymnostachya**
3b Plants greenish silky hairy, hairs not always appressed . . . . **G. phaeotricha**
4a Flowers in axils of upper leaves, not distinctly capitate . . . . . **G. polystachya** var. **congesta**
4b Flowers in a bracteate head . . . . . 5
5a Involucral bracts membranous, brownish . . . . . 6
5b Involucral bracts leaf-like . . . . . 7
6a Involucral bracts prominently overlapping . . . . . **G. polycephala**
6b Involucral bracts not prominently overlapping . . . . . **G. microcephala**
7a Inflorescences terminal and axillary when overtopped by young branchlets . . . . . **G. nodiflora**
7b Inflorescences terminal, not overtopped by young branchlets . . . . . 8
8a Branches abbreviated, densely leafy . . . . . **G. compacta**
8b Branches not abbreviated, not densely leafy . . . . . **G. sericocephala**

### **compacta** (C.H.Wright) J.H.Ross

*Arthrosolen compactus* C.H.Wright

Perennial herb, up to 450 mm high; cushion-forming; branches abbreviated, densely leafy. **Leaves** at apices of branches; alternate, imbricate; blade narrowly oblong, 6–8 × 2–3 mm,

apex obtuse. **Flowers**: in terminal heads; petals absent; calyx with tube 4–5 mm long, yellow; Oct.–Jan. Mountain grassland, stony ridges, rocky soil. *Alpine saffron bush*.

MsGr

**gymnostachya** (C.A.Mey.) Gilg
*Arthrosolen gymnostachys* C.A.Mey.

Dwarf shrub, 300–400 mm high; many stemmed; greyish silky, appressed hairy. **Leaves** opposite; sessile; blade narrowly linear-ovate or oblong, 15–17 × 3–4 mm, apex acute. **Flowers**: in terminal, ebracteate spikes; peduncle absent; petals absent; calyx with tube 3.0–3.5 mm long, hairy on outer surface, reddish brown; Oct.–Mar. Open grassland, road verges, hill slopes, sandy soil.

DrGr MsGr

**microcephala** Meisn.
*Arthrosolen microcephalus* (Meisn.) E.Phillips

Perennial herb, up to 300 mm high; stems single or many; glabrous. **Leaves** alternate, sessile or subsessile; blade linear, narrowly ovate to narrowly obovate, 10–18 × 0.5–3.0 mm, apex acuminate or acute. **Flowers**: in sessile or pedunculate heads, surrounded by broad, membranous, brownish bracts, bracts ovate with apices abruptly acuminate, margins ciliate; petals 4; calyx with tube ± 5 mm long, dull yellow to orange; Aug.–Mar. Grassland, hill slopes, roadsides.

DrGr

**nodiflora** Meisn.

Dwarf shrub, up to 350 mm high; multi-stemmed. **Leaves** appressed along stem; blade linear 5–10 mm long, apex acute, densely hairy. **Flowers**: in sessile terminal or axillary clusters when overtopped by young branchlets; petals 8, fleshy; calyx with tube 3–6 mm long, white or pale yellow; Sep.–Mar. Grassland, open mountain grassland.

DrGr MsGr

**phaeotricha** Gilg
*Arthrosolen phaeotrichus* C.H.Wright

Decumbent herb; stems greenish silky, patently hairy. **Leaves** with blade elliptic, 15–20 × 7–8 mm, margins patently hairy. **Flowers**: in a spike; petals absent; calyx with tube 5 mm long, wine-red, dark brown; Dec.–Mar. Grassland, vleis.

MsGr

**polycephala** (C.A.Mey.) Gilg
*Arthrosolen polycephalus* C.A.Mey.

Shrub, up to 0.9 m high. **Leaves** narrowly linear-ovate, apex acute. **Flowers**: in terminal heads; bracts prominently overlapping, membranous, brownish; petals absent; calyx with tube 12–15 mm long, rich yellow; Jul.–Oct. Grassland. Figure 23, p. 28.

AcGr DrGr KarSh

**polystachya** P.J.Bergius var. **congesta** C.H.Wright

Dwarf shrub, up to 2 m high; of variable habit. **Leaves** alternate; appressed along stem; blade narrowly linear-ovate, 5–7 mm long, glabrous. **Flowers**: in axils of upper leaves, not distinctly capitate; petals 8; calyx with tube 3–4 mm long, white; Oct., Nov. Grassland.

MsGr

**sericocephala** (Meisn.) Gilg ex Engl.
*Arthrosolen sericocephalus* Meisn.

Dwarf shrub, up to 1 m high; sericeous or pilose. **Leaves** alternate; sessile; blade linear, 12–20 mm long, apex acute. **Flowers**: in heads borne on long peduncles with leaves; bracts ovate, apices abruptly acuminate; petals absent; calyx with tube 6–12 mm long, silky hairy on outer surface, greenish yellow to pale yellow; Nov.–Jan. Grassland, hill slopes.

DrGr

**wikstroemiana** Meisn.

Dwarf shrub, up to 0.6 m high; stems woody; branches short, rigid. **Leaves** opposite, imbricate; blade narrowly ovate-oblong, ± 4 × 1 mm, greyish silvery hairy. **Flowers**: in small heads; petals 4; calyx tube 3 mm long; Jul.–Oct. Mountain slopes.

DrGr KarSh

## **Lasiosiphon** Fresen. (sthn Afr.: 17 spp.)

### Key to species:

1a Leaves distant . . . . . **L. microphyllus**
1b Leaves longer than internodes . . . . . 2
2a Flower heads distinctly stalked . . . . . 3
2b Flower heads sessile . . . . . 4
3a Inflorescences borne on conspicuous, long peduncles . . . . . **L. kraussianus** var. **kraussianus**
3b Inflorescences with heads borne on short, lax peduncles . . . . . **L. capitatus**
4a Leaves with a persistently dense indumentum . . . . . **L. polyanthus**
4b Leaves glabrous or less dense with age . . . . . 5
5a Leaves glabrous . . . . . **L. caffer**
5b Leaves with indumentum less dense in age, young leaves silvery pubescent . . . . . **L. burchellii**

**burchellii** Meisn.
*Gnidia burchellii* (Meisn.) Gilg

Shrub, up to 0.9 m high; much branched. **Leaves** sessile; blade linear to elliptic, 5–25 × 1.5–4.0 mm, densely appressed-pubescent on both surfaces, less dense with age, becoming glabrous, young leaves silvery hairy. **Flowers**: in terminal, sessile heads; petals present, minute; calyx with tube 15–20 mm long, densely, patently hairy, bright yellow; Jun.–Oct. Grassland, lower slopes of and steep, rocky hillsides. *Harpuisbossie* (A). Figure 59.

VreDm DrGr MsGr KarSh

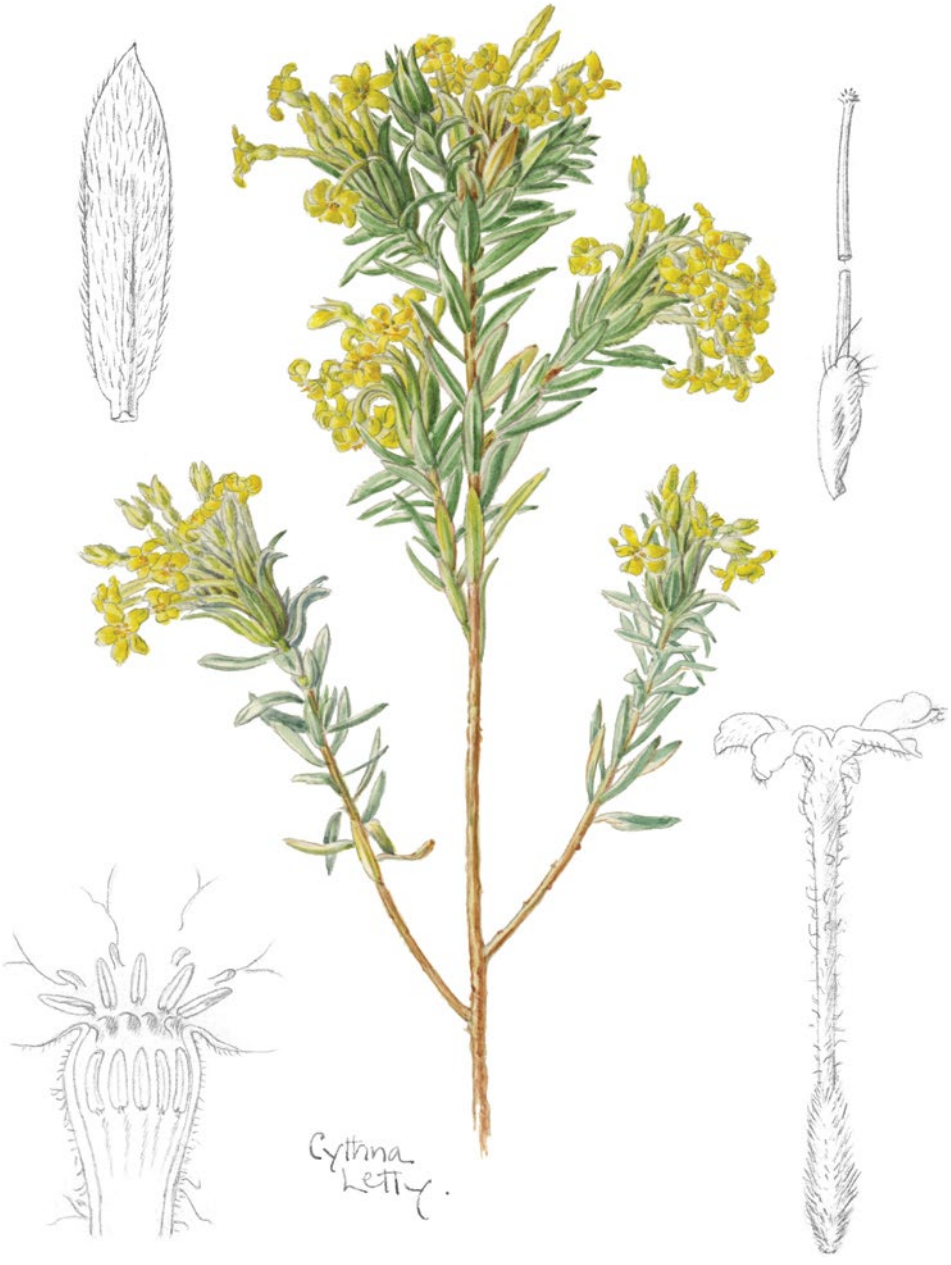



**Figure 59.** *Lasiosiphon burchellii* (Thymelaeceae). Artist: C. Letty.

## THYMELAEACEAE

**caffer** Meisn.

*Gnidia caffra* (Meisn.) Gilg

Dwarf shrub, 300–400 mm high; sparsely silvery hairy; many stemmed; stems yellowish. **Leaves** densely arranged along stems; blade ovate, ± 30 × 6 mm, apex acute, glabrous or pubescent. **Flowers**: in sessile heads, terminal and axillary when overtopped by young branchlets; petals 5; calyx with tube 12–18 mm long, lemon-yellow to dark yellow; Jun.–Mar. Grassland, hill slopes, stony soil. *Gifbossie* (A).

DrGr MsGr

**capitatus** (L.f.) Burtt Davy

*Gnidia capitata* L.f.

*L. linifolius* Decne.

Perennial herb, 250–450 mm high; many stemmed; stems reddish brown. **Leaves** sessile; blade oblong to linear, 30 × 3–6 mm, apex acuminate, upper surface glabrous, lower surface hairy, green to blue-grey. **Flowers**: in lax, few-flowered heads; peduncles short; petals 5; calyx with tube 15–17 mm long, mustard-yellow to orange; Oct.–Dec. Grassland, rocky places. *Kerrieblom* (A); *setele*, *thopa-e-nyenyane*, *thopana* (SS); *isidikili* (Z).

DrGr MsGr KarSh

**kraussianus** (Meisn.) Burtt Davy var. **kraussianus**

*Gnidia hoepfneriana* Gilg

*G. kraussiana* Meisn. var. *kraussiana*

Perennial herb, 0.20–0.75 m high; glabrous to densely hairy; many stemmed. **Leaves** with blade narrowly ovate to ovate, 15–40 × 5–20 mm, margins often fringed with hairs, silky hairy. **Flowers**: in heads borne on long, leafless peduncles; hairy at base of flower; petals 5; calyx with tube 7–12(–15) mm long, yellow or orange; Jun.–Feb. Open grassland, hill slopes. *Lesser yellow-head*; *harige gifbossie* (A); *thobeha*, *thopa* (SS); *umfukuzane*, *umsilawengwe* (Z).

DrGr MsGr KarSh

**microphyllus** (Meisn.) Meisn.

*Gnidia microphylla* Meisn.

Dwarf shrub, up to 350 mm high; many stemmed; sparse foliage. **Leaves** alternate; distant, appressed to stem; blade linear, narrowly ovate or narrowly obovate, 5–10 mm long, apex acute. **Flowers**: in heads with bracts ovate, apices obtuse, appressed silvery hairy, membranous, brownish; petals 5; calyx with tube ± 10 mm long, light yellow; Sep.–Nov. Grassland.

KarSh

**polyanthus** (Gilg) C.H.Wright

*Gnidia polyantha* Gilg

Perennial herb, 400–500 mm high; single stemmed, sparsely branched; silvery silky. **Leaves** crowded on upper parts of stems; blade elliptic to ovate, apex acute, appressed, silvery hairy, not becoming glabrous with age. **Flowers**: in sessile heads; petals 5; calyx with tube 12–18 mm long, lobes up to 8 mm long, spreading-pilose, bright yellow; May–Sep. Grassland, rocky slopes.

MsGr

## **Passerina** L. (sthn Afr.: 16 spp.)

### **montana** Thoday

Shrub, up to 3 m high; many stemmed with many short, slender branchlets. **Leaves** crowded, appressed or slightly diverging from stem; blade ovate to linear, 1.3–4.0 × 0.5 mm. **Flowers**: in terminal, 4-flowered clusters; bracts often keeled and subacute, usually thin and coloured, longitudinally veined, glabrous on back; stamens exserted; calyx with tube 3–5 mm long, creamy yellow to pink, red or brown; Sep.–Dec. Mountain grassland; streambanks, forest edges. *Mountain passerina*, *mountain gonna*; *berg-gonna* (A); *lekhapu* (SS).

DrGr MsGr

## Reference

WRIGHT, C.H. 1915. Thymelaeaceae. *Flora capensis* 5,2: 1–81.

# TROPAEOLACEAE

Annual or biennial herbs, slightly succulent. **Stems** trailing or climbing. **Leaves** alternate; simple; peltate; blade orbicular, margins shallowly lobed. **Flowers**: bisexual, irregular, solitary in axils of leaves; pedicels long; calyx 5-lobed, unequal, dorsal one extended into a long, nectariferous spur; petals 5, free, heteromorphic, clawed; stamens 8, anthers 2-thecous, opening by longitudinal slits; ovary superior, 3-locular with 1 ovule per locule; style simple with 3 stigmatic lobes. **Fruit** dividing into 3, 1-seeded, fleshy mericarps. *Nasturtium family*.

## **Tropaeolum L.** (sthn Afr.: 1 spp.)

### ***majus** L.

Annual herb, up to 0.3 m high; slightly succulent. **Stems** trailing or climbing, up to 1 m long. **Leaves** glabrous; blade orbicular, variable in size, ± 30–150 mm in diameter, margins entire or shallowly lobed, upper surface green, prominently veined, lower surface paler; petioles up to 300 mm long. **Flowers**: solitary on long pedicels; corolla 25–60 mm in diameter, dark orange, shades of red and yellow or yellow with red markings; Oct.–Apr. **Fruit** of 3 mericarps; seeds elongate, 10–15 mm long. Garden escape. Native to South America. *Garden nasturtium*; *kappertjie* (A).

DrGr

# ULMACEAE

Trees or shrubs, rarely climbers, with or without spines. **Leaves** alternate; simple; petiolate; base of blade often with unequal sides, margins variously toothed rarely entire; with stipules. **Flowers**: in terminal or axillary cymes often loose clusters; unisexual, sometimes bisexual, regular; sepals 4–8, free; petals absent; stamens usually same number as sepals and opposite them; ovary superior; styles 2, divergent. **Fruit** a drupe or samara, dry or with a thin fleshy layer. *Elm family*

## Key to genera

Fruit a thinly fleshy drupe . . . . . **Celtis**
Fruit a flattened samara with membranous wings . . . . . **Ulmus**

## **Celtis** L. (sthn Afr.: 3 spp.)

### **africana** Burm.f.

*C. kraussiana* Burm.f.

Deciduous tree, up to 35 m high. **Stems** without spines. **Bark** pale grey, smooth. **Leaves** with blade ovate, 15–100 × 10–50 mm; base asymmetrical, apex shortly and abruptly tapering, margins entire and coarsely toothed or serrate in upper two-thirds, veining on lower surface prominent with 3 major veins from base, sparsely to densely pubescent. **Flowers**: in loose clusters; stamens greenish yellow; perianth maroon; Aug., Sep. **Fruit** a yellow drupe, ovoid, ± 6 mm in diameter. Forest and grassland, bush clumps on hillsides. *Camdeboo stinkwood*, *white stinkwood*; *witstinkhout*, *camdeboostinkhout* (A); *lesika* (SS); *modutu* (T).

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## **Ulmus** L. (sthn Afr.: 2 spp.)

### ***parvifolia** Jacq.

Medium-sized tree, up to 6 m high. **Stems** with branchlets thinly pubescent, branches without spines. **Leaves** petiolate; blade elliptic to ovate, small, 25–45 × 10–20 mm long, base asymmetric, apex acute, margins serrate, leathery, glossy green on upper surface, prominently veined on lower surface, glabrous; stipules present, falling early. **Flowers**: inconspicuous; Mar. **Fruit** a flattened samara with membranous wings. Streambanks, garden escape. Native to China and Japan. *Chinese elm*; *Chinese iep*, *fynblaar olm* (A).

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# URTICACEAE

Herbs, dwarf shrubs, shrubs or occasionally small trees; sap watery; bark tough and fibrous. **Indumentum** of stiff non-stinging hairs, often curled or sharply hooked or of

stinging hairs. **Leaves** alternate, rarely opposite, simple; blade sometimes lobed, with 3 subequal nerves from base reaching towards leaf apex; with stipules. **Flowers**: very small, regular, unisexual; calyx with 4 or 5 lobes; petals absent; stamens the same number as and opposite calyx lobes; filaments bent inward in bud; ovary superior, 1-locular. **Fruit** an achene. *Nettle family*.

## Key to genera

1a Plants with stinging hairs . . . . . **Urtica**
1b Plants with no stinging hairs . . . . . 2
2a Leaf blade broadly ovate, margins entire . . . . . **Parietaria**
2b Leaf blade narrowly ovate, margins crenate. . . . . **Didymodoxa**

## **Didymodoxa** Wedd. (sthn Afr.: 2 spp.)

### **caffra** (Thunb.) Friis & Wilmot-Dear

Slender, annual herb, up to 0.5 m high, much branched. **Leaves** with blades 2–3 × as long as broad, margins with apical teeth, sparse, appressed, stiff hairs on upper surface, lower surface with many hairs on veins, a few scattered ones between veins. **Stipules** narrowly ovate with apex attenuate. **Flowers**: anthers white; perianth green; Nov.–Mar. **Fruit** covered with broad, hooked hairs and glands. Among rocks or in forest in moist places.

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## **Parietaria** L. (sthn Afr.: 1 sp.)

### **debilis** G.Forst.

Annual, occasionally perennial, herb, 0.17–0.45 m high. **Stems** procumbent, delicate. **Leaves** with blades broadly ovate, 5–30 × 3–23 mm, apex ± obtuse, margins entire. **Flowers**: 1–few in leaf axils, male, female and bisexual intermixed; bracts with unbranched, glandular hairs and long curved, unbranched standard hairs. **Fruit** ± 1.5 mm long, smooth, glabrous, shiny, dark brown. Wet shady places such as caves, dense forest and also on edges of vleis.

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## **Urtica** L. (sthn Afr.: 3 spp.)

### Key to species:

Leaf blade as broad as or broader than long, base cordate . . . . . **U. lobulata**
Leaf blade elliptic, base cuneate . . . . . **U. urens**

### **lobulata** Blume

Erect, annual herb, up to 0.8 m high. **Stems** with dense stinging hairs. **Leaves** with blade as broad as or broader than long, 20–170 × 20–180 mm, base cordate, margins toothed, teeth sometimes lobed. **Flowers**: in dense, cylindrical inflorescences, erect to drooping; sessile or

shortly pedicellate; perianth green; Oct.–Jan. **Fruit** smooth to rugose, pale ochre to brownish, sometimes with pale to dark brown speckling. Among rocks in seepage areas or along streams.

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***urens** L.

Erect, ascending or procumbent, annual herb, up to 0.5 m high, monoecious. **Stems** with stiff hairs when young, stinging hairs dense to sparse. **Leaves** with blade elliptic, 22–45 × 18–28 mm, base cuneate, margins with long, narrow teeth, often 3-lobed. **Flowers**: perianth green; Nov. **Fruit** smooth or minutely punctate, pale ochre. An invasive weed of disturbed places, in shade or sun. Native to Eurasia. *Burning nettle*, *stinging nettle*; *brandnetel*, *brandblare*; *ububazi* (X); *imbabazane* (Z).

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# VAHLIACEAE

Herbs or dwarf shrubs, glabrous or glandular-hairy. **Leaves** opposite, simple, sessile or subsessile; blade obovate, ovate to linear, entire, midrib apparent, but lateral veins obscure; without stipules. **Flowers**: in axillary pairs; bisexual, regular; calyx tube cup-shaped, fused to ovary; petals 5, free, shorter than or just exceeding calyx lobes; stamens 5, arising from margin of a disc, filaments free; ovary inferior, styles 2, free. **Fruit** a many-seeded capsule, all floral parts (except anthers) persistent. *Vahlia family*.

## **Vahlia** Thunb. (sthn Afr.: 2 spp.)

### Key to varieties:

Leaf blade narrowly linear to linear, seemingly glabrous, but sparsely adpressed pubescent, hairs unbranched, multicellular . . . . . **V. capensis** subsp. **vulgaris** var. **linearis**

Leaf blade linear to narrowly ovate or occasionally narrowly obovate, sparsely to densely glandular-hairy . . . . . .**V. capensis** subsp. **vulgaris** var. **vulgaris**

**capensis** (L.f.) Thunb. subsp. **vulgaris** Bridson var. **linearis** E.Mey. ex Bridson
*V. cynodonteti* Dinter

Many-stemmed, annual, occasionally perennial herb, up to 150 mm high. **Stems** not or sometimes slightly woody at base. **Leaves** with blade narrowly linear to linear, up to 2 mm wide, seemingly glabrous, but sparsely appressed pubescent, hairs unbranched, multicellular. **Flowers**: petals ± as long as calyx, ± 4 mm long; corolla yellow; Oct.–Mar. **Fruit** ± 2 mm long. Grassland.

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**capensis** (L.f.) Thunb. subsp. **vulgaris** Bridson var. **vulgaris**

Much-branched, annual, occasionally perennial herb, up to 380 mm high. **Leaves** with blade linear to narrowly ovate or occasionally narrowly obovate, sparsely to densely glandular-hairy.

**Flowers**: petals shorter than calyx lobes, ± 2.5–3.0 mm long; corolla yellow; Nov.–Apr. **Fruit** ± 2 mm long. Grassland.

VreDm | | DrGr | | | |

# VALERIANACEAE

Annual or perennial herbs, odoriferous. **Leaves** opposite, often in a basal rosette; simple or compound; blade with margins entire; without stipules. **Flowers**: in a dichasial cyme; regular to weakly irregular; calyx absent or reduced to small teeth, or forming a pappus, persisting on the fruit; corolla tubular or trumpet-shaped; stamens 1–4, arising from corolla; ovary inferior, style slender with a 2- or 3-lobed stigma. **Fruit** an achene, sometimes crowned with an enlarged calyx. *Valerian family*.

## **Valeriana** L. (sthn Afr.: 1 sp.)

### **capensis** Thunb. var. **capensis**

Perennial herb, up to 1.5 m high. **Stems** arising singly from a fleshy rhizome and fibrous roots; unbranched; glabrous. **Leaves** mainly basal; blade pinnate or pinnatipartite, up to 130 mm long, imparipinnate with terminal leaflet larger than lateral ones. **Flowers**: inflorescence branches near top of stem; calyx segments form a feathery pappus in fruit; corolla trumpet-shaped, white, sometimes flushed pink, throat often with dense white hairs; Oct.–Feb. **Fruit** narrowly ovoid, 3–5 × 1.5–3.0 mm, glabrous, ribbed. Marshy areas and streamsides in upland grasslands. *Cape valerian*; *wildebalderjan* (A); *motetele* (SS).

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# VERBENACEAE

Herbs, shrubs or trees. **Stems** often 4-angled. **Leaves** opposite, sometimes whorled; blade simple, variously lobed or deeply dissected, margins entire or toothed, often strongly scented; without stipules. **Flowers**: in branched racemes, or in spike-like inflorescences; ± irregular, frequently ± 2-lipped; calyx 4- or 5-lobed or -toothed, tubular or campanulate, persistent, sometimes accrescent; corolla tubular, 4- or 5-lobed, stamens usually 4, arising from corolla tube, alternating with corolla lobes; disc inconspicuous; ovary superior, style terminal, stigma entire or bifid. **Fruit** a drupe, or dividing at maturity into nutlets or pyrenes. *Vervain family*.

## Key to genera

1a Fruit with 2 or 4 pyrenes; ovary 4-locular . . . . . 2
1b Fruit with (1)2 pyrenes; ovary 2-locular . . . . . 3
2a Calyx hardly accrescent; pyrenes 4, each 1-seeded . . . . . **Verbena**
2b Calyx accrescent in fruit; pyrenes 2, each 2-seeded . . . . . **Priva**

3a Calyx with a conspicuous tube . . . . . **Chascanum**
3b Calyx very small and inconspicuous . . . . . 4
4a Fruit fleshy, drupaceous, in obvious small clusters; calyx truncate or shallowly toothed; corolla 4- or 5-lobed . . . . . **Lantana**
4b Fruit dry and hard; calyx 2–4-fid or conspicuously toothed; corolla 4-lobed . . . . . 5
5a Shrubs, dwarf shrubs or perennial herbs . . . . . **Lippia**
5b Soft herbs, stems decumbent, rooting at nodes . . . . . **Phyla**

## **Chascanum** E.Mey. (sthn Afr.: 14 spp.)

### Key to species:

Leaves with blade obovate to very broadly obovate, margins dentate to serrate-dentate in upper half . . . . . **C. hederaceum** var. **hederaceum**
Leaves with blade deeply lobed, margins entire . . . . . **C. pinnatifidum** var. **pinnatifidum**

### **hederaceum** (Sond.) Moldenke var. **hederaceum**

*Plexipus hederaceus* (Sond.) R.Fern. var. *hederaceus*

Perennial herb, 0.10–0.45 m high. **Stems** and branches short and glandular pubescent. **Leaves** petiolate; blade obovate to very broadly obovate, 8–40 × 7–30 mm, base long-cuneate, apex obtuse, margins dentate to serrate-dentate in upper half; petioles 1–7 mm long. **Flowers**: in slender, many-flowered spikes 40–300 mm long; corolla with tube 20–30 mm long, lobes 4.0–4.5 mm long, white, cream-coloured, yellow; Oct.–Mar. **Fruit** with cocci separating spontaneously when ripe. Grassland.




### **pinnatifidum** (L.f.) E.Mey. var. **pinnatifidum**

*Plexipus pinnatifidus* (L.f.) R.Fern. var. *pinnatifidus*

Perennial herb, 0.1–0.5 m high. **Stems** and branches shortly pubescent, eglandular. **Leaves** with blade deeply lobed, 10–50 × 10–30 mm, segments 5–7, decurrent, base cuneate, apex acute or obtuse, margins entire. **Flowers**: in abbreviated, usually few-flowered spikes, 10–45 mm long; corolla with tube 18–25 mm long, white, cream-coloured or dull yellow; Nov.–Mar. **Fruit** with cocci not separating spontaneously when ripe. Grassland, often in shade.




## **Lantana** L. (sthn Afr.: 6 spp.)

### **rugosa** Thunb.

*L. salviifolia* Jacq.

Much-branched shrub, up to 1 m high; densely, shortly pubescent. **Leaves** petiolate; blade ovate to narrowly ovate, 7–55 × 5–40 mm, apex acute, margins closely crenate or crenulate with 9–15 shallow teeth on either side; petioles up to 8 mm long. **Flowers**: in elongate spikes; lowest bracteoles larger than rest; calyx ± as long as corolla tube; corolla with tube 3–4 mm long, swollen in middle, pink to mauve; Sep.–Jun. **Fruit** a drupe, 2.5–3.5 mm long, purple or wine-coloured on ripening. Hill sides, grassland and woodland, often in shade of bush clumps.

*Bird's brandy*; *voëlbrandewyn*, *wildesalie* (A); *mabele-mabutsoa-pele*, *molutoane* (SS); *utyani-bentaka* (X); *ubukhwebezane*, *ubungungundwane*, *uguguvama*, *umkhukhuthwane*, *utshwala*, *benyoni*, *impema* (Z).

VreDm | AcGr | DrGr | MsGr | KarSh

## **Lippia** L. (sthn Afr.: 6 spp.)

### **scaberrima** Sond.

Perennial herb or low shrub, up to 0.6 m high; strongly aromatic. **Stems** 1–several, erect or spreading. **Leaves** petiolate; narrowly ovate to elliptic, 25–65 × 4–20 mm, base cuneate, apex acute, margins crenate-serrulate in upper part, entire in lower part, veins prominent below, surfaces glandular and strigose. **Flowers**: in dense, many-flowered spikes; bracts broadly ovate, up to 12 × 6 mm, apex shortly acuminate, exceeding flowers; calyx distinctly 2-lobed, hispidulous; corolla with tube ± 4 mm long, white or cream-coloured; Aug.–Apr. Grassland and along roadsides. *Beukesbossie*, *laventelbos* (A); *mosukutswane* (T); *umsuzwane* (Z).

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## **Phyla** Lour. (sthn Afr.: 1 sp.)

### ***nodiflora** (L.) Greene

*Lippia nodiflora* (L.) Michx.
*L. nodiflora* (L.) Greene var. *rosea* (D.Don) Moldenke

Perennial herb. **Stems** decumbent, rooting at nodes. **Leaves** shortly petiolate or subsessile; blade spathulate, obovate to narrowly obovate, 8–72 × 4–25 mm, base cuneate, margins entire in basal half, sharply and coarsely dentate towards apex; petioles up to 8 mm long. **Flowers**: in short, dense spikes; peduncles much longer than subtending leaves; calyx deeply 2-lobed; corolla with tube 1.5–2.0 mm long, 2-lipped, upper lip 2-lobed, lower one 3-lobed, white with a yellow throat or mauve-pink; Jul.–Feb. Water's edge or seepage areas. Native to South America and the United States. *Turkey tangle*.

DrGr | KarSh

## **Priva** Adans. (sthn Afr.: 3 spp.)

### **meyeri** Jaub. & Spach var. **meyeri**

Perennial herb, up to 0.5 m high. **Stems** laxly spreading or sprawling. **Leaves** petiolate; blade ovate, 15–50 × 10–35 mm, base truncate, apex acute, margins crenate; petioles up to 8 mm long. **Flowers**: in a terminal spike; calyx accrescent in fruit; corolla 7–10 mm long, only white or with pale mauve markings; Sep.–May. **Fruit** dry, enclosed in calyx tube, separating into 2 pyrenes. Bush clumps, along watercourses, disturbed places, in shade. *Blasiesklits* (A).

DrGr

## **Verbena** L. (sthn Afr.: 6 spp.)

### Key to species:

[after Fernandes: 9 (2005)]

1a Leaves deeply divided . . . . . 2
1b Leaves simple, margins at most only serrate or incised-serrate. . . . . 3
2a Corolla with tube ± 2.5 mm long, limb ± 2 mm in diameter; calyx 2.0–2.5 mm long; spikes slender, becoming elongate in fruit . . . . . **V. officinalis** subsp. **africana**
2b Corolla with tube 10–13 mm long, limb > 6 mm in diameter; calyx 7–9 mm long; spikes head-like . . . . . **V. aristigera**
3a Leaves petiolate, or if sessile then not amplexicaule, blade with base attenuate; spikes not dense, elongate, lax in fruiting stage . . . . . **V. litoralis**
3b Leaves sessile, amplexicaule, blade with base widening or subcordate; spikes dense in fruiting stage . . . . . 4
4a Plant a creeping, rhizomatous herb with aerial stems 0.15–0.60 m high; floral bracts 2–3 × as long as calyx; corolla tube 9–10 mm long. . . . . **V. rigida**
4b Plant not a creeping, rhizomatous herb, stems erect, robust, up to 2.5 m high; floral bracts nearly equalling calyx; corolla tube up to 5.5 mm long . . . . . 5
5a Uppermost corolla limbs overtopping spike; floral bracts slightly shorter than calyces . . . . . **V. bonariensis**
5b Uppermost corolla limbs not overtopping spike; floral bracts equalling or slightly longer than calyces. . . . . **V. brasiliensis**

### ***aristigera** S.Moore

*V. tenuisecta* Briq.

Perennial herb, up to 0.3 mm high. **Stems** procumbent, decumbent, trailing. **Leaves** with fascicles of smaller leaves in axils; blade triangular or ovate, 20–35 × 20–30 mm, 2-pinnatisect or 3-sect with segments also 2-pinnatisect or 3-sect, decurrent. **Flowers**: in dense, solitary, terminal, head-like spikes; calyx 7–9 mm long; corolla with tube 10–13 mm long, limb > 6 mm in diameter; bluish purple, sometimes white; Sep.–Mar. Grassland, disturbed places. Native to South America. *Moss verbena*, *tuber vervain*, *fine-leafed verbena*; *wilde verbena*, *fynblaar verbena* (A).

DrGr

### ***bonariensis** L.

Perennial herb, up to 2 m high. **Stems** stiffly erect, strongly 4-angled. **Leaves** simple; sessile; blade ovate, narrowly ovate or oblong, 50–120 × 5–30 mm, amplexicaul, margins dentate to incised-serrate. **Flowers**: in many spikes, spikes in a dense flat-topped or rounded cluster; uppermost corolla limbs overtopping spike; floral bracts slightly shorter than calyces; corolla tube up to 5.5 mm long, corolla blue or mauve; Oct.–May. Grassland, along streams and riverbanks, marshy places. Native to South America. *Purple top*, *wild verbena*; *blouwaterbossie* (A).

DrGr MsGr

### ***brasiliensis** Vell.

Annual, occasionally a short-lived perennial, robust herb, 0.7–1.5 m high. **Stems** stiff, branched above, 4-angled. **Leaves** simple; blade oblong, ovate-oblong to narrowly ovate, 50–80 × 12–35 mm, decurrent, margins serrate to double serrate. **Flowers**: in many spikes, spikes

in a dense flat-topped or rounded cluster; uppermost corolla limbs not overtopping spike; floral bracts equalling or slightly longer than calyces; corolla tube up to 5.5 mm long, corolla mauve, purple or bluish purple; Sep.–May. Grassland, along riverbanks and streambanks and disturbed places. Native to South America.

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### *__litoralis__ Humb., Bonpl. & Kunth

Perennial herb or shrub, up to 2 m high. **Stems** erect or suberect; 4-angled. **Leaves** simple, petiolate or sessile, not amplexicaule; blade ovate, rhombic ovate or narrowly obovate, 20–50 × 10–20 mm, margins serrate to double serrate, base attenuate. **Flowers**: in much-branched inflorescences with lax groups of triads; triads with median spike usually longer and subsessile, lateral ones on peduncles, 5–8 mm long; calyx 2–3 mm long; corolla 3.0–3.5 mm long; corolla violet or purple; Nov.–May. Grassland. Native to South America.

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### *__officinalis__ L. subsp. __africana__

Perennial or annual herb, up to 1 m high. **Stems** erect, leafy, 4-angled. **Leaves** simple, deeply lobed; blade ovate, 40–105 × 25–80 mm, 3-partite or -pinnatifid. **Flowers**: in many, slender, terminal and axillary spikes, becoming elongate in fruit; calyx 2.0–2.5 mm long; corolla with tube ± 2.5 mm long, limb ± 2 mm in diameter; pale pink, purple or blue; Oct.–Jan. Along riverbanks, streambanks, disturbed wet places. Native to Europe and Asia. *Vervain*, *wild verbena*; *Europese verbena* (A); *seona-se-seholo* (SS).

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### *__rigida__ Spreng.

*V. venosa* Gillies & Hook.

Perennial, mat-forming herb, up to 0.6 m high. **Stems** erect. **Leaves** sessile; blade oblong, narrowly obovate or oblong-ovate, 30–120 × 10–25 mm, base amplexicaul or subcordate, margins coarsely dentate to incised serrate. **Flowers**: in solitary, terminal spikes or 3–5 spikes in dichotomous cymes; bracts 2–3 × as long as calyx; corolla tube 9–10 mm long, corolla reddish or bluish purple, mauve, white in lower part; Sep.–May. Grassland and disturbed places. Native to South America. *Veined vervain*; *morod* (SS).

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## Reference

FERNANDES, R. 2005. Verbenaceae. *Flora zambesiaca* 8,7: 6–61.

# VITACEAE

Shrubs, herbs or trees. **Stems** erect, procumbent, or climbing; often succulent. **Tendrils** present or absent. **Leaves** alternate, simple, pinnately or palmately compound, sessile or petiolate, often succulent; with stipules. **Flowers**: inflorescence opposite a leaf; small, regular, greenish; disc present; petals 4–6, free or often ± united at tips and falling as bud opens; stamens 4–6, free, opposite petals; ovary superior, embedded in disc; style short. **Fruit** a berry. *Grape family*.

## Key to genera

Flower bud cylindrical, constricted ± in middle; disc divided into 4 glands . . . . . .
. . . . . .**Cyphostemma**
Flower bud subglobose, not constricted in middle; disc annular . . . . .**Rhoicissus**

## **Cyphostemma** (Planch.) Alston (sthn Afr.: 34 spp.)

**hereroense** (Schinz) Desc. ex Wild & R.B.Drumm.
*Cissus hereroensis* Schinz

Succulent, procumbent herb. **Leaves** pubescent; blade digitately 3–6-foliolate, sessile; blades of leaflets folded or rolled in, narrowly obovate to very narrowly elliptic, ± 100 × 17 mm, base narrowly cuneate, margins coarsely serrate. **Flowers**: corolla greenish yellow or yellow with reddish brown tips; Dec.–Feb. **Fruit** subglobose, puberulous, orange when ripe. Open grassland flats, in deep sand or hard, gravelly soil. *Lakseerbos* (A).

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## **Rhoicissus** Planch. (sthn Afr.: 7 spp.)

**tridentata** (L.f.) Wild & R.B.Drumm. subsp. **cuneifolia** (Eckl. & Zeyh.) Urton
*R. cuneifolia* (Eckl. & Zeyh.) Planch.
*R. erythrodes* (Fresen.) Planch.

Shrub or woody climber, up to 10 m or higher. **Leaves** glabrescent, fulvous- or ferruginous-pubescent; blade 3-foliolate, terminal leaflet with > 4 dentations or crenations, narrowly to broadly obovate, base cuneate. **Flowers**: greenish yellow; Jan.–Apr. Grassland, bushveld, woodland, riverbanks. *Bushman's grape*; *boesmansdruif* (A); *morara-oa-thaba* (SS); *isaqoni* (X); *isinwazi*, *umthwazi* (Z).

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# ZYGOPHYLLACEAE

Annual or perennial herbs, shrubs or trees. **Branches** often jointed at nodes. **Leaves** opposite, alternate or fascicled; sometimes anisophyllous; blade simple or pinnately compound, or with 1–3 leaflets; with stipules. **Flowers**: in axillary or terminal cymes,

paired or solitary in leaf axils; bisexual or unisexual; regular; disc usually present; sepals and petals 5, free; stamens usually twice as many as petals; ovary superior, style 1. **Fruit** a capsule, schizocarp with mericarps often spinescent, or a fleshy drupe. *Devil-thorn family*

## Key to genera

Leaves paripinnate; fruit indehiscent, splitting into spiny indehiscent mericarps . . . . . **Tribulus**
Leaves simple or bifoliolate; fruit capsular or splitting into indehiscent mericarps . . . . . **Zygophyllum**

## **Tribulus** L. (sthn Afr.: 5 spp.)

### Key to species:

Mericarps with 2 lateral divergent acute spines inserted above middle, and 2 shorter spines directed downwards and inserted near base of mericarp . . . . . **T. terrestris**
Mericarps armed with 4(–6) well-developed spines or spines much reduced, giving mericarp a warted appearance . . . . . **T. zeyheri**

### **terrestris** L.

Annual herb. **Branches** spreading, procumbent or decumbent. **Leaves** pinnate, usually unequal with 1 of a pair shorter than other. **Flowers**: intrastaminal glands free; petals 3–12 mm long, yellow; Sep.–Mar. **Fruit** schizocarp; mericarps with 2 lateral divergent acute spines inserted above middle, and 2 shorter spines directed downwards and inserted near base of mericarp. Grassland, disturbed areas. *Devil's thorn*; *dubbeltjie*, *volstruisdoring* (A); *inkunzane* (Z).

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### **zeyheri** Sond. subsp. **zeyheri**

Perennial herb. **Branches** procumbent. **Leaves** unequal, the larger up to 90 mm long, up to 9-jugate, the smaller up to 50 mm long, up to 4-jugate. **Flowers**: intrastaminal glands connate to form cup at base of ovary; petals broadly cuneate, up to 25 mm long, yellow; Oct.– Apr. **Fruit** schizocarp; mericarps armed with 4(–6) well-developed spines or spines much reduced, giving mericarp a warted appearance. Savanna, deep sand, disturbed areas. *Devil-thorn weed*; *dubbeltjiedoring*, *platdubbeltjie* (A).

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## **Zygophyllum** L. (sthn Afr.: 44 spp.)

### Key to species:

[after Van Zyl: 81 (2000)]

1a Leaves simple; fruit succulent when fresh, mericarps thin-walled with many dark tubercles. . . . . **Z. simplex**
1b Leaves bifoliolate; fruit not succulent nor with tubercles. . . . . 2

2a Fruit dividing in 5 mericarps; mericarps with undulate wings . . . . . **Z. microcarpum**
2b Fruit a capsule . . . . . 3
3a Fruit ridged; young stems white-pustulate, hairy, spines present . . . . . **Z. incrustatum**
3b Fruit winged; young stems not white-pustulate hairy, spines absent . . . . . **Z. lichtensteinianum**

## **incrustatum** E.Mey. ex Sond.

Rounded to spreading, many-stemmed shrub, up to 1 m high. **Stems** with prominently white, densely pustulate, hairy, young branches and spike-like branchlets, branchlets at first a nude spine which eventually becomes leafy or remains leafless; spines single or branched. **Leaves** bifoliolate; leaflets conduplicate or open, elliptic, base rounded, apex obtuse, sparsely glandular; petioles 3–4 mm long. **Flowers**: solitary, axillary; nectar disc fleshy, papillate, regularly 10-angled; petals obovate, 9–10 mm long, base with claw, apex obtuse, emarginate, deep yellow, unmarked; Oct.–Mar. **Fruit** a drooping, ovoid, 5-lobed capsule, each lobe with a prominent central ridge where splitting will occur, black when dried. Along pans, streambanks, hill slopes. *Skeleton*; *spekboskareedoring*, *witkriedoring*, *ysterbos* (A).




## **lichtensteinianum** Cham. & Schltdl.

*Z. gilfillani* N.E.Br.

Rounded, many-stemmed shrub, up to 1 m high. **Leaves** bifoliolate with flat petioles, petioles 3–10 mm long; leaflets obovate, 8–17 mm long, base oblique, apex obtuse. **Flowers**: solitary, axillary; nectar disc fleshy, papillate, 10-angled; petals suborbicular or widely obovate, 8–11 mm long, base with a short claw, apex rounded, emarginate, pale yellow with reddish brown, rhombic markings at base; Oct.–May. **Fruit** a subspheroid, 5-winged capsule, 6–7 mm long; wings reticulate, apex and base usually retuse. Along streambanks, hill slopes and ridges. *Spekbos*, *skilpadbos*, *vaalspekbos* (A).




## **microcarpum** Licht. ex Cham. & Schltdl.

Erect shrub, up to 1.5 m high. **Leaves** bifoliolate with petioles 4–8 mm long; leaflets narrowly obovate, 6–11 mm long. **Flowers**: solitary, axillary; petals spathulate with a long claw, 7–8 mm long, apex round, white or pale yellow; nectar disc smooth, 10-angled with 10 small lobes orientated downwards at base; Jan.–Dec. **Fruit** an erect or semi-erect, 5-winged capsule, propellate (twisted like a propeller), yellow or reddish orange when mature; wings undulate. Rocky hillsides, roadsides, grassland, brackish soil, sandy loam. *Armoedsbos*, *gannabos*, *ou-ooibos*, *sandrapuis* (A).




## **simplex** L.

Annual or biennial, procumbent herb, up to 0.1 m high, forming dense mats. **Leaves** simple, sessile, obovoid or globose, 4–12 × 1.5–4.0 mm. **Flowers**: solitary or 2 together, axillary; petals spathulate, 3–4 mm long, yellow; Jan.–Dec. **Fruit** breaking up in 5 mericarps; mericarps thin walled with many dark tubercles arranged in rows or scattered along margins. Margins of pans, hill slopes, in dry, sandy riverbeds. *Brakkies*, *brakspekbos*, *panspekbos*, *rankspekbos*, *volstruisdruiwe*, *volstruisslaai* (A).



## Reference

VAN ZYL, L. 2000. *A systematic revision of* Zygophyllum *(Zygophyllaceae) in the southern African region*. Unpublished Ph.D. thesis, University of Stellenbosch, Stellenbosch.

# Monocotyledonae

See 'Guide to family groups in the monocotyledonae' p. 24 for key to families.

## ACORACEAE

Rhizomatous, aromatic, wetland herbs, containing ethereal oils; raphides and lactifers absent. **Leaves** distichous, linear to ensiform, equitant; venation parallel. **Inflorescence** a short, uniform, pedunculate spadix subtended by an erect, linear, leaf-like, persistent spathe. **Flowers**: regular, bisexual, typically 3-merous, densely congested on spadix; perianth segments 3 + 3, free; stamens 3 + 3; filaments free, linear, flattened, as long as perianth segments; anthers 2-thecous, horseshoe-shaped, dehiscing by longitudinal slit; ovary superior or embedded in spadix, 2- or 3-locular; several pendulous, orthotropous ovules on apical-axile placenta; style absent; stigma subsessile. **Fruit** a ± dry berry. **Seeds** few, pendulous, with copious endosperm. *Sweet flag family*.

### **Acorus** L. (sthn Afr.: 1 sp.)

***calamus** L.

Perennial herb, up to 2 m high. **Leaves** distichous; blade linear to sword-shaped, 0.8–2.0 m long, ± 10 mm wide, margins undulate. **Flowers**: densely congested on a lateral spadix, up to 90 mm long; spathe leaf-shaped, green like spadix; perianth 3–4 mm long, yellowish green; Feb., Mar. Wet swampy areas, disturbed streambanks, perennial shallow, slow-flowing or stagnant water. Native to Asia. *Common sweet flag*.

VreDm

## AGAPANTHACEAE

Perennial herbs, often forming colonies, glabrous, glossy, rich in saponins; with a cylindrical, branched rhizome, bearing copious fleshy roots. **Leaves** evergreen or deciduous; distichous: many; blade linear, apex acute, margins entire, smooth, firm. **Flowers**: bisexual; regular; arranged in a central umbel on a long, naked, stout peduncle, produced above leaves, usually many, showy; pedicels firm, erect, spreading or cernuous; perianth deep to light blue or white, cylindric to campanulate, with a short or long tube shorter or longer than perianth segments, somewhat unequal; segments 3 + 3; outer 3 usually narrower than inner ones, often slightly hooded, erect or spreading; stamens 3 + 3, arising from perianth; anthers small; ovary superior; style filiform, stigma small. **Fruit** an ovoid to fusiform capsule. **Seeds** flat, ovate, winged, black, shiny. *Agapanthus family*.

## **Agapanthus** L'Hér. (sthn Afr.: 10 spp.)

### Key to subspecies:

[after Leighton: 30 (1965)]

Perianth segments spreading to ± 45° from axis . . . . . **A. campanulatus** subsp. **campanulatus**
Perianth segments spreading widely to 90° from axis . . . . . **A. campanulatus** subsp. **patens**

### **campanulatus** F.M.Leight. subsp. **campanulatus**

Perennial herb, up to 1.5 m high. **Leaves** deciduous; caulescent; blade strap-shaped, 250–400 × 10–25 mm, apex acute or subacute. **Flowers**: perianth with segments spreading to ± 45° from axis; funnel-shaped, 20–35 mm long, tube up to 10 mm long, sky-blue; Dec.–Feb. Montane, rocky grassland. *Small agapanthus*; *bloulelie* (A); *lehlaha-hlaha*, *leta-laphofu* (SS); *ugebeleweni* (X); *uBani* (Z).

MsGr

### **campanulatus** F.M.Leight. subsp. **patens** (F.M.Leight.) F.M.Leight.

Perennial herb, up to 1 m high. **Leaves** deciduous; caulescent; blade strap-shaped, 250–400 × 10–25 mm, apex acute or subacute. **Flowers**: perianth with segments spreading widely to 90° from axis, sometimes reflexed, funnel-shaped, 20–35 mm long, tube ± 5 mm long, sky-blue; Dec.–Feb. Montane, rocky grassland. *Bell agapanthus*; *bloulelie* (A); *leralaphofu* (SS); *ugebeleweni* (X); *ubani* (Z).

DrGr MsGr

## Reference

LEIGHTON, F.M. The genus *Agapanthus* L'Herit. *Journal of South African Botany*, suppl. vol. 4: 1–50.

# AGAVACEAE (including Anthericaceae in part)

Compiled by G.F. Smith, R.R. Klopper, E. Retief & N.L. Meyer

Perennial herbs or robust, monocarpic, usually rosulate multi-annuals, perennial through short rhizomes or short erect caudex. **Leaves** usually crowded in basal rosette, spirally arranged or distichous; blade erect, flat, sometimes terete or triangular, linear, soft-textured, leathery or succulent, amplexicaul, inconspicuously parallel-veined, rarely

scleromorphic, persisting for many years. **Flowers**: in simple or compound racemes, or panicles, sometimes condensed into heads or clusters or inflorescences apical, tall, fast-growing, terminating in panicle, often massive; bisexual, regular or somewhat irregular (*Chlorophytum*), perianth 3 + 3, often fleshy, free or united below into tube; stamens 3 + 3, filaments free, glabrous, anthers mostly dorsifixed, epipeltate, or basifixed; ovary superior or inferior; style terminal with small stigma. **Fruit** a loculicidal capsule. *Agave and spider plant family*.

## Key to genera

[after Snijman: 31 (2013)]

Robust, succulent perennials; leaves leathery or succulent; perianth tubular, fleshy, long-lasting; ovary inferior . . . . . **Agave**
Herbaceous perennials; leaves soft-textured; perianth rotate, fugacious; ovary superior . . . . . **Chlorophytum**

## **Agave** L. (sthn Afr.: 4 naturalised spp.)

### Key to species:

Leaves with blade narrowly ovate, reflexed, usually blue-green, up to 2 m long; marginal teeth present on mature leaves, straight or recurved; panicle not bulbiferous; flowers 70–100 mm long . . . . . **A. americana** var. **americana**
Leaves ensiform to narrowly ovate, rigid, usually light to dark green, up to 1.3 m long; marginal teeth absent from mature leaves; panicle bulbiferous after flowering; flowers 55–65 mm long. . . . . **A. sisalana**

### ***americana** L. var. **americana**

Massive, stemless or short-stemmed, monocarpic, rosulate, leaf succulents. **Rosettes** up to 2 m high at maturity, profusely proliferous through basal suckers. **Leaves** light blue-green, erect at first, becoming spreading to reflexed, sword-shaped, apically very sharp-tipped; margins armed with many, simple teeth. **Flowers**: flowering pole massive, branched, tree-like, never bulbiferous; flowers erect, yellow to greenish yellow; Dec.–Feb., sporadically all year. Naturalised throughout most of Free State in diverse habitats. Native to Mexico, Arizona and Texas. *Agave*, *American agave*, *American aloe*, *century plant*; *Amerikaanse aalwee*, *Amerikaanse aalwyn*, *blou-aalwee*, *gareboom*, *garingboom*, *kaalgaarboom*, *makaalwyn* (A); *lekhala* (SS).

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### ***sisalana** Perrine

Medium-sized to large, stemless or short-stemmed, monocarpic, rosulate, leaf succulents. **Rosettes** up to 2 m high at maturity, profusely proliferous through elongated rhizomes. **Leaves** dark green, erect throughout, sword-shaped, apically very sharp-tipped; margins lacking teeth. **Flowers**: flowering pole massive, branched, tree-like, profusely bulbiferous; flowers erect, green to dull greenish white; Nov.–Feb., sporadically throughout year. Naturalised mainly in grassland vegetation. Native to Mexico. *Hemp plant*, *sisal hemp*; *garingboom*, *sisal* (A).

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## **Chlorophytum** Ker Gawl. (sthn Afr.: 38 spp.)

### Key to species:

[after Obermeyer: 674 (1962)]

1a Leaves rosulate, many; flowers solitary; capsule ovoid, beaked . . . . . **C. transvaalense**
1b Leaves distichous, ± 8; flowers congested in a raceme; capsule globose or oblong, not beaked . . . . . 2
2a Robust plants, up to 1.5 m high; roots woody, sturdy; leaf margins raised . . . . . **C. angulicaule**
2b Smaller, more slender plants, 100–600 mm high; roots wiry, many, with scattered tubers; leaf margins not raised . . . . . 3
3a Leaves with blade linear to narrowly ovate; fruit globose, 8 mm in diameter . . . . . **C. cooperi**
3b Leaves with blade linear to filiform; fruit oblong, 9 mm long . . . . . **C. fasciculatum**

**angulicaule** (Baker) Kativu
*Anthericum angulicaule* Baker

Perennial herb, up to 1.5 m high. **Roots** woody. **Leaves** distichous, ± 8; blade linear to narrowly ovate, up to 750 × 25 mm. **Flowers**: congested in a raceme; perianth with segments ± 10 mm long, white with dark green keel, tips ciliate; Aug.–May. **Fruit** globose, ± 6 mm long. Grassland, regularly ravaged by fires.

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**cooperi** (Baker) Nordal
*Anthericum cooperi* Baker

Perennial herb, up to 400 mm high. **Roots** wiry, many. **Leaves** distichous, ± 8; blade linear to narrowly ovate, 50–300 × 3–10 mm. **Flowers**: congested in a raceme; perianth with segments 8–12 mm long, white with a greenish brown keel; Oct.–Feb. **Fruit** globose, ± 8 mm in diameter. Grassland, mountain sourveld. *Cooper's anthericum*.

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**fasciculatum** (Baker) Kativu
*Anthericum fasciculatum* Baker

Perennial herb, up to 0.6 m high. **Roots** wiry, many. **Leaves** distichous, ± 8; blade linear to filiform, 50–400 × 1–5 mm. **Flowers**: congested in a raceme; perianth with segments ± 14 mm long, white; Aug.–Mar. **Fruit** oblong, 9 mm long. Rocky grassland.

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**transvaalense** (Baker) Kativu
*Anthericum transvaalense* Baker

Perennial herb, up to 0.8 m high. **Roots** wiry, many. **Leaves** rosulate, many; blade narrowly ovate, 50–350 × 1.0–6.0 mm. **Flowers**: solitary; perianth with segments ± 13 mm long, white; Oct.–Jan. **Fruit** ovoid, ± 7 mm long; beaked. Grassland.

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## References

OBERMEYER, A.A. 1962. A revision of the South African species of *Anthericum*, *Chlorophytum* and *Trachyandra*. *Bothalia* 7: 669–778.
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# ALISMATACEAE

Annual or perennial, aquatic or marsh herbs; milky latex present. **Leaves** basal; stalks long and expanded below to form an open sheath; blade ovate to narrowly ovate, base hastate or sagittate, margins entire; with an apical hydathode; axillary scales present. **Flowers**: in thyrsoid inflorescences with flowers in whorls or in simple compound umbels; regular; bisexual and/or unisexual; sepals 3; petals 3, free; stamens 3–many; ovary superior with 2–many free carpels; style terminal or ventral, stigma apical. **Fruit** 3–many achenes, buoyant. *Water plantain family*.

## **Alisma** L. (sthn Afr.: 1 sp.)

### ***plantago-aquatica** L.

Perennial, stoloniferous, aquatic herb, up to 1 m high; glabrous. **Stems** triangular. **Leaves** petiolate; blade ovate, 150–300 mm long, base rounded to cordate; petioles up to 400 mm long. **Flowers**: in a much-branched, pyramidal panicle; stamens 6; sepals 3, green; petals larger than sepals, 3 ± 10 mm in diameter, white, pink or purple; Nov.–Mar. Shallow water, vleis. Native to Northern Hemisphere. *Common water-plantain*, *mad-dog weed*.

VreDm | DrGr

# ALLIACEAE

Perennial herbs with bulbs or bulb-like corms, membranous or fibrous scales, or rhizome. **Leaves** basally concentrated, spirally set or distichous; blade filiform-linear, linear ovate, rarely ovate, flat, terete, fistulose or angular, sheathing at base, parallel-veined; onion-like smell. **Flowers**: inflorescence umbel-like with short- or long-pedicelled flowers, pedicels not articulated, subtended by involucre of 2 or more membranous spathal bracts, free; scape terete or angular; bisexual, regular, hypogynous; perianth 3 + 3, free or connate to form tubular perianth with erect, spreading or sometimes recurved lobes; stamens 3 + 3; filaments arising at base of tepals or in tube, flat; anthers elongate, epipeltate; ovary superior; style 1; stigma 3-lobed or capitate. **Fruit** a loculicidal, 3-locular capsule. **Seeds** black, few–many, sometimes small, ovoid or ellipsoidal to subglobose, more often triangular and half-ovoid, half-globose or tetrahedral. *Onion family*.

## Key to genera

[after Meyer: 569 (2000)]

1a Rhizomatous herbs; seeds large, 4–11 mm long; perianth with a corona . . . . . **Tulbaghia**
1b Bulbous herbs; seeds small, < 4 mm long; perianth without corona. . . . . 2
2a Perianth segments connate; spathes distinctly overlapping at their bases; without onion-smell . . . . . **Nothoscordum**
2b Perianth segments free or almost free; spathes not overlapping at their bases; with onion-smell . . . . . **Allium**

## **Allium** L. (sthn Afr.: 2 spp.)

### **dregeanum** Kunth

Bulbous geophyte, up to 1.2 m high; strongly aromatic, sometimes forming bulbils. **Leaves** dry at flowering time; blade linear, suberect. **Flowers**: in a compact spherical head; spathes not overlapping at their bases; perianth with segments free or almost free, white to pink; Oct.–Jan. Dry stony slopes and flats. *Wild onion*; *ajiun*, *wilde ui* (A).

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## **Nothoscordum** Kunth (sthn Afr.: 1 sp.)

### ***borbonicum** Kunth

*N. fragrans* (Vent.) Kunth

Bulbous plant, up to 0.6 m high, producing many bulbils. **Leaves** linear, soft, flat, 100–300 mm long. **Flowers**: in umbel on a long stem with 2 small spathes below umbel; spathes distinctly overlapping at their bases; perianth with segments connate, white to greenish white; Oct.–Dec. Disturbed places, often present in nursery tins. Native to North America. *Fragrant false garlic*; *basterknoffel* (A).

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## **Tulbaghia** L. (sthn Afr.: 25 spp.)

### Key to species:

[after Vosa: 110 (2000)]

1a Corona with very indistinct lobes . . . . . **T. acutiloba**
1b Corona with distinct lobes. . . . . 2
2a Perianth segments at least 4 × as long as broad . . . . . **T. leucantha**
2b Perianth segments < 1/3 as long as broad . . . . . **T. cernua**

### **acutiloba** Harv.

Geophyte, up to 200 mm high. **Leaves** with blade 4–5 mm wide, folded and V-shaped in section. **Flowers**: corona with indistinct lobes, lobes light brown to purplish brown; perianth

with segments markedly reflexed, green; Aug.–Apr. Grassland, vleis. *Wild garlic*; *wilde knoffel* (A); *motsuntsunyane*, *sefothafotha* (SS); *ishaladi lezinyoka* (Z). Figure 12E, p. 9.

DrGr | MsGr | KarSh | Zastr

**cernua** Avé-Lall.

*T. campanulata* N.E.Br.

Geophyte, up to 500 mm high. **Leaves** with blade linear to narrowly ovate, 8–15 mm wide, prominently keeled. **Flowers**: corona with distinct lobes, lobes flame-coloured; perianth with segments < $^1/_3$ as long as broad, flat, apex acute, green; Sep.–Nov. Grassland. *Wild garlic*; *wilde knoffel* (A).

DrGr | Zastr

**leucantha** Baker

*T. dieterlenii* E.Phillips

Geophyte, up to 300 mm high. **Leaves** with blade linear, wide. **Flowers**: corona cylindrical, with distinct lobes, margins serrate, orange or scarlet; perianth with segments 4 × longer than broad, margins conspicuously rolled, whitish, green; Sep.–Feb. Grassland, rocky areas. *Mountain wild garlic*; *fonteinknoffel* (A); *sefothafotha* (SS).

VreDm | AcGr | DrGr | MsGr

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SNIJMAN, D.A. (ed.). 2013. Plants of the Greater Cape Floristic Region, Vol. 2: the Extra Cape flora. *Strelitzia* 30. South African National Biodiversity Institute, Pretoria.

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# AMARYLLIDACEAE

Lily-like herbs; bulbous or rarely rhizomatous. **Leaves** mostly strap-shaped or broadly ovate, generally arranged in two ranks, usually glabrous. **Flowers**: in an umbel at top of leafless stalk, ± regular, subtended by 2–8 involucral bracts; perianth segments 3 + 3, showy; stamens 6; ovary inferior, often visible as a swelling at base of a long perianth tube; 3-locular. **Fruit** loculicidally dehiscent or indehiscent; pericarp dry or fleshy. **Seeds** black. *Amaryllis or Daffodil family*.

## Key to genera

[after Snijman: 570 (2000)]

1a Scape hollow at least at base or apex, rarely solid; fruit dehiscent, leathery to papery; seeds dry, black, flattened, often winged. . . . . .**Cyrtanthus**

1b Scape solid; fruit dehiscent and papery or indehiscent and papery to fleshy; seeds water-rich, cream-coloured, pink, reddish or green . . . . . 2
2a Leaves 1–many; blade narrow, often spiralled; inflorescence acaulescent, 1-flowered; fruit clavate, cylindric or ellipsoid, much longer than wide, neither ribbed nor conspicuously veined . . . . . 3
2b Leaves 2–many; blade narrow to broad, rarely spiralled; inflorescence well developed above ground, (1–)many-flowered; fruit subfusiform to globose or trigonous, rarely much longer than wide and then ribbed or conspicuously veined . . . . . 4
3a Leaves few–many, glabrous or pubescent, often with conspicuous sheaths; stamens in a single series; anthers 6–many . . . . . **Gethyllis**
3b Leaves 1–few, glabrous, sheath not conspicuous; stamens in 2 series; anthers 6. . . . . **Apodolirion**
4a Plants rhizomatous or bulbous; bulb tunics not producing extensible threads when torn; leaves often speckled with red; spathe valves 4 or more, often conspicuous; fruit indehiscent, fleshy or with pulp . . . . . 5
4b Plants bulbous; tunics producing extensible threads when torn; leaves immaculate or if speckled, then fringed with bristles; spathe valves 2, becoming inconspicuous; fruit dehiscent or indehiscent, papery, membranous or rarely fleshy . . . . . .6
5a Plants with large, fleshy bulbs; leaves sword- to tongue-shaped, without a midrib, succulent, often pubescent . . . . . **Haemanthus**
5b Plants rhizomatous; leaves with a petiole-like base and prominent midrib, thin-textured, glabrous. . . . . .**Scadoxus**
6a Leaf margins hyaline, ± fringed with short, branched cilia; pedicels usually shorter than flowers at anthesis; filaments free to base; fruit indehiscent, often beaked; seeds thinly cork-covered . . . . . 7
6b Leaf margins smooth, softly pubescent or raised, reddened and fringed with long bristles or short, branched cilia; pedicels rarely shorter than flowers at anthesis; filaments ± connate at base, if free, then fused to style base; fruit dehiscent, beakless; seeds cutinous, not corky . . . . . 9
7a Leaves annual, distichous, closely abutting each other to form an erect fan; all leaf tips subacute to obtuse; fruiting head detaching from scape apex; fruit trigonous, prominently 3-ribbed . . . . . **Boophone**
7b Leaves perennial, suberect or lying flat; usually tips of all but youngest leaves truncate; fruiting head not detaching from scape apex; fruit irregularly-shaped, smooth or 6-ribbed . . . . . 8
8a Leaves evenly spreading or in a vertical distichous pattern, suberect to recurved, often sheathing to form a false stem; flowers irregular, sometimes only by deflexed style; perigone tube mostly curved, occasionally straight. . . . .**Crinum**
8b Leaves biflabellate, arching or spreading on ground; flowers regular; perigone tube straight . . . . . **Ammocharis**
9a Flowers regular. . . . . .**Strumaria**
9b Flowers irregular, sometimes only by the deflexed style . . . . . 10
10a Leaves with blade narrow, usually < 25 mm wide, subsucculent; pedicels slender, rarely longer than flowers; tepal margins ± undulate; capsules subglobose, membranous, without conspicuous transverse veins . . .**Nerine**
10b Leaves broad, > 25 mm wide, leathery; pedicels stout, much longer than flowers; tepal margins rarely crisped; capsules trigonous to subfusiform, prominently ribbed, with conspicuous transverse veins . . . . . **Brunsvigia**

## **Ammocharis** Herb. (sthn Afr.: 5 spp.)

### **coranica** (Ker Gawl.) Herb.

*Amaryllis coranica* Ker Gawl.

Geophyte, up to 300 mm high. **Bulb** ovoid, up to 160 mm in diameter, up to 250 mm long. **Leaves** with blade strap-like, 400 × 50 mm, falcate. **Flowers**: umbel 3–56-flowered; pedicels

as long as or longer than perianth tube, 40–50 mm long; perianth with tube 20 mm long, apices of lobes spirally recurved, 55 × 7 mm, pink to pinkish copper-brown; Oct.–Dec. **Fruit** an indehiscent, papery capsule. Bushveld and mopani veld. *Ammocharis*, *ground lily*, *berg lily*; *berglelie*, *gifbol* (A); *boka* (SS); *umbhodiya*, *icukudo*; *incukudwane isidiya* (Z).

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## **Apodolirion** Baker (sthn Afr.: 6 spp.)

### **buchananii** Baker

Geophyte, up to 100–200 mm high. **Bulb** deeply buried. **Leaves** 1 or 2; produced after flowers; blade grass-like, blunt-tipped. **Flower**: solitary, after fires; ovary in underground portion; perianth 25–35 mm in diameter, tube 50–100 mm, acting as a stem, white to pink; Aug., Sep. **Fruit** an indehiscent capsule, at surface of soil. Grassland. *Natal crocus*, *yellow-bell*; *icukudwane*, *indwa* (Z).

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## **Boophone** Herb. (sthn Afr.: 2 spp.)

### **disticha** (L.f.) Herb.

Geophyte, up to 300 mm high. **Bulb** 120–170 mm high, 100–150 mm in diameter with a thick tunic of dry membranous leaf bases. **Leaves** distichous, greyish green, erect, arranged in a conspicuous fan. **Flowers**: in a dense, many-flowered umbel; stamens stiffly exserted; pedicels elongate after flowering to produce a large seed head, up to 150 mm long; perianth ± 30 mm long, shades of pink to red, usually bright pink; Oct.–Jan. **Fruit** an indehiscent, 3-ribbed capsule. Grassland. *Bushman poison bulb*, *candelabra flower*, *tumblehead*; *boesmangifbol*, (A); *lesoma*, *motlatsisa*, *khutsane ea na ha* (SS); *incwadi* (X); *iNcotho* (Z). Figure 60.

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## **Brunsvigia** Heist. (sthn Afr.: 17 spp.)

### Key to species:

[after Dyer: 69 (1950)]

1a Leaves 8–20, ascending when young and only spreading on ground with age . . . . . **B. grandiflora**
1b Leaves 2–6, soon spreading flat on ground . . . . . 2
2a Peduncle 180–250 mm high; pedicels 100–120 mm long . . . . . **B. natalensis**
2b Peduncle 300–500 mm high; pedicels 200–300 mm long . . . . . **B. radulosa**

### **grandiflora** Lindl.

Geophyte, up to 400 mm high. **Leaves** 8–20; produced about same time as scape; ascending when young and only spreading on ground with age; blade tongue-shaped, 200–450 × 25–45 mm, falcate, glabrous. **Flowers**: in a ± 30-flowered umbel; peduncle ± 450 mm high;

pedicels 15–25 mm long; perianth 6-parted, ± 50–70 mm long, nearly equally spreading, light to dark pink; Jan. **Fruit** an inflated capsule. Grassland. *Giant candelabra flower*; *kandelaarblom* (A); *isichwe* (X); *umqhele-wenkunzi* (Z).

MsGr

### **natalensis** Baker

Geophyte, up to 250 mm high. **Leaves** 2–6; leaves and inflorescence developing at same time; flat on ground to semi-erect; blade oblong, 150–250 × 100–120 mm, apex obtuse, upper surface scabrous, lower surface glabrous. **Flowers**: in a 30–60-flowered umbel; peduncle 180–250 mm high; pedicels 100–120 mm long; perianth ± 40 mm long, deep pink; Nov.–Feb. **Fruit** an inflated capsule. Grassland, streambanks, stony hillsides. *Natal candelabra flower*; *kandelaarblom* (A); *umbhola* (Z).

MsGr

### **radulosa** Herb.

Geophyte, up to 500 mm high. **Leaves** 4–6; absent when flowering or spreading on ground, thick and tough; blade oblong, 250–500 × 100–200 mm, upper surface scabrous, lower surface glabrous. **Flowers**: in a 30–60-flowered umbel; peduncle 300–500 mm high; pedicels 200–300 mm long; perianth 45–55 mm long, red or pink; Feb.–Apr. **Fruit** an inflated




**Figure 60.** *Boophone disticha* (Amaryllidacae). Artist: C. Letty.

capsule. Grassland, marshy areas, swamps. *Candelabra flower*; *kandelaarblom*, *misryblom* (A); *lematla* (SS). Figure 12A, p. 9.

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## **Crinum** L. (sthn Afr.: 23 spp.)

### Key to species:

[after Verdoorn: 29 (1973)]

Perianth tube short, ± 30 mm long, shorter than segments . . . . . .**C. macowanii**
Perianth tube long, > 70 mm long, segments ± as long as or shorter than tube . . . . . **C. bulbispermum**

### **bulbispermum** (Burm.f.) Milne-Redh. & Schweick.

Perennial herb, up to 0.9 m high. **Leaves** bluish grey-green, folded upwards, > 50 mm broad at middle; new leaves many. **Flowers**: perianth tube long, > 70 mm long; perianth segments ± as long as or shorter than tube, forming a narrow trumpet-shape; anthers grey or brown; old flowers drying pink or red; perianth white with a dark red keel; Sep.–Nov. **Fruit** an indehiscent, subglobose capsule, not beaked, tipped with a ring. Along rivers and streams or in damp depressions in black clay or sandy soil. *River lily*, *Orange/Vaal River lily*; *Vaalrivier-/Oranjerivierlelie*, *vleilelie* (A); *lelutla*, *mototse* (SS); *umNduze* (Z). Figure 11F, p. 8.

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### **macowanii** Baker

Perennial herb, up to 0.9 m high. **Leaves** spreading at ground level, glaucous-green, flaccid, usually undulate, > 50 mm broad at middle; new leaves few in centre. **Flowers**: perianth tube short, ± 30 mm long, shorter than segments; perianth segments forming a wide trumpet shape; anthers black showing up on white inside; old flowers drying brown; perianth white with a rose-coloured keel; Oct.–Jan. **Fruit** an indehiscent, subglobose, beaked capsule. Grassland, along rivers, in gravelly soil or on sandy flats. *Cape coast lily*, *Cape lily*; *rivierlelie*, *boslelie* (A); *intelezi* (X); *umNduze* (Z). Figure 1, p. iv.

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## **Cyrtanthus** L.f. (sthn Afr.: 52 spp.)

### Key to species:

[after Reid & Dyer: 4 (1984)]

1a Perianth yellow to green, cream-coloured or white, lobes not different. . . . 2
1b Perianth red to orange, lobes may be green . . . . . 5
2a Perianth campanulate . . . . . **C. breviflorus**
2b Perianth tubular . . . . . 3
3a Perianth slightly constricted at throat . . . . . **C. stenanthus** var. **major**
3b Perianth not constricted at throat . . . . . 4
4a Perianth lobes 6–7 mm long; leaves with blade 5–10 mm broad . . . . . .**C. attenuatus**

4b Perianth lobes ± 15 mm long; leaves with blade 10–20 mm broad . . . . . **C. flanaganii**
5a Perianth tube not dilated evenly from base to throat, often somewhat inflated . . . . . 6
5b Perianth tube dilated fairly evenly from base to throat . . . . . 7
6a Perianth tube very slender, constricted at throat . . . . . **C. stenanthus** var. **stenanthus**
6b Perianth tube narrow for a short distance at base, inflated above, contracted or not at throat . . . . . **C. contractus**
7a Perianth lobes spreading. . . . . **C. obrienii**
7b Perianth lobes connivent . . . . . 8
8a Perianth yellowish at base, becoming deep blood-red towards apex . . . . . **C. tuckii** var. **tuckii**
8b Perianth tube red . . . . . 9
9a Perianth red throughout. . . . . **C. tuckii** var. **transvaalensis**
9b Perianth tube red, lobes green . . . . . **C. tuckii** var. **viridilobus**

## **attenuatus** R.A.Dyer

Bulbous herb, up to 500 mm high. **Leaves** 3 or 4; present at flowering; blade linear, ± 400 × 5–10 mm, narrowing gradually to both ends. **Flowers**: in a 6–9-flowered umbel; perianth with tube slender, gradually dilated to throat, 55–65 mm long, lobes broadly ovate, 6–7 × 5 mm, outer 3 with an inflexed apiculus, dull yellowish green; Sep.–Dec. **Fruit** a 3-valved capsule. Streambanks, in rocky grassland.

DrGr MsGr

## **breviflorus** Harv.

*C. luteus* Baker

Bulbous herb, up to 200 mm high. **Leaves** 1–6; usually absent at flowering in drier habitat, present at flowering in moist habitat; blade filiform, up to 18 mm wide. **Flowers**: in a 1–20-flowered umbel; perianth with tube campanulate, 5–10 mm long, lobes narrowly ovate, 15–20 mm long, apex acute, bright yellow; Mar.–Dec. **Fruit** a 3-valved capsule. Grassland, marshes. *Yellow fire-lily*, *wild crocus*; *geelvuurlelie*, *wildekrokus* (A); *lematlana-la-loti*, *moroloane*, *moroloane-o-moholo* (SS); *uvelabahleka*, *injobo* (Z).

DrGr MsGr

## **contractus** N.E.Br.

Bulbous herb, up to 200 mm long. **Leaves** 2 or 3; present after flowering; blade linear, 300–500 × 8–12 mm. **Flowers**: in a 4–10-flowered umbel; pendulous; perianth with tube widest above middle, contracted or not towards throat, 50–60 mm long, lobes ovate-ellipsoid, 13–15 mm long, scarlet-red to carmine; Jul.–Jun. **Fruit** a 3-valved capsule. Grassland. *Fire lily*; *vuurlelie*, *brandlelie* (A); *impingizana* (Z). Figure 22, p. 26.

DrGr MsGr

## **flanaganii** Baker

Bulbous herb, up to 200 mm high. **Leaves** up to 4; present at flowering; blade strap-shaped, 100–200 × 10–20 mm, apex obtuse. **Flowers**: in a 4–7-flowered umbel; perianth with tube narrowly trumpet-shaped, 40–55 mm long, lobes oblong, ± 15 mm long, yellow; Sep.–Jan. **Fruit** a 3-valved capsule. Marshy conditions. *Flanagan's cyrtanthus*, *yellow dobo lily*; *geeldobolelie*, *ifafalelie* (A).

MsGr

### **obrienii** Baker

Bulbous herb, up to 300 mm high. **Leaves** 2 or 40; present at flowering; blade linear, 300 × 4–8 mm. **Flowers**: in a 7- or 8-flowered umbel; nodding; perianth with tube curved, dilated gradually to throat, ± 30 mm long or more, lobes ovate, spreading, 4–5 mm long, bright to pale scarlet; Jul.–Sep. **Fruit** a 3-valved capsule. Crevices of rocks.

MsGr

### **stenanthus** Baker var. **major** R.A.Dyer

Bulbous herb, up to 300 mm high. **Leaves** 2 or 4; present or absent at flowering; blade linear, 200–300 × 2–5 mm long. **Flowers**: in a 3–7-flowered umbel; suberect; perianth with tube very slender, slightly constricted at throat, 32–42 mm long, lobes ovate, ± 3 mm long, becoming recurved, yellow; Oct.–Mar. **Fruit** a 3-valved capsule. Mountain grassland.

DrGr MsGr

### **stenanthus** Baker var. **stenanthus**

Bulbous herb, up to 300 mm high. **Leaves** 2 or 4; present or absent at flowering; blade linear, 200–300 × 2–5 mm long. **Flowers**: perianth with tube very slender, constricted at throat, 25–30 mm long, lobes ovate-ellipsoid, ± 3 mm long, spreading or recurved, red, purplish red or greenish red, lobes sometimes green; Sep.–Dec. **Fruit** a 3-valved capsule. Mountain grassland. *Long-tubed cyrtanthus*; *ifafalelie* (A); *lepontoana*, *moroloanyane-oa-litšoene* (SS); *impingizana encane ebomvu* (Z).

MsGr

### **tuckii** Baker var. **transvaalensis** I.Verd.

Bulbous herb, up to 450 mm high. **Leaves** 2; present or absent at flowering; blade linear, 300–450 mm long. **Flowers**: in a 10–15-flowered umbel; nodding; perianth with tube curved, dilated gradually from base to throat, 30–40 mm long, lobes oblong, connivent, 6–9 mm long, red throughout; Sep.–Nov. **Fruit** a 3-valved capsule. Grassland.

MsGr

### **tuckii** Baker var. **tuckii**

Bulbous herb, up to 450 mm high. **Leaves** 2; present or absent at flowering; blade linear, 300–450 mm long. **Flowers**: in a 10–15-flowered umbel; nodding; perianth with tube curved, dilated gradually from base to throat, 30–40 mm long, lobes oblong, connivent, 6–9 mm long, yellowish at base, passing into deep red; Sep.–Nov. **Fruit** a 3-valved capsule. Grassland. *Green-tipped fire lily*; *brandlelie* (A); *isiwesa* (Z).

MsGr

### **tuckii** Baker var. **viridilobus** I.Verd.

Bulbous herb, up to 450 mm high. **Leaves** 2; present or absent at flowering; blade linear, 300–450 mm long. **Flowers**: in a 10–15-flowered umbel; nodding; perianth with tube curved, dilated gradually from base to throat, 30–40 mm long, lobes oblong, connivent, 6–9 mm long, tube red, lobes green; Sep.–Nov. **Fruit** a 3-valved capsule. Grassland.

MsGr

## **Gethyllis** L. (sthn Afr.: 31 spp.)

### **transkarooica** D.Müll.-Doblies

Bulbous geophyte, up to 150 mm high. **Leaves** dry at flowering, spiralled, glabrous, mostly smooth. **Flowers**: anthers 6, tailed; perianth rose-pink; Nov., Dec. **Fruit** an indehiscent, ± succulent capsule. Slopes or flats in sand or clay. *Kukumakranka* (A).

AcGr DrGr

## **Haemanthus** L. (sthn Afr.: 22 spp.)

### Key to species:

[after Snijman: 20 (1984)]

1a Stamens included in perianth, < 1/2 the length of segments at anthesis . . . . . **H. carneus**
1b Stamens equalling perianth segments or well exserted at anthesis. . . . . 2
2a Perianth tube 1–2 mm long; leaves erect, glabrous. . . . . **H. montanus**
2b Perianth tube 1–12 mm long; leaves flat on ground or recurved, ± pubescent . . . . . 3
3a Umbel loose, hemispherical; flowers rose-pink to white . . . . . **H. humilis** subsp. **humilis**
3b Umbel stiff, widely obconical to hemispherical; flowers pale pink to white . . . . . **H. humilis** subsp. **hirsutus**

### **carneus** Ker Gawl.

Geophyte, up to 275 mm high. **Leaves** 2 or 3; present or shortly after flowering; usually flat on ground; blade broadly to narrowly elliptic or ovate, 100–210 × 35–135 mm, apex acute to obtuse, margins ciliate. **Flowers**: umbel loose, globose, with spathe valves membranous; stamens included in perianth, < 1/2 the length of segments at anthesis; perianth with tube 2.5–3.5 mm long, lobes narrowly oblong to narrowly ovate, 8.5–10.0 mm long, rose-pink; Jan.–Mar. **Fruit** a berry. In shade of trees and bushes, rocky outcrops. *Bobbejaanoor* (A).

KarSh

### **humilis** Jacq. subsp. **hirsutus** (Baker) Snijman

*H. hirsutus* Baker

Geophyte, up to 300 mm high; plant deciduous. **Leaves** 2; present or shortly after flowering; flat to suberect, ± pubescent; blade oblong, 150–300 × 55–130 mm. **Flowers**: umbel stiff, widely obconical to hemispherical; stamens exserted by 5–15 mm; perianth (15–) 16–26 mm long, tube 5–12 mm long, lobes 10–21 mm long, pale pink to white; Nov.–Feb. **Fruit** a berry. Grassland, rock crevices. *Rabbit's ears*; *bobbejaanoor*, *velskoenblaar* (A); *sekitla*, *tsebe-ea-phofu* (SS).

MsGr

### **humilis** Jacq. subsp. **humilis**

*H. nelsonii* Baker

Geophyte, up to 300 mm high. **Leaves** 2; present at, or shortly after flowering; flat or recurved, ± pubescent; blade broadly elliptic to oblong, 20–240 mm long, 13–150 mm wide in middle.

**Flowers**: umbel loose, hemispherical; stamens equalling perianth lobes or exserted by up to 5(–8) mm; perianth 7–16(–18) mm long, tube 1–6(–7) mm long, lobes 4–10(–14) mm long, rose-pink to white; Jan., Feb. **Fruit** a berry. Bushveld, hillsides, rock crevices.

DrGr KarSh

### **montanus** Baker

*H. amarylloides sensu* Baker, *non* Jacq.

Geophyte, up to 300 mm high. **Leaves** 2, occasionally 3; erect, glabrous; blade strap-shaped, 150–250 mm long, 15–50 mm broad near middle. **Flowers**: 30–70 or more in an umbel; stamens slightly exserted; perianth 10–14 mm long, tube 1–2 mm long, lobes 9–13 mm long, white with pink flush when old; Oct.–Dec. **Fruit** a berry. Grassland, riverbanks, dry vleis, poorly drained flats.

DrGr

## **Nerine** Herb. (sthn Afr.: 25 spp.)

### Key to species:

[after Obermeyer, tentative key, not published]

| | | |
|---|---|---|
| 1a | Perianth erect, actinomorphic, with lobes smooth or crisped | 2 |
| 1b | Perianth angled downwards, zygomorphic, with lobes usually crisped | 4 |
| 2a | Pedicels glandular-pubescent or hairy | **N. gracilis** |
| 2b | Pedicels glabrous | 3 |
| 3a | Stamen appendages forming a cup with rim fringed | **N. frithii** |
| 3b | Stamen appendages free, 2 horned | **N. hesseoides** |
| 4a | Stamen appendages present, fused below | **N. appendiculata** |
| 4b | Stamen appendages absent | 5 |
| 5a | Pedicels glabrous | 6 |
| 5b | Pedicels glandular with sessile or stalked glands | 7 |
| 6a | Leaves present after flowering; umbel 6- or 7-flowered | **N. bowdenii** |
| 6b | Leaves present when flowering; umbel many-flowered | **N. laticoma** |
| 7a | Leaves ± 5, linear; usually solitary plants found in vleis | **N. angustifolia** |
| 7b | Leaves many, filiform; caespitose plants | **N. filifolia** |

### **angustifolia** (Baker) Baker

Geophyte, up to 0.9 m high, usually solitary plants. **Leaves** ± 5; present at flowering; blade linear, ± 300 × 3–5 mm. **Flowers**: in a 6–12-flowered umbel; pedicels 13–50 mm long, pedicels glandular with sessile glands; stamen appendages absent; perianth angled downwards, zygomorphic, with tube 2–3 mm long, lobes linear oblong, 30–40 × 5 mm, deep pink; Nov.–Apr. **Fruit** a subglobose, membranous capsule. Grassland, vleis, marshes, swampy conditions. *Berglelie* (A); *lematlana* (SS).

DrGr MsGr

### **appendiculata** Baker

Geophyte, up to 0.9 m high. **Leaves** 1–3; present at flowering, occasionally absent; blade linear, ± 450 × 5 mm, deeply channelled. **Flowers**: in a 10–20-flowered umbel; pedicels 30–50 mm long; stamen appendages present, fused below; perianth angled downwards, zygomorphic,

tube very short, lobes narrowly obovate, usually crisped, 25–30 × 3–5 mm, pale to deep pink, midvein darker; Jan.–Apr. **Fruit** a subglobose, membranous capsule. Marshy areas, near streams. *Nerine*; *umlukulo* (Z).




### **bowdenii** Watson

Geophyte, up to 0.7 m high. **Leaves** ± 6; present after flowering; erect; blade linear, flat, 350–730 × 25 mm, turning yellow at anthesis. **Flowers**: in a 6- or 7-flowered umbel; pedicels up to 50 mm long, glabrous; stamen appendages absent; perianth angled downwards, zygomorphic, with tube very short, lobes linear, 50–70 × 8–12 mm, bright pink or white, midvein dark rose; Jan.–May. **Fruit** a subglobose, membranous capsule. Moist ground around rocks, at base of cliffs. *Large pink nerine*; *grootpienknerina* (A).




### **filifolia** Baker

Geophyte, up to 300 mm high, plants caespitose. **Leaves** many; present at flowering; blade filiform, 150–200 mm long. **Flowers**: in a 8–12-flowered umbel; pedicels 25–38 mm long, pedicels glandular with stalked glands; stamen appendages absent; perianth angled downwards, zygomorphic, with tube 2 mm long, lobes linear, narrowly ovate, 25–30 × 3–4 mm, rose pink; Dec.–Apr. **Fruit** a subglobose, membranous capsule. Along watercourses.




### **frithii** L.Bolus

Geophyte, up to 400 mm high. **Leaves** often only 2; present at flowering; blade filiform, 150 × 1.0–1.5 mm. **Flowers**: in 5–7-flowered umbels; pedicels glabrous; stamen appendages forming a cup with rim fringed; perianth erect, actinomorphic, with a very short tube, lobes linear, 15 × 4 mm, pink; Sep.–Apr. **Fruit** a subglobose, membranous capsule. Grassland. *Vleilelie* (A).




### **gracilis** R.A.Dyer

Geophyte, up to 250 mm high. **Leaves** 3–5; present at flowering; blade linear, 300 × 1.5–2.0 mm. **Flowers**: in a 8–10-flowered umbel; pedicels 40–70 mm long, glandular-pubescent or hairy; perianth erect, actinomorphic, lobes elliptic-oblong, smooth or crisped, ± 10 mm long, pink or white, suffused with pink; Feb., Mar. **Fruit** a subglobose, membranous capsule. Grassland, riverbanks, vleis.




### **hesseoides** L.Bolus

Geophyte, up to 250 mm high. **Leaves** 2–7; present at flowering; flat or slightly sulcate above, blade linear, 180 × 1.0–1.5 mm. **Flowers**: in a 6–14-flowered umbel; pedicels glabrous; stamen appendages free, 2 horned; perianth erect, actinomorphic, lobes ovate to narrowly ovate, pink; Mar. **Fruit** a globose, membranous capsule. Grassland.



**laticoma** (Ker Gawl.) T.Durand & Schinz
*N. falcata* W.F.Barker.

Geophyte, up to 300 mm high. **Leaves** 6–8; present at flowering; distichous; flat on ground; blade linear, 180–360 × 12–20 mm. **Flowers**: in a many-flowered umbel; pedicels 45–100 mm, glabrous; stamen appendages absent; perianth angled downwards, zygomorphic, with tube 3 mm long, lobes narrowly linear-ovate, 37–38 mm long, pinkish mauve; Jan., Feb. **Fruit** a subglobose, membranous capsule. Open grassland, turf soil between dolomite slabs. *Vleilelie*, *seeroogbol*, *misryersblom*, *gifbol* (A).

AcGr DrGr KarSh

## **Scadoxus** Raf. (sthn Afr.: 3 spp.)

**puniceus** (L.) Friis & Nordal
*Haemanthus magnificus* Herb.
*Haemanthus natalensis* Pappe ex Hook.

Perennial herb, up to 0.75 m high. **Leaves** 2–7, forming a false stem by their sheathing parts, 5–500 mm long, free part of petioles < 100 mm long. **Flowers**: involucral bracts obvious, 30–85 mm long; perianth white and orange-red to pinkish; Sep.–Dec. **Fruit** a globose to ovoid, red berry. Woodland, rocky slopes. *Paintbrush*, *snake lily*, *blood lily*; *rooikwas*, *seerooglelie*, *skeerkwas* (A); *idumbe-lika-nhloyile*, *idumbelentaba*, *umgola*, *umPhompho* (Z).

VreDm MsGr

## **Strumaria** Jacq. ex Willd. (sthn Afr.: 25 spp.)

**tenella** (L.f.) Snijman subsp. **orientalis** Snijman

Bulbous geophyte, 100–200 mm high; slender. **Leaves** up to 6; usually present at flowering; blade filiform to narrowly ovate, pubescent or glabrous. **Flowers**: in a many-flowered umbel; regular; style conspicuously swollen in proximal half; perianth with tepals free, star-shaped, 4.5–7.0 mm long, white, sometimes flushed with pink; Apr.–Jul. **Fruit** a subglobose, papery capsule. Seasonally damp, loamy flats. *Cape snowflake*; *tolbol* (A).

DrGr KarSh

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# APONOGETONACEAE

Freshwater aquatic herbs with a tuberous rhizome. **Leaves** basal, long and narrow, sometimes with a floating blade. **Flowers**: inflorescence a forked spike; perianth segments in a single whorl of 1–3 white to pink tepals; stamens 6 or more. **Fruit** a follicle. *Waterblommetjie family*.

## **Aponogeton** L.f. (sthn Afr.: 9 spp.)

Key to species:

Flowers arranged in neat rows along one side of each spike . . . . . **A. junceus**
Flowers arranged in all directions along each spike. . . . . **A. rehmannii**

### **junceus** Lehm.

*A. junceus* Lehm. subsp. *junceus*
*A. spathaceus* E.Mey. ex Hook.f.

Fresh-water aquatic with tuberous rhizome. **Tuber** globular or obovoid. **Leaves** 40–430 mm long, needle-like or band-shaped, usually without a blade, often upright and emergent. **Flowers**: inflorescence with 2 spikes, flowers arranged along one side; perianth segments with 1–7 veins, ± 4 mm long, white or pink; Oct.–Apr. **Seeds** with 1 coat. Shallow water, pools, swamps, flood plain pans, dams. *Aponogeton*, *ramshorn*; *wateruintjie*, *waterblommetjie* (A); *lijo-tsa-lihohoana* (SS).

| VreDm | | DrGr | MsGr | KarSh | |
|---|---|---|---|---|---|

### **rehmannii** Oliv.

*A. junceus* Lehm. subsp. *rehmannii* (Oliv.) Oberm.

Fresh-water aquatic with tuberous rhizome. **Leaves** with a distinct blade, almost always floating; petioles up to 300 mm long. **Flowers**: inflorescence with 2 spikes, ± 15 mm long, flowers turned in all directions; stamens usually absent; perianth segments 2–3 mm long, white or pale pink; Nov.–Apr. **Seeds** with 2 coats. Temporary, shallow pools, flooded pans, muddy banks. *Pondweed*; *wateruintjie* (A).

| VreDm | | DrGr | | | |
|---|---|---|---|---|---|

# ARACEAE

Aquatic or terrestrial herbs; monoecious or dioecious; evergreen or deciduous. **Stems** rhizomatous or tuberous with watery or milky juice. **Leaves** simple or compound,

sheathing at base. **Flowers**: small, arranged on a spadix, enclosed by an often showy spathe; perianth 4–6, free or with connate segments; stamens 4–6, free or united; ovary superior or submersed in spadix. **Fruit** a berry. *Arum lily family*.

## **Zantedeschia** Spreng. (sthn Afr.: 8 spp.)

### Key to species:

[after Letty: 9 (1973)]

1a Plants evergreen; female flowers interspersed with staminodes . . . . . **Z. aethiopica**
1b Plants deciduous; female flowers not interspersed with staminodes. . . . . 2
2a Leaves either conspicuously maculate (spotted) or not (immaculate); blade usually oblong-hastate, rarely ovate-hastate, lower lobes short to triangular-spreading or strap-shaped; spathes with limb ± spreading, usually tapering gradually to apex . . . . . **Z. albomaculata** subsp. **albomaculata**
2b Leaves usually sparsely maculate; blade usually triangular-hastate, lower lobes bluntly triangular; spathes ± truncate, abruptly apiculate. . . . . **Z. albomaculata** subsp. **macrocarpa**

### **aethiopica** (L.) Spreng.

Perennial herb, up to 0.6 m high; evergreen. **Leaves** with blade broadly ovate-cordate, 150–200 × 100–150 mm. **Flowers**: female flowers interspersed with staminodes; spathe ivory-white with bright green at base; Sep.–Feb. **Fruit** ± spherical, ± 12 mm long, green becoming orange at base when ripe. Vleis, marshy depressions. *White arum lily*, *calla lily*; *varklelie*, *witvarkoor*, *aronskelk* (A); *mohalalitoe*, *mothebe* (SS); *intebe* (X, Z); *ihlukwe* (Z).




### **albomaculata** (Hook.) Baill. subsp. **albomaculata**

Perennial herb, up to 0.75 m high; deciduous. **Leaves** either conspicuously maculate or immaculate; blade usually oblong-hastate, rarely ovate-hastate (and then white-spotted), lower lobes short to triangular-spreading or strap-shaped. **Flowers**: spathe with limb ± spreading, usually tapering gradually to apex, white or ivory-coloured; Nov.–Mar. Vleis, marshy soil beside rivers or streams, grassy hillsides, forest margins. *Arrow-leaved arum*, *spotted-leaved arum*; *kleinvarkoor*, *witvlekvarkoor* (A); *mohalalitoe*, *mothebe* (SS); *intebe*, *iLabathekelimhlope* (Z).




### **albomaculata** (Hook.) Baill. subsp. **macrocarpa** (Engl.) Letty

*Z. macrocarpa* Engl.

Perennial herb, up to 0.75 m high; deciduous. **Leaves** sparsely maculate; blade usually triangular-hastate. **Flowers**: spathe ± truncate, abruptly acuminate, cream- or straw-coloured; Nov.–Jan. **Fruit** large, up to 20 mm in diameter. Marshy ground beside streams, grassy vleis. *Arrow-leaved arum*, *spotted-leaved arum*; *kleinvarkoor*, *witvlekvarkoor* (A); *mohalalitoe*, *mothebe* (SS); *intebe* (Z).



## Reference

LETTY, C. 1973. The genus *Zantedeschia*. *Bothalia* 11: 5–26.

# ASPARAGACEAE

Suffrutices or scramblers with perennial or annual stems from a compact woody base. **Rhizome** sympodial, often covered by persistent erect cataphylls; roots many, fibrous or often tuberous. **Leaves** much reduced, bract-like, with a spinous or soft spur. **Cladodes** (phylloclades) solitary or fascicled, persistent or deciduous, green, terete or angled to flat, linear to ovate, apex mucronate, in some species forming a basal disc. **Spines** usually present, in some species cauline or foliar in origin. **Flowers**: inconspicuous, solitary, fascicled or racemose, peduncles or pedicels terete or grooved or reduced to a disc or none, articulated once or twice; bisexual, regular, hypogynous; bracts minute or larger and concave; perianth with tepals 3 + 3, similar, free and spreading or fused basally; stamens 3 + 3; filaments free, arising from base of tepals; ovary superior, style usually short; stigma capitate, 3-lobed or with 3 branches. **Fruit** usually a globose or ovoid berry, sometimes a nutlet; tepals often persisting below. **Seeds** 1–several, globose, black. *Asparagus family*.

## **Asparagus** L. (sthn Afr.: 81 spp.)

### Key to species:

[adapted from Obermeyer & Immelman: 1119 (1992)]

| | | |
|---|---|---|
| 1a | Tepals cohering in lower half, forming a tube, spreading in upper half; flowers pendulous and usually solitary; spines always absent | 2 |
| 1b | Tepals free, spreading at base; flowers often erect, fascicled or racemose, rarely solitary; spines usually present | 3 |
| 2a | Cladodes solitary, ovate to cordate | **A. asparagoides** |
| 2b | Cladodes in fascicles of 3, linear | **A. ramosissimus** |
| 3a | Spines cauline in origin (stems and branches ending in spines) | 4 |
| 3b | Spines, if present, foliar in origin (placed below cladodes and along stems), rarely absent | 6 |
| 4a | Fruit a nutlet; flowers fascicled on reduced branchlets | **A. glaucus** |
| 4b | Fruit a berry; flowers apical or lateral | 5 |
| 5a | Flowers lateral beside opposing cladode fascicles; branchlets absent; basal half of spine puberulous, apical half glabrous | **A. flavicaulis** subsp. **flavicaulis** |
| 5b | Flowers apical on branchlets; stems usually minutely pubescent | **A. suaveolens** |
| 6a | Stems and branches pseudo-sympodial | **A. striatus** |
| 6b | Stems and branches monopodial | 7 |
| 7a | Cladodes many, arranged in spherical fascicles (sometimes flattened) or stellate; flowers solitary or few, either apical, inside or beside a fascicle | 8 |
| 7b | Cladodes solitary to many, erect or spreading-erect, if many, then close together at base so that fascicle resembles a brush; flowers various | 11 |

8a Plants scandent; young stems not ribbed . . . . . 9
8b Erect shrubs; young stems ribbed . . . . . 10
9a Cladode fascicles globose, cladodes 4–7(–12) mm long; main roots swollen in young plants . . . . . **A. setaceus**
9b Cladode fascicles flattened, cladodes ± 3(–5) mm long; main roots terete . . . . . **A. plumosus**
10a Cladodes shortly cylindrical, terete, glabrous, placed on a disc on receptacle; flowers solitary, pendulous . . . . . **A. microraphis**
10b Cladodes filiform, attenuate at base; flowers few. . . . . **A. concinnus**
11a Spines absent; erect shrubs; flowers pendulous, solitary. . . . . **A. virgatus**
11b Spines present, at least on lower part of stem, occasionally absent; plant erect or scandent; flowers erect, several . . . . . 12
12a Stems and branches zigzagging with epidermis peeling into membranous strips; flowers usually 2, divaricate; main roots swollen into fusiform tubers below rhizome . . . . . **A. exuvialis**
12b Stems and branches straight with epidermis entire; flowers one to many; roots thick but terete and not swollen into fusiform tubers . . . . . 13
13a Spines present below cladode fascicles . . . . . 14
13b Spines present on main branches but not below cladode fascicles . . . . . 15
14a Erect shrub; young stems white . . . . . **A. laricinus**
14b Shrub when young, becoming a scrambler; young stems not white . . . . . **A. africanus**
15a Stems clearly longitudinally striate when young . . . . . 16
15b Stems without clear longitudinal striations when young, may have faint striations or be wrinkled where stems twisted . . . . . 18
16a Branches recurving; cladodes entirely absent at anthesis; flowers in clusters at ends of short branches with some scattered along branches . . . . . **A. denudatus**
16b Branches at right angles to stems; cladodes present at flowering time, may be shorter than at maturity; flowers along branches . . . . . 17
17a Shrub or rounded erect herb; branchlets often becoming spiny . . . . . **A. bechuanicus**
17b Twiner, branches usually soft and twining . . . . . **A. cooperi**
18a Plants pubescent, at least on young branches . . . . . **A. devenishii**
18b Plants glabrous at all stages . . . . . 19
19a Flowers always placed along branches and branchlets . . . . . **A. cooperi**
19b At least some flowers placed on ends of short spreading or recurved branchlets. . . . . **A. edulis**

## **africanus** Lam.

*Protasparagus africanus* (Lam.) Oberm.

Erect shrub or scrambler, up to 2 m high. **Roots** thick, terete. **Stems** greenish, yellowish or brownish when young, straight, not zigzagging, epidermis not peeling into strips. **Spines** straight or reflexed, sharp, reddish brown with scale leaves above similar in colour, present below cladode fascicles. **Cladodes** ± 12 per fascicle, filiform. **Flowers**: tepals white, Oct. **Fruit** a berry. Stony hillsides, fairly moist places. *Wild asparagus*; *wag-'n-bietjie*, *haakdoring* (A); *leunyeli*, *lelala-tau-le-leholo* (SS); *ubulawu ubumhlope*, *umthunzi* (X); *isigobo*, *isiGoba* (Z).




## **asparagoides** (L.) Druce

*Myrsiphyllum asparagoides* (L.) Willd.

Scandent, much-branched, perennial herb, up to 5 m high. **Roots** with tubers attached close to and radiating from rhizome, fusiform, 40–60 × 10–15 mm. **Spines** absent. **Cladodes** solitary, ovate to cordate, 25–40 × 8–20 mm. **Flowers**: pendulous; style 1; tepals white with green stripes,

cohering in lower half, forming a tube, spreading in upper half; Jul.–Sep. **Fruit** a berry. Forest, wooded areas, riverbanks. *Broad-leaved asparagus*, *Cape smilax*; *breëblaarklimop*, *krulkransie* (A); *khopananyane*, *likhopa*, *sethota-sa-mathuela* (SS); *isicakathi* (X); *iButha*, *inkunzimbili* (Z).

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|

### **bechuanicus** Baker

*Protasparagus bechuanicus* (Baker) Oberm.

Shrub or rounded, erect herb, up to 0.6 m high. **Stems** clearly longitudinally striate when young; branches at right angles to stems. **Spines** present on main branches, but not below cladode fascicles. **Cladodes** present at flowering time. **Flowers**: along branches; tepals white; Jun.–Nov. **Fruit** a berry. Dry grassland, mopane veld.

| | | DrGr | | | |
|---|---|---|---|---|---|

### **concinnus** (Baker) Kies

*Protasparagus concinnus* (Baker) Oberm. & Immelman

Small, erect shrub, up to 1 m high. **Stems** and branches closely, minutely ribbed, often pubescent. **Cladodes** many, filiform, attenuate at base. **Flowers**: few on long recurved pedicels, exserted from base of cladode fascicles; tepals creamy white; Nov., Dec. **Fruit** a berry. Grassland, hillsides, often in rocky situations.

| | | DrGr | MsGr | KarSh | |
|---|---|---|---|---|---|

### **cooperi** Baker

*Protasparagus cooperi* (Baker) Oberm.

Scandent, glabrous or pubescent chamaephyte, up to 2 m high. **Roots** terete. **Stems** sometimes longitudinally striate when young, erect, with short sharp spines below, twining above; branches at right angles to stems. **Cladodes** maturing later in season, (5–)10–20 mm long, filiform, becoming very dense. **Flowers**: inside cladode fascicle, along branches and branchlets, tepals white with a green midrib; Sep.–Nov. **Fruit** a berry. In bush or exposed places, sometimes in disturbed soil. *Lehonyeli*, *lelala-tau-le-leholo*, *leunyeli*, *molala-tau-o-moholo* (SS).

| | AcGr | DrGr | MsGr | KarSh | |
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### **denudatus** (Kunth) Oberm.

*Protasparagus denudatus* (Kunth) Oberm.

Shrub, up to 1.5 m high. **Roots** terete. **Stems** longitudinally striate when young, branches recurving. **Spines** only on main branches. **Cladodes** 2–4 mm long, absent at anthesis, appearing Jan.–Jul., deciduous. **Flowers**: in clusters of 2–4 at ends of short branches, some scattered along branches; Oct., Nov. **Fruit** a berry. Rocky situations, riverbanks.

| | | DrGr | MsGr | | Zastr |
|---|---|---|---|---|---|

### **devenishii** (Oberm.) Fellingham & N.L.Mey.

*Protasparagus devenishii* Oberm.

Small, robust shrub, up to 1 m high, pubescent, at least on young branches. **Roots** terete. **Stems** without clear longitudinal striations. **Spines** reflexed, ± 5 mm long, present only along

stem nodes. **Cladodes** in thick fascicles. **Flowers**: tepals white; Oct. **Fruit** a berry. Montane, rocky areas.

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**edulis** (Oberm.) J.-P.Lebrun & Stork
*Protasparagus edulis* Oberm.

Annual herb, erect at first, lengthening and scrambling with age, glabrous, slender. **Roots** cylindrical. **Stems** flexuous, without clear longitudinal striations. **Spines** present on main branches. **Cladodes** ± 5 mm long, soft. **Flowers**: 1–4 at ends of spreading or recurved branchlets; tepals white; Oct.–Jan. **Fruit** a berry. Open grassland or in shade in scrub. *Wild asparagus*.

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**exuvialis** Burch. forma **exuvialis**
*Protasparagus exuvialis* (Burch.) Oberm. forma *exuvialis*

Erect or scrambling, glabrous shrub, up to 2 m high. **Roots** swollen into fusiform tubers below rhizome. **Branches** and branchlets widely zigzagging, with short internodes, with membranous bark peeling off in white strips. **Spines** poorly developed, small, present only below nodes of branches or absent. **Cladodes** deciduous, absent or immature at anthesis. **Flowers**: 2 at each node, divaricate, erect, stalk ± 3 mm long; bracts broad, short; tepals yellow or white; Jan. **Fruit** a berry. In sandy areas and on surface limestone.

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**flavicaulis** (Oberm.) Fellingham & N.L.Mey. subsp. **flavicaulis**
*Protasparagus flavicaulis* Oberm. subsp. *flavicaulis*

Erect chamaephyte, up to 0.3 m high. **Roots** terete. **Branchlets** absent. **Stems** yellow when young. **Spines** basal half of spine puberulous, apical half glabrous. **Cladodes** glabrous, smooth. **Flowers**: lateral beside opposing cladode fascicles, placed halfway along a spinous branch; tepals white; Aug.–Dec. **Fruit** a berry. Grassland, rocky hillsides.

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**glaucus** (Kies) Oberm.
*Protasparagus glaucus* (Kies) Oberm.

Erect, glabrous shrub, up to 0.5 m high. **Roots** thick, terete. **Stems** erect, secondary branches terminating in spines. **Cladodes** in small fascicles evenly spaced along innocuous, deciduous branchlets, usually secund on spreading branchlets, absent at anthesis. **Flowers**: many, fascicled on reduced branchlets; tepals greenish. **Fruit** a nutlet. Brackish soils.

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**laricinus** Burch.
*Protasparagus laricinus* (Burch.) Oberm.

Erect shrub, up to 2.5 m high. **Roots** thick, terete, not swollen into tubers. **Stems** white when young, straight, not zigzagging, epidermis not peeling into strips. **Spines** present below cladode fascicles, short, hard, straight or slightly curved. **Cladodes** many, filiform, up to 35 mm

long. **Flowers**: tepals white; Oct.–Feb. **Fruit** a berry. Bushveld and grassland. *Wild asparagus*; *bergkatbos*, *bergkatdoring* (A); *ibutha* (Z).

AcGr DrGr MsGr KarSh

**microraphis** (Kunth) Baker

*Asparagopsis microraphis* Kunth

*Protasparagus microraphis* (Kunth) Oberm.

Dome-shaped, erect shrub, up to 2 m high. **Roots** cylindrical, woody. **Stems** ribbed when young, later pale grey. **Cladodes** shortly cylindrical, terete, glabrous, many in each fascicle, placed on a circular receptacle. **Flowers**: solitary, pendulous, stalk with disc near base; tepals cream-coloured with a salmon-coloured or green centre stripe; Oct.–Dec. **Fruit** a berry. Mountainsides, humid, rocky places. *Lehonyeli*, *lelala-tau*, *leunyeli*, *mankoe*, *molala-tau* (SS).

DrGr MsGr

**plumosus** Baker

*Protasparagus plumosus* (Baker) Oberm.

Scandent, evergreen, perennial herb. **Roots** with main ones terete. **Stems** not ribbed when young; branches and cladodes spreading in one plane. **Cladode** fascicles compressed (flattened); cladodes ± 3(–5) mm long. **Flowers**: few, apical, in centre of upper cladode fascicle; tepals white; Feb., Mar. **Fruit** a berry. Undergrowth in shade of forests, occasionally in open grassland. *Satisfaction*, *feathery asparagus*; *platkatdoring*, *katstert* (A).

MsGr

**ramosissimus** Baker

*Myrsiphyllum ramosissimum* (Baker) Oberm.

Climber, up to 2 m high. **Roots** fusiform. **Stems** and branches angled. **Spines** absent. **Cladodes** in fascicles of 3, linear to filiform, laxly spreading, ± 1 mm wide, with a prominent midrib. **Flowers**: pendulous, solitary, anthers red; tepals spreading in upper half, white; Sep.–Feb. **Fruit** a globose berry, 1–3-seeded, red. Forests, kloofs, riverbanks, moist, shady places. *Khopa*, *sesilatsane* (SS); *ibutha* (Z).

DrGr MsGr

**setaceus** (Kunth) Jessop

*Protasparagus setaceus* (Kunth) Oberm.

Evergreen, perennial, usually scandent shrub, up to 5 m high. **Roots** main ones swollen in young plants. **Stems** not ribbed when young, not zigzagging. **Spines** few, short, basal. **Cladode** fascicles globose, cladodes 4–7(–12) mm long. **Flowers**: solitary in centre of apical cladode fascicle, tepals white; Nov.–Mar. **Fruit** a berry. Undergrowth, in moist, humus-rich soil. *Asparagus fern*; *ibutha* (Z).

DrGr MsGr

**striatus** (L.f.) Thunb.

*Protasparagus striatus* (L.f.) Oberm.

Small, stiff shrub, up to 1.2 m high. **Roots** with tubers on side roots, some distance away from rhizome. **Stems** erect, branches somewhat zigzagging (pseudo-sympodial). **Spines** poorly

developed. **Cladodes** on short branches, solitary, linear, ± 30–40 × 2–5 mm, acute, striate, hard. **Flowers**: in apical fascicles; tepals white; Oct.–Dec. **Fruit** a berry. Dry karroid areas, rocky niches. *Bobbejaanappel*, *bergappel* (A).

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**suaveolens** Burch.

*Protasparagus suaveolens* (Burch.) Oberm.

Erect chamaephyte, up to 1 m high. **Roots** terete. **Stems** minutely pubescent. **Branches** either spreading or suppressed (fox-tail habit adopted during dry conditions). **Spines** straight, often producing spinules. **Cladodes** filiform. **Flowers**: apical on branchlets; tepals white with a dark midrib; Jun.–Jan. **Fruit** a berry. Rocky grassland. *Wild asparagus*; *katdoring* (A); *mvane* (X).

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**virgatus** Baker

*Protasparagus virgatus* (Baker) Oberm.

Erect, stiff, herbaceous shrub, up to 1.4 m high. **Roots** terete. **Stems** erect with spreading branches, giving a fern-like appearance, glabrous and clearly quadrate. **Spines** absent. **Cladodes** (1)2–4(–7) in a fascicle, 5–15(–25) mm long. **Flowers**: solitary, pendulous, placed along branches; tepals white; Sep.–Jan. **Fruit** a berry. In shade. *Makkatdoring*, *katstert* (A); *iphinganhloya*, *ihabiya*, *ibutha*, *unwele* (Z).

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## Reference

OBERMEYER, A.A. & IMMELMAN, K.L. 1992. Asparagaceae. *Flora of southern Africa* 5,3: 11–82.

# ASPHODELACEAE

Compiled by R.R. Klopper & G.F. Smith

Perennial, rarely annual, herbs, shrubs, succulent rosette plants to small pachycaul trees. **Leaves** dorsiventral, often succulent, sometimes terete, sheathing at base, often serrate-dentate and marginally spiny in succulent taxa. **Flowers**: in simple or compound racemes or spikes; bisexual, perianth segments 3 + 3, free, nearly free or fused into tube, white, yellow, orange, red or mauve, never blue-violet; stamens 3 + 3, filaments free, linear; ovary superior; style single with small apical stigma. **Fruit** usually a 3-locular, loculicidal capsule. *Aloe family*.

## ASPARAGACEAE

## Key to genera

1a Leaves distinctly succulent; blade usually margined with prominent teeth . . . . 2
1b Leaves ± non-succulent, mesophytic or leathery; blade with margins lacking distinct spines . . . . . 8
2a Filaments with feathery appendages . . . . . **Bulbine**
2b Filaments without feathery appendages . . . . . 3
3a Perianth bilabiate, < 15 mm long, mouth not upturned, white . . . . . 4
3b Perianth regular, if rarely weakly bilabiate, then flowers > 15 mm long, mouth upturned, usually brightly coloured . . . . . 5
4a Leaves smooth, pubescent or rugulose; perianth curved, segments free . . . . . **Haworthia**
4b Leaves smooth or with white, subtuberculate to subspinescent spots; perianth straight, segments fused . . . . . **Haworthiopsis**
5a Leaves cauline dispersed, sheath prominent. . . . . **Aloiampelos**
5b Leaves rosulate or distichous, sheath not prominent . . . . . 6
6a Leaves without spines or prickles, distinctly 3-ranked . . . . . **Gonialoe**
6b Leaves usually with spines or prickles, rosulate or distichous . . . . . 7
7a Rosettes small; leaf blade with several scattered small, white, subtuberculate to spinulescent spots, apex tapering to distinct hair-like awn. . . . . **Aristaloe**
7b Rosettes of various sizes; leaf blade smooth or with prickles but not with small subtuberculate or spinulescent spots, apex unarmed or armed with fierce spine . . . . . **Aloe**
8a Perianth tubular, segments fused towards base . . . . . **Kniphofia**
8b Perianth stellate, segments free . . . . . **Trachyandra**

## **Aloe** L. (sthn Afr.: 144 spp.)

### Key to species:

1a Much-branched shrub . . . . . **A. arborescens** subsp. **arborescens**
1b Single stemmed or acaulescent . . . . . 2
2a Plants with a single, usually unbranched stem, occasionally branched at apex, > 0.5 m long. . . . . 3
2b Plants acaulescent or with single stem < 0.5 m long . . . . . 5
3a Inflorescence usually simple; bracts prominent, obscuring flowers. . . . . **A. broomii** var. **broomii**
3b Inflorescence much branched; bracts small . . . . . 4
4a Racemes 500–800 mm long; floral bracts 8–10 mm long; perianth scarlet to orange, uncurved. . . . . **A. ferox**
4b Racemes ± 250 mm long; floral bracts 4–5 mm long; perianth yellow to golden-yellow, slightly decurved. . . . . **A. spectabilis**
5a Leaves with blade linear, only slightly succulent, deciduous (grass aloes) . . . . 6
5b Leaves with blade variously shaped, very succulent, not deciduous. . . . . 11
6a Leaves with blade very narrowly linear, leaf bases forming bulb-like swelling underground. . . . . 7
6b Leaves with blade variously shaped; leaf bases not forming bulb-like swelling underground. . . . . 9
7a Flowers scarlet, not *Haworthia*-like, 35–50 mm long . . . . . **A. kniphofioides**
7b Flowers whitish to greenish brown, *Haworthia*-like, up to 15 mm long. . . . . 8
8a Bulbs usually single; leaves ± 2 mm wide, twisting a few times; inflorescence usually appears before leaves, with semi-erect flowers . . . . **A. subspicatum**
8b Bulbs often clumping; leaves 4–5 mm wide, strongly spiralling; inflorescence appears with leaves, with erect flowers . . . . . **A. jeppeae**
9a Leaves distichous, blade narrowly long-deltoid, distinctly keeled, V-shaped in cross section; perianth salmon-pink near base, green at apex. . . . . **A. cooperi** subsp. **cooperi**

9b Leaves not distichous, blade narrowly ovate, not distinctly keeled; perianth yellow to red . . . . . 10
10a Leaves with blade up to 90 mm wide; perianth salmon-pink, cylindrical, ± 40 mm long. . . . . **A. boylei**
10b Leaves with blade up to 70 mm wide; perianth yellow to red, markedly swollen in middle, 20–24 mm long . . . . . **A. ecklonis**
11a Inflorescence almost horizontal; plants forming dense, often hollow, circular groups, rosettes not erect, facing outwards . . . . . **A. claviflora**
11b Inflorescence erect; plants solitary or forming dense groups, rosettes usually erect . . . . . 12
12a Flowers not constricted above ovary; leaf blade obscurely lineate, without spots on upper surface, sometimes with few white spots on lower surface, scattered or arranged in transverse bands . . . . . **A. hereroensis** var. **hereroensis**
12b Flowers constricted above ovary; leaf blade with many white spots, arranged in interrupted, wavy, transverse bands on both surfaces or only on upper surface . . . . . 13
13a Flowers in capitate-corymbose racemes . . . . . **A. maculata**
13b Flowers in cylindrical or conical racemes. . . . . 14
14a Perianth distinctly club-shaped. . . . . **A. grandidentata**
14b Perianth not club-shaped . . . . . 15
15a Winter-flowering (Jun., Jul.) . . . . . **A. davyana**
15b Summer-flowering (Nov.–Apr.) . . . . . **A. zebrina**

## **arborescens** Mill. subsp. **arborescens**

Succulent, perennial shrub; caulescent. **Stems** 2–3 m high, much branched to form an arborescent shrub. **Leaves** dull green to grey-green, without spots, 0.5–0.6 m long; margins with firm, pale teeth, usually curved forward. **Flowers**: inflorescence usually simple, erect, ± 0.8 m high, with conical to elongate-conical, dense racemes; stamens and stigma exserted; perianth ± 40 mm long, orange, scarlet, or occasionally yellow; May–Aug. Rocky outcrops. *Krantz aloe*; *kransaalwyn* (A); *ikhala*, *unomaweni* (X); *inhlaba-encane*, *inkalane-encane*, *umhlabana* (Z).




## **boylei** Baker

Succulent, perennial herb, grass aloe; caulescent. **Stems** short or up to 0.2 m long, simple or suckering to form dense groups, erect. **Leaves** with blade narrowly ovate-ensiform, 500–600 mm long, up to 90 mm wide; margins white, with soft, white teeth, deep green, upper surface usually without spots, sometimes lineate or with few scattered spots near base, lower surface copiously white-spotted near base. **Flowers**: inflorescence simple, erect, 0.4–0.6 m high, with capitate, subcorymbose or slightly conic, dense racemes; stamens and stigma exserted; perianth ± 40 mm long, salmon-pink, greenish tipped, cylindrical, narrowing towards mouth; Dec., Jan. Eastern Escarpment grassland. *Boyle's grass aloe*; *Boyle-se-grasaalwyn* (A); *isiphukuthwane*, *isiphuthumane* (Z).




## **broomii** Schönland var. **broomii**

Succulent, perennial herb; caulescent. **Stems** short, up to 1 m long, usually simple, sometimes dividing at apex, procumbent, with many persistent dried leaves. **Leaves** with blade broadly ovate to narrowly ovate, ± 300 mm long, apex dry, terminating in very pungent spine; margins reddish brown, with deltoid, pale-tipped teeth, yellowish green, obscurely lineate. **Flowers**: inflorescence usually simple, erect, 1.0–1.5 m high, with cylindric, slightly acuminate, dense

racemes; stamens and stigma well exserted; perianth 20–25 mm long, hidden by large bracts, pale lemon-coloured; Aug.–Oct. Rocky slopes. *Bergaalwyn*, *slangaalwyn* (A). Figure 11E, p. 8.

AcGr DrGr MsGr KarSh

### **claviflora** Burch.

Succulent, perennial herb; acaulescent, forming dense, often hollow, circular groups, rosettes not erect, facing outwards, 150–250 mm in diameter. **Leaves** with blade, somewhat sickle-shaped, up to 200 mm long; margins with sharp, brown teeth, grey-green, few spines along tip of keel. **Flowers**: inflorescence usually simple, almost horizontal, with cylindrical, dense racemes; stamens and stigma well exserted; perianth club-shaped, 30–40 mm long, bright red, yellowing with age Aug., Sep. Usually on calcrete, margins of Kalahari thornveld. *Aanteelaalwyn*, *kanonaalwyn*, *kraalaalwyn* (A).

KarSh

### **cooperi** Baker subsp. **cooperi**

Succulent, perennial herb, grass aloe; acaulescent or with a slender stem up to 0.15 m high, usually simple, sometimes suckering to form small groups. **Leaves** distichous; blade narrowly long-deltoid, distinctly keeled, V-shaped in cross section; margins narrow, white, with firm, white teeth, green, usually without spots on upper surface, with copious white spots at base on lower surface, obscurely lineate. **Flowers**: inflorescence simple, erect, up to 1 m or more high, with dense, conical racemes; stamens not or only slightly exserted, stigma exserted; perianth 38–40 mm long, salmon-pink near base, green at apex; Jan.–Mar. Marshy places or among rocks on hillsides. *Cooper's grass aloe*; *inqimindolo*, *isiphukuthwane*, *isiphuthumane* (Z).

MsGr

### **davyana** Schönland

Succulent, perennial herb; acaulescent; rosettes solitary or few. **Leaves** with blade triangular to narrowly ovate, ± 100 mm long, with additional ± 100 mm dry, twisted apical portion; margins horny, brown, with pungent, brown teeth, green, with many oblong, white spots, sometimes arranged in interrupted, wavy transverse bands on upper surface, pale glaucous green, obscurely lineate without spots on lower surface. **Flowers**: inflorescence branched, 0.6–1.0 m high, branches ascending, with broadly conical, apically dense, basally laxer racemes; stamens and stigma exserted; perianth 32–35 mm long, pale pink, whitish- to greyish-striped; Jun., Jul. Rocky outcrops in grassland. *Oorbeweidingsaalwyn* (A).

VreDm DrGr

### **ecklonis** Salm-Dyck

Succulent, perennial herb, grass aloe; acaulescent or stem very short, rosettes solitary or in small groups. **Leaves** with blade narrowly ovate, up to 400 mm long, up to 70 mm wide; margins white, cartilaginous, with firm, white, deltoid teeth, dull green, without spots, sometimes with few, small, white spots near base. **Flowers**: inflorescence simple, erect, up to 0.5 m high, with densely capitate, somewhat corymbose racemes; stamens and stigma exserted; perianth, 20–24 mm long, markedly swollen in middle, yellow to red; Nov.–Feb. Grassland, heavy soils. *Ecklon's grass aloe*; *Ecklon-se-grasaalwyn* (A); *maroba lihale* (SS); *isiphukuthwane*, *isiphuthumane* (Z).

DrGr MsGr

**ferox** Mill.

Succulent, perennial tree; caulescent. **Stems** 2–3 m long, simple, erect, densely covered with persistent dried leaves. **Leaves** with blade narrowly ovate-ensiform, up to 1 m long; margins with stout, deltoid, reddish to brownish red teeth, dull green, sometimes reddish tinged, without spots, with smooth or with irregular scattered spines. **Flowers**: inflorescence much branched, ± 1 m high, with cylindrical, very dense racemes; floral bracts 8–10 mm long; stamens and stigma well exserted; perianth ± 33 mm long, scarlet to orange; May–Nov. Rocky slopes. *Bitter aloe*; *tapaalwyn*, *bitteraalwyn*, *opregte-aalwyn*, *karoo-aalwyn* (A); *hlaba* (SS); *ikhala* (X); *umhlaba* (Z).

Zastr

**grandidentata** Salm-Dyck

Succulent, perennial herb; acaulescent or stems very short, suckering to form dense groups. **Leaves** with blade narrowly ovate, 100–150 mm long; margins horny, reddish brown, with pungent, deltoid, reddish brown teeth, upper surface brownish green, with many dull, white, oblong spots, usually arranged in interrupted, transverse bands, more prominently marked on lower surface. **Flowers**: inflorescence branched above middle, ± 0.9 m high, with cylindric, slightly acuminate, lax racemes; stamens and stigma exserted; perianth club-shaped, 28–30 mm long, dull red; Aug.–Oct. Gravelly or stony soil in flat areas and on ironstone koppies. *Kleinbontaalwyn* (A). Figure 11B, p. 8.

AcGr DrGr KarSh

**hereroensis** Engl. var. **hereroensis**

Succulent, perennial herb; acaulescent or older plants with very short stem, rosettes solitary or suckering to form small clumps. **Leaves** with blade narrowly ovate to ovate, 300–400 mm long; margins cartilaginous, with pungent, deltoid, red-brown teeth, greyish green or often bronzed, obscurely lineate, usually without spots on upper surface, few to many whitish spots scattered or arranged in transverse bands on lower surface. **Flowers**: inflorescence erect, branched, lower branches rebranched, up to 1 m high, branches widely spreading, with corymbose-capitate, very dense racemes; not constricted above ovary; stamens and stigma exserted; perianth 25–33 mm long, scarlet; Jun.–Sep. Arid, stony desert conditions with very low rainfall. Figure 2, p. vi.

AcGr DrGr

**jeppeae** Klopper & Gideon F.Sm.
*Chortolirion latifolium* Zonn. & G.P.J.Fritz

Succulent, bulbous perennial; acaulescent. **Bulb** often clumping, with loosely packed, membranous scales covering slightly fleshy leaf bases. **Leaves** semisucculent, grass-like, deciduous; blade erect, slender, 4–5 mm wide, strongly spiralling, greyish green, white-spotted near base; margins with soft, white, decurved teeth. **Flowers**: *Haworthia*-like, zygomorphic, erect; inflorescence a lax, unbranched raceme, appearing with leaves; perianth reddish brown to greenish brown with greenish keels to segments; Nov., Dec. **Fruit** an apically acuminate capsule. Sandy soil in rather open, short grasslands.

DrGr

**kniphofioides** Baker

Succulent, perennial herb, grass aloe; acaulescent; rosettes solitary, leaf bases forming bulb-like swelling underground. **Leaves** green, without spots, blade narrowly linear, 200–300 mm

long; margins entire or minutely dentate, with small, white teeth. **Flowers**: inflorescence single, rarely 2, simple, erect, up to 0.55 m high, with very lax, few-flowered racemes; stamens and stigma not or very shortly exserted; perianth 35–50 mm long, cylindrical, scarlet, green-tipped; Nov., Dec. Grassy slopes in stony ground. *Grass aloe*, *poker aloe*; *grasaalwyn* (A).

MsGr

## **maculata** All.

*A. saponaria* (Aiton) Haw.

Succulent, perennial herb; acaulescent or stem up to 0.5 m long, rosettes solitary or suckering to form dense groups. **Leaves** with blade narrowly ovate to ovate, up to 250–300 mm long, with dried twisted apex; margins with pungent, deltoid, horny, brown teeth, pale to darker green, with many, dull, white spots in irregular broken, wavy, transverse bands on upper surface, paler green, obscurely lineate and usually without spots on lower surface. **Flowers**: inflorescence branched in middle, 0.4–1.0 m high, branches ascending, with capitate-corymbose, dense racemes; constricted above ovary; stamens and stigma exserted; perianth 35–45 mm long, red or orange to yellow; Jun., Jul. or Sep.–Jan. Rocky outcrops and grassland. *Common soap aloe*; *bontaalwyn*, *seepaalwyn* (A); *lekhala*, *lekhala-la-Lesotho* (SS); *ingcelwane* (X); *amahlala*, *icena* (Z).

AcGr DrGr MsGr KarSh

## **spectabilis** Reynolds

Succulent, perennial tree; caulescent. **Stems** up to 5 m long, simple, rarely forked high up, erect, densely covered with persistent dried leaves. **Leaves** with blade narrowly ovate-ensiform, ± 1 m long; margins with stout, pungent, deltoid, reddish to brownish teeth, dull green, sometimes reddish tinged, without spots, with scattered, reddish brown, pungent spines. **Flowers**: inflorescence much branched, up to 1 m high, with cylindrical, rather truncate, fairly erect, dense racemes; floral bracts 4–5 mm long; stamens and stigma well exserted; perianth ± 32 mm long, slightly decurved, yellow to golden-yellow; Jul., Aug. *Umhlaba*, *inhlaba*, *ikhala*, *inhlabane* (Z).

Naturalised population on farm Besterskrik, 5 km north of Korannaberg.

DrGr MsGr

## **subspicatum** (Baker) Boatwr. & J.C.Manning

*Chortolirion subspicatum* (Baker) A.Berger
*Haworthia subspicata* Baker

Succulent, bulbous perennial; acaulescent. **Bulb** mostly single, with loosely packed, membranous scales covering slightly fleshy leaf bases. **Leaves** semisucculent, grass-like, deciduous; blade flaccid to erect, slender, ± 2 mm wide, usually 2–5 twisted, light green to glaucous-green, white-spotted near base; margins with soft, white, decurved teeth. **Flowers**: *Haworthia*-like, zygomorphic, semi-erect, slightly subsecund; inflorescence a lax, unbranched raceme, appearing before leaves; perianth whitish to light greenish brown with greenish keels to segments; Aug.–Apr. **Fruit** an apically acuminate capsule. Sparse or dense grasslands.

VreDm AcGr DrGr KarSh Zastr

## **zebrina** L.

Succulent, perennial herb; acaulescent, rosettes sometimes solitary or usually suckering to form groups. **Leaves** with blade narrowly ovate, 150–350 mm long, usually with dried twisted

apex; margins with stout, pungent, red-brown teeth, dull green, sometimes rich brown in dry conditions, with transverse bands of conspicuous, whitish, oblong spots on upper surface, usually obscurely or copiously spotted on lower surface. **Flowers**: inflorescence branched at ± middle or above, 0.75–2.00 m high, branches ascending, with narrowly cylindrical-acuminate, dense to very lax racemes; stamens and stigma exserted; perianth 25–35 mm long, dull red to pinkish red or coral-coloured with paler segment margins; Nov.–Apr. Rocky outcrops and grassland. *Bontaalwyn* (A).

| VreDm | | | | | |
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## **Aloiampelos** Klopper & Gideon F.Sm. (sthn Afr.: ± 7 spp.)

### **striatula** (Haw.) Klopper & Gideon F.Sm. var. **striatula**

*Aloe striatula* Haw. var. *striatula*

Succulent, perennial shrub; caulescent. **Stems** up to 1.75 m long, much branched. **Leaves** cauline dispersed; blade linear to narrowly ovate, up to 250 mm long, apex acuminate; margins very narrow, cartilaginous, with firm, white, deltoid teeth; semiglossy green, without spots, sheath prominently green-lined. **Flowers**: inflorescence simple, with cylindric-conic, dense racemes; stamens and stigma well exserted; perianth 40–45 mm long, yellow to slightly orange-tinged; Oct., Nov. *Mohalakane*, *seholobe* (SS).

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## **Aristaloe** Boatwr. & J.C.Manning (sthn Afr.: ± 1 sp.)

### **aristata** (Haw.) Boatwr. & J.C.Manning

*Aloe aristata* Haw.

Succulent, perennial herb; acaulescent, usually suckering to form dense clumps, rosettes 100–150 mm in diameter. **Leaves** with blade green with several scattered small, white, subtuberculate to spinulescent spots, very narrowly ovate, 80–100 mm long, apex tapering to hair-like awn; margins with soft, white, cartilaginous teeth, soft white spines in 1 or 2 rows at apex of keel. **Flowers**: inflorescence occasionally simple, usually branched from middle, erect, ± 0.5 m high, with lax racemes; stamens and stigma slightly exserted; perianth ± 40 mm long, red on upper surface, paler below; Nov. Sandy karroid flats and mountain slopes in grassland. *Guinea-fowl aloe*; *tarentaalaalwyn* (A); *lekhala-le-lenyenyane*, *lekhalana*, *sereleli* (SS); *umathithibala* (Z).

| | | DrGr | MsGr | | Zastr |
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## **Bulbine** Willd. (sthn Afr.: ± 66 spp.)

### Key to species:

1a Plants with a tuberous base, crowned by a dense ring of erect bristles . . . . . **B. favosa**
1b Plants with a rhizomatous base. . . . . 2
2a Leaves strap-shaped . . . . . **B. narcissifolia**
2b Leaves semiterete to terete . . . . . 3
3a Leaves spirally twisted; capsule inflated . . . . . **B. angustifolia**

| | | |
|---|---|---|
| 3b | Leaves not twisted; capsule not inflated | 4 |
| 4a | Plants caulescent | **B. frutescens** |
| 4b | Plants acaulescent | 5 |
| 5a | Racemes capitate | **B. capitata** |
| 5b | Racemes elongated | 6 |
| 6a | Leaves bluish green; plants with vertically elongated, rhizomatous base | **B. lagopus** |
| 6b | Leaves dark green, in dense basal rosette | 7 |
| 7a | Pedicels erect when barren | **B. abyssinica** |
| 7b | Pedicels recurved to recurved-recoiled when barren | **B. asphodeloides** |

## **abyssinica** A.Rich.

Succulent, perennial herb; acaulescent, base rhizomatous. **Leaves** in a basal rosette; blade terete, up to 400 mm long, bright, dark green. **Flowers**: inflorescences several, erect, sometimes arcuate, raceme lax to very dense; bracts whitish brown or yellow, apex long-acuminate, base auriculate, margins entire; pedicels erect when barren; perianth yellow; Aug.–May. **Fruit** with capsule not inflated. Widespread in grassland and also drier areas. *Bushy bulbine*; *geelkatstert*, *wildekopieva* (A); *moetsa-mollo* (SS); *intelezi* (X); *ibuchu* (Z). Figure 61.

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| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |

## **angustifolia** Poelln.

*B. tortifolia* I.Verd.

Succulent, perennial, herb; acaulescent, base rhizomatous. **Leaves** subdistichous to whorled; blade terete, spirally twisted, up to 0.5 m long, dark green. **Flowers**: inflorescences 1 or 2, erect to slightly curved, raceme dense; bracts whitish brown when dry, apex caudate, base irregularly auriculate, margins entire; pedicels erect when flowering, curved in fruit; perianth yellow; Nov.–Mar. **Fruit** an inflated capsule. Sand, loam or granite.

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## **asphodeloides** (L.) Spreng.

Succulent, perennial herb; acaulescent or almost caulescent, base rhizomatous. **Leaves** in a basal rosette; blade semiterete, up to 0.57 m long, dark green. **Flowers**: inflorescences several, erect to curved, raceme lax to slightly compact; bracts white, apex filiform-caudate, base subauriculate, margins deeply divided, hairy towards base; pedicels recurved to recurved-recoiled when barren; perianth yellow; Jan.–Dec. **Fruit** with capsule not inflated. Grassland, sandy soil. *Copiva*, *spreading bulbine*; *wildekopieva*, *balsamkopieva*, *geelkatstert* (A); *khomo-ya-ntsuka*, *moetsa-mollo*, *pekane* (SS); *intelezi*, *itswelemyoka* (X); *ibhucu*, *ithethe elimpofu* (Z).

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## **capitata** Poelln.

*B. stenophylla* I.Verd.

Succulent, perennial herb; acaulescent, base rhizomatous, overtopped by persistent leaf-bases. **Leaves** in a basal rosette; blade, terete, up to 400 mm long, light green. **Flowers**: inflorescences 1–3, erect to slightly curved, raceme dense, capitate; bracts transparent, white when dry, apex acuminate-caudate, base auriculate, margins entire; perianth yellow; Jul.–Jan. **Fruit** with capsule not inflated. Grassland or thorn scrub in sandy or stony soil. *Narrow-leaved bulbine*.

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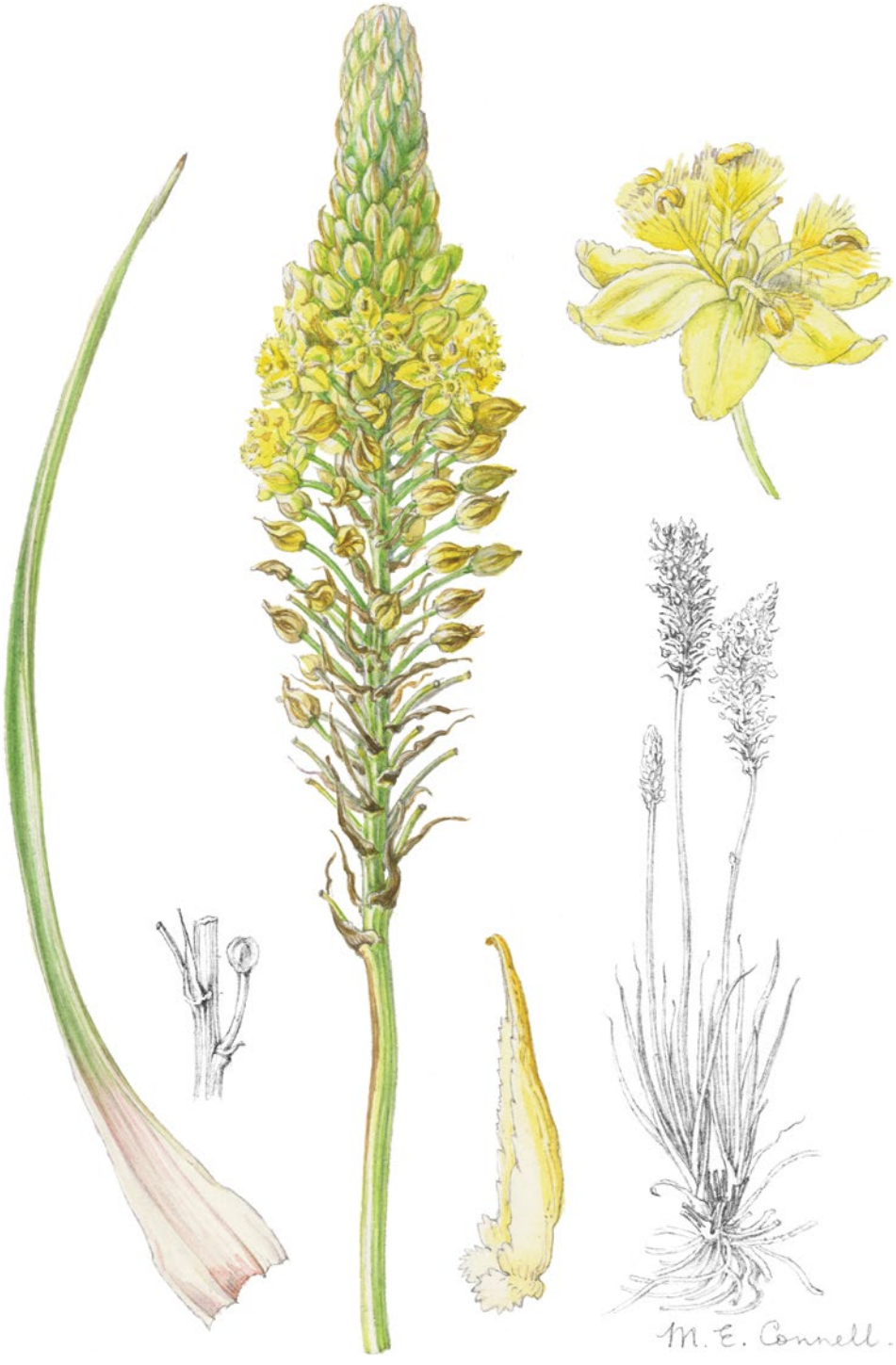



**Figure 61.** *Bulbine abyssinica* (Asphodelaceae). Artist: M.E. Connell.

**favosa** (Thunb.) Schult. & Schult.f.
*B. filifolia* Baker
*B. trichophylla* Baker

Succulent, perennial herb; acaulescent, base tuberous, crowned by a dense ring of erect bristles. **Leaves** in a basal rosette; blade semiterete, up to 230 mm long, green. **Flowers**: inflorescences 1–3, erect to slightly curved, racemes lax; bracts white, transparent, apex acuminate-caudate, base truncate, margins entire; pedicels recurved when barren; perianth yellow; Oct.–Feb. **Fruit** with capsule not inflated. Grassland and rocky areas.

VreDm | AcGr | DrGr | MsGr | | Zastr

**frutescens** (L.) Willd.
*B. caulescens* L.

Succulent, dwarf shrub; caulescent, base rhizomatous. **Stems** and branches up to 0.7 m long, woody or rosulate. **Leaves** whorled along stem; mostly terete or subterete, up to 280 mm long, green to glaucous-green. **Flowers**: inflorescences many, erect or slightly curved, raceme lax to dense; bracts white, apex filiform-caudate, base subauriculate, margins deeply lobed, hairy towards base; pedicels patent to recurved when barren; perianth yellow; Jan.–Dec. **Fruit** with capsule not inflated. Bushveld, woodland, grassland, rocky slopes. *Rankkopieva* (A).

| | | DrGr | MsGr | KarSh | |

**lagopus** (Thunb.) N.E.Br.

Succulent, perennial herb; acaulescent, base rhizomatous, vertically elongated. **Leaves** in a basal rosette; blade semiterete, up to 490 mm long, bluish green. **Flowers**: inflorescences many, erect to slightly curved, raceme basally lax; bracts narrowly ovate, apex piliferous, base auriculate, margins deeply lobed; pedicels reflexed to revolute when barren; perianth yellow; Aug.–Nov. **Fruit** with capsule not inflated. S and SW aspects in stony soil.

| | | DrGr | MsGr | | |

**narcissifolia** Salm-Dyck

Succulent, perennial herb; acaulescent, base rhizomatous. **Leaves** distichous; strap-shaped, laxly twisted, up to 350 mm long, grey-green. **Flowers**: inflorescences 1 or 2, erect, raceme dense, compacted; bracts white, membranous, apex caudate, base auriculate, margins entire; pedicels adpressed to rachis when barren; perianth yellow; Feb.–Apr., Sep.–Nov. **Fruit** with capsule not inflated. Grassland, sandy soil. *Strap-leaved bulbine*; *geelslangkop*, *wildekopieva* (A); *khomo-ea-balisa*, *serelelile* (SS).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

## **Gonialoe** (Baker) Boatwr. & J.C.Manning (sthn Afr.: ± 3 spp.)

**variegata** (L.) Boatwr. & J.C.Manning
*Aloe variegata* L.

Succulent, perennial herb. **Plants** acaulescent; stoloniferous, forming dense groups. **Leaves** *Gasteria*-like; blade narrowly ovate-deltoid, 100–150 mm long; margins white, horny, with closely spaced, small protuberances; keeled, without spines or prickles, distinctly 3-ranked, green or brownish, mottled white. **Flowers**: inflorescence usually branched, ± 0.3 m high, with conical, lax racemes; stamens not or very shortly exserted, stigma exserted; perianth nodding,

35–45 mm long, dull pink to red, rarely yellow; Jul.–Sep. Stony ground, usually in protection of small bushes. *Partridge-breasted aloe*, *variegated aloe*; *bontaalwyn*, *kanniedood* (A).

KarSh

## **Haworthia** Duval (sthn Afr.: ± 42 spp.)

### **bolusii** Baker var. **blackbeardiana** (Poelln.) M.B.Bayer

Succulent, perennial herb; acaulescent, 40–150 mm in diameter, slowly proliferating. **Leaves** incurved; blade soft, translucent, boat-shaped, bluish green; margins and keel with pale, pliable, bristle-like spines 2 mm long. **Flowers**: inflorescence simple, robust, erect; perianth bilabiate, curved, < 15 mm long, segments free, greenish white with ± dirty green keels; Oct., Nov. Among low-growing, sparse, mesic vegetation.

KarSh

## **Haworthiopsis** G.D.Rowley (sthn Afr.: ± 18 spp.)

### **tessellata** (Haw.) Boatwr. & J.C.Manning

*Haworthia venosa* (Lam.) Haw. subsp. *tessellata* (Haw.) M.B.Bayer

Succulent, perennial herb; acaulescent, 15–70 mm in diameter, freely suckering from stoloniferous roots. **Leaves** spreading; blade tough, triangular, dark green to grey-green, with many longitudinally tessellately branched veins on upper surface; margins and keel with firm, triangular spines. **Flowers**: inflorescence simple or sparsely branched, lax, erect; perianth bilabiate, straight, < 15 mm long, segments fused, greenish white with ± dirty green keels; Sep.–Dec. Grassland, sandy soil or rock crevices.

KarSh Zastr

## **Kniphofia** Moench (sthn Afr.: 49 spp.)

### Key to species:

1a Perianth up to 10 mm long. . . . . 2
1b Perianth > 10 mm long . . . . . 4
2a Flowers pendulous when mature . . . . . **K. breviflora**
2b Flowers ascending to spreading when mature . . . . . 3
3a Buds greenish white to orange-yellow tipped with red; perianth whitish to yellow, non-fragrant; leaves mesophytic . . . . . **K. multiflora**
3b Buds dark brown; perianth brown to purplish brown, fragrant; leaves succulent . . . . . **K. typhoides**
4a Leaves with blade narrow, grass-like, < 5 mm wide . . . . . 5
4b Leaves with blade > 5 mm wide . . . . . 6
5a Perianth white or tinged with reddish brown towards base. . . . . **K. thodei**
5b Perianth concolorous, coral-red, orange-red or salmon-red to yellow-orange . . . . . **K. triangularis** subsp. **triangularis**
6a Margins and keel always entire . . . . . 7
6b Margins and keel usually serrulate to sparsely toothed . . . . . 8

7a Perianth 42–50 mm long; leaf blade 8–25 mm wide . . . . . **K. fluviatilis**
7b Perianth 30–40(–42) mm long; leaf blade 6–14 mm wide **K. porphyrantha**
8a Plants usually caulescent . . . . . **K. caulescens**
8b Plants acaulescent or occasionally shortly caulescent. . . . . 9
9a Plants occasionally shortly caulescent; buds purplish orange; perianth pale yellow-green or tinged with orange . . . . . **K. albomontana**
9b Plants acaulescent. . . . . 10
10a Perianth 15–21 mm long . . . . . .11
10b Perianth > 25 mm long . . . . . 12
11a Flowering time Oct.–Dec.; perianth white to greenish white. . . . . **K. ensifolia** subsp. **ensifolia**
11b Flowering time Feb., Mar.; perianth whitish to yellow . . . . . **K. ensifolia** subsp. **autumnalis**
12a Inflorescence overtopping reflexed leaves, 0.8–1.5 m high. . . . . .**K. linearifolia**
12b Inflorescence subequal to or shorter than leaves, 0.4–0.8 m high . . .**K. ritualis**

## **albomontana** Baijnath

Perennial herb; acaulescent or occasionally shortly caulescent. **Stems** 1–4, up to 0.25 m long. **Leaves** recurved; blade stiff, 0.6–1.0 m × 22–45 mm, V-shaped in cross section; margins and keel finely serrulate. **Flowers**: inflorescence overtopping leaves, 0.8–1.2 m high, raceme ovoid, dense; perianth 18–22 mm long, purplish orange and spreading in bud, pale yellow-green or tinged with orange and pendulous when mature; Nov.–Feb. Mountain grassland, seepage areas.




## **breviflora** Harv. ex Baker

Perennial herb; caulescent. **Stem** single, short. **Leaves** first ascending, later recurving, narrow, grass-like, 400–700 × 2.5–6 mm, triangular in cross section; margins and keel entire. **Flowers**: inflorescence overtopping leaves, 0.4–0.8 m high, racemes ovoid to oblong, basally medium-lax, apically dense; perianth 7–11 mm long, yellow-green, often tinged red and erect to spreading in bud, whitish to yellow and spreading to pendulous when mature; Jan.–Mar. Mountain grassland, hillsides, vleis. *Leloele* (SS).




## **caulescens** Baker

Perennial herb; caulescent. **Stems** several, simple or sparsely branched, up to 0.6 m long. **Leaves** with blade erect or recurved towards apex, 450–700 × 25–50 mm, V-shaped in cross section; margins and keel distinctly finely serrulate. **Flowers**: inflorescence overtopping or subequal to leaves, 0.3–0.6 m high, raceme oblong to cylindrical, very dense; perianth 22–24 mm long, coral-pink to flame-coloured and spreading in bud, pale greenish yellow to creamy yellow and spreading to pendulous when mature; Jan.–Mar. Mountain grassland, marshy places, seepage areas. *Lesotho red-hot poker*; *basoetovuurpyl* (A); *leloele-la-loti*, *leloele-lenyenyane* (SS); *icacane*, *umathunga* (Z).




## **ensifolia** Baker subsp. **autumnalis** Codd

Perennial herb; acaulescent, occasionally shortly caulescent. **Stems** several, short. **Leaves** erect, recurved toward apex, 0.5–1.2 m × 15–45 mm, V-shaped in cross section; margins and keel usually conspicuously serrulate, rarely smooth. **Flowers**: inflorescence overtopping leaves, 0.6–1.8 m high, raceme cylindrical, very dense; perianth 15–21 mm long, greenish white, red tinged or dull to flame red and spreading in bud, whitish to yellow with green stripe

down each lobe and spreading to pendulous when mature; Feb., Mar. Black clay soil along streambanks, low-lying areas in grassland.

DrGr MsGr

### **ensifolia** Baker subsp. **ensifolia**

Perennial herb; acaulescent, occasionally shortly caulescent. **Stems** several, short. **Leaves** erect, recurved toward apex, 0.5–1.2 m × 15–45 mm, V-shaped in cross section; margins and keel usually conspicuously serrulate, rarely smooth. **Flowers**: inflorescence overtopping leaves, 0.6–1.8 m high, with cylindrical, very dense racemes; perianth greenish white, sometimes red-tinged or dull to flame red and spreading in bud, white to greenish white with green stripe down each lobe and spreading to pendulous when mature, 15–21 mm long; Oct.–Dec. Black clay soil in marshy places, vleis and streambanks.

DrGr KarSh

### **fluviatilis** Codd

Perennial herb; caulescent. **Stems** several, short. **Leaves** erect, firm, 350–700 × 8–25 mm, V-shaped in cross section; margins and keel entire. **Flowers**: inflorescence usually overtopping leaves, 0.45–0.65 m high, raceme ovoid to subglobose, dense; perianth 42–50 mm long, flame to orange-red and deflexed in bud, apricot-yellow to greenish yellow and pendulous when mature; Nov., Dec. Mountain grassland, streambanks. *River poker*.

MsGr

### **linearifolia** Baker

Perennial herb; acaulescent, occasionally shortly caulescent. **Stems** several to many, short. **Leaves** first erect, later recurved, rigid to flaccid, 0.6–1.4 m × 12–28 mm, strongly keeled; margins and keel serrulate to sparsely toothed, occasionally smooth. **Flowers**: inflorescence overtopping reflexed leaves, 0.8–1.5 m high, with ovoid or oblong to rhomboid, dense racemes; perianth pinkish red to green, tinged with dull red and erect to spreading in bud, yellow-orange to yellow-green or greenish and pendulous when mature, 25–35 mm long; Jan.–Apr. Streambanks, marshy places and mountain grassland. *Common marsh poker*; *vuurpyl* (A); *icacane*, *umathunga* (Z).

MsGr Zastr

### **multiflora** J.M.Wood & M.S.Evans

Perennial herb; caulescent. **Stems** usually several, short. **Leaves** erect, later recurved, 0.8–1.8 m × 20–40 mm, deeply keeled; margins and keel serrulate. **Flowers**: inflorescence overtopping reflexed leaves, 0.8–2.0 m high, racemes slender, elongate, subdense; perianth 7–12 mm long, greenish white to orange-yellow tipped with red and ascending in bud, whitish to yellow and ascending when mature; Feb.–Apr. Mountain marshes, vleis and streambanks.

MsGr

### **porphyrantha** Baker

Perennial herb; caulescent. **Stems** usually many, short. **Leaves** first erect, later recurved, 300–450 × 6–14 mm, keeled; margins and keel smooth. **Flowers**: inflorescence overtopping leaves, 0.4–0.6 m high, racemes subglobose to shortly cylindrical, dense; perianth 30–42 mm long, flame-orange, tipped with yellow and spreading in bud, lemon-yellow and pendulous when

mature; Oct.–Feb. Mountain grassland, grassy vleis. *Dwarf red-hot poker*; *hoëveldvuurpyl* (A); *leloele* (SS); *icacane*, *umathunga* (Z).

MsGr

### **ritualis** Codd

Perennial herb; acaulescent, occasionally shortly caulescent. **Stems** solitary to few, short. **Leaves** first erect, later recurved to semispreading, soft; 400–900 × 12–24 mm, deeply keeled; margins and keel conspicuously and regularly serrulate. **Flowers**: inflorescence subequal to or shorter than leaves, 0.4–0.8 m high, racemes rhomboid-cylindrical to ovoid, basally dense, apically laxer; perianth 25–30 mm long, coral or salmon-coloured to dull orange-red and spreading to pendulous in bud, greenish yellow and pendulous when mature; Jan.–Mar. Shallow soil in rock crevices, dry watercourses and on grassy slopes. *Ritual poker*; *leloele-la-Lesotho*, *lelutla* (SS).

DrGr MsGr

### **thodei** Baker

Perennial herb; caulescent. **Stem** usually single, short. **Leaves** first erect, later recurved, soft, 250–500 × 2–5 mm wide, keeled; margins and keel smooth to finely serrulate, especially toward apex. **Flowers**: inflorescence overtopping leaves, 0.3–0.5 m high, with subglobose to ovoid, dense racemes; perianth 20–35 mm long, dull red to reddish brown, often white-tipped and spreading to pendulous in bud, white or tinged with reddish brown towards base and pendulous when mature; Nov.–Mar. Moist places in mountain grassland. *Thode's poker*; *leloele* (SS).

MsGr

### **triangularis** Kunth subsp. **triangularis**

Perennial herb; caulescent. **Stem** solitary to several, short. **Leaves** erect, recurved at middle; blade triangular in cross-section, 280–600 × 1.5–3.0 mm; margins and keel entire to serrulate. **Flowers**: inflorescence subequal to leaves, 0.3–0.6 m high, racemes subcylindrical to ovoid, dense; perianth 24–35 mm long, concolorous, coral-red, orange-red or salmon-red to yellow-orange, pendulous in bud and when mature; Jan.–Apr. Mountain grassland. *Mandarin poker*; *leloele-le-lenyenyane*, *motosi*, *qaloe* (SS).

MsGr

### **typhoides** Codd

Perennial herb; caulescent. **Stem** solitary to several, short. **Leaves** ± distichous, succulent, ascending, firm; blade tending to be spirally twisted, 350–650 × 8–25 mm, keeled; margins and keel entire. **Flowers**: inflorescence overtopping leaves, 0.50–0.75 m high, racemes cylindrical, very dense; perianth 4.5–6.5 mm long, dark brown and erect in bud, brown to purplish brown and ascending to spreading when mature; Feb., Mar. Black clay soil. *Bulrush poker*.

VreDm DrGr MsGr

## **Trachyandra** Kunth (sthn Afr.: 49 spp.)

### Key to species:

[partially based on Obermeyer: 717 (1962)]

1a Inflorescence simple or with 1 or 2 ascending branches . . . . . 2
1b Inflorescence divaricately branched. . . . . 6

2a Inflorescence simple, sometimes with 1 or 2 ascending branches; leaves somewhat distichous; roots red . . . . . **T. erythrorrhiza**
2b Inflorescence always simple; leaves tufted or in a basal rosette; roots not red . . . . . 3
3a Scape erect, densely reflexipilose, especially when immature. . . . . **T. reflexipilosa**
3b Scape arcuate near base, protruding outside leaf rosette, glabrous . . . . . 4
4a Pedicels recurved in fruit . . . . . **T. saltii** var. **secunda**
4b Pedicels erect in fruit . . . . . 5
5a Pedicels ± 10 mm long in fruit . . . . . **T. saltii** var. **saltii**
5b Pedicels ± 20–30 mm long in fruit . . . . . **T. saltii** var. **oatesii**
6a Plants with short, woody stem, with persistent, reticulate fibres of old leaf bases. . . . . **T. burkei**
6b Plants acaulescent. . . . . 7
7a Leaves often sticky; fruit a glabrous capsule . . . . . 8
7b Leaves nearly glabrous or minutely glandular pubescent; fruit covered with short, gland-tipped tubercles . . . . . 9
8a Lowest branches of inflorescence not trichotomous, but alternate; scape not clavate at apex; plants rather slender . . . . . **T. laxa** var. **laxa**
8b Lowest 3 branches of inflorescence trichotomous; scape clavate at apex; plants sturdy . . . . . **T. laxa** var. **rigida**
9a Fruit densely and evenly covered with short, gland-tipped tubercles; leaves flat and keeled or triquetrous. . . . . 10
9b Fruit sparsely covered with short, gland-tipped tubercles; leaves terete . . .11
10a Pedicels scabrid, twisted in fruit . . . . . **T. asperata** var. **asperata**
10b Pedicels glabrous, erecto-patent in fruit . . . . **T. asperata** var. **nataglencoensis**
11a Pedicels twisted in fruit, up to 7 mm long . . . . . **T. asperata** var. **basutoensis**
11b Pedicels erect in fruit, up to 15 mm long . . . . . **T. asperata** var. **macowanii**

## **asperata** Kunth var. **asperata**

Perennial herb, 0.15–0.25 m high; acaulescent. **Leaves** with persistent fibres of old leaf bases; blade linear or triquetrous, straight or twisted, 200–250 × 1–5 mm, glabrous or minutely glandular pubescent. **Flowers**: in a divaricately branched raceme; pedicels scabrid, contorted in fruit, up to 12 mm long; perianth white or pink with darker keel; Sep.–Dec. **Fruit** densely covered with short, gland-tipped tubercles. Marshy areas or stony soil in grassland. *Wildeknoflok* (A); *leloelenyana-la-lilomo*, *motoropo* (SS); *unjwazi* (Z).




## **asperata** Kunth var. **basutoensis** (Poelln.) Oberm.

Perennial herb, 0.26–0.60 m high; acaulescent. **Leaves** with persistent fibres of old leaf bases; blade terete, grass-like, 200–300 × 1–5 mm, nearly glabrous. **Flowers**: in a divaricately branched raceme; pedicels contorted in fruit, up to 7 mm long; perianth white or pink with darker keel; Sep.–Dec. **Fruit** sparsely covered with short, gland-tipped tubercles. Mountain grassland.




## **asperata** Kunth var. **macowanii** (Baker) Oberm.

Perennial herb, 0.20–0.45 m high; acaulescent. **Leaves** with persistent fibres of old leaf bases; blade terete, grass-like, 200–300 × 1–5 mm, nearly glabrous. **Flowers**: in a divaricately branched raceme; pedicels erect in fruit, up to 15 mm long; perianth white or pink with darker keel; Sep.–Dec. **Fruit** sparsely covered with short, gland-tipped tubercles. Mountain grassland.



**asperata** Kunth var. **nataglencoensis** (Kuntze) Oberm.

Perennial herb, 0.3–2.2 m high; acaulescent. **Leaves** with persistent fibres of old leaf bases; blade linear or triquetrous, 200–400 × 1–5 mm, glabrous or minutely glandular pubescent. **Flowers**: in a divaricately branched raceme, with ascending branches; pedicels glabrescent, erect to erecto-patent in fruit, up to 15 mm long; perianth white or pink with darker keel; Sep.–Dec. **Fruit** densely covered with short, gland-tipped tubercles. Marshy areas or stony soil in grassland.

DrGr MsGr

**burkei** (Baker) Oberm.

*Anthericum burkei* Baker

Perennial herb, 0.3–1.2 m high; caulescent; stems short, woody, with persistent, reticulate fibres of old leaf bases. **Leaves** grass-like; blade semiterete, up to 400 mm long, ± 2 mm wide. **Flowers**: in a divaricately branched raceme, up to 300 mm high; scape arcuate at base, glabrous; pedicels patent, up to 15 mm long; perianth white with 2 dark spots at base of lobes; Sep.–Mar. **Fruit** glabrous. Sandveld.

AcGr

**erythrorrhiza** (Conrath) Oberm.

Perennial herb, 0.45–0.80 m high; acaulescent, with red roots. **Leaves** somewhat distichous; blade linear, erect often with twist, up to 400 mm long, ± 6 mm wide, shortly and sparsely pubescent, striate. **Flowers**: inflorescence simple or with 1 or 2 ascending branches, up to 0.8 m high; pedicels patent-erect in fruit, up to 18 mm long; perianth white with yellow spots; Oct. **Fruit** covered with short glandular tubercles. Black turf marshes.

VreDm

**laxa** (N.E.Br.) Oberm. var. **laxa**

Perennial herb, 0.25–0.80 m high; acaulescent, slender. **Leaves** terete, up to 400 mm long, ± 3 mm wide, often sticky. **Flowers**: in a divaricate, much-branched raceme, branches alternate; scape not clavate at apex; pedicels erect in fruit, up to 6 mm long; perianth white with darker keel, recurved; Feb.–Apr. **Fruit** glabrous. Grassland, sandveld. *Rolbossie*, *tolbossie*, *sand-ui* (A).

VreDm

**laxa** (N.E.Br.) Oberm. var. **rigida** (Suess.) Roessler

*T. laxa* (N.E.Br.) Oberm. var. *erratica* (Oberm.) Oberm.

Perennial herb, 0.4–1.2 m high; acaulescent, sturdy. **Leaves** with blade terete, up to 400 mm long, ± 3 mm wide, often sticky. **Flowers**: in a divaricate, much-branched raceme, 3 lowest branches trichotomous; scape clavate at apex; pedicels erect in fruit, up to 6 mm long; perianth white with darker keel, recurved; Feb.–Apr. **Fruit** glabrous. Grassland, sandveld. *Rolbossie*, *tolbossie*, *sandui* (A).

AcGr DrGr

**reflexipilosa** (Kuntze) Oberm.

Perennial herb, 0.25–0.80 m high; acaulescent. **Leaves** grass-like; blade linear, up to 450 mm long, ± 8 mm wide, glabrous on upper surface, evenly setose and ribbed on lower surface.

**Flowers**: inflorescence a simple raceme, up to 1 m high; scape erect, densely reflexipilose, especially when immature; pedicels spreading in fruit, up to 25 mm long; perianth white with darker keel; Oct.–Mar. **Fruit** glabrous. Moist grassland, swamps or black turf.

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### **saltii** (Baker) Oberm. var. **oatesii** (Baker) Oberm.

Perennial herb, 0.1–0.5 m high; acaulescent. **Leaves** grass-like; blade linear, up to 500 mm long, glabrous or pubescent. **Flowers**: inflorescence a simple raceme, up to 400 × 1–25 mm; scape arcuate near base, protruding outside leaf rosette, glabrous; pedicels erect in fruit, ± 20–30 mm long; perianth white with darker keel; Nov.–Mar. **Fruit** glabrous. Grassland.

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### **saltii** (Baker) Oberm. var. **saltii**

Perennial herb; acaulescent. **Leaves** grass-like; blade linear, up to 500 mm long, glabrous or pubescent. **Flowers**: inflorescence a simple raceme, up to 400 × 1–25 mm; scape arcuate near base, protruding outside leaf rosette, glabrous; pedicels erect in fruit, ± 10 mm long; perianth white with darker keel; Nov.–Mar. **Fruit** glabrous. Grassland.

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### **saltii** (Baker) Oberm. var. **secunda** (K.Krause & Dinter) Oberm.

Perennial herb, 0.27–0.60 m high; acaulescent. **Leaves** grass-like; blade linear, up to 500 mm long, glabrous or pubescent. **Flowers**: inflorescence a simple raceme, up to 400 × 1–25 mm; scape arcuate near base, protruding outside leaf rosette, glabrous; pedicels recurved in fruit, ± 15 mm long; perianth white with darker keel; Nov.–Mar. **Fruit** glabrous. Grassland.

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# COLCHICACEAE

Erect or climbing geophytes; with subterranean, starch-rich corms to tubers, sometimes stoloniferous. **Leaves** few and basally concentrated, or several on short leafy stem, alternate, distichous, verticillate or crowded, or many and scattered on a long, sometimes branched stem; dorsiventral, linear or narrowly ovate, sessile, sheathing at base, parallel-veined, rarely ending in tendril. **Stems** usually stiff and erect, sometimes climbing, ending in racemes or rarely in a single flower. **Flowers**: regular, bisexual, 3-merous, hypogynous; perianth 3 + 3, similar, free or basally connate, with basal nectaries; stamens 3 + 3; filaments free, narrow or basally broad, glabrous; anthers 2-thecous, dehiscing longitudinally, extrorse or introrse; ovary superior, 3-locular; with axile placentas; ovules several to many; styles 3, or 1 with 3 stigmatic branches. **Fruit** usually a septicidal capsule. **Seeds** globose or ovoid. *Colchicum family*.

## Key to genera

[after Meyer: 588 (2000)]

1a Leaf apex attenuated into a recurved tendril, or with an arista; leaves cauline; flowers solitary . . . . . **Littonia**
1b Leaf apex not cirrhiferous; leaves basal, rosulate or distichous; flowers variously arranged . . . . . 2
2a Flowers ebracteate. . . . . **Wurmbea**
2b Flowers bracteate. . . . . 3
3a Flowers in a capitulum overtopped by exterior green or petaloid bracts. . . . . **Colchicum**
3b Flowers in a raceme, with bracts placed opposite flowers . . . . . **Ornithoglossum**

## **Colchicum** L. (sthn Afr.: 41 spp.)

### Key to species:

1a Perianth with blade flat; stamens much shorter than perianth . . . . . 2
1b Perianth with blade concave at base; stamens equalling perianth or longer, very rarely shorter . . . . . 3
2a Perianth pink or pale mauve, blade 7.5–26.0 mm long . . . . . **C. roseum**
2b Perianth white, blade 5.5–10.0 mm long. . . . . **C. asteroides**
3a Bracts leaf-like, green, green and white or bluish green . . . . . 4
3b Bracts distinctly different from leaves. . . . . 6
4a Leaves erect; perianth purple . . . . . **C. burkei**
4b Leaves in a basal rosette, spreading; perianth greenish yellow or dull white . . . . . 5
5a Perianth greenish yellow . . . . . **C. leistneri**
5b Perianth dull white . . . . . **C. longipes**
6a Perianth with blade much longer than claw . . . . . **C. striatum**
6b Perianth with blade much shorter than claw . . . . . 7
7a Perianth with blade 4.5–10.0 mm and claw 4.5–8.5 mm long . . . . . **C. melanthioides** subsp. **melanthioides**
7b Perianth with blade 4.5–7.0 mm and claw 3.5–5.0 mm long . . . . . **C. melanthioides** subsp. **australe**

**asteroides** (J.C.Manning & Goldblatt) J.C.Manning & Vinnersten
*Androcymbium asteroides* J.C.Manning & Goldblatt
*A. roseum* Engl. subsp. *albiflorum* U.Müll.-Doblies, Raus, Weiglin & D.Müll.-Doblies

Sessile, cormous herb. **Leaves** in a basal rosette, narrowly ovate, up to 135 mm long. **Flowers**: bracts leaf-like; stamens much shorter than perianth; perianth with a flat blade, 5.5–10.0 mm long, claw 4–10 mm long, white; May, Jun. Seasonally waterlogged depressions, clay soils.

KarSh

**burkei** (Baker) J.C.Manning & Vinnersten
*Androcymbium burkei* Baker

Sessile, cormous herb, up to 70 mm high. **Leaves** erect; blade narrowly ovate, up to 420 mm long. **Flowers**: bracts herbaceous, green; perianth with blade 9–15 mm long, concave at base, claw 9–15 mm long, ± as long as blade, purple; Jul. Grassland. *Cup-and-saucer*; *patrysblom* (A).

DrGr MsGr KarSh

**leistneri** (U.Müll.-Doblies & D.Müll.-Doblies) C.Archer
*Androcymbium leistneri* U.Müll.-Doblies & D.Müll.-Doblies

Sessile, cormous herb, up to 70 mm high. **Leaves** in a basal rosette, spreading; blade narrowly ovate, up to 300 mm long. **Flowers**: bracts herbaceous, green; perianth with blade 8.5–11.0 mm long, concave at base, claw 8–12 mm long, longer or as long as blade; greenish yellow; Jun.–Aug. Grassland. *Cup-and-saucer*; *patrysblom* (A).

DrGr

**longipes** (Baker) J.C.Manning & Vinnersten
*Androcymbium longipes* Baker

Cormous, acaulescent geophyte, up to 250 mm high. **Leaves** in a basal rosette, spreading; blade narrowly ovate, up to 440 mm long, channelled, grading into bracts. **Flowers**: enclosed in green and white bracts; stamens twice as long as perianth limbs; perianth with blade 8.5–19.0 mm long, concave at base, blade much shorter than claw, 10.5–35.0 mm long, dull white; Jun.–Aug. Stony flats.

MsGr

**melanthioides** (Willd.) J.C.Manning & Vinnersten subsp. **australe** (U.Müll.-Doblies & D.Müll.-Doblies) J.C.Manning & Vinnersten
*Androcymbium melanthioides* Willd. subsp. *australe* U.Müll.-Doblies & D.Müll.-Doblies

Cormous, acaulescent herb, up to 250 mm high. **Leaves** in a basal rosette, spreading; blade linear or narrowly ovate, up to 170 mm long. **Flowers**: bracts mauve or white with darker veins; perianth with blade 4.5–7.0 mm long, concave at base, claw 3.5–5.0 mm long, as long as blade or shorter; Jun. *Cup-and-saucer*; *patrysblom* (A).

DrGr

**melanthioides** (Willd.) J.C.Manning & Vinnersten subsp. **melanthioides**
*Androcymbium melanthioides* Willd. subsp. *melanthioides*

Cormous, acaulescent herb, up to 250 mm high. **Leaves** in a basal rosette, spreading; blade narrowly ovate, up to 340 mm long. **Flowers**: bracts mauve or white with darker veins, furnished

with a leafy point; perianth with blade 4.5–10.0 mm long, concave at base, claw 4.5–8.5 mm long, ± as long as blade, white; May–Aug. Grassland, often in disturbed veld. *Cup-and-saucer*; *patrysblom* (A).

DrGr KarSh

**roseum** (Engl.) J.C.Manning & Vinnersten
*Androcymbium roseum* Engl.

Cormous, acaulescent herb, up to 300 mm high. **Leaves** in a basal rosette, spreading with blade narrowly linear-ovate, up to 250 mm long. **Flowers**: bracts leaf-like; stamens much shorter than perianth; perianth with a flat blade, 7.5–26.0 mm long, claw 6–13 mm long, shorter than blade, pink or pale mauve; May, Jun. Seasonally waterlogged depressions in clay soil.

KarSh

**striatum** (Hochst. ex A.Rich.) J.C.Manning & Vinnersten
*Androcymbium striatum* Hochst. ex A.Rich.
*A. melanthioides* Willd. var. *striatum* (A.Rich.) Baker

Cormous herb, up to 350 mm high. **Leaves** narrowly linear-ovate. **Flowers**: hidden within large, greenish white, longitudinally striate bracts; perianth with blade concave at base, blade much longer than claw, exceeding claw by almost double, white; Dec., Jan. Grassland, in rock crevices. *Pajama flower*; *bobbejaanskoen*, *patrysblom* (A); *khara*, *khukhoana-e-nyenyane*, *metsane* (SS).

MsGr

## **Littonia** Hook. (sthn Afr.: 2 spp.)

**modesta** Hook.
*L. rigidifolia* Bredell

Climbing geophyte, up to 2 m high. **Leaves** cauline, verticillate below, alternate above; blade linear to ovate, ± 130 mm long, apex a recurved tendril or with an arista. **Flowers**: solitary; perianth with segments free, connate at base, apices pointed, recurved, golden-yellow; Nov.–Mar. Woodland, forest, montane grassland. *Littonia*; *geelklokkies* (A); *iHlamvu lehlathi*, *uhlamvu lwentombazana* (Z).

MsGr

## **Ornithoglossum** Salisb. (sthn Afr.: 8 spp.)

### Key to species:

[after Nordenstam: 24 (1982)]

Nectary margin shaped like a funnel or protruding mouth; fruit ovoid-oblong . . . . . **O. dinteri**
Nectary margin simple; fruit pyriform-globose . . . . . **O. vulgare**

### **dinteri** K.Krause

*O. glaucum* Salisb. var. *grandiflorum* Baker *p.p.*

Geophyte, up to 500 mm high. **Stem** with above-ground part 100–200 mm long. **Leaves** 2–5, erect to spreading or recurved; blade 40–200 mm long, 10–30 mm wide at base, tapering to an acute or acuminate tip. **Flowers**: perianth with tepals 10–25 mm long, reflexed, nectary margin shaped like a funnel or protruding mouth, green, purple or brown; Jan.–Apr. **Fruit** ovoid-oblong, 15–25 × 10–15 mm. Grassland, sandy flats. *Snake lily.*

| VreDm? | AcGr | DrGr | MsGr | KarSh | Zastr? |
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### **vulgare** B.Nord.

Geophyte, up to 1.5 m high. **Flowers**: pedicels erect to spreading or recurved; perianth with tepals 10–23 mm long, reflexed, nectary margin simple, straight or emarginated, reddish brown, maroon or purplish black; Sep.–Jan. **Fruit** pyriform-globose, 10–27 × 10–15 mm. Bush groups, sandy flats, rock crevices. *Snake lily.*

| | AcGr | | | KarSh | |
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## **Wurmbea** Thunb. (sthn Afr.: 19 spp.)

### Key to species:

[after Nordenstam: 213 (1978)]

1a Flowering shoot with only cauline leaves, all basally sheathing . . . **W. elatior**
1b Flowering shoot with cauline leaves and a solitary basal leaf; the latter not stem-sheathing, but enclosed with the stem in a common basal sheath . . 2
2a Nectary an elevated scale with a free, obtuse or emarginate tip . . . . . **W. kraussii**
2b Nectary grooved, without a distinct free tip . . . . . **W. angustifolia**

### **angustifolia** B.Nord.

Geophyte, up to 0.2 m high. **Leaves** one flat basal leaf with inrolled, minutely scabrid margins, enclosed with stem in basal sheath, stem with 1 or 2 leaves; blade spathaceous, 20–150 mm long, apex long acuminate. **Flowers**: in a spike, 1–7-flowered; perianth with tube distinct, 1.5–2.5 mm long, segments erect, nectary on segment grooved, without free tips, creamy to greenish white; Nov.–Mar. Moist montane to subalpine grassland. *Spike lily.*

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### **elatior** B.Nord.

Geophyte, up to 0.4 m high. **Leaves** 2 or 3, all cauline and basally sheathing stem; blade narrowly ovate, ± 450 mm long, apex attenuate. **Flowers**: in a spike, 3–20-flowered; perianth with tube oblong, 2–6 mm long, segment with nectary 2 round-backed elevations separated by a groove, white with shiny deep reddish purple or black patch in middle of each segment; musky smell; Jan.–May. In montane marshes, along streambanks. *Pepper-and-salt-flower*; *sout-en-peper-blommetjie* (A); *khahlana-ea-loti* (SS).

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**kraussii** Baker

Geophyte, up to 0.15 m high. **Leaves** one narrow basal leaf, enclosed with stem in basal sheath; 1 or more broad-based cauline leaves, blade spathaceous, 10–30 mm long, 3–7 mm at base, apex acuminate. **Flowers**: in a spike, 1–6-flowered; perianth with tube 0.7–1.5 mm long, segments distinctly veined, nectary raised with obtuse or emarginate tips free, white or pinkish; Jul.–Dec. In damp places, on grassy slopes. *Spike lily*.

MsGr

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# COMMELINACEAE

Herbs with ± succulent stems; nodes swollen. **Leaves** alternate, with a closed sheath at base enveloping stem. **Flowers**: borne in boat-shaped bracts (spathes); regular or irregular; sepals 3, green; petals 3, free or united into a tube at base, upper 2 flat, long-clawed, lower one reduced often colourless; stamens 6, all fertile or 3 or 4 sterile, often with brightly coloured hairs on filaments; ovary superior, 3-locular. **Fruit** a capsule. *Commelina family*.

## Key to genera

1a Inflorescences contracted, fused in pairs, 2–several in a pseudo-umbel; petals white. . . . . **Gibasis**

1b Inflorescences elongate or contracted, never fused in pairs; petals not white . . . . . 2

2a Flowers irregular; inflorescences enclosed in folded or obliquely funnel-shaped spathes; fertile stamens 2 or 3; filaments glabrous . . . . **Commelina**

2b Flowers regular; inflorescences not enclosed in spathes; fertile stamens 6; filaments densely bearded . . . . . **Cyanotis**

## **Commelina** L. (sthn Afr.: 16 spp.)

### Key to species:

[after Obermeyer & Faden: 24 (1985)]

1a Spathes simply folded, dry inside, proximal end free, convex . . . . . 2

1b Spathes obliquely fused, mucilaginous inside when flowering, proximal side connate, straight . . . . . 6

2a Annual; spathe subsessile, falcate; cyme solitary, ± 3-flowered, flowers only just exserted at anthesis, one at a time . . . . . **C. subulata**
2b Perennial; spathe pedunculate; cymes 2; flower(s) of upper cyme exserted . . . . . 3
3a Leaves flat, oblong, narrowed at base . . . . . **C. africana** var. **africana**
3b Leaves folded, usually linear, not or hardly narrowed at base . . . . . 4
4a Spathe usually short and broad; leaves pubescent. . . . . **C. africana** var. **krebsiana**
4b Spathe usually narrow, long-acuminate; leaves glabrous or glabrescent . . . 5
5a Flowers small (upper petal ± 8 mm long); leaves usually > 50 mm long . . . . . **C. africana** var. **lancispatha**
5b Flowers large (upper petal ± 15 mm long); leaves narrow, short, falcate, margins often crenulate. . . . . **C. africana** var. **barberae**
6a Annual with thin roots; capsule quadrate with ventral locules 2-seeded, constricted between seeds, dorsal locule 1-seeded or often aborted. . . . . **C. benghalensis**
6b Perennial; capsule triangular with 3 one-seeded, subglobose locules . . . . . **C. livingstonii**

## **africana** L. var. **africana**

Perennial herb, up to 500 mm high; spreading; mesophytic. **Leaves** flat; blade oblong, narrowed at base, usually glabrous. **Flowers**: spathe pedunculate; cymes 2; flower(s) of upper cyme exserted; petals yellow; Nov.–Mar. Grassland, floors of pine plantations. *Yellow commelina*, *yellow wandering Jew*; *geeleendagsblom* (A); *khopo*, *khotsoana*, *tabola-lefalo* (SS); *lekzotswana* (X); *idangabane* (Z).

DrGr | MsGr

## **africana** L. var. **barberae** (C.B.Clarke) C.B.Clarke

*C. karooica* C.B.Clarke
*C. karooica* C.B.Clarke var. *barberae* C.B.Clarke

Perennial herb, up to 500 mm high; spreading. **Leaves** with blade, narrow, short, falcate, with margins often crenulate, folded, glabrous or glabrescent. **Flowers**: large (upper petal ± 15 mm long); spathes usually narrow, long-acuminate; petals yellow; Nov.–Mar. **Fruit** oblong. Grassland.

DrGr | KarSh

## **africana** L. var. **krebsiana** (Kunth) C.B.Clarke

*C. krebsiana* Kunth

Perennial herb, up to 500 mm high; spreading; plants hispid to densely tomentose. **Leaves** with blade usually linear, not or hardly narrowed at base, folded, pubescent. **Flowers**: spathes usually short and broad; petals yellow; Nov.–May. **Fruit** oblong. Bushveld, grassland, woodland.

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr?

## **africana** L. var. **lancispatha** C.B.Clarke

*C. africana* L. var. *glabriuscula* (Norl.) Brenan

Perennial herb, up to 500 mm high; spreading. **Leaves** with blade, broadly to narrowly linear, usually > 50 mm long, folded, usually glabrous or glabrescent. **Flowers**: small (upper petal

± 8 mm long); spathes usually narrow, long-acuminate; petals yellow; Nov.–Apr. **Fruit** oblong. Grassland, rocky slopes.

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### **benghalensis** L.

Annual herb, up to 0.9 m high; spreading. **Leaves** with blade ovate, green, margins smooth, leaf sheaths often with long red setae at mouth. **Flowers**: spathes obliquely fused, mucilaginous inside when flowering; petals ink blue; Nov.–May. **Fruit** quadrate with ventral locules 2-seeded, constricted between seeds, dorsal locule 1-seeded or often aborted. Widespread weed. Scrub, grassland, cultivated land. *Blue wandering Jew*, *Benghal commelina*; *Bengaalse wandelende Jood*, *blouselblommetjie* (A); *khotswana*, *khopo-e-nyenyane* (SS); *uhlotshane* (X); *idambiso*, *idangabane*, *idemadema idlebendlele* (Z).

DrGr

### **livingstonii** C.B.Clarke

Perennial herb, with spreading, branched stems, up to 300 mm high. **Leaves** with blade linear to oblong, eared at base, abruptly narrowed into sheath, folded. **Flowers**: cymes 1 in each spathe, the upper aborted; spathes clustered and subsessile at apices of stems; petals blue to white; Oct.–Apr. **Fruit** triangular, with 3 one-seeded, subglobose locules. Grassland and bushveld.

AcGr | DrGr | KarSh

### **subulata** Roth

*C. violacea* C.B.Clarke

Annual herb, many stemmed and dome-shaped, up to 250 mm high. **Leaves** with blade linear, margins smooth, folded. **Flowers**: only just exserted at anthesis, one at a time; spathes simply folded, dry inside, proximal end free, convex; subsessile, falcate; cyme solitary, ± 3-flowered; petals yellow, orange, pink, apricot, blue or brownish violet; Dec.–Mar. **Fruit** ovoid. Seasonally wet areas such as margins of pans.

DrGr

## **Cyanotis** D.Don (sthn Afr.: 7 spp.)

### **speciosa** (L.f.) Hassk.

*C. nodiflora* Kunth

Perennial herb, up to 500 mm high; solitary or few together; pubescence of short, patent hairs. **Rhizome** vertical to U-shaped, with hard, terete roots. **Stems** with erect, fertile shoots. **Leaves** 5, subdecussate; blade linear, ± 170 × 8 mm, upper surface glabrous, lower surface clothed with long, patent hairs. **Flowers**: regular, usually in 4–6-flowered clusters, widely spaced; petals ± 10 mm long, pale to deep oriental blue or mauve; filaments densely bearded; Oct.–Feb. Grassland. *Doll's powderpuff*; *bloupoeierkwassie* (A); *khopo*, *khopa*, *theepebalingoana* (SS); *umagoswana* (X); *ingonga*, *inkombo*, *isosonga*, *udabulamafu*, *umakotigoyile* (Z).

VreDm | DrGr | MsGr

## **Gibasis** Raf. (sthn Afr.: 1 sp.)

### ***pellucida** (M.Martens & Galeotti) D.R.Hunt

Creeping, sprawling herb, rooting at nodes. **Leaves** sessile; 2-ranked; blade narrowly ovate-oblong, 45–70 × 14–23 mm, base asymmetric, rounded to cordate, apex acute to acuminate. **Flowers**: cymes in pairs in compound inflorescences; petals ± 7 mm long, white; Oct.–Dec. Disturbed places, in moist shade. Native to Mexico. *Bridal-veil*.

MsGr

## Reference

OBERMEYER, A.A. & FADEN, R.B. 1985. Commelinaceae. *Flora of southern Africa* 4: 23–35.

# CYPERACEAE

Perennial or annual, grass-like herbs, usually with a perennial rhizome; usually growing in moist or wet places. **Stems** (culms) erect, decumbent, rarely procumbent; 3-angled or cylindric; generally unbranched below inflorescence; sometimes rooting. **Leaves** alternate or arranged in 3 ranks, mostly crowded in a basal tuft, usually consisting of a closed sheath, a long, narrow blade with a ligule at junction of sheath and blade. **Flowers**: inflorescences terminal, capitate, paniculate or anthelate; spikelets 1–many; subtending bracts foliose; spikelets bearing 1–many, usually bisexual florets, within distichous to spirally arranged, imbricate glumes; perianth absent or 3–6 or more scales or bristles; stamens 1–3; anthers often basally appendaged and with a distal, usually barbate apiculus; ovary superior; style 1, simple or branched. **Fruit** a nutlet. *Sedge family*.

## Key to genera

[after Archer: 595 (2000)]

1a Florets all unisexual or functionally unisexual; spikelets unisexual or bisexual; some empty glumes and/or spikelet bracts present . . . . . 2
1b Florets all bisexual, or bisexual and unisexual or functionally unisexual together; spikelets, at least aerial ones, bisexual; some empty glumes and/or spikelet bracts occasionally present . . . . . 4
2a Female spikelet not enclosed by a perigynium (modified bract) . . . . **Scleria**
2b Female spikelet partially or wholly enclosed by perigynium. . . . . 3
3a Perigynium entire or split unevenly in 1 or 2 places; rachilla present, usually bearing male florets, which are exserted from perigynium . . . . . **Schoenoxiphium**
3b Perigynium entire, bottle-shaped, frequently apex rostrate, 2-toothed; rudimentary rachilla occasionally present within perigynium . . . . . **Carex**
4a Spikelets composed of 1 bisexual floret, without or with 1 empty glume and/or spikelet bracts at base. . . . . 5

4b Spikelets composed of (1–)several bisexual florets, or of bisexual and unisexual florets together, with several empty glumes and/or spikelet bracts at base . . . . . 6
5a Glumes adaxially connate, dorsiventrally compressed or trumpet-shaped. . . . . **Ascolepis**
5b Glumes not adaxially connate . . . . . **Lipocarpha**
6a Glumes distichous . . . . . 7
6b Glumes subdistichous to spirally arranged; 1–3 . . . . . 12
7a Spikelets with 0–2 empty glumes and/or bracts at base; nutlets not accompanied by bristles . . . . . 8
7b Spikelets with 3 or more empty glumes and/or bracts at base; nutlets sometimes accompanied by bristles . . . . . 11
8a Spikelets ± uniform in width, often cylindric, disarticulating eventually from a cushion below lowest fertile glume, usually with 4–7(–12) glumes . . . . **Cyperus**
8b Spikelets usually broadest below middle or oblong, but not cylindric, not disarticulating, usually with > 7, often many, glumes . . . . . 9
9a Stigmas 3 (sometimes very short or absent), or if 2, nutlet dorsiventrally compressed . . . . . **Cyperus**
9b Stigmas 2; nutlet laterally compressed . . . . . 10
10a Inflorescence digitate or anthelate to compound-anthelate; florets many (> 5) . . . . . **Pycreus**
10b Inflorescence capitate (occasionally with accessory capitula); florets 1 or 2(–5) . . . . . **Kyllinga**
11a Spikelets with bristles . . . . . **Carpha**
11b Spikelets without bristles, or if present, minute . . . . . **Schoenus**
12a Style base enlarged . . . . . 13
12b Style base not enlarged . . . . . 16
13a Inflorescence a single spikelet (occasionally with accessory spikelets); inflorescence bracts scale-like; style base persisting . . . . . **Eleocharis**
13b Inflorescence seldom a single spikelet, or if so, then inflorescence bracts not scale-like and style base not persisting . . . . . 14
14a Mouth of leaf sheath pilose; style base persisting as a button-like structure on nutlet . . . . . **Bulbostylis**
14b Mouth of leaf sheath glabrous; style base not persisting on nutlet . . . . . 15
15a Inflorescence of 1–4 large spikelets > 8 mm long; stigmas 3; nutlet obpyriform, epidermal cells isodiametric . . . . . **Abildgaardia**
15b Inflorescence of > 10 small spikelets < 5 mm long, or if > 8 mm long, then stigmas 2; nutlet obovoid (occasionally obpyriform), epidermal cells mostly horizontally elongated . . . . . **Fimbristylis**
16a Nutlet borne on gynophore . . . . . 17
16b Nutlet not borne on gynophore . . . . . 18
17a Ligule usually well developed, papyraceous . . . . . **Ficinia**
17b Ligule not well developed . . . . . **Scirpus**
18a Culms nodose (i.e. nodes aerial, spaced ± equally along culm), leaf-bearing, usually markedly 3(–5)-angled . . . . . 19
18b Culms appearing nodeless (i.e. nodes ± basal, concealed by leaves) . . . . 20
19a Inflorescence anthelate to compound-anthelate, occasionally capitate or reduced to a single spikelet but, if so, with at least 2 leaf-like involucral bracts . . . . . **Bolboschoenus**
19b Inflorescence paniculate or occasionally capitate but, if so, with only 1 involucral bract . . . . . **Fuirena**
20a Leaf blades well developed . . . . . **Isolepis**
20b Leaf blades reduced to sheaths (sometimes a very short blade developed) . . . . . 21
21a Inflorescence pseudolateral with subtending bract appearing as continuation of culm . . . . . 22
21b Inflorescence terminal . . . . . 23
22a Glumes generally mucronate or, if inflorescence digitate and glumes rounded, then inflorescence bract > $^1/_2$ (–3 ×) length of culm . . . . . **Schoenoplectus**

22b Glumes generally rounded at apex and inflorescence digitate or, if inflorescence of several stalked, rounded clusters of spikelets, and glumes mucronate, then inflorescence bract in both cases < 1/40 length of culm . . . . . **Scirpoides**
23a Inflorescence paniculate, of many spikelets . . . . . **Pseudoschoenus**
23b Inflorescence capitate, of (1–)several spikelets . . . . . **Isolepis**

## **Abildgaardia** Vahl (sthn Afr.: 3 spp.)

### **ovata** (Burm.f.) Kral

*Fimbristylis monostachya* Hassk.

Tufted, perennial herb, up to 300 mm high. **Flowers**: inflorescence usually with 1 spikelet, occasionally 2; glumes > 4.5 mm long, pale straw-coloured or greenish white; Oct.–Mar. **Fruit** with mature nutlet obovate, not clawed. Grassland, riverbanks.

| VreDm | | DrGr | MsGr | | |
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## **Ascolepis** Nees ex Steud. (sthn Afr.: 2 spp.)

### **capensis** (Kunth) Ridl.

Perennial herb, up to 400 mm high. **Flowers**: spikelets 1–3 per head, much fused together; squamellas with elongated, flattened beaks, holding nutlets in hollows or pockets near their bases; glumes oblong, shorter than squamella, white or straw-coloured; Nov.–Mar. **Fruit** a sessile nutlet. Margins of streams, swamps.

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## **Bolboschoenus** Palla (sthn Afr.: 3 spp.)

### **glaucus** (Lam.) S.G.Sm.

*Scirpus glaucus* Lam.

Perennial, up to 1.5 m high. **Rhizome** with distant scales only associated with the development of culms. **Culms** 300–800(–1 500) mm high. **Leaf** blades up to 600 mm long, 4–10 mm wide. **Flowers**: inflorescence simple or 2(3) × compound; spikelets pale golden-brown, borne on rays, oblong in outline at maturity; glumes 5–8 mm long, tightly overlapping, midrib elongated into 1.5–2.0 mm long awn; perianth bristles 4–6. Along banks of rivers, streams and pans. *Snygras* (A).

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## **Bulbostylis** Kunth (sthn Afr.: 18 spp.)

### Key to species:

[after Gordon-Gray: 27 (1995)]

1a Plants perennial, tufted, or with clearly defined rhizome. . . . . 2
1b Plants annual, usually sparsely tufted, without means of underground perennation . . . . . 8

2a Sheath mouth indistinctly bearded even when young, long hairs soon breaking away; glumes with midvein terminating slightly below apex, not excurrent into a minute mucro; glume apex rounded (obtuse) to emarginate . . . . . 3
2b Sheath mouth distinctly bearded with long hairs; glumes with midvein terminating in apex or excurrent into a minute mucro . . . . . 4
3a Shoots clothed with persistent, soft, brown leaf sheaths; plants usually in water or in very damp situations; glume apices clearly rounded to emarginate, midvein terminating below apex, margins minutely white-ciliate . . . . . **B. schoenoides**
3b Shoots clothed with persistent hard, coarse, dark brown to black leaf sheaths; plants usually in grassland, often not far from water, but not in it; glume apices becoming lacerated, fragments appearing acute; termination of midvein below glume apex only apparent in young glumes; glume margins not always minutely white-ciliate. . . . . **B. scleropus**
4a Leaf blades mostly reduced to apiculate projections from sheath mouth, sometimes uppermost sheath of shoot with blade better developed. . . . . **B. oritrephes**
4b Leaf blades well developed, filiform or hardly wider . . . . . 5
5a Inflorescence an open branched anthela of at least 15 spikelets, most of these arranged as single pedicelled units . . . . . 6
5b Inflorescence variable . . . . . 7
6a Style base round in outline, vertically flattened, persistent on nutlet; nutlet 0.6–1.0 × 0.4–0.7 mm . . . . . **B. burchellii**
6b Style base pyramidal, only temporarily persistent on nutlet; nutlet 1.0–2.0 × 0.8–1.3 mm . . . . . **B. contexta**
7a Glumes 2.4–3.6 mm long, dark chestnut-red to black; plants usually recognisable by swollen cormose shoot bases confluent in a uniseriate row . . . . . **B. oritrephes**
7b Glumes (largest) 3.6–5.8 mm long, varying in shades of brown, but seldom dark chestnut-red; plants medium to fine, sometimes with uniseriate rhizome, bases not swollen; more usually neatly tufted . . . . . **B. contexta**
8a Style base vertically flattened, almost round in outline, persistent upon nutlet, never shed with style . . . . . **B. densa** subsp. **afromontana**
8b Style base pyramidal or triangular in shape and angular in outline, not always permanent upon nutlet, sometimes shed with, or soon after style. . . . . 9
9a Inflorescence a branching anthela of ± 10 spikelets; glumes dark brown with lighter keels, broadly boat-shaped, with or without a short, recurved mucro; style base pyramidal, frequently shed with style, or very shortly after; nutlet pyriform. . . . . **B. hispidula** subsp. **pyriformis**
9b Inflorescence unbranched; glumes pallid, long mucronate, pale brown or fawn-coloured; style branches 2 or 3 . . . . . **B. humilis**

## **burchellii** (Ficalho & Hiern) C.B.Clarke

Perennial herb, up to 400 mm high; densely tufted, with woody rhizome; sheath mouth distinctly bearded with long hairs. **Leaves** with blade filiform, well developed, forming a conspicuous feature of plant. **Flowers**: inflorescence umbellate or contracted into a false head; style base round in outline, vertically flattened, persistent on nutlet; glumes light brown, with midvein terminating in apex or excurrent into a minute mucro; Nov.–May. **Fruit** a nutlet, 0.6–1.0 × 0.4–0.7 mm. Riverine woodland, mopani veld, rocky hillsides. *Joang-ba-nokana* (SS).

VreDm? | AcGr | DrGr

## **contexta** (Nees) M.Bodard

Perennial herb, up to 300 mm high; usually tufted, or sometimes with uniseriate rhizome and bases not swollen; sheath mouth distinctly bearded with long hairs. **Leaves** with blade filiform,

well developed. **Flowers**: inflorescence variable; anther crests rounded; glumes dark chestnut-brown, seldom chestnut-red, with 3 veins terminating slightly below apex, 3.6–5.8 mm long; style base pyramidal, only temporarily persistent on nutlet; Oct.–Feb. **Fruit** a nutlet, 1.0–2.0 × 0.8–1.3 mm. Montane grassland, shrubland and grassland. *Geelhoutkop* (A).

DrGr MsGr

**densa** (Wall.) Hand.-Mazz. subsp. **afromontana** (Lye) R.W.Haines
*B. capillaris* (L.) C.B.Clarke var. *trifida* (Nees) C.B.Clarke

Annual herb, up to 150 mm high; sparsely tufted, without rhizome. **Flowers**: spikelets 1.3–2.0 mm wide, polygonal-cylindric, never clearly 4-ranked in age; glumes golden-brown, usually shortly pubescent, with margins never long ciliate; style base vertically flattened, almost round in outline, persistent upon nutlet, never shed with style; Dec.–Apr. **Fruit** a nutlet, 0.5–1.0 × 0.35–0.80 mm. Among rocks where it is wet.

DrGr MsGr

**hispidula** (Vahl) R.W.Haines subsp. **pyriformis** (Lye) R.W.Haines
*Abildgaardia hispidula* (Vahl) Lye var. *pyriformis* Lye
*Scirpus hispidulus* Vahl

Annual herb, up to 300 mm high. **Flowers**: inflorescence a branching anthela of ± 10 spikelets; style base pyramidal, usually falling together with style before nutlets shed from spikelet; glumes deep chestnut-brown or dark brown, with lighter keels, broadly ovate, 2.0–3.3 × 2.0–3.4 mm, with or without a short, recurved mucro; Oct.–Mar. **Fruit** pyriform nutlets, with apex shortly projecting. Bushveld, sandveld, arid lowveld, vleis, sandy soil.

VreDm AcGr DrGr

**humilis** (Kunth) C.B.Clarke
*B. breviculmis* Kunth,
*B. striatella* C.B.Clarke

Annual herb, up to 150 mm high; tufted, without rhizome. **Flowers**: inflorescence unbranched, a solitary spikelet or head of 2–5 sessile spikelets; style branches 2 or 3; glumes pale brown or fawn-coloured, pallid, long mucronate; Jan.–Mar. **Fruit** a nutlet, 0.95–1.30 × 0.8–0.9 mm. Grassland, wet sandy soil. *Shy sedge*; *skaambiesie* (A); *boea-ba-ntja* (SS).

DrGr MsGr KarSh

**oritrephes** (Ridl.) C.B.Clarke
*B. oritrephes* (Ridl.) C.B.Clarke subsp. *australis* B.L.Burtt

Perennial herb, up to 300 mm high; culm bases swollen and persistent, arise close together so that an absolutely characteristic linear series of swollen bases is produced. **Leaf** blades mostly reduced to apiculate projections from sheath mouth, sometimes uppermost sheath of shoot with blade better developed. **Flowers**: spikelets sessile; glumes dark chestnut-red to black, with midvein terminating in apex or excurrent into a minute mucro, 2.4–3.6 mm long; margins densely white-ciliate; Sep.–Apr. **Fruit** a nutlet, 0.9–1.3 × 0.6–1.0 mm. Mountain grassland. *Lejabutle-le-letšoana* (SS).

MsGr

### **schoenoides** (Kunth) C.B.Clarke

Tufted perennial, up to 400 mm high; densely tufted, with woody rhizome, with sparse pubescence; shoots clothed with persistent, soft, brown leaf sheaths**. Flowers**: hemispherical heads of 4–6 large, sessile spikelets; glumes dark blackish brown, with apices clearly rounded to emarginate, midvein terminating below apex, margins minutely white-ciliate. **Fruit** a nutlet, 1.0–1.8 × 0.50–1.25 mm. Wet to very damp areas, vlei to semi-vlei grassland.

MsGr

### **scleropus** C.B.Clarke

Robust perennial, up to 0.5 m high, tufted; culms clothed with persistent hard, coarse, dark brown to black leaf sheaths, with sparse pubescence. **Flowers**: hemispherical heads of 4–6 large, sessile spikelets; glumes dark greyish brown or reddish black, with apices becoming lacerated, fragments appearing acute, termination of midvein below glume apex only apparent in young glumes, margins not white-ciliate. **Fruit** transversely rugose. Grassland, wet to very damp areas, vlei to semivlei grassland.

MsGr

## **Carex** L. (sthn Afr.: 18 spp.)

### Key to species:

[after Reid: 98 (1991)]

1a Inflorescence glomerate-spicate to glomerate-paniculate; stigmas 2 . . . . . 2
1b Inflorescence paniculate or raceme of spikes; stigmas 3 or rarely 2 . . . . . 3
2a Bracts of pistillate spikelets longer and wider than perigynia; mature perigynia suberect . . . . . **C. divisa**
2b Bracts of pistillate spikelets shorter and narrower than perigynia; mature perigynia spreading . . . . . **C. glomerabilis**
3a Inflorescence paniculate; stigmas 3 . . . . . **C. spicato-paniculata**
3b Inflorescence a raceme of spikes . . . . . 4
4a Spikes erect or suberect . . . . . 5
4b Spikes pendulous . . . . . 6
5a Apex of perigynium rostrum deeply bidentate; teeth 0.5–1.0 mm long . . . . . **C. cognata**
5b Apex of perigynium rostrum shallowly bidentate; teeth 0.2–0.5 mm long . . . . . **C. acutiformis**
6a Stigmas 3; mature perigynia glabrous . . . . . **C. cognata**
6b Stigmas 2; mature perigynia papillate, with solid papillae . . . . . **C. austro-africana**

### **acutiformis** Ehrh.

Robust, tufted perennial, up to 0.8 m high. **Rhizomes** stoloniferous. **Culms** sharply 3-angled. **Leaves** glaucous, mid-green. **Flowers**: inflorescence a raceme of erect or suberect spikes, 130–400 mm long; female glume distinctly longer than perigynium; perigynium flattened, up to 5 mm long, with hollow papillae, conspicuously veined, rostrum apex shallowly bidentate, teeth 0.2–0.5 mm long; stigmas 3; Sep.–May. Waterlogged marshland, on dolomite-derived or clay or loam substratum. *Lesser pond-sedge*.

MsGr

**austro-africana** (Kük.) Raymond

*C. cernua* Boott var. *austro-africana* Kük.

Perennial up to 0.6 m high; usually but not always caespitose. **Rhizomes** short, creeping. **Culms** sharply 3-angled. **Leaves** glaucous, yellow or mid-green. **Flowers**: inflorescence a raceme of pendulous spikes, ± 70 mm long; mature perigynium papillate, with solid papillae; stigmas 2; Sep.–May. Waterlogged marshland or riparian situations. *Nodding sedge*, *cat's tail sedge*; *knikkende rietgras* (A); *lesuoane-le-lenyenyane* (SS).

MsGr

**cognata** Kunth

*C. cognata* Kunth var. *drakensbergensis* (C.B.Clarke) Kük.

Tufted, rhizomatous perennial, up to 1.4 m high. **Leaves** with conspicuous transverse venation, especially in dry material. **Flowers**: inflorescence a raceme of erect, suberect or pendulous spikes, 115–195 mm long; perigynium evenly inflated, rostrum 1.1–2.0 mm long, apex deeply bidentate, teeth 0.5–1.0 mm long, glabrous when mature; stigmas 3; Oct.–Jul. Waterlogged marshland or wet flushes, or in riparian situations.

MsGr

***divisa** Huds.

Robust, rhizomatous perennial, up to 0.4 m high. **Stem** 3-angled, 1 mm in diameter at middle. **Leaves** shorter than flowering stem, blades V-shaped to flat, 2.0–2.5 mm wide, yellow-green. **Flowers**: inflorescence glomerate-spicate to glomerate-paniculate; terminal, 12–17 × 7–8 mm, basal bract inconspicuous, occasionally well developed, leaf-like, suberect, bracts of pistillate spikelets longer and wider than perigynia; mature perigynium suberect; stigmas 2; Jun.–Nov. **Fruit** a square nutlet. Waterlogged marshland, on sandy substratum. Native to Northern Africa, Europe, temperate and tropical Asia. *Divided sedge*.

AcGr

**glomerabilis** Krecz.

*C. glomerata* Thunb.

*C. vulpina* L. var. *glomerata* (Thunb.) Wahlenb.

Robust perennial, up to 0.7 m high. **Leaves** yellowish green. **Flowers**: inflorescence glomerate-spicate to glomerate-paniculate; bracts of pistillate spikelets shorter and narrower than perigynia; mature perigynium spreading, base with a layer of corky material, margins winged; stigmas 2; Sep.–May. **Fruit** a square nutlet. Waterlogged marshland, on clay or loam substratum.

VreDm AcGr DrGr MsGr KarSh

**spicato-paniculata** C.B.Clarke

Slender, caespitose perennial, up to 1.4 m high. **Leaves** dark green. **Flowers**: inflorescence paniculate; bracteoles subtending higher order inflorescence branches, inflated; glumes brown; mature perigynium not inflated, 4–6 conspicuous nerves on abaxial surface; stigmas 3; Jul.–Jun. Forest margins. *Sedge*.

MsGr

## **Carpha** Banks & Sol. (sthn Afr.: 5 spp.)

### **filifolia** Reid & T.H.Arnold

Tufted, perennial herb, up to 0.6 m high. **Leaves** filiform, 0.50–0.75 mm in diameter. **Culms** single-noded or nodeless. **Fruit** a nutlet, 4–5 mm long. Along streambanks, marshes, wet cliffs, on sandstone or basalt.




## **Cyperus** L. (sthn Afr.: 87 spp.)

### Key to species

[after Vorster: 112, 115 (1978), Gordon-Gray; 45 (1995)]

1a Glumes few per spikelet; spikelets abscising as entire units, except for basal sterile glumes . . . . . 2
1b Glumes many per spikelet; glumes and nutlets abscising individually leaving a persistent rachilla . . . . . 14
2a Plants annual . . . . . 3
2a Plants perennial . . . . . 5
3a Glumes winged on keels . . . . . **C. assimilis**
3b Glumes not winged on keels . . . . . 4
4a Nutlets narrowly ellipsoid, surface smooth . . . . . **C. atriceps**
4b Nutlets obovate, covered with conical, sparsely spaced, flat-topped papillae . . . . . **C. squarrosus**
5a Basal part of plant not swollen or enlarged, joined to underground bulbs by filiform rhizomes . . . . . 6
5b Basal part of plant swollen or enlarged . . . . . 7
6a Inflorescence an expanded umbel of 5–13 lax spikes; glumes copper-coloured . . . . . **C. fulgens** var. **fulgens**
6b Inflorescence a single, terminal, dense spike, rarely an umbel of up to 7 spikes; glumes dark purple-brown . . . . . **C. usitatus** var. **usitatus**
7a Base not a narrowly ovate pseudo-bulb; umbels simple or compound . . . . 8
7b Base a narrowly ovate pseudo-bulb; umbels invariably simple . . . . . 9
8a Glumes purple-black, tightly imbricate; hygrophyte . . . . . **C. congestus**
8b Glumes greenish straw-coloured, laxly imbricate; xerophyte . . . . . **C. turrillii**
9b Inflorescence an open umbel . . . . . 10
9a Inflorescence contracted in a head. . . . . 12
10a Apices of glumes recurving. . . . . **C. indecorus** var. **decurvatus**
10b Apices of glumes not recurving. . . . . .11
11a Spikelets narrowly ovate, acute; fruit > 3 × as long as wide . . . . . .**C. indecorus** var. **inflatus**
11b Spikelets not narrowly ovate, not conspicuously acute; fruit < 3 × as long as wide. . . . . .**C. uitenhagensis**
12a Spikelets distinctly reddish brown . . . . . **C. indecorus** var. **namaquensis**
12b Spikelets greenish, olive-green or straw-coloured . . . . . 13
13a Inflorescence of several completely separate but closely packed, sessile spikes . . . . . **C. marlothii**
13b Inflorescence with spikes confluent into a single head . . . . . **C. capensis**
14a Plants with leaves reduced to sheaths . . . . . 15
14b Plants with leaf blades developed. . . . . 17
15a Style branches 2 . . . . . **C. laevigatus**
15b Style branches 3 . . . . . 16
16a Culms soft, 3-angled, clearly winged below inflorescence; anthers crested . . . . . **C. denudatus** var. **denudatus**

16b Culms firm, terete or obscurely 3-angled below inflorescence; anthers lacking crests . . . . . **C. marginatus**
17a Inflorescence a single head of sessile spikelets . . . . . 18
17b Inflorescence branched, branches umbellate, taking the form of rays to an anthela . . . . . 24
18a Inflorescence bright yellow . . . . . **C. obtusiflorus** var. **flavissimus**
18b Inflorescence other than bright yellow . . . . . 19
19a Inflorescence white or cream-coloured . . . . . 20
19b Inflorescence other than white or cream-coloured . . . . . 21
20a Rhizome usually uniseriate; shoots close in sequence . . . . . **C. obtusiflorus** var. **obtusiflorus**
20b Rhizome not always uniseriate; shoots forming tufts not always very closely aligned . . . . . **C. margaritaceus** var. **margaritaceus**
21a Inflorescence green . . . . . 22
21b Inflorescence dark brown . . . . . 23
22a Spikelets ± oblong, brownish black with green . . . . . **C. schlechteri**
22b Spikelets narrowly ovate, yellowish green . . . . . **C. bellus**
23a Spikelets ovate or elliptic, margins coarsely serrate; glumes laxly imbricated . . . . . **C. rupestris** var. **rupestris**
23b Spikelets narrowly linear-ovate to elliptic-oblong, margins finely serrate . . . . . **C. rupestris** var. **parvinux**
24a Spikelets spicate . . . . . 25
24b Spikelets digitate . . . . . 28
25a Plants lacking elongate stolons . . . . . **C. fastigiatus**
25b Plants with elongate stolons . . . . . 26
26a Stolons coarse, not terminating into small tubers; glumes uniformly dark brown with lighter brown membranous wings . . . . **C. longus** var. **tenuiflorus**
26b Stolons rather fine, wiry, terminating in small tubers; glumes golden-yellow or dark red-brown to purplish . . . . . 27
27a Glumes golden-yellow, with thin basal wings, flanks 3- or 4-veined, veins fading before the membranous, obtuse apex . . . . . **C. esculentus** var. **esculentus**
27b Glumes dark red-brown to purplish, clearly winged basally, flanks 2- or 3-veined, fading some distance before membranous margins. . . . . **C. rotundus** subsp. **rotundus**
28a Plants annual . . . . . 29
28b Plants perennial . . . . . 30
29a Glumes < 2.0 mm long . . . . . **C. difformis**
29b Glumes > 2.0 mm long . . . . . **C. eragrostis**
30a Plants with stolons . . . . . **C. rigidifolius**
30b Plants lacking stolons . . . . . 31
31a Glume with a midrib and one clearly defined longitudinal vein on each flank; plants tufted, leaves rather stiff forming a basal rosette to shoot . . . **C. tenax**
31b Glume and plants not as above . . . . . 32
32a Spikelets dull green or pale brown, suffused red . . . . . **C. sphaerospermus**
32b Spikelets reddish brown to purplish black or greenish brown to dark greyish brown . . . . . 33
33a Spikelets reddish brown to purplish black; style undivided, or with 1–3 short, poorly developed branches. . . . . **C. semitrifidus**
33b Spikelets greenish brown to dark greyish brown; style with 3 well-developed branches. . . . . **C. haematocephalus**

**assimilis** Steud.

*Courtoisina assimilis* (Steud.) Maquet
*Mariscus assimilis* (Steud) Podlech

Annual herb, up to 0.4 m high. **Leaf blades** as long as culm. **Flowers**: umbel with bracts similar to leaves, overtopping umbel; spikelets 4–12 together, clustered in subglobose heads, abscising

as entire units, except for basal sterile glumes; glumes few per spikelet; fertile ones mucronate, winged on keels, yellowish brown; Feb.–May. Grassland, pans, marshy swamps, vleis.

AcGr DrGr KarSh

**atriceps** (Kük.) C.Archer & Goetgh.

*Cyperus aristatus* Rottb. var. *atriceps* Kük.

Annual herb, up to 0.27 m high; nutlets narrowly ellipsoid, surface smooth. **Flowers**: spikes shortly cylindrical to almost spherical; spikelets > 3 mm long, abscising as entire units, except for basal sterile glumes; glumes few per spikelet, not winged, median longitudinal vein of glume more-or-less recurved, reddish black; Feb.–May. Dry, sandy soil, open grassland, bordering pans.

DrGr KarSh

**bellus** Kunth

*C. remotiflorus* Kük.

Annual herb, up to 0.06 m high. **Flowers**: in a single head of sessile spikelets; spikelets digitate or clustered, rarely solitary, narrowly ovate, leaf-bearing, yellowish green; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many; Mar., Apr. Grassland, on limestone.

DrGr MsGr KarSh

**capensis** (Steud.) Endl.

*Mariscus capensis* (Steud.) Schrad.

Perennial herb, up to 1 m high; tufted, base a narrowly ovate pseudo-bulb. **Flowers**: inflorescence with spikes confluent into a single head; spikelets not conspicuously pointed, greenish, olive-green or straw-coloured, abscising as entire units, except for basal sterile glumes; glumes few per spikelet, 3.1–4.2 mm long; Dec.–Mar. Short grassland.

DrGr MsGr KarSh

**congestus** Vahl

*Mariscus congestus* (Vahl) C.B.Clarke

Perennial herb, up to 0.9 m high; hygrophyte, tufted, base globular. **Flowers**: in simple or compound umbels; spikelets very densely crowded, very narrowly ovate to ovate, laterally conspicuously compressed, abscising as entire units, except for basal sterile glumes; glumes tightly imbricate, few per spikelet, purple-black; Nov.–Mar. Grassland, open savanna, along streambanks and in locally wet locations. *Qoqothoana* (SS).

AcGr DrGr MsGr KarSh Zastr

**denudatus** L.f. var. **denudatus**

Perennial herb, up to 0.9 m high; tufted; culms soft, 3-angled, 0.3–1.0 m long, usually clearly winged below inflorescence. **Leaf blades** absent or up to 10 mm long. **Flowers**: inflorescence an open or congested anthela, 20–120 mm wide; anthers crested; style branches 3; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, light to dark reddish brown; Oct.–Mar. Vleis, temporary pans, swamps.

VreDm DrGr MsGr

**difformis** L.

Annual herb, up to 0.8 m high; slender. **Leaf blades** developed. **Flowers**: inflorescence a solitary, congested anthela or with many, subumbellately arranged heads; spikelets digitate; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, 0.5–0.7 mm long, with a winged keel, dark reddish brown; Feb.–May. Seasonally wet grassland, temporary swamps and pools. *Smallflower umbrella plant*.

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

***eragrostis** Lam.

*C. vegetus* Willd.

Annual, up to 0.9 m high; tufted, erect, stem 3-angled. **Leaf blades** flat, keeled, 4–8 mm wide. **Flowers**: inflorescence of several, rounded, stalked clusters of spikelets radiating from stem apex, overtopped by several, spreading, leaf-like, basal bracts; spikelets digitate, flattened, 2.5–3.0 mm wide; glumes and nutlets abscising individually leaving a persistent rachilla; stamen 1; glumes many, > 2.0 mm long, green or fawn-coloured with greenish and/or reddish markings, when dry, pallid or brown with, or without, greenish or reddish markings Nov.–Apr. Margins of watercourses. Native to America. *Tall flat sedge*.

VreDm | AcGr | DrGr

**esculentus** L. var. **esculentus**

*C. esculentus* L. var. *cyclolepis* Kük.

*C. esculentus* L. var. *nervoso-striatus* (Turrill) Kük.

Perennial herb, up to 0.1 m high; robust, with rather fine, wiry stolons, covered with scales and ending in tubers. **Leaf blades** developed. **Flowers**: inflorescence branched; spikelets spicate; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many, 2.2–2.6 mm long, golden-yellow with an uncoloured marginal border, flanks 3- or 4-veined, veins fading before the membranous, obtuse apex; Nov.–Apr. Seasonally wet grasslands and swamps. *Edible galingale*, *earth almond*, *yellow nut sedge*; *geeluintjie*, *patrysuintjie*, *hoenderuintjie* (A); *manakalali* (SS); *indawo*, *insikane* (Z).

VreDm | AcGr | DrGr | MsGr

**fastigiatus** Rottb.

Perennial herb, up to 2.6 m high; robust, without elongate stolons. **Leaf blades** developed. **Flowers**: inflorescence anthelate; spikelets spicate on rays, often suberect; glumes and nutlets abscising individually leaving a persistent rachilla, wings of rachilla golden-brown, spirally twisted, persistent for a short while after glumes and nutlets have fallen; glumes many per spikelet, reddish brown; Oct.–Mar. Along streams and rivers. *Sedge*; *mothoto* (SS).

VreDm | AcGr | DrGr | MsGr | KarSh

**fulgens** C.B.Clarke var. **fulgens**

Perennial herb, up to 0.3 m high; joined to underground bulbs by filiform rhizomes. **Flowers**: expanded umbel with 5–13 lax spikes; spikes narrowly linear-ovate, laxly arranged, stellately spreading, 19–60 × 20–45 mm; spikelets 7.7–26.0 × 0.8–3.3 mm, laxly arranged, abscising as entire units, except for basal sterile glumes; glumes few per spikelet, spaced 1.2–2.0 mm apart, golden-brown to copper-coloured; Dec.–Feb. Disturbed areas.

DrGr

**haematocephalus** C.B.Clarke

Perennial, herb, up to 0.6 m high; without stolons. **Leaf blades** developed. **Flowers**: umbel with densely agglomerated spikelets; spikelets digitate, greenish brown to dark greyish brown; glumes and nutlets abscising individually leaving a persistent rachilla; style with 3 well-developed branches; glumes many per spikelet, with a strongly recurved awn at apex, > 2.0 mm long, brown; Nov.–Feb. Vleis.

DrGr MsGr

**indecorus** Kunth var. **decurvatus** (C.B.Clarke) Kük.

*Mariscus indecorus* (Kunth) Podlech var. *decurvatus* (C.B.Clarke) Podlech

*M. rehmannianus* C.B.Clarke

Perennial herb, up to 0.5 m high; base a narrowly ovate pseudo-bulb. **Leaves** basal, many. **Flowers**: 4–7 bracts, up to 290 mm long; inflorescence an open, terminal umbel of 5–9, ± spreading spikelets; spikelets 6.2–12.5 × 0.6–3.3 mm long, narrowly elliptical, abscising as entire units, except for basal sterile glumes; glumes few per spikelet, 2.9–6.7 mm long, narrowly ovate with apex long-acuminate, conspicuously recurved, reddish brown; Nov.–Feb. Dry, open areas.

AcGr DrGr KarSh

**indecorus** Kunth var. **inflatus** (C.B.Clarke) Kük.

*Mariscus albomarginatus* C.B.Clarke

*M. indecorus* (Kunth) Podlech var. *inflatus* (C.B.Clarke) Podlech

Perennial herb, up to 0.45 m high; base a narrowly ovate pseudo-bulb; nutlets > 3 × as long as wide. **Leaves** basal, many. **Flowers**: 3–6 bracts, up to 250 mm long; inflorescence an open, terminal umbel of 3–9 spikelets, usually ascending; spikelets 2.8–6.2 × 0.5–1.0 mm, narrowly ovate, acute, abscising as entire units, except for basal sterile glumes; glumes few per spikelet, 2.7–4.6 mm long, narrowly ovate to linear-ovate, straw-coloured with golden-brown flanks, apices not recurving; Nov.–Mar. Grassland, sandy soil.

AcGr DrGr KarSh

**indecorus** Kunth var. **namaquensis** (C.B.Clarke) Kük.

*Mariscus indecorus* (Kunth) Podlech var. *namaquensis* (Kük.) Podlech

Perennial herb, up to 0.3 m high; tufted, base a narrowly ovate pseudo-bulb. **Leaves** basal, many. **Flowers**: 4–7 bracts, up to 170 mm long; inflorescence contracted in a head; spikelets 2.5–3.4 × 0.5–0.8 mm, trigonous, reddish brown, abscising as entire units, except for basal sterile glumes; glumes few per spikelet, 2.5–3.7 mm long, narrowly ovoid, straw-coloured with reddish brown flanks; Feb.–Apr. Grassland, dry brackish sand.

DrGr

**laevigatus** L.

*Juncellus laevigatus* (L.) C.B.Clarke

Perennial herb, up to 0.6 m high; tufted or rhizomatous; culms crowded or solitary on a long, creeping rhizome. **Leaf blades** very short, rigid, reduced to sheaths. **Flowers**: inflorescence appearing lateral, ± 10–20(–30) × ± 8–20(–30) mm, a digitate cluster of (1–)several spikelets, overtopped by largest, erect and rigid basal bract; spikelets 2.0–2.5 mm wide; glumes and nutlets abscising individually leaving a persistent rachilla; style branches 2; glumes many per

spikelet, light brown or purplish; Oct.–Apr. Stream and riverbanks, moist soil around springs, pans, dams. *Rivierkweek* (A).

DrGr | KarSh

**longus** L. var. **tenuiflorus** (Rottb.) Boeck.

Perennial herb, up to 1 m high; rhizomatous, erect, with coarse, elongate stolons, not terminating into small tubers; culm base not much swollen. **Leaf blades** flat, keeled, 3–4 mm wide, glaucous. **Flowers**: inflorescence branched, of several, stalked clusters of spikelets, radiating from stem apex with several, suberect, leaf-like basal bracts; spikelets spicate, flattened, linear, 1.0–1.5 mm wide; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, dark brown with pale margins; Oct.–Apr. Damp flats and watercourses. *Sweet cyperus*; *waterbiesie*, *dooiwortel* (A).

VreDm | AcGr | DrGr | KarSh

**margaritaceus** Vahl var. **margaritaceus**

Perennial herb, up to 0.75 m high; shortly rhizomatous, stiff, shoots forming tufts not always very closely aligned. **Leaf blades** developed. **Flowers**: inflorescence of 2–7 slightly flattened spikelets in a single head; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, whitish, pale yellow or light reddish brown; Nov.–Mar. Open woodland or grassland. *Witbiesie* (A).

VreDm? | AcGr | DrGr

**marginatus** Thunb.

Perennial herb, up to 1 m high; robust, rhizomatous or tufted; culms firm, terete or obscurely 3-angled below inflorescence. **Leaf blades** absent; leaf sheaths straw-coloured or brown, very wide and prominent. **Flowers**: inflorescence compact or of several stalked clusters of spikelets, radiating from stem apex with 3 suberect, rigid and leaf-like basal bracts, inconspicuous or up to ± 30 mm long; spikelets flattened, 2–3(–4) mm wide; glumes and nutlets abscising individually leaving a persistent rachilla; anthers lacking crests; style branches 3; glumes many per spikelet, chestnut-brown with pale margins; Oct.–Feb. Rock crevices in seasonal watercourses. *Matjiesgoed* (A).

VreDm | AcGr | DrGr | MsGr | KarSh

**marlothii** Boeck

*Mariscus marlothii* (Boeck.) C.B.Clarke

Perennial herb, up to 0.25 m high; base a narrowly ovate pseudo-bulb. **Leaves** basal ones ± as long as primary peduncle. **Flowers**: inflorescence of several completely separate, but closely-packed, sessile spikes; spikelets greenish, olive-green or straw-coloured, abscising as entire units, except for basal sterile glumes; glumes few per spikelet, apices not recurving; Jan.–Mar. Edges of pans.

DrGr | KarSh

**obtusiflorus** Vahl var. **flavissimus** (Schrad.) Boeck.

*C. obtusiflorus* Vahl var. *sphaerocephalus* (Vahl) Kük.

*C. sphaerocephalus* Vahl

Perennial herb, up to 500 mm high. **Leaf blades** developed. **Flowers**: inflorescence a single, tight head of many, sessile spikelets; spikelets 7–10 mm long; glumes and nutlets abscising

individually leaving a persistent rachilla; glumes many per spikelet, bright yellow; Oct.–Mar. Stony grassland. *Yellow sedge*; *geelbiesie* (A); *lejabutle-le-lesehla*, *monakalali-oa-litšoene* (SS).

VreDm | | DrGr | MsGr | | Zastr

**obtusiflorus** Vahl var. **obtusiflorus**

*C. niveus* Retz. var. *leucocephalus* (Kunth) Fosberg

Perennial herb, up to 0.45 m high; rhizome usually uniseriate; shoots close in sequence. **Leaf blades** developed. **Flowers**: inflorescence a single, globose head of 10–45 sessile spikelets; spikelets 5–17 mm long; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, white with pinkish brown tinge; Nov.–Apr. Dry grassland, savanna, rocky slopes.

| | | DrGr | | | |

**rigidifolius** Steud.

Perennial herb, up to 0.5 m high; with slender stolons. **Leaf blades** developed. **Flowers**: inflorescence branched; spikelets digitate; bracts leafy, erect or spreading; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, 2.5–3.0 mm long, dark reddish brown to black with a green midrib; Dec.–Mar. Grassland, often near roads and cultivations.

| | | DrGr | MsGr | | |

**rotundus** L. subsp. **rotundus**

Perennial herb, up to 0.65 m high; fine, wiry stolons ending in small tubers persisting as hard, swollen bases of stem. **Leaf blades** developed. **Flowers**: spikelets spicate; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many, dark red-brown to purplish with a green midrib, clearly winged basally, flanks 2- or 3-veined; Dec.–Apr. Grassland, roadsides, cultivations.

| | | DrGr | MsGr | | |

**rupestris** Kunth var. **parvinux** (C.B.Clarke) Kük.

*C. parvinux* C.B.Clarke

Perennial herb, up to 0.05 m high. **Leaf blades** developed. **Flowers**: inflorescence a single head of sessile spikelets; spikelets narrowly linear-ovate to elliptic-oblong; dark brown, margins finely serrate; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, chestnut-brown with a green midrib and apicules; Jan.–May. Montane grassland.

| | | DrGr | MsGr | | |

**rupestris** Kunth var. **rupestris**

Perennial herb, up to 0.15 m high. **Leaf blades** developed; old leaf sheaths greyish fawn-coloured, somewhat papery. **Flowers**: 2–9 sessile spikelets in a single, compressed head; spikelets ovate or elliptic, margins coarsely serrate, chestnut-brown or dark red; glumes and nutlets abscising individually leaving a persistent rachilla; style divided at apex into 3 long stigmas; glumes many per spikelet, laxly imbricate; Nov.–Mar. Montane grassland, soil pockets on rock. *Russet rock sedge*; *taoane*, *taoanenyana* (SS).

| | | DrGr | MsGr | | Zastr |

**schlechteri** C.B.Clarke

Perennial herb, up to 0.3 m high. **Leaves** short, blades 3 mm wide. **Flowers**: inflorescence a single head of sessile spikelets, 10–12 mm in diameter, green; bracts 3 or 4, 30–50 mm long; spikelets 6–10, ± oblong, brownish black with green; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, imbricate; Nov.–Jan. Grassland, seepage areas. *Roroana* (SS).

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**semitrifidus** Schrad.

Perennial herb, up to 0.25 mm high, with woody rhizome, without stolons. **Leaf blades** developed; old leaf sheaths brown and quite hard. **Flowers**: spikelets digitate; style undivided or divided into 2 or 3 short stigmas; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, > 2 mm long, reddish brown to purplish black; Oct.–Mar. Grassland, rocky slopes. *Hlohoana-ntso*, *ma-taoataoane*, *matobane* (SS).

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**sphaerospermus** Schrad.

*C. denudatus* L.f. var. *sphaerospermus* Schrad.

Perennial herb, up to 0.9 m high; tufted or rhizomatous, without stolons; culm 3-angled, not winged. **Leaf blades** well developed, flat, keeled, ± 3 mm wide. **Flowers**: inflorescence of several, stalked clusters of spikelets, radiating from stem apex with several, suberect, leaf-like basal bracts; spikelets digitate, flattened, 2 mm wide, dull green to pale brown, suffused red; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, golden-brown to reddish brown; Oct.–Mar. Bush clumps, grassland, margins of vleis, pans. *Matjiesgoed* (A).

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**squarrosus** L.

*Mariscus squarrosus* (L.) C.B.Clarke

Annual herb, up to 0.30 m high; forming small tufts; nutlets obovate, covered with conical, sparsely spaced, flat-topped papillae. **Leaves** developed. **Flowers**: inflorescence with long peduncle, terminal, simple umbel of up to 7 spikes; spikelets abscising as entire units, except for basal sterile glumes; glumes few per spikelet, not winged on keels, with aristae 0.4–1.1 mm long, greenish, lightly tinged with purple-brown; Feb.–Apr. Bush clumps, grassland, edges of pans, vleis.

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**tenax** Boeck.

Perennial herb, up to 0.65 m high; densely tufted, without stolons. **Leaves** many, stiff, in a rosette at culm base with many, persistent, dead leaves. **Flowers**: inflorescence of 1 sessile spikelet-cluster and 3–12 stalked, head-like clusters; spikelets digitate; glumes and nutlets abscising individually leaving a persistent rachilla; glumes many per spikelet, with a midrib and one clearly defined longitudinal vein on each flank, brownish black; Oct.–Jan. Dry and sandy grassland.

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| | | DrGr | | | |

**turrillii** Kük.

*Mariscus laxiflorus* Turrill

Perennial herb, up to 0.95 m high; xerophyte, basal part swollen. **Flowers**: in simple or compound umbels; spikelets 5–10-flowered, very laxly arranged, spreading, ovate to very narrowly ovate in outline, abscising as entire units, except for basal sterile glumes; glumes few per spikelet, 2.6–3.9 mm long, rather laxly arranged, not imbricate at maturity, but spreading from rachilla at an angle of 45°, greenish straw-coloured; Dec.–Feb. Dry, high, open woodland in partial shade.

| | | DrGr | MsGr | KarSh | Zastr |
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**uitenhagensis** (Steud.) C.Archer & Goetgh.

*Mariscus uitenhagensis* Steud.

Perennial herb, up to 0.3 m high; with narrowly ovate pseudo-bulb; nutlets < 3 × as long as wide. **Leaf blades** developed. **Flowers**: in a open umbel; spikes cylindrical with densely crowded, green, 1-flowered spikelets; spikelets conspicuously acute, abscising as entire units, except for basal sterile glumes; glumes > 2 mm long with median vein only slightly or not at all excurrent; glumes few per spikelet, apices not recurving, greenish straw-coloured; Oct.–Mar. Long grassland and deep soil, rocky ledges, disturbed areas.

| | | DrGr | | | |
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**usitatus** Burch. var. **usitatus**

Perennial herb, up to 0.45 m high; joined to underground bulbs by filiform rhizomes. **Leaf blades** developed. **Flowers**: in a single, terminal, dense spike, rarely an umbel of up to 7 spikes; spikelets densely arranged, abscising as entire units, except for basal sterile glumes; glumes few per spikelet, densely and compactly imbricate, dark purple-brown; Dec.–Mar. Rock slabs.

| | AcGr | DrGr | MsGr | KarSh | Zastr |
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## **Eleocharis** R.Br. (sthn Afr.: 17 spp.)

### Key to species:

[after Cook: 95 (2004)]

Styles mostly 2-cleft; nutlets rounded, nutlet walls smooth and glossy . . . . . .
. . . . . **E. dregeana**
Styles mostly 3-cleft; nutlets 3-sided, nutlet walls with net-like pits . . . . **E. limosa**

**dregeana** Steud.

Perennial herb, up to 400 mm high; tufts from a woody, creeping rhizome. **Stems** rounded. **Flowers**: spikelets 10–15 mm long, blackish; perianth bristles mostly 4; styles mostly 2-cleft, base ovoid-deltoid, ± 0.3 mm long; Dec.–Mar. **Fruit** an obovoid nutlet, up to 1.1 mm long, walls smooth and glossy. Margins of marshes. Hybridises with *E. palustris*. *Sechaba* (SS).

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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**limosa** (Schrad.) Schult.

Perennial herb, up to 0.6 m high; tufts from a thick, creeping rhizome.. **Stems** cylindrical, ± 5 mm in diameter at middle. **Flowers**: inflorescence a single, terminal, oblong, brown spikelet, (18–)30–35 × 4–5 mm, basal bract scale-like and green; perianth bristles mostly 6; styles (2)3-cleft, base pointed, ± 0.3–0.5 mm long; Aug.–Dec. **Fruit** an obovoid nutlet, bluntly 3-sided, 1.3–1.5 mm long, walls with net-like pits. Margins of marshes or pools.

DrGr MsGr

## **Ficinia** Schrad. (sthn Afr.: 63 spp.)

### Key to species:

[after Gordon-Gray: 82 (1995)]

1a Ligule at least 5 mm long, splitting early; glumes obtuse, margins membranous, midnerve terminating below apex. . . . . **F. stolonifera**
1b Ligule < 5 mm long; glumes not as above. . . . . 2
2a Glume apex rounded with midvein terminating in a blunt point (scarcely prolonged); anther crest long triangular, 0.2 mm long . . . . . **F. gracilis**
2b Glume apex rounded with midvein projecting in a short elongate apiculum; anther crest nearly round in outline, densely scabrid . . . . . **F. dasystachys**

**dasystachys** C.B.Clarke

Tufted, perennial herb, up to 350 mm high. **Leaves** ± flat; ligule < 5 mm long. **Flowers**: spikelets many per head, blackish; glume apex rounded, midvein projecting in a short to slightly elongate blunt, straight or slightly curved apiculum; anther crest round in outline, densely scabrid; Oct.–Mar. **Fruit** a nutlet, unknown.

Zastr

**gracilis** Schrad.
*F. undosa* B.L.Burtt

Tufted, perennial herb, up to 450 mm high. **Leaves** ± flat; ligule < 5 mm long. **Flowers**: spikelets many per head, blackish; glume apex rounded, midvein terminating in a blunt point; anther crest long triangular, 0.2 mm long, smooth or scabrid; Oct.–Mar. **Fruit** an obovate nutlet, irregularly ridged. Marshy ground, moist grassland.

DrGr MsGr

**stolonifera** Boeck.

Tufted, perennial herb, up to 400 mm high. **Stems** filiform. **Leaves** filiform; ligule conspicuous, papery, white to straw-coloured, at least 5 mm long, splitting early. **Flowers**: spikelets few per head, brown; glumes obtuse, margins membranous, midnerve terminating below apex; gynophore large, 3-lobed; Sep.–Dec. Grassland.

MsGr

## **Fimbristylis** Vahl (sthn Afr.: 10 spp.)

### Key to species:

[after Gordon-Gray: 90 (1995)]

Nutlet surface longitudinally ridged, trabeculate or latticed; leaf blades developed . . . . . **F. dichotoma**
Nutlet surface reticulate or smooth; leaves with fringed ligule. . . . . **F. complanata**

**complanata** (Retz.) Link
*Scirpus complanatus* Retz.

Perennial herb, up to 500 mm high. **Rhizome** well developed, usually clearly sympodial, of closely packed shoot bases confluent in a uniseriate row, occasionally irregularly forming a tuft. **Leaves** with fringed ligule. **Flowers**: style with base, excluding style branches, > 1.3 mm long; glumes brown; Oct.–Apr. **Fruit** with nutlet surface reticulate or smooth. Marsh to moist grassland. Figure 62.

DrGr?

**dichotoma** (L.) Vahl
*F. diphylla* (Retz.) Vahl

Perennial herb, up to 1 m high. **Leaf** sheaths with blades usually well developed. **Flowers**: spikelets smoothly rounded; glumes with upper half of abaxial surface glabrous, dark brown; Nov.–May. **Fruit** with nutlet biconvex, surface longitudinally striate and trabeculate under > 15 × magnification. Marsh or riverine areas (often a weed of damp, disturbed situations). *Biesie* (A).

DrGr

## **Fuirena** Rottb. (sthn Afr.: 13 spp.)

### Key to species:

[after Gordon-Gray: 97 (1995)]

1a Mature nutlets with epidermal cells of pericarp large (visible with 10 × lens) with deeply and closely rippled anticlinal walls; rhizome 3–9 mm in diameter . . . . . **F. coerulescens**
1b Mature nutlets appearing smooth (with 10 × lens); rhizome variable . . . . . 2
2a Inner whorl of 3 perianth bristles; glume awn 0.2–0.8 mm long; rhizome absent or poorly developed. . . . . **F. stricta** var. **stricta**
2b Inner whorl of perianth lacking or small; glume awn 1.0–3.0 mm long; rhizome present . . . . . **F. pubescens** var. **pubescens**

**coerulescens** Steud.
*F. reticulata* Kük.

Perennial herb, up to 500 mm high. **Rhizome** 3–9 mm in diameter. **Flowers**: usually 3 perianth scales, with awn; glumes reddish green, with awns 0.8–1.7 mm long, pubescent except distally. **Fruit** a nutlet 1.3–1.6 × 0.7–0.9 mm, epidermal cells of pericarp large (visible with 10 × lens) with deeply and closely rippled anticlinal walls. Seasonal vleis, pans.

DrGr MsGr

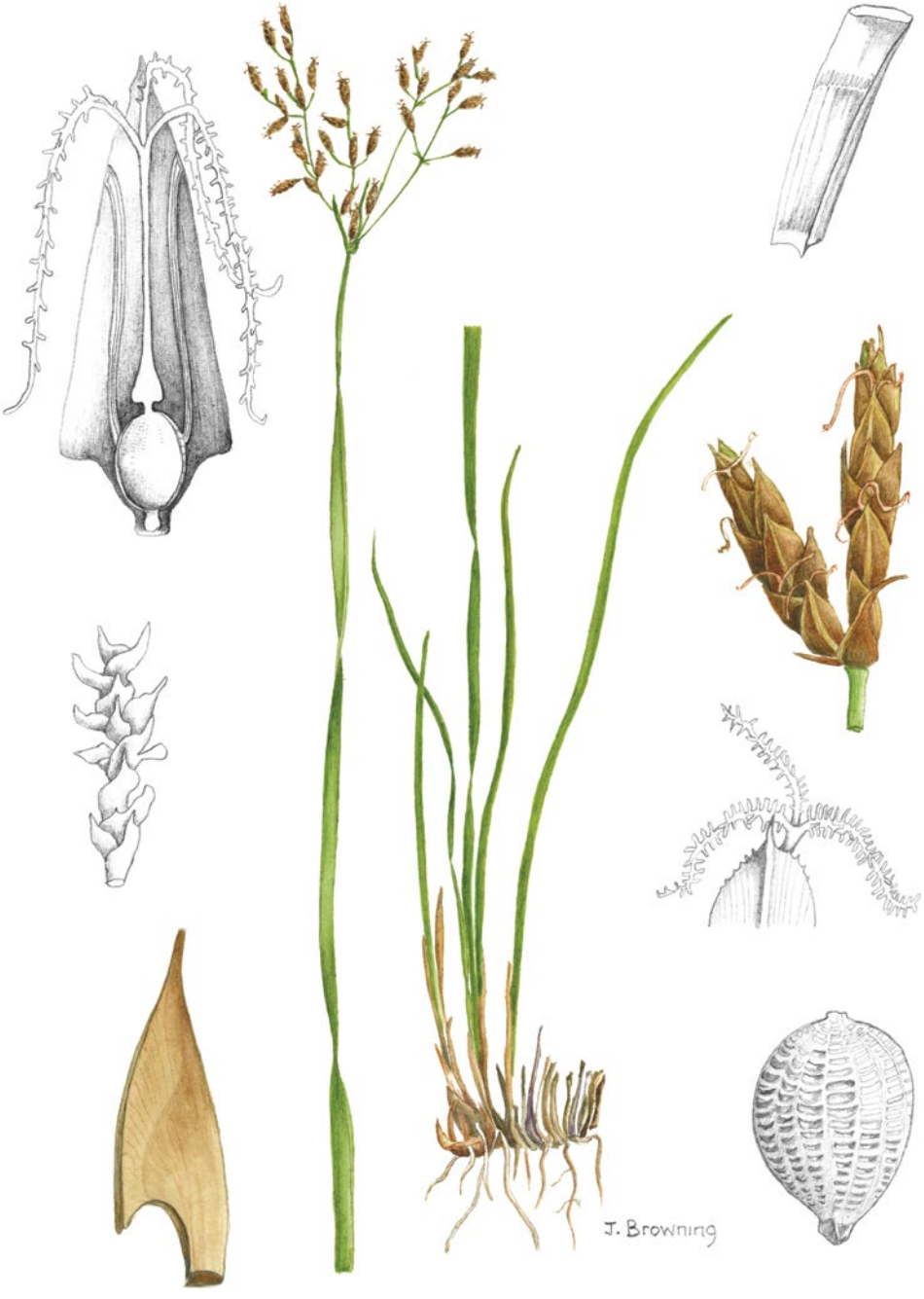



**Figure 62.** *Fimbristylis complanata* (Cyperaceae). Artist: J. Browning.

**pubescens** (Poir.) Kunth var. **pubescens**

Hairy, perennial herb, up to 0.6 m high. **Rhizome** elongate or contracted. **Flowers**: perianth bristles absent or very small; glumes with awn 1.0–3.0 mm long, greenish brown; Sep.–Mar. **Fruit** nutlet 1.0–1.6(–1.8) mm long, appearing smooth. Margins of streams, vleis, edges of pools in black turf.

VreDm | AcGr | DrGr | MsGr

**stricta** Steud. var. **stricta**

Tufted, perennial herb, up to 0.75 m high. **Rhizome** absent or poorly developed. **Flowers**: perianth bristles 3 + 3; glumes puberulous, with awns 0.2–0.8 mm long. **Fruit** nutlet appearing smooth. Margins of streams, wet sites in grassland.

DrGr

## **Isolepis** R.Br. (sthn Afr.: 34 spp.)

### Key to species:

[after Gordon-Gray: 104, 105 (1995)]

1a Surface of mature nutlets trabeculate. . . . . 2
1b Surface of mature nutlets smooth or minutely papillate . . . . . 3
2a Plants with leaves reduced to sheaths only; blades reduced to short outgrowths ≤ 5 mm long. . . . . **I. costata**
2b Plants with leaves bearing blades usually > 5 mm long . . . . . **I. setacea**
3a Plants creeping; inflorescence a solitary, terminal spikelet without an overtopping bract. . . . . **I. fluitans** var. **fluitans**
3b Plants erect, tufted; inflorescence with at least one projecting bract longer than spikelets . . . . . **I. cernua** var. **cernua**

**cernua** (Vahl) Roem. & Schult. var. **cernua**

*Scirpus cernuus* Vahl

Tufted, annual herb, up to 150 mm high. **Stems** filiform. **Leaves** with sheaths frequently reddish; blades absent or rarely very short. **Flowers**: inflorescence terminal, of 1(2) spikelet(s); at least 1 basal bract longer than spikelets; spikelets ovoid, 3.0 × 1.5 mm; glumes boat-shaped, straw-coloured or reddish, with green keels, mucro < 0.1 mm long; Nov.–Mar. **Fruit** nutlet tuberculate. Riverbanks, damp sites in grassland. *Leshomokxoane* (SS).

VreDm | DrGr | MsGr

**costata** Hochst. ex A.Rich

*Scirpus costatus* (Hochst. ex A.Rich) Boeck.

Tufted, perennial herb, up to 500 mm high. **Leaves** basal leaf sheaths truncate, otherwise plants leafless. **Flowers**: inflorescence compact head of 10 or more spikelets, overtopped by a bract; glumes ovate, obtuse, green keeled, ferruginous with a pale membranous margin; Sep.–Jan. **Fruit** a white nutlet, surface trabeculate. Swamps, streambanks, vleis.

AcGr | DrGr | MsGr

**fluitans** (L.) R.Br. var. **fluitans**

*Scirpus fluitans* L.

Annual, creeping herb, up to 350 mm high. **Stem** with equally spaced, leaf-bearing nodes. **Flowers**: inflorescence a solitary, terminal spikelet, lanceolate, ± 5 mm long, without overtopping bract; glumes ovate, obtuse, straw-coloured or purplish brown; Jul.–Jun. **Fruit** a lenticular nutlet, dark brown, shortly beaked, surface puncticulate. Moist wetlands and swamps, in streams. *Waterbiesie* (A).

DrGr? MsGr

**setacea** (L.) R.Br.

*Scirpus setaceus* L.

Tufted, annual herb, up to 150 mm high. **Stems** filiform. **Leaves** present, blades > 5 mm long. **Flowers**: inflorescence a terminal head of 1–few spikelets, basal bract erect to suberect, filiform; spikelets ovoid, 2.0(–3.5) × 1.5–2 mm; glumes pale, often with red markings or entirely red; style branches 3; Oct., Nov. **Fruit** a longitudinally ribbed nutlet. Riversides. *Boleanyana* (SS).

DrGr MsGr KarSh

## **Kyllinga** Rottb. (sthn Afr.: 13 spp.)

### Key to species:

[after Gordon-Gray: 112 (1995)]

1a Inflorescence dark red . . . . . **K. pulchella**
1b Inflorescence variously coloured, but never dark red . . . . . 2
2a Inflorescence of few (6–20) spikelets; at least some of the inflorescences proliferous. . . . . **K. pauciflora**
2b Inflorescence of many (> 20) spikelets; proliferous inflorescences unknown . . . . . 3
3a Rhizome coarse, woody, uniseriate, usually closely enveloped in persistent leaf bases; culms pubescent; inflorescence golden-green; glumes markedly winged . . . . . **K. alata**
3b Plants not as above . . . . . 4
4a Plants tufted, the rhizome forming a short row or mass of stem bases covered in dark, tough and fibrous leaf sheaths. . . . . **K. alba**
4b Plants with a firm, succulent rhizome; leaf sheaths not dark, tough and fibrous . . . . . **K. erecta** var. **erecta**

**alata** Nees

Perennial herb, up to 300 mm high; with culms pubescent. **Rhizome** coarse, woody, uniseriate, usually closely enveloped in persistent leaf bases. **Flowers**: inflorescence a single, ovate to globose spike; glumes markedly winged, golden-green; keels green, excurrent into long, slender mucros; Oct.–Feb. Grassland, vleis.

DrGr MsGr KarSh

**alba** Nees

Perennial herb, up to 500 mm high. **Rhizome** forming a short row or mass of stem bases covered in dark, tough and fibrous leaf sheaths. **Flowers**: inflorescence a fairly large, subglobose head;

bracts usually 3; lower fertile glume apex blunt or scarcely excurrent into a mucro; glumes white or cinnamon-coloured; Oct.–Jan. Grassland, sandy soil. *Witbiesie* (A); *qheme*, *robo*, *monokotsoai-oa-litsoene* (SS); *umxhopho* (Z).

AcGr DrGr MsGr

**erecta** Schumach. var. **erecta**

Perennial herb, up to 250 mm high. **Rhizome** a row of firm, bulbous-based, contiguous stems clothed in scales (when dry, stem bases shrunken within scales); leaf sheaths not dark, tough and fibrous. **Flowers**: inflorescence a single, globose spike; glumes gold-coloured or green; Nov.–Apr. Marshy grassland. *White sedge*, *white kyllinga*; *witbiesie*, *uintjie* (A).

VreDm AcGr DrGr MsGr

**pauciflora** Ridl.

Rhizomatous, perennial herb, up to 0.6 m high. **Flowers**: inflorescence lax, of 6–20 spikelets, or fewer, some replaced by a vegetative shoot; glumes golden-green. Nov., Dec. Damp, swampy grassland.

MsGr

**pulchella** Kunth

Slender, perennial herb, up to 430 mm high. **Stolons** very slender, < 1 mm in diameter. **Flowers**: inflorescence of 1–3, sessile, cylindrical spikes; glumes dark red; Dec.–Apr. **Fruit** nutlet ellipsoid to obovoid, half the length of glume, chestnut-brown. Sides of pans, edges of dams, vleis.

DrGr MsGr KarSh

## **Lipocarpha** R.Br. (sthn Afr.: 6 spp.)

### Key to species:

[after Gordon-Gray: 121 (1995)]

1a Bisexual floret unaccompanied by glume or prophyll within the subtending bract . . . . . **L. rehmannii**
1b Bisexual floret accompanied by both glume and prophyll within the subtending bract . . . . . 2
2a Inflorescence terminal, a head of 1–4 spikes; bracts of spikes with an acuminate, recurved apex 0.4–0.8(–1.3) mm long . . . . . **L. nana**
2b Inflorescence pseudolateral with 1 or 2 spikes; bracts of spikes 0.4–0.7 mm wide, broadly obovate, apex mucronate. . . . . **L. hemisphaerica**

**hemisphaerica** (Roth) Goetgh.
*L. isolepis* (Nees) R.W.Haines

Tufted, annual herb, up to 150 mm high. **Flowers**: inflorescence pseudolateral with 1 or 2 spikes; bisexual floret accompanied by both glume and prophyll within the subtending bract; overtopped by a well-developed main bract; bracts 0.4–0.7 mm wide, broadly obovate, apex mucronate. Shallow soil, rocky outcrops.

DrGr

**nana** (A.Rich.) Cherm.
*L. pulcherrima* Ridl.

Slender, annual herb, up to 300 mm high. **Flowers**: inflorescence terminal, a head of 1–4 spikes; bisexual floret accompanied by both glume and prophyll within the subtending bract; dark red bracts with an acuminate, recurved apex 0.4–0.8(–1.3) mm long, apex yellowish to greenish; spikelets dark or becoming so at maturity; Jan.–May. Marshy grassland.

MsGr

**rehmannii** (Ridl.) Goetgh.
*Rikliella rehmannii* (Ridl.) J.Raynal
*Scirpus hystricoides* B.Nord.

Tufted, annual herb, up to 200 mm high; plant caespitose, foliate at base. **Flowers**: inflorescence capitate, terminal or pseudolateral, comprising 3–12 distinct spikes; spikelets uniflorus, crowded; bisexual floret unaccompanied by glume or prophyll within the subtending bract; bracts dark brown or greenish brown with long reflexed apex; Dec.–Apr. Vlei edges, seepage areas.

MsGr

## **Pseudoschoenus** (C.B.Clarke) Oteng-Yeb. (sthn Afr.: 1 sp.)

**inanis** (Thunb.) Oteng-Yeb.
*Scirpus inanis* (Thunb.) Steud.
*S. spathaceus* Hochst.

Rhizomatous perennial, up to 2 m high. **Stem** cylindrical, stout, reed-like, 4–7 mm in diameter at middle. **Leaves** sheaths often dark reddish black, blades absent. **Flowers**: inflorescence a slender, terminal panicle of many spikelets; basal bract erect, scale-like, brown; spikelets pale brown, ± 8 × 2 mm; Nov., Dec. Streamsides at high altitudes. *Matjiesriet*, *hardematjiesgoed* (A).

KarSh Zastr

## **Pycreus** P.Beauv. (sthn Afr.: 22 spp.)

### Key to species:

[after Gordon-Gray: 139, 141 (1995)]

1a Plants dwarf annuals with a poorly developed rooting system; culms < 300 mm long. . . . . **P. pumilis**
1b Plants perennial, with or without evident underground organs of perennation; if annual, then with erect culms ± 300 mm or more in length, or if shorter, then usually robustly tufted . . . . . 2
2a Plants often with copious growth consisting of underground stolons covered in persistent sheaths and rooting at nodes; trailing leafy stems that terminate each in a nodeless culm carrying an anthelate inflorescence . . . . . 3
2b Plants erect, slenderly to robustly tufted; with short rhizomes or elongate stolons . . . . . 4
3a Spikelets 2–3 mm wide; glume with each flank marked by a small, shallow, obliquely longitudinal depression, pallid and membranous against the dark rather dull brown of the remainder; leaves often with a bluish tint in life; stolons 1–4 mm thick . . . . . **P. mundii**

3b Spikelets 3–4 mm wide; glumes dark, shining chestnut-brown with lighter greenish markings on keel, flanks unmarked by any depression; leaves bright green in life, often clustered immediately behind terminal nodeless culm; robust stolons 3–8 mm thick, clearly nodose . . . . . **P. nitidus**

4a Glumes never black; spikelets linear, golden-yellow to cherry-red or chestnut . . . . . **P. chrysanthus**

4b Glumes almost black or blackish brown with, or without, lighter markings at keels or margins . . . . . 5

5a Plants appearing annual, except that there may be thin, lateral stolons linking the slender aerial shoots; spikelets ± 20-flowered . . . . . **P. betschuanus**

5b Plants perennial, generally more robust with a descending stoloniferous base to each shoot; spikelets 2–10 in a head . . . . . **P. macranthus**

## **betschuanus** (Boeck.) C.B.Clarke

Perennial, appearing annual, erect herb, up to 300 mm high. **Stolons** wiry, clothed by very pale brown scales. **Flowers**: inflorescence anthelate or head-like, spikelets ± 20-flowered, florets flat; glumes dark purplish brown to black; Nov.–Mar. **Fruit** an obovoid nutlet. Margins of marshes and rivers.

DrGr

## **chrysanthus** (Boeck.) C.B.Clarke

Perennial, erect herb, up to 500 mm high, stems single. **Stolons** covered in leaf sheaths. **Flowers**: rays basally black; spikelets linear; style branches 2; glumes gaping near base, ovate, boat-shaped, golden-yellow to cherry-red or chestnut; Jan.–Apr. **Fruit** nutlet oblong-ellipsoid, black, beaked. Vleis.

DrGr

## **macranthus** (Boeck.) C.B.Clarke

Perennial, erect herb, up to 0.6 m high with descending stoloniferous base to each shoot. **Flowers**: head subsessile or inflorescence rays very short; spikelets 2–10, up to 30 × 3–5 mm, lanceolate; glumes dark reddish brown; Oct.–Apr. **Fruit** a transversely undulate nutlet. Edges of vleis.

DrGr MsGr

## **mundii** Nees

Perennial herb, up to 400 mm high. **Stolons** 1–4 mm thick. **Leaves** often with bluish tint. **Flowers**: spikelets 2–3 mm wide; glume with each flank marked by a small, shallow, obliquely longitudinal depression, pallid and membranous against the dark rather dull brown of the remainder; glumes dark brown; Oct.–May. **Fruit** a dotted nutlet. Margins of streams, vleis.

DrGr MsGr

## **nitidus** (Lam.) J.Raynal

*P. lanceus* Turrill

*P. umbrosus* Nees

Perennial herb, up to 0.6 m high. **Stolons** robust, 3–8 mm thick, clearly nodose, covered in leaf sheaths. **Leaves** 2–8 mm wide, bright green, often clustered immediately behind terminal

nodeless culm. **Flowers**: rays ± 50 mm long; spikes umbelled; spikelets 3–4 mm wide; style branches 2; glumes dark, shining chestnut-brown with lighter greenish markings on keel, flanks unmarked by any depression; Oct.–Feb. **Fruit** nutlet dotted, obovoid, dark brown. Marshy grassland, pan basin, vleis. *Waterbiesie* (A); *leya-butle*, *motaoa-taoane*, *motobane (S)*; *intsekane*, *ikhwane* (Z).




**pumilis** (L.) Domin

Small, tufted, annual herb, up to 300 mm high. **Rhizome** poorly developed. **Flowers**: inflorescence of 1 sessile and 1–6 stalked spikelet clusters; glumes 1.0–1.2 mm long, conspicuously mucronate, greyish green to reddish brown; Feb.–Apr. **Fruit** an obovate to elliptic nutlet, dark grey, with minute tubercles in longitudinal rows. Vlei edges, along streams.




## **Schoenoplectus** Palla (sthn Afr.: 18 spp.)

### Key to species:

[after Cook: 110 (2004)]

1a Culms and lowermost inflorescence bracts transversely septate. . . . . **S. senegalensis**
1b Culms and lowermost inflorescence bracts without transverse septa or, if culms septate, then bracts not septate. . . . . 2
2a Annual, usually slender and tufted, without rhizomes; culms usually < 2 mm in diameter ± half way up . . . . . **S. leucanthus**
2b Perennial, usually robust and rhizomatous; culms usually > 2 mm in diameter ± half way up . . . . . 3
3a Nutlets 2-sided; styles 2-cleft (rarely 3-cleft) . . . . . **S. tabernaemontani**
3b Nutlets 3-sided; styles 3-cleft . . . . . 4
4a Inflorescence a dense lateral cluster of few to many, sessile spikelets, most spikelets sessile on the culms, occasionally some spikelet clusters on elongate rays . . . . . 5
4b Inflorescence an open panicle with elongated rays; most spikelets or spikelet clusters stalked . . . . . 6
5a Glumes 2.8–4.5 mm long; anthers linear, > 1 mm long . . . . . **S. decipiens**
5b Glumes 1.2–2.8 mm long; anthers oblong, < 1 mm long . . . . . **S. pulchellus**
6a Nutlets smooth; glumes without a dark inverted V each side of the keel below the tip . . . . . 7
6b Nutlets transversely wrinkled; glumes with a dark inverted V each side of the keel below the tip . . . . . 8
7a Lowermost involucral bracts boat-shaped, much shorter than the inflorescence; mature spikelets bristly at the tip; glumes terminating in 0.25–0.55 mm long mucros . . . . . **S. brachyceras**
7b Lowermost involucral bracts culm-like, as long as or longer than the inflorescence; mature spikelets smooth at the tip; glumes terminating in 0.12–0.20 mm long mucros . . . . . **S. corymbosus**
8a Glumes chestnut-brown or rust-coloured (except for the pale keel); culms firm, 1–2 mm diameter below the inflorescence. . . . . **S. muriculatus**
8b Glumes pale whitish yellow or pale green; culms soft, 2–4 mm in diameter below the inflorescence. . . . . **S. muricinux**

**brachyceras** (Hochst. ex A.Rich.) Lye

*S. corymbosus* (Roth. ex Roem. & Schult.) J.Raynal var. *brachyceras* (Hochst. ex A.Rich.) Lye

Rhizomatous perennial, up to 1.6 m high. **Flowers**: in panicle with clusters of spikelets; spikelets dark brown to almost black at maturity, bristly at tip; lowermost involucral bract boat-shaped, much shorter than spikelets; glumes terminating in 0.25–0.55 mm long mucros, without dark inverted V each side of keel; anther crest 0.35–0.50 mm long; style 3-cleft. **Fruit** a 3-sided, smooth nutlet, 1.1–1.7 mm long. Edges of lakes and dams, along streams and rivers.

| | | DrGr | | | |
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**corymbosus** (Roth. ex Roem. & Schult.) J.Raynal

*Scirpus inclinatus* (Delile) Asch. & Schweinf.

Rhizomatous perennial, up to 2.8 m high. **Flowers**: in panicle with clusters of spikelets; spikelets dark brown to almost black at maturity, smooth at tip; lowermost involucral bract culm-like, as long as or longer than spikelets; glumes terminating in 0.12–0.20 mm long mucros, without dark inverted V each side of keel; anther crest 0.18–0.25 mm long; style 3-cleft. **Fruit** a 3-sided, smooth nutlet, 1.2–2.0 mm long. Edges of lakes and dams, along streams and rivers, also swamps and bogs. *Matjiesgoed* (A); *roro-ro-ea-mokhoabo* (SS).

| | | DrGr | | | |
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**decipiens** (Nees) J.Raynal

*Scirpus paludicola* Kunth forma *decipiens* (Nees) C.B.Clarke

Rhizomatous perennial, up to 0.9 m high. **Flowers**: in a cluster of sessile spikelets; whitish with dark brown markings or almost black; glumes 2.8–4.5 mm long; anthers linear, 1.00–1.75 mm long; style 3-cleft; Oct.–Apr. **Fruit** a 3-sided nutlet, smooth or wrinkled. Marshes.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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**leucanthus** (Boeck.) J.Raynal

*Scirpus leucanthus* Boeck.

Small, tufted annual, up to 300 mm high, without rhizome. **Culms** cylindrical, 0.5–0.8 mm diameter at middle. **Leaves** with short blades or absent, up to 50 mm long. **Flowers**: inflorescence appearing lateral, up to 10 × 10 mm, a digitate cluster of a few spikelets or rarely solitary, overtopped by an erect, long basal bract; spikelets 3–4 mm long, green to dark brown; upper glumes 1.2–1.5 mm long; Nov. **Fruit** a 3-angled nutlet, 0.7–1.0 mm long, transversely wrinkled. Riverbanks.

| | | DrGr | | | |
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**muricinux** (C.B.Clarke) J.Raynal

*Scirpus muricinux* C.B.Clarke

Robust, tufted perennial, up to 0.5 m high. **Leaves** reduced to 2 or 3 sheaths. **Culms** soft, 2–4 mm in diameter below the inflorescence. **Flowers**: in a panicle with clusters of spikelets on unequal branches; glumes 1.8–2.6 mm long, usually uniform above the basal smaller ones, pale whitish yellow or pale green with dark brown inverted V each side of keel; anther including crest 0.4–0.7 mm long; style 3-cleft. **Fruit** a 3-sided, transversely wrinkled nutlet. Permanently wet or seasonally flooded vleis, riverbanks, marshes.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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### **muriculatus** (Kük.) Browning

Slender, tufted perennial, up to 0.9 m high. **Culms** firm, 1–2 mm diameter below the inflorescence. **Leaves** reduced to 2 or 3 sheaths. **Flowers**: in a simple or compound panicle with clusters of spikelets; glumes chestnut-brown or rust-coloured with reddish brown streaks forming an inverted V each side of keel; style 3-cleft. **Fruit** a 3-sided, transversely wrinkled nutlet. Permanently wet swamps.

DrGr | MsGr

### **pulchellus** (Kunth) J.Raynal

Slender, tufted perennial, up to 0.3 m high. **Leaves** reduced to 2 or 3 sheaths. **Flowers**: in a simple or compound panicle, with clusters of sessile spikelets; perianth bristles reduced to 2 or 3 horn-like projections at base of nutlet; glumes 1.2–2.8 mm long; anthers oblong, 0.25–0.32 mm long; style 3-cleft. **Fruit** a 3-sided, smooth nutlet, 0.7–0.9 mm long. In water surrounding seasonal pools, along stream margins, dams.

DrGr

### **senegalensis** (Steud.) J.Raynal

Annual herb, up to 0.6 m high. **Leaves** reduced to 1–3 bladeless sheaths. **Culms** many, tufted, 0.3–1.6 mm in diameter, transversely septate. **Flowers**: compact, sessile spikelets in a dense head-like cluster; lowermost bracts transversely septate; spikelets golden-brown or bronze-coloured; glumes concave, triangular, 2.5–3.2 mm long. **Fruit** a sharply 3-angled nutlet, obovoid, transversely wavy on sides. Seasonally flooded places, shallow permanent water.

DrGr

### ***tabernaemontani** (C.C.Gmel.) Palla

Robust, rhizomatous perennial, up to 2 m high. **Leaves** basal, reduced to sheaths, rarely upper sheath bladed. **Culms** terete, up to 50 mm in diameter below, 3–15 mm diameter below inflorescence, waxy blue-green to grey-green. **Flowers**: spikelets usually stalked, reddish brown; perianth bristles with backwardly directed, spine-like teeth along the margins; style 2(3)-cleft. **Fruit** 2-sided nutlet. Streams, ditches, pools, swamps. Native to Eurasia. *Softstem bulrush*, *great bulrush*.

VreDm | AcGr | DrGr | MsGr | KarSh

## **Schoenoxiphium** Nees (sthn Afr.: 16 spp.)

### Key to species:

[after Gordon-Gray: 162 (1995)]

1a Robust, rhizomatous perennials with majority of leaf blades 4–12 mm wide . . . . . **S. madagascariense**

1b Medium to slender rhizomatous or tufted perennials with majority of leaf blades not wider than 4 mm . . . . . 2

2a Inflorescence consisting of a terminal portion only; lowest inflorescence bract widened basally, but not forming a closed enveloping sheath to inflorescence base. . . . . **S. basutorum**

2b Inflorescence consisting of a terminal portion with other partial inflorescences developed from lower culm nodes; each inflorescence bract with a base forming a closed enveloping sheath to the culm for at least 15 mm above node from which it arises. . . . . 3
3a Utricle 4.5–5.5 mm long including a beak 1.2–2.2 mm long and a basal stipe ± 0.5 mm long . . . . . **S. lehmannii**
3b Utricle variable in length with a beak < 1.0 mm long, or hardly beaked; basal stipe present or not, but never as long as 0.5 mm. . . . . 4
4a Plants slender with delicate culms; partial inflorescences distantly spaced giving a lax, fragile appearance; leaves mostly 1.5–2.0 mm wide; utricles (2–)4 or 5 per partial inflorescence, ± 2-ranked on scabrid axis; subtending glumes early caducous . . . . . **S. perdensum**
4b Plants medium (grass-like) with firm culms carrying 2 or 3(–7) partial inflorescences, usually fairly closely approximated to one another, either towards culm apex or less commonly some partially hidden amongst leaves; utricles > 5 per partial inflorescence, crowded, not distichous; subtending glumes not falling early . . . . . **S. sparteum**

### **basutorum** Turrill

Tufted, perennial herb, up to 0.5 m high. **Leaves** with blade < 4 mm wide. **Flowers**: inflorescence small, 7–40 mm long; bracts evaginate, but not forming a closed enveloping sheath to inflorescence base; utricles 6.5–7.0 mm long, with beak 1.6–1.8 mm long.

MsGr Zastr

### **lehmannii** (Nees) Steud.

*Kobresia lehmannii* (Nees) T.Koyama var. *lehmannii*
*K. lehmannii* (Nees) T.Koyama var. *schimperiana* (Boeck.) T.Koyama

Tufted, slender, perennial herb, up to 0.6 m high. **Leaves** with blade 2–4 mm wide. **Flowers**: inflorescence lax, slender; bracts with a base forming a closed enveloping sheath to the culm for at least 15 mm above node from which it arises; spikelets green to brownish; utricles 4.5–5.5 mm long, including beak 1.2–2.2 mm, with basal stipe 0.5 mm long; Oct.–Jan. Shady, forested slopes. *Watergras* (A).

DrGr

### **madagascariense** Cherm.

Robust, rhizomatous, perennial herb, up to 1 m high. **Leaves** with blade 4–12 mm wide, very long, slender, tapering apices. **Flowers**: inflorescence large, rounded, 70–80 mm long; bracts evaginate; utricles narrow, 5–9 × 0.7–1.8 mm. Open forest areas, rocky outcrops, streambanks, damp grassy slopes.

MsGr

### **perdensum** Kukkonen

Densely tufted, perennial herb, up to 300 mm high. **Culm** ± 0.5 mm wide, delicate. **Leaves** with blade 1.5–2.0 mm wide. **Flowers**: in a sparse spike; bracts with a base forming a closed enveloping sheath to the culm for at least 15 mm above node from which it arises; utricles (2–)4 or 5 per partial inflorescence, ± 2-ranked on scabrid axis, ± 3 mm long, with a conspicuous vein on each side, beak 0.75 mm long; female glumes fall early, exposing scabrid-margined axis; male spikelets becoming very long with age. Grassland, stony places.

DrGr MsGr KarSh

**sparteum** (Wahlenb.) C.B.Clarke

*Kobresia sparteum* (Wahlenb.) T.Koyama

Tufted, rigid, perennial herb, up to 0.6 m high. **Culm** 2 mm wide, firm. **Leaves** with blades 2–4 mm wide. **Flowers**: inflorescence a rather compact and rigid panicle; spikelets green; utricles > 5 per partial inflorescence, crowded, not distichous, 2.0–2.9 × 1.5–1.7 mm, including beak up to 0.6 mm long; subtending glumes not falling early; May–Nov. Damp shady slopes, grassland.

DrGr | MsGr | Zastr

## **Schoenus** L. (sthn Afr.: 1 sp.)

**nigricans** L.

Tufted, perennial herb, up to 1.5 m high. **Stems** and leaves bright, dark green. **Flowers**: inflorescence a terminal, bracteate head, reddish brown; Oct. **Fruit** a sessile or stalked nutlet. High, open shrubland, growing in water.

MsGr

## **Scirpoides** Ség. (sthn Afr.: 3 spp.)

**dioecus** (Kunth) Browning

*Scirpus dioecus* (Kunth) Boeck.

Robust, tufted, perennial herb, up to 1.8 m high, with basal sheaths splitting, acute. **Stems** rigid, slightly compressed-cylindrical, ± 2 mm in diameter at middle. **Leaves** with sheaths dark reddish brown, blades absent. **Flowers**: inflorescence pseudo-subterminal, dense, digitate cluster of spikelets ± 15–25 × 20–25 mm, overtopped by an erect, rigid, basal bract with a spine-like tip; spikelets light to dark brown; glumes with membranous margins, ovate, boat-shaped, ± 2 mm long, dark brown; Oct.–Jan. **Fruit** a greyish nutlet, with a reticular surface pattern. Banks of seasonal rivers and pans. *Biesie* (A).

AcGr | DrGr | MsGr | KarSh

## **Scirpus** L. (sthn Afr.: 4 spp.)

### Key to species:

[after Gordon-Gray: 174 (1995)]

Tufted perennials with fine, wiry culms and leaves . . . . . **S. falsus**
Tufted perennials with coarse culms far more conspicuous than leaves . . . . . **S. ficinioides**

**falsus** C.B.Clarke

Tufted, perennial herb, up to 200 mm high. **Leaves** wiry, slender, overtopping wiry culms. **Flowers**: compact head of dark brown spikelets; glumes dark brown; antrorsely scabrous hypogynous bristles; Nov.–Feb. Grassland, vlei margins.

DrGr | MsGr

**ficinioides** Kunth

Tufted, perennial herb, up to 0.6 m high. **Culms** firm, erect, rounded. **Leaves** longer than stem, linear-setaceous. **Flowers**: single head; long overtopping bract; glumes reddish dark brown; Nov.–Jan. Marshy grassland.

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## **Scleria** P.J.Bergius (sthn Afr.: 23 spp.)

**woodii** C.B.Clarke

Perennial herb, up to 0.75 m high. **Rhizome** soft, fleshy, strongly scented, white or pink, tuberous, shrinking markedly soon after removal from soil. **Leaves** with lamina profile V-shaped. **Flowers**: inflorescence much branched, branches delicate; glumes pale red with darker red striae; Nov.–Mar. Seasonally boggy, open areas and damp woodland in partial shade. *Nut-rush*.

| | | | MsGr | | |
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# DIOSCOREACEAE

Herbaceous or partly woody climbers; usually dioecious. **Roots** tuberous, thick woody or rhizomatous. **Leaves** alternate; blade with base cordate, sagittate, rounded or truncate, margins entire or digitately divided. **Flowers**: solitary, paired, in spikes, racemes or panicles; regular; perianth 6-lobed or -fid (male) or divided to base (female); stamens 6; ovary inferior, 3-locular. **Fruit** a capsule, 3-angled with angles prominent or winged. **Seeds** winged. *Yam family*.

## CYPERACEAE

## **Dioscorea** L. (sthn Afr.: 17 spp.)

### Key to varieties:

[after Burkill: 189 (1952)]

Leaves with basal sinus wide, auricles projecting outwards; capsules ± 15 mm long . . . . . **D. sylvatica** var. **sylvatica**
Leaves with basal sinus narrow, auricles not projecting outwards; capsules 20–25 mm long . . . . . **D. sylvatica** var. **rehmannii**

### **sylvatica** Eckl. var. **rehmannii** (Baker) Burkill

Slender scrambler. **Leaves** with blade deltoid, base deeply cordate, thin, with convergent auricles, basal sinus narrow, auricles not projecting outwards. **Flowers**: in hanging spikes; perianth yellowish green; Oct.–Jan. **Fruit** obovoid, 20–25 mm long. Bush clumps, scrub. *Forest elephant's foot*, *wild yam*; *olifantsvoet*, *skilpadknol* (A); *ingwevu*, *ufudu* (Z).




### **sylvatica** Eckl. var. **sylvatica**

Slender scrambler, up to 15 m high. **Leaves** with blade heart-shaped, 3-lobed or without lobes, basal sinus wide with auricles projecting outwards. **Flowers**: in long hanging spikes; perianth yellowish green, edges of lobes reddish brown; Nov.–Apr. **Fruit** obovoid, ± 15 mm long. Forest margins and over bushes in stream gullies. *Forest elephant's foot*, *wild yam*; *olifantsvoet*, *skilpadknol* (A); *ingwevu*, *ufudu* (Z).




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# DRACAENACEAE

Shrubs, trees or rhizomatous, xerophytic perennials. **Leaves** spirally arranged, often in rosettes and crowded at base or top of stem, entire, with parallel venation, stiff, often succulent. **Flowers**: ± regular, bisexual, hypogynous, in racemes or panicles; pedicels with an equal, often disc-like articulation; tepals 3 + 3, petal-like, united into a short to very long tube; stamens 3 + 3, arising at base of lobes, exserted; filaments filiform to inflated; anthers versatile, introrse; ovary superior, trilocular with a single axile, anatropous ovule in each locule; style slender; stigma capitate. **Fruit** a berry. **Seeds** 1–3, dirty white. *Dragon-tree family*.

## **Sansevieria** (sthn Afr.: 7 spp.)

### **aethiopica** Thunb.

Perennial herb, up to 0.75 m high. **Leaves** many, rosulate; blades of adult plants 10–20 mm broad, narrowly ovate to linear, subulate tip white, deeply channelled down face, with irregular transverse lighter green bands, slightly rough. **Flowers**: in a raceme; perianth ± 50 mm long, with a narrow tube ± 35 mm long, lobes recurved, ± 15 mm long, white, sometimes purple or cream-coloured; Nov.–Jan. Dry open places or bushveld, on well-drained soil. *Bowstring hemp*; *aambeiwortel*, *wildewortel* (A).

DrGr KarSh

# ERIOCAULACEAE

Tufted herbs, often in marshes. **Leaves** usually crowded, radical; blade grass-like, often with a white spongy latticed tissue at base. **Flowers**: in dense heads (capitula); unisexual; regular or irregular; scape surrounded at base by a closed sheath; sepals 2–4, free or variously connate; petals 2 or 3, free or copular; stamens 4–6; ovary superior. **Fruit** a capsule. *Pipewort family*.

## **Eriocaulon** L. (sthn Afr.: 12 spp.)

Key to species:

1a Perennials, robust; leaves with blade > 2 mm wide, usually > 50 mm long; heads > 5 mm in diameter . . . . . **E. sonderianum**
1b Annuals, delicate; leaves with blade usually < 2 mm wide and < 50 mm long; heads rarely > 5 mm in diameter . . . . . 2
2a Petals absent or rudimentary . . . . . **E. hydrophilum**
2b Petals present, at least in female flowers . . . . . **E. abyssinicum**

### **abyssinicum** Hochst.

Small, tufted, dome-shaped annual, up to 100 mm high. **Leaves** few; blade distinctly flattened, usually < 2 mm wide and < 50 mm long, tapering to fine point. **Flowers**: scape slender; heads dark with paler involucral bracts; bracts and sepals broadly ovate, obtuse; receptacle usually quite glabrous; stigmas 3; sepals 3, with a smooth margin; petals grey to black. **Seeds** almost smooth, very faintly net-like. Stream- and riverbanks, seasonally flooded areas, mist zone of waterfalls.

DrGr MsGr

### **hydrophilum** Markötter

Annual herb, up to 340 mm high; usually submerged, except for black heads. **Leaves** in basal rosettes; blade linear, usually < 50 mm long and < 2 mm wide. **Flowers**: heads small, shiny, jet-black; anthers black; petals usually absent; Feb., Mar. **Seeds** testa with transverse, white, fringed ridges. Pans, streams, at high altitudes.

MsGr

**sonderianum** Körn.

*E. baurii* N.E.Br.

*E. dregei* Hochst. var. *sonderianum* (Körn.) Oberm.

Perennial herb, up to 380 mm high. **Leaves** with blade up to 80 mm long, apex long acuminate, ending in a fine point. **Flowers**: scape sheath usually longer than leaves; heads few, globose to semidiscoid, ± 8 mm in diameter, densely covered with short white setae; white; Oct.–Mar. **Seeds** uncommon, broadly ellipsoid. Streambanks, marshes, vleis, at high altitudes. *Water pom-pom*, *pipewort*; *nyokoana-ea-likhoho*, *sekolana* (SS).

MsGr

# HYACINTHACEAE

Perennial, bulbous herbs. **Bulb** generally with a membranous outer covering or tunic and a number of free or coalescent bulb scales. **Leaves** simple, 1–many; basal and well developed, occasionally rudimentary, usually deciduous and contemporary with flowers, sometimes developing before or after flowering; usually sheathing at base. **Flowers**: solitary, or in 1–many-flowered racemes, spikes or occasionally capitate heads; peduncle (scape) leafless; bisexual, usually regular, rarely irregular; perianth 3 + 3, generally segments similar, sometimes different, free, more often fused below forming a tube; stamens 6 usually in 1 or 2 whorls, arising either at base of segment or in tepal tube; filaments free, connate or fused; anthers dorsifixed, occasionally basifixed, opening longitudinally or rarely by an apical pore; ovary superior, 3-locular; ovules (1)2–many in each locule; style 1, terminating in a punctiform or sometimes distinctly 3-lobed stigma. **Fruit** a capsule, usually dehiscing loculicidally, occasionally septicidally. **Seeds** rounded to angular, usually shiny black. *Hyacinth family*.

The family is under revision by various researchers, e.g. Martínez-Azorín *et al.* (2011).

## Key to genera

[after Williams: 610 (2000) and Speta: 270 (1998)]

1a Leaves rapidly deciduous; plants appearing leafless; inflorescence much branched (stem-like), erect, prostrate or climbing. . . . . 2

1b Leaves present or developing after flowering; inflorescence not branched (except for one species in *Ledebouria*), either a spike or raceme, rarely a head-like cluster of flowers . . . . . 3

2a Inflorescence erect or prostrate, wiry; withered perianth forming a cap on the developing capsule . . . . . **Drimia**

2b Inflorescence usually climbing, fleshy; perianth persistent, remaining attached to base of capsule. . . . . **Bowiea**

3a Bracts, at least the lower ones, spurred, sometimes falling early; withered perianth forming a cap on the developing capsule; seeds flattened, shiny, with a loose testa; leaf or leaves often developing after flowering; bulbs sometimes reddish, individual scales often visible . . . . . **Drimia**

3b Bracts not spurred, usually persistent, sometimes minute or absent; perianth deciduous or persistent (not forming a cap on the developing capsule); seeds globose, angular or flat, testa firm; leaf or leaves present during flowering; bulbs never reddish, individual scales not clearly visible, bulb often covered with a tunic . . . . . 4

4a Perianth stellate or campanulate, not tubular, segments free or fused near base . . . . . 5
4b Perianth tubular . . . . . 10
5a Inflorescence topped with a coma of green bracts . . . . . **Eucomis**
5b Inflorescence not as above . . . . . 6
6a Inner perianth segments erect, outer segments spreading . . . . . **Albuca**
6b All perianth segments ± similar . . . . . 7
7a Inflorescence axillary, flexuose to suberect; leaves often maculate (with spots and blotches) . . . . . **Ledebouria**
7b Inflorescence terminal, often erect; leaves immaculate . . . . . 8
8a Perianth white, yellow, orange or green, never blue; bracts 1 per flower, not decurrent . . . . . **Ornithogalum**
8b Perianth blue, pinkish, greenish or white, never yellow; bracts 1 or 2 per flower, decurrent. . . . . 9
9a Leaf blade not prominently veined; perianth blue . . . . . **Merwilla**
9b Leaf blade prominently veined; perianth white, pinkish or greenish . . . . . **Schizocarphus**
10a Inflorescence a lax raceme, flowers usually to one side; perianth dull green or brown, sometimes yellowish or reddish, deciduous; perianth segments united at base, then connivent, with inner segments connivent for longer than outer segments (forming a short, extended tube), lobes spreading, 3 outer segments usually tipped with a tail-like appendage, lobes cucullate; leaves 1–many, but never 2 opposing and basal . . . . . **Dipcadi**
10b Combination of characters not as above . . . . . 11
11a Inflorescence (200–)300–1 000 mm high . . . . . 12
11b Inflorescence up to 100(–200) mm long . . . . . 13
12a Leaves (3)4–many, never succulent or grass-like; inner and outer perianth lobes ± equal . . . . . **Galtonia**
12b Leaves usually 2 or occasionally 1 or 3, subsucculent, rarely grass-like; outer perianth lobes shorter than inner, rarely equal . . . . . **Lachenalia**
13a Flowers of two types: perianth of outer or lower flowers irregular, perianth of inner or apical flowers ± regular . . . . . **Daubenya**
13b Flowers all regular (occasionally upper vestigial) . . . . . 14
14a Inflorescence a spike, raceme or rarely a capitate head, upper flowers of spike or raceme vestigial; outer perianth lobes shorter than inner, rarely equal . . . . . **Lachenalia**
14b Inflorescence forming a capitate head, no flowers vestigial; outer and inner perianth lobes ± equal . . . . . **Massonia**

## **Albuca** L. (sthn Afr.: ± 72 spp.)

Genus under revision by various researchers, e.g. Müller-Doblies (2006), Manning *et al*. (2009). *A. namaquensis* Baker, known from Fauresmith, and described by Dyer (1957) in *Flowering Plants of Africa*, most probably was from material Henrici collected elsewhere, a similar example is *A. glandulosa*, known from a smallholding in Bloemfontein.

### Key to species:

[after Baker: 452 (1897) and Manning *et al*.: 92 (2009)]

1a Flowers nodding; apex of inner perianth segments cucullate or developed into a hinged flap . . . . . 2
1b Flowers erect; apex of inner perianth segments developed into a fleshy boss . . . . . 4
2a Inner perianth segments with apex cucullate; capsule ovoid, apex acute . . . . . **A. namaquensis**

2b Inner perianth segments with apex developed into a hinged flap; capsule oblong, apex obtuse . . . . . 3
3a Plants with an indumentum of stalked glands . . . . . **A. shawii**
3b Plants glabrous . . . . . **A. xanthocodon**
4a Bulb with tunics decaying into a conspicuous collar of stiff fibres . . . . . 5
4b Bulb with tunics not decaying into a conspicuous collar of stiff fibres . . . . . 7
5a Leaf blade linear-filiform; outer tunics barred across . . . . . **A. collina**
5b Leaf blade linear to broadly strap-shaped; tunics not barred across . . . . . 6
6a Leaf blade linear; peduncle short . . . . . **A. fastigiata**
6b Leaf blade broadly strap-shaped; peduncle long . . . . . **A. tortuosa**
7a Three outer stamens without anthers . . . . . **A. glandulosa**
7b All stamens bearing anthers . . . . . 8
8b Perianth yellow, banded with green . . . . . **A. sp. A**
8a Perianth white, banded with green . . . . . **A. humilis**

## **collina** Baker

*Ornithogalum monticola* J.C.Manning & Goldblatt

Geophyte; scape up to 0.2 m high. **Bulb** with tunics decaying into a conspicuous collar of stiff fibres; fibres connected by transverse bars. **Leaves** with blade linear-filiform. **Flowers** erect; apex of inner perianth segments developed into a fleshy boss; 3 fertile stamens; perianth white with green keels; Aug., Sep. Clay soils.




## **fastigiata** Dryand.

*Ornithogalum fastigiatum* (Dryand.) J.C.Manning & Goldblatt

Geophyte; scape up to 0.2 m high. **Bulb** with tunics decaying into a few fibres, fibres not connected by transverse bars. **Leaves** with blade linear-filiform, margins undulate. **Flowers** erect; peduncle short; apex of inner perianth segments developed into a fleshy boss; 3 fertile stamens; perianth white with green keels; Aug., Sep. Clay soils.




## **glandulosa** Baker

*Ornithogalum glanduliferum* J.C.Manning & Goldblatt

Geophyte; glandular-hairy; scape up to 0.35 m high. **Bulb** with tunics not decaying into a conspicuous collar of stiff fibres, tunics membranous, rings around neck. **Leaves** 1–4, narrow, channelled, clasping below. **Flowers**: erect; 3 outer stamens without anthers; inner segments bright yellow, outer segments yellow with greenish keels; Aug., Sep. Dry, stony, shale slopes.




## **humilis** Baker

*Ornithogalum humile* (Baker) J.C.Manning & Goldblatt

Geophyte; scape up to 30–250 mm high. **Bulb** with tunics not decaying into a conspicuous collar of stiff fibres. **Leaves** 1 or 2, cylindrical, longer than with bases not decaying into conspicuous fibres. **Flowers**: all stamens bearing anthers; perianth white, outer segments striped green, inner tipped yellow; Nov.–Jan. Rocky grassland.



**namaquensis** Baker

*A. circinata* Baker

*Ornithogalum namaquense* (Baker) J.C.Manning & Goldblatt

Geophyte; scape up to 0.3 m high. **Bulb** with tunics not splitting into fibres. **Leaves** channelled or rolled, usually coiled above, not clasping below, scabrid or hairy, not glandular. **Flowers**: nodding; inner perianth segments with apex cucullate; perianth segments yellow with green keels; Sep., Oct. **Fruit** an ovoid capsule, apex acute. Rocky slopes. *Growwetamarak* (A).

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**shawii** Baker

*A. granulata* Baker

*Ornithogalum shawii* (Baker) J.C.Manning & Goldblatt

Geophyte; with an indumentum of stalked glands; scape up to 0.4 m high. **Bulb** with tunics not splitting into fibres. **Leaves** filiform. **Flowers**: nodding; inner perianth segments with apex developed into a hinged flap; anthers of outer stamens very small and sterile; perianth bright yellow; Sep.–Feb. **Fruit** an oblong capsule, apex obtuse. Rocky grassland. *Small yellow albuca*; *lanternblom* (A).

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**tortuosa** Baker

*A. nelsonii* Baker *sens. auct.*

*A. setosa* Baker *sens. auct.*

*Ornithogalum tortile* J.C.Manning & Goldblatt

Geophyte; scape up to 0.6 m high. **Bulb** with basal sheaths fibrous, neck without woody rings. **Leaves** 4–8, broadly strap-shaped, fleshy, not clasping below, margins hyaline, often ciliolate. **Flowers**: erect on long pedicels; peduncle long; perianth yellow or white with green or dull fawn-coloured keels; Oct., Nov. Grassland, along watercourses, in clay.

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**xanthocodon** Hilliard & B.L.Burtt

*Ornithogalum xanthocodon* **(**Hilliard & B.L.Burtt) J.C.Manning & Goldblatt

Geophyte; glabrous; scape up to 0.15–0.25 m high. **Bulb** with tunics not decaying into a conspicuous collar of stiff fibres. **Leaves** 3–14, non-clasping, stiffly erect, filiform, rib and margins papillose. **Flowers**: nodding; inner perianth segments with apex developed into a hinged flap; perianth segments yellow with green keels; Aug.–Dec. **Fruit** an oblong capsule, apex obtuse. Rocky hillsides, sandy soil.

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**sp. A** (near *A. tenuifolia* Baker)

Geophyte; scape up to 25 mm high. **Bulb** with tunics not decaying into a conspicuous collar of stiff fibres. **Leaves** subterete. **Flowers**: erect; stamens all fertile; perianth pale yellow with green keels; Oct.–Dec. Mountain grassland.

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## **Bowiea** Harv. ex Hook.f. (sthn Afr.: 1 sp.)

### **volubilis** Harv. ex Hook.f. subsp. **volubilis**

Climbing geophyte. **Bulb** depressed, subglobose, up to 150 mm in diameter, bright green if exposed. **Leaves** filiform, dry at flowering. **Flowers**: flowering stems bright green, slender, fleshy, twining up to 4(–10) m high; perianth lobes reflexed, 5 mm long, green; sweetly scented; Sep.–Apr. **Fruit** 8–30 mm long, with acuminate valves. Shady understorey of dry forest. *Zulu potato*, *climbing green lily*; *knolklimop* (A); *umgaqana* (X); *iguleni*, *ugibisisila* (Z).

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## **Daubenya** Lindl. (sthn Afr.: 8 spp.)

### **comata** (Burch. ex Baker) J.C.Manning & A.M.van der Merwe

*Massonia comata* Burch. ex Baker
*Neobakeria comata* (Burch. ex Baker) Schltr.

Bulbous succulent, up to 50 mm high. **Leaves** usually paired; blade narrowly ovate to ovate, 80–220 × 15–60 mm, margins undulate or crisped. **Flowers**: largest bracts < 10 mm long or early deciduous; inflorescence axis usually somewhat elongate; perianth with tube > 20 mm long, ± pale white-purplish; Apr. Grassland.

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## **Dipcadi** Medik. (sthn Afr.: 13 spp.)

### Key to species:

[after Obermeyer: 120 (1964)]

1a Style short, stigma capitate, subpersistent . . . . . 2
1b Style and stigmatic lobes forming a pencil-shaped organ ± as long as ovary . . . . . 3
2a Leaves 4–6, linear to narrowly ovate, acuminate, glaucous, glabrous, margins yellow, prominently papillate; scape often minutely ribbed and papillate . . . . . **D. papillatum**
2b Leaves many, grass-like, the outer with short, white, straggling hairs on the margins and dorsally at the base; scape smooth . . . . . **D. marlothii**
3a Anthers with a short apical appendage; large plants with many rosulate, glaucous leaves up to 70 mm wide; pedicels 20–70 mm long **D. glaucum**
3b Anthers without an apical appendage; plants usually smaller and with narrower leaves; pedicels short . . . . . 4
4a Ovary and capsule shortly stipitate; leaves glabrous . . . . . **D. longifolium**
4b Ovary and capsule sessile, if occasionally shortly stipitate (in *D. ciliare*) then leaves ciliate . . . . . 5
5a Outer perianth segments with short to long caudate appendages; leaves straight or spirally twisted . . . . . **D. viride**
5b Outer perianth segments not caudate, ± equal in length to inner; leaves with a lax spiral twist in upper half when young. . . . . 6
6a Perianth ± 10 mm long; leaves usually many, not rosulate, filiform, ± equalling inflorescences in length, glabrous, margins entire . . . . . **D. dipcadioides**
6b Perianth 20–28 mm long; leaves many, rosulate, linear, flat, apex attenuate, shorter than inflorescences, margins crisped and ciliate . . . . . **D. ciliare**

**ciliare** (Zeyh. ex Harv.) Baker
*Ornithogalum readii* (Baker) J.C.Manning & Goldblatt

Bulbous geophyte, up to 400 mm high. **Leaves** many, rosulate, linear to narrowly ovate, flat, apex attenuate, often coiled in upper half, shorter than inflorescences, margins crisped and ciliate. **Flowers**: perianth 20–28 mm long, outer segments ± equal in length to inner, green, brownish or yellowish green; Nov.–May. Stony flats or slopes. *Curly-curly*, *jig-a-jig*; *slanguintjie* (A).

DrGr KarSh

**dipcadioides** Baker
*D. gracillimum* Baker
*D. polyphyllum* Baker

Bulbous geophyte, up to 300 mm high. **Leaves** many (at least after rains), not rosulate, filiform, ± equalling inflorescences in length, glabrous, with a lax spiral twist in upper half when young, margins entire. **Flowers**: perianth ± 10 mm long, outer segments ± equal in length to inner, green, sometimes with a reddish tinge; Sep.–Mar. Woodland. *Ouma-se-groottoon* (A).

VreDm DrGr KarSh

**glaucum** (Ker Gawl.) Baker
*Ornithogalum magnum* (Baker) J.C.Manning & Goldblatt

Large, bulbous geophyte, up to 1.2 m high. **Leaves** many, rosulate, glaucous, up to 70 mm wide. **Flowers**: pedicels 20–70 mm long; anthers with a short, apical appendage; perianth green with a brownish margins; Nov.–May. Woodland. *Wild onion*, *poison onion*; *grootmalkopui*, *wilde-ui*, *slangkop* (A).

MsGr KarSh

**longifolium** (Lindl.) Baker
*D. firmifolium* Baker
*D. venenatum* Schinz
*Ornithogalum longifolium* (Lindl.) J.C.Manning & Goldblatt

Bulbous, glabrous geophyte, up to 0.7 m high. **Leaves** 4–7, linear to narrowly ovate, glabrous. **Flowers**: pedicels short but lengthening up to 15 mm in fruit; ovary and capsule shortly stipitate; anthers without an apical appendage; perianth fused only near base, spreading, obtuse, not caudate, green, brownish, yellowish or whitish green; Nov.–Apr. Usually hygrophytic plants.

DrGr

**marlothii** Engl.
*D. bakerianum* Schinz
*D. ernestii-ruschii* Dinter
*Ornithogalum durandianum* (Schinz) J.C.Manning & Goldblatt

Bulbous geophyte, up to 1 m high. **Leaves** many, grass-like, outer with short, white, straggling hairs on margins and dorsally at base (these sometimes absent later in season). **Flowers**: scape smooth; style short, stigma capitate, subpersistent; Sep.–Apr. On sand or rocks. *Dronkui* (A); *morothoana-phookoana* (SS).

AcGr DrGr MsGr KarSh

**papillatum** Oberm.

*Ornithogalum papillatum* (Oberm.) J.C.Manning & Goldblatt

Bulbous geophyte, up to 400 mm high. **Leaves** 4–6, linear to narrowly ovate, acuminate, glaucous, glabrous, margins yellow, prominently papillate. **Flowers**: scape often minutely ribbed and papillate; style short, stigma capitate, subpersistent; perianth green; Nov.–Mar. Grassland, red sandy soil.

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**viride** (L.) Moench

*D. umbonatum* (Baker) Baker

*Ornithogalum viride* (L.) J.C.Manning & Goldblatt

Bulbous geophyte, up to 1.2 m high. **Leaves** linear to narrowly ovate, glabrous, soft, long-tapered towards apex, straight or spirally twisted, margins not prominent. **Flowers**: directed to one side (secund); ovary and capsule sessile; perianth green to brown, outer segments with short to long, filiform appendages; Sep.–Feb. Stony flats or slopes. *Dainty green bells*, *green Dipcadi*; *gifbolletjie*, *grootslymuintjie*, *skaamblommetjie* (A); *lephotoana*, *molubeli*, *morotoana-phookoana*, *theleli-moro* (SS); *ikhakhakha elihluza* (Z).

| VreDm | | DrGr | MsGr | KarSh | Zastr |
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## **Drimia** Jacq. ex Willd. (sthn Afr.: 50 spp.)

### Key to species:

[after Jessop: 269, 271 (1977)]

| | | |
|---|---|---|
| 1a | Inflorescence branched | 2 |
| 1b | Inflorescence simple | 3 |
| 2a | Plants erect | **D. intricata** |
| 2b | Plants twining | **D. cuscutoides** |
| 3a | Anthers opening by apical pores | **D. platyphylla** |
| 3b | Anthers opening by slits appearing simultaneously along length of anther | 4 |
| 4a | Stamens enclosed; filaments 0.5–2.0 mm long | **D. uniflora** |
| 4b | Stamens exserted or filaments usually > 3 mm long | 5 |
| 5a | Anthers basifixed | 6 |
| 5b | Anthers dorsifixed | 7 |
| 6a | Perianth up to 20 mm long; filaments linear to narrowly ovate | **D. angustifolia** |
| 6b | Perianth at least 22 mm long; filaments terete in distal half | **D. macrantha** |
| 7a | Perianth at least 7 mm long, segments usually recurved | 8 |
| 7b | Perianth up to 7 mm long, segments usually spreading | 11 |
| 8a | Perianth free or with a tube < 20% of length of free segments | **D. altissima** |
| 8b | Perianth fused, with a tube at least 20% of length of free segments | 9 |
| 9a | Inflorescence a ± globose raceme | **D. sphaerocephala** |
| 9b | Inflorescence a ± elongate raceme | 10 |
| 10a | Bulb epigeal; perianth tube 2–4 mm long | **D. haworthioides** |
| 10b | Bulb hypogeal; perianth tube 3–7 mm long | **D. elata** |
| 11a | Inflorescence a ± globose head | 12 |
| 11b | Inflorescence a ± elongate raceme | 13 |
| 12a | Perianth segments recurved | **D. sphaerocephala** |
| 12b | Perianth segments spreading | **D. depressa** |
| 13a | Bulbs with conspicuous apical bristles | **D. multisetosa** |
| 13b | Bulbs without conspicuous apical bristles | **D. calcarata** |

**altissima** (L.f.) Ker Gawl.
*Urginea altissima* (L.f.) Baker
*U. epigea* R.A.Dyer

Geophyte, up to 2.5 m high. **Bulb** mainly above ground, 100–150 mm in diameter, composed of large fleshy scales. **Leaves** with blades flattened, oblong, 200–400 × 25–40 mm. **Flowers**: in elongate racemes; peduncles > 600 mm long; bracts ≥ 5 mm long; spur of lowest bract up to 3 mm long; anthers dorsifixed; perianth free or with a tube up to 2 mm long, segments 7–10 mm long, white with a green dorsal stripe; Oct.–Dec. Wooded hillsides. *Wild onion*; *jeukbol*, *maermanbol*, *slangkop* (A); *umgulube*, *isiklenama*, *umahlokolosi* (Z).

KarSh

**angustifolia** Baker
*Thuranthos basuticum* (E.Phillips) Oberm.
*Urginea basutica* E.Phillips

Geophyte, up to 0.9 m high. **Bulb** globose to ellipsoid, ± 55 mm in diameter, scales whitish. **Leaves** usually produced after inflorescence; blades linear, 55–160 × 7–13 mm. **Flowers**: filaments linear to narrowly ovate, curving inwards around style, forming a cage-like body; anthers basifixed; perianth 14–20 mm long, reflexed, yellowish green to brownish white; Oct., Nov. Grassland, along streams.

VreDm

**calcarata** (Baker) Stedje
*D. modesta* (Baker) Jessop
*Ornithogalum calcaratum* Baker
*Urginea calcarata* (Baker) Hilliard & Burtt
*U. modesta* Baker

Geophyte, up to 450 mm high. **Bulb** 10–25 mm long, ovoid to globose, usually with white fleshy scales, without apical bristles. **Leaves** 4–8, usually produced after inflorescence; blades linear, fleshy. **Flowers**: in elongate racemes; spur of lowest bract at least 2 mm long; pedicels 5–8 mm long, spreading; anthers dorsifixed; perianth 4–5 mm long, white with a brown dorsal stripe; Sep.–Dec. Grassland, rocky slopes. *Dainty urginea*; *khoho-ea-lefika* (SS).

DrGr MsGr KarSh

**cuscutoides** (Burch. ex Baker) J.C.Manning & Goldblatt
*Schizobasis cuscutoides* (Burch. ex Baker) Benth. & Hook.

Geophyte, 100–150 mm high. **Bulb** globose to ovoid, 20–50 mm long. **Leaf** ephemeral, filiform. **Flowers**: in wiry, often flexuose panicles, nodding on 6–15 mm long pedicels; filaments ± 1 mm long, anthers opening by longitudinal slits, connective prolonged; perianth campanulate, 3–4 mm long, pale yellow or pink; Jan.–Mar. **Fruit** an ovoid capsule, 3–5 mm long, erect on deflexed pedicels. Stony slopes.

KarSh

**depressa** (Baker) Jessop
*Urginea capitata* (Hook.) Baker

Geophyte, up to 1 m high. **Bulb** ovoid to ovoid-elliptic, 25–40 mm long. **Leaves** usually produced after inflorescence; blades linear, 100–240 × 10–26 mm. **Flowers**: inflorescence a ± globose head;

anthers dorsifixed; perianth 3–6 mm long, segments spreading, white and with a purple, brown or pink dorsal surface; Aug.–Dec. Grassland, among stones. *Bergslangkop*, *jeukui* (A); *moretele* (SS).

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**elata** Jacq.

*D. ciliaris* Jacq.

*D. robusta* Baker

Geophyte, up to 0.7 m high. **Bulb** hypogeal, ± ovoid, 40–100 mm long. **Leaves** produced after inflorescence; blades, glabrous, flattened. **Flowers**: inflorescence a dense, elongate raceme, many-flowered; pedicels ± as long as flowers; anthers dorsifixed; perianth 12–16 mm long, tube 3–7 mm long, green, mauve, silvery white, pink, purple, yellowish beige; Aug.–Jan. Grassland, especially near water, among rocks. *Satin squill*; *brandui*, *jeukbol* (A); *undongana-zibomvana*, *isiklenama*, *umqumba* (Z).

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**haworthioides** Baker

Geophyte, up to 400 mm high. **Bulb** epigeal, with loose scales, ± 20–30 mm long. **Leaves** dry at flowering, spreading; blades narrowly ovate, margins often ciliate. **Flowers**: in erect, elongate racemes; stamens connivent; anthers ± 2 mm long, dorsifixed, blue to purple; perianth 10–15 mm long, tube 2–4 mm long, segments reflexed, silvery white, green or purple; Nov.–Feb. Dry karroid areas.

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**intricata** (Baker) J.C.Manning & Goldblatt

*Schizobasis intricata* (Baker) Baker

*Schizobasis macowanii* Baker

Geophyte, up to 700 mm high. **Bulb** pear-shaped. **Leaf** 1, soon withering and falling; blade filiform. **Flowers**: inflorescence erect or scrambling, green, copiously and intricately branched, forming a complex raceme which persists after flowering and fruiting until end of season; withered perianth forming a cap on capsule; perianth 3–4 mm long, white; Aug.–Oct. Woodland, rocky hillsides. *Volstruiskos*, *jeukui*; *ubulilibekhonde*, *umthondo-wemfene* (Z).

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**macrantha** (Baker) Baker

*Thuranthos macranthum* (Baker) C.H.Wright

*Urginea macrantha* (Baker) E.Phillips

Geophyte, up to 1.4 m high. **Bulb** ovoid to globose, 30–100 mm long. **Leaves** produced after flowering; blades linear, 420–600 × 6–10 mm, channelled. **Flowers**: pedicels 40–50 mm long; filaments 10–19 mm long, terete in distal half, connivent above ovary; anthers basifixed; perianth 28–33 mm long, tube 1–2 mm long, reflexed, green to brown, open in evening; Oct., Nov. Grassland, woodland, sandy slopes or heavy turf.

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**multisetosa** (Baker) Jessop

*Urginea multisetosa* Baker

Geophyte, up to 1 m high. **Bulb** 25–70(–80) mm long, ovoid to ovoid-oblong with long fibres (often ± 20–30 mm long). **Leaves** usually produced after inflorescence; blades linear, 120–400

× 7–14 mm. **Flowers**: in elongate racemes; anthers dorsifixed; perianth brown, yellow or white with brown to black stripes; perianth 4.5–6.0 mm long, tube 1.00–1.75 mm long; Aug.–Nov. Grassland, sand, shale or among rocks.

DrGr MsGr

**platyphylla** (B.Nord.) J.C.Manning & Goldblatt
*Rhadamanthus platyphyllus* B.Nord.

Geophyte, up to 0.3 m high. **Bulb** subglobose to ovoid, up to 50 mm long. **Leaves** dry at flowering, usually 2, prostrate; blades elliptic, longitudinally grooved, velvety. **Flowers**: 5–50 in racemes, longitudinally grooved, 30–700 mm high; nodding on 3–10 mm long pedicels; filaments papillate, 1.0–1.5 mm long; anthers basally barbellate, opening by apical pores; perianth bell-shaped, 3.5–6.0 mm long, connate for 1–3 mm, reddish brown to creamy pink; Nov.–Jan. Rock sheets and pockets, widespread.

KarSh

**sphaerocephala** Baker
*D. capitata* Baker
*D. neriniformis* Baker

Geophyte, up to 450 mm high. **Bulb** ovoid to subglobose, 20–30 mm long. **Leaves** produced after flowers. **Flowers**: in congested, globose racemes, 30–40 mm in diameter; anthers dorsifixed; perianth 8–12 mm long, tube 3–4 mm long, segments linear, cucullate at tip, white; Nov., Dec. Grassland, vleis. *Round-head drimia*; *snotuintjie* (A); *hlare-sa-noko* (SS).

MsGr

**uniflora** J.C.Manning & Goldblatt
*Litanthus pusillus* Harv.

Geophyte, up to 80 mm high. **Bulb** globose, 6–13 mm long, white; roots many, thin, villous. **Leaves** 2–4, produced after flowers; blades filiform. **Flowers**: 1(2), nodding on 1.0–1.5 mm long pedicels; bracts spurred; stamens enclosed, filaments 0.5–2.0 mm long; perianth deciduous, cernuous, tubular, tube 2.5–5.0 mm long, segments ± 1 mm long, white to pale pink; Dec.–Mar. Streambanks, rock outcrops. *Fairy-snowdrop*; *Khoho-ea-lefika*, *khoho-ea-mafika* (SS).

MsGr

## **Eucomis** L'Hér. (sthn Afr.: 10 spp.)

### Key to species and subspecies:

[after Reyneke: 151 (1972) and Reyneke: 140 (1980)]

1a Pedicels of mature flowers ≥ 15 mm long, drooping. . . . . **E. bicolor**
1b Pedicels of mature flowers ≤ 12 mm . . . . . 2
2a Plants with purple colour and small, up to 100 mm high. . . . . **E. schijffii**
2b Plants without purple colour, > 100 mm high . . . . . 3
3a Leaves with blade linear, 130–300 × 15–40 mm; peduncle clavate; perianth segments 6–10 mm long . . . . . **E. autumnalis** subsp. **amaryllidifolia**

3b Leaves with blade ovate to narrowly ovate, seldom linear, 150–550 × 40–130 mm; peduncle cylindrical or clavate; perianth segments 10–17 mm long . . . . . 4

4a Peduncle clavate; capsule with a hard, double-layered pericarp . . . . . **E. autumnalis** subsp. **clavata**

4b Peduncle cylindrical; capsule with a thin, sometimes inflated, pericarp . . . . . **E. autumnalis** subsp. **autumnalis**

### **autumnalis** (Mill.) Chitt. subsp. **amaryllidifolia** (Baker) Reyneke

Bulbous geophyte, up to 300 mm high. **Leaves** with blade linear, 130–300 × 15–40 mm, margins undulate. **Flowers**: peduncle clavate; pedicels up to 7 mm long; perianth segments 6–10 mm long, pale green; Dec.–Apr. **Fruit** papery. Between rocks on mountain slopes.

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### **autumnalis** (Mill.) Chitt. subsp. **autumnalis**

*E. undulata* Aiton

Bulbous geophyte, up to 500 mm high. **Leaves** with blade ovate to narrowly ovate, seldom linear, 150–550 × 60–130 mm, margins undulate. **Flowers**: peduncle cylindrical; pedicels up to 12 mm long; perianth segments 10–16 mm long, pale green; Dec.–Apr. **Fruit** with a thin, sometimes inflated, pericarp. Open grassland, mountainsides, forest margins. Figure 63.

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### **autumnalis** (Mill.) Chitt. subsp. **clavata** (Baker) Reyneke

*E. robusta* Baker

Bulbous geophyte, up to 0.6 m high. **Leaves** with blade ovate to narrowly ovate, 150–550 × 40–130 mm, margins undulate, cuticle on leaf margins dentate. **Flowers**: peduncle clavate; pedicels up to 6 mm long; perianth segments 12–17 mm long, green, yellowish green, greenish white; Nov.–Apr. **Fruit** with a hard, double-layered pericarp. Open grassland, marshes. *Common pineapple lily*; *krulkop*, *wildepynappel* (A); *khapumpu*, *khato*, *maboni*, *mathebethebale*, *moboni*, *mohale-oa-marumo*, *mothusi* (SS); *ubuhlungu becanti* (X); *umathunga*, *umakhlondle* (Z).

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### **bicolor** Baker

Bulbous geophyte, up to 500 mm high. **Leaves** with blade linear to obovate, keeled, 300–600 × 50–140 mm, with purple spots at base, margins undulate. **Flowers**: pedicels of mature flowers ≥ 15 mm long, drooping; filaments purplish; perianth segments white with purplish margins; Jan. Mountain sides, along streams. *Bontpynappelblom* (A); *khapumpu-ea-thaba* (SS); *umbola* (Z).

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### **schijffii** Reyneke

Bulbous geophyte, up to 100 mm high. **Leaves** with blade ovate, 60–100 × 40–70 mm, without purple spots, margins smooth or minutely crisped. **Flowers**: peduncle clavate, 20–70 mm long, sometimes with purple spots; pedicels absent or 1 mm long; perianth and stamens dark purple; Nov.–Feb. **Fruit** inflated with thin and membranous pericarp. Grassland and vleis. *Miniature eucomis*.

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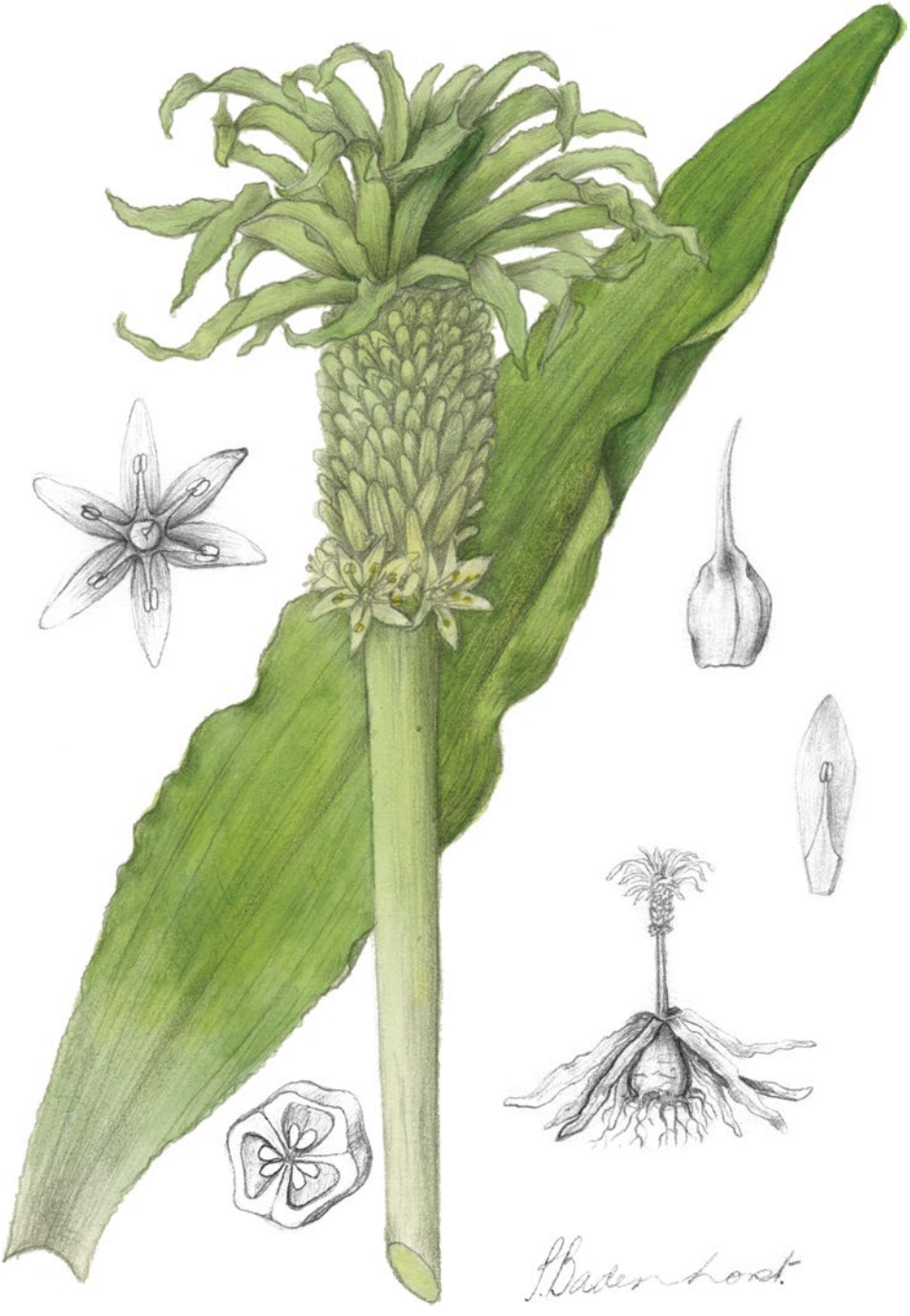



**Figure 63.** *Eucomis autumnalis* subsp. *autumnalis* (Hyacinthaceae). Artist: P. Badenhorst.

## **Galtonia** Decne. (sthn Afr.: 4 spp.)

### Key to species:

[after Verdoorn: t. 1188 (1955)]

Leaves with blade up to 50 mm broad, narrowing gradually to apex; perianth usually white or with some green at base . . . . . **G. candicans**
Leaves with blade up to 100 mm broad, lower ones narrowing abruptly to form a broad apex with a distinct mucro; perianth pale green . . . . . **G. viridiflora**

### **candicans** (Baker) Decne.

*Ornithogalum candicans* (Baker) J.C.Manning & Goldblatt

Bulbous geophyte, up to 1.3 m high. **Leaves** with blade up to 50 mm broad, up to 1 m long, narrowing gradually to apex. **Flowers**: bracts prominent, narrowly ovate; perianth ± 30 mm long, lobes distinctly longer than tube, white with some green at base; Dec.–Feb. **Fruit** oblong. Scrub margins, forest, streambanks and vleis. *Common berg lily*, *Cape hyacinth*; *berglelie* (A).




### **viridiflora** I.Verd.

*Ornithogalum viridiflorum* (I.Verd.) J.C.Manning & Goldblatt

Bulbous geophyte, up to 0.9 m high. **Leaves** erect, glaucous, with blade up to 100 mm broad, lower narrowing abruptly to form a broad apex with a distinct mucro. **Flowers**: bracts prominent, narrowly ovate; perianth < 30 mm long, lobes longer than tube, pale green; Jan., Feb. **Fruit** ovate. Cliffs, steep rocky slopes, drier areas. *Green berg lily*.




## **Lachenalia** J.Jacq. ex Murray (sthn Afr.: ± 107 spp.)

### **karooica** W.F.Barker ex G.D.Duncan

Bulbous geophyte, up to 220 mm high. **Leaf** 1(2); blade narrowly ovate, suberect, 5–25 mm broad, blue-green with scattered blotches on upper surface, margins leathery. **Scape** suberect, shorter than leaves, mottled with maroon and green. **Flowers**: suberect; stamens white, spreading; perianth greenish white with maroon or brown keels and gibbosities; Jun.–Sep. Often on dolomite outcrops. *Lachenalia*; *viooltjie* (A).




## **Ledebouria** Roth. (sthn Afr.: 21 spp.)

### Key to species:

1a Leaves erect . . . . . 2
1b Leaves appressed to soil surface or variously spreading . . . . . 4
2a Leaves difficult to tear, with strong fibres . . . . . **L. marginata**
2b Leaves tear easily, without strong fibres. . . . . 3
3a Bulbs with relatively loosely arranged scales . . . . . **L. cooperi**
3b Bulbs with tightly clasping scales. . . . . **L. macowanii**
4a Leaves appressed to soil surface . . . . . **L. ovatifolia**

4b Leaves variously spreading but not appressed . . . . . 5
5a Leaves and live bulb scales with copious spidery threads when torn, live bulb scales with yellowish colour especially when cut . . . . . **L. luteola**
5b Leaves and bulb scales without copious threads when torn, live bulb scales not yellowish. . . . . 6
6a Leaves with blade linear, apex long attenuate . . . . . **L. apertiflora**
6b Leaves with blade narrowly ovate, apex attenuate . . . . . **L. revoluta**

## **apertiflora** (Baker) Jessop

*Scilla lorata* Baker

Geophyte, up to 200 mm high. **Bulb** cylindrical or spherical, often pink towards top, bulb scales tightly clasping. **Leaves** 4–7, erect when young, later spreading; blade sublinear, usually 200–350 mm long, < 25 mm wide, tapering almost from base, apex long attenuate. **Flowers**: inflorescence erect or flexuose, often with 50–150 flowers; perianth dull purple; Oct.–Jan. Rocky grassland. *Common squill*.

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## **cooperi** (Hook.f.) Jessop

*Scilla cooperi* Hook.f.
*Scilla saturata* Baker

Geophyte, up to 200 mm high. **Bulb** with relatively loosely arranged scales. **Leaves** erect; blade linear, 100–200 mm long, widest in upper $^1/_3$, glossy green with dark spots towards base. **Flowers**: raceme moderately dense; perianth purple; Sep.–Dec. Moist grassland, mountain sourveld, rocky hillsides, vleis. *Cooper's ledebouria*, *wild squill*; *lepjetlane*, *phetola* (SS); *icubudwana*, *icukudwane* (Z).

| VreDm | | DrGr | MsGr | KarSh | |
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## **luteola** Jessop

Geophyte, up to 150 mm high. **Bulb** with scales producing copious threads when torn; inner scales yellow. **Leaves** 4–10, erect or arcuate; blade narrowly ovate to linear, up to 80(–130) mm long, spotted or transversely marked, rather firm. **Flowers**: perianth segments mauvish brown inside and green outside; Sep.–Nov. Grassland, slopes of kloofs.

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## **macowanii** (Baker) S.Venter

*Scilla macowanii* Baker

Geophyte, up to 100 mm high. **Bulb** with roots fibrous, scales lacking threads, dead bulb scales tightly clasping. **Leaves** erect; blade narrowly ovate to linear, dull green; inflorescence and leaves flaccid. **Flowers**: perianth green to pink; Oct.–Mar. Damp, shallow lithosols derived from quartzites, conglomerates or sandstones.

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## **marginata** (Baker) Jessop

*Scilla marginata* Baker

Geophyte, up to 150 mm high. **Bulb** with outer scales often dark and glossy with pink markings. **Leaves** erect; blade strap-like, up to 160 × 10–30 mm, apex acuminate, firm with prominent

veins. **Flowers**: inflorescence usually flexuose with 50–150 flowers; perianth purplish green; Sep.–Nov. Grassland.

VreDm | | DrGr | MsGr | | |

### **ovatifolia** (Baker) Jessop

*Scilla climatocarpha* C.A.Sm.
*Scilla ovatifolia* Baker

Geophyte, up to 200 mm high. **Bulb** with scales loosely arranged, very fleshy, producing copious threads when torn. **Leaves** firmly appressed to soil surface; blade usually ovate, up to 250 mm long, **Flowers**: inflorescence lax; perianth segments pink to purplish green; Jul.–Mar. Grassland, rocky hillsides. *Boekhoe* (SS); *icubudwana*, *untanganazibomvu* (Z).

| | | DrGr | | KarSh | |

### **revoluta** (L.f.) Jessop

*Scilla lanceaefolia* (Jacq.) Baker

Geophyte, up to 200 mm high. **Bulb** ovoid, scales firm, dark and glossy, not yellowish. **Leaves** 4–8, variously spreading; blade ovate to narrowly ovate, rarely longer than 150 mm, up to 30 mm wide. **Flowers**: inflorescence usually suberect; perianth mauve-purple; Sep.–Feb. Grassland. *Bokhoe* (SS); *ubuhlungu*, *inqwebebane* (X); *iCubudwana* (Z).

| | | DrGr | MsGr | | |

## **Massonia** Thunb ex Houtt. (sthn Afr.: 7 spp.)

### Key to species:

[after Jessop: 408 (1976)]

Anthers > 2 mm long; leaves glabrous, very rarely with minutely ciliate margins . . . . . **M. depressa**
Anthers usually < 2 mm long or, if more, then leaves pustulate. . . .**M. jasminiflora**

### **depressa** Houtt.

Geophyte, up to 50 mm high. **Bulb** ovoid, 20–30 mm long, scales whitish. **Leaves** flat on ground; blade orbicular to oblong, 70–150 × 40–100 mm, apex acute, glabrous with margins entire, rarely ciliate. **Flowers**: clustered between leaves, deeply cup-shaped below, inflorescence with ± 20–30 flowers; bracts 30–40 mm long; anthers 2.5–4.0 mm long; perianth with tube 10–15 mm long, 4–6 mm broad at mouth, green, yellow, white, cream-coloured, pink to red or brown, occasionally flecked with purple; May–Jul. **Fruit** an obovoid capsule. Sandy and clay flats. *Hedgehog lily*; *krimpvarkie*, *botterkannetjie*, *ramblom* (A).

| | | | | KarSh | |

### **jasminiflora** Burch. ex Baker

*M. bowkeri* Baker

Geophyte, up to 0.05 m high. **Bulb** ovoid to ellipsoid, 10–20 mm long, scales whitish. **Leaves** flat on ground, ovate to broadly oblong, 30–60 × 15–50 mm, apex acute, glabrous, rarely postulate, occasionally with ciliate margins. **Flowers**: inflorescence capitate usually with < 15 flowers; anthers < 2 mm long; perianth with tube 8–20 mm long, lobes 4–8 mm long, light

purplish pink to white; May–Jul. **Fruit** an obovoid capsule. Open grassland, limestone gravel, surface calcrete tufa. *Hedgehog lily*; *bobbejaanboek*, *krimvarkie* (A). Figure 12B, p. 9.

AcGr DrGr Zastr

## **Merwilla** Speta (sthn Afr.: 2 spp.)

### **plumbea** (Lindl.) Speta

*Scilla kraussii* Baker
*S. natalensis* Planch.

Geophyte, up to 1 m high. **Bulb** with purplish brown, papery sheaths. **Leaves** basal; blade narrowly ovate to ovate, up to 30 × 10 mm after anthesis, pubescent. **Flowers**: inflorescence erect; perianth segments spreading, vivid blue or purplish blue; Jul.–Nov. Grassland, streambanks, humus filled pockets in rocks. *Large blue scilla*; *blouslangkop* (A); *kherere*, *matunga* (SS); *ichitha*, *imbizenkulu*, *ubulika*, *inguduza* (Z).

MsGr

## **Ornithogalum** L. (sthn Afr.: ± 106 spp.)

### Key to species:

[after Obermeyer: 331 (1978)]

1a Capsule fusiform to ellipsoid, transparent; perianth segments with or without midrib . . . . . 2
1b Capsule tricostate, oblong-globose, coriaceous; perianth segments withering irregularly, with a green or dark midrib . . . . . 5
2a Leaves up to 6, linear, 8–12 mm broad and usually erect, rarely glabrous; leaf sheaths often purplish, brittle, soon breaking up horizontally . . . . . **O. graminifolium**
2b Leaves few to many, linear, filiform or ensiform; sheaths, if present, not breaking up as above . . . . . 3
3a Geophytes in grassveld, karroid areas and rocky outcrops; bulbs well developed; perianth segments with midrib darkening with age . . . . . **O. juncifolium**
3b Hygrophytes with bulbs usually poorly developed; perianth segments not developing a distinct midrib with age . . . . . 4
4a Raceme subspicate; pedicels 2–4 mm long . . . . . **O. paludosum**
4b Raceme cylindrical, lax; pedicels up to 50 mm long . . . . . **O. flexuosum**
5a Leaf 1, rarely 2 or 3, oblong, ± 50 mm long, proteranthous, usually flat on ground; dry karroid places . . . . . **O. unifolium** var. **unifolium**
5b Leaves 5–12, synanthous, erect to erecto-patent, linear to narrowly ovate, often long-acuminate . . . . . 6
6a Racemes subspicate, usually very long and many-flowered with flowers close together; pedicels 4–10 mm . . . . . 7
6b Racemes subpyramidal or cylindrical; pedicels up to 50 mm long . . . . . 8
7a Bulb in older plants extended into a neck, often with transverse ridges; leaves many, filiform, 2–4 mm wide towards middle . . . . **O. tenuifolium** subsp. **aridum**
7b Bulb not extended into a neck; leaves ± 5 per flowering shoot, linear-acuminate, 4–8 mm wide towards middle . . . . . **O. tenuifolium** subsp. **tenuifolium**
8a Perianth greenish, segments 8 mm long . . . . . **O. prasinum**
8b Perianth white with a green midrib, segments 12–20 mm long. . . . **O. seineri**

**flexuosum** (Thunb.) U.Müll.-Doblies & D.Müll.-Doblies

*O. ornithogaloides* (Kunth) Oberm.

*O. zeyheri* Baker

Hygrophytic, gregarious, glabrous geophyte, up to 450 mm high. **Bulb** small. **Leaves** 4–8, erect; up to 450 mm long, ± 2 mm in diameter. **Flowers**: raceme cylindrical, lax, shorter to as long as leaves; pedicels up to 50 mm long; perianth segments ± 4 mm long, white; Nov.–Feb. **Fruit** an obovoid capsule. Riverbanks and vleis. *Grass chincherinchee*, *vlei chinkerinchee*; *vleitjienkerientjee*, *gras-tjienkerientjee* (A).

VreDm | DrGr | MsGr

**graminifolium** Thunb.

Geophyte, up to 300 mm high. **Bulb** globose, 15–30 mm in diameter. **Leaves** up to 6, often dry at flowering; blade narrowly ovate to linear-acuminate, 8–12 mm broad, erect, sometimes hairy, reddish below; leaf sheaths often purplish, brittle, soon breaking up horizontally. **Flowers**: usually in a narrow, spike-like raceme; perianth white, dull yellow or pale pink; Dec.–Mar. **Fruit** an ovoid capsule. Stony clay flats and slopes, often moist sites. *Chincherinchee*; *tjienk* (A); *metsana-a-manyenyane*, *nko-ea-ntja* (SS).

MsGr

**juncifolium** Jacq.

Mesophytic or xerophytic geophyte. **Bulb** well developed, tunics not breaking up in claws, leathery. **Leaves** normally many, ribbed, forming a bristly neck; blade with margins strigose, bristles often retrorse, rarely glabrous. **Flowers**: perianth white, segments with midrib darkening with age; Sep.–Feb. **Fruit** an ovoid capsule. Wooded slopes, rock crevices, sandstone ledges. *Grass-leaved chincherinchee*; *tjienk* (A); *lijo-tsa-noko* (SS); *indlolothi encane* (Z).

VreDm | DrGr | MsGr | KarSh

**paludosum** Baker

*Elsiea flanaganii* (Baker) F.M.Leight.

*O. gracile* Baker

Solitary, slender, hygrophilous geophyte, up to 0.6 m high. **Bulb** usually poorly developed. **Flowers**: raceme subspicate; pedicels 2–4 mm long; perianth with segments spreading when fully open, usually untidily twisted or spreading or reflexed when withered, white; Oct., Nov. **Fruit** an ovoid capsule. Montane grassland, in moist alpine or marshy depressions.

MsGr

**prasinum** Lindl.

Geophyte, up to 300 mm high. **Bulb** ovoid, ± 50 mm in diameter. **Leaves** 300 × 10–16 mm. **Flowers**: raceme cylindrical, 15–30-flowered, pedicels 20 mm long; perianth with segments narrowly oblong, ± 8 mm long, obtuse, greenish; Oct.–Jan. **Fruit** an obcordate, deeply trigonous capsule. Dry, sandy or alluvial, grassy flats, overgrazed areas. *Chincherinchee*; *maerman*, *gifbol* (A).

DrGr | KarSh

**seineri** (Engl. & K.Krause) Oberm.

Geophyte, up to 400 mm high. **Bulb** ovoid, up to 0.1 m in diameter, with a short neck. **Leaves** dark speckled below. **Flowers**: racemes subpyramidal; peduncle up to 300 mm long; pedicels up to 50 mm long; perianth with segments spreading, oblong, 12–20 mm long, white, midrib green; Nov.–Feb. **Fruit** a broadly 3-lobed capsule. Bush clumps. *Chincherinchee*; *ienk* (A).

DrGr KarSh

**tenuifolium** D.Delaroche subsp. **aridum** Oberm.

Geophyte, up to 0.6 m high. **Bulb** in older plants extended into a neck, often with transverse ridges. **Leaves** many, synanthous, erect to erecto-patent; blade filiform, 2–4 mm wide towards middle. **Flowers**: raceme subspicate, pedicels 4–10 mm long; perianth with segments white with a broad, green, central band; Sep.–Feb. **Fruit** an ovoid-acute capsule. Grassland. *Bosui* (A).

DrGr KarSh

**tenuifolium** D.Delaroche subsp. **tenuifolium**

Geophyte, up to 0.6 m high. **Bulb** not extended into a neck. **Leaves** ± 5 per flowering shoot, synanthous, erect to erecto-patent; blade linear-acuminate, 4–8 mm wide towards middle. **Flowers**: raceme subspicate; pedicels 4–10 mm long; perianth with segments white with a broad, green keel; Nov.–Mar. **Fruit** an ovoid-acute capsule. Wooded kloofs, rocky grassland. *Bosui* (A); *moretele-o-monyenyane* (SS).

VreDm DrGr MsGr KarSh Zastr

**unifolium** Retz. var. **unifolium**

Geophyte, up to 300 mm high. **Bulb** ovoid, up to 30 mm in diameter, forming a broad neck. **Leaves** usually dry at flowering, solitary, rarely 2 or 3 in older plants; blade oblong, ± 50 mm long, usually procumbent. **Flowers**: perianth with segments pale yellow to cream- or buff-coloured with a broad dark central band. **Fruit** a globose capsule with prominent keels. Sep.–Nov. Dry karroid places. *Chincherinchee*; *tjienk* (A).

KarSh

## **Schizocarphus** Van der Merwe (sthn Afr.: 1 sp.)

**nervosus** (Burch.) Van der Merwe
*Scilla nervosa* (Burch.) Jessop
*Scilla rigidifolia* Baker

Geophyte, up to 300 mm high. **Bulb** with a fibrous top. **Leaves** basal; blade usually > 125 mm long, prominently veined. **Flowers**: inflorescence always simple; floral bract situated some distance below pedicel; perianth white, greenish or pinkish; Sep.–Feb. Grassland, mountain sourveld. *White squill*, *sand lily*; *sandlelie* (A); *seboka* (SS); *magaqana* (X); *ingcino*, *ingcolo*, *umgcinywana*, *imbizankulu*, *ingema* (Z).

AcGr DrGr MsGr KarSh

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# HYDROCHARITACEAE

Aquatic herbs, partially or completely submerged; usually monoecious or dioecious. **Leaves** radical, in rosettes or cauline, alternate, opposite or crowded, submerged or on floating blades. **Flowers**: unisexual, exserted during anthesis; male flowers many; female flowers mostly solitary inside spathe; ovary inferior. **Fruit** rounded or tubular, fleshy or leathery. *Frog's bit family.*

## Key to genera

[after Glen: 619 (2000)]

Leaves arranged in whorls of 3 or more, apex not recurved, acute, bearing one terminal spine, margins without fibre cells, serrulate . . . . . **Egeria**
Leaves spirally arranged, apex often recurved, bearing two spines, margins serrate or toothed . . . . . **Lagarosiphon**

## **Egeria** Planch. (sthn Afr.: 1 sp.)

### ***densa** Planch.

Aquatic herb, submerged. **Leaves** opposite or in whorls of 3 or 4; blade 1.5–4.5 mm wide, tip acute, terminating in a spine. **Flowers**: emergent; long-stalked, exserted 20 mm above water surface; petals 3, ± 15 mm in diameter, showy, white, sweet-scented; Aug.–Dec. Native to Brazil and Argentina. Declared weed in South Africa. *Ditch moss*, *water thyme*, *water weed*; *waterpes* (A).

DrGr

## **Lagarosiphon** Harv. (sthn Afr.: 5 spp.)

### Key to species:

[after Cook: 143 (2004)]

Foliage leaves > 2 mm wide, thick, opaque, epidermal cells with all sides ± equal; stems thick, ± 3 mm in diameter . . . . . **L. major**
Foliage leaves < 2 mm wide, thin, translucent, epidermal cells longer than wide; stems slender, 0.5–1.5 mm in diameter . . . . . **L. muscoides**

### **major** (Ridl.) Moss ex Wager

Aquatic herb, submerged. **Stems** robust, ± 3 mm in diameter. **Leaves** with blade thick, 2–5 mm wide, margins opaque and with short, blunt, ascending teeth. **Flowers**: male inflorescence with up to 50 flower buds; female inflorescence with perianth pink, up to 150 mm long; Nov.–Apr. Vleis, streams, rivers, dams. *Coarse oxygen weed*; *growwe babergras*, *bobbejaantou* (A).

AcGr DrGr MsGr

### **muscoides** Harv.

*Hydrilla dregeana* C.Presl

Aquatic herb, submerged. **Stems** slender, 0.5–1.5 mm in diameter. **Leaves** translucent; blade < 2 mm wide, margins with 4–6 rows of fibre-like cells, with sharp teeth, epidermal cells longer than wide. **Flowers**: male inflorescence with up to 40 flower buds; female inflorescence with perianth white, up to 250 mm long; Sep.–Apr. Pans, vleis, dams. *Fine oxygen weed*; *waterblommetjie*, *fynbabergras watergras*, *perdegras* (A).

AcGr DrGr MsGr KarSh

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# HYPOXIDACEAE

Compiled by Y. Singh (*Hypoxis*), E. Retief & N.L. Meyer

Herbs with vertical rhizomes or fibrous corms, mostly pubescent. **Leaves** basal, 1–many, usually arranged in 3 ranks, deciduous or persistent, linear to lanceolate. **Flowers**: inflorescence spicate, racemose or corymbose, sometimes reduced to a single flower; scape leafless, often hairy; bracts present or absent; bisexual, regular, trimerous, rarely tetramerous; pedicels long or short; perianth segments (4)6, free or fused into a long, narrow tube, persistent or deciduous, glabrous or pubescent; yellow, orange, red, pink or white; stamens (3, 4)6 arising from perianth, filaments short, free, anthers basifixed or dorsifixed, opening by longitudinal slits, entire or 2-lobed at base, rarely with apical appendages; ovary inferior, 1- or 3-locular; nectaries absent; style (0)1, short, stigma lobes 3(6). **Fruit** a capsule, indehiscent and subsucculent, sometimes beaked. **Seeds** subglobose, black. *Star-flower family*.

## Key to genera

[after Snijman: 621 (2000)]

1a Plants glabrous or, if sparsely pubescent, then hairs uniseriate and absent from perianth segments; fruit indehiscent, subsucculent . . . . . **Empodium**
1b Plants, including perianth segments, densely pubescent; hairs predominantly pluriseriate, varying from biramous to stellate; fruit dehiscent, capsule opening by a circular slit . . . . . 2
2a Perianth yellow, occasionally white, segments free to base, patent . . . **Hypoxis**
2b Perianth red, pink or white, segments united at base, inflexed, closing perigone throat . . . . . **Rhodohypoxis**

## **Empodium** Salisb. (sthn Afr.: 7 spp.)

### **elongatum** (Nel) B.L.Burtt *s.l.*

*Forbesia elongata* Nel

Perennial herb, up to 200 mm high. **Corm** globose, 10–15 × 10–20 mm. **Leaves** 3–7; well developed at flowering; leaf sheaths dark brown above; blade linear, 150–250 × 3–6 mm, not unfolding with age. **Flowers**: inflorescence 1-flowered, 2–4 per plant; pedicels hidden within leaf sheaths; ovary shortly exserted from leaf; perianth segments 10–25 × 2–4 mm, acuminate, yellow; Oct.–Dec. **Fruit** beaked. Grassland.

DrGr MsGr

## **Hypoxis** L. (sthn Afr.: ± 28 spp.)

### Key to species:

[after Singh: 194 (2009)]

1a Plants > 150 mm high, if shorter, then leaves narrowly ovate and > 12 mm wide, and flowers firm, with perianth segments of the lowermost flowers 10–20 mm long. . . . . 2

1b Plants < 150 mm high, if taller, then leaves linear and < 12 mm wide, and flowers delicate, with perianth segments of the lowermost flowers 2–10 mm long . . . . . 10
2a Plants taller than wide; leaves tightly clasping at base to form a false stem . . . . . 3
2b Plants as tall as wide; leaves spreading upwards and outwards from base, false stem absent . . . . . 7
3a False stem opening into funnel above; leaves erect, converging apically (connivent), blade lanceolate, 30–85(–110) mm wide . . . . . **H. colchicifolia**
3b False stem upright in the form of a column; leaves spreading or recurving apically, linear or filiform, 3–20 mm wide . . . . . 4
4a Leaves firm but not rigid, erect, spirally twisting towards apex, pilose on both surfaces, margins and midrib on lower surface; flowers 2 (sometimes 4–6) . . . . . **H. acuminata**
4b Leaves rigid, erect or recurving above middle, ± straight towards apex, near-glabrous or sparsely to densely hairy on both surfaces, margins and on lower surface of midrib fringed with hairs; flowers 3–11 (2 or 3 in first few inflorescences) . . . . . 5
5a Leaves ribbed near margins only; veins of uneven thickness with 3–5 near each margin raised on upper surface; leaf blade sparsely to densely hairy . . . . . **H. rigidula** var. **rigidula**
5b Leaves strongly ribbed; veins of uniform thickness, raised on upper surface; leaf blade near-glabrous, margins and midrib on lower surface outlined in white by a thickened band of squat hairs . . . . . 6
6a Leaves filiform, 2–4 mm wide; veins 4–6 . . . . . **H. longifolia**
6b Leaves strap-like, 10–15 mm wide; veins 10–16 . . . . . **H. ludwigii**
7a Plants in flower small, 50–150 mm high; leaves < 7, overlapping in helical arrangement to give a rosette-like appearance; blade flat, oblong-lanceolate . . . . . 8
7b Plants in flower large, 150–600 mm high; leaves many, > 7, arranged one above the other in 3 ranks; blade folded together along length, lanceolate . . . . . 9
8a Leaves covered with long, weak hairs mostly along margins and midrib (ciliate) . . . . . **H. costata**
8b Leaves covered with short, stiff hairs (scabrous) throughout . . . . **H. multiceps**
9a Leaves firm but not rigid, remaining straight with age, non-waxy; veins flush on upper surface . . . . . **H. hemerocallidea**
9b Leaves rigid, spirally twisting towards apex with age, waxy; veins raised on upper surface (ribbed) . . . . . **H. obtusa**
10a Leaves membranous in texture, drying papery, sparsely covered with long, weak hairs . . . . . 11
10b Leaves thick in texture, sparsely or densely covered with hairs of different types . . . . . 13
11a Leaves lanceolate, radiating irregularly from rhizome . . . . . **H. parvula** var. **parvula**
11b Leaves linear-triangular, loosely arranged in 3 ranks . . . . . 12
12a Plants solitary, < 120 mm high; leaves 3–4 mm wide; 2 veins near each margin raised on upper surface . . . . . **H. angustifolia** var. **angustifolia**
12b Plants in tufts, > 120 mm high; leaves 8–18 mm wide; 4 veins near each margin raised on upper surface . . . . . **H. angustifolia** var. **buchananii**
13a Leaves strongly ribbed, veins close to each other, uniformly thickened, raised on upper surface . . . . . 14
13b Leaves not ribbed, veins of uneven thickness, 1 or 2 near each margin thickened, raised on upper surface . . . . . 15
14a Leaf margins ciliate; hairs yellow or white; filaments subulate . . . **H. kraussiana**
14b Leaf margins pilose; hairs white; filaments filiform . . . . . **H. filiformis**
15a Plants 30–60 mm high; inflorescence overtopping leaves; flowers 1 or 2 . . . . 16
15b Plants 70–120 mm high; inflorescence as tall as or shorter than leaves; flowers 1–5 . . . . . 17

16a Leaves 2–5 mm wide; pedicels 20–30 mm long; flowers small, perianth segments 5–8 mm long . . . . . **H. uniflorata**
16b Leaves 4–8 mm wide; pedicels 5–15 mm long; flowers large, perianth segments 8–10 mm long . . . . . **H. parvifolia**
17a Hairs mostly stellate, dense in channels between veins, forming a silky-white layer on lower surface . . . . . **H. argentea** var. **argentea**
17b Hairs mostly biramous, scattered in channels between veins with an even distribution on both surfaces. . . . . **H. argentea** var. **sericea**

## **acuminata** Baker

Perennial herb, 200–300 mm high; slender, growing singly or in tufts. **Rhizome** subglobose or oblong, 15–25 mm in diameter. **Leaves** 4–8; well developed at flowering; blade erect, firm, clasping at base to form a column spirally twisting towards apex, linear, 130–380 × 4–7 mm; veins flush with surface, 2–4 near each margin raised on upper surface; pilose on both surfaces, margins and midrib; hairs biramous, few stellate, white. **Flowers**: inflorescence 1–4 per plant, 2-flowered, sometimes 4–6, racemose, appearing with leaves; pedicels 4–12 mm long; perianth segments 11–20 × 3–7 mm, broadly elliptic, yellow; Sep.–Dec. **Fruit** a capsule, 5–8 × 4–6 mm, opening by a circular slit. Grassland, vleis. *Moli-motsanyane*, *thoto-linyenyane* (SS).

DrGr MsGr

## **angustifolia** Lam. var. **angustifolia**

*H. lata* Nel

Perennial herb, 50–120 mm high; small, growing singly. **Rhizome** oblong, 12–40 × 8–12 mm. **Leaves** 4–10, well developed at flowering, loosely arranged in 3 ranks; blade linear-triangular, 50–120 × 3–4 mm, flaccid, membranous; veins flush with surface, 2 near each margin raised on upper surface; pilose on both surfaces, margins and on lower surface of midribs; hairs biramous, white. **Flowers**: inflorescence 2–5 per plant, (1)2-flowered, corymbose, appearing with leaves; pedicels 15–60 mm long; perianth segments 4–5 × 2–3 mm, ovate-elliptic, yellow, sometimes red-striped below; Nov.–Jan. **Fruit** a capsule, 3–5 × 2–3 mm, opening by a circular slit, then splitting longitudinally into 3 lobes. Grassland. *Molinyana* (SS).

DrGr MsGr

## **angustifolia** Lam. var. **buchananii** Baker

*H. obliqua* Jacq. var. *woodii* (Baker) Nel
*H. woodii* Baker

Differs from *H. angustifolia* var. *angustifolia* in growing in tufts and its larger habit, up to 250 mm high; leaves 120–300 × 8–18 mm, veins flush with surface, 4 near each margin raised on upper surface; perianth segments 9–10 × 3–4 mm. Vleis, moist situations, semishade.

DrGr

## **argentea** Harv. ex Baker var. **argentea**

Perennial herb, small, 70–100 mm high; growing singly. **Rhizome**: oblong, 20–30 mm × 10–15 mm. **Leaves** 4–7(–10), well developed at flowering, clasping at base to form a slender, false stem; blade linear, thick, 50–200 × 3–6 mm; not ribbed, veins flush with surface, 1 or 2 near each margin strongly thickened and raised on upper surface, straw-coloured; densely hairy on lower surface' hairs long, mostly stellate, white, forming a silky-white layer on lower surface. **Flowers**: inflorescence 1–6 per plant, 1–5-flowered, corymbose, appearing with leaves, not overtopping leaves; pedicels 10–30 mm; perianth segments 5–9 × 2–3 mm, ovate-

elliptic, yellow sometimes red-striped below. Aug.–Mar. **Fruit** a capsule, 3–5 × 2.5–3.0 mm Grassland, rocky hillsides. *Small yellow star-flower*; *leihlo-khoma le leholo*, *lesikitlane*, *moli* (SS); *ixalanxa* (X); *inongwe* (X, Z); *isinana* (Z).

DrGr MsGr

**argentea** Harv. ex Baker var. **sericea** Baker

*H. dinteri* Nel
*H. sericea* Baker
*H. sericea* Baker var. *dregei* Baker
*H. sericea* Baker var. *flaccida* Baker

Differs from *H. argentea* var. *argentea* in having leaves lightly hairy, with an even distribution on both surfaces; hairs mostly biramous, mainly scattered in channels between veins. Grassland, stony outcrops.

DrGr MsGr KarSh

**colchicifolia** Baker

*H. distachya* Nel
*H. gilgiana* Nel
*H. latifolia* Hook.
*H. oligotricha* Baker

Perennial herb, 250–500 mm high; robust, growing singly. **Rhizome** globose or oblong, 40–70 mm in diameter. **Leaves** 4–8, erect, well developed at flowering, clasping at base to form a broad false stem opening into funnel above, converging apically (connivent); blade flat, broadly lanceolate, (100–)200–600 × 30–85(–110) mm, coriaceous; strongly ribbed, veins evenly spaced, almost all thickened and raised on upper surface; hairs, if present, few along margins, biramous, white. **Flowers**: inflorescence appearing with leaves, 1–4 per plant, racemose, (5–)8–17-flowered; pedicels 7–15 mm long; perianth segments 11–19 × 3–5 mm, ovate-elliptic, yellow; Sep.–Feb. **Fruit** a capsule, 6–8 mm × 4–7 mm, opening by a circular slit. Grassland. *Broad-leaved hypoxis*; *igudu*, *ilabatheka*, *ingcobo*, *inkomfe* (Z).

MsGr

**costata** Baker

Perennial herb, 100–150 mm high; stout, growing singly or in tufts. **Rhizome** oblong or subglobose, 10–40 mm in diameter. **Leaves** 4–6(–8), erect or semi-erect, elongating in post flowering; blade flat, oblong-lanceolate, 100–200 × 30–50 mm; strongly ribbed, veins close to each other, uniformly thickened; sparsely hairy, dense on margins and midrib on lower surface (ciliate); hairs biramous with a few stellate, long, weak, white or yellow. **Flowers**: inflorescence 1–5 per plant, 3–5-flowered, corymbose, appearing with leaves, covered with short, yellow hairs in upper part; pedicels 4–12 mm long; perianth segments 11–17 × 3–5 mm, broadly elliptic, yellow; Sep.–Dec. **Fruit** a capsule, 5–6 mm long, opening by a circular slit**.** Grassland. *Moli-kharatsa* (SS).

MsGr

**filiformis** Baker

*H. caespitosa* Baker
*H. dregei* (Baker) Nel

Perennial herb, 50–150 mm high; slender, wiry, growing singly. **Rhizome** oblong or globose, 10–20 mm in diameter. **Leaves** 4–7, erect, rigid, subterete, 80–200 × 2–3 mm; ribbed, veins

close to each other, uniformly thickened and raised on upper surface; sparsely hairy along margins and midrib, pilose; hairs biramous, few stellate, weak, white. **Flowers**: inflorescence 1–5 per plant, 2(–4)-flowered, racemose, appearing with leaves; pedicels short, 5–15 × 1 mm; filaments filiform; perianth segments 4.5–9.0 × 1.8–4.0 mm, ovate-elliptic, yellow; Sep.–Feb. **Fruit** a capsule, 4–5 × 2–3 mm, opening by a circular slit, splitting longitudinally into 3 lobes. Grassland, hill slopes. *Grass star-flower*; *moli-letsane* (SS); *izinongwe* (Z).

DrGr MsGr

**hemerocallidea** Fisch., C.A.Mey. & Ave-Lall.

*H. elata* Hook.f. (*non* Schult. & Schult.f.)
*H. obconica* Nel
*H. patula* Nel
*H. rooperi* T.Moore
*H. rooperi* var. *forbesii* Baker

Perennial herb, 100–600 mm high; robust, growing singly. **Rhizome** globose, oblong or turbinate 25–100 × 25–60 mm. **Leaves** 8–12, well developed at flowering, noticeably arranged one above the other in 3 ranks; blade lanceolate, seldom linear-lanceolate, firm, non-waxy, 200–500 × 18–25 mm, sickle-shaped (falcate); veins flush on upper surface; evenly hairy on both surfaces, pilose; hairs biramous or stellate, white. **Flowers**: inflorescence 3–8 per plant, 4–12-flowered, racemose, appearing with leaves; pedicels 10–30 × 1.5–4.0 mm; perianth segments 10–20 × 4–8 mm, ovate-elliptic, yellow; Sep.–Mar. **Fruit** a capsule, 7–10 × 5–7 mm, opening by a circular slit. Grassland and mixed woodland. *Star-flower*, *yellow star*; *gifbol* (A); *lotsane* (SS); *iNkomfe* (Z).

DrGr MsGr

**kraussiana** Buchinger ex Baker

*H. neliana* Schinz

Perennial herb, 70–100 mm high; slender, growing singly. **Rhizome** oblong, 10–20 × 7–15 mm. **Leaves** 4–6, well developed at flowering; blade linear, subterete, thick, 50–250 × 2–4 mm; strongly ribbed; with an even distribution of biramous hairs on blade, margins and midrib outlined by a thickened band of stellate hairs; hairs yellow or white. **Flowers**: inflorescence 1 or 2 per plant, 2- or 3-flowered, racemose; appearing with leaves, scape wiry, covered with short, yellow hairs in upper part; pedicels 5–10 mm long; filaments subulate; perianth segments 7–9 × 2–4 mm, yellow, ovate-elliptic; Oct.–Dec. **Fruit** a capsule, ± 3 × 2.5 mm, opening by a circular slit. Grassland.

MsGr

**longifolia** Baker ex Hook.f.

*H. longifolia* Baker ex Hook.f. var. *thunbergii* Baker

Perennial herb, 200–350 mm high; slender, growing singly. **Rhizome** turbinate, 40–52 × 35–50 mm. **Leaves** 4–6(–8), well developed at flowering, clasping at base to form a narrow false stem; blade filiform, 150–500 × 2–4 mm, ribbed, veins 4–6, near-glabrous or with few hairs, margins and midrib on lower surface outlined in white by a thickened band of squat hairs (ciliate); hairs stellate. **Flowers**: inflorescence 2–4 per plant, 4- or 5-flowered, racemose, appearing with leaves; pedicels 11–30 × 0.5–1.0 mm; perianth segments 10–14 × 4–6 mm, broadly elliptic, yellow; Aug.–May. **Fruit** a capsule, 4–7 × 3–5 mm, opening by a circular slit. Grassland.

DrGr MsGr KarSh

**ludwigii** Baker

Perennial herb, 250–350 mm high; slender, growing in tufts. **Rhizome** oblong, 25–40 × 15–20 mm. **Leaves** 8–10; well developed at flowering; clasping at base to form a narrow false stem; blade strap-like, linear, 300–450 × 10–15 mm, coriaceous; strongly ribbed, veins 10–16; sparsely hairy, dense on margins and midrib on lower surface forming a white band (ciliate); hairs biramous or stellate. **Flowers**: inflorescence 1–4 per plant, 2–5-flowered, racemose; pedicels 15–25 mm long; perianth segments 8–12 × 3–4 mm, broadly elliptic, yellow; Aug.–Feb. **Fruit** a capsule, 6–8 × 4–7 mm, opening by a circular slit. Grassland.

DrGr MsGr

**multiceps** Buchinger ex Baker

Perennial herb, 100–140 mm high; stout, scabrous, growing singly or in tufts. **Rhizome** oblong to subglobose, 30–50 mm × 15–35 mm. **Leaves** 4–6 per plant, blade flat, oblong-lanceolate, (30–)80–150 × 12–45(–60) mm, elongating to 250–300 mm in post-flowering, sometimes forming false petioles of 40–200 mm long; hairs stellate, patent, yellow or brown. **Flowers**: inflorescence 2–6 per plant, 2(4)-flowered, corymbose, appearing before or with emergence of leaves, hispid; pedicels short, 4–15 × 1 mm; perianth segments 10–15 × 5–8 mm, ovate-elliptic, yellow; Aug.–Nov. **Fruit** a capsule, 5–8 × 4–6 mm, opening by a circular slit. Grassland. *Moli-motsane*, *moli-kharatsa*, *morethetlo* (SS); *inkomfe* (Z).

DrGr MsGr

**obtusa** Ker Gawl.

*H. iridifolia* Baker

*H. nitida* I.Verd.

*H. obtusa* var. *chrysotricha* Nel

Perennial herb, 200–450 mm high; robust, growing singly. **Rhizome** subglobose, oblong or turbinate, 4–12 × 4–8 mm. **Leaves** 8–15, well developed at flowering, coriaceous, erect or recurving, arranged one above the other in 3 ranks, rigid, spirally twisting towards apex with age, waxy; blade lanceolate, sometimes linear-lanceolate, 100–700 × 6–30 mm; ribbed, bases sometimes red or purple; almost glabrous or hairy towards base, margins and midrib outlined in white by a thickened band of squat hairs (ciliate); hairs stellate. **Flowers**: 5–12-flowered, racemose, 2–5 per plant; perianth segments 10–20 × 6–10 mm, ovate-elliptic, yellow; Aug.–Feb. **Fruit** a capsule, 6–7 × 5–7 mm, opening by a circular slit. Grassland. *Moli-boea* (SS); *inkomfe* (Z).

DrGr MsGr

**parvifolia** Baker

Perennial herb, 50–60 mm high; dwarf, growing singly. **Rhizome** oblong, 10–30 × 5–15 mm. **Leaves** 4–8, emerging or well developed at flowering; blade linear to linear-lanceolate, thick, 40–100 × 4–8 mm, not ribbed, veins flush with surface, 1 or 2 near each margin strongly thickened and raised on upper surface; sparsely to densely hairy on both surfaces, hairs mostly biramous, few stellate, white. **Flowers**: inflorescence 1(2) per plant, 1- or 2-flowered, appearing before or with leaves, covered in long, white or yellow hairs; pedicels short, 5–15 × 1.0–1.5 mm, perianth segments 8–10(–13) × 3–7 mm, narrow to ovate-elliptic, yellow; Aug.–Dec. **Fruit** a capsule, 3–5 × 2–3 mm, opening by a circular slit. Grassland.

MsGr

**parvula** Baker var. **parvula**

*H. brevifolia* Baker

Perennial herb, 40–80 mm high; dwarf, delicate, growing singly. **Rhizome** oblong, 50–100 mm in diameter. **Leaves** 3–5, wrapped at base in a membranous, white or brown tunic, radiating irregularly from rhizome; blade lanceolate, membranous, 15–70(–90) × 5–10 mm; veins flush with surface; sparsely hairy throughout; hairs a mixture of simple, biramous or stellate, white. **Flowers**: inflorescence 1(–3) per plant, 1-flowered, appearing with leaves; pedicels, long, weak, 30–40 × 0.5 mm; perianth segments 2–7 × 1.5–2.5 mm, ovate-elliptic, yellow or white; Nov.–Apr. **Fruit** a capsule, 3–4 × 2–3 mm, opening by a circular slit, splitting longitudinally into 3 lobes. Damp grassland.

MsGr

**rigidula** Baker var. **rigidula**

*H. cordata* Nel
*H. elliptica* Nel
*H. longifolia* Baker
*H. oblonga* Nel
*H. volkmanniae* Dinter

Perennial herb, 600–700 mm high; slender, growing singly or in tufts. **Rhizome** oblong-globose, 40–90 × 30–50 mm. **Leaves** 4–12, clasping at base to form false stem, usually recurving apically, rigid, whip- or strap-like; blade linear, 320–800 × (4–)7–20 mm; veins of uneven thickness with 3–5 near each margin raised on upper surface; sparsely to densely hairy, dense on margins and on lower surface of midrib (ciliate); hairs biramous or stellate, white. **Flowers**: inflorescence 2–5 per plant, 3–9-flowered (2 in first inflorescences of new season), racemose or spicate; pedicels subsessile or short, 8–16 × 1.0–1.5; perianth segments 8–20 × 3–6 mm, broadly elliptic, yellow; Sep.–Mar. **Fruit** a capsule, 5–8 × 3–5 mm, opening by a circular slit. Grassland. *Silver-leaved star-flower*; *botterblom* (A); *moli-tieane* (SS); *inkomfe* (Z).

DrGr MsGr

**uniflorata** Markötter

Perennial herb, minute, up to 60 mm high; growing singly. **Rhizome** subglobose, 10–15 × 5–10 mm. **Leaves** 4–6, wrapped at base in a membranous, white or brown tunic, loosely arranged in 3 ranks, blade linear, thick, 20–65 × 2–5 mm; not ribbed; sparsely hairy throughout; hairs mainly biramous, white. **Flowers**: inflorescence solitary, 1-flowered, appearing with and overtopping leaves; pedicels long, weak, 20–30 mm long; perianth segments 5–8 × 2–3 mm, ovate-elliptic, yellow; Nov. **Fruit** not seen. Moist grassland, wet rocks.

MsGr

## **Rhodohypoxis** Nel (sthn Afr.: 6 spp.)

### Key to species:

[after Hilliard & Burtt: 52 (1978)]

Leaves impressed above and its groove clearly visible up to the leaf tip, hairy right to tip; perianth white, changing to pink, deep red with age . . . . . **R. baurii** var. **confecta**

Leaves ending in solid veinless tips, tips always glabrous; perianth bright red, rarely pink or white . . . . . **R. milloides**

**baurii** (Baker) Nel var. **confecta** Hilliard & B.L.Burtt

Perennial herb, up to 30–60 mm high; minute. **Rhizome** oblong, ± 10 × 5 mm. **Leaves** 4–10, erect, bright green; blade linear, 25–75 × 1.5–5.0 mm, midrib impressed above, groove clearly visible up to leaf tip; hairy right to tip. **Flowers**: inflorescence 1 or 2 per plant, 1- or 2-flowered; perianth segments 10–16 × 4–9 mm, white, pink, rarely red, some flowers opening white, changing to pink, then red with age; Oct.–Jan. **Fruit** a capsule, 4–6 mm long, opening by a circular slit. Moist grassland, among rock outcrops or summit plateau. *Red or white star*; *rooisterretjie* (A).




**milloides** (Baker) Hilliard & B.L.Burtt

*Hypoxis milloides* Baker

*R. palustris* Killick

Perennial herb, 40–170 mm high. **Rhizome** subglobose, 10–12 × 8–10 mm. **Leaves** 4–10, erect, stiff, light bright green; blade linear to narrowly lanceolate, 25–100 × 2–3 mm, keeled, ending in solid veinless tip, sparsely hairy, tip always glabrous. **Flowers**: inflorescence 1–4 per plant, 1- or 2-flowered; perianth segments elliptic, 10–20 × 4–10 mm, bright red, rarely pink or white; Oct.–Jan. **Fruit** a capsule up to 5 mm long, opening by a circular slit**.** Grassland, marshes.




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SNIJMAN, D.A. 2000. Hypoxidaceae. In O.A. Leistner, Seed plants of southern Africa: families and genera. *Strelitzia* 10: 621–623. National Botanical Institute, Pretoria.

# IRIDACEAE

Herbs with corms or rhizomes. **Stems** usually erect and leafy. **Leaves** basal and cauline, sword-shaped and arranged in 2 ranks, bases usually imbricate, usually contemporary with flowers, occasionally produced later or dry at flowering; with or without distinct central vein, plane, ribbed, plicate or occasionally terete. **Flowers**: regular or irregular, bisexual; perianth showy with 3 + 3 segments (tepals), variously coloured, often with contrasting markings (nectar guides), outer segments usually largest and hooded, inner segments sometimes with cusps (abrupt, sharp, rigid points), often united below into a tube; stamens 3; ovary inferior, 3-locular; style usually 3-branched or 3-lobed, style branches either filiform or distally expanded. **Fruit** a loculicidal capsule. *Iris family*.

# Key to genera

[after Goldblatt & Manning: 624 (2000)]

1a Flowers in umbellate clusters (rhipidia) enclosed by a pair of opposed leafy bracts (spathes), rarely solitary on peduncles, or plants acaulescent, but then style either dividing below anthers into tangentially compressed, petal-like branches or dividing below or above base of anthers and obscurely 3-lobed apically, lobes entire or fringed; individual flowers sessile or pedicellate; flowers with segments free to basally connate, or united in an extended tube; rootstock a woody caudex, a rhizome, or a corm . . . . . 2

1b Flowers arranged in spikes, or flowers solitary on peduncles, sometimes in pseudopanicles, or acaulescent, individual flowers always sessile and style branches filiform, simple or deeply divided; flowers with segments united below in a tube; rootstock a corm. . . . . 3

2a Style eccentric, apically notched or lobed, lobes sometimes fringed; perianth usually deep blue (occasionally lilac, white or pale blue), segments shortly connate basally . . . . . **Aristea**

2b Style central, usually dividing near base of anthers into distinct branches, these either extending between anthers or appressed against them, sometimes style exceeding anthers; perianth variously coloured; segments free, connate basally or united in a tube . . . . . **Moraea**

3a Outer and inner bracts membranous to scarious, usually translucent to transparent with veins often darkly coloured, occasionally outer solid below but then margins lacerate . . . . . 4

3b Outer and inner bracts green to brown and dry, soft-textured or firm to leathery, never lacerate, sometimes inner bracts with broad membranous to scarious margins . . . . . 6

4a Plants acaulescent; leaves usually entirely bifacial, usually channelled to adaxially grooved, sometimes terete; bracts tubular below; corm tunics woody; flowers shades of blue to purple . . . . . **Syringodea**

4b Plants with stems aerial or acaulescent; leaves unifacial, oriented edgewise to stem, blade plane and linear to narrowly ovate or oval to terete in transverse section; bracts with margins free to base or united below; corm tunics woody or papery to fibrous; perianth variously coloured . . . . . 5

5a Bracts pale, dry, papery and crinkled or solid, irregularly streaked with dark flecks or veins. . . . . **Dierama**

5b Bracts pale or rust-coloured, membranous or dry, then not papery and crinkled, sometimes streaked with dark flecks or veins . . . . . **Tritonia**

6a Style branches dividing at apex of perianth tube or within tube, branches undivided, long and laxly spreading. . . . . **Hesperantha**

6b Style branches usually dividing well above mouth of perianth tube, branches simple or deeply divided, relatively short and spreading to recurved . . . . . 7

7a Corms bell-shaped, with a flat base; leaves plane or corrugate **Lapeirousia**

7b Corms globose to obconic, round or pointed at base, or sometimes bell-shaped with a flat base but then leaves ± terete and 4-grooved . . . . . 8

8a Style branches deeply divided, usually once, occasionally multifid . . . . . 9

8b Style branches undivided or at most notched apically . . . . . 11

9a Leaves terete to oval in transverse section with narrow longitudinal grooves, or 4-winged; corm tunics composed of brittle, woody concentric layers; flowers actinomorphic, solitary on branches, not arranged in spikes or plants acaulescent . . . . . **Romulea**

9b Leaves usually with plane blade or round in transverse section, but without longitudinal grooves; corm tunics of coriaceous to fibrous layers; flowers zygomorphic or if actinomorphic then arranged in spikes and plants never acaulescent . . . . . 10

10a Spikes inclined to horizontal, flowers borne on upper side; bracts green or dry above, and then often dark brown at apices . . . . . **Freesia**

10b Spikes erect, flowers distichous or spirally arranged; bracts green or partly to entirely dry, but then never dark brown at apices . . . . . **Watsonia**
11a Leaves several in a distichous fan, blade plane or plicate, but then leaves, stems or bracts never pubescent; perianth shades of orange to scarlet; floral bracts short, ± twice as long as ovary, coriaceous, green or dry, nearly equal . . . . . **Crocosmia**
11b Characters not combined as above . . . . . 12
12a Leaf blade pleated, sometimes ± linear and striate; stems and/or leaves or bracts pubescent to pilose . . . . . **Babiana**
12b Leaf blade plane, corrugated or rounded in transverse section with or without 4 longitudinal grooves; plants glabrous or sometimes pubescent on leaves and/or bracts . . . . . **Gladiolus**

## **Aristea** Aiton (sthn Afr.: 44 spp.)

### Key to species:

[after Vincent: 215 (1985)]

1a Bracts with cleft and incurved apices. . . . **A. angolensis** subsp. **angolensis**
1b Bracts without cleft and incurved apices . . . . . 2
2a Cauline leaves solitary or absent . . . . . **A. abyssinica**
2b Cauline leaves 2 or more . . . . . 3
3a Cauline leaves foliaceous . . . . . **A. angolensis** subsp. **acutivalvis**
3b Cauline leaves coriaceous. . . . . 4
4a Basal leaves narrowly spread . . . . . **A. torulosa**
4b Basal leaves spreading . . . . . **A. montana**

### **abyssinica** Pax

*A. cognata* N.E.Br. ex Weim.

Rhizomatous, perennial herb, up to 300 mm high. **Leaves** with blade of basal ones narrowly ovate, 1–3 mm wide, leaf apices finely acuminate; cauline leaves solitary or absent. **Flowers**: scape narrow, 1–2 mm wide; bract apices acuminate; perianth purplish blue, segments 9–17 × 4.5–7.5 mm; Jan. **Fruit** an oblong capsule, 5–13 mm long. Grassland. *Blue-eyed grass*, *miniature blue aristea*; *lethepu-le-lenyenyane* (SS); *icebethwane* (Z).

DrGr | MsGr | Zastr

### **angolensis** Baker subsp. **acutivalvis** Weim.

Rhizomatous, perennial herb, up to 0.7 m high. **Leaves** with cauline leaves 2 or more; blade foliaceous. **Flowers**: inflorescence usually simple; scape > 355 mm long; bract apices acuminate, not incurved, deeply lacerated; perianth blue, segments 8–12 × 3–7 mm; Feb. **Fruit** an oblong or subglobose capsule, 4–6 mm long. Rocky slopes, savanna woodland, roadside grassland.

MsGr

### **angolensis** Baker subsp. **angolensis**

Rhizomatous, perennial herb, up to 1 m high. **Leaves** with cauline leaves 2 or more; blade foliaceous. **Flowers**: inflorescence a lax panicle; scape > 355 mm long; bract apices cleft and incurved; perianth blue, segments 8–12 × 3–7 mm; Oct.–Feb. **Fruit** an oblong to subglobose capsule, 4–6 mm long. Grassland, streambanks.

MsGr

### **montana** Baker

Rhizomatous, perennial herb, up to 400 mm high. **Leaves** with basal ones spreading; cauline leaves 2 or more, coriaceous, apices of upper cauline leaves incurved. **Flowers**: bracts very broadly ovate; perianth bright blue, segments 8.0–12.5 × 4.0–8.5 mm; Nov. **Fruit** an ovoid capsule, 6.0–7.5 mm long, dark brown and black. Moist grassland.

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### **torulosa** Klatt

*A. woodii* N.E.Br.

Rhizomatous, perennial herb, up to 1.4 m high. **Leaves** with basal ones narrowly spread; cauline leaves 2 or more, blade coriaceous, apices of upper blades hyaline and fimbriate. **Flowers**: bracts with finely lacerated apices; perianth pale blue to deep mauve, segments 8–10 × 3–6 mm; Dec.–Mar. **Fruit** an oblong capsule, 5–8 mm long. Mountain grassland. *Wood's aristea*; *blousuurkanol* (A); *khahla*, *lethepu-le-lenyenyane* (SS); *umlozi omncane* (Z).

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## **Babiana** Ker Gawl. (sthn Afr.: 88 spp.)

### Key to species:

[after Goldblatt & Manning: 12 (2007)]

Perianth shades of blue to violet with white markings on lower segments; filaments 10–15 mm long; flowering mainly Feb.–May . . . . . **B. bainesii**
Perianth shades of yellowish to buff-coloured; filaments 15–18 mm long; flowering mainly Jun.–Sep. . . . . **B. hypogea**

### **bainesii** Baker

*B. hypogea* Burch. var. *longituba* G.J.Lewis

Cormous geophyte, up to 250 mm high. **Leaves** with blade linear to sword-shaped, pleated, densely hairy. **Flowers**: arising below ground; zygomorphic; filaments 10–15 mm long; perianth with tube 33–55(–70) mm long, dorsal segment 30–50 mm long, blue to violet with white markings on lower segments; Feb.–May. Stony or sandy slopes, flats in dry grassland and bush.

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### **hypogea** Burch.

*B. falcata* G.J.Lewis
*B. flavida* G.J.Lewis

Cormous geophyte, up to 150 mm high. **Leaves** with blade linear to falcate, slightly pleated, sparsely hairy. **Flowers**: arising below ground; zygomorphic; filaments mostly 15–18 mm long; perianth with tube 30–40 mm long, dorsal segment 24–40 mm long, greenish yellow to buff-coloured, dry segments often with broad purple median streak; Jun.–Sep. Grassland. *Bobbejaanuintjie*, *ertappeluintjie* (A).

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## **Crocosmia** Planch. (sthn Afr.: 7 spp.)

### Key to species:

[after Goldblatt *et al*.: 66 (2004)]

1a Perianth tube < twice length of segments . . . . . **C. aurea**
1b Perianth tube at least twice length of segments . . . . . 2
2a Branches of panicle strongly zigzagging in upper part; perianth up to 75 mm long; plants in large clumps . . . . . **C. paniculata**
2b Branches of spike straight or faintly zigzagging; perianth 70–90 mm long; plants solitary . . . . . **C. pearsei**

### **aurea** (Pappe ex Hook.) Planch. subsp. **aurea**

Geophyte, up to 1 m high. **Leaves** with blade linear to narrowly ovate, usually up to 20 mm wide, veins many, closely spaced. **Flowers**: in spikes exceeding leaves; peduncle ribbed, usually 3- or 4-branched; stamens and style widely exserted; perianth with tube 13–20(–27) mm long, segments 30–35(–40) mm long, salver-shaped, spreading or recurved, bright golden-orange or reddish orange, without dark blotches on inner segments; Feb., Mar. Forest margins, wooded kloofs, riverbanks. *Falling stars*, *montbretia*; *umlunge*, *udwendweni* (Z).




### **paniculata** (Klatt) Goldblatt

*Curtonus paniculatus* (Klatt) N.E.Br.

Geophyte, up to 1.8 m high, plants in large clumps. **Leaves** with blade plicate, 400–600 × 25–50 mm. **Flowers**: branches of panicle strongly zigzagging in upper part; perianth narrowly funnel-shaped, up to 75 mm long, tube at least twice length of segments, orange-red, rusty red or brownish orange; Jan., Feb. Forest margins, grassland, moist places. *Falling stars*, *zigzag crocosmia*; *vallende sterretjies*, *waaierlelie* (A); *khahla-ea-Bokone*, *moloke* (SS); *umlunge*, *udwendweni* (Z).




### **pearsei** Oberm.

Geophyte, up to 1 m high, solitary or in small clumps. **Leaves** with blade pleated. **Flowers**: in a spike held horizontally, straight to slightly zigzagging; perianth hooded, funnel-shaped, 70–90 mm long, red-orange; Jan., Feb. Rocky grassland.




## **Dierama** K.Koch (sthn Afr.: 37 spp.)

### Key to species:

[after Hilliard *et al*.: 41 (1991)]

1a Inflorescences erect or suberect; bracts 10–20 × 3–6 mm, whitish to orange-buff-coloured and slightly flecked all over, tip of each reaching to or beyond base of second bract above it . . . . . **D. tysonii**
1b Either inflorescences pendulous or bracts broader or differently coloured or tip of each not reaching to or beyond base of second bract above it . . . . . 2

2a Flowering stem 60–110 mm high, growing singly or a few tufted together; bracts 14–23 × 7–11 mm, dark brown with strongly contrasting white shoulders; perianth 15–23 mm long; stigmas held 2.5–6.0 mm below top of perianth. . . . . **D. pictum**
2b Combination of characters not as above . . . . . 3
3a Plants usually forming large clumps; terminal spike 4–7-flowered; conflorescences mostly 2–5-flowered; bracts 13–20 × 6–12 mm, main veins 5 each side of midvein, intermediates strongly developed or not; perianth 19–29 mm long, tube 5–7 mm, segments 13–20 × 5–8 mm; stigmas 7–12 mm below top of perianth . . . . . .**D. dracomontanum**
3b Combination of characters not as above . . . . . 4
4a Bracts 8–14 mm broad, tip of each bract reaching to or below base of second bract above it;; anthers (7–)8–12 mm long; perianth 26–35 mm long . . . . . .**D. robustum**
4b Bracts 5–8 mm broad, tip of each bract reaching at least to base of second bract above it; anthers 5–8 mm long; perianth up to 15 mm long . . . . . **D. cooperi**

## **cooperi** N.E.Br.

Cormous herb, up to 2 m high; plants solitary, in small tufts, or in extensive colonies. **Flowers**: bracts 5–8 mm broad, veins crowded, tip of each bract reaching at least to base of second bract above it; anthers 5–8 mm long; perianth with segments up to 15 × 6.5 mm, bright pink, sometimes white; Nov.–Feb. Grassland.

MsGr

## **dracomontanum** Hilliard

Cormous herb, up to 1 m high; plants in large clumps. **Leaves** with blade up to 650 × 3–6 mm. **Flowers**: inflorescences pendulous, 2–4 branches with 2–5-flowered; bracts solid dark or red-brown, shoulders broad, 13–20 × 6–12 mm, white or heavily flecked, 5 main veins each side; stigmas 7–12 mm below top of perianth; perianth 19–29 mm long, tube 5–7 mm, segments 13–20 × 5–8 mm, light to dark rose-pink, coral-coloured or red, sometimes purple pink; Nov.–Feb. Grassland, sometimes dominating mountain slopes. *Drakensberg hairbell*; *lethepu* (SS).

MsGr

## **pictum** N.E.Br.

Cormous herb, up to 1 m high; plants solitary or few tufted together. **Flowers**: coflorescences (1–)3–6; lowermost peduncles mostly 60–110 mm long; bracts 14–23 × 7–11 mm, dark brown with strongly contrasting white shoulders, tip of each reaching to or beyond base of second bract above it, main veins 6–8 each side of midvein; stigmas held 2.5–6.0 mm below top of perianth; perianth 15–23 mm long, light to dark mauve-pink, magenta or deep wine-red; Nov.–Feb. Rocky grassland.

MsGr

## **robustum** N.E.Br.

Cormous herb, up to 2 m high; plants solitary or in small clumps. **Leaves** with blade 400–1 200 × 4–8 mm. **Flowers**: inflorescence pendulous with 3–7 branches; bracts (18–)20–35 × 8–14 mm, tip of each reaching to or beyond base of second bract above it, whitish heavily flecked brown in upper parts; anthers (7–)8–12 mm long; perianth 26–35 mm long, creamy white to pale pink or mauve; Dec.–Feb. Grassland. *Lethepu* (SS).

DrGr MsGr Zastr

**tysonii** N.E.Br.

Cormous herb, up to 0.85 m high. **Leaves** 300–600 mm long. **Flowers**: inflorescences erect or suberect; peduncle 0.45–0.85 m high; coflorescences 4–7-flowered; bracts 10–20 × 3–6 mm, translucent, whitish to orange-buff-coloured and slightly flecked all over, tip of each reaching to or beyond base of second bract above it; perianth 19–23 mm long, tube 5–6 mm long, light to deep pink; Sep., Oct. Open grassland.

MsGr

## **Freesia** Klatt (sthn Afr.: 15 spp.)

**andersoniae** L.Bolus

Cormous geophyte, up to 0.2 m high. **Stem** erect, simple or with 1 or 2 branches. **Leaves** several, with blade linear-ensiform, (50–)100–180 mm long, acute. **Flowers**: in horizontal 2–5-flowered spikes; spikes 50–65 mm long; bracts 7–10(–12) mm long, dry-membranous, brown-veined, rust-tipped; inner bract ± 1 mm longer, acute; perianth with tube 36–44 mm long, curved towards apex of narrow basal part, inner segments 12–15 × 8–9 mm, ovate; outer segments up to 7 mm wide, white to cream-coloured with yellow markings on lower segments, purple lines in throat; Aug.–Oct. Rocky koppies and flats. *Bergaandblommetjie* (A). Figure 4, p. viii.

KarSh

## **Gladiolus** L. (sthn Afr.: 164 spp.)

### Key to species:

[after Goldblatt & Manning: 60–62 (1998)]

1a Leaf blade with margins and midrib strongly thickened; oval in section with four narrow longitudinal grooves . . . . . 2
1b Leaf blade with margins and midrib lightly or not at all thickened; more-or-less plane in section . . . . . 3
2a Flowers in a 2–7-flowered spike . . . . . **G. longicollis** subsp. **longicollis**
2b Flowers in a 1- or 2-flowerd spike . . . . . **G. longicollis** subsp. **platypetalus**
3a Leaf sheaths distinctly hairy; blade reduced, shorter than sheaths or vestigial; perianth tube up to 1.5 × as long as bracts . . . . . **G. woodii**
3b Leaf sheaths glabrous or at most velvety to minutely scabrid, but then perianth tube at least twice as long as bracts and blade well developed and longer than sheaths . . . . . 4
4a Perianth carmine to red with median streaks or spots on lower segments . . . . . **G. saundersii**
4b Perianth various colours except carmine to red, and with various markings on lower segments . . . . . 5
5a Perianth uniformly pigmented in shades of pink to mauve or salmon-coloured, lower segments with longitudinal reddish streaks, tube 25–50 mm long . . . . . 6
5b Perianth not as above, long-tubed species white or speckled, never pink. . . 7
6a Margins of inner bracts united below around ovary . . . . . **G. oppositiflorus**
6b Margins of inner bracts free. . . . . **G. microcarpus**
7a Leaf margins not thickened or raised; leaves linear, up to 10 mm wide . . . . 8
7b Leaf margins thickened or raised; leaves lanceolate, > 10 mm wide. . . . . 10
8a Perianth tube 28–50 mm long, at least 1.5 × as long as dorsal segment . . . . . **G. robertsoniae**

8b Perianth tube 9–28 mm long, < 1.5 × as long as dorsal segment . . . . . 9
9a Filaments strongly arched, 20–25 mm long; dorsal segment narrowly oblong . . . . . **G. orchidiflorus**
9b Filaments ascending to slightly curved, 7–16 mm long; dorsal segment spathulate . . . . . **G. permeabilis** subsp. **edulis**
10a Perianth tube 25–70 mm long; filaments 20–40 mm long . . . . . 11
10b Perianth tube 10–35 mm long; filaments usually 10–18 mm long, rarely up to 22 mm but then perianth nodding and bell-shaped and tube 18–20 mm long . . . . . 12
11a Dorsal segment 35–50 × 22–30 mm, horizontal and hooded over stamens; anthers 12–16 mm long . . . . . **G. dalenii** subsp. **dalenii**
11b Dorsal segment 25–30 × 14–16 mm, ascending, not hooded over stamens; anthers 9–11 mm long . . . . . **G. antholyzoides**
12a Spikes distichous and erect; margins of inner bracts united around ovary . . . . . 13
12b Spikes never distichous, often inclined; margins of inner bracts free to base . . . . . 15
13a Leaves forming a tight basal fan shorter than spikes; leaf blade with many fine parallel veins and without a prominent midrib; plants never hairy. . . . . **G. elliotii**
13b Leaves narrow and usually exceeding spikes, in a lax fan usually arising some distance above ground; leaf blade always with a prominent midrib and sometimes secondary veins also well developed; plants usually hairy . . . . 14
14a Plants always glabrous . . . . . **G. sericovillosus** subsp. **calvatus**
14b Plants always conspicuously hairy . . . . . **G. sericovillosus** subsp. **sericeovillosus**
15a Floral bracts imbricate, 2–3 internodes long, somewhat inflated and folded on midline, 40–80 mm long; perianth darkly speckled to spotted over entire surface on a pale background . . . . . **G. ecklonii**
15b Floral bracts slightly < 1 or 2 internodes long, thus sometimes overlapping, not or hardly inflated and not or barely folded on midline, 12–40 mm long; perianth uniformly pigmented, rarely minutely speckled over entire surface on a pale background . . . . . 16
16a Perianth 40–55 mm long . . . . . **G. papilio**
16b Perianth 23–38(–40) mm long . . . . . **G. crassifolius**

## **antholyzoides** Baker

Cormous geophyte, up to 0.9 m high. **Leaves** 5–8, lower 3–5 basal, forming a tight fan, remaining leaves smaller, shorter, uppermost sheathing for most of its length. **Flowers**: in a 8–12-flowered spike; anthers 9–11 mm long, pale yellow; perianth 55–70 mm long, tube 28–40 mm, dorsal segment 25–30 × 14–16 mm, ascending, not hooded over stamens, pale lemon-yellow to deep yellow; Oct.–Dec. Moist areas, sometimes fairly dry, sandy soil.

DrGr

## **crassifolius** Baker

*G. dieterlenii* E.Phillips

Cormous geophyte, up to 1 m high. **Leaves** 4–8 or several; blade linear, yellowish green, with raised yellow ribs and margins. **Flowers**: in a 16–22-flowered spike; bracts 12–40 mm long; anthers 7–8 mm long, pale lilac to purple; perianth 23–38(–40) mm long, lower lateral lobes short with a broad dark blotch near apex, pink, red, orange, mauve, purple or white; Feb.–Apr. Grassy plains and slopes. *Thick-leaved gladiolus*; *khahla-e-nyenyane* (SS); *igulusha*, *ingangulazi* (Z).

DrGr MsGr

**dalenii** Van Geel subsp. **dalenii**

*G. psittacinus* Hook.f.

Cormous geophyte, up to 1.5 m high. **Leaves** 4–6(7), blade narrowly ovate to linear. **Flowers**: in a 3–8-flowered spike; anthers 12–16 mm long, yellow to brownish; perianth 65–100 mm long, tube shorter or ± as long as upper lobe, lobes well developed, dorsal segment 35–50 × 22–30 mm, horizontal and hooded over stamens, variously coloured; Nov.–Feb. Grassland, rocky ridges, vleis. *African gladiolus*, *wild gladiolus*; *papegaaigladiolus*, *wildeswaardlelie* (A); *khahla-e-kholo* (SS); *isidwi esibomvu*, *uhlakahle*, *udwendweni* (Z). Figure 11D, p. 8.

DrGr | MsGr | Zastr

**ecklonii** Lehm.

Cormous geophyte, up to 0.5 m high. **Leaves** sword-shaped (ensiform), fairly short. **Flowers**: in a 8–12-flowered spike; bracts boat-shaped, imbricate, somewhat inflated and folded on midline, 40–80 mm long; anthers 7–10 mm long, cream-coloured; perianth directed outward and forward (porrect) with a short tube, white, speckled with red or maroon, rarely pink; Nov.–Apr. Grassy slopes. *Sheathed gladiolus*; *kxahla*, *litšoantšoang*, *mokhabebe* (SS).

DrGr | MsGr

**elliotii** Baker

*G. rigidifolius* Baker

Cormous, glabrous geophyte, up to 0.8 m high; without hairs. **Leaves** in a compact fan, shorter than spikes, acute with many fine close-set similar nerves, without prominent midrib. **Flowers**: in a 14–20-flowered spike; bracteole with 2 long teeth; anthers > 12 mm long, mauve; perianth white, speckled with purple or rarely plain white; Nov.–May. Grassland.

VreDm | DrGr | MsGr | KarSh

**longicollis** Baker subsp. **longicollis**

Cormous geophyte, up to 0.6 m high. **Leaves** 3, upper 2 sheathing stem, terete, blade with margins and midrib thickened, 4-grooved. **Flowers**: in a 2–7-flowered spike; long-tubed, widening from base to apex; anthers 10–12 mm long, purplish; perianth brown to cream-coloured with brownish speckling; Sep., Oct. Sandstone slopes. *Honey-flower*; *aandblom* (A); *khahle-e-nyenyane*, *khukhurupa* (SS); *umbejo* (Z).

DrGr | MsGr | Zastr

**longicollis** Baker subsp. **platypetalus** (Baker) Goldblatt & J.C.Manning

*G. praelongitubus* G.J.Lewis

Cormous geophyte, up to 0.8 m high. **Leaves** terete; 4-grooved; glabrous. **Flowers**: in a 1- or 2-flowered spike; anthers 11–13 mm long, purplish; perianth with tube slightly widened above, slightly constricted at throat, > 60 mm long, segments usually fairly short and acute, outer often longer than inner, white, cream-coloured or yellow, often with dark reddish brown or purple spotting and dark median lines; Dec., Jan. Montane grassland.

MsGr

**microcarpus** G.J.Lewis

Cormous geophyte, up to 1 m high. **Leaves** in a soft fan, forming a sheathing stem, with fine gold-coloured hairs on prominent ribs. **Flowers**: in a 8–12-flowered, pendulous spike; spike

axis and bracts smooth; margins of inner bracts free; anthers > 8 mm long, whitish to lilac; perianth with tube long, narrow, 35–40 mm, dorsal segments 35–40 mm long, tips narrowing to slender points, pink or mauve with darker stripes on lower 3 segments; Dec.–Feb. Hanging from moist crevices in cliffs, rocky outcrops.

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**oppositiflorus** Herb.

*G. salmoneus* Baker

Cormous geophyte, up to 1 m high. **Leaves** arranged in a fan, sheathing stem below, velvety hairy between raised veins. **Flowers**: in a 7–15-flowered, erect spike, in 2 ranks, 65–110 mm long; margins of inner bracts united below around ovary; anthers ± 11 mm long, light mauve; perianth with tube 25–50 mm long, pale to deep pink to deep salmon-coloured, with dark lines on segments, blotches in throat; Dec.–Mar. In clumps, on damp, rocky slopes. *Salmon gladiolus*, *Transkei gladiolus*; *Transkei-swaardlelie* (A).

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**orchidiflorus** Andrews

Cormous geophyte, up to 0.8 m high. **Leaves** with blade linear to sword-shaped. **Flowers**: in a 5–12-flowered spike; bilabiate; anthers 5–11 mm long, lilac to purple, strongly arched; perianth with tube 9–28 mm long, dorsal segment narrowly oblong, greenish to purple with dark purple markings, fragrant; Aug.–Oct. Clay and sandstone soils. *Grey kalkoentjie*; *groenkalkoentjie*, *vaalkalkoentjie* (A).

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**papilio** Hook.f.

*G. purpureo-auratus* Hook.f.

Cormous geophyte, up to 0.9 m high. **Leaves** superposed, not forming a fan. **Flowers**: in a sharply inflexed and strongly inclined, 4–8-flowered spike, 40–55 mm long; bracts 12–40 mm long; anthers 8–10 mm long, purplish or cream-coloured; perianth recurved, nodding, with a short tube and gaping campanulate limb, lower lateral lobes with a oblong dark area, bright to dull yellow or purple with a dark red or purple central band; Dec.–Mar. Marshy areas or damp, grassy places. *Butterfly gladiolus*; *ibutha*, *igulusha* (Z).

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**permeabilis** D.Delaroche subsp. **edulis** (Burch. ex Ker Gawl.) Oberm.

*G. edulis* Burch. ex Ker Gawl.

Cormous geophyte, up to 0.5 m high. **Leaves** 4–7 with 4–6 basal ones forming a fan; blade linear. **Flowers**: in a 4–8-flowered spike; bracts without red margins, rachis glabrous; anthers 7–16 mm long, ascending to slightly curved, dull cream-coloured to grey-purple; perianth with lobes caudate and spreading, occasionally sarmentose, dorsal segment spathulate, white to cream-coloured, often with a deep pink, crimson, maroon or purplish median line; Nov.–Mar. **Seed** winged. Grassy slopes, sandy flats, riverbanks, black turf, limestone areas. *Patrysuintjie* (A).

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**robertsoniae** F.Bolus

Cormous geophyte, up to 450 mm high.. **Leaves** with blade linear, soft. **Flowers**: salver-shaped; in a 4–8-flowered spike; anthers 5–9 mm long, white or light mauve; perianth with tube

28–50 mm long, longer than segments, mauve or white, tinged with pale mauve or lilac, 3 lower lobes speckled or striped with red or mauve near base; Oct.–Dec. Grassland, shale slopes.

DrGr

**saundersii** Hook.f.

Cormous geophyte, up to 0.6 m high, in colonies. **Leaves** firm, erect, in a fan, 15–25 mm wide, midrib thickened, veins prominent. **Flowers**: in a 4–9-flowered, erect spike; ± 60 mm wide, downward facing, strongly hooded; anthers 15–16 mm long, purple; perianth bright red with broad white mark and speckling on 3 lower segments; Jan.–Mar. Fairly dry rocky places. *Saunders' gladiolus*, *Lesotho lily*; *khahla-ea-Maloti* (SS).

MsGr

**sericeovillosus** Hook.f. subsp. **calvatus** (Baker) Goldblatt

*G. ludwigii* Pappe ex Baker var. *calvatus* Baker

*G. sericeovillosus* Hook.f. var. *glabrescens* L.Bolus

Cormous geophyte, up to 2 m high; glabrous. **Leaves** narrow and exceeding spikes, in a lax fan, usually some distance above ground; blade with a prominent midrib, sometimes secondary veins too. **Flowers**: in a 12–20-flowered spike; rachis and bracts glabrous or sparsely ciliate; bracteoles often tubular below or occasionally with free margins; anthers 8–10 mm long, yellow; perianth cream-coloured, yellow or in various shades of pink, lavender-coloured or wine-red, plain or faintly spotted; Feb.–Apr. Grassland.

VreDm

**sericeovillosus** Hook.f. subsp. **sericeovillosus**

*G. ludwigii* Pappe ex Baker var. *ludwigii*

Cormous geophyte, up to 2 m high, conspicuously hairy. **Leaves** narrow and exceeding spikes, in a lax fan, usually some distance above ground; blade with a prominent midrib, sometimes secondary veins too. **Flowers**: in a 12–20-flowered spike; bracteoles with free margins; perianth cream-coloured, yellow or in various shades of pink, lavender-coloured or wine-red, plain or faintly spotted; Dec.–Feb. Mountain grassland or in black turf. *Large speckled gladiolus*; *bloupypie* (A); *udwendweni*, *isidwi esincana*, *umlunge* (Z).

VreDm MsGr

**woodii** Baker

Cormous, hairy geophyte, up to 0.6 m high. **Leaves** (2)3 or 4, sheaths distinctly hairy, produced after flowering period. **Flowers**: in a 6–11-flowered spike; ± 30 mm long, bilabiate, with 3–5 short sheathing bracts; stamens unilateral and arcuate; anthers 6–9 mm long, blackish; perianth with dorsal segment often larger than lower 3, lower lateral segments distinctly clawed, claws and limbs often channelled, maroon or pale yellow; Oct.–Dec. Montane grassland.

MsGr

## **Hesperantha** Ker Gawl. (sthn Afr.: 68 spp.)

### Key to species:

[after Goldblatt: 400–402 (2003)]

1a Flowers nodding; perianth white to cream-coloured, outer segments usually brown on outside, tube curved just below apex . . . . . 2

1b Flowers not nodding; perianth variously pink to mauve, red, or white to creamy yellow, sometimes outer segments darker on outside, tube mostly straight . . . . . 3
2a Perianth tube 18–30 mm long; plants flowering in spring . . . . . **H. longicollis**
2b Perianth tube 8–15 mm long; plants flowering in early to mid summer . . . . . **H. radiata**
3a Perianth produced in spring when foliage leaves are absent or partly emergent; leaves fully developed after flowering, produced on separate shoots . . . . . 4
3b Perianth produced in spring, summer or autumn, always bearing fully developed foliage leaves on flowering stem . . . . . 5
4a Leaves 2 or more, ± terete; perianth tube 6–10 mm long; segments white or pale pink inside, outer segments slightly to strongly marked purple to brownish on outside. . . . . **H. schelpeana**
4b Leaf solitary, falcate; perianth tube 20–27 mm long; segments uniformly whitish cream-coloured . . . . . **H. altimontana**
5a Perianth tube (14–)18–60 mm long, sometimes curved near apex; seeds often with a prominent wing or thread-like appendage at one or both ends . . . . . 6
5b Perianth tube 3–15(–22) mm long, always straight; seeds globose or slightly angled, sometimes ridged on angles but never winged . . . . . 8
6a Filaments 6–12 mm long . . . . . **H. coccinea**
6b Filaments 3–6 mm long . . . . . 7
7a Leaves scabrid-pubescent; stamens erect and style branches evidently remaining suberect and noticeably shorter than anthers . . . . **H. pubinervia**
7b Leaves glabrous; stamens and style branches ascending to spreading, style branches as long as or longer than stamens . . . . . **H. longituba**
8a Perianth pink or white; flowering in spring before rainy season . . . . . 9
8b Perianth pink to mauve; flowering in summer and autumn in wet season 10
9a Perianth tube mostly 14–22 mm long, white; flowers open late afternoon, close after dark. . . . . **H. longituba**
9b Perianth tube mostly 4–12 mm long, white or pink to mauve-pink; flowers open during the day, close late afternoon . . . . . **H. candida**
10a Perianth tube 3–6 mm long . . . . . **H. glareosa**
10b Perianth tube mostly 6–13(–15) mm long . . . . . .11
11a Leaves (3)4, with the lower 2 basal, usually ± $^{1}/_{2}$–$^{2}/_{3}$ as long as stem; anthers 5–9 mm long, pollen yellow; perianth tube (4.5–)6.0–12.5 mm long . . . . . **H. baurii** subsp. **baurii**
11b Leaves 4 or 5, the lower 3 basal, often ± as long as stem or slightly longer; anthers 2.3–6.0 mm long, pollen white; perianth tube 7–12(–15) mm long . . . . . 12
12a Segments 7–8 mm long, reverse of outer segments pale greenish towards base and with darker green longitudinal veins; perianth tube 7–9 mm long; anthers 2.5–4.0 mm long; style branches unusually short . . . . **H. brevistyla**
12b Segments 12–16 mm long, reverse of outer segments not pale green with dark veins, ± uniformly pale pink; perianth tube 12–15 mm long; anthers 4.5–5.5 mm long; style branches 10–12 mm long . . . . . **H. leucantha**

## **altimontana** Goldblatt

Cormous geophyte, up to 120 mm high. **Leaf** solitary, falcate, produced after flower, on a separate shoot. **Flowers**: solitary; perianth with tube 20–27 mm long, segments 14–22 × 6–9 mm, whitish cream-coloured; Oct. Stony open ground, at high altitudes.

MsGr

**baurii** Baker subsp. **baurii**

Cormous geophyte, up to 0.75 m high. **Leaves** (3)4, lower (2)3 basal or subbasal; blade usually 2.5–4.0 mm broad, firm to leathery; midrib and margins slightly raised. **Flowers**: mostly 5–12 in a spike; anthers 5–9 mm long; pollen yellow; perianth with tube (4.5–)6.0–12.5 mm long, segments bright pink; Jan.–Apr. Moist, open grassland. *Khahla-e-nyenyane*, *khukhu-e-nyenyane*, *qelo* (SS); *isidwa* (Z).




**brevistyla** Goldblatt

Cormous geophyte, up to 160 mm high. **Leaves** 4 or 5, lower 3 or 4 basal; blade 2–4 mm wide, firm; midrib and margins slightly raised. **Flowers**: 1–4 in a spike; anthers 2.5–4.0 mm long; pollen white; style branches ± 6 mm long; perianth with tube 7–9 mm long, segments 7–8 mm long and pale pink, outer ones pale greenish towards base, with darker green longitudinal veins; Feb., Mar. Basalt slopes and rocky pavements in shallow damp soil.




**candida** Baker

*H. vernalis* Hilliard & B.L.Burtt

Cormous geophyte, up to 300 mm high. **Leaves** with blade narrowly oblong-ovate, 2–6 mm wide; upper part of blade often withered or missing, raised midrib hemispherical in outline. **Flowers**: 2–6 in a spike, open during the day, close late afternoon; perianth with tube (4–)9–12 mm long, tube straight, white or pink to mauve-pink; Mar., Apr. Grassland, bushveld, rock ledges, between boulders.




**coccinea** (Backh. & Harv.) Goldblatt & J.C.Manning

*Schizostylis coccinea* Backh. & Harv.

*S. pauciflora* Klatt

Rhizomatous geophyte, up to 0.75 m high; sometimes with axillary cormlets. **Leaves** with blade linear, grass-like, with a distinct midrib. **Flowers**: 6–8, ± 65 mm in diameter, arranged in a lax, distichous spike; filaments 6–12 mm long; anthers 3–9 mm long, yellow to whitish; perianth with segments pink or red; Nov.–Apr. Marshy grassland, stream and riverbanks. *Scarlet river lily*, *crimson flag*; *rooirivierlelie* (A); *khahlana* (SS).




**glareosa** Hilliard & B.L.Burtt

Cormous geophyte, up to 200 mm high. **Leaves** 4, lower 3 basal and firm; blade 0.75–1.50(–2.00) mm broad, midrib rounded in outline. **Flowers**: perianth with tube 3–6 mm long, tube straight, segments 10.0–14.5 mm long, bright pink; Jan.–Mar. Damp turf around and between rock sheets, marshy turf, in silty and gravelly places.




**leucantha** Baker

Cormous geophyte, up to 200 mm high. **Leaves** 4 or 5, lower 3 basal, weak and drooping. **Flowers**: anthers 4.5–5.5 mm long; style branches 10–12 mm long; perianth with tube 12–14(–

15) mm long, segments 12–16 mm long, ± uniformly pale pink; Jan.–Apr. In shade of rocks, on cliffs in kloofs, damp places.




**longicollis** Baker

*H. sabiensis* N.E.Br. ex R.C.Fost.
*H. widmeri* Beauv.

Cormous geophyte, up to 300 mm high. **Leaves** 5 or 6, 2 basal, linear, 3 or 4 upper ones reduced in size. **Flowers**: laxly spaced, nodding, in a few-flowered spike; bracts erect to patent; perianth tube curved, 18–30 mm long with a reddish tinge, segments wine-red and white; Aug., Sep. Grassland.




**longituba** (Klatt) Baker

Cormous geophyte, up to 220 mm high. **Leaves** with blade broad, leathery, glabrous, margins and midrib prominent. **Flowers**: open late afternoon and close after dark; stamens erect, filaments 3–6 mm long, anthers 3–9 mm long, yellow to whitish; style branches ascending to spreading, as long as or longer than stamens; perianth with tube 14–22 mm long, segments 15–20 mm long, white; Aug.–Oct. Dolerite ridges.




**pubinervia** Hilliard & B.L.Burtt

Cormous geophyte, up to 300 mm high. **Leaves** with blade linear, scabrid-pubescent, midrib prominent. **Flowers**: 1–3; stamens erect; filaments 3–6 mm long; anthers 3–9 mm long, yellow to whitish; style branches suberect, shorter than anthers; perianth with segments 14–18 × 3.5 mm, dull salmon-pink, pale yellow-green inside tube; Feb., Mar. Rocky grassland.




**radiata** (Jacq.) Ker-Gawl.

*H. tysonii* Baker

Cormous geophyte, up to 400 m high. **Leaves** with blade short, linear, fleshy. **Flowers**: nodding; in a 5–10-flowered spike; bract margins united around stem for ± half its length; perianth with tube curved, 8–15 mm long, slightly exceeding bracts, segments white to cream-coloured, red to brown on reverse; Nov.–Jan. Sandstone granite and clay soils. *Evening flower*; *aandblom*, *bontrokkie* (A); *khahlana*, *nala-la-nonyana* (SS).




**schelpeana** Hilliard & B.L.Burtt

Cormous geophyte, up to 10 mm high. **Leaves** 2 or more, ± terete, produced after flowers, on a separate shoot. **Flowers**: solitary; perianth with tube 6–10 mm long, segments 14–22 mm long; pale pink to white inside, slightly to strongly marked purple to brownish outside; Oct. Short wet turf, seasonally waterlogged, stony ground.



## **Lapeirousia** Pourr. (sthn Afr.: 37 spp.)

### **plicata** (Jacq.) Diels subsp. **plicata**

Cormous geophyte. **Leaves** basal; blade linear, 50–200 × 1–3 mm, falcate, conspicuously ribbed, margins entire. **Flowers**: actinomorphic; true bracts as long as flowers or much longer, usually recurved or falcate; perianth with segments < 10 mm long, blue to white; Jul.–Sep. Dry shale flats, grassland. *Haascabong* (A).

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## **Moraea** Mill. (sthn Afr.: 177 spp.)

### Key to species:

[based on Goldblatt: 432 (1981); Goldblatt: 24 (1986); Goldblatt: 1 (1993)]

1a Style branches not petaloid, style branch crests, if present inconspicuous or plumose-fimbriate; both inner and outer segments with fairly inconspicuous nectar guides . . . . . 2
1b Style branches petaloid, terminating in paired crests with entire margins; only outer segments with a nectar guide at base of limb . . . . . 3
2a Outer segments 18–25 mm long, 5–9 mm wide . . . . . **M. pallida**
2b Outer segments 29–43 mm long, 14–18 mm wide. . . . . **M. cookii**
3a Ovary elongate-cylindric, ± sessile and included within spathes, tapers into a tube-like beak . . . . . **M. simulans**
3b Ovary globose to oblong, long-pedicellate, exserted or included near top of spathes, tubular above . . . . . 4
4a Plants acaulescent; leaves several and hardly distinct from inflorescence spathes . . . . . **M. falcifolia**
4b Plants with a produced aerial stem; leaves solitary or if > 1, then distinct from inflorescence spathes . . . . . 5
5a Foliage leaves > 1 . . . . . **M. polystachya**
5b Foliage leaves solitary . . . . . 6
6a Perianth with outer segments at least 35 mm long, inner segments entire, with an expanded blade. . . . . 7
6b Perianth with outer segments < 35 mm long, inner segments either entire, or tricuspidate, linear or lacking . . . . . .11
7a Cataphylls of mature plants split regularly into rigid, blackish-fibres, innermost cataphyll not forming an open network above . . . . . **M. robusta**
7b Cataphylls of mature plants brown to black, entire or irregularly broken, but not forming rigid vertical bristles, innermost cataphyll sometimes forming a pale open fibrous network above . . . . . 8
8a Style crests marked with single dark blotch at base; plants of running streams . . . . . **M. huttonii**
8b Style crests self-coloured; not growing in water . . . . . 9
9a Perianth pinkish or at least style crests deep pink. . . . . **M. carnea**
9b Perianth yellow to white . . . . . 10
10a Cataphyll forming a pale, fibrous network around base . . . . . **M. alticola**
10b Cataphyll without a pale fibrous network above . . . . . **M. spathulata**
11a Inner segments entire with an expanded blade, usually at least 1.5 mm wide . . . . . 12
11b Inner segments tricuspidate or linear to ciliate, without an expanded limb . . . . . 17

12a Plants leafless when in bloom, or leaf of flowering stem dead; upper lateral inflorescences sessile . . . . . 13
12b Plants with living basal leaf attached to stem. . . . . 14
13a Inner segments < 10 mm long . . . . . **M. alpina**
13b Inner segments > 10 mm long . . . . . **M. stricta**
14a Leaf ± basal . . . . . 15
14b Leaf inserted well above ground near base of branches. . . . . 16
15a Segment claws 2–3 mm long; anthers exceeding style branches and displayed well above segments . . . . . **M. crispa**
15b Segment claws 8–12 mm long; anthers shorter than style branches, concealed by outer segment claws . . . . . **M. elliotii**
16a Capsule spherical; outer spathes brown, < half as long as inner; plants occasionally pubescent. . . . . **M. inclinata**
16b Capsule ovoid to elliptic; outer spathes green or brown, ± half as long as inner ones; plants never pubescent . . . . . **M. elliotii**
17a Inner segments linear to ciliate, not tricuspidate . . . . . **M. modesta**
17b Inner segments tricuspidate . . . . . 18
18a Inner segments comprising a long central cusp and shorter lateral lobes . . . . . 19
18b Inner segments comprising a slender central cusp and long apically expanded lateral lobes . . . . . 20
19a Plants leafless when in bloom, or leaf of flowering stem dead . . . . **M. modesta**
19b Plants with a living basal leaf attached to stem . . . . . **M. trifida**
20a Outer segments narrowly ovate-obovate, reflexed, ± 20 mm long . . . . . **M. brevistyla**
20b Outer segments broadly ovate, spreading, 24–28 mm long . . . . . **M. vigilans**

## **alpina** Goldblatt

Cormous geophyte, up to 120 mm high. **Leaf** solitary, absent or emergent at flowering, not attached to current flowering stem, terete, 0.5 mm wide. **Flowers**: flowering stem simple or few branched; style crests 2–3 mm long; perianth with inner segments < 10 mm long, at least 1.5 mm wide, outer segments 12–16 mm long, dark blue to violet with yellow-orange nectar guides on outer segments; Oct.–Dec. Open rocky sites, low mountain grassland.




## **alticola** Goldblatt

Robust, cormous geophyte, up to 1 m high, base encircled with pale, fibrous network of cataphylls. **Leaf** solitary; blade 15–30 mm wide, flat, margins thickened. **Flowers**: ± 90 mm wide; perianth pale yellow with darker nectar guides on outer segments; Nov.–Jan. In large clumps, in stream gullies, marshy grassland. *Teele-e-kholo* (SS).




## **brevistyla** (Goldblatt) Goldblatt

*M. pubiflora* N.E.Br. subsp. *brevistyla* Goldblatt

Cormous geophyte, up to 350 mm high. **Leaf** solitary; blade 4 mm wide. **Flowers**: borne all on one side; crests linear, 2–3 mm long; perianth with outer segments narrowly ovate-obovate, ± 20 mm long, reflexed, inner segments upright with long lateral cusps obtuse, slender, acute central cusp curving outwards in a wide arc, white, inner segments, claws and nectar guides yellow with brown spots; Nov.–Mar. Grassland, often near streams.



**carnea** Goldblatt

Cormous geophyte, up to 0.5 m high; cataphylls of mature plants brown to black, entire or irregularly broken, but not forming rigid vertical bristles. **Leaf** solitary; 3–6 mm wide, channelled. **Flowers**: style crests deep pink; perianth with outer segments up to 60 mm long, inner segments entire with an expanded blade, cream-coloured, veined and flushed purple to pale red-brown; Nov., Dec. On damp grassy slopes, along streams.




**cookii** (L.Bolus) Goldblatt

*Homeria cookii* L.Bolus

Cormous geophyte, up to 0.6 m high. **Leaf** solitary, sheathing lower stem, channelled and trailing above, 3–6 mm wide. **Flowers**: style branches not petaloid, terminating in paired crests with entire margins; perianth with outer segments 29–43 × 14–18 mm; only outer segments with a nectar guide at base of limb, segment claws short, yellow with darker yellow-speckled centres; Aug., Sep. Rocky sandstone slopes. *Cape tulip*.




**crispa** Thunb.

Cormous geophyte, up to 200 mm high. **Leaf** usually solitary, basal; blade linear, channelled, often lightly twisted, margins crisped. **Flowers**: anthers exceeding style branches and displayed well above segments; style crests vestigial; perianth with segment claws 2–3 mm long, segments subequal, blue-mauve with yellow to orange markings; Oct., Nov. Clay slopes. *Uintjie* (A).




**elliotii** Baker

Cormous geophyte, up to 0.55 m high, without pubescence. **Leaf** solitary, basal or inserted above ground, linear, margins inrolled. **Flowers**: anthers shorter than style branches, concealed by outer segment claws; style branches broad and flat; crests prominent; perianth with outer spathes green or brown, outer and inner segment limbs reflexed, segment claws 8–12 mm long, segments blue-violet with yellow to orange nectar guides on outer segments; Dec.–May. **Fruit** an ovoid to elliptic capsule. Moist grassland, especially in montane habitats in thin rocky soils. *Bloutulp* (A).




**falcifolia** Klatt

Cormous geophyte, up to 50 mm high; plants acaulescent. **Leaves** several, usually falcate; blade with margins undulate. **Flowers**: several basal inflorescences; spathes similar to leaves; filaments up to 6 mm long, joined in lower half; ovary globose to oblong, exserted from spathes; perianth with inner segments 13–20 mm long, segments white with yellow nectar guides on outer segments, dark purple blotches on inner segment limbs; May–Aug. Dry open stony or clay flats, among low bushes.




**huttonii** (Baker) Oberm.

*M. rivularis* Schltr.

Cormous geophyte, up to 1 m high; cataphylls of mature plants brown to black, entire or irregularly broken, but not forming rigid vertical bristles. **Leaves** long, strap-like. **Flowers**: style




**Figure 64.** *Moraea huttonii* (Iridaceae). Artist: R. Collett.

crests marked with a single, dark brown to purple blotch at base; perianth with inner segments erect, bright yellow with deeper yellow nectar guides on outer segments; Oct.–Dec. In large clumps, in or near mountain streams. *Large golden vlei moraea*; *teale-ea-noka* (SS). Figure 64.

| | | | MsGr | | |
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**inclinata** Goldblatt

Cormous geophyte, up to 0.9 m high, occasionally pubescent. **Leaf** solitary, round, much longer than flowering stem, inserted on upper part of stem below flowers. **Flowers**: flowering stem inclining, with 2–4 branches; perianth with outer spathes brown, < $^1/_2$ as long as inner, up to 25 × 10 mm, blue-violet with yellow nectar guides; Dec.–Feb. **Fruit** a spherical capsule. Scattered colonies, in damp grassland. *Nodding wild moraea*; *knikkende wilde-iris* (A).

| | | | MsGr | | |
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**modesta** Killick

Cormous geophyte, up to 200 mm high. **Leaf** solitary, absent at flowering. **Flowers**: perianth with inner segments reduced to linear or ciliate cusps, 3–6 mm long, outer segments 20–27 mm long, claw nearly erect, segments white to pale blue mauve, inner segments and style crests usually dark purple, nectar guides yellow; Sep.–Nov. Dry mountain grassland.

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**pallida** (Baker) Goldblatt

*Homeria glauca* J.M.Wood & M.S.Evans

*H. pallida* Baker

*H. pura* N.E.Br.

Cormous geophyte, up to 400 mm high. **Leaves** solitary, basal, falcate or erect. **Flowers**: style branches not petaloid; perianth with outer segments 18–25 × 5–9 mm, yellow, dark yellow and green, inconspicuous nectar guides; Aug.–Oct. Grassland. *Geeltulp* (A); *teele* (SS); *indlolothi*, *ingqunde* (Z). Figure 24, p. 28.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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**polystachya** (Thunb.) Ker Gawl.

Cormous geophyte, up to 0.8 m high; with a much-branched aerial stem. **Leaves** several; blade linear, 6–12(–20) mm wide, not similar to spathes. **Flowers**: ovary 6–10 mm long, usually exserted from spathes; perianth with outer segments 36–50 mm long, violet to pale blue with yellow to orange nectar guides on outer segments; Mar.–Jun. Open areas, dry karroid slopes. *Uintjie* (A).

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**robusta** (Goldblatt) Goldblatt

*M. galpinii* (Baker) N.E.Br. subsp. *robusta* Goldblatt

Cormous geophyte, up to 0.6 m high; cataphylls of mature plant split regularly into rigid, blackish fibres and innermost cataphyll not forming an open network above. **Leaf** solitary, with blade 4–10 mm wide, thick. **Flowers**: perianth with outer segments 55–57 mm long, pale yellow to white; Nov., Dec. Mountain grassland.

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**simulans** Baker

*Gynandriris cladostachya* (Baker) R.C.Foster
*G. simulans* (Baker) R.C.Foster

Cormous geophyte, up to 400 mm high; cataphylls of mature plant split regularly into rigid, blackish fibres, innermost cataphyll not forming an open network above. **Leaf** solitary, linear, up to 0.7 m long. **Flowers**: style crests 3–6 mm long; filaments united for < a ¼ of their length; ovary elongate-cylindric, ± sessile, included within spathes, tapers into a tube-like beak; perianth with outer segment limb spotted throughout; inner segments 9–20 mm long, pale blue-lilac with darker speckles and yellow nectar guides; Aug.–Oct. Xeric grassland.

VreDm | | DrGr | MsGr | KarSh | Zastr

**spathulata** (L.f.) Klatt

*M. spathulata* (L.f.) Klatt subsp. *saxosa* Goldblatt
*M. spathulata* (L.f.) Klatt subsp. *transvaalensis* Goldblatt

Cormous geophyte, up to 0.9 m high; cataphylls usually dark brown and often unbroken. **Leaf** solitary, flat above, 15 mm wide, twisted. **Flowers**: perianth with outer segments 35–50 mm long, yellow with deep yellow nectar guides on outer segments; Nov.–Feb. Usually in clumps, open grassland, edge of forest or thickets, among rocks. *Yellow tulp*, *mountain moraea*; *grootgeeltulp*, *bergmoraea* (A); *leloele*, *teele-e-kholo* (SS); *ihlamvu elincane*, *ihlamvu lentaba*, *indlolothi*, *ingqunda* (Z).

| | | | MsGr | | |

**stricta** Baker

*M. mossii* N.E.Br.
*M. trita* N.E.Br.

Cormous geophyte, up to 250 mm high. **Leaf** solitary, absent at flowering; blade linear, up to 0.6 m long. **Flowers**: flowering stem erect with 3–6 short branches; style crests ≥ 2 mm long and acute; perianth with segments ≥ 20 × 1.5 mm, pale lilac to blue-violet with yellow-orange spotted nectar guides on outer segments; Jul.–Oct. Open, often stony grassland. *Bloutulp* (A).

| | | DrGr | MsGr | | |

**trifida** R.C.Foster

*M. culmea* Killick

Cormous geophyte, up to 0.55 m high. **Leaf** solitary; usually shorter than flowering stem, attached to stem; blade stiff, hard. **Flowers**: perianth with segments, 15–20 × 6–10 mm; outer segments reflexed, inner segments trilobed with central lobe long and slender, lateral lobes much smaller and obtuse, creamy yellow, spotted brown to green; Oct.–Feb. Solitary in moist grassland, often along seeps and streambanks.

| | | | MsGr | | |

**vigilans** Goldblatt & J.C.Manning

Cormous geophyte, up to 0.7 m high. **Leaf** solitary; blade 4 mm wide. **Flowers**: borne all to one side; crests narrowly triangular, 3–4 mm long; outer segments broadly ovate, 24–28 mm long, spreading or held up to 30°; outer segment claws 7–9 mm long, inner segments erect,

limb tricuspidate, with outer lobes spathulate and erect, inner lobes filiform, arching outwards; segments white, faintly tinged with mauve; Jan., Feb. Steep, moist slopes in basalt outcrops.




## **Romulea** Maratti (sthn Afr.: 74 spp.)

### Key to species:

[after De Vos: 10–37 (1983)]

Basal foliage leaves with blade filiform; perianth yellow. . . . . **R. macowanii** var. **macowannii**
Basal foliage leaves 4-winged, X-shaped in transverse section; perianth not yellow, sometimes with a yellow cup . . . . . **R. camerooniana**

### **camerooniana** Baker

*R. campanuloides* Harms var. *campanuloides*
*R. campanuloides* Harms var. *gigantea* M.P.de Vos
*R. thodei* Schltr.
*R. thodei* Schltr. subsp. *gigantea* M.P.de Vos

Cormous geophyte, up to 250 mm high. **Leaves** terete, with 4 wings, X-shaped in transverse section, all inserted below ground. **Flowers**: solitary on aerial axes; perianth 15–35 mm long, tube shorter than segments, segments lilac to violet, yellow to greenish yellow in centre, darkly veined; Dec.–Mar. Montane grassland, amongst rocks.




### **macowanii** Baker var. **macowanii**

Cormous geophyte, up to 400 mm high. **Leaves** slender; blade filiform, 150–400 × ± 1 mm. **Flowers**: perianth with a narrow tube, widened in upper part, 13–33 mm long, segments 8–15 mm wide, golden-yellow becoming orange at base, 3 outer segments brownish purple outside; Jan.–Mar. In large colonies on high plateaux, wet turf. *Macowan's romulea*; *khukhu* (SS).




## **Syringodea** Hook.f. (sthn Afr.: 8 spp.)

### **bifucata** M.P.de Vos

*S. bicolor* Baker

Cormous geophyte, up to 150 mm high. **Corm** with a very small ridge on a pointed base. **Leaves** several; blade filiform, 60–200 × 0.5–1.5 mm. **Flowers**: perianth with throat yellow or orange-yellow, tube 45–70 mm long, segments 65–100 mm long, pale to bright violet and orange-yellow; Mar. Grassland. *Cape crocus*.



## **Tritonia** Ker Gawl. (sthn Afr.: 26 spp.)

### Key to species:

[after De Vos: 90 (1999)]

1a Spike dense; perianth white, cream-coloured or pale pink; leaf blade with margins crisped or undulate . . . . . **T. crispa** var. **crispa**

1b Spike lax; perianth red to orange, yellow or sometimes pale; leaf blade with margins entire, rarely undulate . . . . . 2

2a Perianth cream-coloured, pale yellow or straw-coloured to pale apricot; flowering time mostly Aug.–Nov. . . . . **T. lineata** var. **lineata**

2b Perianth red, orange-red or pink; flowering time mostly Jan.–Apr. . . . . **T. disticha** subsp. **rubroluces**

**crispa** (L.f.) Ker Gawl. var. **crispa**

Cormous geophyte, up to 350 mm high. **Leaves** with blade sword-shaped, margins crisped or undulate. **Flowers**: in a dense spike; bracts small, obtuse, with reddish brown upper margins; perianth > 40 mm long, segments > 12 mm long, cream-coloured with red markings, pink on outside; Oct.–Dec. Rocky sandstone slopes.




**disticha** (Klatt) Baker subsp. **rubrolucens** (R.C.Foster) M.P.de Vos

*T. rubrolucens* R.C.Foster

Cormous geophyte, up to 0.8 m high. **Leaves** with margins of blade entire. **Flowers**: in a simple or branched, lax spike; outer bracts 3-toothed, middle tooth sometimes reduced, or irregularly toothed, or lower ones sometimes acute, not elongating after flowering; perianth 25–35 mm long, red, orange-red or pink; Jan.–Apr. Grassland. *Red tritonia*; *basterkalkoentjie* (A); *khahla-e-nyenyane* (SS); *isidwi esimpofu isidwi esibomvu* (Z).




**lineata** (Salisb.) Ker Gawl. var. **lineata**

*T. flavida* Schltr.

*T. gladiolaris* (Lam.) Goldblatt & J.C.Manning

*T. kraussii* Baker

Cormous geophyte, up to 0.6 m high. **Leaves** suberect or spreading, usually not reaching base of spike; blade narrowly linear-ovate, > 150 × 5 mm, margins entire, often drying brown with pale veins. **Flowers**: in a simple or branched, lax spike; perianth cream-coloured, pale yellow or straw-coloured, usually with dark veining; Aug.–Nov. Grassland. *Pencilled tritonia*, *yellow tritonia*; *bergkatjietee* (A); *khahla-e-nyenyane*, *khetleleli* (SS); *isidwi esimpofu* (Z).




## **Watsonia** Mill. (sthn Afr.: 52 spp.)

### Key to species:

[after Goldblatt: 27 (1989)]

Plants solitary, 0.25–0.70 m high; bracts narrow with spike axis often visible between bracts; stem bracts inflated. . . . . **W. lepida**

Plants usually in clumps, 0.65–1.20 m high; bracts relatively broad with spike axis usually hidden by bracts; stem bracts rarely inflated . . . . . **W. pulchra**

### **lepida** N.E.Br.

Cormous geophyte, up to 0.7 m high; plants solitary. **Stem** bracts inflated. **Leaves** with 2 or 3 basal ones; blade 5–15 mm wide, margins and midrib strongly thickened. **Flowers**: in a 12–22-flowered spike, internodes 5–9 mm long; peduncle short, sturdy, erect; bracts narrow, ± 25 × 12 mm, only clasping stem near base, stem bracts inflated, bracts dry uniformly dark brown; perianth with tube 20–30 mm long, segments ± 20 × 9 mm, bright pink; Oct.–Dec. Grassland. *Khahla* (SS).




### **pulchra** N.E.Br. ex Goldblatt

Cormous geophyte, up to 1.2 m high; plants usually in clumps. **Stem** bracts rarely inflated. **Leaves** 4–7; blade 15–30 mm wide, margins and midrib hardly or not at all thickened. **Flowers**: in a 30–60-flowered spike, internodes 4–8 mm long; bracts relatively broad with spike axis usually hidden by bracts, stem bracts rarely inflated, bracts dry, dark brown; perianth with segments 16–25 mm long, pink to purple or maroon; Dec.–Mar. Grassland and woodland.




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# JUNCACEAE

Marsh or aquatic herbs, tufted, rhizomatous. **Stems** erect, woody, bearing terminal leaf rosettes. **Leaves** grass- or rush-like, filiform, linear to narrowly ovate and soft, or terete, hard, often septate or reduced to open or tubular sheaths. **Flowers**: bisexual, small, regular; perianth with 3 outer and 3 inner segments, subsimilar; stamens 6, hypogynous; ovary superior, 1- or 3-locular. **Fruit** a capsule. *Rush family*; *biesie familie* (A).

## Key to genera

[after Glen: 639 (2000)]

Leaves glabrous, usually with an open leaf sheath; seeds many, small, occasionally tailed . . . . . **Juncus**
Leaves with inconspicuous, scattered, silky hairs; leaf sheath closed; seeds few, subglobose, minutely striate, often with appendages . . . . . **Luzula**

## **Juncus** L. (sthn Afr.: 22 spp.)

### Key to species:

[after Obermeyer: 71 (1985)]

1a Each flower subtended by a bract and 2 bracteoles . . . . . 2
1b Each flower subtended by a single bract . . . . . 4
2a Leaves flat; cataphylls absent; flowers in secund spikes . . . . . **J. bufonius**
2b Leaves cylindric, cauliform, pungent, surrounded below by sheathing cataphylls; inflorescence pseudolateral . . . . . 3
3a Stamens 3; tepals 2 mm long, spreading; pith in leaves and scapes continuous, at least in lower part; capsule obtuse, thin . . . . . **J. effusus**
3b Stamens 6; tepals 4 mm long, erect; pith in leaves and scapes interrupted, with lateral septas; capsule acute, hard . . . . . **J. inflexus**
4a Leaves few, cylindric, hard and pungent or softer and acute; cataphylls well developed, sheathing; perennials . . . . . 5
4b Leaves many, flat or channelled, basal, not septate; cataphylls absent; perennials or annuals with many thin roots . . . . . 9
5a Leaves non-septate, basal, rigid, pungent; flowers clustered in compound, pseudolateral inflorescences; seeds appendaged or apiculate . . . . . 6
5b Leaves septate, cauline, fairly soft and pointed; flowers in capitula on divaricate terminal inflorescences; seeds apiculate . . . . . 7
6a Capsule globose, exserted from perianth; inner tepals with apical hyaline auricles . . . . . **J. acutus** subsp. **leopoldii**
6b Capsule subterete, triangular, ± as long as or just exserted from perianth; inner tepals with a straight, narrow, hyaline margins . . . . . **J. rigidus**
7a Flowering stem with 1 long leaf; capsule tri-locular; medulla of stem consisting of a central and lateral airspaces . . . . . **J. punctorius**
7b Flowering stem with 3–5 leaves; capsule unilocular; medulla of stem with a central cavity only . . . . . 8
8a Capsule ovoid, obtuse, enclosed in perianth . . . . . **J. oxycarpus**
8b Capsule cylindrical, beaked, exserted from perianth . . . . . **J. exsertus** subsp. **exsertus**
9a Perennials; flowers in terminal panicles; capitula dense to few-flowered . . . . . **J. dregeanus** subsp. **dregeanus**
9b Annuals; capitula solitary or in panicles, many- to few-flowered . . . . . **J. capitatus**

**acutus** L. subsp. **leopoldii** (Parl.) Snogerup

Robust, tufted perennial, up to 2 m high. **Leaves** basal, terete, rigid, pungent, without septas, with 2–4 sheaths. **Flowers**: inner tepals with apical hyaline auricles. **Fruit** globose, with blunt tip, much longer than perianth segments. **Seeds** both ends apiculate. *Leopold' rush*.

DrGr

***bufonius** L.

Soft annual, up to 300 mm high. **Stems** leafy. **Leaves** forming loose basal rosettes; blade flat, linear, base not persisting; cataphylls absent. **Flowers**: solitary or in clusters of 2–5, in leafy panicles, each flower with a bract and 2 bracteoles; perianth green; Oct.–Jan. Disturbed areas that may be flooded for very short periods. Nativity unknown. *Toadrush*.

DrGr KarSh

***capitatus** Weigel

Small, tufted, annual herb, up to 80 mm high. **Leaves** many; blade narrowly linear; cataphylls absent. **Flowers**: capitulum pseudolateral; stamens 3; single subtending bract exserted, forming continuation of stem; perianth green; Jun. Native to Eurasia and North Africa. Vleis. *Leafybract dwarf rush*.

DrGr MsGr

**dregeanus** Kunth subsp. **dregeanus**

*J. subcuneatus* Adamson

*J. subglobosus* Adamson

Compact, tufted, perennial herb, up to 400 mm high. **Leaves** in loose basal rosettes grass-like; blade flat, linear, hard, base persisting; cataphylls absent. **Flowers**: inflorescences terminal panicles; capitula dense to few-flowered; style and stigma very short, remaining within perianth; anthers as long as filaments; perianth 3–4 mm long, dark brown to black. Marshes, along streams and wet grassland.

VreDm DrGr MsGr

**effusus** L.

Tufted, perennial herb, up to 1 m high. **Leaves** surrounded below by sheathing cataphylls, 70–170 mm long; blade cylindric, cauliform; pith in leaves and scapes continuous, at least in lower part. **Flowers**: inflorescence placed ± one-fifth from top of straight scape; scape bright to yellowish green, smooth with 40–90 longitudinal stripes; each flower with a bract and 2 bracteoles; tepals 2 mm long, spreading; stamens 3; perianth green; Nov.–Jan. **Fruit** obtuse, thin. Swamps, river- and streambeds. Cosmopolitan.

VreDm AcGr MsGr

**exsertus** Buchenau subsp. **exsertus**

*J. rostratus* Buchenau

Tufted, perennial herb, up to 0.8 m high. **Leaves** septate, terete or somewhat flattened, in transverse section with central gas channel only. **Flowers**: scape 0.3–0.4 m high, septate, with

2–5 leaves; perianth reddish brown; Sep.–May. **Fruit** 1.5–2.0 × as long as perianth segments, attenuate, beaked. Swamps, streambanks, shallow water.

VreDm? | | DrGr | MsGr | | Zastr

### **inflexus** L.

Tufted, perennial herb, up to 0.9 m high. **Leaves** surrounded below by sheathing cataphylls, 70–170 mm long; blade cylindric, cauliform; pith in leaves and scapes interrupted, with lateral septas. **Flowers**: inflorescence placed ± one-fifth from top of straight scape; scape greyish green, with 12–16 prominent longitudinal ridges; each flower with a bract and 2 bracteoles; tepals 4 mm long, erect; stamens 6; perianth green; Nov.–Jan. **Fruit** acute, hard. Along streambanks and swamps, at high altitudes.

| | | DrGr | MsGr | KarSh | |

### **oxycarpus** E.Mey. ex Kunth

*J. brevistilus* Buchenau
*J. gentilis* N.E.Br.

Robust, tufted, perennial herb, up to 1 m high. **Leaves** cauline, fairly soft and pointed; septate. **Flowers**: scape septate, with 3–5 leaves, terete or somewhat flattened, in transverse section with central cavity only; perianth brown; Oct.–May. **Fruit** unilocular, oblong-ovoid, obtuse, enclosed in perianth segments. **Seeds** both ends apiculate. Stream- and riverbanks, swamps.

| AcGr? | DrGr | MsGr | | Zastr

### **punctorius** L.f.

Robust, tufted, perennial herb, up to 1.5 m high. **Leaves** cauline, fairly soft and pointed; blade septate. **Flowers**: scape septate, with 1 leaf arising near middle, terete, in transverse section with central gas channel and several lateral ones; perianth light brown; Oct.–Jan. **Fruit** 3-locular. **Seeds** both ends apiculate. Swamps, marshes, riverbanks or shallow water.

| | DrGr | MsGr | | |

### **rigidus** Desf.

*J. arabicus* (Asch. & Buchenau) Adamson

Robust, tufted, perennial halophyte, up to 1.5 m high. **Leaves** non-septate, basal, rigid, pungent. **Flowers**: inflorescence paniculate, usually elongated and rather compact; bisexual; inner perianth segments acute, with hyaline margins; perianth yellowish brown. **Fruit** subterete, triangular, with pointed tip, exserted from perianth. **Seeds** with white appendages. Saline or alkaline pools and marshes.

VreDm | AcGr | DrGr | | KarSh | Zastr?

## **Luzula** DC. (sthn Afr.: 1 sp.)

### **africana** Drège ex Steud.

Tufted, grass-like, annual or perennial herb, up to 400 mm high. **Leaves** with long, soft, inconspicuous, scattered hairs; leaf sheaths closed; blade flat, linear. **Flowers**: in a long,

compact head, each subtended by a small, membranous, ciliate bract; perianth brown; Sep., Oct. **Fruit** 3-seeded. Grassland, vleis, streambanks.

MsGr

## References

GLEN, R.P. 2000. Juncaceae. In O.A. Leistner, Seed plants of southern Africa: families and genera. *Strelitzia* 10: 639. National Botanical Institute, Pretoria.
OBERMEYER, A.A. 1985. Juncaceae. *Flora of southern Africa* 4,2: 71–91.

# LEMNACEAE

Small to minute, aquatic herbs forming a discoid, oblong, strap-shaped or globular body (frond); usually monoecious. **Roots** simple or absent (plants free-floating). **Fronds** annual fronds changing to turions under unfavourable conditions; usually solitary, variously shaped. **Flowers**: unisexual, naked or enclosed in a sheath; perianth absent; male flower with 1 stamen; female flower with 1 sessile ovary. **Fruit** 1- to 5-seeded utricle; seeds smooth or ribbed. *Duckweed family*; *damslyk familie* (A).

### Key to genera

[after Dyer: 896 (1976)]

1a Roots absent; plants globular . . . . . **Wolffia**
1b Roots present; plants discoid . . . . . 2
2a Plants with several, usually short roots; fronds with under surface usually reddish; veins usually distinct . . . . . **Spirodela**
2b Plants with one, usually long root; fronds with under surface green, reddish or streaked with reddish brown; veins often indistinct . . . . . **Lemna**

## **Lemna** L. (sthn Afr.: 3 spp.)

### Key to species:

[after Cook: 158 (2004)]

Root sheath winged at base; root tip sharply pointed (in fresh material); roots usually < 30 mm long; fronds without a reddish tinge or flecks . . . . . **L. aequinoctialis**
Root sheath not winged; root tip mostly rounded (in fresh material); roots often > 30 mm long; fronds often with a reddish tinge or with reddish spots **L. gibba**

### **aequinoctialis** Welw.

*L. paucicostata* Hegelm.

Perennial, sometimes annual, aquatic herb. **Root** sheath winged at base, tip sharply pointed (fresh material), usually < 30 mm long. **Fronds** with only 1 prominent papule above node,

without reddish tinge or flecks. **Seeds** 1 per fruit; with 8–26 longitudinal ribs, brownish. Roadside pools, village ponds, buffalo wallows and dams. *Duckweed*; *eendekroos* (A).

| | | | | | |
|---|---|---|---|---|---|
| | | | | KarSh | |

### **gibba** L.

Perennial, aquatic herb. **Root** sheath not winged, tip mostly rounded (fresh material), often more then 30 mm long. **Fronds** usually inflated, > 1 mm thick, largest gas-filled chambers more then 0.3 mm in diameter; often with red spots, under surface red. **Seeds** 1–5 per fruit; with 8–16 longitudinal ribs, whitish; Nov., Dec. Wide range of aquatic habitats. *Frog-buttons*, *duckweed*; *damslyk*, *eendekroos* (A).

| | | | | | |
|---|---|---|---|---|---|
| VreDm | | DrGr | | KarSh | |

## **Spirodela** Schleid. (sthn Afr.: 2 spp.)

### Key to species:

[after Cook: 159 (2004)]

1a Fronds 1.5–2.0 × as long as wide, upper surface with papillae along the mid-vein; veins 3–7; roots 2–7. . . . . **S. punctata**

1b Fronds 1.0–1.5 × as long as wide, upper surface without papillae; veins 7–16(–21); roots 7–21 . . . . . **S. polyrhiza**

### **polyrhiza** (L.) Schleid.

Perennial, aquatic herb. **Roots** 7–21. **Fronds** ovate to ± circular, 1.0–1.5 × as long as wide, upper surface without papillae; veins 7–16(–21). Eutrophic conditions, lakes, large dams. *Great duckweed*, *water flexseed*. Figure 65.

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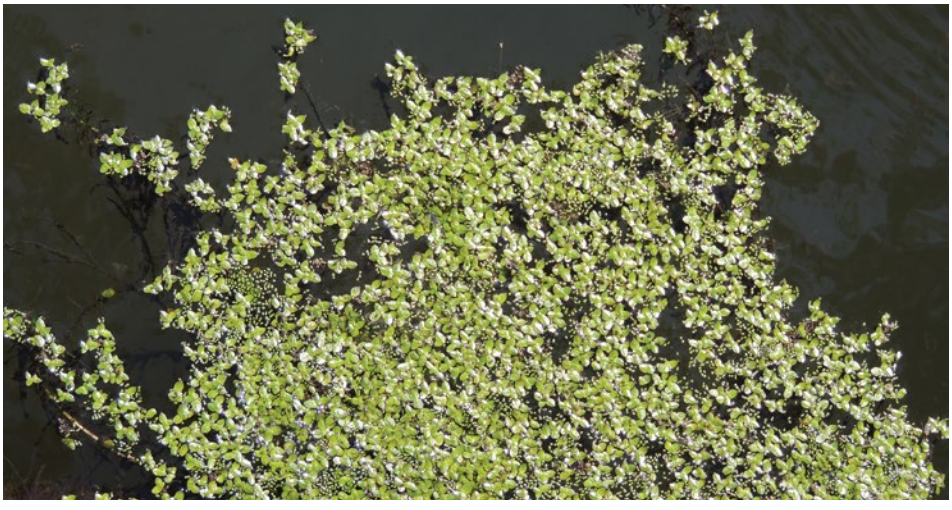


**Figure 65.** *Spirodela polyrhiza* (Lemnaceae)

**punctata** (G.Mey.) C.H.Thomps.

Perennial, aquatic herb, minute, floating, forming dense colonies. **Roots** 2–7. **Fronds** narrowly ovate to ovate, 1.5–2.0 × as long as wide, upper surface with papillae along the mid-vein; veins 3–7. Freshwater pools, almost cosmopolitan in warm regions. *Duckweed*.

DrGr

## **Wolffia** Horkel ex Schleid. (sthn Afr.: 2 spp.)

**arrhiza** (L.) Horkel ex Wimm.

Perennial, aquatic herb. **Roots** absent. **Fronds** floating, spherical to ellipsoid, 1.0–1.3 × as long as wide, biggest width below water surface, shiny and bright green on upper surface, with 10–100 stomata. Surface of freshwater dams, pools. *Duckweed*; *eendekroos* (A).

DrGr KarSh

## References

COOK, C.D.K. 2004. *Aquatic and wetland plants of southern Africa*. Backhuys, The Netherlands.

DYER, R.A. 1976. *The genera of southern African flowering plants*. 2. Gymnosperms and monocotyledons. Botanical Research Institute, Pretoria.

# ORCHIDACEAE

Perennial herbs, terrestrial, occasionally epiphytic; often with rhizomes or corms. **Leaves** alternate, mostly basal, spirally set or in 2 ranks, with parallel veins. **Flowers**: irregular, with a complex structure; perianth in 2 whorls; outer 3 (sepals) mostly coloured and petaloid, odd one in front (anticous) or by twisting of ovary (posticous) often hooded (galeate); inner 3 with 2 lateral segments often different from odd one, which forms a lip or labellum; lip when anticous often lobed, sometimes spurred, when posticous then sometimes galeate; stamens highly modified, fused with style into a column (gynostemium), base of column sometimes extended (mentum); pollen united into waxy masses (pollinia) and concealed by an anther cap; ovary inferior, 1-locular. **Fruit** a capsule. **Seeds** minute, many. *Orchid family*.

## Artificial key to genera

[after Kurzweil: 647–650 (2000)]

1a Pollinia at apex of gynostemium under removable anther cap; if anther cap insignificant or absent; pseudobulbs or underground corms consisting of more that one node . . . . . **Eulophia**

1b Pollinia in pouch-like structures without removable cap; underground organs almost always root tubers, rarely clusters of thick roots with furry sheath or

bundles of thick fleshy roots (in latter case leaves arranged in basal rosette) . . . . . 2
2a Gynostemium with significant basal column-part which is longer than wide; anther pendent . . . . . **Satyrium**
2b Gynostemium without prominent column-part . . . . . 3
3a Lip or its side lobes with fringed or lacerated margins . . . . . 4
3b Lip not with fringed margins; if lobed then with < 6 lobes . . . . . 7
4a Median sepal spurred . . . . . **Disa**
4b Median sepal not spurred . . . . . 5
5a Lip with large appendage . . . . . **Pterygodium**
5b Lip not appendiculate . . . . . 6
6a Leaves cauline . . . . . **Huttonaea**
6b Leaves 1 or 2, basal, adpressed to ground . . . . . **Holothrix**
7a Lateral sepals each with spur or sac. . . . . **Disperis**
7b Lateral sepals without spurs or sacs . . . . . 8
8a Lip spurred . . . . . 9
8b Lip not spurred . . . . . 13
9a Receptive surface of stigmas on 2 projecting, club-shaped organs . . . . . 10
9b Receptive surface of stigmas flat or concave, in cavity below rostellum . . . 11
10a Lateral sepals and lower petal lobes fused to stigmatic arms . . . . . **Bonatea**
10b Lateral sepals and lower petal lobes not fused to stigmatic arms . . . **Habenaria**
11a Leaves scattered along stem . . . . . **Brachycorythis**
11b Leaves basal or clustered in lower stem portion . . . . . 12
12a Petals as long as or longer than sepals; inflorescences erect; leaves 1 or 2, adpressed to ground . . . . . **Holothrix**
12b Petals shorter than sepals; inflorescences normally nodding . . . . **Schizochilus**
13a Lip without appendage . . . . . 14
13b Lip with prominent appendage . . . . . 21
14a Leaves grass-like, linear or narrowly lorate, basal . . . . . 15
14b Leaves not basal and grass-like . . . . . 16
15a Inflorescence apex nodding; sepals 2–4 mm long . . . . . **Schizochilus**
15b Inflorescence erect; flowers mostly larger . . . . . **Disa**
16a Lip linear or narrowly lorate, < and erect in front of gynostemium. . . . . **Brownleea**
16b Lip spreading or patent, ≥ gynostemium. . . . . 17
17a Lip 3-lobed with prominent lobes . . . . . 18
17b Lip entire or with minute side lobes . . . . . 19
18a Stem densely leafy. . . . . **Brachycorythis**
18b Stem only with sheaths . . . . . **Schizochilus**
19a Leaf 1; petals ± half as long as sepals; inflorescence slightly nodding. . . . . **Dracomonticola**
19b Leaves 2–several; petals ± as long as sepals; inflorescence erect . . . . . 20
20a Leaves 2 or 3, basal; median sepal unspurred; anther erect **Neobolusia**
20b Leaves several; median sepal usually spurred; anther mostly reflexed to a horizontal or pendent position . . . . . **Disa**
21a Median sepal and petals forming shallow, concave hood . . . . **Pterygodium**
21b Median sepal and petals forming deep globose hood, widespread; if median sepal rather shallow, then lip appendage with prominent median keel on front side. . . . . **Corycium**

## **Bonatea** Willd. (sthn Afr.: 10 spp.)

### Key to species:

[after Stewart *et al*.: 97 (1982)]

Leaves cauline, not in a basal rosette . . . . . **B. speciosa** var. **antennifera**
Leaves borne in a basal rosette . . . . . **B. polypodantha**

**polypodantha** (Rchb.f.) L.Bolus
*Habenaria insignis* Schltr.

Herb, up to 330 mm high; slender. **Leaves** basal in a rosette, broadly elliptic. **Flowers**: spur < 45 mm long, slightly swollen; side lobes of lip very narrowly linear, attenuate, 30–35 mm long, white; perianth white and pale green; Feb.–Apr. Thorn scrub.

MsGr

**speciosa** (L.f.) Willd. var. **antennifera** (Rolfe) Sommerv.
*B. antennifera* Rolfe

Herb, up to 1 m high; robust, leafy. **Leaves** cauline, oblong to broadly lanceolate. **Flowers**: upper petal lobe 15–25 mm long; lower petal lobe narrowly linear throughout, slightly curved; perianth green and white; Mar., Apr. Thorn savanna. *Moederkappie* (A). Figure 66.

DrGr

## **Brachycorythis** Lindl. (sthn Afr.: 7 spp.)

**ovata** Lindl. subsp. **ovata**

Herb, up to 400 mm high. **Leaves** many, lanceolate, up to 70 × 22 mm. **Flowers**: lip 3-lobed at apex, central keel white with purple spots; perianth pink to pale mauve; Sep.–Feb. Grassland. *Imfeyamasele yentaba* (Z).

MsGr

## **Brownleea** Harv. ex Lindl. (sthn Afr.: 5 spp.)

### Key to species:

[after Stewart *et al*.: 154 (1982)]

1a Flowers in an apical head, or at least apically congested; petals expanded apically, margins crenulate . . . . . 2
1b Flowers in a lax to subimbricate spike; petals not apically expanded, margins not crenulate. . . . . 3
2a Lateral sepals 6–7 mm long, lip < 1.5 mm long . . . **B. galpinii** subsp. **galpinii**
2b Lateral sepals (6.5–)8.0–10.0 mm long, lip > 1.7 mm long . . . . . **B. galpinii** subsp. **major**
3a Spur > 2 × as long as dorsal sepal, straight or gradually decurved . . . . . **B. macroceras**
3b Spur < 2 × as long as dorsal sepal, sharply and geniculately decurved . . . . . **B. parviflora**

**galpinii** Bolus subsp. **galpinii**

Herb, up to 0.5 m high. **Leaves** (2–)4, linear, conduplicate. **Flowers**: 5–25 in an apical head; petals expanded apically, margins crenulate, spreading, lateral sepals 6–7 mm long, lip < 1.5 mm long; petals white to cream-coloured, with small purple spots. Mar., Apr. Damp grassland, streambanks, rarely rocky areas in full sunlight.

MsGr



**Figure 66.** *Bonatea speciosa* var. *antennifera* (Orchidaceae).



**Figure 67.** *Brownleea galpinii* subsp. *major* (Orchidaceae).

ORCHIDACEAE

**galpinii** Bolus subsp. **major** (Bolus) H.P.Linder

Herb, up to 0.5 m high. **Leaves** (2–)4, linear, conduplicate. **Flowers**: 5–25 in an apical head; petals expanded apically, margins crenulate, spreading, lateral sepals (6.5–)8.0–10.0 mm long, lip > 1.7 mm long; petals white to cream-coloured, with small purple spots. Jan.–Mar. High altitude grassland and open *Protea* savannah, in full sunlight, often in damper areas. Figure 67.

MsGr

**macroceras** Sond.

*B. monophylla* Schltr.

Herb, up to 0.5 m high. **Leaves** 1(–3), narrowly lanceolate, < 10 mm wide. **Flowers**: 1–3(–5) in lax spike, petals not apically expanded, margins not crenulate, not spreading; slender spur 25–40 mm long, somewhat decurved; petals mauve to almost white; Feb.–Apr. Rock ledges. *Lefokotsoane* (SS).

MsGr

**parviflora** Harv. ex Lindl.

*B. transvaalensis* Schltr.

Herb, up to 0.6 m high. **Flowers**: in dense to rarely lax, cylindrical spikes, petals not apically expanded, margins not crenulate; spur < 2 × as long as dorsal sepal, sharply decurved; dorsal sepal < 6 mm long; perianth white; Feb.–Apr. Grassland, full sun and often between rocks. *'Mametsana* (SS).

MsGr

## **Corycium** Sw. (sthn Afr.: 14 spp.)

### Key to species:

[after Stewart *et al.*: 190 (1982)]

| | | |
|---|---|---|
| 1a | Lip linear-oblong, 3-pointed at apex | **C. tricuspidatum** |
| 1b | Lip oblong, not 3-pointed | 2 |
| 2a | Lateral sepals joined for most of their length | **C. nigrescens** |
| 2b | Lateral sepals joined for ± ½ their length | 3 |
| 3a | Lip greenish; dorsal sepal ± 4 × 3 mm | **C. dracomontanum** |
| 3b | Lip pale maroon; dorsal sepal ± 7 × 6 mm | **C. alticola** |

**alticola** Parkman & Schelpe

Herb, up to 0.42 m high. **Leaves** lanceolate, up to 130 mm long. **Flowers**: dorsal sepal ± 7 × 6 mm; lateral sepals joined for ± ½ their length; petals pale green; lip oblong, not 3-pointed, pale maroon; Feb. Grassland.

Zastr

**dracomontanum** Parkman & Schelpe

Herb, up to 0.54 m high. **Leaves** lanceolate, up to 170 mm long. **Flowers**: dorsal sepal ± 4 × 3 mm; lateral sepals joined for ± ½ their length; petals green tinged with purple; lip oblong, not 3-pointed, greenish; Dec.–Mar. Grassland.

MsGr

### **nigrescens** Sond.

Herb, up to 0.4 m high. **Flowers**: many in dense inflorescence; lateral sepals joined on lower margin for most of their length; petals purple-brown to almost black; lip oblong, not 3-pointed; Dec.–Feb. Grassland. *Black-faced orchid*; *moederkappie* (A); *umabelembuca* (Z).




### **tricuspidatum** Bolus

Herb, up to 0.33 m high. **Leaves** narrowly lanceolate, up to 70 mm long. **Flowers**: many in dense inflorescence; lateral sepals free; lip linear-oblong, 3-pointed at apex, margins undulate; lip appendage with long deflexed apical lobes; petals purple; Feb., Mar. Grassland.




## **Disa** P.J.Bergius (sthn Afr.: 132 spp.)

### Key to species:

[after Linder & Kurzweil: 188 (1999)]

1a Anther erect . . . . . 2
1b Anther reflexed to a horizontal or pendent position . . . . . 3
2a Spur much inflated, subacute, longer than median sepal **D. chrysostachya**
2b Spur slender, rarely subclavate, obtuse, as long as median sepal; flowers white to mauve . . . . . **D. fragrans** subsp. **fragrans**
3a Lip rather wide, reniform, ovate or spathulate, sometimes with a long stalk; lip margins often lacerate or crenulate; petals falcate; flowers blue . . . **D. baurii**
3b Lip mostly narrow, filiform, linear or lorate (sometimes slightly wider in apical part); lip margins entire . . . . . 4
4a Viscidium 1, very rarely 2 on an unlobed rostellum; spur pendent from base of galea; lip fleshy . . . . . **D. brevicornis**
4b Viscidia 2 on a 3-lobed rostellum; spur usually horizontal from base of galea; lip thin-tissued . . . . . 5
5a Radical leaves dry at flowering time . . . . . **D. porrecta**
5b All leaves green at flowering time . . . . . 6
6a Separate sterile shoots present . . . . . 7
6b Separate sterile shoots not present . . . . . 10
7a Spur shorter than median sepal . . . . . 8
7b Spur longer than median sepal . . . . . 9
8a Spur horizontal or ascending . . . . . **D. aconitoides** subsp. **aconitoides**
8b Spur pendent . . . . . **D. versicolor**
9a Lip green, broadly spathulate to lorate, margins ± serrate; spur 30–45 long, ascending . . . . . **D. cooperi**
9b Not with the above combination of characters; lip never green . . . **D. thodei**
10a Spur sharply ascending . . . . . 11
10b Spur ± horizontal or pendent . . . . . 12
11a Spur > 20 mm long, lip broadly spathulate . . . . . **D. cooperi**
11b Spur 2–6 mm long, grooved . . . . . **D. stachyoides**
12a Spur shorter than median sepal . . . . . 13
12b Spur longer than median sepal . . . . . 20
13a Leaves rigid, if soft, then inflorescence subcapitate; floral bracts dry, acuminate; spur slender, tapering . . . . . 14
13b Leaves soft; floral bracts green; spurs variable . . . . . 16

14a Flowers aggregated into a head . . . . . 15
14b Flowers in a lax or subimbricate raceme . . . . . 17
15a Perianth white; slender herbs with hard leaves . . . . . **D. cephalotes** subsp. **cephalotes**
15b Perianth pink; robust herbs with soft leaves. . . **D. cephalotes** subsp. **frigida**
16a Spur < 6 mm long . . . . . **D. stricta**
16b Spur > 7 mm long . . . . . **D. pulchra**
17a Spur pendent at its point of origin. . . . . **D. versicolor**
17b Spur horizontal at its point of origin, sometimes at length descending . . . . 18
18a Petals fused to whole length of lateral rostellum lobes . . . . . **D. aconitoides** subsp. **aconitoides**
18b Petals free from rostellum, or fused only to base. . . . . 19
19a Spur dorsiventrally flattened . . . . . **D. stachyoides**
19b Spur not dorsiventrally flattened, > 6 mm long . . . . . **D. patula** var. **transvaalensis**
20a Spur < 20 mm long . . . . . 21
20b Spur > 20 mm long . . . . . 23
21a Petals ± ovate in outline . . . . . 22
21b Petals narrowly oblong to oblong in outline. . . **D. patula** var. **transvaalensis**
22a Spur pendent or sharply curved downwards . . . . . **D. versicolor**
22b Spur horizontal or at length gradually curved downwards . . . . . **D. oreophila** subsp. **oreophila**
23a Leaves rigid; floral bracts dry . . . . . **D. oreophila** subsp. **oreophila**
23b Leaves soft; floral bracts green. . . . . **D. thodei**

## **aconitoides** Sond. subsp. **aconitoides**

Herb, up to 0.6 m high, rarely with separate sterile shoots. **Leaves** cauline, lanceolate, imbricate. **Flowers**: sepals 5–8 mm long, dorsal sepal galeate; spur horizontal, shorter than median sepal, longer than lateral sepals, 6–10 mm long; petals fused to whole length of lateral rostellum lobes; lip thin, narrowly elliptic; viscidia 2 on a 3-lobed rostellum; perianth whitish or pale mauve with darker spots; Dec. Grassland. *Oumakappie* (A); *ihlamvu*, *umashushu* (Z).

MsGr

## **baurii** Bolus

*Herschelia baurii* (Bolus) Kraenzl.
*Herschelianthe baurii* (Bolus) Rauschert

Herb, up to 0.4 m high. **Leaves** appearing after flowering, frequently overtopping the inflorescence, sheathing. **Flowers**: dorsal sepal galeate with a cylindrical, obtuse, horizontal spur, 4–6 mm long; petals with apex narrowly obtriangulate or obscurely bilobed; lip rather wide, reniform, ovate or spathulate, sometimes with a long stalk; lip margins deeply dissected, beard-like; perianth sky-blue to purple-blue; Sep.–Nov. Montane grassland. *Bloumoederkappie* (A).

MsGr

## **brevicornis** (Lindl.) Bolus

*Monadenia brevicornis* Lindl.

Erect herb, up to 0.5 m high. **Leaves** narrowly lanceolate to narrowly ovate, basal ones up to 150 mm long. **Flowers**: dorsal sepal maroon, 7–10 mm high; spur clavate, acute, 7–11 mm long, pendent from base of galea; lateral sepals reflexed; lip narrowly oblong, fleshy; viscidium 1, very rarely 2 on an unlobed rostellum; perianth green; Nov.–Feb. Grassland.

MsGr

**cephalotes** Rchb.f. subsp. **cephalotes**

Erect herb, up to 0.5 m high, slender, without separate sterile shoots. **Leaves** lax, cauline, linear, hard. **Flowers**: inflorescence subcapitate; floral bracts dry, acuminate; sepals 5–8 mm long; spur slender, tapering, 3–6 mm long; viscidia 2 on a 3-lobed rostellum; perianth white; Jan., Feb. Dry to damp grassland, rarely in moss on rocks, in full sunlight.




**cephalotes** Rchb.f. subsp. **frigida** (Schltr.) H.P.Linder

Erect herb, up to 0.25 m high, robust, without separate sterile shoots. **Leaves** lax, cauline, soft. **Flowers**: inflorescence subcapitate; floral bracts dry, acuminate; sepals 5–8 mm long; spur slender, tapering, 3–6 mm long; viscidia 2 on a 3-lobed rostellum; perianth pink; Jan.–Mar. Dry to damp alpine grassland.




**chrysostachya** Sw.

Herb, up to 1 m high. **Leaves** very narrowly elliptic, cauline leaves densely imbricate. **Flowers**: in a slender, tapering spike; dorsal sepal galeate with a pendent, clavate, subacute, much inflated spur 5–11 mm long; anther erect; perianth bright orange and yellow; Nov.–Jan. Damp or marshy areas. *Torch orchid*; *'mametsana*, *mohupung* (SS); *uklamkleshe*, *umnduze wotshani obomvu*, *umnduze wotshani ompofu* (Z).




**cooperi** Rchb.f.

Herb, up to 0.7 m high, with or without separate sterile shoots. **Leaves** usually conduplicate, cauline leaves imbricate. **Flowers**: lip green, thin, broadly spathulate to lorate, margins ± serrate; sepals 10–14 mm long, dorsal sepal galeate with ascending spur 34–45 mm long, lateral sepals reflexed at anthesis; viscidia 2 on a 3-lobed rostellum; perianth white or cream-coloured with green lips; Jan.–Mar. Dry to damp grassland. *'Mametsana-a-liliba* (SS).




**fragrans** Schltr. subsp. **fragrans**

Herb, up to 0.5 m high, with separate sterile shoots. **Leaves** narrowly elliptic, acute, conduplicate, cauline leaves imbricate, usually with purple bars around sheaths. **Flowers**: spur slender, obtuse or rarely subclavate, 5–10 mm long; anther erect; petals oblanceolate, obtuse; perianth white to pale lilac or carmine, usually mottled; Mar., Apr. Grassland in full sun. *Fragrant disa*; *lekkerruik-disa* (A).




**oreophila** Bolus subsp. **oreophila**

Herb, up to 0.35 m high, generally flexuose, without separate sterile shoots. **Leaves** erect or falcate, conduplicate, 1–3 mm wide, rigid. **Flowers**: bracts dry; sepals < 10 mm long; dorsal sepal 4–6 mm long; spur 5–10 mm long, horizontal or at length gradually curved downwards; perianth white or pink; Jan. Occasional in rock crevices and on ledges in cave sandstone.



**patula** Sond. var. **transvaalensis** Summerh.

*D. gerrardii* Rolfe

Herb, up to 0.6 m high, without separate sterile shoots. **Leaves** erect, imbricate, conduplicate, linear to narrowly lanceolate, up to 200 mm long. **Flowers**: inflorescence < 35 mm wide; dorsal sepal < 10 mm long; petals narrowly oblong in outline; spur > 8 mm long, not dorsiventrally flattened; perianth pink with purplish spots near apices of petals; Jan.–Mar. In dry to slightly damp grassland.

MsGr

**porrecta** Sw.

Herb, up to 0.6 m high. **Leaves** basal ones appearing after flowers, erect, linear, often persisting as fibrous sheath. **Flowers**: sepals 5–8 mm; dorsal sepal deeply galeate; spur 20–40 mm long, ascending; lip thin, narrowly oblong to lanceolate; viscidia 2 on a 3-lobed rostellum; perianth bright red, petals and lip yellow; May. Grassland. *'Mametsana* (SS).

DrGr MsGr

**pulchra** Sond.

Herb, up to 0.6 m high. **Leaves** rigid, imbricate, conduplicate, linear-lanceolate, up to 200 mm long, > 3 mm wide. **Flowers**: inflorescence lax; floral bracts dry, acuminate; lip thin; sepals 20–30 mm long, angled forwards; dorsal sepal shallowly galeate; horizontal spur 15–20 mm long, slender, tapering; lip lanceolate; viscidia 2 on a 3-lobed rostellum; perianth rose-pink; Dec. Hilly, mountainous areas. *'Mametsana* (SS).

DrGr MsGr

**stachyoides** Rchb.f.

*Monadenia leydenburgensis* Kraenzl.

Herb, up to 0.4 m high, without separate sterile shoots. **Leaves** erect, imbricate, linear to lanceolate. **Flowers**: spur thin, dorsiventrally flattened, grooved, 2–6 mm long, sharply ascending; sepals 4–7 mm long, dorsal sepal angled forwards; lip lorate, 4–5 mm long; viscidia 2 on a 3-lobed rostellum; perianth purple with apices of petals and lip white; Nov.–Feb. Dry grassland in full sun. *Ihlamvu elimpofu lasenkangala* (Z).

MsGr

**stricta** Sond.

Erect herb, up to 0.45 m high, slender, without separate sterile shoots. **Leaves** erect, imbricate, conduplicate, linear, rigid. **Flowers**: inflorescence a dense spike; floral bracts dry, acuminate; lip thin; sepals 4–5 mm long; spur slender, tapering, 2.5–5.0 mm long; viscidia 2 on a 3-lobed rostellum; perianth lilac or bluish; Nov., Dec. Grassy slopes or damp floodplains.

MsGr

**thodei** Schltr. ex Kraenzl.

Herb, up to 0.3 m high, slender, with separate sterile shoots. **Leaves** petiolate, flat or shallowly conduplicate, soft. **Flowers**: inflorescence lax; bracts green; spur slender horizontal, 20–40 mm long; lip thin, not green; viscidia 2 on a 3-lobed rostellum; perianth white to mauve, mottled pink, strong scent; Dec., Jan. Damp grassland or along streams.

MsGr

**versicolor** Rchb.f.

Herb, up to 0.5 m high, with or without separate sterile shoots. **Leaves** soft, sterile leaves (10–)20–30(–40) mm wide, rarely petiolate, conduplicate, cauline leaves imbricate. **Flowers**: floral bracts green; spur shorter than median sepal, pendent or sharply curved downwards, reaching below base of dorsal sepal, > 4.5 mm long; lip thin; viscidia 2 on a 3-lobed rostellum; perianth mottled pink; Dec.–Feb. Damp to dry grassland. *Apple-blossom orchid*; *ihlamvu elibomvu* (Z). Figure 68.




## **Disperis** Sw. (sthn Afr.: 26 spp.)

### Key to species:

[after Linder & Kurzweil: 301 (1999)]

1a Leaf 1 . . . . . 2
1b Leaves 2–5 . . . . . 4
2a Leaf half-way up stem, spreading; bracts spreading, ovate, acute; flowers 1–4, not secund . . . . . **D. lindleyana**
2b Leaf basal, suberect; bracts conduplicate, reniform; flowers (2–)6–20, secund . . . . . 3
3a Petals oblong, hooded with inner surface concealed; median sepal 3–4 mm long; lateral sepals 4–5 mm long; petals ± 4 mm long . . . . . **D. cardiophora**
3b Petals triangular, flaring at apex to expose purple markings within; median sepal 4–5 mm long; lateral sepals 6.5–8.0 mm long; petals ± 7 mm long . . . . . **D. renibractea**
4a Lip appendage with apex deflexed and descending . . . . . **D. fanniniae**
4b Lip appendage horizontal or ascending . . . . . 5
5a Rostellum arms porrect; lip blade at first horizontal then sharply flexed upwards . . . . . **D. stenoplectron**
5b Rostellum arms bent or curved; lip blade ascending from base . . . . . 6
6a Rostellum arms deflexed then geniculate, much widened at base; lateral sepals 10–11 mm long . . . . . **D. cooperi**
6b Rostellum arms tightly incurled; lateral sepals 6–8 mm long . . . . . **D. tysonii**

**cardiophora** Harv.

Herb, up to 250 mm high. **Leaf** solitary, basal, suberect. **Flowers**: (2–)6–20, secund; bracts conduplicate, reniform; petals oblong, hooded with inner surface concealed, ± 4 mm long; median sepal 3–4 mm long; lateral sepals 4–5 mm long; perianth white and green with dull purple at tips; Jan. Grassland.




**cooperi** Harv.
*D. allisonii* Rolfe
*D. buchananii* Rolfe

Herb, up to 400 mm high. **Leaves** 2–5. **Flowers**: dorsal sepal with a rounded hood, 5–8 mm deep; rostellum arms wide and bent, often twisted; lip blade ascending from base; lateral sepals 10–11 mm long; petals spotted with purple and green warts on outer margins; whitish or pinkish purple, often tinged with green; Mar. Damp places in grassland and temporary vleis.





**Figure 68.** *Disa versicolor* (Orchidaceae).

**fanniniae** Harv.

Herb, up to 300 mm high. **Leaves** 2–5. **Flowers**: lateral sepals > 10 mm long; dorsal sepal a deep broad hood, 12–20 mm long; lip linear, dilated in centre and lobed and papillose at apex; lip appendage ovate, green, shorter than limb, apex deflexed and descending; perianth white, flushed pink or green; Jan.–Mar. On floor of forests and pine plantations. *Granny bonnet*; *moederkappie* (A).




**lindleyana** Rchb.f.

Herb, up to 400 mm high. **Leaf** solitary, halfway up stem, spreading, very shiny. **Flowers**: 1–4, not secund; bracts spreading, ovate, acute; dorsal sepal with a conical, obtuse sac, 8–10 mm deep; petals with outer margins wavy; perianth white or cream-coloured, sometimes flushed with pink; Dec., Jan. On floor of forests and pine plantations. *Granny bonnet*; *moederkappie* (A).




**renibractea** Schltr.

Herb, up to 300 mm high. **Leaf** solitary, basal, suberect. **Flowers**: (2–)6–20, secund; bracts conduplicate, reniform; petals triangular, flaring at apex to expose purple markings within, ± 7 mm long; median sepal 4–5 mm long; lateral sepals 6.5–8.0 mm long; perianth green, pink or brown; Dec.–Feb. Grassland.




**stenoplectron** Rchb.f.

*D. anomala* Schltr.

*D. natalensis* Rolfe

Herb, up to 230 mm high. **Leaves** 2–5. **Flowers**: dorsal sepal hooded, hood up to 10 mm deep; rostellum arms porrect, narrow and straight; lip blade at first horizontal then sharply flexed upwards; perianth deep purple and green, sometimes dull white or dirty pink tinged with purple; Feb., Mar. Grassland, often on slopes.




**tysonii** Bolus

*D. bicolor* Rolfe

*D. kermesina* Rolfe

Herb, up to 400 mm high. **Leaves** 2–5. **Flowers**: 2–14; dorsal sepal with a deep hood 5–8 mm long, often tipped backwards in apical half; rostellum arms tightly incurled; lateral sepals 6–8 mm long; lip blade ascending from base; perianth pink or deep rose-coloured; Jan.–Mar. Common in grassland.




## **Dracomonticola** H.P.Linder & Kurzweil (sthn Afr.: 1 sp.)

**virginea** (Bolus) H.P.Linder & Kurzweil

*Neobolusia virginea* (Bolus) Schltr.

Slender herb, up to 250 mm high. **Leaves** solitary. **Flowers**: 3–6, inflorescence short and dense, slightly nodding; dorsal sepal 8–15 mm long; lip 6–8 × 4 mm; petals ± ½ as

long as sepals; perianth white with pale pink petals and lip; Oct.–Jan. Grassy ledges, rock crevices.

MsGr

## **Eulophia** R.Br. ex Lindl. (sthn Afr.: 45 spp.)

### Key to species:

[after Stewart *et al*.: 229 (1982)]

1a One or both petals, and sometimes lip, fused to gynostemium and variously distorted; spur elongate. . . . . **E. hians** (see 10a for subspp.)
1b Neither petals nor lip united with gynostemium, or very rarely, if so, then spur absent . . . . . 2
2a Spur absent; lip attached only to apex of a prominent mentum; petals usually oblanceolate or broadly elliptic. . . . . 3
2b Spur present; if obsolete, then either lip attached to > 1/3 length of mentum, or mentum absent; petals variously shaped . . . . . 5
3a Papillae wart-like and very sparse on distal half of lip midlobe; raceme generally dense and elongate. . . . . **E. foliosa**
3b Papillae or lamellae elongate, usually many on distal half of lip midlobe; raceme dense and short . . . . . 4
4a Odd sepal 5–9 mm long, gynostemium foot up to 2 mm long; sepals, petals and lip dull ivory to white or greenish white, lip sometimes tinged pale purple . . . . . **E. aculeata** subsp. **aculeata**
4b Odd sepal 9–18 mm long, gynostemium foot 2–5 mm long; sepals, petals and lip greenish white to pink, tinged with green to dark reddish purple; lip crests usually yellowish green to white . . . . . **E. aculeata** subsp. **huttonii**
5a Crests on distal 2/3 of lip composed of broad, smooth or verrucose ridges that gradually become lower to vestigial near lip apex. . . . . 6
5b Crests on distal 2/3 of lip composed of papillae or lamellae generally rather abruptly terminated, or lip without crests in distal 2/3. . . . . 8
6a Gynostemium 2–4 mm long; margins of lip midlobe undulate; median sepal 4–9 mm long. . . . . **E. clitellifera**
6b Gynostemium usually > 5 mm long: rarely, if less, then margins of lip midlobe entire; median sepal 7–30 mm long . . . . . 7
7a Petals often shortly clawed, obovate-elliptic; gynostemium 4–8 mm long; lip side lobes obliquely truncate . . . . . .**E. parviflora**
7b Petals never clawed, lanceolate-elliptic to ovate-oblong; gynostemium 7–9 mm long; lip side lobe apices rounded . . . . . **E. cooperi**
8a Lip crest composed of lamellae, either confined to base or extending onto midlobe; lamellae continuous or with a few incisions to lip surface, smooth to crenulate. . . . . 9
8b Lip crest composed of lamellae basally, passing into slender papillae in distal parts of lip; papillae many and elongate, or rarely, few and short 12
9a Lip with a broadly rounded sac beneath end of gynostemium. . . . . .**E. calanthoides**
9b Lip without a broadly rounded sac beneath end of gynostemium . . . . . 10
10a One or both petals, and sometimes lip, fused to side of gynostemium; petals and lip white to purple or yellow . . . . . .**E. hians** var. **hians**
10b Petals and lip not fused to sides of gynostemium . . . . . .11
11a Spur 4–7 mm long; petals and lip bright yellow. . . . **E. hians** var. **inaequalis**
11b Spur 1.4–5.2 mm long; petals and lip white to pale or deep purple or tinged with blue or yellow . . . . . **E. hians** var. **nutans**

12a Petals nearly always a little narrower than lateral sepals and oblanceolate to narrowly oblong; if slightly wider, then clearly oblanceolate . . . **E. leontoglossa**
12b Petals 1.2–2.6× as wide as lateral sepals, and usually ovate to oblong; if suboblanceolate, then clearly much wider. . . . . 13
13a Leaves < 1/2 length of scape at anthesis; spur 1.2–2.2 mm long; crest papillae few, confined to basal 1/3 of lip midlobe . . . . . **E. cooperi**
13b Leaves usually > 2/3 length of scape at anthesis; if less, then spur > 3 mm long and crest papillae many over most of lip . . . . . 14
14a Petals ovate, tapering to a subacute apex . . . . . 15
14b Petals oblong, acute or obtuse; if slightly ovate-oblong, then very obtuse. . . . 16
15a Spur 1.0–2.9 mm long, stout and rather flattened; petals pale straw-yellow, brownish purple at base outside, a few dark speckles inside with main veins lemon-yellow . . . . . **E. ovalis** var. **bainesii**
15b Spur 2.5–5.6 mm long, conical to cylindrical; petals white, slightly tinged with yellow-purple at base outside, blue-speckled along veins inside . . . . . **E. ovalis** var. **ovalis**
16a One or both petals, and sometimes lip, fused to side of gynostemium; petals and lip white to purple or yellow . . . . . **E. hians** var. **hians**
16b Petals and lip not fused to sides of gynostemium . . . . . 17
17a Spur 4–7 mm long; petals and lip bright yellow . . . . **E. hians** var. **inaequalis**
17b Spur 1.4–5.2 mm long; petals and lip white to pale or deep purple or tinged with blue or yellow . . . . . **E. hians** var. **nutans**

## **aculeata** (L.f.) Spreng. subsp. **aculeata**

Herb, up to 0.65 m high. **Leaves** partly to fully developed at anthesis, up to 11 mm wide. **Flowers**: small, in a rather dense and short raceme; odd sepal 5–9 mm long, gynostemium foot up to 2 mm long; lip attached only to apex of a prominent mentum; petals usually oblanceolate or broadly elliptic; sepals subobtuse to subacute; spur absent; sepals, petals and lip dull ivory to white or greenish white, lip sometimes tinged pale purple; Dec., Jan. Sour grassland.




## **aculeata** (L.f.) Spreng. subsp. **huttonii** (Rolfe) A.V.Hall

*E. huttonii* Rolfe
*E. oliveriana* Bolus

Herb, up to 0.65 m high. **Leaves** partly to fully developed at anthesis, up to 17 mm wide. **Flowers**: medium-sized, in a rather dense and short raceme; odd sepal 9–18 mm long, gynostemium foot 2–5 mm long; lip attached only to apex of a prominent mentum; petals usually oblanceolate or broadly elliptic; spur absent; sepals, petals and lip greenish white to pink, tinged with green to dark reddish purple; lip crests usually yellowish green to white; Sep.–Dec. Sour and tall grassland. *Lekholela*, *'mametsana* (SS).




## **calanthoides** Schltr.

*E. acuminata* Rolfe
*E. allisonii* Rolfe
*E. subintegra* Rolfe

Herb, up to 0.8 m high. **Leaves** thin, fully developed at anthesis, up to 700 × 60 mm. **Flowers**: large, up to 25, sepals 20–33 mm long; lip with 5 mm spur at base, 3 mm deep, broadly rounded sac below gynostemium, crests of low ridges in basal part of lip; petals and lip very pale yellow, minute blue speckles; lip's crested area bright yellow; Dec.–Feb. Forest margins.



**clitellifera** (Rchb.f.) Bolus

Herb, up to 350 mm high. **Leaves** thick, absent or partially developed at anthesis, up to 240 × 13 mm. **Flowers**: gynostemium 2–4 mm long; median sepal 4–9 mm long; margins of midlobe of lip undulate; spur slightly conical, 2.5–4.0 mm long; petals and lip dull white with reddish purple lines on inner surfaces; Sep.–Dec. Scrub, thornveld, bushveld and grassland.

| | | DrGr | | | |
|---|---|---|---|---|---|

**cooperi** Rchb.f.

*E. fragrans* Schltr.

*E. sankeyi* Rolfe

Herb, up to 370 mm high. **Leaves** < $^1/_2$ length of scape at anthesis, up to 300 × 16 mm. **Flowers**: petals not clawed, lanceolate-elliptic to ovate-oblong; gynostemium 7–9 mm long; median sepal 7–30 mm long; lip side lobe apices rounded; crest papillae few, confined to basal $^1/_3$ of lip midlobe; spur 1.2–2.2 mm long; petals and lip straw-yellow with lip tinged purple and crest bright yellow; Oct.–Dec. Grassland.

| | | | MsGr | | |
|---|---|---|---|---|---|

**foliosa** (Lindl.) Bolus

Herb, up to 450 mm high. **Leaves** partly to fully developed at anthesis, up to 600 × 25 mm. **Flowers**: in a generally dense and elongate raceme; papillae wart-like and very sparse on distal half of midlobe of lip; lip attached only to apex of a prominent mentum; petals usually oblanceolate or broadly elliptic; spur absent; perianth dull lime-green, ends of lip lobes tinged with dark purple or pale purple to white; Nov.–Feb. Sour grassveld. *Lekholela*, *loetsane*, *'mametsana* (SS). Figure 69.

| | | DrGr? | MsGr | | Zastr |
|---|---|---|---|---|---|

**hians** Spreng. var. **hians**

*E. clavicornis* Lindl. var. *clavicornis*

*E. violacea* Rchb.f.

Herb, up to 0.92 m high. **Leaves** emergent to < half developed at anthesis, up to 300 mm long. **Flowers**: one or both petals, and sometimes lip, fused to side of gynostemium and sometimes distorted; side lobe veins gradually curving away from central axis of lip; mentum absent or vestigial; lip lamina ± as long as odd sepal; spur elongate, 4–7 mm long; sepals green to purplish brown, petals and lip white to purple or yellow; Aug.–Dec. Grassland. *Maholohanya*, *'mametsana*, *lekholela* (SS); *elihlaza*, *imfeya-masele* (Z).

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|

**hians** Spreng. var. **inaequalis** (Schltr.) S.Thomas

*E. clavicornis* Lindl. var. *inaequalis* (Schltr.) A.V.Hall

*E. watkinsonii* Rolfe

Herb, up to 0.92 m high. **Leaves** emergent to < half developed at anthesis, up to 300 mm long. **Flowers**: petals and lip not fused to sides of gynostemium; side lobe nerves not curving away from central axis of lip; mentum 1–2 mm long; lip lamina often rather shorter than odd sepal; spur elongate, 4–7 mm long; sepals green to dark purplish brown, petals and lip bright yellow; Aug.–Oct. Grassland.

| | | DrGr | MsGr | | |
|---|---|---|---|---|---|




**Figure 69.** *Eulophia foliosa* (Orchidaceae). Artist: R. Collett.

**hians** Spreng. var. **nutans** (Sond.) S.Thomas
*E. clavicornis* Lindl. var. *nutans* (Sond.) A.V.Hall
*E. flanaganii* Bolus
*E. galpinii* Schltr.

Herb, up to 0.92 m high. **Leaves** fully developed at anthesis, 100–730 mm long. **Flowers**: petals and lip not fused to sides of gynostemium; midlobe crests of many papillae, often united at base; spur 1.4–5.2 mm long; sepals green to dark purplish brown, petals and lip white to pale or deep purple or tinged with blue or yellow; Dec.–Feb. Grassland.

DrGr MsGr

**leontoglossa** Rchb.f.
*E. stenantha* Schltr.

Herb, up to 300 mm high. **Leaves** partly to fully developed at anthesis, up to 370 × 9 mm. **Flowers**: midlobe 1/3 of length of lip, excluding spur; apices of side lobes of lip acute; petals usually narrower than lateral sepals, oblanceolate to narrowly oblong; spur rather slender, 3–5 mm long; sepals white to lemon-yellow or pink tinged with green, petals and lip white to pale yellow or pink; Oct.–Jan. Grassland on dry to marshy soils. *Lion's tongue*, *lion's tooth orchid*; *leeutong* (A); *lekholela*, *lekoesha*, *loetsana* (SS); *iphamba* (Z).

DrGr MsGr Zastr

**ovalis** Lindl. var. **bainesii** (Rolfe) P.J.Cribb & la Croix
*E. complanata* Verdoorn

Herb, up to 0.65 m high. **Leaves** fully developed at anthesis, up to 110–620 × 4–30 mm. **Flowers**: petals ovate, tapering to a subacute apex; odd sepal 18–36 mm long; midlobe of lip 9–18 mm long; spur 1.0–2.9 mm long, stout and rather flattened; petals pale straw-yellow, brownish purple at base outside, a few dark speckles inside with main veins lemon-yellow; Oct.–Mar. Open grassland and grassy places in bush or thornveld. *Lekholela-la-Matabele*, *lekoesha*, *'mametsana* (SS); *ihamba lesigodi*, *iphamba* (Z).

DrGr MsGr

**ovalis** Lindl. var. **ovalis**
*E. bakeri* Rolfe

Herb, up to 0.65 m high. **Leaves** fully developed at anthesis, up to 110–620 × 4–30 mm. **Flowers**: petals ovate, tapering to a subacute apex; odd sepal 14–26 mm long; midlobe of lip 5–15 mm long; spur 2.5–5.6 mm long, conical to cylindrical; petals white, slightly tinged with yellow-purple at base outside, blue-speckled along veins inside; Dec. Grassland. *Lekholela-la-matabele*, *lekoesha*, *'mametsana* (SS); *ihamba lesigodi*, *iphamba* (Z). Figure 70.

DrGr MsGr

**parviflora** (Lindl.) A.V.Hall

Herb, up to 500 mm high. **Leaves** partly extended at anthesis, up to 250 × 16 mm. **Flowers**: petals often shortly clawed, obovate-elliptic; gynostemium 4–8 mm long; side lobes of lip obliquely truncate; median sepal 7–30 mm long; spur 2–5 mm long; sepals dull brownish green outside, rich orange-brown inside, petals pale yellow, lip yellow; Aug.–Oct. Sour grassland.

MsGr

## **Habenaria** Willd. (sthn Afr.: 35 spp.)

### Key to species:

[after Linder & Kurzweil: 111 (1999)]

| | | |
|---|---|---|
| 1a | Petals entire, sometimes broadly rounded or angled on outer margins but not lobed | 2 |
| 1b | Petals distinctly bipartite, often divided nearly to base | 3 |
| 2a | Lip tripartite | **H. laevigata** |
| 2b | Lip with filamentous side lobes | **H. epipactidea** |
| 3a | Leaves several, cauline, neither orbicular nor adpressed to ground | 4 |
| 3b | Leaves 1 or 2, basal, orbicular or cordate, adpressed to ground | 6 |
| 4a | Lower petal lobes linear, horn-like, spreading forwards and curved upwards | **H. clavata** |
| 4b | Lower petal lobes not linear and horn-like | 5 |
| 5a | Spur 8–15 mm long, tapered from a widened mouth; median sepal 3–5 mm long; anther canals incurved | **H. dives** |
| 5b | Spur 20–40 mm long; median sepal 6–7 mm long; anther canals adpressed throughout their length | **H. falcicornis** subsp. **caffra** |
| 6a | Spur expanded at mouth; lower petal lobe much shorter than upper; lip side lobes shorter than midlobe | **H. dregeana** |
| 6b | Spur not expanded at mouth; petal lobes subequal or lower longer; lip lobes subequal or side lobes longer | **H. lithophila** |



**Figure 70.** *Eulophia ovalis* var. *ovalis* (Orchidaceae).

**clavata** (Lindl.) Rchb.f.

Herb, up to 0.7 m high. **Leaves** several, cauline. **Flowers**: lower petal lobes linear, horn-like, spreading forwards and curved upwards, twice as long as posterior lobe; spur 30–50 mm long, inflated towards apex; perianth green with white stigmas; Jan., Feb. Well-drained grassland. *'Mametsana* (SS).




**dives** Rchb.f.

Herb, up to 0.6 m high. **Leaves** several, cauline. **Flowers**: median sepal 3–5 mm long; anther canals incurved; anterior lobe of petal broadly lanceolate, shorter than oblong posterior lobe; lateral sepals with a lateral apiculus; spur 8–15 mm long, tapered from a widened mouth; perianth white with sepals green-veined; Dec.–Mar. Well-drained grassland. *Death orchid*; *lekoesha*, *'mametsana* (SS); *inhluthi yotshani* (Z).




**dregeana** Lindl.

Herb, up to 330 mm high. **Leaves** basal 2, cauline 15–many. **Flowers**: lateral lobes of lip distinctly shorter than midlobe; anterior petal lobe shorter than posterior; spur 8–13 mm long, mouth widened; perianth green; Feb.–Apr. Short grassland on rocky hillsides. *Small green hood*; *'mametsana* (SS).




**epipactidea** Rchb.f.
*H. foliosa* (Sw.) Rchb.f.
*H. polyphylla* Kraenzl.

Robust herb, up to 400 mm high. **Leaves** several, cauline. **Flowers**: dorsal sepal 9–12 mm long; petals entire, broadly ovate-oblong, rounded to subacute; lip with filamentous side lobes; spur ± 30 mm long; Jan.–Mar. Marshy grassland. *'Mametsana* (SS); *umabelebuca omkhulu*, *uklamkleshe*, *unokleshe* (Z).




**falcicornis** (Burch. ex Lindl.) Bolus subsp. **caffra** (Schltr.) J.C.Manning
*H. caffra* Schltr.
*H. falcicornis* (Burch. ex Lindl.) Bolus var. *caffra* (Schltr.) Renz & Schelpe
*H. tetrapetala* Kraenzl.

Herb, up to 0.7 m high. **Leaves** several, cauline. **Flowers**: median sepal 6–7 mm long; anther canals adpressed throughout their length; anterior petal lobe lanceolate to oblong-lanceolate, ± as long as posterior lobe; spur 20–40 mm long; sepals green, petals and lip white; Feb., Mar. Grassland.




**laevigata** Lindl.
*H. ornithopoda* Rchb.f.

Herb, up to 400 mm high. **Leaves** narrowly elliptic, acute, appressed to stem, up to 70 mm long. **Flowers**: petals entire, sometimes broadly rounded or angled on outer margins but not

lobed; lip tripartite; lateral lobes of lip half length of midlobe; spur 16–20(–30) mm long; Dec.–Feb. Well-drained grassland.




**lithophila** Schltr.

*H. macowaniana* Kraenzl.

*H. petri* Schltr.

Herb, up to 250 mm high. **Leaves** basal 2, cauline 5–30. **Flowers**: median sepal erect; lobes of lip and petal lobes subequal; spur 8–11 mm long, mouth not widened; perianth green; Jan.–Mar. Short grassland.




## **Holothrix** Rich. ex Lindl. (sthn Afr.: 23 spp.)

### Key to species:

[after Stewart *et al*.: 58 (1982)]

| | | |
|---|---|---|
| 1a | Petals divided into 3 narrow lobes | **H. scopularia** |
| 1b | Petals undivided | 2 |
| 2a | Leaves withered at flowering time | **H. thodei** |
| 2b | Leaves not withered at flowering time | **H. incurva** |

**incurva** Lindl.

*H. rupicola* Schltr.

Herb, up to 170 mm high. **Leaves** hairless, not withered when flowering. **Flowers**: inflorescence lax; flowering stem, ovary, sepals and bracts hairy; spur ± 2 mm long; lip deeply 5-lobed, linear; petals undivided; sepals green, petals and lip yellowish green; Jan., Feb. Grassy rock ledges and rock crevices.




**scopularia** (Lindl.) Rchb.f.

*H. multisecta* Bolus

*Scopularia secunda* Lindl.

Herb, up to 340 mm high. **Leaves** moderately to densely pilose, flat on ground. **Flowers**: spur ¼–1 × length of lip; lip divided into 5–12 carnose lobes; petals divided into 3 narrow lobes; perianth cream-coloured or pinkish cream-coloured, sometimes wine-coloured; Sep.–Nov. Grassy slopes and rocky outcrops.




**thodei** Rolfe

Herb, up to 250 mm high. **Leaves** with dense, stiff, curved hairs above; withered when flowering. **Flowers**: many; hairs on flowering stem deflexed; petals 4–5 mm, linear to lanceolate, undivided; midlobe of lip 2 × as long as 2 side lobes; perianth yellowish green; Jan.–Mar. Rocky grassland.



## **Huttonaea** Harv. (sthn Afr.: 5 spp.)

### **grandiflora** (Schltr.) Rolfe

Slender herb, up to 0.25 m high. **Leaves** cauline, sessile, up to 50 mm long. **Flowers**: large, 20–30 mm high; dorsal sepal without a spur; lip and petals with fringes 5–8 mm long; petals erect, with long claws, claws partially united; perianth pale green and white, inner margins of petals marked with purple; Feb., Mar. Grassland on steep slopes or rock crevices.

MsGr

## **Neobolusia** Schltr. (sthn Afr.: 1 sp.)

### **tysonii** (Bolus) Schltr.

*Brachycorythis tysonii* Bolus

Slender herb, up to 460 mm high. **Leaves** 2 or 3, basal. **Flowers**: inflorescence lax, 2–12; median sepal without spur; lip widest near apex, 8–12 × 4–8 mm; anther erect; perianth brownish green with a white lip; Dec.–Feb. Moist or marshy grassland. *'Mametsana-a-manyenyane* (SS).

MsGr

## **Pterygodium** Sw. (sthn Afr.: 17 spp.)

### Key to species:

[after Stewart *et al*.: 183 (1982)]

1a Robust herb, up to 1.5 m high . . . . . **P. magnum**
1b Slender herb, up to 0.4 m high . . . . . 2
2a Lip appendage dark green and contrasting with pale green flowers . . . . . **P. leucanthum**
2b Lip appendage not contrasting in colour with flower. . . . . 3
3a Lip appendage 3-pointed, bright green within; petals white; lip apex erose . . . . . **P. hastatum**
3b Lip with 2 stout, acute, deflexed side lobes . . . . . **P. cooperi**

### **cooperi** Rolfe

Slender herb, up to 0.3 m high. **Flowers**: inflorescence lax to dense, 5–many; lip apex pointed; lip appendage with a vertical ridge in front, lateral lobes of lip not overlapping midlobe; sepals pale green to purplish green; petals white and green or purplish on inner half; lip and appendage white; Jan.–Mar. Montane forest or mountain grassland. *'Mametsana-a-manyenyane* (SS).

MsGr

### **hastatum** Bolus

Slender herb, up to 0.35 m high. **Flowers**: inflorescence lax, 2–many; lip apex erose; lip appendage 3-pointed, bright green within; sepals bright green; petals white with small purple dots at apex; Jan., Feb. Grassland. *'Mametsana-a-manyenyane* (SS).

MsGr

### **leucanthum** Bolus

Slender herb, up to 0.4 m high. **Flowers**: inflorescence lax, 3–many; lip appendage with 2 dark green apical lobes contrasting with rest of flower; sepals pale green; petals cream-coloured; Jan.–Mar. Mountain grassland.




### **magnum** Rchb.f.

*Corycium magnum* (Rchb.f.) Rolfe

Very robust herb, up to 1.5 m high. **Flowers**: many; inflorescence dense; petals with denticulate margins; sepals green; petals yellowish with many red dots or reddish with darker veins; Jan.–Mar. In marshy grassland and river floodplains.




## **Satyrium** Sw. (sthn Afr.: 37 spp.)

### Key to species:

[after Linder & Kurzweil : 154 (1999)]

1a Leaves absent at flowering time or borne on a sterile shoot . . . . . 2
1b Leaves borne on fertile stem . . . . . 5
2a Lip subovoid, entrance much smaller than lip diameter (in front view), apical flap minute; flowers yellow, tinged with maroon . . . . . **S. parviflorum**
2b Lip not subovoid, entrance as wide as galea; flowers red, pink, white, orange or yellow, apical flap well developed. . . . . 3
3a Apical lip flap glabrous; spurs 5–15 mm long . . . . . **S. neglectum** subsp. **neglectum**
3b Apical lip flap hairy inside; spurs 13–46 mm long . . . . . 4
4a Lower bracts 4–7 mm wide; sepals 4–7 mm long; spurs 13–26 mm long . . . . . **S. longicauda** var. **jacottetianum**
4b Bracts 6–12 mm wide; sepals 5–11 mm long; spurs 22–46 mm long . . . . . **S. longicauda** var. **longicauda**
5a Leaves basal, orbicular or ovate, fully or partly adpressed to ground . . . . . **S. candidum**
5b Leaves cauline or ± basal, but always spreading or suberect . . . . . 6
6a Rostellum with 2 spreading arms with terminal viscidia, arms sometimes short and rather flat; spurs absent or as slight pouches . . . . . **S. microrrhynchum**
6b Rostellum not with 2 spreading arms, either blunt-ended and then often with a terminal lobe or bifid with parallel arms; spurs various . . . . . 7
7a Free end of petals ± 1 mm long, drying brown after flower opens; lip with very narrow entrance . . . . . **S. parviflorum**
7b Free end of petals normally > 1 mm long; lip entrance as wide as lip galea or nearly so . . . . . 8
8a Bracts erect . . . . . **S. stenopetalum** subsp. **brevicalcaratum**
8b Bracts deflexed at anthesis . . . . . 9
9a Perianth lobes with narrow tips which become dry soon after flower opens; lateral sepals and petals facing sideways . . . . . **S. ligulatum**
9b Flower not as above. . . . . 10
10a Leaves narrowly oblong to elliptic-oblong, cauline, suberect, merging gradually into sheaths; lip with sides semi-orbicular at aperture; spurs

appearing abruptly at base of lip, 7–31 mm long; perianth lobes variously pink or white . . . . . **S. hallackii** subsp. **ocellatum**

10b Leaves basal, spreading near soil surface; perianth lobes white with red markings . . . . . **S. cristatum** var. **cristatum**

## **candidum** Lindl.

Herb, 0.2–0.6 m high. **Leaves** 2, pressed flat on ground, orbicular or ovate. **Flowers**: 6–36 in spike; ovary 7–17 mm long; sepals 10–12 mm long, ± 1/3 fused with petals, then bent down; lip partly bent backwards with a slight ridge; spurs 10–20 mm long; perianth white to ivory-white, faintly tinged with pink, strong sweet scent; Sep.–Jan., after fires. Moist sandy flats.

MsGr

## **cristatum** Sond. var. **cristatum**

Herb, up to 0.55 m high. **Leaves** basal, spreading near soil surface. **Flowers**: bracts deflexed at anthesis; sepals and petals fused with lip for ± half their length and usually forming a shallow sac beneath column; lip entrance 3–6 mm high; spurs often shorter than ovary, 3–7 mm long; perianth white with red markings; Jan.–Mar. On moist grassy flats sometimes marshy. *Lekholela-la-bana-ba-seng*, *'mametsana* (SS).

DrGr MsGr

## **hallackii** Bolus subsp. **ocellatum** (Bolus) A.V.Hall

*S. ocellatum* Bolus

Herb, up to 0.6 m high. **Leaves** narrowly oblong to elliptic-oblong, cauline, suberect, merging gradually into sheaths. **Flowers**: dense or more usually well-spaced; bracts deflexed at anthesis; lip with sides semi-orbicular at aperture; spurs appearing abruptly at base of lip, 15–31 mm long; sepals usually 8–11 mm long; perianth variously pink or white; Dec.–Mar. Marshes.

MsGr

## **ligulatum** Lindl.

*S. emarcidum* Bolus

Herb, up to 0.55 m high. **Leaves** 1–4, lower spreading near soil surface, with gradual transition into sheaths above. **Flowers**: 4–85 in narrow spike; bracts deflexed at anthesis, lower bracts 4–7 mm wide; sepals 5–10 mm long, side sepals stand up next to lip for 2/3 of length; lateral sepals and petals facing sideways, narrow tips pointing upwards, browning soon after opening; spurs 5–10 mm long; perianth yellow-green to cream-coloured, tinged with purple; Sep.–Dec. Woodland on peaty loam, moist flats among grass.

MsGr

## **longicauda** Lindl. var. **jacottetianum** (Kraenzl.) A.V.Hall

Herb, up to 0.8 m high. **Leaves** on separate shoot. **Flowers**: lower bracts 4–7 mm wide; sepals 4–7 mm long; apical lip flap hairy inside; spurs 13–26 mm long, lying close to 6–12 mm long ovary; perianth white to pink; Jan.–Mar. Grassland, often in stony places or marshy soils. *Blushing bride satyrium*; *langstert-trewwa* (A); *lekoesha* (SS).

MsGr

### **longicauda** Lindl. var. **longicauda**

Herb, up to 0.8 m high. **Leaves** on separate shoot. **Flowers**: bracts 6–12 mm wide; sepals 5–11 mm long; apical lip flap hairy inside; spurs 22–46 mm long, lying close to 8–15 mm long ovary; perianth white to pink; Dec.–Feb. Open grassland. *Blushing bride satyrium*; *langstert-trewwa* (A); *lekoesha* (SS); *uklamkleshe*, *unoklamu*, *unokleshe* (Z).




### **microrrhynchum** Schltr.

Slender herb, up to 0.36 m high. **Leaves** 2 or 3, partly erect. **Flowers**: very small, 12–56 in dense mass; bracts deflexed; sepals 3–5 mm long; lip taller than deep, with prominent apical flap, hairs around bottom of entrance; rostellum with 2 spreading arms with terminal viscidia, arms sometimes short and rather flat; spurs absent or as slight pouches; perianth pale yellowish green to dull white; Jan., Feb. Grassy, sometimes stony or moist slopes.




### **neglectum** Schltr. subsp. **neglectum**

Herb, up to 1 m high. **Leaves** absent at flowering time or borne on a separate shoot. **Flowers**: aperture of labellum 3–4 mm high; rostellum apex deflexed, semi-orbicular; spike ± 20 mm in diameter; apical lip flap glabrous; spurs 5–15 mm long; perianth pink to dark red or orange to orange-yellow; Jan.–Mar. Occasional in open to sheltered places in upland grassland on usually moist slopes. *Pink candle satyrium*.




### **parviflorum** Sw.

*S. wilmsianum* Kraenzl.

Herb, up to 1.3 m high. **Leaves** variable. **Flowers**: free parts of petals ± 1 mm long, withering to brown shortly after anthesis; lip subovoid with a small aperture; apical flap minute; spurs 5–15 mm long, curved away from ovary at first; perianth yellowish green, tinged olive to dark maroon; Dec.–Apr. Grassland, moist to dry places. *Devil orchid*; *'mametsana* (SS); *ilabatheka elikhulu elibomvu*, *impimpi enkulu* (Z).




### **stenopetalum** Lindl. subsp. **brevicalcaratum** (Bolus) A.V.Hall

Slender herb, up to 0.56 m high. **Leaves** partly erect, leathery and stiff. **Flowers**: small, 5–27 in inflorescence; bracts stiff, erect; petals long; side sepals 5–10 mm long; lip flap large, 4 mm long; spurs 9–14 mm, shorter or as long as ovary; perianth white tinged with cream and traces of pink; pungent scent; Sep.–Dec. Moist flats and rock flushes.




## **Schizochilus** Sond. (sthn Afr.: 8 spp.)

### Key to species:

[after Stewart *et al*.: 76 (1982)]

Spur < 2 mm long; flowers white, with lip yellow . . . . . **S. angustifolius**
Spur 2–6 mm long; flowers bright yellow. . . . . **S. zeyheri**

**angustifolius** Rolfe
*S. albiflos* Schltr.

Slender herb, up to 200 mm high. **Leaves** in basal cluster. **Flowers**: lip with central lobe 1.5 mm long and lateral lobes 0.8 mm long, acute, no calli; spur 1 mm long; perianth white, lip yellow; Jan., Feb. Stony grassland, only at high altitudes of 2 100–3 000 m.




**zeyheri** Sond.

Slender herb, up to 600 mm high. **Leaves** generally all cauline. **Flowers**: lip deeply 3-lobed with central lobe 2 mm long and lateral lobes 1 mm long and 3 fleshy calli; spur 2–6 mm long; perianth bright yellow; Dec.–Feb. Wet grassland.




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# POACEAE

Annual or perennial herbs, often with rhizomes and/or stolons; aerial stems, known as culms, generally terminating in an inflorescence; internodes ± circular and usually solid in cross-section. **Leaves** alternate, arranged in 2 ranks, sessile; blade long, narrow, forming a sheath at base; sheath usually open with edges meeting or overlapping slightly; ligule usually present on upper surface at junction of blade and sheath. **Flowers**: small, inconspicuous, bisexual, unisexual or sterile; enclosed in 2 bracts, arranged with sterile bracts in spikelets, forms the basic unit of the inflorescence; perianth reduced and represented by 2, rarely 3 microscopic scales (lodiculae) at base of ovary; stamens 3; filaments long and slender; anthers elongate; ovary superior, 1-locular; stigmas 2, large and feathery. **Fruit** dry, indehiscent, a caryopsis or an achene, often dispersed while still tightly enclosed in persistent bracts (husk). *Grass family*; *grasfamilie* (A).

[Keys and descriptions after Gibbs Russell *et al*. (1990), Moffett (1997), Van Wyk & Malan (1997), Müller (2007), Van Oudtshoorn (2009) and Fish *et al*. (2015)]

# Key to genera

1a Tall woody bamboo; base of leaf blade constricted into a pseudo-petiole; flowering erratically . . . . . **Thamnocalamus** (*woody bamboo*)
1b Culms herbaceous, sometimes woody; base of leaf blade rarely constricted into a pseudo-petiole; flowering annually. . . . . 2
2a Inflorescence an obvious complex, leafy, false panicle; spikelet-bearing axis (usually a short raceme) either single or paired, closely to sparsely subtended by spathes and spatheoles. . . . . .**Key 1** (p. 988)
2b Inflorescence leafless or spikelet-bearing axis not obviously subtended by spathes or spatheoles (sometimes closely associated with uppermost or flag leaf) . . . . . 3
3a Inflorescence digitate or subdigitate, branches either paired or 3–many . . . . . .**Key 2** (p. 988)
3b Inflorescence not digitate or subdigitate . . . . . 4
4a Inflorescence a true spike or spike-like (spikelets or inflorescence branches being so closely packed against the axis to appear like a spike), ± linear in shape, occasionally spikelet solitary on culm . . . . . .**Key 3** (p. 990)
4b Inflorescence an open or contracted panicle, never spike-like or with spike-like primary branches scattered up the elongated central axis . . . . . .**Key 4** (p. 992)

## Key 1: Inflorescence a complex, false panicle

1a Inflorescence branches each subtended by a smooth ivory-like bead or cupule enclosing female spikelets; male spikelets on a tassel exserted from bead; annual. . . . . **Coix**
1b Inflorescence branches not subtended by a smooth ivory-like bead or cupule; annual or perennial. . . . . 2
2a Upper lemma of sessile spikelet not awned. . . . . **Hemarthria**
2b Upper lemma of sessile spikelet awned or mucronate (sometimes minutely so) . . . . . 3
3a Spikelets clustered into triangular units resembling a single spikelet, each unit usually 1-awned, rarely 2- or 3-awned, composed of a single, awned, sessile, bisexual spikelet and 2 pedicelled spikelets, enclosed by an involucre of 4 sterile sessile spikelets . . . . . **Themeda**
3b Spikelets not in triangular units resembling a single spikelet . . . . . 4
4a Racemes solitary in spatheoles . . . . . **Monocymbium**
4b Racemes 2 or more in spatheoles. . . . . 5
5a Inflorescence without conspicuous spathes and spatheoles subtending spikelet-bearing axis (low down on flowering culm(s) and closely appressed to inflorescence rachis) . . . . . **Andropogon**
5b Inflorescence with conspicuous spathes and spatheoles subtending spikelet-bearing axis . . . . . 6
6a Awn of upper lemma of sessile spikelet glabrous (hairs may not be visible on fresh wet material); sessile spikelet callus inserted into apex of internode, apex not visible; fresh plants usually aromatic. . . . . **Cymbopogon**
6b Awn of upper lemma of sessile spikelet distinctly hairy (awns need to be dry); sessile spikelet callus applied to apex of internode, apex visible; fresh plants not aromatic . . . . . **Hyparrhenia**

## Key 2: Inflorescence digitate or subdigitate with branches paired or 3–many

1a Spikelets 2–many-nate (at point of attachment to rachis) . . . . . 2
1b Spikelets solitary (at point of attachment to rachis). . . . . 13

2a Spikelets all similar; upper lemma usually similar to firmer in texture than glumes; spikelets sessile, subsessile or equally or unequally pedicelled . . . . 3
2b Spikelet pairs usually dissimilar; if similar, then upper lemma of bisexual spikelet less firm in texture than glumes; 1 spikelet usually sessile or subsessile, the other pedicelled (long–short combination), sometimes pedicel without spikelet . . . . . 8
3a Spikelets not awned (glume or lemma sometimes long-acuminate and appearing awned) . . . . . 4
3b Spikelets awned or mucronate (sometimes minutely so) . . . . . 7
4a Upper lemma with flat, thin margins covering most of the palea and often overlapping (*Digitaria*-type) . . . . . **Digitaria**
4b Upper lemma with narrow, inrolled margins clasping only edges of palea (*Paspalum*-type) . . . . . 5
5a Female-fertile lemmas mucronate or awned . . . . . **Urochloa**
5b Female-fertile lemmas neither mucronate nor awned . . . . . 6
6a Lower glume absent. . . . . **Paspalum**
6b Lower glume present . . . . . **Echinochloa**
7a Florets 2 per spikelet, lower sterile or male, upper bisexual; spikelets dorsiventrally compressed, falling with glumes . . . . . **Alloteropsis**
7b Florets 2 or more per spikelet, lower floret(s) bisexual; spikelets laterally compressed, disarticulating above glumes . . . . . **Chloris**
8a Internodes of rachis and pedicels stout, 3-angled, rounded or flattened and thickened upwards; upper lemma of bisexual spikelet (usually sessile spikelet) not awned . . . . . **Urelytrum**
8b Internodes of rachis and pedicels slender, filiform or linear, sometimes thickened upwards, clavate or substantial, but then upper lemma of bisexual spikelet (usually sessile spikelet) awned . . . . . 9
9a Spikelets unequally pedicelled; subsessile spikelet male or sterile, not awned, long-pedicelled spikelet bisexual, awned . . . . . **Trachypogon**
9b Spikelets usually 1 sessile and the other pedicelled, with only the sessile spikelet or both spikelets bisexual, awned or not awned . . . . . 10
10a Upper lemma of sessile spikelet entire, gradually passing into awn; callus of sessile spikelet not inserted into hollowed top of internode . . . . . 11
10b Upper lemma of sessile spikelet lobed, awned from between lobes or low down on back; callus of sessile spikelet inserted into hollowed top of internode (if not clear, then pedicels and internodes inflated) . . . . . 12
11a Lower glume of sessile spikelet acute to subacute; pedicels and internodes longitudinally grooved with a translucent median line . . . . . **Bothriochloa**
11b Lower glume of sessile spikelet obtuse to truncate; pedicels and internodes not grooved, without a translucent median line . . . . . **Dichanthium**
12a Callus long, acute to pungent . . . . . **Diheteropogon**
12b Callus often short, obtuse to truncate . . . . . **Andropogon**
13a Inflorescence branches not obviously secund. . . . . **Lophacme**
13b Inflorescence branches obviously secund. . . . . 14
14a Each inflorescence spike ending in a rigid, naked point . . . . **Dactyloctenium**
14b Each inflorescence spike not ending in a naked point . . . . . 15
15a Florets strictly 1 per spikelet, occasionally with a rachilla extension, rarely a vestigial floret present (if lower glume & palea missing and upper glume & lower lemma similar see *Paspalum*) . . . . . **Cynodon**
15b Florets 2 or more per spikelet, florets all fertile or mixed, some fertile and others male, sterile or reduced . . . . . 16
16a Lemma(s) of bisexual floret(s) not awned, sometimes mucronate . . . . **Eleusine**
16b Lemma(s) of bisexual floret(s) awned, awn sometimes minute. . . **Eustachys**

Key 3: Inflorescence a single, terminal spike or spike-like raceme or a compact panicle (side branches contracted close to central axis, forming a narrow, spike-like mass)

1a Plants reed-like; leaves mainly cauline . . . . . **Phragmites**
1b Plants not reed-like . . . . . 2
2a Spikelets in triads with pedicels fused, the whole mimicking a single spikelet . . . . . **Tristachya**
2b Spikelets not as above . . . . . 3
3a Spikelets solitary on flowering culm . . . . . 4
3b Spikelets many on flowering culm . . . . . 6
4a Inflorescence a single raceme . . . . . **Brachypodium**
4b Inflorescence of spike-like main branches . . . . . 5
5a Ligule an unfringed membrane, minutely ciliolate only . . . . . **Bewsia**
5b Ligule a dense fringe of hairs . . . . . **Tetrachne**
6a Spikelet or clusters of spikelets enclosed in an involucre of bracts or subtended by 1–many bristles, spines, scales or bracts, bristle may be solitary, not obvious or hardened to form rigid spines, or inflorescence enclosed by a specialised inflated flag leaf, and the whole falling as a unit . . . . . 7
6b Spikelets not enclosed by an involucre of bracts nor subtended by a bristle or bristles, if enclosed in flag leaf this not specialised and inflorescence not falling as a unit, sometimes enclosed by chaffy and/or enlarged glumes or spathes . . . . . 12
7a Bristle(s) persisting on axis after spikelet(s) falls . . . . . **Setaria**
7b Bristle(s), scales, bracts or herbaceous cupule falling with spikelet(s) . . . . 8
8a Involucre of several sterile spikelets or coriaceous bracts; bristles absent . . . . . **Anthephora**
8b Involucre of one to many bristles, spines or herbaceous cupules or scales . . . . . 9
9a Involucral bristle, scale or cupule solitary . . . . . 10
9b Involucral bristles or spines several to many . . . . . 11
10a Spikelets subtended by a herbaceous, lobed cupule or scale, one lobe longer and awn-like; stipe supporting spikelet blunt . . . . . **Odontelytrum**
10b Spikelets subtended by a solitary robust and awn-like or slender bristle; stipe supporting spikelet pungent or absent . . . . . **Pennisetum**
11a Bristles free throughout, ± filiform . . . . . **Pennisetum**
11b Bristles connate and flattened below, forming a disc, sometimes flattened and/or hardened, forming rigid spines enclosing the spikelet . . . . **Cenchrus**
12a Inflorescence obviously 1-sided (secund) to subsecund . . . . . 13
12b Inflorescence not obviously secund; spikelets sometimes distichous . . . . 19
13a Spikelets, all or at least some, awned . . . . . **Cynosurus**
13b Spikelets all not awned or mucronate . . . . . 14
14a Spikelet with 2 florets, lower male or sterile, upper bisexual (lower glume may be minute or absent, upper glume and lower lemma may resemble each other) . . . . . **Digitaria**
14b Spikelet with 1–many florets, all bisexual or upper male or sterile, or florets 3 with lower 2 sterile and upper bisexual, or if florets 2, then lowest bisexual . . . . . 15
15a Glumes unequal in size . . . . . 16
15b Glumes ± equal in size . . . . . 17
16a Upper glume 1-nerved; floret 1 per spikelet, falling with glumes . . . **Catalepis**
16b Upper glume 3–7-nerved; florets 2–5(–10) per spikelet, disarticulating above glumes . . . . . **Harpochloa**
17a Floret 1 per spikelet . . . . . **Microchloa**
17b Florets 2 or more per spikelet . . . . . 18
18a Annuals; spikelets laterally compressed; glumes 5–8-nerved . . . **Pentameris**
18b Perennials; lower glume obliquely compressed, upper glume dorsiventrally compressed; glumes 1-nerved . . . . . **Rendlia**

19a Ligule absent from upper or all leaves . . . . . 20
19b Ligule present on all leaves . . . . . 21
20a Spikelets densely and irregularly crowded on inflorescence, softly long-hairy . . . . . **Brachiaria**
20b Spikelets in regular rows on inflorescence, minutely soft-hairy or with long, rigid hairs . . . . . **Echinochloa**
21a Bisexual spikelet with 1 floret (rachilla extension sometimes present) . . . . 22
21b Bisexual spikelet with 2–many florets (some florets may be reduced to lemmas or differ in size and shape) . . . . . 28
22a Ligule an unfringed membrane . . . . . 23
22b Ligule a fringed membrane or a fringe of hairs . . . . . 25
23a Spikelets in triads, central spikelet bisexual, 2 lateral spikelets male or sterile; central spikelet with one floret, rachilla extension present; glumes side by side . . . . . **Hordeum**
23b Spikelets not in triads, or if in triads then all spikelets alike in function; glumes not displaced . . . . . 24
24a Inflorescence a contracted panicle; lemma 5-nerved . . . . . **Polypogon**
24b Inflorescence a cylindrical spike or spike-like raceme; lemma 1-nerved . . . . . **Perotis**
25a Spikelets awned or mucronate (sometimes minute) . . . . . 26
25b Spikelets neither awned nor mucronate . . . . . 27
26a Lemma 1–3-awned. . . . . **Aristida**
26b Lemma mucronate, muticous or not awned. . . . . **Oropetium**
27a Upper glume with large, hooked, curved or straight prickles, 5–7-nerved; spikelets dorsiventrally compressed; lower glume absent or a minute scale . . . . . **Tragus**
27b Upper glume without hooked, curved or long, straight prickles, 1-nerved; spikelets laterally to not noticeably compressed; lower glume substantial or reduced to a scale . . . . . **Sporobolus**
28a Ligule an unfringed membrane . . . . . 29
28b Ligule a fringed membrane (fringe sometimes minute) or a fringe of hairs . . . . . 34
29a All spikelets not awned and not mucronate . . . . . 30
29b All or some spikelets awned or mucronata . . . . . 32
30a Glumes unequal in size, sometimes lower one reduced or absent (terminal spikelets often have both glumes well developed) . . . . . **Lolium**
30b Glumes ± equal in size . . . . . 31
31a Florets 2 or 3 per spikelet; lowest 1 or 2 florets sterile or reduced to lemmas, upper floret bisexual . . . . . **Phalaris**
31b Florets 2–many per spikelet; lowest floret bisexual, upper sometimes sterile or reduced . . . . . **Melica**
32a Spikelets in pairs, these dissimilar in form and sex, sometimes some pairs on inflorescence similar . . . . . **Heteropogon**
32b Spikelets solitary, in clusters or in pairs, all spikelets similar in form and sex on inflorescence. . . . . 33
33a Florets 3 per spikelet; lower 2 male or sterile; upper bisexual, not awned. . . . . **Anthoxanthum**
33b Florets 2–many per spikelet; lowest usually bisexual, sometimes male; upper sometimes sterile and reduced, awned or not awned. . . . . **Koeleria**
34a All spikelets muticous . . . . . **Imperata**
34b All or some spikelets awned or mucronate . . . . . 35
35a Lemma 5- or 9-awned . . . . . **Enneapogon**
35b Lemma 1–3-awned or mucronate (at least one lemma) . . . . . 36
36a Spikelets paired, usually dissimilar in sex and form (heterogamous), often one sessile and the other pedicelled (pedicel sometimes fused to rachis but discernible) . . . . . **Elionurus**
36b Spikelets solitary, clustered or paired, all similar in sex and form . . . . . 37

37a One or more lemmas with median awn geniculate or at least twisted in lower part . . . . . 38
37b One or more lemmas mucronate or with a straight median awn . . . . . 39
38a Glumes unequal in size . . . . . **Arundinella**
38b Glumes ± equal in size . . . . . **Tenaxia**
39a Glumes obviously much shorter than spikelet . . . . . 40
39b Glumes (at least upper glume) ± as long as to much longer than spikelet . . . . . 41
40a Lemma glabrous (rarely with tubercle-based hairs on side nerves). . . . . **Pogonarthria**
40b Lemma hairy. . . . . **Stiburus**
41a Inflorescence of short, stiff spikes spaced up to 30 mm apart, ascending at first, reflexing at maturity . . . . . **Dinebra**
41b Inflorescence dense and continuous or of dense, globose clusters at intervals on central axis . . . . . **Fingerhuthia**

## Key 4: Inflorescence an open to contracted panicle

1a Lemma 5- or more-awned . . . . . 2
1b Lemma not awned, or < 5-awned. . . . . 3
2a Lemma 5-awned, awns scabrid, alternating with hyaline lobes . . .**Schmidtia**
2b Lemmas 9-awned, awns plumose or scabrid, not alternating with hyaline lobes . . . . . **Enneapogon**
3a Leaf blade with cross venation (usually more conspicuous on lower surface) . . . . . **Panicum**
3b Leaf blade without obvious cross venation . . . . . 4
4a Ligule an unfringed membrane (sometimes minutely or sparsely ciliolate or fimbriate) . . . . . 5
4b Ligule a fringe of hairs or a fringed membrane . . . . . 25
5a Spikelets unconventional and hard to interpret; glumes absent or very reduced or specialised . . . . . **Leersia**
5b Spikelets conventional; glumes, at least upper one, usually present. . . . . 6
6a Floret 1 per spikelet . . . . . 7
6b Florets 2 or more per spikelet . . . . . 12
7a Glumes shorter than spikelet . . . . . **Festuca**
7b Glumes ± as long as to longer than spikelet . . . . . 8
8a Lemma less firm to similar in texture to glumes, not becoming indurated; lemma not awned, mucronate or awned; awn slender . . . . . 9
8b Lemma firmer in texture than glumes, becoming indurated; lemma not awned, mucronate or awned, awn robust . . . . . .11
9a Spikelets falling with glumes; lemma not awned or awned, central awn arising at or near apex . . . . . **Polypogon**
9b Spikelets disarticulating above glumes; lemma not awned or awned, central awn arising well below apex or at base . . . . . 10
10a Inflorescence a panicle with spikelets not secund on branches; lemma not keeled . . . . . **Agrostis**
10b Inflorescence of one-sided racemes scattered along central axis due to spikelets being secund on branches; lemma keeled . . . . . **Leptochloa**
11a Lemma apex fuse into a crown; asymmetrically awned; spikelets gibbous. . . . . **Nassella**
11b Lemma apex without crown; awn central; spikelets not gibbous . . . . . **Stipa**
12a Florets 2 per bisexual spikelet; rachilla extension present or absent. . . . . 13
12b Florets > 2 per bisexual spikelet. . . . . 22
13a Spikelets paired (terminal spikelets often in triads), usually dissimilar in function, one sessile and the other pedicellate, sometimes pedicel without a spikelet, or spikelets unequally pedicelled . . . . . **Sorghum**
13b Spikelets solitary, paired or in groups, all similar in function . . . . . 14

14a Lower floret male or sterile; upper bisexual . . . . . 15
14b Both florets bisexual or upper male, sterile or reduced. . . . . 16
15a Spikelets surrounded by an involucre of long, spreading hairs from callus . . . . . **Miscanthus**
15b Spikelets not obviously surrounded by involucre of long, spreading hairs from callus or callus glabrous or absent . . . . . **Tarigidia**
16a Lemmas all not awned. . . . . 17
16b Lemmas all, or at least one in spikelets, awned or mucronate . . . . . 20
17a Spikelets large, 7–45 mm long; ovary pilose; glumes as long as to longer than spikelet . . . . . **Avena**
17b Spikelets small, up to 8 mm long; ovary glabrous; glumes shorter than to rarely ± as long as spikelets . . . . . 18
18a Lemma distinctly keeled on back, at least near base . . . . . **Poa**
18b Lemma rounded on back, at least at base (sometimes keeled on all nerves) . . . . . 19
19a Glumes ± equal in size . . . . . **Aira**
19b Glumes unequal in size . . . . . **Puccinellia**
20a Plant perennial . . . . . **Dactylis**
20b Plant annual . . . . . 21
21a Glumes shorter than spikelet . . . . . **Vulpia**
21b Glumes as long as to longer than spikelet . . . . . **Trichoneura**
22a Florets 3, lower 2 sterile or male (often reduced to lemma only), upper floret bisexual. . . . . **Ehrharta**
22b Florets 3 or more, if 3 then lower floret bisexual and uppermost sterile or reduced. . . . . 23
23a Lemma as wide as long, gibbous and cordate at base; lemma 7–9-nerved . . . . . **Briza**
23b Characters not in same combination as above . . . . . 24
24a Lemma awned, awn geniculate . . . . . **Helictotrichon**
24b Lemma mucronate or awned, awn straight . . . . . **Bromus**
25a Floret 1 per spikelet . . . . . 26
25b Florets 2–many per spikelet . . . . . 30
26a Spikelets up to 6 mm long, not awned . . . . . 27
26b Spikelets up to 30 mm long, awned or mucronate (either may be minute), sometimes lemma not awned but then apex awn-like and spikelets 8–15 mm long . . . . . 28
27a Lemma glabrous . . . . . **Sporobolus**
27b Lemma hairy. . . . . **Polevansia**
28a Lemma mucronate or minutely awned or not awned and sometimes awn-like . . . . . **Cortaderia**
28b Lemma usually 3-awned (may appear as a single awn with 3 branches due to fusion), rarely 1-awned. . . . . 29
29a Awns of lemma all or only central one plumose (*S. anomala* with awn solitary and with a pencil of hairs at base of column); palea indurated . . . **Stipagrostis**
29b Awns of lemma all glabrous, smooth or scabrid, (lateral awns may be reduced or absent and 1-awned); palea not indurated . . . . . **Aristida**
30a Florets 2 per spikelet . . . . . 31
30b Florets 3–many per spikelet . . . . . 39
31a Lemma of bisexual spikelet less firm in texture than glumes; spikelets usually paired, one sessile and the other pedicellate and dissimilar in form and function, or in triads, rarely paired or solitary and similar in form and function . . . . . 32
31b Lemma of bisexual floret similar to firmer in texture than glumes; spikelets solitary, in pairs, triads or groups, similar in form and function . . . . . 34
32a Lowest floret male or sterile. . . . . **Melinis**
32b Lowest floret bisexual . . . . . 33
33a Plants reed-like; inflorescence a large plumose panicle . . . . . **Arundo**

33b Plants not reed-like; inflorescence not large and plumose . . . . . **Tribolium**
34a Lower floret male or sterile, usually reduced to a lemma; upper floret bisexual . . . . . 35
34b Both florets bisexual or upper sterile . . . . . 38
35a Spikelets supported on a bead-like swelling . . . . . **Eriochloa**
35b Spikelets not supported on a bead-like swelling . . . . . 36
36a Ligule a fringed membrane; upper lemma scabrid to scaberulous . . . . . **Arundinella**
36b Ligule a fringe of hairs; upper lemma usually hairy to glabrous or smooth, rarely scaberulous . . . . . 37
37a Lower lemma 3-nerved . . . . . **Loudetia**
37b Lower lemma 5–9-nerved . . . . . **Tricholaena**
38a Spikelets up to 2.5 mm long . . . . . **Eragrostis**
38b Spikelets 3–7 mm long. . . . . **Merxmuellera**
39a Plants reed-like; leaves mainly cauline . . . . . **Phragmites**
39b Plants not reed-like . . . . . 40
40a Central awn of lemma short and straight, or lemma shortly mucronate or not awned . . . . . **Triraphis**
40b Central awn of lemma geniculate or bent, lower part usually twisted . . . . 41
41a Spikelets 4.0–7.0 mm long. . . . . **Schismus**
41b Spikelets 7.5–25.0 mm long . . . . . **Tenaxia**

## **Agrostis** L. (sthn Afr.: 11 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 53 (2015)]

1a Glumes 3.5–5.5 mm long . . . . . 2
1b Glumes up to 3.5 mm long . . . . . 5
2a Plants annual; glumes 2.0–3.5 mm long . . . . . **A. avenacea**
2b Plants perennial; glumes 3.5–5.5 mm long . . . . . 3
3a Rachilla absent; leaf blades 1–2 mm wide; panicle branches rigid, straight, ascending . . . . . **A. eriantha** var. **eriantha**
3b Rachilla present; leaf blades 2–6 mm wide; panicle branches flexuous, spreading at maturity . . . . . 4
4a Lemma awned from 1/4 above the base; glumes 4.0–5.5 mm long. . . . . **A barbuligera** var. **barbuligera**
4b Lemma awned from ± the middle; glumes 3.0–3.5(4.0) mm long . . . . . **A. barbuligera** var. **longipilosa**
5a Spikelets widely separated; panicles very diffuse, branches hair-like . . . . . 6
5b Spikelets close together; panicles open or compact, not diffuse. . . . . 7
6a Glumes 1.5–2.5 mm long; anthers 0.8–1.2 mm long . . . . . **A. bergiana** var. **bergiana**
6b Glumes 2.5–3.0 mm long; anthers 1.3–1.7 mm long . . . . . **A. bergiana** var. **laeviuscula**
7a Anthers 0.5–0.7 mm long; lemmas 3-nerved; panicle 150–400 mm long, narrow and sinuous, branches held nearly erect. . . . . **A. lachnantha**
7b Anthers 0.8–1.7 mm long; lemmas 3–5-nerved; panicle up to 200 mm long, open or compact, branches ascending to spreading . . . . . 8
8a Lemmas glabrous; rachilla absent . . . . . **A. subulifolia**
8b Lemmas hairy; rachilla present. . . . . 9
9a Plants annual; lemma hairs up to 0.5 mm long, not spreading . . . **A. avenacea**
9b Plants perennial; lemma hairs up to 1.5 mm long, spreading. . . . . **A. barbuligera** var. **longipilosa**

### *avenacea C.C.Gmel.

Annual, 0.18–0.60 m high. **Leaf blades** up to ± 170 × 2 mm. **Flowers**: panicle open, 80–190 mm long; spikelets 2.5–4.0 mm long; rachilla < ½ length of floret; glumes 2.0–3.5 mm long; lemmas hairy, 4-nerved, hairs up to 0.5 mm long, not spreading; Jul.–Mar. Disturbed areas or wet places, weed of cultivation. Native to Australia. *Blown grass*, *bent grass*.




### **barbuligera** Stapf var. **barbuligera**

Perennial, up to 0.8 m high; tufted. **Leaf blades** up to 250 × 2–6 mm, flat; basal sheaths splitting into fibres. **Flowers**: panicle branches flexuous, spreading at maturity; spikelets 4.0–5.5 mm long; rachilla produced as a hairy bristle; glumes 4.0–5.5 mm long; lemmas awned from near base; Nov.–Mar. Mountain grassland.




### **barbuligera** Stapf var. **longipilosa** Gooss. & Papendorf

Differs from typical variety in its smaller spikelets, glumes 3.0–3.5(4.0) mm long, and with more hairy lemmas, hairs up to 1.5 mm long, spreading, lemmas awned from ± the middle.




### **bergiana** Trin. var. **bergiana**

Perennial or annual, 0.15–0.30(–0.60) m high; delicate weak. **Leaf blades** up to 90 mm long, 1–2 mm wide. **Flowers**: panicle very diffuse, branches hair-like; pedicels 5–10 mm long; spikelets 1.5–2.5 mm long, widely separated; glumes 1.5–2.5 mm long; paleae present; anthers 0.8–1.2 mm long; Nov.–Feb. Grassland, in sheltered or wet places.




### **bergiana** Trin. var. **laeviuscula** Stapf

Perennial or annual, up to 0.3 m high; delicate, weak. **Leaf blades** up to 90 mm long, 1–2 mm wide. **Flowers**: panicle very diffuse, branches hair-like; spikelets 2.5–3.0 mm long, widely separated; pedicels 5–10 mm long; glumes 2.5–3.0 mm long; paleae present; anthers 1.3–1.7 mm long; Oct.–Feb. Mountain grassland in sheltered or wet places.




### **eriantha** Hack. var. **eriantha**

Perennial, up to 0.7 m high; rhizomatous and tufted. **Leaf blades** up to 180 × 1–2 mm, folded. **Flowers**: panicle branches rigid, straight, held ascending at maturity; spikelets 3.5–5.0 mm long; rachilla not produced; glumes 3.5–5.5 mm long; lemmas awned from ± middle; Jan.–Apr. Wet places, sometimes in disturbed areas or cultivation.




### **lachnantha** Nees

*A. huttoniae* (Hack.) C.E.Hubb.,
*A. lachnantha* Nees var. *glabra* Gooss. & Papendorf

Perennial, short-lived or annual, up to 0.9 m high; usually robust, loosely tufted. **Leaf blades** 70–200 × 2–4 mm. **Flowers**: panicle contracted, narrow, sinuous, 150–400 mm long, branches

held nearly erect; spikelets 1.5–2.5(–3.0) mm long, close together; lemmas 3-nerved; anthers 0.5–0.7 mm long; Oct.–Mar. (occasionally earlier or later). Riverbanks and wet places. *South African bent grass*; *roggras*, *vinkgras*, *polgras*, *vleigras* (A).

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

### **subulifolia** Stapf

Perennial, 0.05–0.30 m high; delicate, tufted. **Leaf blades** folded; up to 70 mm long, 0.5–1.0 mm wide. **Flowers**: panicle contracted to open, 15–80 mm long; spikelets 2–3 mm long, branches ascending, rachilla not produced; lemmas 3–5-nerved, glabrous; anthers 0.8–1.7 mm long; Jan.–Mar. Hydrophyte, in mountain bogs.

| | | | MsGr | | |
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## **Aira** L. (sthn Afr.: 2 spp.)

### ***cupaniana** Guss.

Annual, 0.03–0.40 m high; tufted. **Leaf blades** up to 10–95 × 3 mm. **Flowers**: panicle open, spreading; spikelets 2-flowered, 2–3 mm long glumes pear-shaped; lemmas awned from the lower $^1/_3$, lower lemma sometimes not awned; Sep.–Jan. Shallow soils in damp to wet areas. Native to Europe. *Silver hair grass*; *haasgras* (A).

| | | | MsGr | | |
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## **Alloteropsis** J.Presl (sthn Afr.: 3 spp.)

### Key to species:

[after Moeaha in Fish *et al*.: 62 (2015)]

Basal leaf sheath nerves forming ribs 0.5–1.1 mm wide; racemes (40–)60–100(–170) mm long, spikelets loosely arranged, light coloured; leaf blades tapering gradually to apex. . . . . **A. semialata** subsp. **semialata**
Basal leaf sheath nerves up to 0.3 mm wide; racemes (30–)40–70(–160) mm long, spikelets tightly packed together, dark coloured; leaf blades tapering abruptly to apex . . . . . **A. semialata** subsp. **eckloniana**

### **semialata** (R.Br.) Hitchc. subsp. **eckloniana** (Nees) Gibbs Russ.

*A. semialata* (R.Br.) Hitchc. var. *ecklonii* (Stapf) Stapf

Perennial, up to 1.1 m high; shortly rhizomatous, tufted. **Basal parts** V-shaped in silhouette, not bulbous; basal sheaths with veins up to 0.3 mm wide. **Leaf blades** flat, 3–12 mm wide, base tapering, tapering abruptly to apex, velvety to sparsely hairy, margins not ciliate. **Flowers**: inflorescence digitate, racemes (30)40–70(160) mm long; spikelets 5–8 mm long; dark-coloured, tightly packed; palea glabrous or with sparse hairs; Sep.–Mar. Grassland, rocky places and forest margins; usually at higher altitudes and more acid soil than subsp. *semialata*.

| | | DrGr | MsGr | | |
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### **semialata** (R.Br.) Hitchc. subsp. **semialata**

Perennial, up to 1.5 m high; shortly rhizomatous, tufted. **Basal parts** bulbous, rounded in silhouette; basal sheaths with ribs 0.5–1.1 mm wide. **Leaf blades** 3–5(–7) mm wide, usually

curved inward or loosely rolled, sparsely hairy, base tapering, gradually tapering to apex, margins not ciliate. **Flowers**: inflorescence digitate, racemes (40)60–100(170) mm long; spikelets light-coloured, loosely arranged; palea glabrous or with sparse hairs; Sep.–Mar. Grassland, bush clumps.

MsGr

## **Andropogon** L. (sthn Afr.: 15 spp.)

### Key to species:

[after Fish in Fish *et al*.: 68 (2015)]

1a Inflorescence a complex, false panicle, silky plumose; internode and pedicel hairs at least as long as sessile spikelet . . . . . **A. eucomus**
1b Inflorescence digitate or subdigitate . . . . . 2
2a Sessile spikelet lower glume with upper part winged, wings often asymmetrical . . . . . 3
2b Sessile spikelet lower glume not winged . . . . . 4
3a Plant base densely hairy; pedicel and internodes with one margin long hairy (maybe difficult to see or only basally hairy), other margin glabrous or sparsely short hairy; sessile spikelet 9–16 mm long, upper lemma awn 15–30 mm long. . . . . **A. distachyos**
3b Plant base glabrous or hairs scattered; pedicel and internodes margins both clearly densely long hairy; sessile spikelet 5.0–8.5 mm long, upper lemma awn 10–15 mm long . . . . . **A. amethystinus**
4a Pedicellate spikelet lower glume not ribbed, central nerve prominent, 2 or 3 slender lateral nerves are widely spaced . . . . . **A. appendiculatus**
4b Pedicellate spikelet lower glume appears ribbed due to many nerves equidistance from each other . . . . . 5
5a Sessile spikelet lower glume keels separate; basal parts and rhizomes knotted; basal sheaths glabrous; mountain sourveld . . . . . **A. ravus**
5b Sessile spikelet lower glume keels nearly meeting; basal parts and rhizomes straight; basal sheaths hairy at base (often only at very base where roots come out); various habitats . . . . . **A. schirensis**

### **amethystinus** Steud.

Perennial, 0.08–0.70 m high; rhizomatous, tufted, base glabrous or with scattered hairs. **Leaf blades** 10–150 × 1–4 mm. **Flowers**: inflorescence digitate, spike-like, racemes 2 per spathe; pedicels linear or slightly clavate, densely long hairy; spikelets 5.0–8.5 mm long; lower glume of sessile spikelets flat on back, hairs > 1 mm long, but inflorescence not plumose; upper lemma awn 10–15 mm long; Feb.–Jun. Mountain grassland.

MsGr

### **appendiculatus** Nees

Perennial, up to 1.3 m high; densely tufted. **Leaf blades** up to 150–500 × 6 mm; basal leaf sheaths keeled, flattened, yellow, becoming brown, shining. **Flowers**: inflorescence subdigitate, 1 or 2 flowering branches per culm, spike-like, racemes 4–20 per spathe, (30–)60–150 mm long, dark purple, with short hairs, pedicels rounded, slightly clavate; spikelets sessile or pedicellate, 5–7 × (0.7–)0.9–1.2 mm; callus of sessile spikelets inserted in a membranous-edged socket; lower glume of pedicellate spikelet not ribbed, central nerve prominent, 2 or

3 slender lateral nerves widely spaced; lemma awn 10–15 mm long; Oct.–Apr. Wet or shady places. *Blue grass*; *blougras* (A).

VreDm | AcGr | DrGr | MsGr | | Zastr

### **distachyos** L.

Perennial, up to 1 m high; rhizomatous and tufted, base with silky hairs. **Leaf blades** 70–200 × 2–4 mm. **Flowers**: inflorescence digitate, spike-like, racemes 2 per spathe, pedicels stout, slightly clavate, with one margin long hairy sessile spikelets 9–16 mm long, pedicellate spikelets shorter; lower glume of sessile spikelets flat on back, broadly winged on upper $^1/_3$, apex bidentate, often awned, glabrous; glumes purplish; upper lemma awn 15–30 mm long; Jan.–Jun. Mountain grassland.

| | | DrGr | MsGr | | |

### **eucomus** Nees

Perennial, up to 0.9 m high; densely tufted. **Leaf blades** 40–200 × 4 mm. **Flowers**: a complex, false panicle, plumose; internode and pedicel hairs at least as long as sessile spikelets, racemes 2–5 per spathe, with white silky hairs twice as long as spikelets; spikelets 2–3 mm long, all sessile, accompanied by a hairy empty pedicel; silky plumose, of 2–6 flowering branches; lower glume of sessile spikelets deeply and narrowly grooved; Nov.–May. Vleis and wet places. *Snowflake grass*, *silver thread grass*, *oldman's beard*; *kleinwitbaard-andropogon*, *veergras*, *fynblaar-andropogon* (A); *mohlaala* (SS). Figure 71.

VreDm | AcGr | DrGr | MsGr | |

### **ravus** J.G.Anderson

Perennial, 0.15–0.90 m high; glaucous green, rhizomatous, basal parts and rhizomes knotted; basal sheaths glabrous. **Leaf blades** up to 300 × 2–7 mm. **Flowers**: inflorescence digitate, with 2 or 3 spike-like, glaucous-green racemes; sessile spikelets 7–9 mm long, pedicellate spikelets considerably longer; pedicels cuneate-clavate; lower glume of sessile spikelets deeply grooved, keels separate, glumes not awned; lemma awn 15–20 mm long; Jan.–Mar. Grassland, mountain sourveld.

| | | DrGr | MsGr | | |

### **schirensis** A.Rich.

*A. schirensis* A.Rich. var. *angustifolius* Stapf

Perennial, up to 1.2 m high; densely tufted, reddish, basal parts and rhizomes straight; basal sheaths hairy at base. **Leaf blades** 90–600 × 3–14 mm. **Flowers**: inflorescence digitate with 2(–5) spike-like racemes; sessile spikelets 5–7 mm long, pedicellate spikelets slightly longer, pedicels clavate; lower glume of sessile spikelets deeply and very narrowly grooved, keels nearly meeting; glumes not awned; lemma awn 25–30 mm long; Dec.–Apr. Open veld and rocky hillsides.

VreDm | | DrGr | MsGr | KarSh |

## **Anthephora** Schreb. (sthn Afr.: 4 spp.)

### **pubescens** Nees

Perennial, up to 1.5 m high; tufted. **Leaf blades** 100–150 × 3–5 mm. **Culms** not branched; leaves long-tapering to soft apex, often curling. **Flowers**: inflorescence a spike, straw-coloured



**Figure 71.** *Andropogon eucomus* (Poaceae).

or dull purple, 5–10 mm wide; spikelets ± 8 × 3 mm, densely hairy; lower glumes acuminate or shortly awned; Dec.–Apr. Shallow, acid, sandy soils, often on hillsides. *Wool grass*, *bottle brush grass*, *cat's tail grass*; *bloubuffelsgras*, *wolgras*, *borseltjiegras* (A).




## **Anthoxanthum** L. (sthn Afr.: 5 spp.)

### **ecklonii** (Nees ex Trin.) Stapf

Perennial, up to 0.8 m high; loosely or densely tufted and rhizomatous. **Culms** with bases usually bulbous. **Leaf blades** 70–250 × 4–9 mm. **Flowers**: panicle compact, spike-like, 40–130 mm long; spikelets 6–8 mm long; lower glume 1-nerved; lower lemma ± 5 mm long, pale to light brown, usually sparsely hairy; Dec.–Apr. Usually moist places such as streamsides and grassy mountainsides, extending to forest margins. *Sweet vernal grass*.




## **Aristida** L. (sthn Afr.: 26 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 84 (2015)]

1a Lower glume without an awn or mucro. . . . . 2
1b Lower glume with an awn or mucro (can be minute) . . . . . 12
2a Lower glume longer than upper glume, tapering to acuminate apex (sometimes breaking off early) . . . . . **A. monticola**
2b Lower glume shorter than to equalling the upper glume. . . . . 3
3a Plants annual . . . . . **A. adscensionis**
3b Plants perennial . . . . . 4
4a Lemma articulation absent or inconspicuous . . . . . 5
4b Lemma articulation present between the lemma apex and column base . . . 7
5a Plant robust; culm diameter 5.0–6.0 mm . . . . . **A. sciurus**
5b Plant slender; culm diameter 1.5–3.0 mm . . . . . 6
6a Spikelets up to 22 mm long (including awns); inflorescence branches with spikelets congested; callus apex naked, rounded and swollen . . . . . **A. canescens** subsp. **canescens**
6b Spikelets 25–45 mm long (including awns); inflorescence branches with spikelets distinct from one another; callus apex bifid . . . . . **A. diffusa** subsp. **burkei**
7a Lower internodes of culms pubescent to woolly hairy, upper internodes pubescent or glabrous. . . . . 8
7b Lower and upper culm internodes glabrous . . . . . 9
8a Lemma column 8–20 mm long; inflorescence oblong to broadly oblong, symmetrical, up to 800 mm long, > 200 mm wide, much branched . . . . . **A. meridionalis**
8b Lemma column 5–7 mm long; inflorescence narrowly oblong to narrowly elliptic, usually asymmetric, up to 200 × 120 mm . . . . . **A. vestita**
9a Lower glume with upper 1/3 membranous, often torn and broken . . . . . **A. spectabilis**
9b Lower glume apex firm or only the very apex membranous . . . . . 10
10a Some leaf auricles with long woolly hairs. . . . . **A. meridionalis**

10b All leaf auricles glabrous, if pubescent then hairs not long woolly . . . . . .11
11a Upper glume 12–18 mm long. . . . . **A. diffusa** subsp. **diffusa**
11b Upper glume up to 12 mm long. . . . . .**A. diffusa** subsp. **burkei**
12a Lemma articulation present (sometimes only shown by a swollen line or colour differentiation, usually directly below branching point of awns) 13
12b Lemma articulation absent . . . . . 18
13a Lemma articulation between lemma apex and base of long column; callus 1.5–3.0 mm long, apex acuminate, pungent . . . . . 14
13b Lemma articulation not as above; callus 0.5–1.5 mm long, apex narrowly or broadly rounded to truncate . . . . . 17
14a Lower internodes of culms woolly to densely tomentose . . . . . **A. mollissima** subsp. **mollissima**
14b Lower internodes of culms glabrous or hairy but not with woolly hairs . . . . 15
15a Inflorescence not spike-like, much interrupted, branches suberect or spreading . . . . . .**A. stipitata** subsp. **graciliflora**
15b Inflorescence spike-like, sometimes interrupted towards base, branches closely appressed to main axis. . . . . 16
16a Plant robust, up to 1.5 m high; culms sparsely branched at upper nodes; inflorescence usually 150–300 mm long . . . . . **A. stipitata** subsp. **stipitata**
16b Plant slender, up to 0.6 m high; culms much branched at upper nodes; inflorescence usually to 150 mm long . . . . . .**A. stipitata** subsp. **spicata**
17a Inflorescence very dense, branches closely appressed and covering main axis except occasionally at base where 1 or 2 subspicate branches spread from main axis . . . . . **A. congesta** subsp. **congesta**
17b Inflorescence variable, with many side branches spreading from and exposing main axis, these either with a few spikelet laxly clustered or many spikelets densely clustered at the ends of long, naked side branches, or with spikelets appressed all along side branches. . . . . .**A. congesta** subsp. **barbicollis**
18a Plants annual . . . . . **A. adscensionis**
18b Plants perennial to short-lived perennial . . . . . 19
19a Inflorescence open, branches rigid, spreading at 90° from main axis; lower glume equal to or longer than upper glume. . . . . **A bipartita**
19b Inflorescence contracted, usually dense, branches flexible, erect or spreading not > 45° from main axis; glumes variable, but lower glume never longer than upper glume. . . . . 20
20a Leaves mainly basal, forming a dense basal tuft in which culms are hidden; culms mainly unbranched at upper nodes. . . **A. junciformis** subsp. **galpinii**
20b Leaves mainly cauline, or not basally dense and culms obvious for most of their length; culms branched or unbranched in upper nodes. . . . . **A. junciformis** subsp. **junciformis**

## **adscensionis** L.

*A. curvata* (Nees) T.Durand & Schinz
*A. submucronata* Schumach.

Annual, up to 1 m high; tufted. **Culms** erect, often branched. **Leaf blades** up to 300 × 3 mm. **Flowers**: panicle compact, narrowly oblong to lanceolate, 10–50 mm wide, interrupted at base, with side branches appressed to main axis, sometimes branches open and spreading, with spikelets densely clustered on branches; spikelets 10–40 mm long (including awns); lower glume $^{2}/_{3}$–$^{3}/_{4}$ length of upper glume, sometimes with a mucro or short awn up to 0.8 mm long; lemmas laterally compressed, articulation and column absent, usually scabrid only on keel; awns 3, laterals well developed, shorter than central awn; callus with rounded, naked apex; Dec.–Sep. Stony, sandy loam, clayey, calcareous, shallow soils on stony hills, moist areas along pans and rivers, along roads and other disturbed ground.

AcGr DrGr MsGr KarSh

**bipartita** (Nees) Trin. & Rupr.

Perennial, sometimes short-lived, up to 0.65 m high; tufted. **Culms** erect or geniculate. **Leaf blades** up to 200 × 2 mm. **Flowers**: panicle open, branches rigid, naked for most of their length, spreading at 90° from main axis, spikelets borne at apices of long, naked branches; spikelets 18–20 mm long (including awns); lower glume equal to or longer than upper glume, awned; lemma articulation and column absent; awns 3, subequal; callus apex thickened, naked, rounded to obtuse; Oct.–May. Sandy, stony, loamy, clayey and black turf soils in moist areas around vleis and dongas, and in overgrazed and other disturbed ground. *Three-awned rolling grass*; *rolsteekgras*, *krulgras* (A); *bohlanya-ba-pere* (SS).

VreDm | DrGr | MsGr | KarSh

**canescens** Henrard subsp. **canescens**

Perennial, up to 1.5 m high; tufted, slender. **Culms** 1.5–3.0 mm in diameter, unbranched to sparsely branched from upper nodes. **Leaf blades** up to 300 × 2 mm, flat or rolled, curved to curled. **Flowers**: panicle contracted; spikelets up to 22 mm long, including awns, congested on inflorescence branches; lower glume firm except apex, which is membranous, $^1/_2$ as long as to nearly equalling upper glume, without mucro or awn; lemma articulation and column absent; awns 3; callus apex naked, subobtuse to rounded; Dec.–May. Shallow, sandy, stony soils on rocky ridges, eroded and disturbed ground.

VreDm | DrGr | MsGr | KarSh

**congesta** Roem. & Schult. subsp. **barbicollis** (Trin. & Rupr.) De Winter

*A. barbicollis* Trin. & Rupr.

Perennial or annual, up to 0.75 m high; tufted. **Culms** erect, slender. **Leaf blades** up to 200 × 3 mm. **Flowers**: panicle open, variable, with many side branches spreading from and exposing main axis, either with few spikelets laxly clustered or with many spikelets densely clustered at ends of long, naked side branches or spreading to base of side branches; longest pedicel up to 1.5 mm long; spikelets 20–30(–50) mm long, including awns, clusters narrow, obovate to ovate; lower glume awned; lemma articulation between apex of column and branching point of awns, articulation sometimes represented only by a swollen line or colour differentiation, column present; awns 3, laterals well developed; callus 0.5–1.5 mm long, apex naked, narrow or broadly rounded to truncate; Oct.–May. Deep, sandy clayey soils on rocky hillsides, old lands and disturbed ground.

VreDm | AcGr | DrGr | MsGr | KarSh

**congesta** Roem. & Schult. subsp. **congesta**

*A. alopecuroides* Hack.

*A. longicauda* Hack. & Henriq.

Perennial, occasionally annual, up to 0.9 m high; densely tufted. **Culms** erect. **Leaf blades** up to 300 × 5 mm. **Flowers**: panicle compact, very dense, branches closely appressed, enclosing main axis except occasionally at base where 1 or 2 subspicate side branches spread away from main axis; spikelets 25–30 mm long (including awns); spikelet clusters narrowly obovate to obovate; lower glume awned; lemma articulation between apex of column and branching point of awns, articulation sometimes represented only by a swollen line or a colour differentiation, column present; awns 3, laterals well developed; callus apex naked, narrowly to broadly rounded to truncate; Dec.–May. Hard or stony loam, sandy basalt, black clayey soils, Kalahari sands on stony slopes, open eroded places, old lands, road verges and other disturbed ground. *Piercing grass*, *white stick grass*, *cat's-tail three-awned grass*, *buffalo grass*; *rotstertsteekgras*, *witsteekgras*, *langsteekgras*, *katstertsteekgras*, *klossaadsteekgras* (A); *lefielo* (SS).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### **diffusa** Trin. subsp. **burkei** (Stapf) Melderis

*A. diffusa* Trin. var. *burkei* (Stapf) Schweick.

Perennial, up to 1 m high; densely tufted. **Culms** 1.5–3.0 mm in diameter, unbranched or sparsely branched. **Leaf blades** up to 300 × 2 mm; auricles glabrous or short-hairy, not woolly. **Flowers**: panicle open, with spikelets distinct from one another; spikelets 25–45 mm long, including awns; lower glume obtuse, occasionally coarsely fimbriate at apex, $^{1}/_{2}$–$^{2}/_{3}$ length of upper glume, mucro or awn absent; upper glume up to 12 mm long; lemma articulation present between apex of lemma and base of column, or absent, column present; callus apex naked, deeply bifid; Nov.–Apr. Dry, sandy, gravelly loam soils on hilly slopes. Barely distinguished from subsp. *diffusa*; further study is needed.

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### **diffusa** subsp. **diffusa**

Perennial, up to 1 m high; densely tufted. **Culms** 1.5–3.0 mm in diameter, unbranched or sparsely branched. **Leaf blades** up to 300 × 2 mm; auricles glabrous or short-hairy, not woolly. **Flowers**: panicle open, with spikelets distant from one another; spikelets 25–40 mm long (including awns); lower glume obtuse, occasionally coarsely fimbriate at apex, $^{1}/_{2}$–$^{2}/_{3}$ length of upper glume, mucro or awn absent; upper glume 12–18 mm long; lemma articulation present between apex of lemma and base of column, or absent, column present; callus apex naked, deeply bifid; Oct. Sandy soils, between rocks and in disturbed places.

DrGr | MsGr | KarSh

### **junciformis** Trin. & Rupr. subsp. **galpinii** (Stapf) De Winter

Perennial, up to 0.5 m high; long, oblique, thinly rhizomatous and densely tufted, erect. **Culms** mainly unbranched at upper nodes; leaves mainly basal, forming a dense basal tuft in which culms remain hidden. **Leaf blades** up to 250 × 1 mm. **Flowers**: panicle contracted, branches erect or spreading but not > 45° from main axis; spikelets 15–30 mm long, including awns; glumes usually very unequal, lower $^{1}/_{2}$–$^{2}/_{3}$ length of upper, mucronate to shortly awned; lemmas narrowly lanceolate, articulation absent, distinctly tapering towards a short beak or very short column; awns 3, lateral ones well developed; callus apex naked, truncate or broadly rounded; Nov.–Apr. Shallow soils, overgrazed areas on basalt or sandstone, rocky slopes of very high mountains.

AcGr | DrGr | MsGr

### **junciformis** Trin. & Rupr. subsp. **junciformis**

Perennial, up to 0.9 m high; stoutly rhizomatous, densely tufted. **Culms** unbranched to branched at some nodes, obvious for most of their length; leaves mainly cauline or at least not densely basal. **Leaf blades** up to 300 × 3 mm. **Flowers**: panicle contracted, dense to lax, branches erect to spreading up to 45° from main axis; spikelets 20–30 mm long (including awns); lower glume up to $^{2}/_{3}$ length of upper, awned; lemmas narrowly lanceolate, distinctly tapering into a beak or column, articulation absent; awns 3, laterals well developed; callus apex naked, swollen, rounded to truncate; Nov.–May. Sandy, clayey, stony soils or shallow soils on stony hillsides, in depressions where water collects and in other damp places, along roadsides and other disturbed ground. *Wire grass*, *bristle grass*, *Ngongoni bristle grass*; *heigras*, *koperdraadgras*, *steekgras*, *besemgras*, *Ngongonisteekgras* (A); *lefielo* (SS); *umGongoni* (Z).

VreDm | AcGr | DrGr | MsGr

### **meridionalis** Henrard

Perennial, up to 2 m high; densely tufted. **Culms** with lower internodes glabrous or pubescent to woolly hairy. **Leaf blades** up to 650 × 5 mm; leaves flexible, some leaf auricles with long woolly hairs. **Flowers**: panicle oblong to broadly oblong, symmetrical, large, up to 800 mm long, > 200 mm wide, much branched; spikelets 35–50 mm long (including awns); lower glume < $^{2}/_{3}$ length of upper; lemma articulation between apex of lemma and base of column, column 8–20 mm long; awns 3, subequal; callus apex naked, deeply bifid; Nov.–May. Deep sandy to stony soils in open areas, along roadsides and in moist areas around vleis and damp depressions. *Langbeensteekgras* (A).




### **mollissima** Pilg. subsp. **mollissima**

Perennial, up to 0.85 m high; densely tufted. **Culms** lower internodes woolly to densely tomentose. **Leaf blades** up to 300 × 4 mm. **Flowers**: panicle contracted, spike-like, very dense; spikelets 50–95 mm long (including awns); lower glume up to $^{2}/_{3}$ length of upper, awned; lemma articulation between lemma apex and base of column, column 16–30 mm long; awns 3, subequal; callus 1.5–3.0 mm long, apex naked, acuminate, pungent; Dec.–May. Deep sandy soils, especially red Kalahari sands.




### **monticola** Henrard

Perennial, up to 0.9 m high; long-rhizomatous and tufted, erect to geniculate. **Culms** much branched. **Leaf blades** up to 120 × 2 mm. **Flowers**: panicle contracted to lax; spikelets 18–25 mm long (including awns); lower glume longer than upper glume, long-tapering to acuminate apex (breaking off early), awn or mucro absent; lemmas without articulation, beak or short, twisted column present; awns 3, 2 laterals shorter than central; callus apex naked, rounded to truncate; Jan.–May. Moist and shady areas, streambanks and seepage areas on mountain slopes.




### **sciurus** Stapf

Perennial, up to 1.4 m high; robust, shortly rhizomatous and tufted, erect. **Culms** 5–6 mm in diameter, unbranched, lower internodes woolly hairy or glabrous. **Leaf blades** up to 800 × 2–3(–6) mm. **Flowers**: panicle contracted; spikelets 25–30 mm long (including awns); lower glume $^{1}/_{2}$ length of upper glume, mucro or awn absent; lemma articulation absent, lemma narrowed into a beak or very short twisted column; awns 3, subequal; callus apex small, naked, swollen and rounded; Jan.–May. Moist sandy soils mainly in mountain sourveld. *Tall three-awned grass*, *bristle grass*; *groot steekgras* (A).




### **spectabilis** Hack.

Perennial, up to 1.75 m high; densely tufted. **Culms** with internodes glabrous. **Leaf blades** up to 600 × 4–5 mm. **Flowers**: panicle open; spikelets 35–40 mm long (including awns); lower glume $^{1}/_{2}$ length to nearly as long as upper glume, firm below, upper $^{1}/_{3}$–$^{2}/_{3}$ membranous and often torn, mucro or awn absent; lemma articulation present between apex of lemma and base of column, column 4–6 mm long, twisted; awns 3, equal to subequal; callus apex naked,

emarginate to distinctly bifid; Feb.–Apr. Shallow and sandy soils, mainly from quartzite on stony, rocky mountain slopes. *Bergsteekgras* (A).

VreDm

**stipitata** Hack. subsp. **graciliflora** (Pilg.) Melderis

*A. graciliflora* Pilg.

*A. stipitata* Hack. var. *graciliflora* (Pilg.) De Winter

Perennial, up to 0.9 m high; slender loosely tufted, erect. **Culms** 1.0–2.5 mm in diameter, lower internodes glabrous or pubescent, not woolly hairy. **Leaf blades** up to 200 × 2–3 mm. **Flowers**: panicle contracted, narrow, not spike-like, sparse, branches lax, suberect or spreading; spikelets 60–80 mm long (including awns); lower glume up to $^{2}/_{3}$ length of upper, awned; lemma articulation between apex of lemma and base of column, column present; awns 3, laterals well developed; callus 1.5–3.0 mm long, apex naked, acuminate, pungent; Nov.–Jun. Sandy or loamy soils in rocky situations, seepage zones and disturbed ground.

AcGr DrGr KarSh

**stipitata** Hack. subsp. **spicata** (De Winter) Melderis

Perennial, up to 0.6 m high; slender, loosely to densely tufted, erect. **Culms** much branched at upper nodes, lower internodes glabrous or pubescent, not woolly hairy. **Leaf blades** up to 150 mm long. **Flowers**: panicle contracted, narrow, dense, spike-like, branches closely appressed to main axis, sometimes interrupted towards base, usually up to 150 mm long; spikelets 50–100 mm long (including awns); lower glume up to $^{2}/_{3}$ length of upper, awned; lemma articulation between apex of lemma and base of column, column well developed; awns 3, laterals well developed; callus 1.5–3.0 mm long, apex naked, acuminate, pungent; Feb.–May. Deep sandy soils associated with rocky outcrops.

MsGr

**stipitata** Hack subsp. **stipitata**

Perennial, up to 1.5 m high; robust, tufted, erect. **Culms** sparsely branched at upper nodes, lower internodes glabrous or pubescent, not woolly hairy. **Leaf blades** up to 300 × 4 mm. **Flowers**: panicle contracted, narrow, 150–300 mm long, dense, spike-like, branches closely appressed to main axis, sometimes interrupted towards base; spikelets 50–90 mm long (including awns); lower glume up to $^{2}/_{3}$ the length of upper glume, awned; lemma articulation between apex of lemma and base of column, column present; awns 3, laterals well developed; callus 1.5–3.0 mm long, apex naked, acuminate, pungent; Dec.–Apr. Deep sandy or calcareous soils.

DrGr

**vestita** Thunb.

Perennial, up to 0.85 m high; densely tufted. **Culms** with lower internodes pubescent to woolly hairy, upper internodes pubescent to glabrous. **Leaf blades** up to 240 × 4 mm. **Flowers**: panicle open, narrowly oblong to narrowly elliptic, usually asymmetric, up to 200 × 120 mm; spikelets 30–50 mm long (including awns); lower glume up to $^{2}/_{3}$ length of upper, awn or mucro absent; lemma articulation between lemma apex and base of column, column 5–7 mm long; awns 3, laterals well developed; callus apex naked, distinctly bifid; mostly Nov.–May. Dry sandy loam or black clay, limestone soils in stony and rocky veld. *Teesuikergras*, *besemgras*, *brossteekgras*, *hardegras* (A).

AcGr DrGr KarSh

## **Arundinella** Raddi (sthn Afr.: 1 sp.)

### **nepalensis** Trin.

Perennial, up to 1.5 m high; tufted; with creeping rhizome, often covered with short scale-like leaves, resulting in a plaited look. **Leaf blades** 80–300 × 3–10 mm. **Flowers**: panicle contracted, dense, 120–300 mm long; spikelets 4–6 mm long, usually in pairs, brown, sometimes tinged with green or purple; glumes unequal and acute; lower lemma with a truncate, hairy callus, awns 3–6 mm long; Dec.–Mar. Vleis, riverbanks and moist grasslands. *Beesgras*, *riviergras* (A).

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## **Arundo** L. (sthn Afr.: 1 sp.)

### ***donax** L.

Perennial, up to 3 m high; robust, rhizomatous, not tufted. **Leaf blades** up to 0.7 × 80 mm, rounded or caudate at base, apices not sharp, leaves deciduous at base of blade; ligule with fringing hairs shorter than membranous base. **Flowers**: panicle compact with ascending branches 0.3–0.6 m long; spikelets 8–15 mm long; lemmas with long hairs on back; Feb., Apr. Moist disturbed places. Native to warm regions of the Old World. *Giant reed*, *spanish reed*, *bamboo reed*; *spaanseriet* (A).

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## **Avena** L. (sthn Afr.: 5 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 111 (2015)]

Lemma sparsely hairy or glabrous at the base only; central awn straight or weakly geniculate, sometimes absent . . . . . **A. sativa**
Lemma densely hairy from base up to awn insertion; central awn strongly geniculate . . . . . **A. fatua**

### ***fatua** L.

Annual, 0.25–0.70 m high; solitary or loosely tufted. **Leaf blades** 50–280 × 3–8 mm. **Flowers**: panicle open; spikelets 18–32 mm long, brownish, specially on the hairs; lemmas densely hairy from base up to awn insertion, with lobes 1.0–1.5 mm long; central awn strongly geniculate; Aug.–Nov. Disturbed and waste places, roadsides on sandy soil. Native to Europe. *Common wild oat*.

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### ***sativa** L.

Annual, up to 1.5 m high; solitary or loosely tufted. **Leaf blades** 100–400 × 3–9 mm. **Flowers**: panicle open; spikelets 17–35 mm long; lemmas sparsely hairy or glabrous at base, apex emarginate; central awn with a distinct column, almost straight, sometimes absent; Sep.–Nov. Waste places, disturbed areas, roadsides. Native to Europe. *Common oats*; *gewone hawer* (A); *habore* (SS).

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## **Bewsia** Gooss. (sthn Afr.: 1 sp.)

### **biflora** (Hack.) Gooss.

*Diplachne biflora* Hack. ex Schinz

Perennial, up to 0.93 m high; shortly rhizomatous and tufted. **Leaf blades** 100–400 × 1–5 mm. **Flowers**: in spike-like racemes; spikelets 5.5–9.0 mm long, 2–4-flowered; lemmas dorsally awned; awn 1–8 mm long, arising 1–2 mm from apex; Nov.–Apr. Rocky hillsides, plains, bush clumps. *Blousaadgras* (A).

DrGr

## **Bothriochloa** Kuntze (sthn Afr.: 3 spp.)

Key to species:

[after Moeaha in Fish *et al*.: 118 (2015)]

Sessile spikelet of lower glume without pits . . . . . **B. radicans**
Sessile spikelet of lower glume with 1–3 deep pits. . . . . **B. insculpta**

### **insculpta** (A.Rich.) A.Camus

*B. pertusa auctt*., *non* (L.) A.Camus

Perennial, up to 1.5 m high; sometimes stoloniferous. **Leaf blades** 40–300 × 2–8 mm. **Flowers**: inflorescence subdigitate, axis shorter than racemes; racemes 3–20, pedicel and callus hairs 1–3 mm long; spikelets (sessile) 4.5–5.0 mm long; lower glumes with 1–3 deep pits; Oct.–Jun. Grassland and hillsides, often in overgrazed places. *Pinhole grass*, *tassel grass*, *turf grass*; *terpentyngras*, *turfgras*, *lidjiesgras*, *stippelgras*, *stinkgras* (A); *motsamabudi* (SS); *imbutane* (Z).

DrGr

### **radicans** (Lehm.) A.Camus

Perennial, up to 0.7 m high; often stoloniferous. **Leaf blades** 60–200 × 2–6 mm. **Flowers**: inflorescence subdigitate, axis shorter than racemes, racemes 5–16; spikelets (sessile) 3–5 mm long; lower glume of sessile spikelets sparsely hairy, not pitted; Oct.–Apr. Rocky hillsides.

DrGr

## **Brachiaria** (Trin.) Griseb. (sthn Afr.: 19 spp.)

Key to species:

[after Gibbs Russell: 64 (1990); Mashau in Fish *et al*.: 120 (2015)]

1a Raceme not conspicuously secund; spikelets clustered; racemes appressed to central axis . . . . . **B. glomerata**
1b Raceme very conspicuously secund; spikelets usually arranged in 1 or 2(4) rows; racemes spreading, rarely appressed . . . . . 2
2a Lower glume distinctly darker coloured at base; lower lemma often long-acuminate. . . . . **B. nigropedata**

2b Lower glume base rarely with a distinctive colour difference; lower lemma and palea with a short stout mucro or awn up to 1.5 mm long . . . . . 3
3a Spikelets arranged in 4 rows, sparsely hairy with distinct tufts of erect, stiff hairs near apex on either side of upper glume and lower lemma, usually between the first and second nerve . . . . . **B. marlothii**
3b Spikelets arranged in 2 rows, without distinct tufts of hairs . . . . . 4
4a Lower lemma and palea extending into a short stout mucro, up to 1.5 mm long; spikelets with dense, white or purple, long hairs concentrated at apex . . . . . **B. serrata**
4b Lower lemma acute or rounded; palea rounded at apex; spikelets sparsely pilose. . . . . 5
5a Spikelets 3.0–3.8 mm long, distinctly flattened on one side; upper lemma narrowly obovate-oblong, rough, matt . . . . . **B. advena**
5b Spikelets 1.7–2.7 mm long, not distinctly flattened; upper lemma obtuse, smooth, shiny . . . . . **B. eruciformis**

### *advena Vickery

Perennial or annual, up to 0.8 m high; very loosely tufted, or stoloniferous (occasionally). **Culms** erect or decumbent and rooting at nodes, sometimes straggly. **Leaf blades** 50–130 × 2–6 mm. **Flowers**: panicle simple, racemes secund, 10–30 mm long, pedicels equal; spikelets 3.0–3.8 mm long, in 2 rows, sparsely pilose, distinctly flattened on one side; upper lemma narrowly obovate-oblong, rough, matt; Dec.–Mar. Usually in damp, disturbed areas on black clayey soil, often in maize or sunflower fields. Native to Australia. *Phethola* (SS).

DrGr MsGr

### eruciformis (Sm.) Griseb.

Annual, up to 0.5 m high; loosely tufted, sometimes straggly or procumbent. **Culms** erect or decumbent and rooting at nodes. **Leaf blades** 20–150 × 2–6 mm. **Flowers**: inflorescence subdigitate, racemes secund, 10–25(–30) mm long, pedicels equal; spikelets 1.7–2.7 mm long, in 2 rows, sparsely pilose, not distinctly flattened; Nov.–May. In moist places on clay or black turf and in disturbed areas. *Sweet signal grass*; *soetgras*, *soetlitjiesrysgras*, *litjiesinjaalgras* (A); *khalane* (SS); *umfisane* (Z).

AcGr DrGr MsGr KarSh

### glomerata (Hack.) A.Camus

Annual, up to 0.6 m high; loosely tufted. **Culms** decumbent, sometimes rooting from lower nodes; covered with soft, white, velvety hairs. **Leaf blades** 50–130 × 5–10(–18) mm. **Flowers**: inflorescence subdigitate, racemes not conspicuously secund, appressed to central axis, 20–30 mm long; pedicels equal but inconspicuous; spikelets densely clustered, 2–4 mm long; rachilla extension short, stalk-like; Dec.–Jun. Red sand dunes or sandy patches on granite outcrops, also in dry watercourses.

DrGr

### marlothii (Hack.) Stent

Usually annual, up to 0.5 m high; stoloniferous or tufted. **Culms** decumbent and rooting from lower nodes. **Leaf blades** 10–140 × 1–5 mm. **Flowers**: inflorescence subdigitate, racemes secund, 25–50 mm long; pedicels unequal; spikelets 2.0–2.5 mm long, arranged in 4 rows, sparsely hairy on nerves, with very distinct tufts of hairs in upper half on either side of upper glume and lower lemma; Dec.–May. Disturbed or heavily grazed areas on shallow sand or loam

near dams or in seasonally moist spots. *Small signal grass*; *wortelklitsgras*, *kleinsinjaalgras*, *kruipgras* (A); *phetola* (SS).

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### **nigropedata** (Ficalho & Hiern) Stapf

Perennial, up to 1.2 m high; densely tufted, with long and creeping rhizome. **Culms** erect, unbranched, nodes with short, white hairs. **Leaf blades** up to 300 × 5–9 mm. **Flowers**: inflorescence subdigitate, racemes secund, 15–30(–40) mm long; pedicels equal; spikelets 3–4 mm long, in 2 rows; lower glume acuminate but very variable in same inflorescence, distinctly darker coloured at base, clasping short internode between 2 glumes; upper glume and lower lemma also acuminate; Nov.–Apr. Open veld or bush on rocky slopes or among rocks, usually on sandy or well-drained soils. *Sweet grass*, *spotted signal grass*; *soetgras*, *swartvoetjiegras*, *wurmsinjaalgras*, *wurmpiesgras*, *krulgras*, *haasgras* (A); *phetola* (SS); *mlabie* (T).

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### **serrata** (Thunb.) Stapf

*B. serrata* (Thunb.) Stapf var. *serrata*

*B. serrata* (Thunb.) Stapf var. *gossypina* (A.Rich.) Stapf

Perennial, up to 0.75 m high; densely or loosely tufted or rhizomatous, vegetative parts very variable. **Culms** single or profusely branched. **Leaves** sometimes in a dense tuft at base or cauline, leaving base bare; with blades 50–250 × 2–10 mm. **Flowers**: inflorescence subdigitate, racemes secund, 10–25 mm long; pedicels equal; spikelets 2.3–4.5 mm long, in 2 rows, with dense, long, silky, white or purple hairs concentrated at apex; lower lemma and palea extending into a short stout mucro up to 1.5 mm long; Oct.–May. Shallow sandy soil, usually in rocky areas or on mountainsides but extending into open bush, grassland and occasionally to edges of vleis. *Velvet signal grass*; *fluweelsinjaalgras*, *krulgras* (A).

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## **Brachypodium** P.Beauv. (sthn Afr.: 3 spp.)

### Key to species:

[after Gibbs Russell: 70 (1990)]

Culms erect; racemes straight, with 1–4 spikelets crowded near apex; leaves mainly basal, erect, rigid, blade narrowly ovate . . . . . **B. bolusii**
Culms straggling; racemes usually flexuous, with (3–)5–9 spikelets along rachis; leaves mostly cauline, spreading, soft, blade linear . . . . . **B. flexum**

### **bolusii** Stapf

Perennial, 0.15–0.45(–0.70) m high; densely tufted at base. **Culms** erect. **Leaf blades** up to 20–70(–170) × 4 mm, lanceolate; leaves basal, rigid, erect. **Flowers**: inflorescence subdigitate, elongate, racemes up to 55 mm long, straight, with 1–4 spikelets crowded near apex; spikelets up to 30 mm long; lemma awns 4–8 mm long; Nov.–Mar. Mountain grassland.

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### **flexum** Nees

Perennial, up to 0.9 m high. **Culms** straggling, slender, wiry, sometimes decumbent and rooting at lower nodes. **Leaf blades** 50–170 × 2–8 mm; leaves mainly cauline, linear, soft, spreading.

**Flowers**: inflorescence subdigitate, elongate, racemes 60–120 mm long, usually flexuous, with (3–)5–9 spikelets spread along rachis; spikelets 12–44 mm long; lemma awns 4–8 mm long; Oct.–Apr. In moist shady places of forests, usually near streams, occasionally in thickets and bushland. *Katstertgras*, *valsbromus* (A).

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## **Briza** L. (sthn Afr.: 3 spp.)

### ***maxima** L.

Annual, up to 0.6 m high; loosely tufted. **Culms** erect, simple or branched. **Leaf blades** 70–250 × 3–8 mm. **Flowers**: panicle open, branches single or in fascicles of 2–4; spikelets 3–12, longer than wide, 7–20-flowered, nodding, solitary at apices of slender branches; spikelets 8–25 × 8–15 mm; glumes green, brown or purple, 5–9-nerved; lemmas straw-coloured, sometimes variegated with purple; Jul.–Dec. Well-drained soils in disturbed areas, especially on roadsides or on margins of irrigated lands, cultivated in gardens. Native to Mediterranean region. *Big quaking grass*, *fairy bells*, *bronco grass*, *shaky grass*, *lady's heart grass*; *grootklokkiesgras*, *grootbewertjiesgras*, *trilgras*, *janbewertjies* (A).

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## **Bromus** L. (sthn Afr.: 15 spp.)

### Key to species:

[after Fish in Fish *et al*.: 141 (2015)]

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| 1a | Plants perennial; anthers 2–8 mm long (if shorter see *B. catharticus*, cleistogamous floret anthers 0.5–1.0 mm long and chasmogamous floret anthers 2–5 mm long) | 2 |
| 1b | Plants annual; anthers 0.5–1.7 mm long (if longer see *B. catharticus*) | 6 |
| 2a | Spikelets strongly laterally compressed | **B. catharticus** |
| 2b | Spikelets not noticeably laterally compressed to terete | 3 |
| 3a | Spikelets glabrous or scabrid | **B. leptoclados** |
| 3b | Spikelets densely hairy (hairs maybe minute, or hairiness variable in same inflorescence) | 4 |
| 4a | Pedicels glabrous and smooth, rarely with few scattered prickles | **B. speciosus** |
| 4b | Pedicels hairy to scabrid or scaberulous | 5 |
| 5a | Pedicels scabrid; spikelets usually pale green | **B. leptoclados** |
| 5b | Pedicels usually entirely densely hairy, sometimes sparsely hairy just below spikelet only or scaberulous; spikelets usually dark or at least strongly flushed with purple | **B. firmior** |
| 6a | Lemma awn 30–70 mm long | **B. diandrus** |
| 6b | Lemma not awned or awn 0.2–25.0 mm long | 7 |
| 7a | Spikelets strongly laterally compressed; lemmas keeled | **B. catharticus** |
| 7b | Spikelets terete to moderately laterally compressed; lemmas rounded on back | 8 |
| 8a | Awn equalling or shorter than lemma (ignore lowest lemma awn); lemma apex rounded to subacute | **B. commutatus** |
| 8b | Awn longer than lemma (ignore lowest lemma awn); lemma apex acute to subacuminate | **B. pectinatus** |

***catharticus** Vahl

*B. unioloides* Humb. & Kunth

*B. willdenowii* Kunth

Annual or short-lived perennial, up to 1 m high; tufted. **Leaf blades** up to 400 × 8 mm. **Flowers**: panicle lax, pedicels longer than spikelets; spikelets 20–35 × 5–8 mm, strongly laterally compressed; glumes and lemmas prominently keeled, acute; glumes 3–9-nerved; lemmas 15–25 mm long, keeled, minutely bifid, lobes < 0.5 mm long, awns < 3 mm long; anthers 0.5–1.0 mm long in cleistogamous florets, 2–5 mm long in chasmogamous florets; Oct.–Apr. Moist to wet places, often in shade, in disturbed and natural veld. Different strains from Europe, Australia and America.

VreDm | DrGr | MsGr | KarSh

**commutatus** Schrad.

Annual, up to 0.9 m high; tufted. **Leaf blades** 60–150 × 3–6 mm. **Flowers**: panicle lax, pedicels (at least some of them) longer than spikelets; spikelets 10–25 × 4–7 mm; spikelets almost linear at maturity; lower glume 3–5-nerved, upper 5–9-nerved; lemmas 7–9 mm long, lemma apex rounded to subacute, awns 3–8 mm long; anthers 0.5–1.7 mm long; Sep.–Dec. Disturbed, wet places. *Meadow brome*, *hairy chess*.

DrGr | KarSh

***diandrus** Roth

Annual, up to 1.1 m high; loosely tufted. **Leaf blades** 50–400 × 3–8 mm. **Flowers**: panicle usually lax and spreading, pedicels glabrous, scabrid or villous; spikelets 30–90 × 3–8 mm (including awns); spikelets open, wedge-shaped; lower glume 1-nerved, upper 3-nerved; lemmas 12–22 mm long, awns stiff and straight, 30–70 mm long; anthers 0.8–1.6 mm long; Sep.–Jan.(Mar.). Disturbed and weedy places. Native to Europe. *Broncho grass*, *wild oat*, *ripgut brome*; *langnaaldbromus*, *predikantsluis*, *bronkhorstgras* (A).

KarSh

**firmior** (Nees) Stapf

Perennial, up to 1.5 m high; tufted. **Leaf blades** 200–400 × 4–8 mm wide. **Flowers**: panicle open, much exserted, pedicels sparsely to densely pilose, longer than spikelets; spikelets 15–45 × 4–8 mm, green to purple, moderately laterally compressed to terete; lower glume 1–3-nerved, upper 3–5-nerved; lemmas villous, 10–20 mm long, awns 3–12 mm long; anthers 4–8 mm long; Nov.–Mar. At high altitudes on moist grassy slopes of the Drakensberg.

MsGr

**leptoclados** Nees

Perennial, up to 1.5 m high; tufted. **Leaf blades** 100–300 × 5–13 mm. **Flowers**: panicle open, pedicels scabrid; spikelets 10–30 × 2–6 mm, open or with flowers closely arranged, glabrous or scabrid, moderately laterally compressed to terete, usually pale green; lower glume 1–3-nerved, upper 3–5-nerved; lemmas 8–12 mm long, awns up to 5 mm long; anthers 2.2–3.0(5.0) mm long; Oct.–Feb. Moist, shady places along rivers and streams. *Mountain brome grass*.

DrGr | MsGr

### **pectinatus** Thunb.

Annual, up to 0.8 m high; tufted. **Leaf blades** 50–300 × 2–8 mm. **Flowers**: panicle open, pedicels longer than spikelets; spikelets 10–30 × 3–6 mm, laterally compressed; lower glume 1–3-nerved, upper 5–7-nerved; lemmas 7–14 mm long, lemma apex acute to subacuminate, awns 6–18 mm long; anthers 0.5–1.3 mm long; Aug.–Feb. Disturbed and eroded areas. *Hawergras* (A).

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### **speciosus** Nees

Perennial, up to 0.6 m high; tufted. **Leaf blades** 80–200 × 2–4 mm. **Flowers**: panicle open, pedicels glabrous or sparsely scabrid, almost as long as spikelets; spikelets 15–50 × 3–6 mm, linear, purplish, densely hairy, moderately laterally compressed to terete; lower glume 1–3-nerved, upper 3–5-nerved; lemmas 10–15 mm long, awns 3–6 mm long; anthers 4–7 mm long; Dec.–Mar. Steep, moist mountain slopes, occasionally in shade and along streams. *Purple brome*; *blousaadgras* (A).

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## **Catalepis** Stapf & Stent (sthn Afr.: 1 sp.)

### **gracilis** Stapf & Stent

Perennial, up to 0.4 m high; creeping, rhizomatous and tufted. **Leaf blades** 10–150 × 1–2 mm; leaves fine and curly with age. **Flowers**: panicle compact (spike-like), 15–30 mm long; spikelets 4–5 mm long; lower glume reduced to a small scale; upper glume 1-nerved; Jan.–Mar. On black clay in vleis, sometimes in shallow sandy soil. *Gauze grass*.

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## **Cenchrus** L. (sthn Afr.: 4 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 157 (2015)]

Plants perennial; bristles 5–10 mm long, joined to form a small inconspicuous disc at base of spikelet cluster . . . . . **C. ciliaris**
Plants annual; bristles and spines 2–5 mm long, joined to form a hard spiny involucre or burr around spikelet cluster . . . . . **C. incertus**

### **ciliaris** L.

Perennial, up to 1 m high; tufted. **Leaf blades** 100–250 × 4–8 mm. **Flowers**: panicle compact, bristly, 40–120 mm long, straw-coloured or purple; bristles mostly 5–10 mm long, inner bristles slender and plumose, outer bristles slender and scabrid, all bristles joined at base below spikelet cluster to form a small inconspicuous disc; spikelets 4–5 × 3 mm; Aug.–Apr. Hot dry areas, especially on sandy soils, widespread elsewhere. *Foxtail buffalo grass*; *bloubuffelsgras* (A); *modula-tjava* (SS); *se-be-kxare-ya-weso* (Z).

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***incertus** M.A.Curtis
*C. pauciflorus* Benth.

Annual, up to 0.4 m high; tufted. **Leaf blades** 60–120 × 3–4 mm. **Flowers**: panicle open or compact, 20–80 mm long; bristles and spines 2–5 mm long, joined to form a hard spiny involucre or burr around spikelet cluster, burrs ovoid to globose with clefts on 2 sides, with 8–40 spines of variable shape and size, inner spines more regular with a plumose inner surface, outer spines connate and spreading in all directions; spikelets 5–7 × 3–4 mm; Jan.–Mar. Mainly sandy soil. Native to tropical America. *Spiny burr grass*, *sandburr grass*; *dubbeltjiegras*, *sandklitsgras* (A).

AcGr | DrGr | KarSh

## **Chloris** Sw. (sthn Afr.: 8 spp.)

### Key to species:

[after Nembudani & Fish in Fish *et al*.: 164 (2015)]

1a Spikelets 2–many-nate (at point of attachment to rachis); lowest lemma glabrous . . . . . **C. pycnothrix**
1b Spikelets solitary (at point of attachment to rachis); lowest lemma hairy . . 2
2a Lowest lemma awn much longer than lemma body, subapical hairs 1.5–4.0 mm long; uppermost leaf inflated around young inflorescence . . . . . **C. virgata**
2b Lowest lemma awn shorter to as long as lemma body; apical hairs 0.5–1.0 mm long; uppermost leaf not inflated around young inflorescence . . . . . **C. gayana**

***gayana** Kunth

Perennial, up to 1.2 m high; stoloniferous and tufted. **Leaf blades** 250–500 × 3–9 mm; basal leaf sheaths strongly keeled, uppermost leaf not inflated. **Flowers**: inflorescence digitate, spikes 7–20, 40–150 mm long; spikelets 3–5 mm long, overlapping for most of their length; lower glume 1.5–2.5 mm long; lowest lemma 2.5–3.5 mm long, sparsely to densely hairy, apical hairs 0.5–1.0 mm long, awn 3.4–7.0 mm long; Nov.–May. Riverine woodland to open veld on well-drained soils. Native to India. *Rhodes grass*, *Hunyani grass*; *rhodesgras*, *rooiklosgras* (A); *nyankomo* (Z).

DrGr | MsGr | KarSh

**pycnothrix** Trin.

Annual, occasionally perennial, up to 0.5 m high; tufted. **Leaf blades** 20–100 × 3–5 mm; leaves with rounded and blunt apices. **Flowers**: inflorescence digitate, spikes 4–9, delicate, narrow, 40–100 mm long, horizontally spreading; spikelets 2–3 mm long; lower glume 1.5–3.0 mm long; lowest lemma 2.5–3.2 mm long, glabrous, apices acuminate to acute, awns 11–27 mm long; Sep.–May. In cultivated lands, disturbed areas and on roadsides in shallow, stony soils. *Spiderweb grass*, *radiate finger grass*, *orchard grass*; *spinnerakgras* (A).

DrGr

**virgata** Sw.

Annual, occasionally perennial, up to 0.75 m high; tufted. **Leaf blades** 100–300 × 2–6 mm; upper leaf sheaths inflated. **Flowers**: inflorescence digitate, spikes 7–15, 20–80 mm long, erect, silky-

feathery; spikelets 3.0–3.5 mm long; lower glume 1.5–2.5 mm long; upper glume 2.5–4.5 mm long; lowest lemma 2.5–4.0 mm long, with a crown of spreading hairs 1.5–4.0 mm long at apex; awns 2–15 mm long; Dec.–Jun. Disturbed places on a variety of soil types. *Feathered chloris*, *feather finger grass*; *klossiegras*, *kwasgras* (A); *sehabane* (SS); *umadolwana* (X); *amafusine* (Z).

VreDm | AcGr | DrGr | MsGr | KarSh

## **Coix** L. (sthn Afr.: 1 sp.)

### ***lacryma-jobi** L.

Annual, 0.9–1.2 m high. **Leaf blades** 100–500 × 2–7 mm. **Flowers**: in a complex, leafy, false panicle, inflorescence branches each subtended by a smooth, ivory-like bead or cupule enclosing female spikelets; male spikelets on a tassel exserted from bead; spikelets 7–10 mm long, unisexual; Aug.–Apr. Damp places. Native to East Indies. *Job's tears*. Figure 72.

MsGr

## **Cortaderia** Stapf (sthn Afr.: 2 spp.)

### ***jubata** (Lem.) Stapf

Perennial, up to 3 m high; robust, densely tufted, leaves mostly basal, to 1/2 height of culm. **Leaf blade** 1 000–1 500 × 9–12 mm, apex not setaceous, bright green, with cutting margins and midrib, flat or only slightly V-shaped in cross section. **Flowers**: panicle compact, 600–800 mm long, extending well above leaves, yellowish or purple, branches flexuous; florets (1–2) 3–5; rachilla purple; spikelets female only; glumes approximately equal, 9–13 mm long, 1-nerved, nerves purple; lemma 8–11(15) mm long, 3-nerved, nerves purple, densely hairy, hairs 7–9 mm long; palea glabrous, 3–5 mm long; anthers minute, < 0.25 mm long; Nov.–Feb. (Mar.). Escape along roadsides, rivers and disturbed places. Native to west tropical South America. *Purple pampas*, *jubata grass*; *pampasgras* (A).

MsGr

## **Cymbopogon** Spreng. (sthn Afr.: 6 spp.)

### Key to species:

[after Fish in Fish *et al*.: 184 (2015)]

1a Lower raceme base internode and pedicel fused and swollen; leaf blades usually rounded to cordate at base; sessile spikelet lower glume with deep, narrow, median groove in lower 1/2, appearing as a rib inside, broadly winged; lowest node of old culms exposed, not clothed by leaf sheaths . . . . **C. caesius**

1b Lower raceme base not swollen; leaf blades parallel-sided at base; sessile spikelet lower glume deeply concave to flat on back, narrowly to broadly winged; lowest node of old culms clothed by leaf sheaths . . . . . 2

2a Sessile spikelet lower glume wingless or wings narrow (0.1–0.3 mm wide), back usually deeply concave (rarely only shallowly concave); leaf blades appearing setaceous . . . . . **C. pospischilii**

2b Sessile spikelet lower glume broadly winged (0.3–0.7 mm wide), back flat, shallowly concave near base; leaf blades setaceous or wide and flat . . . . . 3



**Figure 72.** *Coix lacryma-jobi* (Poaceae). Artist: C. Smith.

3a Leaf blades setaceous, up to 2 mm wide; ligule 5–12 mm long, usually pointed, papery . . . . . **C. dieterleniae**
3b Leaf blades flat, 2–6 mm wide; ligule up to 10 mm long, usually truncate or rounded, firm-textured . . . . . **C. prolixus**

### **caesius** (Hook. & Arn.) Stapf

*C. excavatus* (Hochst.) Stapf ex Burtt Davy

Perennial, up to 1.5 m high; tussocky. **Culms** lowest nodes exposed, not clothed by leaf sheaths. **Leaf blades** 50–300 × 14 mm, rounded to cordate at base. **Flowers**: in a complex, false panicle; lower raceme base internode and pedicel fused and swollen; sessile spikelets 3.5–5.0 mm long, pedicellate spikelets slightly shorter; lower glume of sessile spikelets with deep, narrow, median groove, broadly winged; mostly Nov.–May. Open veld and hillsides. *Common turpentine grass*; *lemoengras*, *buchugras* (A). Figure 73.

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### **dieterleniae** Stapf ex E.Phillips

Perennial, up to 0.85 m high; tufted. **Culms** lowest node clothed by leaf sheaths. **Leaf blades** up to 300–500 × 2 mm long, usually setaceous; ligule 5–12 mm long, papery, pointed. **Flowers**: in a complex, false panicle; lower raceme base not swollen; spikelets 5–6 mm long, sessile or pedicellate; lower glume of sessile spikelets broadly winged, flattish; Nov.–Apr. Open veld and rocky hillsides.

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### **pospischilii** (K.Schum.) C.E.Hubb.

*C. plurinodis* (Stapf) Stapf ex Burtt Davy

Perennial, up to 1 m high; tufted. **Culms** lowest node clothed by leaf sheaths. **Leaf blades** 150–300 × 2–4 mm, parallel-sided at base, often folded and appearing setaceous. **Flowers**: in a complex, false panicle; lower raceme base not swollen; sessile spikelets 5–6 mm long, pedicellate spikelets slightly shorter; lower glume of sessile spikelets deeply concave, usually wingless or with a narrow wing 0.1–0.3 mm wide; Oct.–May. Grassveld. *Bitter turpentine grass*.

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### **prolixus** (Stapf) E.Phillips

Perennial, up to 1.2 m high; tufted. **Culms** lowest node clothed by leaf sheaths. **Leaf blades** 300–500 × 2–6 mm, parallel-sided at base, flat; ligule up to 10 mm long, usually truncate or rounded, firm-textured. **Flowers**: in a complex, false panicle; racemes nearly glabrous, lower raceme base not swollen; sessile spikelets 5–6 mm long, pedicellate spikelets equal or slightly smaller; lower glume of sessile spikelets winged, flattish; Oct.–Apr. Rocky hillsides. *Tamboekiegras* (A).

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## **Cynodon** Rich. (sthn Afr.: 8 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 188 (2015)]

1a Lemma keel winged (not clearly visible on all spikelets); rachilla absent. . . 2
1b Lemma keel not winged; rachilla present . . . . . 3



**Figure 73.** *Cymbopogon caesius* (Poaceae). Artist: C. Smith.

2a Spikelets broadly ovate, 2.0–2.5 mm long; glumes > 1/2 as long as spikelet; leaf blades densely hairy . . . . . **C. hirsutus**
2b Spikelets narrowly ovate, 2.5–3.0 mm long; glumes < 1/2 as long as spikelet; leaf blades glabrous or very sparsely hairy . . . . . **C. incompletus**
3a Racemes 2 (very rarely 1 or 4); plant rhizomatous, seldom > 0.15 m high . . . 4
3b Racemes 3–20; plant rhizomatous and/or stoloniferous, usually 0.1–1.0 m high . . . . . 5
4a Rachilla not produced; culm firm; leaves rigid, often pungent, > 1.5 mm wide; racemes not reflexed at maturity . . . . . **C. polevansii**
4b Rachilla produced, often longer than lower glume; culm delicate; leaves very fine, soft, < 1.5 mm wide; racemes reflexed at maturity . . . . **C. transvaalensis**
5a Plant stoloniferous and rhizomatous; glumes lanceolate in side view . . . . . **C. dactylon**
5b Plant stoloniferous, rhizomes absent; glumes narrowly lanceolate in side view . . . . . **C. bradleyi**

## **bradleyi** Stent

Perennial, up to 0.1 m high; stoloniferous. **Leaf blades** up to 10–35 × 2.5 mm; leaves densely or sparsely hairy. **Flowers**: inflorescence digitate, racemes usually 3; spikelets 2–3 mm long; glumes narrowly lanceolate in side view; rachilla sometimes produced; lemma keel wingless; Dec.–Mar. Fertile, well-drained soils. *Bradley grass*, *quick grass*.

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## **dactylon** (L.) Pers.

Perennial, up to 0.35 m high; sward-forming, rhizomatous and stoloniferous. **Leaf blades** 10–120 × 2–4 mm. **Flowers**: inflorescence digitate, racemes (3)4 or 5(6), in a single whorl; spikelets 2.0–2.5 mm long; glumes lanceolate in side view, upper glume 1/2–3/4 spikelet length; rachilla produced; lemma keel wingless; Sep.–May. Most soils along roadsides and overgrazed, trampled areas. *Couch grass*, *running grass*; *kweekgras* (A); *mohloa* (SS); *mothowa* (T); *uqaqaqa* (X); *uqethu* (Z). Figure 74.

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## **hirsutus** Stent

Perennial, up to 0.25 m high; stoloniferous. **Leaf blades** 15–30 × 2–4 mm, densely hairy. **Flowers**: inflorescence digitate; spikelets 2.0–2.5 mm long, broadly ovate; glumes > 1/2 spikelet length; lemma keel winged; rachilla not produced; Oct.–Apr. Well-drained, loam soils. *Red quick grass*; *Transvaal kweekgras* (A).

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## **incompletus** Nees

Perennial, up to 0.3 m high; stoloniferous. **Leaf blades** 30–60 × 2–3 mm, glabrous or sparsely hairy. **Flowers**: inflorescence digitate; spikelets 2.5–3.0 mm long, narrowly ovate; glumes < 1/2 spikelet length; lemma keel winged; rachilla not produced; Nov.–May. Sandy loam to turf soils. *Karoo quick grass*; *soetkweek*, *karookweekgras* (A).

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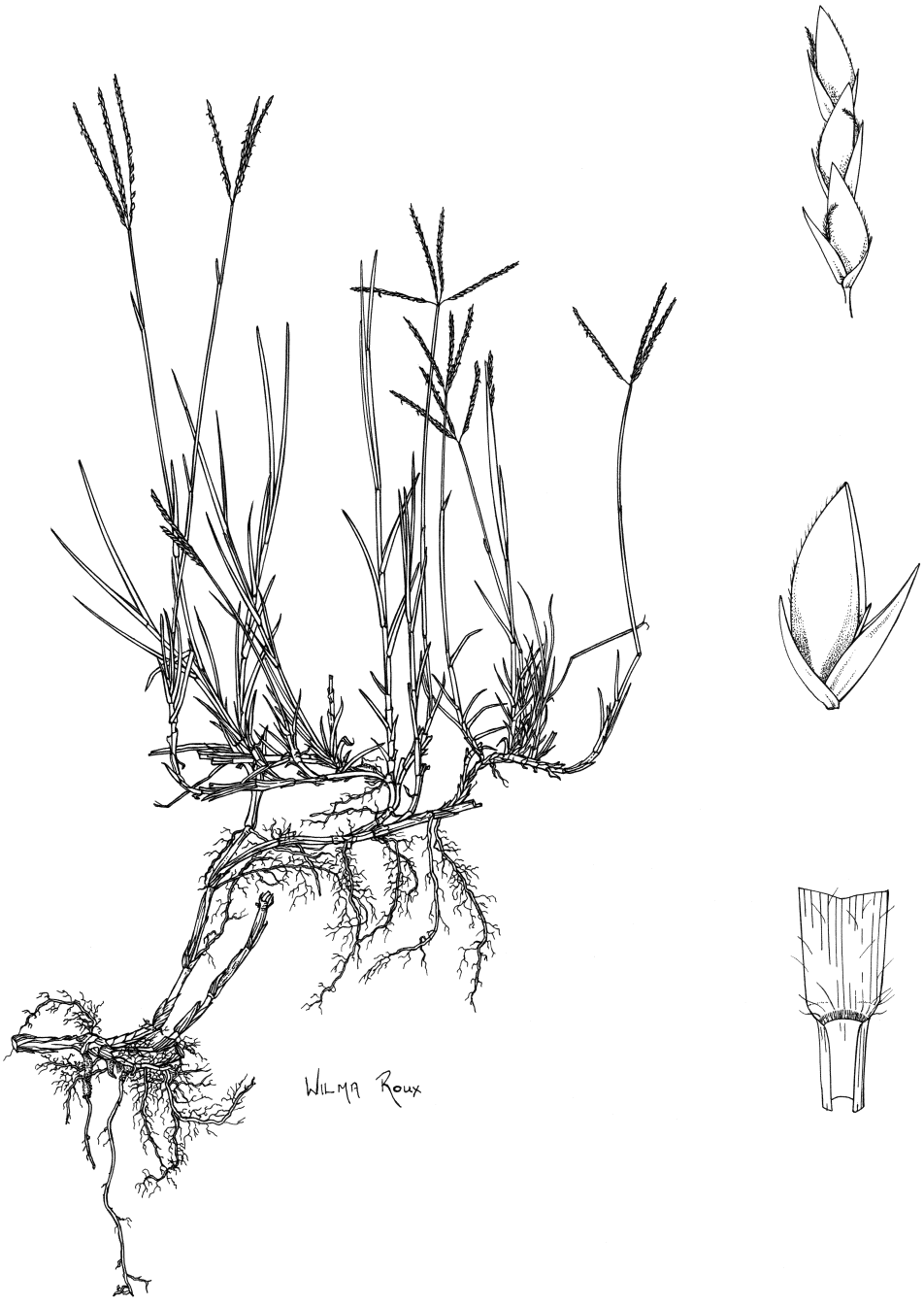



**Figure 74.** *Cynodon dactylon* (Poaceae). Artist: W. Roux.

### **polevansii** Stent

Perennial, up to 0.12 m high; compact, rhizomatous. **Culms** firm. **Leaf blades** 10–20 × ± 2 mm wide; leaves rigid, often pungent. **Flowers**: inflorescence digitate, racemes 2, not reflexed; rachilla not produced; spikelets 2.7–3.5 mm long; lemma keel wingless; Dec. Moist areas.

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### **transvaalensis** Burtt Davy

Perennial, up to 0.3 m high; rhizomatous. **Culms** delicate. **Leaf blades** 1.0–1.5 mm wide, involute and filiform, soft. **Flowers**: inflorescence digitate, racemes usually 2, reflexed at maturity; rachilla produced and often longer than lower glume; spikelets 2.0–2.5 mm long; lemma keel wingless; Nov.–May. Roadsides and weedy places. *Transvaal quick grass*; *Transvaal kweekgras*, *rooikweek* (A).

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## **Cynosurus** L. (sthn Afr.: 2 spp.)

### ***echinatus** L.

Annual, up to 0.6 m high; tufted. **Culms** erect or decumbent at base. **Leaf blades** 50–150 × 3–10 mm. **Flowers**: panicle compacted; spikelets 7–20 mm long, female-fertile spikelets 2- or 3-flowered; glumes and lemmas of sterile spikelets produced into pale awns up to 15 mm long; glumes 7–12 mm long; lemmas 5–7 mm long; anthers 3–4 mm long; Mar. Rocky, well-drained soils and disturbed places like roadsides, often in shade. Native to Europe. *Dog's tail*.

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## **Dactylis** L. (sthn Afr.: 1 sp.)

### ***glomerata** L.

Perennial, up to 0.8 m high; densely and coarsely tufted, or with oblique rhizome. **Leaf blades** 100–450 × 2–14 mm, folded at first, pilose on upper surface, glabrous, shining and smooth below; ligule membranous, 2–10 mm long. **Flowers**: panicle open or contracted, racemes closely spaced, lowest usually solitary, remote and bare at base; spikelets 5–9 mm long; panicle 50–300 mm long; spikelets 3–5(–7)-flowered, laterally compressed; glumes and lemmas strongly keeled, keels finely or coarsely ciliate, apices acuminate, mucronate or awned, awn up to 1.5 mm long; Jul., Aug., Nov.–Feb. Mostly in cultivation but also in other disturbed places like roadsides. Native to Europe. *Cocksfoot*, *orchard grass*; *koksvoetgras*, *kropaargras* (A).

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## **Dactyloctenium** Willd. (sthn Afr.: 4 spp.)

### **aegyptium** (L.) Willd.

Annual, up to 0.75 m high; mat-forming, tufted. **Culms** geniculately ascending and rooting at nodes. **Leaf blades** 30–250 × 3–8 mm. **Flowers**: inflorescence digitate, racemes 4–8, spikelets

3.5–4.5 mm long; spikes 4–8, 15–65 mm long; lemma keel scabrid above middle, ending in a mucro up to 1 mm long; anthers 0.3–0.8 mm long; caryopsis broadly triangular, apex truncate to concave; Jan.–Apr. Disturbed areas near water. *Crowfoot grass*, *Egyptian finger grass*, *duck grass*; *gewone hoenderspoorgras* (A); *ungwengwe* (Z).

DrGr MsGr

## **Dichanthium** Willem. (sthn Afr.: 2 spp.)

### ***aristatum** (Poir.) C.E.Hubb.

Perennial, up to 1.1 m high; tufted. **Culms** velvety below inflorescence; nodes glabrous or short-woolly. **Leave blades** 30–250 × 2–7 mm. **Flowers**: inflorescence digitate; sessile spikelets 3.0–4.5 × 2.5 mm; lower glume of sessile spikelets up to 2.5 mm wide; Oct.–Jun. Disturbed and moist places. Native to tropical Asia. *Angleton bluestem*.

DrGr

## **Digitaria** Haller (sthn Afr.: 36 spp.)

### Key to species:

[after Fish & Moeaha in Fish *et al*.: 209 (2015)]

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| 1a | Inflorescence a single raceme | **D. monodactyla** |
| 1b | Inflorescence digitate or subdigitate with paired or > 2 racemes per inflorescence | 2 |
| 2a | Spikelet hairs extending 1 mm and more beyond apex of spikelet | 3 |
| 2b | Spikelet glabrous or hairy, hairs may extend up to only 1 mm beyond apex of spikelet | 4 |
| 3a | Rhizome horizontal to oblique; rachis narrowly winged; lower lemma flat, not grooved on either side of midrib | **D. tricholaenoides** |
| 3b | Rhizome absent and densely tufted; rachis broadly winged; lower lemma deeply grooved on either side of midrib | **D. brazzae** |
| 4a | Spikelets 3 or more per cluster (sometimes appear as solitary or 2-nate as pedicels are of varying lengths or lower part of longest pedicel is partly fused to rachis or one spikelet is reduced to a small flange) | 5 |
| 4b | Spikelets mostly paired (2-nate) | 9 |
| 5a | Upper lemma yellow, grey or pale brown to greenish | **D. brazzae** |
| 5b | Upper lemma dark brown, black or dark red | 6 |
| 6a | Plants annual | 7 |
| 6b | Plants perennial | 8 |
| 7a | Pedicel with a corona of hairs; spikelets 1.5–2.7 mm long | **D. ternata** |
| 7b | Pedicel without a corona of hairs; spikelets 1.0–1.8 mm long | **D. thouaresiana** |
| 8a | Pedicel apex with stiff white hairs, overtopping the spikelet | **D. diagonalis** var. **diagonalis** |
| 8b | Pedicel apex with or without stiff hairs, but if present, not overtopping the spikelet | **D. setifolia** |
| 9a | Annual | 10 |
| 9b | Perennial | 12 |
| 10a | Spikelet hairs clavate-tipped | **D. ternata** |
| 10b | Spikelet hairs straight or acute, not clavate-tipped | 11 |

11a Lower lemma nerves scaberulous (may need strong lens; look near apex) . . . . . **D. sanguinalis**
11b Lower lemma nerves smooth . . . . . **D. ciliaris**
12a Lower lemma deeply grooved on either side of midrib . . . . . **D. brazzae**
12b Lower lemma not deeply grooved on either side of midrib . . . . . 13
13a Lower lemma with narrowest interspaces adjacent to midrib; racemes often adhering to each other due to hairs becoming entangled . . . **D. argyrograpta**
13b Lower lemma with broadest interspaces adjacent to midrib, or interspaces of similar width; racemes not adhering to each other by the hairs . . . . . 14
14a Base fibrous; upper lemma usually very dark brown; upper glume and lower lemma with brush of brown hairs at apex; spikelet with pin-headed hairs (may be inconspicuous) . . . . . **D. setifolia**
14b Base not fibrous; if upper lemma dark brown, pin-headed hairs and brush of hairs absent . . . . . 15
15a Ligule > 4.0 mm long; lower leaf sheaths rusty brown . . . . . **D. natalensis**
15b Ligule < 3.5 mm long; lower leaf sheaths not rusty brown . . . . . **D. eriantha**

## **argyrograpta** (Nees) Stapf

Perennial, up to 0.6 m high; rhizomatous and tufted; rhizomes knotty. **Culms** profusely branched from lower nodes. **Leave blades** 40–200 × 1–3 mm. **Flowers**: inflorescence digitate, racemes in pairs, 40–100 mm long, often adhering to each other because hairs on spikelets become entangled; spikelets up to 3 × 0.8 mm; lower glume two-thirds to four-fifths as long as spikelet; lower lemma 7-nerved with 3 nerves close together in middle, thus with narrow interspaces adjacent to central nerve; Nov.–Mar. Wide range of habitats. *Silver finger grass*.

DrGr | MsGr | KarSh

## **brazzae** (Franch.) Stapf

Perennial, up to 1.1 m high; densely tufted. **Culms** erect. **Leaf blades** 60–100 × 2–4 mm; cataphylls and basal sheaths densely covered with silky hairs. **Flowers**: inflorescence digitate, racemes 2–4, digitate, 150–200 mm long; rachis broadly winged; spikelets 2.8–3.2 × 1 mm, in clusters of 2–4(5); upper glume $^{1}/_{2}$–$^{3}/_{4}$ as long as spikelet; upper lemma yellow, grey or pale brown to greenish; lower lemma deeply grooved on either side of midrib, with hairs 2–4 mm long forming 2 tufts at base and fringing upper half of margins; Sep.–Apr. Grassland, usually sandy soil, often on stony hillsides. *Brown finger grass*; *bruinvingergras* (A).

DrGr

## **ciliaris** (Retz.) Koeler

*D. adscendens* (Kunth) Henrard
*D. marginata* Link

Annual, up to 0.55 m high; tufted. **Culms** erect. **Leaf blades** 30–160 × 3–10 mm. **Flowers**: inflorescence digitate, racemes 3–7, digitate, 40–100 mm long; **s**pikelets 2.3–3.4 × 1 mm; lower glume a triangular scale up to 0.3 mm long; lower lemma not scaberulous; Jan.–Apr. Disturbed sandy soil. *Tropical finger grass*, *summer grass*, *Henry crab grass*; *tropiese vingergras* (A).

MsGr

## **diagonalis** (Nees) Stapf var. **diagonalis**

*D. trichopodia* Stent
*D. uniglumis* (A.Rich.) Stapf

Perennial, up to 1.5 m high; tufted. **Culms** swollen and bulbous at base; basal leaf sheaths silky hairy, breaking up into fibres. **Leaf blades** 90–170 × 2–3 mm. **Flowers**: inflorescence

subdigitate, racemes on a long central axis; spikelets 1.4–2.4 × 1 mm; spikelets in groups of 3(–6), on unequal pedicels with 10–15 white setae longer than spikelets; upper female-fertile floret bright dark brown or black; Jan.–Apr. Open, usually sourveld grassland, often hillsides and in damp places. *Kruisgras*, *vleivingergras* (A).

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**eriantha** Steud.

*D. smutsii* Stent

Perennial, up to 1.4 m high; sometimes stoloniferous or tufted with knotty and unbranched rhizomes. **Culms** simple or branched; basal leaf sheaths silky and hairy, not rusty brown. **Leaf blades** 50–400 × 2–14 mm; ligule < 3.5 mm long. **Flowers**: inflorescence digitate, racemes 3–15, 50–200 mm long; spikelets 2.2–4.0 × 1 mm; lower glume a membranous scale, ovate to acute; upper glume $^1/_3$–$^2/_3$ as long as spikelet; lower lemma as long as spikelet; upper glume and lower lemma covered with hairs 1 mm long, purple and silvery; Jan.–Apr. Wide range of habitats. *Common finger grass*, *Smuts finger grass*, *Pongola finger grass*, *woolly finger grass*; *kortbeenhoenderspoor*, *kleinvingergras*, *kruisgras*, *hoenderspoorgras*, *wolvingergras*, *Smuts vingergras* (A); *mangole maseka* (T); *moeane*, *mmoyane* (SS); *isikonko* (Z). Figure 75.

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**monodactyla** (Nees) Stapf

*D. monodactyla* Stapf var. *explicata* Stapf

Perennial, up to 0.55 m high; densely tufted. **Culms** with hairy cataphylls. **Leaf blades** 30–60 × 1.8–2.2 mm, often rolled. **Flowers**: raceme solitary, 50–180 mm long; spikelets 2.8–3.2 × 1 mm; spikelets in pairs; upper glume and lower lemma covered with yellow hairs 1 mm long; upper female-fertile floret light brown; Nov.–Feb. Open grassland, usually highland sourveld. *One-finger grass*; *eenvingergras* (A).

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**natalensis** Stent

*D. macroglossa* Henrard

Perennial, up to 1.5 m high; loosely to densely tufted with knotty rhizomes, base not fibrous. **Culms** lower nodes straight and covered by bright, rusty brown sheaths. **Leaf blades** 80–250 × 2–6 mm; ligule membranous, 3.5–12.0 mm long. **Flowers**: inflorescence digitate, racemes 4–12, digitate, 100–200 mm long; spikelets 2.8–3.5 ×0.8 mm; spikelet characters as in *D. eriantha*; Dec.–Jun. Mainly sandy ground. *Coast finger grass*.

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***sanguinalis** (L.) Scop.

Annual, up to 0.6 m high; tufted. **Culms** branched, decumbent and rooting from lower nodes. **Leaf blades** 27–170 × 3–10 mm. **Flowers**: inflorescence digitate or subdigitate, racemes 3–12, 40–105 mm long; spikelets 2.3–3.1 × 1 mm; lower lemma equalling or shorter than spikelet, scaberulous along nerves, very rarely with a ciliate frill; Nov.–May. Disturbed areas. Native to Europe. *Hairy crab grass*, *crab finger grass*, *wild millet*; *kopersaadgras*, *kruisvingergras* (A).

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**Figure 75.** *Digitaria eriantha* (Poaceae). Artist: C. Letty.

### **setifolia** Stapf

Perennial, up to 0.5 m high; densely tufted, base fibrous. **Leaf blades** 50–140 × 1.5–3.0 mm, usually rolled; old leaf sheaths breaking up into brown fibres at base. **Flowers**: inflorescence subdigitate on a short central axis, racemes (2)3 or 4(5), 40–120 mm long; spikelets 3–4 × 1 mm, with pin-headed hairs (may be inconspicuous); spikelets in groups of 2 or 3; pedicel apex with or without stiff hairs, but if present, not overtopping the spikelet; upper glume and lower lemma with conspicuous rows of bright brown, clavate hairs; upper female-fertile floret dark brown; Sep.–Jan. Mountain sourveld areas, usually in damp places or vleis. *Fine-leaved finger grass*; *suurvingergras* (A).

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### **ternata** (A.Rich.) Stapf

Annual, up to 0.6 m high; loosely tufted. **Leaf blades** 20–200 × 1–7 mm. **Flowers**: inflorescence digitate or subdigitate on short central axis, midrib winged, racemes in a pair or up to 6, 40–200 mm long; spikelets 1.5–2.7 × 0.8 mm; spikelets in clusters of (2 or) 3; pedicels with a corona of short hairs at apex; upper glume $^{3}/_{4}$ as long as spikelet; upper glume and lower lemma covered with white clavate hairs; upper female-fertile floret dark brown or purplish black; Nov.–May. Damp and disturbed areas. *Black-seed finger grass*; *swartsaadvingergras*, *soetvingergras*, *soetgras* (A); *moeane* (SS).

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### **thouaresiana** (Flüggé) A.Camus

*D. melanochila* Stapf

*D. tricostulata* (Hack.) Henrard

Annual, up to 1 m high; tufted. **Leaf blades** 30–200 × 2–8 mm. **Flowers**: inflorescence subdigitate, racemes 2–14, 20–120 mm long; spikelets 1.0–1.8 × 0.8 mm; spikelets in clusters of 3 or 4 on winged rachis; pedicels without corona of hairs, only a few hairs at apex; upper glume and lower lemma rarely glabrous, usually covered with white, clavate hairs; female-fertile (upper) floret dark brown to black; Feb.–May. Marshy places and disturbed sites.

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### **tricholaenoides** Stapf

Perennial, up to 0.55 m high; rhizome horizontal to oblique, up to 100 mm long, covered with hairy, persistent, overlapping bases of old leaf sheaths, tufted. **Culms** erect. **Leaf blades** 40–200 × 2–7 mm. **Flowers**: inflorescence subdigitate, racemes 2 or 3(–7), 30–130 mm long; spikelets 3–5 × 1 mm, in clusters of 2–5; upper glume $^{1}/_{2}$–$^{2}/_{3}$ length of spikelet, covered with silvery or purplish hairs 1–2 mm long; rachis narrowly winged; lower lemma flat, not grooved on either side of midrib, covered (except for central interspace) with silvery or purplish hairs 2–4 mm long; Nov.–Mar. Open, sourveld grassland mainly on stony soil. *Purple finger grass*; *persvingergras*, *lasvingergras* (A).

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## **Diheteropogon** (Hack.) Stapf (sthn Afr.: 2 spp.)

### Key to species:

[after Fish in Fish *et al*.: 232 (2015)]

Callus hairy only near the apex; leaves expanded, usually > 3 mm wide, base, at least of upper leaves, rounded or cordate. . . . . **D. amplectens**

Callus hairy along entire callus; leaves usually filiform, up to 4 mm wide (unrolled), base straight . . . . . **D. filifolius**.

**amplectens** (Nees) Clayton
*Andropogon amplectens* Nees

Perennial, up to 2 m high; rhizomatous; young growth waxy. **Leaf blades** 150–300 × 20 mm, expanded; base rounded or cordate, clasping stem. **Flowers**: inflorescence digitate with 2 racemes; sessile spikelets 7–9 mm long, pedicellate spikelets longer; callus hairy only near apex; Nov.–Apr. Poor shallow soils on stony slopes and in woodland. *Broad-leaved bluestem*; *breëblaar-andropogon* (A). Figure 76.




**filifolius** (Nees) Clayton
*Andropogon filifolius* (Nees) Steud.

Perennial, up to 0.6 m high; rhizomatous and tufted. **Leaf blades** 100–500 mm long, filiform or up to 4 mm wide (unrolled), thread-like, bluish green; base straight. **Flowers**: inflorescence digitate with 2 racemes; sessile spikelets 6–8 mm long, pedicellate spikelets much longer; callus hairy along entire callus; Oct.–Apr. Sour open grassland on hillsides. *Wire bluestem*; *draadbloustamgras* (A).




## **Dinebra** Jacq. (sthn Afr.: 1 sp.)

**retroflexa** (Vahl) Panz. var. **condensata** S.M.Phillips

Annual, up to 0.8 m high; loosely tufted. **Leaf blades** 45–280 × 4–8 mm wide. **Flowers**: inflorescence of spike-like main branches, a raceme of many small spikes which become deflexed at maturity; spikelets 5.7–9.0 mm long; glumes 6.0–8.2 mm long, with spreading aristate apices; Dec.–May. Disturbed soil in moist weedy places, often in shade and on black turf or waterlogged soils. *Cat's-tail grass*; *kattestertgras* (A).




## **Echinochloa** P.Beauv. (sthn Afr.: 9 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 238 (2015)]

1a Ligule absent in all leaves . . . . . 2
1b Ligule a fringe of hairs, present, at least in lower leaves . . . . . 4
2a Plants perennial, rhizomatous. . . . . **E. haploclada**
2b Plants annual, not rhizomatous. . . . . 3
3a Raceme untidily 2- to several-rowed, 20–100 mm long, base usually with secondary branchlets; spikelets 3–4(–7) mm long; lower lemma not awned or sometimes with awn 5–35 mm long . . . . . **E. crus-galli**
3b Raceme neatly 4-rowed, usually 10–25 mm long, base with no secondary branchlets; spikelets 1.5–3.0 mm long; lower lemma not awned (acuminate apex may be up to 1 mm long) . . . . . **E. colona**



**Figure 76.** *Diheteropogon amplectens* (Poaceae). Artist: C. Smith.

4a Spikelets rarely > 2.5 mm long, subglobose to elliptic . . . . . **E. haploclada**
4b Spikelets rarely < 3 mm long, elongated, ovate to narrowly ovate, elliptic, narrowly or broadly elliptic . . . . . 5
5a Lower lemma not awned (rarely with a subulate awn up to 3 mm long). . . . . **E. holubii**
5b Lower lemma awn usually > 5 mm long. . . . . 6
6a Inflorescence open; spikelets 4–6 mm long (excluding awn), narrowly ovate . . . . . **E. stagnina**
6b Inflorescence dense; spikelets 3.0–3.5(–4.0) mm long (excluding awn), narrowly elliptic . . . . . **E. jubata**

## **colona** (L.) Link

Annual, up to 1 m high; hydrophyte, stoloniferous and tufted. **Leaf blades** 50–300 × 2–8 mm; ligule absent. **Flowers**: inflorescence subdigitate, 10–150 mm long; racemes neatly 4-rowed, 10–25 mm long, base with no secondary branchlets spikelets 1.5–3.0 × 1.0–1.5 mm, pubescent; lower floret male or sterile; lower lemma not awned (apex sometimes up to 1 mm long); Jan.–Apr. Muddy or swampy places. *Swamp grass*, *jungle rice*, *marsh grass*; *kleinwatergras*, *moerasgras* (A).

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## ***crus-galli** (L.) P.Beauv.

*E. subverticillata* Pilg.

Annual, up to 1 m high; hydrophyte, stoloniferous and tufted. **Leaf blades** 70–350 × 4–20 mm; ligule absent. **Flowers**: inflorescence spike-like, 60–220 mm long; racemes untidily 2- to several-rowed, 20–100 mm long, base usually with secondary branchlets; spikelets 3–4(–7) × 1–2 mm; lower floret sterile; lower lemma usually not awned, rarely with awn 5–35 mm long; Jan.–Apr. Swampy areas, wet places of cultivation. Native to temperate Eurasia. *Barnyard millet*, *cockspur grass*; *blousaadgras*, *hanepootmanna* (A); *joang-ba-masimo* (SS).

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## **haploclada** (Stapf) Stapf

Perennial, up to 3 m high; hydrophyte, rhizomatous and tufted. **Leaf blades** 50–100 × 3–10(–20) mm; ligule absent or a fringe of hairs. **Flowers**: inflorescence spike-like, 70–250 mm long; racemes 10–50 mm long, densely crowded with appressed spikelets; spikelets 1.5–2.5(–3.0) × 1.0–1.5 mm, subglobose to elliptic; lower floret male; lower lemma acute or with awns, 5–15 mm long; Mar., Apr. Streambanks, dry riverbeds.

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## **holubii** (Stapf) Stapf

Perennial, up to 0.9 m high; hydrophyte, rhizomatous and tufted. **Leaf blades** 180–220 × (2–)4(–8) mm; ligule a fringe of hairs, sometimes absent in upper leaves. **Flowers**: inflorescence spike-like, (80–)120(–180) mm long, racemes distant, 15–40 mm long; spikelets 2.5–3.5 × 1.0–1.5 mm, elliptic to elongated; lower floret male or sterile; lower lemma not awned, apex acute to acuminate, up to 3 mm long; Dec.–Apr. Swampy areas, pans and vleis. *Kalahari water grass*; *kalahariwatergras* (A).

| | AcGr | DrGr | | KarSh | |
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### **jubata** Stapf

Perennial, up to 2 m high; hydrophyte, rhizomatous and stoloniferous. **Leaf blades** 100–250 × 3–15 mm; ligule a fringe of hairs, sometimes absent from upper leaves. **Flowers**: inflorescence dense, spike-like, 80–200 mm long; racemes 20–40 mm long; spikelets 3.0–3.5(–4.0) × 1 mm, narrowly elliptic and closely packed, lower floret male or sterile; lower lemma with awns 3–25 mm long; Nov.–May. In water and streamsides, often floating.

| VreDm | AcGr | DrGr | MsGr | | |
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### **stagnina** (Retz.) P.Beauv.

Perennial, rarely annual, 0.8–1.5 m high; hydrophyte, rhizomatous, and stoloniferous. **Leaf blades** 100–450 × 4–15 mm; ligule a fringe of hairs, often absent in upper leaves. **Flowers**: inflorescence open, 80–250 mm long; racemes 20–80 mm long, branches clearly secund; spikelets 4–6 × 1.0–1.8 mm, excluding awn, narrowly ovate, with rigid hairs on nerves; lower floret male or sterile; lower lemma with awns (1–)3–20(–50) mm long; Dec.–May. In water, streamsides and often floating. *Burgu grass*, *long-awned water grass*, *hippo grass*, *umvuma grass*; *watergras* (A); *bohome-ba-liliba* (SS).

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## **Ehrharta** Thunb. (sthn Afr.: 23 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 244 (2015)]

1a Sterile lemmas with long hairs on sides, keels or margins . . . . . **E. calycina**
1b Sterile lemmas without long hairs on sides, keel or margins, glabrous to strongly scabrous (sometimes base with a tuft of hairs) . . . . . 2
2a Glumes nearly as long as to longer than spikelet; sterile lemmas smooth, shining . . . . . **E. longigluma**
2b Glumes $^1/_2$–$^3/_4$ as long as lemmas; sterile lemmas with transverse ribs . . . . 3
3a Spikelets (4.0)4.2–5.0 mm long; sterile lemmas tapering gradually to subacute apices; 2nd sterile lemma base often with a tuft of hairs, sides shallowly transversely ribbed . . . . . **E. erecta** var. **natalensis**
3b Spikelets 3.0–4.2 mm long; sterile lemmas abruptly rounded at apices; 2nd sterile lemma base without a tuft of hairs, sides usually deeply transversely ribbed, especially on the distal $^1/_2$ . . . . . **E. erecta** var. **erecta**

### **calycina** Sm.

Perennial, or possibly annual, up to 0.7 m high; often rhizomatous, very variable. **Leaf blades** filiform or up to 7 mm wide, flat or rolled. **Flowers**: panicle contracted; spikelets 4.0–8.5 mm long; sterile lemmas similar in texture, margins long-hairy, first > $^2/_3$ length of 2nd, 2nd with apex acute, truncate or commonly with mucro arising abruptly from central nerve, and pair of ear-like appendages at base; Jul.–Jun. (usually spring). Many habitats and soil types. *Perennial veld grass*; *polgras*, *pypgras*, *rooisaadgras* (A).

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### **erecta** Lam. var. **erecta**

Perennial, up to 0.6 m high; loosely tufted. **Leaf blades** 30–150 × 3–12 mm, soft. **Flowers**: panicle contracted; spikelets 3.0–4.2 mm long; glumes $^1/_2$–$^3/_4$ length of lemmas; sterile lemmas

similar in texture, sides not long-hairy, usually deeply corrugated especially on upper half, apices abruptly rounded, bases not bearded; (Jul.–)Oct.–Jan.(–Jun.). Shady moist places, often at forest margins. *Lamarck's ehrharta*, *panic veld grass*; *kholane* (SS).

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**erecta** Lam. var. **natalensis** Stapf

Perennial, up to 0.9 m high; loosely tufted or rambling. **Leaf blades** up to 270 × 16 mm. **Flowers**: panicle contracted; spikelets (4.0)4.2–5.0 mm long; glumes $^{1}/_{2}$–$^{3}/_{4}$ length of lemmas; sterile lemmas similar in texture, sides not long-hairy, longitudinally nerved or only shallowly corrugated, tapering gradually to subacute apices, upper sterile lemma often bearded at base; Oct.–Apr.(–Jun.). Shady moist places, especially forest margins.

DrGr | MsGr | KarSh

**longigluma** C.E.Hubb.

Perennial, up to 0.6 m high; rhizomes long and slender, or tufted and erect. **Leaf blades** 25–120 × 2–4 mm, flat. **Flowers**: panicle contracted; spikelets 4.0–7.5 mm long; glumes equal, 0.5–2.0 mm longer than spikelet; sterile lemmas similar, glabrous, shining, not awned, second pair with ear-like appendages at base; Nov.–Mar. Mountain grassland, alt. 2 300–3 300 m, often in peaty soil.

MsGr

## **Eleusine** Gaertn. (sthn Afr.: 4 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 261 (2015)]

1a Plants perennial; inflorescence digitate; lemmas narrowly oblong-lanceolate . . . . . **E. tristachya**

1b Plants annual; inflorescence subdigitate, sometimes in compact clusters, alternating on a short axis; lemmas lanceolate, broadly lanceolate to narrowly ovate . . . . . 2

2a Lemma apex cuspidate or obtuse and mucronate; inflorescence of compact clusters, alternating on a short axis . . . . . **E. multiflora**

2b Lemma apex acute to subacute; inflorescence subdigitate . . . . . **E. coracana** subsp**. africana**

**coracana** (L.) Gaertn. subsp. **africana** (Kenn.-O'Byrne) Hilu & de Wet

*E. africana* Kenn.-O'Byrne

*E. indica* (L.) Gaertn. subsp. *africana* (Kenn.-O'Byrne) S.M.Phillips

Annual, up to 0.6 m high; tufted. **Culms** slanted; culms and inflorescences typically green in colour. **Leaf blades** 220–500 × 6–10 mm; ligule a densely fringed membrane. **Flowers**: inflorescence subdigitate, spikes 3–13, 60–170 × 4–10 mm; spikelets 5–8 × 3–4 mm; spikelets 2–6-flowered, not disarticulating at maturity; lemma apex acute; caryopsis globose; Oct.–May. Ruderal, on many soil types. *African finer millet*, *goose grass*; *osgras* (A).

VreDm | DrGr | MsGr | KarSh

***multiflora** A.Rich.

Annual, up to 0.4 m high; tufted. **Culms** fairly slender and ascending. **Leaf blades** 60–260 × 3–6 mm. **Flowers**: inflorescence of compact clusters, alternating on a short axis, spikes 2–8, stout, 15–25 × 8–15 mm; spikelets 7–11 mm long; lemma apex cuspidate or obtuse and mucronate; Feb.–Apr. Disturbed places in bush- or grassveld, weed in cultivated lands. Native to tropical East Africa to Ethiopia. *Fat-spiked yard grass*.

MsGr

***tristachya** (Lam.) Lam.

Perennial, up to 0.18 m high; tufted. **Leaf blades** 50–180 × 3–5 mm. **Flowers**: inflorescence digitate; spikes 1–4, stout, 10–25 × 4–11 mm; spikelets 4–7 mm long; spikelets 2- or 3-flowered; lemmas narrowly oblong-lanceolate; Feb.–Apr. Disturbed weedy places. Native to tropical America. *Goose grass*.

DrGr MsGr

## **Elionurus** Kunth ex Willd. (sthn Afr.: 2 spp.)

**muticus** (Spreng.) Kunth
*E. argenteus* Nees
*E. glaber* E.Phillips

Perennial, up to 1.2 m high; densely tufted. **Leaves** basal, with blades 10–150 mm long, setaceous or up to 1–2 mm wide. **Flowers**: inflorescence a single spike, erect to sickle-shaped, especially when dry; sessile spikelets 6–14 mm long, pedicellate spikelets somewhat shorter; lower glume of sessile spikelets with long dense, silky, white hairs, apex bidentate; Sep.–May. Open grassland, especially sourveld. *Wire grass*, *silky grass*, *sour grass*; *suurgras*, *polgras*, *wildebeestegras*, *koperdraadgras* (A); *hlooko* (SS); *isinama* (Z).

DrGr MsGr KarSh Zastr

## **Enneapogon** P.Beauv. (sthn Afr.: 6 spp.)

### Key to species:

[after Nembudani & Fish in Fish *et al.*: 273 (2015)]

1a Lemma awns scabrous, never plumose . . . . . **E. scaber**
1b Lemma awns plumose for most of their lengths . . . . . 2
2a Glume apex reddish brown, often shining . . . . . **E. pretoriensis**
2b Glume apex grey or pallid not reddish brown . . . . . 3
3a Plant loosely tufted, densely hairy; base usually not dense, never bulbous; mostly annual . . . . . **E. cenchroides**
3b Plant densely tufted, glabrous or hairy but not densely; base very dense, often bulbous; mainly perennial . . . . . 4
4a Plants usually < 0.3 m high; base densely leafy; often stoloniferous; basal leaf sheaths often persistent, breaking into fibres . . . . . **E. desvauxii**
4b Plants usually > 0.3 m high; culms much branched and densely leafy from a few centimetres above base; basal leaf sheaths persistent but not breaking into fibres . . . . . **E. scoparius**

**cenchroides** (Roem. & Schult.) C.E.Hubb.

Annual or short-lived perennial, up to 1 m high; loosely tufted, densely glandular-hairy, base usually not dense. **Culms** slightly spreading. **Leaf blades** 30–250 × 3–8 mm. **Flowers**: panicle branched but contracted, often dense and spike-like, central axis hidden; spikelets 3–5 mm long; glume apices grey or pallid; lemma awns hair-fringed; anthers 1.0–1.5 mm long; Jan.–Dec., usually summer, but occasionally winter in the north. Sandy soils, in disturbed places and overgrazed veld. *Sour grass*, *fur grass*, *common nine-awned grass*; *suurgras*, *gewone negenaaldgras* (A); *letsoa* (SS); *kabwele* (T).

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**desvauxii** P.Beauv.

*E. brachystachyum* (Jaub. & Spach) Stapf

Perennial or annual, up to 0.3 m high; densely tufted, glandular-hairy, base densely leafy, often stoloniferous. **Culms** often decumbent; nodes with a ring of hairs; basal leaf sheaths often persistent, breaking into fibres. **Leaf blades** 25–250 mm long, filiform or up to 7 mm wide. **Flowers**: panicle spike-like, dense, unbranched; spikelets 3.0–5.5 mm long; lemma awns hair-fringed; anthers 0.2–0.7(–1.2) mm long; Jul.–Jun., usually summer but rarely in winter in the north. Many habitats and soil types, often in overgrazed veld. *Eight-day grass*; *suurgras*, *kalkgras*, *wondergras* (A).

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**pretoriensis** Stent

Perennial, up to 0.65 m high; densely tufted. **Culms** wiry, unbranched, bases erect, clad in hard, shiny, yellowish sheaths. **Leaf blades** 50–250 mm long, setaceous or to 3 mm wide. **Flowers**: panicle contracted, rarely open, branched; spikelets 5.5–7.0 mm long; glume apices reddish brown, often shining; lemma awns hair-fringed; anthers 2.5 mm long; Nov.–May. Rocky hillsides, often on northern aspect. *Suurgras* (A).

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**scaber** Lehm.

Perennial, up to 0.35 m high; tufted. **Leaf blades** 50–115 × 2–5 mm. **Flowers**: panicle open, branched, not spike-like; spikelets 4–5 mm long; lemma awns glabrous or scabrous; anthers 0.8–1.0 mm long; Jan.–Dec., usually in summer. Hillsides among rocks. *Klipgras*, *suurgras* (A).

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**scoparius** Stapf

Perennial, up to 0.65 m high; densely tufted; plant wiry, sparsely hairy. **Culms** erect, much branched, densely leafy from a few centimetres above base; basal leaf sheaths persistent but not breaking into fibres. **Leaf blades** 50–200(–250) mm long, filiform or up to 3 mm wide. **Flowers**: panicle dense, spike-like, unbranched; spikelets 3.5–4.5 mm long; lemma awns hair-fringed; anthers 1.0–2.5 mm long; Jan.–Dec. (usually in summer). Dry grassland and among rocks on hillsides. *Bottlebrush grass*.

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## **Eragrostis** Wolf (sthn Afr.: 82 spp.)

### Key to species:

[after Fish in Fish *et al*.: 282 (2015)]

1a Spikelet disarticulating below glumes, falling as an entire unit . . . **E. superba**
1b Spikelet breaking up, at maturity, above glumes in various ways or not at all . . . . . 2
2a Palea keel hairs bulbous-based, 0.1–1.3 mm long, usually exserted from lemma (for exserted but not bulbous-based hairs or prickles go to 4). . . . . 3
2b Palea keels glabrous, scabrid or ciliate with hairs < 0.3 mm long, and usually not exserted from lemma, bulbous-based hairs not present . . . . . 4
3a Rachilla persistent, lemmas and/or paleae breaking up from base upwards; plants perennial; spikelets (4)5–17 mm long . . . . . **E. lappula**
3b Rachilla fragile, lemma, paleae and part of rachilla internode breaking off as units from apex downwards; plants annual; spikelets 1.5–4.5 mm long . . . . . **E. viscosa**
4a Plants annual . . . . . 5
4b Plants perennial . . . . . 25
5a Inflorescence with lowest branches whorled to subwhorled . . . . . 6
5b Inflorescence with lowest branches not whorled, may be clustered . . . . . 15
6a Inflorescence appearing dense with branches ± appressed to main axis, spikelets close together. . . . . **E. glandulosipedata**
6b Inflorescence open with branches spreading away from main axis, spikelets distant . . . . . 7
7a Anthers up to 0.50 mm long . . . . . 8
7b Anthers 0.55–1.50 mm long. . . . . 13
8a Florets 1–3 per spikelet . . . . . **E. biflora**
8b Florets 4–many per spikelet . . . . . 9
9a Lower glume reaching < ½ way up the lemma above . . . . . 10
9b Lower glume reaching > ½ way up the lemma above . . . . . 12
10a Lemmas on same side of rachilla not to barely reaching the lemma above . . . . . **E. remotiflora**
10b Lemmas on same side of rachilla distinctly overlapping the lemma above . . . . . 11
11a Inflorescence with axils of lowest branches hairy . . . . . **E. pilosa**
11b Inflorescence with axils of lowest branches glabrous . . . . . **E. mexicana** subsp. **virescens**
12a Lowest lemma 1.3–1.7 mm long . . . . . **E. mexicana** subsp. **virescens**
12b Lowest lemma 2.0–2.7 mm long . . . . . **E. tef**
13a Glumes unequal; lowest lemma 2.0–2.7 mm long. . . . . **E. tef**
13b Glumes equal to subequal; lowest lemma 1.0–1.9 mm long . . . . . 14
14a Palea margins wide apart for entire length; leaf sheaths densely covered with bulbous-based hairs . . . . . **E. porosa**
14b Palea margins touching or overlapping; leaf sheaths glabrous, rarely sparsely covered with bulbous-based hairs . . . . . **E. micrantha**
15a Caryopsis subglobose to subrotund . . . . . **E. cilianensis**
15b Caryopsis not as above . . . . . 16
16a Anthers 0.1–0.3 mm long. . . . . 17
16b Anthers 0.4–1.2 mm long. . . . . 23
17a Palea margins wide apart for entire length. . . . . 18
17b Palea margins nearly touching to touching or overlapping for entire length . . . . . 22
18a Leaf margins and/or midrib with glands . . . . . **E. procumbens**
18b Leaf margins without glands . . . . . 19
19a Lower glume usually minute, not keeled to lightly keeled, apex obtuse; inflorescence branches and pedicels gland dotted . . . . . **E. homomalla**

19b Lower glume large, distinctly keeled, apex acute; inflorescence branches and pedicels with or without glands . . . . . 20
20a Inflorescence densely contracted, side branches usually appressed to main axis . . . . . **E. procumbens**
20b Inflorescence open, side branches not appressed to main axis . . . . . 21
21a Lemma 1.7–2.3 mm long, apex obtuse . . . . . **E. barrelieri**
21b Lemma 1.2–1.7 mm long, apex acute to subacute . . . . . **E. mexicana** subsp. **virescens**
22a Caryopsis shallowly grooved on the back . . . . . **E. remotiflora**
22b Caryopsis rounded on the back . . . . . **E.pilosa**
23a Lower glume reaching up to 1/3 of lemma above . . . . . 24
23b Lower glume reaching up to 1/2 and more of lemma above . . . . **E. micrantha**
24a Lemmas on same side of rachilla either not or just overlapping one another . . . . . **E. remotiflora**
24b Lemmas on same side of rachilla distinctly overlapping one another . . . . . **E. tenuifolia**
25a Lemma lateral nerves with elongated black oil glands alongside. . . . **E. caesia**
25b Lemma without elongated black oil glands . . . . . 26
26a Sheaths and culms, below nodes with sticky glandular patches, obvious due to adhering sand grains . . . . . **E. gummiflua**
26b Culms and sheaths without glands or if present, glands not sticky . . . . . 27
27a Rachilla fragile; spikelet disarticulating from apex downwards . . . . . 28
27b Rachilla persistent (upper may become fragile); spikelet disarticulating from base upwards . . . . . 35
28a Lemma apex acute to acuminate . . . . . **E. nindensis**
28b Lemma apex subacute, obtuse, rounded to truncate . . . . . 29
29a Lemma with lateral nerves prominent. . . . . 30
29b Lemma with lateral nerves indistinct or obscure . . . . . **E. pallens**
30a Palea keel broadly winged below and with tooth-like appendage . . . . . 31
30b Palea keels entire, winged or not winged, tooth-like appendage absent . . .32
31a Palea keel wings only shallowly notched near base; palea apex rounded; lemma keels and lateral nerves eglandular . . . . . **E. × pseud-obtusa**
31b Palea keel wings deeply notched near base; palea apex acute; lemma keels and lateral nerves gland dotted . . . . . **E. echinochloidea**
32a Palea margins touching to overlapping at apex. . . . . **E. gummiflua**
32b Palea margins wide apart at apex. . . . . 33
33a Rhizomes absent; palea keels long hairy; basal sheaths glabrous, if rarely hairy, then not woolly hairy . . . . . **E. obtusa**
33b Rhizomes present; palea keels scaberulous; basal sheaths woolly hairy . . . 34
34a Lowest lemma truncate . . . . . **E. truncata**
34b Lowest lemma broadly obtuse . . . . . **E. bergiana**
35a Lemma keel and/or lateral nerves with glands (may appear lumpy) . . . . . **E. plana**
35b Lemma without glands. . . . . 36
36a Basal sheaths and/or prophylls woolly hairy . . . . . **E. sclerantha** subsp. **sclerantha**
36b Basal sheaths glabrous or hairy, often silky hairy, never woolly hairy (often hairy at very base only) . . . . . 37
37a Obvious rhizome (stout or long and slender) present; leaves often mainly cauline. . . . . 38
37b Rhizome absent or not obvious; leaves usually mainly basal. . . . . 42
38a Inflorescence primary branches appressed to main axis . . . . . 39
38b Inflorescence open or contracted, primary branches not appressed to main axis . . . . . 40
39a Spikelets 1.5–1.7 mm wide; lemmas 1.3–1.5 mm long; anthers 0.2–0.4 mm long . . . . . **E. sarmentosa**
39b Spikelets 3–7 mm wide; lemmas 2.5–4.0 mm long; anthers 1–2 mm long . . . . . **E. capensis**

40a Palea keels obscure, sometimes indicated by minute prickles only . . . . . **E. bicolor**
40b Palea keels distinct and prominent along entire length. . . . . 41
41a Most pedicels per inflorescence > 2.5 × the spikelet length . . . . . **E. patentissima**
41b Most pedicels per inflorescence < 2 × the spikelet length. . . . . **E. capensis**
42a Spikelets up to 2.1 mm wide . . . . . 43
42b Spikelets 2.2 mm and wider . . . . . 59
43a Inflorescence contracted, spikelets dense, primary branches appressed to main axis, or primary branches racemose and if open branches short with only a few spikelets . . . . . 44
43b Inflorescence open, branches usually spreading away from main axis . . . .45
44a Lower glume narrowly ovate in side view, apex obtuse. . . . . **E. racemosa**
44b Lower glume lanceolate in side view, apex acute . . . . . .**E. curvula**
45a Basal sheaths densely hairy in furrows between prominent ridges formed by nerves . . . . . .**E. curvula**
45b Basal sheaths glabrous, obscurely to densely hairy but, nerves if distinct or prominent without deep furrows . . . . . 46
46a Palea margins apart for entire length, may be close, but not touching at apex . . . . . 47
46b Palea margins close to touching along entire length, definitely touching to overlapping at apex . . . . . 52
47a Inflorescence branches and/or pedicels with glands (not included are species with glands only around the base of the lowest branches) . . . . . .48
47b Inflorescence without glands on branches and/or pedicels (glands may be present at base of inflorescence) . . . . . 49
48a Inflorescence lowest branches obviously whorled . . . .**E. glandulosipedata**
48b Inflorescence lowest branches not whorled, maybe paired or clustered. . . . . .**E. patentipilosa**
49a Inflorescence lowest branches whorled. . . . . .**E. trichophora**
49b Inflorescence lowest branches not whorled. . . . . 50
50a Culm nodes barbate . . . . . .**E. barbinodis**
50b Culm nodes glabrous, if hairy, then not barbate . . . . . 51
51a Culm internodes glabrous. . . . . **E. lehmanniana** var. **lehmanniana**
51b Culm internodes hairy . . . . . **E. lehmanniana** var. **chaunantha**
52a Anthers 0.2–1.0 mm long; glumes to $^1/_3$ up lemma above, upper glume sometimes not reaching the base of the lemma above. . . . . 53
52b Characters not in the above combination. . . . . 54
53a Lemma 1.0–1.8 mm long, broadly ovate-oblong in side view, apex broadly obtuse to rounded; spikelets up to 1 mm wide . . . . . **E. remotiflora**
53b Lemma 1.7–2.5 mm long, ± narrowly semi-ovate in side view, apex acute to narrowly obtuse; spikelets 1–3 mm wide . . . . . .**E. tenuifolia**
54a Lemma lightly keeled, keel obscure or only prominent in the upper part of the lemma. . . . . 55
54b Lemma strongly keeled, keel prominent and obvious along the entire length . . . . . 57
55a Inflorescence lowest branches whorled; spikelets 2–3(–5)-flowered. . . . . .**E. stapfii**
55b Inflorescence lowest branches not whorled, may be clusters; spikelets 4–11-flowered . . . . . 56
56a Leaves very curly . . . . . **E. chloromelas**
56b Leaves straight or drooping, long thin apex may curl . . . . . .**E. planiculmis**
57a Strong perennial; leaves setaceous, very curly . . . . . **E. chloromelas**
57b Weak to moderate perennial; leaves if setaceous not strongly curling. . . . .58
58a Inflorescence effuse, much branched; florets 3 or 4; lower glume reaching $^1/_2$–$^2/_3$ up lemma above; lemmas greyish to yellowish green, matt; plant base not strongly compressed. . . . . **E. micrantha**

58b Inflorescence not much branched; florets 3–16; lower glume usually barely reaching base of lemma above, never reaching up to 1/2 of lemma above; lemmas dark green, shiny; plant base strongly compressed . . . **E. tenuifolia**
59a Lemma dorsally rounded. . . . . **E. capensis**
59b Lemma keeled (maybe only in upper part). . . . . 60
60a Lower glume ovate to narrowly ovate . . . . . **E. racemosa**
60b Lower glume lanceolate. . . . . 61
61a Spikelets linear; lemmas narrowly ovate . . . . . **E. tenuifolia**
61b Spikelets elliptic to elliptic-oblong, sometimes narrowly so; lemmas ovate to elliptic-ovate in side view . . . . . **E. patentipilosa**

## **barbinodis** Hack.

Perennial; stoloniferous and tufted. **Culms** up to 1 m long, geniculate to decumbent, often rooting at nodes; nodes barbate, without branches. **Leaf blades** 100(–150) × 2–6 mm. **Flowers**: panicle open, branches spreading, lowest branches not whorled; spikelets up to 7 × 1.2–1.5 mm; spikelets linear to oblong, rachilla persistent, sometimes becoming fragile, lemmas and paleae breaking up from base upwards; glumes 1/2–3/4 length of lemmas directly above in intact spikelet; palea margins wide apart, not touching, keels a narrow line, scaberulous; anthers 3, 0.8–1.0 mm long; Dec.–May. Red sandy loam, gritty to sandy soils and black turf.

DrGr KarSh

## ***barrelieri** Daveau

Annual, up to 0.3 m high; laxly tufted, erect to geniculate. **Leaf blades** up to 100 × 3.5 mm. **Flowers**: panicle open, primary branches usually < 40 mm long, spreading, pedicels stout; spikelets 5–15 × 1.5–1.8 mm; spikelet rachilla persistent, lemmas and/or paleae breaking up from base upwards; glumes unequal, lower glume large, distinctly keeled; lemmas 1.7–2.3 mm, obtuse; palea keels scabrid; anthers 3, 0.2–0.3 mm long; caryopsis oblong-elliptic; Dec., Jan. On sand in disturbed areas such as road verges and in gardens. Native to southern Europe. *Mediterranean love grass*.

DrGr KarSh

## **bergiana** (Kunth) Trin.

Perennial, up to 0.4 m high; long rhizomatous and tufted, mat-forming. **Culms** with basal sheaths dense, long, woolly hairy. **Leaf blades** 4–8 mm long. **Leaf blades** 1.0–1.5 × 4–8 mm long. **Flowers**: panicle sparsely branched, spikelets densely clustered on side branches, that are slightly spreading from main axis; spikelets 2.2–3.8 mm wide; spikelets completely pallid or flushed with dark purple, rachilla fragile, lemmas and/or paleae breaking up from apex downwards; lowest lemma broadly obtuse, lateral nerves conspicuous; palea scaberulous; anthers 3, 1.5 mm long; Sep., Dec., and Feb. Limestone soils, especially in pans and eroded places. *Kalkkweek*, *kwaggakweek* (A).

DrGr

## **bicolor** Nees

Perennial, usually a hydrophyte, up to 0.6 m high; densely tufted or with oblique rhizome. **Leaf blades** up to 200 × 1.5 mm; mainly basal, flat, usually glaucous. **Flowers**: panicle open, lax, branches and spikelets spreading, lowest branches solitary or 2 or 3, not whorled; spikelets up to 8 × 1–2 mm; spikelets linear to narrowly oblong, rachilla persistent or upper part fragile and florets breaking off in groups; glumes 1/2–2/3 length of lemmas above them in intact spikelet; lemmas deep purple or violet with a yellowish apex, sometimes mostly yellowish but always

bicoloured; palea margins very close for entire length, just touching to overlapping at apex, palea keels a thin line, entire, smooth or scaberulous; anthers 3.0–1.2 mm long; Oct.–May. Often in brack areas, in water or on wet soil around seasonal pans, and in dry riverbeds. *Two-coloured love grass*, *speckled vlei grass*; *fynvleigras*, *kleinblousaadgras*, *polgras* (A).

AcGr | DrGr | KarSh

### **biflora** Hack. ex Schinz

Annual, up to 0.7 m high; tufted. **Leaf blades** up to 300 × 8 mm. **Flowers**: panicle open, delicate, much branched, with branches spreading away from main axis; pedicels long and slender; spikelets 1.5–2.5 × 0.5–1.2 mm, distant; spikelets narrowly elliptic when young to broadly ovate when mature, with 1 or 2(3) florets, rachilla persistent, becoming fragile in upper part, lemmas and/or paleae breaking up from base upwards; lemmas 1.0–1.5 mm long; palea keels glabrous to scabrid; anthers 3, 0.2–0.3 mm long; Sep.–May. Moist disturbed areas, especially under trees. *Two-flowered love grass*, *shade eragrostis*; *krulblaargras* (A).

DrGr

### **caesia** Stapf

Perennial, up to 0.6 m high; densely tufted. **Leaf blades** up to 200 mm × 3 mm. **Flowers**: panicle dense and contracted, branches usually appressed to main axis, occasionally spreading; spikelets 4–7 × 1.5–2.4 mm; spikelets tardily breaking up between florets; lemmas with distinct elongated black oil glands along lateral nerves; palea keels with hairs < 0.1 mm long; anthers 3, 1.0–1.3 mm long; Nov.–Jun. Moist areas on shallow soil, cave sandstone, and seepage areas in mountainous grassland. *Pangras* (A).

DrGr | MsGr | Zastr

### **capensis** (Thunb.) Trin.

Perennial, up to 0.9 m high; tufted. **Leaf blades** 70–350 × 2–5 mm; basal sheaths glabrous to hairy but not woolly hairy at base; leaves mainly basal. **Flowers**: panicle sparsely branched or unbranched; spikelets 3.5–15.0 × 3–7 mm, appressed to main axis or branches; spikelets plump, with opposite row of florets overlapping and closely packed with rachilla not visible, with rachilla persistent, lemmas and/or paleae breaking up from base upwards, pedicels < 2 × length of spikelets; lemmas 2.5–4.0 mm long, obtuse to subobtuse, dull and granular, greenish to greenish brown, strongly flushed with purple, lateral nerves distinct; palea narrowly obovate, keels entire, membranous to subcartilaginous between keel and margins, margins nearly touching to touching in lower parts to widely separated in upper parts; anthers 3, 1–2 mm long; caryopsis elliptic; Sep.–Apr. Sandy to clayey soils in moist areas on slopes, rocky and disturbed places. *Small heart-seed grass*, *Cape love grass*; *hartjiegras*, *bosluisgras* (A). Figure 77.

VreDm | DrGr | MsGr | KarSh | Zastr

### **chloromelas** Steud.

Perennial, up to 0.8 m high; tufted. **Culms** strongly compacted and not easily separated individually, nodes glabrous. **Leaf blades** up to 300 mm long, setaceous, tapering to very long filiform apices, very curly especially when older; basal sheaths glabrous or obscurely hairy at very base. **Flowers**: panicle open and much branched, branches and pedicels spreading, long hairs in axils, lowest branches usually solitary, never whorled; spikelets 4–6 × 1.0–1.5 mm, narrowly obovate to oblong, pale greenish grey to dark green; rachilla persistent in lower part, usually becoming fragile in upper part, lemmas and/or paleae breaking up from



**Figure 77.** *Eragrostis capensis* (Poaceae).

base upwards; glumes translucent, usually smooth, > 1/3 length of lemmas directly above; palea margins nearly touching to touching along entire length of palea; anthers 3, 0.6–0.8 mm long; caryopsis ellipsoid; Dec.–May. On hillsides, rocky ridges or in disturbed areas on sandy soil, loam and often dolomite. *Narrow curly leaf*, *blue love grass*; *grootblousaadgras*, *growwe-vleigras*, *krulblaargras* (A).

| | AcGr | DrGr | MsGr | KarSh | |
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**cilianensis** (All.) Vignolo ex Janch.

Annual, up to 0.9 m high; loosely tufted, often geniculate. **Culms** with basal sheaths glabrous, if hairy, not densely woolly hairy. **Leaf blades** up to 250 × 10 mm. **Flowers**: panicle with side branches usually < 40 mm long, spreading to appressed near apex, branches and pedicels stout; spikelets 3–20 × 1.5–4.0 mm; spikelets narrowly ovate to narrowly oblong, rachilla persistent, lemmas and/or paleae breaking up from base upwards; lemmas narrowly to broadly obtuse in profile, 1.7–2.8 mm long; palea keels entire, scabrid; anthers 3, 0.2–0.3 mm long; caryopsis subglobose; Oct.–Jun. Sandy soils, often in moist places, also disturbed areas such as cultivated lands, path sides and overgrazed places. *Spreading love grass*, *stink love grass*; *stinkgras*, *rysgras*, *blousoetgras* (A).

| | AcGr | DrGr | MsGr | KarSh | |
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**curvula** (Schrad.) Nees

*E. robusta* Stent

Perennial, up to 1.2 m high; erect and densely tufted, wiry, variable, **Culms** unbranched, not easily compressed, nodes glabrous. **Leaf blades** up to 500 × 3 mm; basal sheaths densely hairy with long hairs in deep furrows between prominent, squarish ridges formed by closely packed nerves; with blades rolled or flat, appearing setaceous, with long tapering, filiform



**Figure 78.** *Eragrostis curvula* (Poaceae).

apices. **Flowers**: panicle much branched, variable, open and spreading, or contracted with branches appressed to main axis, lowest branches whorled or not whorled, pedicels smooth or with prickles distant from one another, spikelets appressed to branches; rachilla persistent or upper part often fragile, lemmas and/or paleae breaking up from base upwards; spikelets 4–10 × 1.0–1.5 mm, linear to oblong; glumes translucent, of variable length but > 1/3 length of lemmas above in intact spikelet, smooth or scaberulous at apex and along keels, lower glume lanceolate in side view, apex acute; lemmas pale green to dark green to greyish; palea margins meeting or overlapping for entire length, keels a thin, narrow line or palea apparently only folded; anthers 3, 0.6–1.0 mm long; caryopsis ellipsoid; Aug.–Jun. High rainfall areas on sandy or acid to loamy soils, often in disturbed or badly managed areas. *African love grass*, *weeping love grass*; *oulandsgras*, *berg-soetgras*, *blousaadgras* (A); *matolo* (SS); *seritsoana* (Z). Figure 78.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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## **echinochloidea** Stapf

Perennial, up to 0.9 m high; tufted, erect or geniculate. **Culms** with basal sheaths glabrous or long-hairy at extreme base only. **Leaf blades** up to 500 × 6 mm. **Flowers**: panicle sparsely branched, spikelets densely congested and secund on branches, pedicels short and stout; spikelets 2–6 × 2.2–3.5 mm; spikelet rachilla very fragile, easily disarticulating between florets from apex downwards; lower glume acuminate; palea acute, keels scaberulous, with lower portion very broad and projecting from upper portion, top of broad portion ends in deep notch or tooth; lemma keels and lateral nerves gland dotted; anthers 3, 0.5–0.7 mm long; caryopsis elliptic; Nov.–May. Shallow, moist, calcrete soils especially around pans, also disturbed sandy places such as cultivated lands. *Tick grass*; *bosluisgras* (A).

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## **gummiflua** Nees

Perennial, up to 0.9 m high; densely tufted. **Culms** with sticky glandular patches below nodes and on leaf sheaths below collar, with sand grains adhering to patches. **Leaf blades** up to 500 × 4.5 mm. **Flowers**: panicle narrowly contracted; spikelets 2.5–4.0 × 1.0–1.8 mm, purplish brown; spikelet rachilla fragile, lemmas and/or paleae breaking up from apex downwards; palea keels scaberulous, palea margins touching to overlapping at apex; anthers 3, 0.5–0.8 mm long; caryopsis oblong-elliptic; Sep.–Apr. *Gum grass*, *sticky-stem love grass*; *taaigras*, *gomgras*, *kleefhalm* (A); *likonono*, *khita-poho* (SS).

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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## **homomalla** Nees

*E. hygrophila* C.E.Hubb. & Schweick.

Annual, up to 0.5 m high; tufted, erect to decumbent. **Leaf blades** 20–100 × 1–4 mm; leaf margins without glands. **Flowers**: panicle open or contracted with branches spreading or appressed to main axis, rigid, gland dotted, spikelets irregularly and densely condensed along primary branches, pedicels stout and gland dotted spikelets 2–7 × 0.7–1.0 mm; spikelets linear to oblong, lemmas on same side of rachilla distinctly overlapping lemma above, rachilla subpersistent, lemmas and/or paleae breaking up from base upwards; lower glume usually minute, up to 1/3 length of lemma above, not keeled to lightly keeled, apex obtuse; lemmas ovate-elliptic, 1.0–1.5 mm long; palea keels smooth to scabrid; anthers 3, 0.3 mm long; caryopsis ellipsoid; Jan.–May. Moist, sandy loam or clay in brackish depressions or seasonally wet pans. *Reëngrassie* (A).

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### **lappula** Nees

Perennial, up to 1.2 m high; shortly rhizomatous and densely tufted, erect. **Leaf blades** up to 250 × 2–4 mm. **Flowers**: panicle open; spikelets (4)5–17 × 1.9–4.0 mm; rachilla persistent, lemmas and/or paleae breaking up from base upwards; lemmas with hairs 0.3–1.2 mm long on lateral nerves and sometimes on median keel; palea keels with bulbous-based hairs 0.3–1.2 mm long which extend beyond lemma; anthers 3, 1.2 mm long; Dec.–May. Moist sandy soils of annually flooded areas and riverbeds.

VreDm | AcGr | DrGr

### **lehmanniana** Nees var. **chaunantha** (Pilg.) De Winter

Perennial, up to 0.6 m high; tufted, erect. **Culm** nodes and internodes hairy. **Leaf blades** up to 250 × 1.5–2.0 mm wide. **Flowers**: panicle open, lax, branches 1 or 2 at base, not whorled; spikelets up to 4–8 × 1 mm; spikelets linear to oblong, rachilla subpersistent usually fragile in upper part; glumes $^{1}/_{2}$–$^{2}/_{3}$ length of lemmas directly above in intact spikelet; palea margins wide apart (except sometimes at base), keels a narrow thin line, scaberulous; anthers 3, 1.0 mm long; caryopsis oblong; Dec.–Apr. Kalahari sand.

AcGr | KarSh

### **lehmanniana** Nees var. **lehmanniana**

Perennial, up to 0.6 m high; tufted, erect, geniculate, sometimes rooting at lower nodes. **Culm** nodes without branches and internodes glabrous. **Leaf blades** up to 100 × 1.5–2.8 mm; basal sheaths papery, nerves round, not close together or forming prominent ridges, glabrous or slightly hairy at extreme base only; with blades gradually narrowing to apex. **Flowers**: panicle open, slightly contracted, interrupted; spikelets 4–8 × 1.0–1.5 mm, linear to oblong, dark green, grey-green to red with yellow, rachilla subpersistent, fragile in upper portion; glumes $^{1}/_{2}$–$^{2}/_{3}$ length of lemmas directly above in intact spikelet; palea margins wide apart, keels thin and narrow, glabrous or scaberulous; anthers 3, 0.7 mm long; caryopsis oblong; Nov.–Jun. Sand or sandy loam usually over limestone, in disturbed areas. *Land-grass*, *Lehmann's love grass*; *kleinsoetgras*, *knietjiesgras*, *growwevleigras* (A). Figure 79.

AcGr | DrGr | MsGr | KarSh | Zastr

### *__mexicana__ (Hornem.) Link subsp. **virescens** (J.Presl.) S.D.Koch & Sánchez Vega

*E. virescens* J.Presl

Annual, up to 0.7 m high; tufted, erect or geniculate. **Leaf blades** up to 250 × 3.5–7.0 mm; basal leaf sheaths glabrous; margins eglandular, scabrid and midvein eglandular. **Flowers**: panicle open, side branches spreading, with axils of lowest branches glabrous, pedicels long and slender; spikelets 3.0–4.5 × 1.0–1.2 mm, oblong, tending to be condensed to branches; rachilla persistent, lemmas and/or paleae breaking up from base upwards; lower glume $^{1}/_{3}$–$^{1}/_{2}$ (sometimes more) length of lemma above in intact spikelet; lemmas 1.2–1.7 mm long, apex acute to subacute; palea keels scabrid; anthers 3, 0.2–0.3 mm long; caryopsis oblong; Dec.–Mar. Sandy soils in cultivated and disturbed areas. Native to South America. *Chilean love grass*.

DrGr | MsGr | KarSh

### **micrantha** Hack.

Perennial, up to 1 m high; tufted, erect, weak. **Culms** not densely compacted at base and easily separated into individual culms. **Leaf blades** up to 600 × 3 mm; basal sheaths glabrous, rarely sparsely covered with bulbous-based hairs; with blades tapering to a filiform apex. **Flowers**:




**Figure 79.** *Eragrostis lehmanniana* var. *lehmanniana* (Poaceae). Artist: C. Letty.

panicle 100–300 mm long, effuse, much branched, branches and spikelets spreading, shortest pedicel of spikelet pair as long as or longer than spikelet; spikelets 2–4 × 1.2 mm; spikelets with rachilla persistent in lower portion, usually fragile in upper portion, lemmas and or paleae breaking up from base upwards; florets 2–4(5); glumes translucent, smooth or scaberulous around apex and along keel, $^{1}/_{2}$–$^{2}/_{3}$ length of lemmas directly above in intact spikelet; lemmas greyish to yellowish green, strongly keeled along entire length; palea margins meeting or overlapping along entire length or at least at apex, keels a thin line or apparently palea only folded; anthers 3, 0.6–1.0 mm long; caryopsis lanceolate; Jan.–May. Sands, loams and calcareous soils in disturbed areas and moist places around vleis and pans, in semishade.

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**nindensis** Ficalho & Hiern

*E. denudata* Hack. ex Schinz

Perennial, up to 0.9 m high; densely tufted, slender. **Culms** up to 2 mm wide; basal sheaths glabrous or hairy, but not densely woolly hairy. **Leaf blades** 50–300 × 2–3 mm; leaves mainly forming a basal tuft. **Flowers**: panicle sparsely branched, spikelets solitary or in clusters subsessile on main axis or side branches; spikelets 4–20 × 1.5–4.0 mm, yellowish green with a serrated outline, rachilla fragile, breaking up from apex downwards; lower glume ovate; lowest lemma 2–3 mm long, acute to acuminate, lateral nerves indistinct and not reaching margins; palea keels entire, flat, winged and scabrid; anthers 3, 1.0–1.4 mm long; caryopsis ellipsoid; Oct.–Jun. Bare exposed areas and stony sandy soils. *Wether love grass*, *perennial love grass*; *agtdaepluimgras* (A).

| | AcGr | DrGr | | KarSh | |
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**obtusa** Munro ex Ficalho & Hiern

Perennial, up to 0.4 m high; tufted, geniculate, rhizome absent. **Leaf blades** up to 150 × 4.5 mm; basal sheaths glabrous or hairy, but not woolly hairy at base. **Flowers**: panicle open and lax to somewhat contracted; spikelets 3–5 × 3–4 mm; pallid, green to dark grey, broadly ovate to oblong, rachilla extremely fragile, breaking up from apex downwards; lemmas obtuse to rounded, lateral nerves distinct; palea broadly elliptic to round, keels entire, shortly ciliolate; anthers 3, 0.8–1.3 mm long; caryopsis broadly elliptic; Jul.–Jun. Sandy or limestone soils in disturbed places such as roadsides and overgrazed areas. *Kwaggakweek*, *bewergras*, *douvatgras* (A).

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
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**pallens** Hack.

Perennial, up to 2 m high; robust, densely tufted. **Culms** erect, 2–4 mm wide. **Leaf blades** up to 1 000 × 8 mm; leaves mainly basal. **Flowers**: panicle variable, open with branches spreading or grading to contracted with branches appressed to main axis; spikelets 5–15(–25) × 1.5–2.0 mm; glossy, greenish grey to yellowish, rachilla fragile, breaking up from apex downwards, upper portion sometimes breaking off as a whole; lowest lemma 1.4–2.0 mm long, broadly obtuse, lateral nerves obscure; palea obovate, usually protruding from lemma, keels wide and flat, scabrid; anthers 3, 1.2 mm long; Dec.–May. Sandy soils, especially with a high moisture content such as around seasonal pans. *Besemgras*, *gemsbokgras*, *olifantsgras* (A).

| | AcGr | DrGr | | | |
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**patentipilosa** Hack.

*E. lamprospicula* De Winter

*E. pseudosclerantha* Chiov.

Perennial, 0.3–0.4 m high; short-lived, sprawling, sometimes stoloniferous. **Culm** geniculate, rooting at nodes, nodes often with glands below. **Leaf blades** up to 90 × 4.5 mm; eglandular,

leaves mainly forming a dense basal tuft; basal sheaths glabrous or sparsely hairy at extreme base. **Flowers**: panicle up to 75 (100) mm long, ovate to broadly ovate, open, lowest branches usually not whorled, maybe clustered; axils glabrous or hairy; pedicel ± slender, long glandular patches present, these often sticky; spikelets 4.0–10.5 × 1.5–3.0 mm, narrowly elliptic, greyish green; spikelets evenly distributed. rachilla persistent; lemmas and/or paleae breaking up from base upwards; glumes unequal, keeled, narrowly lanceolate in side view; lower glume up to 1/2 length of lemma above; upper glume 1/2–2/3 length of lemma above; lemmas 1.8–2.4 mm long, keeled, apex subacute to obtuse, lateral nerves indistinct, dark grey to green, apex always dark; palea persistent, same width between keel and margins, margins far apart, keels a narrow line, entire, scaberulous; anthers 3, 0.7–1.3 mm long; caryopsis ellipsoid; Sep.–Apr. Stony ground; in open places in short grassland or under trees, in disturbed places and roadsides. *Footpath love grass*.

VreDm

## **patentissima** Hack.

Perennial, up to 0.7 m high; rhizomes stout, or tufted and geniculate at base. **Leaf blades** up to 250 × 4 mm; basal sheaths glabrous at base. **Flowers**: panicle ovate to orbicular, branches fairly rigid, spreading, pedicels 3 × length of spikelets, spreading; spikelets 6–8(–15) × 1.5–3.0 mm; spikelets grey-green, rachilla persistent, becoming fragile in upper portion; lemmas acuminate, lateral nerves distinct; palea oblanceolate, thick-textured, apex acute to subacute, keels entire, forming a prominent ridge, shortly ciliolate; anthers 3, 0.8–1.0 mm long; caryopsis elliptic; Nov.–Mar. Sandy to loamy soils of open areas in damp places and disturbed areas. *Losgras* (A).

MsGr

## **pilosa** (L.) P.Beauv.

Annual, up to 0.7 m high; loosely tufted, erect, occasionally geniculate. **Leaf blades** 20–200 × 1–4 mm. **Flowers**: panicle delicate, open, branches and pedicels slender and usually flexible, spikelets distant, axils of branches bearded; spikelets 3–7 × 0.7–1.2 mm; spikelets linear to oblong, lemmas on same side of rachilla distinctly overlapping lemma above, lemmas becoming conspicuously shorter towards apex of spikelet, with rachilla persistent, lemmas and/or paleae breaking up from base upwards; lower glume up to 1/3 length of lemma above in intact spikelet, weakly keeled; lemmas broadly ovate, lateral veins visible, lowest lemma 1.0–1.6 mm long; palea keels glabrous to scabrid; anthers 3, 0.2–0.3 mm long; caryopsis ellipsoid, rounded on back; Oct.–May. Sandy soils in wet areas such as pan edges, vleis and riverbanks, disturbed places, often in shade. *Soft love grass*, *slender meadow grass*; *reëngrassie*, *sagte eragrostis*, *fynsaadgras* (A); *kambumbu* (T).

AcGr DrGr

## **plana** Nees

Perennial, up to 1 m high; densely tufted. **Leaf blades** up to 800 × 4 mm; basal sheaths strongly compressed, smooth and shiny. **Flowers**: panicle with branches usually spreading, spikelets appressed to branches; spikelets 6–10 × 0.5–2.0 mm; spikelets linear-oblong, with rachilla persistent, lemmas and/or paleae breaking up from base upwards; lower glume scale-like, reaching up to 1/3 length of lemma above and upper glume barely reaching or just touching base of lemma above in intact spikelet; lemmas with lateral nerves prominent and with glandular dots; palea keels entire, glabrous to scabrid, glandular dots present or absent; anthers 3, 1.6–2.0 mm long; caryopsis oblong; Nov.–May. In high rainfall regions in waterlogged, overgrazed, burnt or disturbed areas. In dry areas it favours wet soils around vleis and rivers. *Tough love grass*, *ox grass*; *taaipol-eragrostis*, *osgras* (A); *modula* (SS); *umtshiki*, *umvithi* (Z).

DrGr MsGr KarSh Zastr

## **planiculmis** Nees

*E. nebulosa* Stapf

Perennial, up to 1.2 m high; tufted, erect. **Culms** base densely and strongly compacted, not easily separated, nodes glabrous, basal sheaths glabrous, inner sheaths often yellow. **Leaf blades** setaceous, up to 900 × 1.5 mm, long-tapering at apex, straight or drooping; leaves mainly in a dense basal tuft. **Flowers**: panicle 100–700 mm long, open, much branched, lowest branches whorled or not whorled, pedicels long; spikelets up to 8 × 0.5–2.0 mm, linear, 5–11-flowered; rachilla persistent in lower portion, fragile in upper part, lemmas and paleae breaking up from base upwards; glumes translucent, smooth or scaberulous around apex and along keels, lower glume up to $^{3}/_{4}$ length of lemma above in intact spikelet; lemmas dark green to greenish grey, not strongly keeled, keel obscure in lower part; palea margins nearly touching to touching along entire length, overlapping at apex, keel a narrow line; anthers 3, 0.6–1.2 mm long; Nov.–Apr. Clay or dolerite soils in depressions, vlei margins and disturbed areas. *Broom love grass*; *besemgras*, *besem-eragrostis* (A); *masapo-lokane* (SS).

AcGr | DrGr | MsGr | Zastr

## **porosa** Nees

Annual, up to 0.8 m high; loosely tufted, usually erect. **Leaf blades** 40–150 × 2–5 mm; leaf sheaths densely pilose with bulbous-based hairs. **Flowers**: panicle with lowest branches whorled; with rachilla persistent in lower part, fragile above, lemmas and/or paleae breaking up from base upwards; spikelets 3–5 × 1.0–1.5 mm; lowest lemma obovate-elliptic, truncate to broadly rounded, 1.0–1.5 mm long; palea keels minutely scaberulous, palea margins wide apart for entire length; anthers 3, 0.6–0.9 mm long; caryopsis ellipsoid; Jan.–Jul. Stony or sandy soils often on limestone around rivers and pans, also in disturbed areas. *Besembiesie*, *blousoetgras* (A).

KarSh

## **procumbens** Nees

Annual, up to 0.5 m high; tufted, geniculate or procumbent. **Leaf blades** up to 200 × 3.5 mm; basal sheath glabrous or hairy, but not with woolly hairs; leaf margins and/or midrib with glands. **Flowers**: panicle with side branches usually appressed to main axis, though lower branches sometimes spreading, with many spikelets densely congested and appressed to branches; spikelets ± 7 × (1.7–)2.0–2.5 mm; spikelets oblong to elliptic, rachilla persistent, sometimes becoming fragile in upper part, lemmas and/or paleae breaking up from base upwards; glumes shorter than lemmas directly above in intact spikelet; lemmas acute (1.7–)2.0–2.5 mm long, with a minute mucro present or absent; palea keels entire, scabrid; anthers 3, 0.2–0.3 mm long; caryopsis oblong; Oct.–Jun. Moist gravel or sandy soils in depressions, along watercourses and disturbed areas.

DrGr | KarSh

## × **pseud-obtusa** De Winter

Perennial, up to 0.6 m high; tufted, erect. **Leaf blades** up to 150 × 2–3 mm wide. **Flowers**: panicle lax to dense, sparsely branched, spikelets congested; spikelets 3–5 × 2.5–3.5 mm; basal sheaths glabrous, or if hairy not with long-woolly hairs for a distance up along sheaths; spikelets with rachilla fragile, lemmas and/or paleae breaking up from apex downwards; glumes boat-shaped, acute to subacute; palea obtuse to rounded, keels with lower portion very wide and protruding from rest of keel, top of projecting portion rounded or shallowly notched, ciliolate; lemma keels and lateral nerves eglandular; anthers 3, 0.7–0.8 mm long; caryopsis elliptic; Nov.–May. Sandy loam, shallow sandy soils, sand over limestone, in moist areas such as ditches, along streambeds and dams, also in disturbed places.

AcGr | DrGr | KarSh

**racemosa** (Thunb.) Steud.

*E. chalcantha* Trin.

Perennial, up to 0.8 m high; densely tufted, leaves mainly basal. **Leaf blades** 60–100 × 2–5 mm; basal sheaths glabrous or thinly silky hairy. **Flowers**: panicle open or contracted, sparsely branched, secondary branches present or absent, primary branches stiff, with 2–4 spikelets on short, stout pedicels; spikelets 3–10 × 1.5–4.5 mm, dark greenish grey, olive or brownish grey, outline usually smooth; rachilla persistent, lemmas and/or paleae breaking up from base upwards; glumes cartilaginous, ovate, boat-shaped, lower glume narrowly ovate in side view, apex obtuse; lemma with lateral nerves indistinct; palea keels a narrow ridge, entire, scaberulous; anthers 3, 1.0–1.6 mm long; caryopsis almost square; Aug.–May. On shallow sandy, stony or clayey soils. *Narrow heart love grass*; *smalhartjiegras* (A).

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**remotiflora** De Winter

Weak perennial, or annual, up to 0.6 m high; tufted, erect or with some culms geniculate. **Leaf blades** up to 250 × 2.5 mm. **Flowers**: panicle open, branches spreading, pedicels slender; spikelets up to 5 × 1 mm; spikelets oblong to linear, lemmas on same side of rachilla either not or just overlapping one above, rachilla persistent, lemmas and/or paleae breaking up from base upwards; lower glume < 1/3 length of lemma above in intact spikelet, weakly keeled; lemmas 1.0–1.8 mm long, broadly ovate-oblong in side view, apex broadly obtuse to rounded; palea keels scabrid to glabrous; anthers 3, 0.2–0.3 mm long; caryopsis oblong, shallowly grooved on back; Jan.–Apr. Wet and damp areas in pans, vleis and river floodplains, also disturbed areas in semi-arid regions.

| | | DrGr | MsGr | KarSh | |
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**sarmentosa** (Thunb.) Trin.

Perennial, up to 0.4 m high; mat-forming, shortly rhizomatous and tufted. **Culms** occasionally geniculate, decumbent and rooting at nodes. **Leaf blades** up to 100 × 4.5 mm, leaves mainly cauline. **Flowers**: panicle narrow and contracted, branches appressed to main axis, pedicels thick, spikelet groups often distant on main axis, spikelets appressed to branches; spikelets 3–7 × 1.5–1.7 mm; spikelets greyish green to purple, rachilla persistent, upper part often becoming fragile, lemmas and/or paleae breaking up from base upwards; upper glume acute; lowest lemma 1.5 mm long, lateral veins distant, usually not reaching margins, never excurrent into a mucro; palea keels scaberulous; anthers 3, 0.2–0.4 mm; caryopsis ellipsoid to ovoid; Jul.–May. Moist, sandy areas such as edges of riverine vegetation, along floodplains and dams, also disturbed overgrazed areas.

| | | DrGr | | | |
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**sclerantha** Nees subsp. **sclerantha**

Perennial, up to 0.7 m high; densely tufted. **Leaf blades** up to 200 × 6.5 mm; basal sheaths densely woolly hairy, sometimes this only visible on inner sheaths. **Flowers**: panicle with branches spreading; spikelets, many, either appressed to branches or spreading, 2–5 × 1.5–3.0 mm; spikelets dark olive-green, rachilla persistent, lemmas and/or paleae breaking up from base upwards; lemmas acute, without glands, lateral nerves conspicuous; palea keels entire, scabrid; anthers 3, 0.7–1.0 mm long; caryopsis ellipsoid; Jan.–May. Sandy soils and sandy loams between rocks (often quartzite). *Kanariegras* (A).

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**stapfii** De Winter

Perennial, up to 0.9 m high; densely tufted, erect. **Leaf blades** up to 200 × 2 mm; basal sheaths glabrous at base; leaves forming a dense basal tuft, usually tightly rolled and curling. **Flowers**: panicle open, delicate, lowest branches whorled; spikelets up to 4 × 0.5–1.0 mm, with 2 or 3(–5) florets; rachilla subpersistent, upper part fragile, lemmas and/or paleae breaking up from base upwards; lower glume up to $^3/_4$ length of lemma directly above and upper glume a third to four-fifths as long as lemma above in intact spikelet; lemmas pale yellowish grey-green, not strongly keeled, more rounded at back with keel obscure at base; palea margins almost touching along entire length, overlapping at apex, keels a obscure line, smooth or scaberulous; anthers 3, 0.8 mm long; Nov.–Apr. Shallow sand or coarse sandy soils, sometimes in wet disturbed areas.

DrGr | MsGr

**superba** Peyr.

Perennial, up to 1 m high; densely tufted, often geniculate. **Leaf blades** up to 400 × 3–12 mm. **Flowers**: panicle contracted or open; spikelets 6–16 × 3–10 mm, strongly flattened with sides appearing jagged, disarticulating below glumes at maturity and falling as an entire unit; lemmas narrowly ovate in side view, keel winged and scaberulous; palea keels broadly winged, entire, minutely ciliolate, hardly projecting laterally from lemma; anthers 3, 1.5–2.5 mm long; Aug.–May. Sandy and stony soils in disturbed places or drainage areas. *Flat-seed love grass*, *sawtooth love grass*; *knoppiesgras*, *bosluisgras*, *weeluissaadgras* (A); *kampinupinu* (T); *umadolwana* (Z).

VreDm | AcGr | DrGr | KarSh

***tef** (Zucc.) Trotter

*E. abyssinica* (Jacq.) Link

Annual, up to 0.6 m high; loosely tufted, erect. **Leaf blades** up to 300 × 4 mm. **Flowers**: panicle open or contracted, branches usually > 40 mm long, flexible and slender, pedicels slender; spikelets 5.5–9.0 × 1.5–2.0 mm; spikelets with rachilla persistent and lemmas and paleae remaining intact at maturity; glumes unequal, upper glume $^1/_2$–$^2/_3$ length of lemma above in intact spikelet; lemmas 2.0–2.7 mm long; palea keels scaberulous; anthers 3, 0.3–0.6 mm long; caryopsis oblong; Nov.–May (Jul., Sep.). Escape from cultivation, weedy places, along roadsides. Native to northern Africa and Ethiopia. *Teff grass*; *tefgras* (A).

DrGr | MsGr

**tenuifolia** (A.Rich.) Steud.

Weak perennial, or annual, up to 0.4 m high; loosely tufted, plant base strongly compressed. **Leaf blades** 40–300 × 1–3 mm. **Flowers**: panicle open, not much branched, pedicels slender; spikelets 4–16 × 1–3 mm, linear, outline coarsely serrate; florets 3–16; lemmas on same side of rachilla distinctly overlapping lemma above, rachilla persistent, lemmas and/or paleae breaking up from base upwards; upper glume barely reaching to just covering base of lemma directly above, lowest lemma 1.2–2.5 mm long, ± narrowly semi-ovate in side view, apex acute to narrowly obtuse; palea keels scaberulous; anthers 3, 0.4–0.5 mm long; caryopsis oblong, strongly laterally flattened; Jan. Sandy soils, gravel, clay and loam, usually areas of high moisture, also in disturbed areas.

DrGr

**trichophora** Coss. & Durieu

*E. atherstonei* Stapf

*E. henrardii* Jansen

Perennial, up to 0.6 m high; slender, wiry, stoloniferous and tufted, erect to geniculate, rooting at nodes. **Culms** usually branched above; basal sheaths glabrous or hairy, papery and nerves

rounded and well apart at base; round glandular dots, usually flushed with purple, often present below collar of leaf sheaths or around culm nodes. **Leaf blades** up to 150 × 3 mm wide. **Flowers**: panicle open, branches purplish yellow with large prickles, spreading, whorled at base with long hairs in axils, pedicels without glands; spikelets 3.5–5.0 × 1.0–1.2 mm, oblong to narrowly oblong, with 3–5 florets; rachilla subpersistent, fragile in upper part, lemmas and/or paleae breaking up from base upwards; glumes $^{4}/_{5}$ as long as to longer than lemmas directly above them in intact spikelet, lower glume wide and covering most of lemma above; lemmas pale greenish grey to dark grey, apex usually membranous and whitish; palea margins apart for most of its length, nearly touching to touching at apex, keels a narrow line, smooth to scaberulous; anthers 3, 0.8 mm long; Nov.–May. Sand and loam, often on shallow soils and dolomite in moist places, road verges and other disturbed or overgrazed areas. *Atherstone's grass*, *love grass*; *blousaadgras*, *soetgras* (A).

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**truncata** Hack.

Perennial, up to 0.4 m high; mat-forming, rhizome short and branched, or tufted, forming raised cushions and characteristic rings. **Leaf blades** (lower) 10–40 × 1.0–1.5 mm, upper blades up to 100 mm long; basal sheaths with dense, long, woolly hairs. **Flowers**: panicle contracted, up to 60 mm long; spikelets 5–7 × 2.5–3.0 mm, completely pallid to flushed with dark purple, spikelet rachilla very fragile, breaking up from apex downwards, florets being shed with rachilla internode; lowest lemma truncate; palea keels scaberulous, palea margins wide apart at base; anthers 3, 0.8–1.2 mm long; Oct.–May. Mainly in limestone soils, especially in and around pans. *Kwaggakweek*, *gemsbokgras*, *bloupolgras* (A).

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**viscosa** (Retz.) Trin.

Annual, up to 0.5 m high; tufted, erect and geniculate. **Leaf blades** 40–100 × 2–5 mm. **Flowers**: panicle open, with branches spreading and spikelets distant, sticky glands (noticeable due to particles adhering to them) present; spikelets 1.5–4.5 × 1.0–1.5 mm; spikelets with rachilla fragile, breaking up from apex downwards; lemma keels glabrous, palea keels with bulbous-based hairs 0.4–0.5 mm long and exserted from lemma; anthers 3, 0.1–0.3 mm long; Feb.–Aug. Disturbed and open places with sandy or shallow soils. *Sticky love grass*; *klewerige-windhalm* (A); *musizyamaula* (T).

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## **Eriochloa** Kunth (sthn Afr.: 6 spp.)

**fatmensis** (Hochst. & Steud.) Clayton

*E. nubica* (Steud.) Hack. & Stapf ex Thell.

Annual, up to 1.2 m high. **Culms** erect or geniculate. **Leaf blades** 30–300 × 2–10 mm. **Flowers**: panicle open, branches several to many, ascending; spikelets (2.5–)3.0–5.0 mm long; lower glume apparently absent; upper glume with a short awn; lower floret sterile; palea absent; Jan.–Apr. Wet places, usually on black clay, but also weedy by ephemeral water on other soils.

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## **Eustachys** Desv. (sthn Afr.: 1 sp.)

### **paspaloides** (Vahl) Lanza & Mattei

Perennial, up to 0.95 m high; rhizomatous and tufted. **Culms** erect or geniculately ascending. **Leaf blades** 20–180 × 2–5 mm; leaf sheaths strongly compressed, blades folded, with blunt apices. **Flowers**: inflorescence digitate with 4–7 racemes, (3–)4–10(–15), 50–150 mm long; spikelets 1.5–2.5 mm long, golden-brown; lower glume ovate, boat-shaped; upper glume oblong-elliptic with awn 0.5–1.5 mm long; lemmas 1.5–2.4 mm long, with or without a mucro up to 1 mm long; Oct.–May. Sandy and stony soils, occasionally on clay. *Fan grass*, *red Rhodes grass*; *bruinhoenderspoor*, *kruisgras* (A).

AcGr | DrGr | KarSh

## **Festuca** L. (sthn Afr.: 9 spp.)

### Key to species:

[after Fish & Moeaha in Fish *et al*.: 348 (2015)]

1a Inflorescence very open, almost candelabrum-shaped (subcorymbose), lowest branches ± as long as to longer than central axis; branches long, rigid, straight, naked as spikelets congested terminally . . . . . **F. longipes**

1b Inflorescence open or contracted, lowest branches < 1/2 length of central axis; branches flexuous or rigid, either bare in lower 1/3 or with spikelets from ± the base upwards. . . . . 2

2a Basal sheaths splitting into coarse, broad fibres. . . . . **F. costata**

2b Basal sheaths splitting into fine, slender fibres or not splitting at all . . . . . 3

3a Leaf auricles well developed, usually as a large undulating flange with an ear-like extension on either side of sheath (but may be absent as it breaks off easily) . . . . . **F. arundinacea**

3b Leaf auricles not well developed or absent, leaf sheath and/or ligule may extend beyond leaf base . . . . . 4

4a Ligule < 1 mm long; leaf blade up to 1.5 mm wide, involute, filiform, folded; awn 1–4 mm long; basal sheaths glabrous . . . . . **F. caprina**

4b Ligule > 1.5 mm long; leaf blade 1–10 mm wide, rolled or expanded; awn up to 1.2 mm long; basal sheaths white velvet-hairy . . . . . **F. scabra**

### ***arundinacea** Schreb.

*F. elatior* L.

Perennial, up to 2 m high; rhizomatous and tufted. **Leaf blades** 100–600 × 3–12 mm; leaf sheaths not breaking into fibres, sheaths glabrous; leaf auricles well developed, up to 5 mm wide, usually as a large undulating flange with an ear-like extension on either side of sheath (but may be absent as it breaks off easily); ligules up to 2 mm long. **Flowers**: panicle narrowly ovate to ovate, 100–500 mm long, nodding, lowest branches < 1/2 length of central axis; spikelets 10–18 mm long; spikelets 3–10-flowered; lemmas acute or awned, awn up to 4 mm long; Sep.– Apr. Disturbed places near streams, reservoirs and on roadsides. Native to Europe and temperate Asia. *Meadow fescue*, *English blue grass*; *lang-swenkgras* (A); *serakoe* (SS).

VreDm | MsGr

### **caprina** Nees

Perennial, up to 1 m high; rhizomatous and densely tufted. **Leaf blades** 40–250 mm long, filiform, up to 1.5 mm wide, involute, folded; old leaf sheaths persisting as fine fibres, glabrous;

ligule < 1 mm long; leaves usually not > ½ culm length. **Flowers**: panicle open, lax, 50–200 mm long; spikelets 7–15 mm long; spikelets 4–6(–9)-flowered; lemmas awned, awn 1–4 mm long; Sep.–Mar. Moist or wet areas near vleis in high altitude mountain grassland. *Bokbaardgras* (A).

MsGr

### **costata** Nees

Perennial, up to 1.7 m high; tough, erect, rhizome short and stout, or long and deeply burrowed. **Leaf blades** 700–1 000 × 3.5–6.0 mm; leaf sheaths persistent, breaking into coarse fibres that form a protective layer around young shoots; ligules 3–12 mm long. **Flowers**: panicle open, 120–240 mm long, lowest branches < ½ length of central axis, branches flexuous or rigid, either bare in lower ⅓ or with spikelets from ± the base upwards; spikelets 10–20 mm long; spikelets 3–7-flowered; lemmas acute or minutely awned; Sep.–Jan. Moist places in high altitude mountain grassland, encouraged by frequent burning. *Tussock fescue*; *polswenkgras* (A).

MsGr

### **longipes** Stapf

Perennial, up to 0.75 m high; rhizome long and slender. **Leaf blades** 100–300 × 2–6 mm; ligules 2–3 mm long. **Flowers**: panicle open, almost candelabrum-shaped, 150–330 mm long, branches long, rigid, straight, flattened on inner side, borne in remote pairs, unbranched and bare for most of their length, bearing 1–6 spikelets at apices, lower branches almost as long as central axis; spikelets 8–12 mm long, closely 3–6-flowered; glumes and lemmas not awned; Nov.–Apr. Moderate to steep grassy slopes and sandstone ridges, often on edges of forests in partial shade, alt. > 1 500 m.

DrGr MsGr

### **scabra** Vahl

Perennial, up to 1 m high; dioecious; rhizome long or oblique; culm base bulbous at maturity. **Leaf blades** 50–300 × 1–10 mm, inrolled or expanded; leaf sheaths white velvet-hairy at base, old sheaths splitting into fine fibres; ligules 2–7 mm long. **Flowers**: panicle narrow, contracted, sometimes spike-like or interrupted, 50–300 × 10–30 mm; spikelets 7–15 mm long; spikelets 3–7-flowered; lemmas not awned or awn up to 1.2 mm long; Sep.–Feb. Sandy soils in undisturbed, high altitude mountain grassland and extending into valley bush clumps, often in moist places and partial shade, stimulated by fire. *Munnik fescue*; *Munnik swenkgras* (A).

DrGr MsGr Zastr

## **Fingerhuthia** Nees (sthn Afr.: 2 spp.)

### Key to species:

[after Nembudani in Fish *et al*.: 353 (2015)]

Lemma awned from a rounded apex; glume keel densely hairy, hairs 1 mm long, long hairs up most of glume; basal sheaths dull; rhizomes slender; growing in well-drained often calcareous soils . . . . . **F. africana**
Lemma awned from a acuminate apex; glume keel sparsely hairy, hairs 0.5 mm long, longest hairs usually near base only; basal sheaths glossy; rhizomes very well developed; growing in waterlogged and poorly drained soils . . . .**F. sesleriiformis**

**africana** Lehm.

Perennial, sometimes annual, up to 0.9 m high; rhizome slender. **Leaf blades** 25–400 × 2–4 mm; basal sheaths dull. **Flowers**: panicle spike-like, 15–50 mm long; spikelets 4.0–5.5 mm long; glumes with stiff, dense hairs on keels, hairs 1 mm long; lemma apex rounded; Sep.–May. Well-drained sandy or gravelly soils, often calcareous soils. *Thimble grass*; *borseltjiegras*, *rooiklossiegras*, *kalkvingerhoedgras* (A).

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**sesleriiformis** Nees

Perennial, up to 1.1 m high; rhizome robust, well developed; tufted, forming large tussocks. **Leaf blades** 120–240 × 3–5 mm; basal sheaths glossy. **Flowers**: panicle spike-like, up to 80 mm long; spikelets 5–6 mm long; glumes sparsely hairy on keels, hairs 0.5 mm long, longest hairs usually near base only; lemma apex acuminate; Nov.–Apr. Black clay in vleis or clayey soils near rivers. *Thimble grass*; *vingerhoedgras* (A).

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## **Harpochloa** Kunth (sthn Afr.: 1 sp.)

**falx** (L.f.) Kuntze

Perennial, up to 0.9 m high; distinctly rhizomatous, densely tufted. **Leaf blades** 100–250 × 2–4(–6) mm, often inrolled. **Flowers**: spikes solitary, 1-sided, like a toothbrush, up to 80 × 10 mm, sickle-shaped at maturity; spikelets 6–9 mm long; spikelets in 2 rows, 3- or 4-flowered; Sep.–Apr. Stony well-drained to compacted soils on moist slopes. *Caterpillar grass*.

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## **Helictotrichon** Schult. (sthn Afr.: 12 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 364 (2015)]

1a Spikelets 12–15 mm long (excluding awns); lemma lobes 6–8 mm long (including awns) above central awn insertion; panicle usually very dense and contracted; spikelets yellowish . . . . . **H. dodii**

1b Spikelets 8–12 mm long (excluding awns); lemma lobes 3–5 mm long (including awns) from above central awn insertion; panicle open or slightly contracted; spikelets green, often variegated with purple . . . . . 2

2a Leaf blade 200–400 mm long; rachilla hairs 3–4 mm long; spikelets loosely flowered, rachilla exposed between florets . . . . . **H. longifolium**

2b Leaf blade 60–150 mm long; rachilla hairs up to 2 mm long; spikelets closely flowered, rachilla not showing . . . . . **H. turgidulum**

**dodii** (Stapf) Schweick.

Perennial, up to 1.25 m high; tufted. **Leaf blades** 300–500 × 3–5 mm, flat. **Flowers**: panicle narrowly contracted, dense; spikelets 12–15 mm long, yellowish; glumes lanceolate, upper glume $^{2}/_{3}$ spikelet length; rachilla internodes 2 mm long, with hairs 3.0–3.5 mm long; lemmas

glabrous, linear in outline, lobes delicately awned, 6–8 mm long; sporadically, but mainly Oct.–Dec. Coastal sand flats, disturbed places and vlei margins.

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### **longifolium** (Nees) Schweick.

Perennial, up to 0.9 m high; tufted. **Leaf blades** 200–400 mm long, up to 1.5 mm wide, setaceous. **Flowers**: panicle usually open, up to 200 mm long; spikelets 8–10(–12) mm long, loosely flowered; upper glume ± $^{3}/_{4}$ spikelet length; rachilla internodes ± 2 mm long, exposed between florets, with hairs 3–4 mm long; lemmas smooth or finely papillate, lobes above insertion of awn 3–5 mm long; Dec.–Apr. On moist and rocky mountainsides. *Brandgras* (A).

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### **turgidulum** (Stapf) Schweick.

Perennial, up to 1 m high; tufted. **Leaf blades** 60–150 × 1.5–6.0 mm, flat. **Flowers**: panicle open or contracted, often interrupted, 70–300 mm long; spikelets 10–12 mm long, closely flowered; glumes narrowly ovate, upper glume $^{2}/_{3}$ spikelet length; rachilla internodes 2 mm long, not showing, with hairs up to 2 mm long; lemmas glabrous, smooth or papillate, very often variegated with purple, lobes above insertion of awn, 3–5 mm long; Oct.–Apr. Usually in wet places on mountainsides and in vleis, occasionally at roadsides. *Small oat grass*; *hawergras*, *roggras* (A).

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## **Hemarthria** R.Br. (sthn Afr.: 1 sp.)

### **altissima** (Poir.) Stapf & C.E.Hubb.

Perennial, up to 1.5 m high; rust-red, rhizomatous, stoloniferous. **Leaf blades** up to 50–150 × 6 mm. **Flowers**: in a complex, leafy, false panicle, racemes very narrowly cylindrical; spikelets sunken; sessile or pedicellate, 5–7 mm long; sessile spikelet glabrous; lower glume without oil streaks along keel; Oct.–Jun. Wet places. *Red vlei grass*, *Batavian quick grass*, *red swamp grass*; *rooivleigras*, *perdegras* (A); *marotlo-a-mafubelu* (SS).

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## **Heteropogon** Pers. (sthn Afr.: 2 sp.)

### **contortus** (L.) Roem. & Schult.

Perennial, up to 1 m high; rhizomatous. **Leaf blades** 30–300 × 3–8 mm; leaves usually folded, apices rounded and often hooded. **Flowers**: in a single spike with velvety awns from upper half; sessile spikelets 5.5–7.0 mm long, pedicellate spikelets 8–13 mm long and eglandular; Oct.–Jun. Hillsides, rocky places, well-drained soils. *Tanglehead spear grass*, *stick grass*; *malgras*, *swartangelgras*, *pylgras*, *assegaaigras* (A); *selokana* (SS); *makurwane* (T); *isitupe* (Z).

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## **Hordeum** L. (sthn Afr.: 4 spp.)

### Key to species:

[after Fish & Moeaha in Fish *et al*.: 377 (2015)]

Inflorescence < 6 mm wide (including awns); central spikelet lemma awn 2.5–8.0 mm long, lemma sparsely to densely pubescent . . . . . **H. stenostachys**.
Inflorescence > 6 mm wide (including awns); central spikelet lemma awn > 10 mm long; lemmas glabrous . . . . . **H. capense**

### **capense** Thunb.

Perennial, up to 0.6 m high; tufted. **Leaf blades** 60–170(–240) × 3–6 mm, rigid, lacking auricles; leaf sheaths fibrous with age. **Flowers**: spike with clusters of spikelets on reduces axes, 8–17 mm wide (including awns), rachis readily disarticulating at maturity; lemmas glabrous, awn up to 22 mm long; Oct.–Apr. Moist areas such as streamsides, riverbanks and around dams, occasionally in disturbed areas. *Cape wild barley*; *Kaapse-wildegars*, *vulletjie-stertgras* (A); *litse-ba-ntjie* (SS).

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### ***stenostachys** Godr.

Perennial, (0.28–)0.35–1.20(–1.50) m high; tufted. **Leaf blades** 25–90(–102) × 1.5–5.0(–7.0) mm; leaf sheaths lacking auricles. **Flowers**: spike with clusters of spikelets on reduced rachilla, 3–5 mm wide (including awns), often partly enclosed in uppermost leaf sheath; rachis readily disarticulating at maturity; lemmas sparsely to densely pubescent, awn 2.5–8.0 mm long; Oct.–Mar. Moist or seasonally moist areas, vleis and also in disturbed places. Native to South America.

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## **Hyparrhenia** E.Fourn. (sthn Afr.: 20 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 382 (2015)]

1a Raceme bases terete, markedly unequal, upper at least 3 × longer than the lower, usually not deflexed (if deflexed see *H. quarrei*) . . . . . 2
1b Raceme bases flattened, subequal, often deflexed at maturity, usually < 2 mm long. . . . . 6
2a Spikelet hairs reddish brown or yellowish . . . . . **H. dichroa**
2b Spikelets glabrous or hairs white . . . . . 3
3a Upper raceme with 0 or 1 pair of homogamous spikelets at base . . . . . 4
3b Upper raceme with 2 pairs of homogamous spikelets at base . . . . . 5
4a Racemes never deflexed; awns 8–14 per raceme pair. . . . . **H. hirta**
4b Racemes, or some of them, deflexed; awns 6–10 per raceme pair . . . . . **H. quarrei**
5a Awns 4–7 per raceme pair, 25–40 mm long, with hairs 0.1–0.6 mm long; racemes 15–25 mm long; callus 1.0–1.8 mm long; pedicellate spikelets not awned or with an awn-point up to 2 mm long . . . . . **H. anamesa**
5b Awns 2–4 per raceme pair, 30–55 mm long, with hairs 0.7–1.2 mm long; racemes 10–12 mm long; callus 1.8–3.0 mm long; pedicellate spikelets with an awn 1–5 mm long . . . . . **H. filipendula** var. **pilosa**

6a Awns 10–15 per raceme pair; awns short. . . . . .**H. dregeana**
6b Awns < 9 per raceme pair; awns short or long . . . . . **H. tamba**

## **anamesa** Clayton

Perennial, up to 1.2 m high; rhizomatous and densely tufted. **Leaf blades** up to 400 × 4 mm (but often shorter). **Flowers**: in a complex, false panicle; racemes 15–25 mm long, with 2 homogamous pairs at base of upper raceme, raceme pairs with 4–7 awns; awns 25–40 mm long, with hairs up to 0.6 mm long; raceme bases terete, unequal; sessile spikelets 5.0–6.5 mm long, white-villous, callus 1.0–1.8 mm long, pedicellate spikelets not awned or with an awn-point up to 2 mm long; Oct.–May. Dry soils, open places. *Sesigo* (T).




## **dichroa** (Steud.) Stapf

Perennial, up to 3 m high; rhizomatous and tufted. **Culms** stout. **Leaf blades** up to 600 × 8 mm. **Flowers**: in a complex, copiously branched, false panicle; spatheoles narrowly lanceolate, 20–40 mm long; raceme pairs with 6–10 awns; awns (10–)20–30 mm long, racemes often clasped at base by spatheoles at maturity, raceme bases terete, unequal; sessile spikelets 4–5 mm long, with hairs reddish brown or yellowish, scanty, callus 0.4–0.8 mm long; Mar.–Jun. Moist places, weedy places, roadsides.




## **dregeana** (Nees) Stapf ex Stent

*H. aucta* (Stapf) Stapf ex Stent
*H. pilosissima* (Hack.) J.G.Anderson

Perennial, up to 2 m high; robust, rhizomatous and densely tufted. **Culms** 4–9 mm in diameter. **Leaf blades** up to 600 × 3–8 mm; basal sheaths hairy. **Flowers**: in a complex, false panicle; raceme pairs with 10–15 awns; awns 8–20 mm long; raceme bases subequal, flattened, short-appendaged; sessile spikelets 4–5 mm long, densely long-hairy to shortly hairy, rarely glabrous, callus cuneate, 1 mm long; pedicellate spikelets villous to hispidulous, rarely glabrous; spatheoles 20–25 mm long; peduncles 15–50 mm long; Nov.–May. Stony hillsides, streamsides, dry soils around vleis. *Drege's deck grass*, *hairy blue thatching grass*, *tambuki grass*; *harige bloutamboekiegras* (A).




## **filipendula** (Hochst.) Stapf var. **pilosa** (Hochst.) Stapf

Perennial, up to 2 m high; rhizomatous and tufted. **Culms** erect. **Leaf blades** up to 300 × 4 mm. **Flowers**: in a complex, false panicle; racemes 10–12 mm long; raceme pairs with (2–)4 awns; awns 30–55 mm long, with hairs up to 1.2 mm long; raceme bases terete, unequal, with 2 pairs of homogamous spikelets at base of upper raceme; sessile spikelets 5.5–7.0 mm long, white-villous, callus 1.8–3.0 mm long; pedicellate spikelets with an awn 1–5 mm long; Dec.–Apr. Open veld and disturbed places in higher rainfall areas. *Fine thatching grass*; *fyntamboekiegras* (A).




## **hirta** (L.) Stapf

Perennial, up to 0.8 m high; rhizomatous and tufted. **Culms** wiry, slender. **Leaf blades** 20–150 × 1–2(–4) mm. **Flowers**: in a complex, false panicle, panicle scanty, of 2–10 raceme pairs,

pairs with 0 or 1 homogamous pairs at base of upper racemes and 8–14 awns; awns 10–35 mm long, with hairs up to 0.3 mm long; raceme bases terete, unequal; racemes never deflexed, 20–40 mm long; sessile spikelets 4.0–6.5 mm long, yellowish green to violet, white-villous, callus acute; Sep.–Jun. Stony soils. *Common thatching grass*; *boesmangras*, *dektamboekiegras* (A); *mohlomo* (SS); *intunga* (Z).

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### **quarrei** Robyns

Perennial, up to 2 m high; shortly rhizomatous and tufted. **Culms** erect. **Leaf blades** up to 400 × 5 mm. **Flowers**: in a complex, false panicle; raceme pairs with 6–10 awns; awns 18–36 mm long; raceme bases unequal, terete, with 0 or 1 homogamous pairs at base of upper racemes; racemes deflexed at maturity; sessile spikelets 4.5–5.5 mm long, white pubescent to villous, callus slender, 0.7–1.2 mm long; Jan.–Jun. Forest margins. *Thatching grass*.

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### **tamba** (Steud.) Stapf

*H. glauca* Stent

Perennial, up to 3 m high; stout, robust, rhizomatous, densely tufted. **Roots** sometimes with small stilt roots. **Culms** up to 4 mm thick. **Leaf blades** up to 800 × 3–7 mm; basal sheaths hairy. **Flowers**: in a complex, false panicle; raceme pairs with 5–8 awns; awns 16–25 mm long; raceme bases subequal, flattened, short-appendaged; sessile spikelets 5 mm long, becoming dark purplish grey, with long white hairs, callus cuneate; pedicellate spikelets villous; spatheoles 26–40 mm long; peduncles 20–30 mm long; Dec.–Jun. Streamsides and roadsides. *Blue thatching grass*; *bloutamboekiegras*, *berggras* (A). Figure 80.

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## **Imperata** Cirillo (sthn Afr.: 1 sp.)

### **cylindrica** (L.) Raeusch.

*I. cylindrica* (L.) Raeusch. var. *africana* (Andersson) C.E.Hubb.
*I. cylindrica* (L.) Raeusch. var. *major* (Nees) C.E.Hubb.

Perennial, up to 1.2 m high; strongly rhizomatous, in dense stands. **Culms** erect. **Leaf blades** up to 1 500 × 2–12 mm, broad in middle, narrowed at apex and base, reddish in winter. **Flowers**: panicle compact, cylindrical, silky, white; spikelets all alike, 3–6 mm long; Aug.–Jun. Riverbanks, vleis and seasonally wet places. *Cotton-wool grass*, *silver spike*; *silweraargras*, *sygras* (A); *mohlorumo* (SS); *umthente* (Z). Figure 11C, p. 8.

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## **Koeleria** Pers. (sthn Afr.: 1 sp.)

### **capensis** (Steud.) Nees

Perennial, up to 0.8 m high; densely tufted. **Leaf blades** 40–200 × 1–4 mm. **Flowers**: panicle compact, sometimes interrupted; spikelets 3.5–4.0 mm long, 2–4-flowered; paleae projecting out of florets and thus conspicuous in mature spikelets; lemmas entire; Oct.–Jan. Common in



**Figure 80.** *Hyparrhenia tamba* (Poaceae). Artist: C. Smith.




**Figure 81.** *Koeleria capensis* (Poaceae). Artist: C. Letty.

montane areas, often among rocks and steep slopes, dry to wet areas. *Crested koeleria*, *prairie June grass*; *polgras*, *strandgras* (A); *boshoane* (SS). Figure 81.

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## **Leersia** Sw. (sthn Afr.: 4 spp.)

### **hexandra** Sw.

Perennial, up to 1 m high; hydrophyte, rhizome creeping. **Culm** nodes hairy. **Leaf blades** 100–200 × 4–8 mm, flat, strongly scabrous. **Flowers**: panicle open; spikelets 3.4–4.8 × 1.2–1.4 mm; lemma and palea keels with stiff cilia 0.2–0.6 mm long; Jul.–Jun. Floodplains and permanently wet places such as vleis, pans and ditches, often forming extensive colonies. *Rasp grass*, *wild rice grass*; *moerasgras*, *waterkweek* (A); *mohlakamane-a-manyenyane* (SS).

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## **Leptochloa** P.Beauv. (sthn Afr.: 6 spp.)

### **fusca** (L.) Kunth

*Diplachne fusca* (L.) Beauv. ex Roem. & Schult.

Perennial, up to 1.55 m high; hydrophyte, rhizomatous, stoloniferous, and tufted. **Leaf blades** 250–550 × 3–5 mm; ligule a conspicuous membrane, up to 5 mm long, unfringed. **Flowers**: panicle with many racemes; spikelets 6–14 mm long, not overlapping, 5–12-flowered; lemmas rounded on back, minutely hairy on nerves below, apex acute, toothed, mucronate or awned; Oct.–May. Sandy soil, almost always near or in fresh or brackish water up to 0.5 m deep. *Swamp grass*; *kuilgras* (A).

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## **Lolium** L. (sthn Afr.: 4 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 418 (2015)]

1a Glume as long as or longer than spikelet; lemmas elliptic to ovate, < 3 × as long as wide, very turgid at maturity especially towards base; mature caryopsis up to 3 × as long as wide. . . . . **L. temulentum**

1b Glume shorter than spikelet; lemmas oblong to oblong-lanceolate, > 3 × as long as wide, not turgid at maturity; mature caryopsis > 3 × as long as wide . . . . . 2

2a Plants perennial; lemmas not awned; leaf blade flat, folded along midrib when young . . . . . **L. perenne**

2b Plants annual or short-lived perennial; lemma awn up to 15 mm long; leaf blade rolled along midrib when young . . . . . **L. multiflorum**

In Europe, *L. multiflorum* and *L. perenne* are two quite distinct species, but a complete range of intermediates are found in sthn Afr. and the hybrid *L. multiflorum* × *L. perenne* is subjectively separated from *L. multiflorum* and *L. perenne* by many overlapping characters.

### *multiflorum Lam.

Annual or short-lived perennial, up to 0.8 m high; loosely tufted. **Leaf blades** 110–220 × 3–8 mm; leaves rolled along midrib when young. **Flowers**: panicle a single, flat spike; spikelets 8–20 × 2–10 mm; glumes ascending or spreading, not concealing spikelets, 1/4–1/2(–3/4) spikelet length; lemmas acute, not turgid at maturity, awn up to 15 mm long; mature caryopsis > 3 × as long as wide; Oct.–Apr. Roadsides and other disturbed areas. Native to Europe and Mediterranean region. *Italian rye grass*; *Australiese drabok*, *Italiaanse raaigras* (A).

DrGr MsGr KarSh

### *multiflorum Lam. × perenne L.

Annual or short-lived perennial, up to 1 m high; loosely tufted. **Leaf blades** up to 300 × 10 mm. **Flowers**: panicle a single, flat spike; spikelets 6–25 × 3–10 mm; glumes ascending or spreading, not concealing spikelets, 1/4 to as long as spikelets; lemmas not turgid at maturity, ± acute, awns absent or up to 10 mm long; mature caryopsis > 3 × as long as wide; Oct.–Dec. Cultivated or fallow lands, on roadsides and in moist disturbed places. Native to Europe.

DrGr MsGr

### *perenne L.

Perennial, up to 0.5 m high; tufted, with many culms and sterile leafy shoots. **Leaf blades** 50–140(–300) × 2–4 mm; leaves flat, folded along midrib when young. **Flowers**: panicle a single, flat spike; spikelets 10–15 × 3–10 mm; glumes ascending or spreading, not concealing spikelets, 1/2–3/4 spikelet length; lemmas acute, not turgid at maturity, not awned; mature caryopsis > 3 × as long as wide; Mar., Apr., Nov., Dec. Roadsides, in moist disturbed areas and cultivated and fallow lands. Native to Europe. *Perennial rye grass*, *terrell grass*; *meerjarige roggras*, *raaigras* (A).

KarSh Zastr

### *temulentum L.

Annual, up to 0.9 m high; robust. **Culms** solitary or tufted. **Leaf blades** 150–300 × 3–7 mm. **Flowers**: panicle a single, flat spike; spikelets 8–28 × 3–8 mm; glumes ascending or spreading, not concealing spikelets, 3/4–1 1/2 × spikelet length; lemmas elliptical to ovate, very turgid at maturity, awn absent or up to 20 mm long; mature caryopsis 2–3 × as long as wide; Sep.–Feb. Cultivated or fallow lands, gardens or other disturbed areas, often associated with wheat. Native to warm temperate countries. *Virginian oat*, *bearded rye grass*, *poison darnel*; *drabok raaigras*, *dronkgras* (A).

DrGr

## **Lophacme** Stapf (sthn Afr.: 1 sp.)

### **digitata** Stapf

Perennial, 0.17–0.57 m high; rhizome long, slender, tufted. **Leaf blades** 30–45 × 1.0–2.5 mm; basal sheaths fibrous. **Flowers**: in a panicle of slender, spike-like racemes, digitately arranged; spikelets 5–6 mm long; spikes 2–8, up to 80 mm long; central nerve of lemma extending to an awn longer than floret; Feb.–Apr. Open Highveld sourveld.

DrGr MsGr

## **Loudetia** Steud. (sthn Afr.: 6 spp.)

### **simplex** (Nees) C.E.Hubb.

Perennial, up to 1.5 m high; tufted. **Culms** erect. **Leaf blades** 100–300 × 5 mm; old lower sheaths fibrous. **Flower**s: in an open to contracted panicle; spikelets 7–13 mm long; lower glume obtuse or truncate; upper female-fertile lemma lobes acute, 1 mm long, central awn 25–50 mm long; callus of female-fertile floret clearly 2-toothed in mature specimens; stamens 2; Nov.–Jan. Poor coarse, sandy soils in open grassland or hillsides. *Common russet grass*; *stingelgras*, *besemgras* (A).

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## **Melica** L. (sthn Afr.: 2 spp.)

### Key to species:

[after Nembudani in Fish *et al*.: 432 (2015)]

Lemma hairy on margins only, glabrous or slightly scabrous on back; spikelets 5–9(–11) mm long; sterile cluster of florets glabrous or with a few hairs . . . . . **M. racemosa**

Lemma hairy on back and margins; spikelets 10–15 mm long; sterile cluster of florets hairy . . . . . **M. decumbens**

### **decumbens** Thunb.

Perennial, 0.3–0.5 m high; tufted. **Leaf blades** 20–200 × 1.5–3.5 mm, erect, usually rolled, strongly scabrous. **Flowers**: panicle compact; spikelets 10–15 mm long; lemmas of female-fertile florets hairy on back and margins; lemmas of sterile florets usually hairy; Oct.–Apr. Hillsides and mountainsides, among rocks or in shade of trees, occasionally on roadsides. *Staggers grass*; *Kaapse-dronkgras* (A); *ntlo-ea-motintinyane* (SS).

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### **racemosa** Thunb.

Perennial, up to 0.5 m high; tufted. **Leaf blades** 40–300 × 1.0–5.0 mm, erect, flat or rolled, often scabrous. **Flowers**: panicle or raceme narrow, 50–200 mm long; spikelets 5–9(–11) mm long; lemmas of female-fertile florets hairy only on margins; lemmas of sterile florets glabrous or with only a few hairs; Sep.–Apr. Steep hillsides and mountainsides among rocks and also in lightly shaded places at edges of bush clumps and dune forest. *Melic grass*; *haakgras*, *dronkgras* (A); *ntlo-ea-motintinyane-e-enyenyane* (SS).

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## **Melinis** P.Beauv. (sthn Afr.: 10 spp.)

### Key to species:

[after Fish & Moeaha in Fish *et al*.: 434 (2015)]

1a Upper glume and lower lemma similar in shape; inflorescence branches, branchlets and pedicels usually densely hairy; prickles, when present large, usually very dense; pedicels usually stout, straight or slightly wavy, often purple . . . . . **M. nerviglumis**

1b Upper glume distinctly more gibbous on back and broader than lower lemma; inflorescence branches, branchlet and pedicels usually glabrous except at apex of pedicel, prickles absent or minute; pedicels usually fine, very wavy, often twisted round . . . . . 2

2a Spikelets (4)5–12 mm long, conspicuously laterally compressed, glabrous to hairy; internode between glumes (0.5)0.7–1.7(–2.0) mm long . . . . . **M. repens** subsp. **grandiflora**

2b Spikelets 2.2-4.0(-5.0) mm long, slightly laterally compressed, usually densely hairy; internode between glumes 0.1–0.5(–0.6) mm long . . . . . **M. repens** subsp. **repens**

**nerviglumis** (Franch.) Zizka

*Rhynchelytrum nerviglume* (Franch.) Chiov.

*R. setifolium* (Stapf) Chiov.

Perennial, up to 1.2 m high; tufted. **Leaf blades** (30–)100–300(–440) × (1.3–)2.0–3.5(–4.5) mm, rolled; basal leaf sheaths strongly overlapping. **Flowers**: panicle slightly contracted, branches, branchlets and pedicels often densely covered with hairs up to 4 mm long and prickles; pedicels white or purple, usually stout, straight or slightly wavy; spikelets (3.2–)3.6–5.0(–5.7) × 2 mm; internode between glumes 0.3(–0.6) mm long; lower glume 0.5 mm long; awns 1–2(–3) mm long; Jan.–Dec. (mainly summer). Open grassland, stony hillsides. *Fluweelgras* (A).

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**repens** (Willd.) Zizka subsp. **grandiflora** (Hochst.) Zizka

*Rhynchelytrum brevipilum* (Hack.) Chiov.

*R. grandiflorum* Hochst.

*R. villosum* (Parl.) Chiov.

Annual, 0.25–0.90 m high; tufted. **Leaf blades** 40–150(–180) × 2.0–6.5(–8.0) mm. **Flowers**: panicle slightly contracted; spikelets (4–)5–12 × 2–3 mm, conspicuously laterally compressed, glabrous to hairy; internode between glumes (0.5–)0.7–1.7(–2.0) mm long; lower glume (0.6–)1.5–3.0(–4.3) mm long; upper glume and lower lemma gibbous, tapering into elongated beak, awns (2–)12–22 mm long; Jan.–Jul. Sunny arid areas, not a ruderal.

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**repens** (Willd.) Zizka subsp. **repens**

*Rhynchelytrum repens* (Willd.) C.E.Hubb.

Mainly annual or rarely perennial, up to 1.2 m high; tufted. **Leaf blades** 40–200(–270) × 2–11(–13) mm. **Flowers**: panicle slightly contracted; spikelets 2.2–4.0(–5.0) × 2–3 mm, slightly laterally compressed, usually densely hairy; internode between glumes 0.1–0.5(–0.6) mm long; lower glume (0.3–)0.6–1.3(–1.5) mm long; upper glume and lower lemma gibbous, rarely tapering into an elongated beak, mostly shortly awned, up to 3 mm long; Sep.–May. Mainly ruderal, common on disturbed ground. *Natal red top*; *bergrooigras* (A). Figure 12D, p. 9; Figure 82.

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## **Merxmuellera** Conert (sthn Afr.: 4 spp.)

### Key to species:

[after Mashau & Fish in Fish *et al*.: 442 (2015)]

1a Lemma margins fringed, hairs short at base becoming longer towards apex; leaf blades do not break off. . . . . **M. stereophylla**

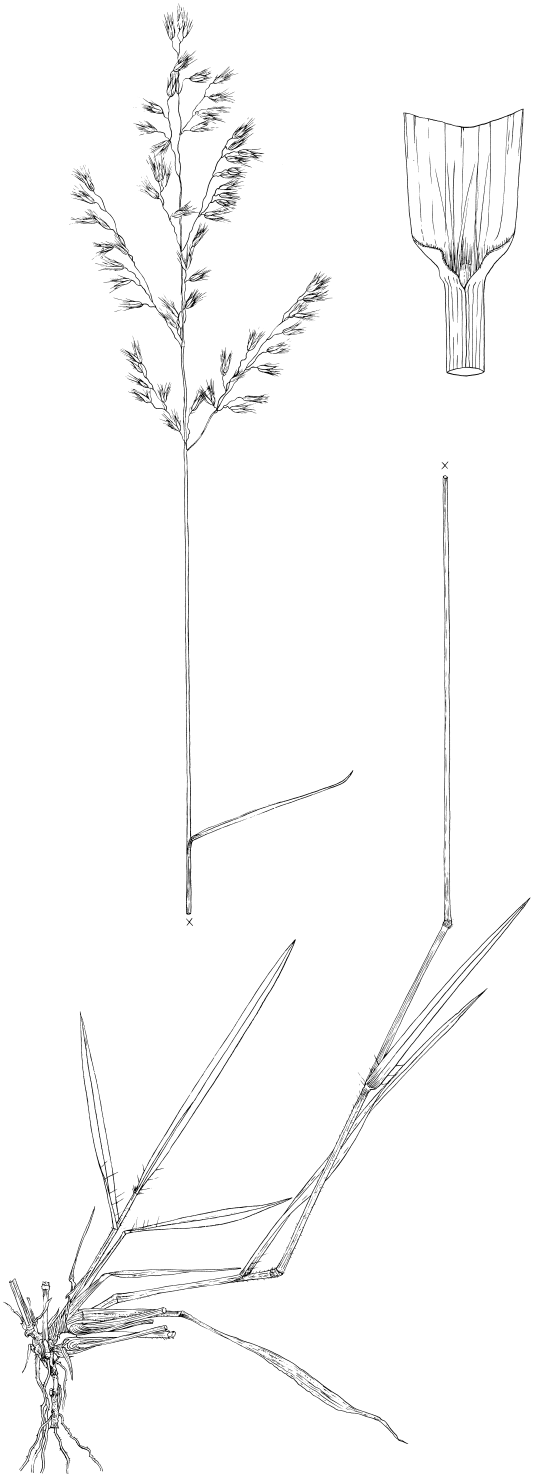


**Figure 82.** *Melinis repens* subsp. *repens* (Poaceae). Artist: C.D. Bartman.

1b Lemma back with 2 or 3 distinct tufts of long, white hairs on each side of the central nerve towards the margins, tufts or fringes of hairs on margins near the base; leaf blades break off ± 10–20 mm above ligule, the piece left is either entire or splits, and is straight or recurved. . . . . 2

2a Lemma lobes completely adnate to central awn, lateral awns absent; central lemma awn seldom geniculate . . . . . **M. macowanii**

2b Lemma lobes wholly or partly free from the central awn, each lobe usually terminating in an awn; central awn usually geniculate . . . . . **M. drakensbergensis**

## **drakensbergensis** (Schweick.) Conert

*Danthonia drakensbergensis* Schweick.

Perennial, up to 1 m high; tufted. **Leaf blades** up to 300 × 1.3 mm; old leaves breaking off close to sheath mouth, and remaining leaf bases splitting along midrib, 2 halves curling away from each other. **Flowers**: panicle loosely contracted, racemes interrupted, 80–180 mm long; spikelets 12–17 × 8–13 mm, including awns; spikelets 5–8-flowered; glumes 13–17 mm long, 1–3-nerved; lemmas 6.5–9.0 mm long, including lobes 3.5–5.0 mm long, adnate to central awn for approximately $^1/_2$ their length, lemma backs with 2 or 3 tufts of equally spaced white hairs on either side of central nerve, marginal tuft most basal; central awn 9–12 mm long, geniculate at point where lemma lobes detach from awn; Oct.–Mar. Mesic sites in streambanks, mud patch communities and rocky outcrops of alpine belt, in areas where soil is deeper than in surrounding areas.

MsGr

## **macowanii** (Stapf) Conert

*Danthonia macowanii* Stapf

Perennial, up to 1.3 m high; tufted. **Leaf blades** up to 650 × 1.3 mm; old leaves breaking off above sheath mouth, remaining leaf bases sometimes splitting along midrib and 2 halves curling away from each other. **Flowers**: panicle loosely contracted, racemes interrupted, shortly branched, 170–270 mm long; spikelets up to 13 × 6 mm, including awns, 2–4-flowered; glumes 9–14 mm long, 1–3-nerved; lemmas 10 mm long, lobes completely adnate to central awn, lateral awns absent; lemma backs with 3 equally spaced tufts of white hairs on either side of central nerve, tuft on margins being most basal; central awn 5–8 mm long, seldom geniculate; Jul.–Jan. Montane and subalpine regions, alt. 1 500–3 000 m. *Moseha*, *mohlabapere* (SS).

MsGr

## **stereophylla** (J.G.Anderson) Conert

*Danthonia stereophylla* J.G.Anderson

Perennial, 0.8 m high; tufted. **Leaf blades** up to 360 × 1.5 mm, rigid, erect, do not break off. **Flowers**: panicle contracted, shortly branched, up to 180 mm long; spikelets up to 20 mm long, including awns, 3–5-flowered; glumes 11–18 mm long, 1-nerved; lemmas 10–16 mm long, including 5–7 mm long lobes free from central awn, lemma backs glabrous with only margins fringed with short hairs from base to middle, fringe terminating in marginal tuft of white hairs; central awn 13–18 mm long, geniculate close to base, twisted basally, apical portion much longer than base and protruding from spikelets for some length; Dec.–Apr. Xeric alpine grasslands and crevices in basaltic cliffs of the Drakensberg, alt. > 2 000 m.

MsGr

## **Microchloa** R.Br. (sthn Afr.: 3 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 445 (2015)]

Anthers 0.4–0.9(1.0) mm long; spikelets 2.0–3.2 mm long; raceme rarely > 1 mm wide; leaf blades tapering to a fine point . . . . . **M. kunthii**
Anthers 1.0–1.6 mm long; spikelets 3.4–4.5 mm long; raceme 1–2 mm wide; leaf blades tapering to an obtuse or acute point . . . . . **M. caffra**

### **caffra** Nees

Perennial, up to 0.5 m high; densely tufted, with most leaves basal. **Leaf blades** 20–100 mm long, tapering to an obtuse or acute point; old leaf sheaths splitting into fibres. **Flowers**: spike one-sided, 40–150 × 1–2 mm; spikelets 3.4–4.5 mm long; anthers 1.0–1.6 mm long; caryopsis terete, > 1 mm long; Oct.–Apr. Shallow soils on rocky outcrops. *Pincushion grass*; *elsgras* (A). Figure 83.

DrGr MsGr KarSh

### **kunthii** Desv.

Perennial, up to 0.43 m high; growing in compact mats, densely tufted, with most leaves basal. **Leaf blades** 10–80 mm long, tapering to a fine point; basal sheaths splitting into fibres. **Flowers**: spike one-sided, 20–150(–250) mm long, rarely > 1 mm wide; spikelets 2.0–3.2 mm long; anthers 0.4–0.9(1.0) mm long; caryopsis 1.5 mm long; Nov.–Apr. Shallow soil on rocky outcrops, open sandy patches or sometimes even on waterlogged, clayey soil. *Pincushion grass*; *elsgras* (A).

DrGr MsGr KarSh Zastr

## **Miscanthus** Andersson (sthn Afr.: 2 spp.)

### Key to species:

Leaf blades terete, reduced to a midrib . . . . . **M. junceus**
Leaf blades expanded, sometimes folded, may be narrowed to the midrib near base only . . . . . **M. ecklonii**

### **ecklonii** (Nees) Mabb.

*M. capensis* (Nees) Andersson
*Miscanthidium sorghum* (Nees) Stapf
*Miscanthidium erectum* Stent & C.E.Hubb.

Perennial, up to 2.4 m high; often robust, rhizomatous, tufted. **Leaf blades** up to 90 × 16 mm, expanded, sometimes folded or narrowed to midrib near base. **Flowers**: panicle contracted, 200–450 mm long; spikelets 3–6 mm long; callus hairs $^{1}/_{4}$–$^{1}/_{3}$ length of spikelet; upper lemma not awned or awn up to 7 mm long; Nov.–Apr. Riverbanks, forest margins and wet places. *Daba grass*; *ruigtegras* (A).

DrGr MsGr KarSh Zastr

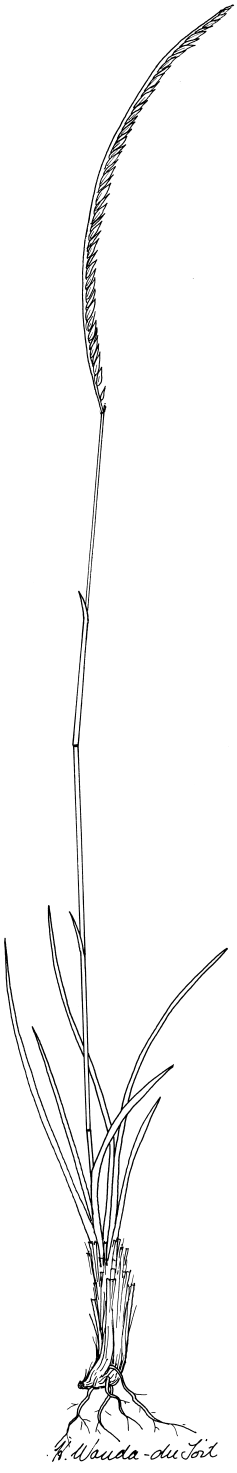


**Figure 83.** *Microchloa caffra* (Poaceae). Artist: Artist H.W. du Toit.

**junceus** (Stapf) Pilg.
*Miscanthidium junceum* (Stapf) Stapf
*Miscanthidium teretifolium* (Stapf) Stapf

Perennial, 1.0–1.8 m high; rhizomatous, tufted. **Leaf blades** up to 500–1 000 × 3 mm, terete, reduced to a yellow midrib. **Flowers**: panicle contracted, 200–550 mm long; spikelets 3–5 mm long; lower glume hairy; upper lemma awned; awns 2–10 mm long; Nov.–Jun. Riverbanks and vleis. *Broom grass*; *besemgras*, *ruigtegras* (A).

MsGr

## **Monocymbium** Stapf (sthn Afr.: 1 sp.)

**ceresiiforme** (Nees) Stapf

Perennial, up to 1 m high; sometimes shortly rhizomatous, loosely or densely tufted. **Leaf blades** 50–180 × 2–6 mm. **Flowers**: in a complex, false panicle, racemes solitary, partly enclosed in reddish brown, boat-shaped spatheole; spikelets (sessile and pedicellate) 3.5–4.0 mm long; plant reddish or purple-tinged when flowering; Jan.–Jun. Open grassland and hillsides, often in wet places. *Boat grass*, *wild oat grass*; *bootjiegras*, *wildehawergras* (A); *'meseletso*, *mobeseletso* (SS).

DrGr MsGr

## **Nassella** (Trin.) E.Desv. (sthn Afr.: 3 spp.)

***neesiana** (Trin. & Rupr.) Barkworth
*Stipa neesiana* Trin. & Rupr.

Perennial, 0.3–1.0 m high; tufted. **Culms** erect. **Leaf blades** up to 300 × 3 mm. **Flowers**: panicle contracted; spikelets 15–17 mm long, excluding scabrous, bent and twisted awn up to 100 mm long; glumes dark purple; lemmas with a raised collar at junction of awn; Nov., Dec. Disturbed places. Infrequent, or locally common. Native to South America. *Uruguayan tussuck grass*.

DrGr MsGr

## **Odontelytrum** Hack. (sthn Afr.: 1 sp.)

**abyssinicum** Hack.

Perennial, up to 1 m high; hydrophyte. **Culms** soft, spongy. **Leaf blades** 100–200 × 7 mm. **Flowers**: inflorescence a spike, embraced below by uppermost leaf sheath; spikelets up to 12 × 3 mm; spikelets solitary, subtended by a lobed herbaceous scale, with 1 lobe free and awn-like, up to 20 mm long; Dec.–Feb. Stagnant and running water.

DrGr

## **Oropetium** Trin. (sthn Afr.: 1 sp.)

**capense** Stapf

Dwarf perennial, up to 0.17 m high; densely tufted. **Leaf blades** 10–40 × 1.2 mm. **Flowers**: spikes solitary, straight or curved; spikelets 2.5–4.0 mm long, sunk into rachis; upper glume

2–3 mm long; Dec.–May. Shallow soil in open places or rocky outcrops or in crevices and hollows on exposed rocks, often in badly grazed or disturbed veld. *Dwarf grass*; *haasgras* (A).

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## **Panicum** L. (sthn Afr.: 39 spp.)

### Key to species:

[after Fish in Fish *et al*.: 472 (2015)]

1a Glumes and lower lemma apices pectinate . . . . . **P. ecklonii**
1b Glumes and lower lemma entire . . . . . 2
2a Upper lemma conspicuously transversely rugose. . . . . **P. maximum**
2b Upper lemma smooth, scaberulous or if sculptured not conspicuously rugose. . . . . 3
3a Plants annual . . . . . 4
3b Plants perennial short-lived perennial . . . . . 5
4a Spikelets obtuse or bluntly acute . . . . . **P. schinzii**
4b Spikelets acuminate. . . . . **P. impeditum**
5a Lower glume separated from upper glume by internode . . . . . **P. deustum**
5b Lower glume not separated by internode. . . . . 6
6a Spikelets rounded to nearly globose; upper lemma verruculose (look carefully) . . . . . **P. natalense**
6b Spikelets oblong, ovate to elliptic; upper lemma smooth, granulose or papillose . . . . . 7
7a Lower lemma with interspaces between nerves broadest adjacent to central nerve . . . . . **P. hygrocharis**
7b Lower with broadest interspaces between nerves not confined to those by the central nerve. . . . . 8
8a Spikelets 3.2–4.5 mm long; abaxial surface at sheath mouth densely covered with long woolly hairs. . . . . **P. kalaharense**
8b Spikelets up to 3.2 mm long; abaxial surface of the sheath mouth glabrous or hairs short, or long and straight, or papillate . . . . . 9
9a Leaves mainly basal. . . . . **P. stapfianum**
9b Leaves mainly cauline . . . . . **P. coloratum** var. **coloratum**

### **coloratum** L. var. **coloratum**

*P. coloratum* L. var. *makarikariense* Gooss.

Perennial, up to 1 m high; tufted. **Culms** erect, geniculate or occasionally decumbent. **Leaf blades** up to 300 × 5–10 mm; lower leaf sheaths glabrous to densely appressed-hairy, bulbous-based hairs present or absent; leaves mainly cauline, broad. **Flowers**: panicle with branches spreading with spikelets distant; spikelets 2.5–3.0 mm long; lower glume ovate, $^{1}/_{2}$–$^{2}/_{3}$ length of spikelet; upper glume and lower lemma 7(–9)-nerved; lower floret male, with palea well developed; upper female-fertile lemma pale to dark, shiny; Oct.–May. Sandy or clay soils in riverbeds, drainage courses, around pans or in depressions. *White buffalo grass*; *witbuffelgras*, *miergras*, *bamboeskweek* (A).

| VreDm | AcGr | DrGr | | KarSh | |
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### **deustum** Thunb.

Perennial, up to 2 m high; shortly rhizomatous, sometimes rooting at lower nodes. **Culms** slender or robust, branched or unbranched. **Leaf blades** 150–480 × 5–35(–45) mm; leaves

mainly cauline, cordate or straight at base. **Flowers**: panicle with branches usually with clavellate hairs; spikelets 3.5–5.0(–5.5) mm long; lower glume 1/2–2/3 length of spikelet, separated by a short internode from rest of spikelet; upper glume 7-nerved; lower floret male, lemma 5-nerved and palea well developed; upper female-fertile lemma pale, dull or shiny; Sep.–Apr. Moist soils, shady places or rocky hillsides on clay, loam or sandy soils. *Reed panicum*, *broad-leaved panicum*; *breëblaarwintergras*, *rietbuffelgras* (A).




## **ecklonii** Nees

Perennial, up to 0.8 m high; shortly rhizomatous, tufted. **Culms** erect. **Leaf blades** 60–200(–260) × 3–8 mm; leaves mainly basal, flat, bright green, usually densely hairy with long tubercle-based hairs. **Flowers**: panicle slightly contracted, branches purple; spikelets 2.5–3.5 mm long, usually flushed with purple; glumes and lower lemma pectinate at apex; lower floret sterile with palea absent; upper female-fertile lemma dull, often flushed purple and shortly hairy towards apex; Sep.–Apr. Sandy soils and often in moist areas in mountainous regions subjected to burning.




## **hygrocharis** Steud.

*P. repentellum* Napper

Perennial to short-lived perennial, up to 0.6 m high; hydrophyte, rhizomatous, stoloniferous. **Culms** erect or decumbent. **Leaf blades** 50–120 × 3–5 mm, slender; leaves mainly cauline. **Flowers**: panicle closely associated with uppermost leaf, narrow and sparsely branched, ascending; spikelets 2.0–3.5 mm long; lower glume broadly ovate; upper glume and lower lemma 7-nerved; lower floret usually male, lemma with broadest interspaces of nerves adjacent to central nerve, palea well developed; upper female-fertile lemma pale, shiny; Jan.–May. Black or grey soil around vleis and lakes or in water.




## **impeditum** Launert

Annual, up to 0.5 m high; hydrophyte, tufted. **Culms** geniculate, erect to procumbent. **Leaf blades** 20–80 × 3–6 mm, upper leaf surface densely covered with papillae. **Flowers**: base of panicle enclosed by uppermost leaf, extending beyond apex of leaf; spikelets 2.7–3.3 mm long, acuminate, crowded and appressed to inflorescence branches; lower glume up to 1/2 length of spikelet, not separated by internode from upper glume; upper glume and lower lemma 7–9-nerved; lower floret sterile with palea reduced; upper female-fertile lemma pale, smooth and shiny; Nov.–May. Moist sandy or clay soils around water holes, vleis and pans.




## **kalaharense** Mez

Perennial, up to 2.5 m high; robust, shortly rhizomatous, tufted. **Leaf blades** up to 350 × 8 mm, flat or rolled; upper leaf surface densely covered with short hairs, sheath mouth with dense, long to woolly hairs on abaxial side, hard and dense, basal sheaths densely hairy; leaves mainly basal. **Flowers**: panicle slightly contracted; spikelets 3.2–4.5 mm long; lower glume broadly ovate, up to 1/2 length of spikelet, 3–5-nerved, not separated from upper glume; upper glume and lower lemma 7–9-nerved; lower floret male with palea well developed; upper female-fertile lemma pale and dull; Dec.–Apr. Kalahari sands and disturbed places such as roadsides.



**maximum** Jacq.

Perennial or occasionally annual, up to 2 m high; loosely to densely tufted. **Culms** erect, geniculate, rooting at nodes. **Leaf blades** 6–40(–100) × 4–12(–35) mm. **Flowers**: panicle open, much branched with secondary branches well developed, flexuous; spikelets 2.5–3.0(–4.0) mm long; spikelets blunt or acute, rounded on back, cartilaginous; closed spikelet with many nerves clearly visible on lemma of lower floret; lower floret usually male with palea well developed; upper female-fertile lemma pale, conspicuously transversely rugose; Nov.–Jul. Shady places, especially under canopy of trees, in cultivated areas and along riverbanks, but well adapted to a variety of conditions. *Guinea grass*, *purple-top buffalo grass*; *gewone buffelsgras*, *blousaadsoetgras* (A); *lehola*, *mofantsoe* (SS); *mphaga* (T); *ubabe* (Z). Figure 84.

AcGr DrGr KarSh

**natalense** Hochst.

Perennial, up to 0.5 m high; shortly rhizomatous, densely tufted, base knotty. **Culms** slanted, seldom erect. **Leaf blades** up to 500 × 3.5 mm; tightly folded or flat, blue-green; leaves mainly basal. **Flowers**: panicle slightly contracted; spikelets 1.7–2.2 mm long, nearly rounded in outline; lower glume $^{1}/_{2}$–$^{3}/_{4}$ spikelet length; upper glume and lower lemma 5-nerved; lower floret male or sterile, palea membranous, well developed or reduced in width only, not longer than lemma; upper female-fertile lemma pale, sparsely to densely verruculose; Oct.–Apr. Sandy loam or sandy soil, well-drained or shallow soil in rocky areas, often in burnt veld. *Natal buffalo grass*; *Natalbuffelgras*, *suurbuffelsgras* (A).

DrGr MsGr

**schinzii** Hack.

*P. laevifolium* Hack. var. *laevifolium*

Annual, up to 0.9 m high; tufted, occasionally rooting at nodes. **Culms** erect to sprawling, **Leaf blades** up to 300 × 20 mm; lower sheaths glabrous or sparsely hairy at extreme base, leaves dark green. **Flowers**: panicle slightly contracted, well exserted from uppermost leaf, open, narrowly obovate, profusely branched with many spikelets; spikelets 2.0–2.5(–3.5) mm long, obtuse to bluntly acute; apices of glumes not recurved; lower glume broadly ovate; upper glume and lower lemma 9–11-nerved; lower floret male or both male and sterile occurring in same inflorescence, palea well developed; upper female-fertile lemma pale to yellow, shiny; Nov.–May. Moisture loving, in sandy and clay soils of seepage areas, depressions where water collects and in cultivated lands. *Land grass*, *vlei panicum*, *sweet buffalo grass*; *blousaadgras*, *vleibuffelsgras*, *oulandegras* (A).

AcGr DrGr MsGr Zastr

**stapfianum** Fourc.

Perennial, up to 0.9 m high; tufted, with bulbous-based hairs present or absent. **Culms** erect or sprawling. **Leaf blades** up to 400 × 5 mm, usually shorter; leaves mainly basal, upper leaf surface usually densely papillate. **Flowers**: panicle slightly contracted; spikelets up to 3 mm long; lower glume $^{1}/_{2}$–$^{2}/_{3}$ length of spikelet; upper glume and lower lemma 7–9-nerved; lower floret male with palea well developed; upper female-fertile lemma pale yellow to flushed greyish, smooth; Nov.–May. Damp area on heavy or sandy soils, disturbed or calcrete areas and occasionally rocky dry areas. *Thompson grass*; *blousaadgras*, *buffelsgras*, *soetgras* (A).

DrGr MsGr KarSh Zastr



**Figure 84.** *Panicum maximum* (Poaceae). Artist: C. Smith.

## **Paspalum** L. (sthn Afr.: 6 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 503 (2015)]

1a Spikelets with upper glume margins fringed with long hairs, rest of surface pubescent or glabrous, matt . . . . . **P. dilatatum**
1b Spikelets with upper glume margins not fringed, surface glabrous or minutely hairy, usually glossy. . . . . 2
2a Spikelet apex rounded; spikelets ovate to elliptic, 1.0–1.5 × as long as wide . . . . . 3
2b Spikelet apex acute; spikelets nearly lanceolate to narrowly obovate, > 2 × longer than wide. . . . . 4
3a Spikelets 2.8–3.7 mm long; rachis often zigzag; rhizome very well developed, horizontally creeping . . . . . **P. notatum**
3b Spikelets 2.0–2.5 mm long; rachis flat, linear, almost leaf-like; rhizome short, not horizontally creeping . . . . . **P. scrobiculatum**
4a Upper glume minutely hairy (look carefully); spikelets narrowly obovate, 2.5–3.5 mm long; lower glume a small triangular scale up to $^{2}/_{3}$ as long as spikelet to absent (all 3 states can occur on the same inflorescence); leaves > 3 mm wide. . . . . **P. distichum**
4b Upper glume glabrous; spikelets almost lanceolate, 3.0–4.5 mm long; lower glume absent or reduced to a rim; leaves < 3 mm wide . . . . . **P. vaginatum**

### ***dilatatum** Poir.

Perennial, up to 1.8 m high; rhizome short and creeping, or tufted. **Leaf blades** 90–350(–450) × 6–14 mm; ligule conspicuous, membranous, 2–8 mm long; basal sheaths glabrous or sparsely hairy. **Flowers**: inflorescence digitate with central axis 30–200 mm long; racemes 4–9, scattered on axis; spikelets 3–4 × 2.0–2.5 mm, fringed with white hairs and arranged in 4 rows on one side of rachis; Oct.–May. Damp places, most often in disturbed areas such as roadsides, gardens and cultivated lands. Native to South America. *Dallis grass*, *large waterseed paspalum*; *watergras*, *gewone paspalum*, *breësaadvleigras* (A). Figure 85.

VreDm | AcGr | DrGr | MsGr | KarSh

### **distichum** L.

*P. paspalodes* (Michx.) Scribn.

Perennial, up to 0.3 m high; hydrophyte, rooting at nodes, rhizomatous or stoloniferous (mat-forming). **Leaf blades** 20–220 × 3–8 mm. **Flowers**: inflorescence digitate, racemes 2; spikelets 2.5–3.5 × 1.3–1.5 mm, arranged in 2 rows, glabrous, narrowly obovate, apices acute; lower glume usually developed into a small triangular scale or sometimes absent; upper glume minutely hairy; Nov.–May. In or near salt or fresh water on riverbanks, in vleis and along pan edges in muddy soil, sand or black turf. *Bankrotkweek*, *buffelsgras*, *tweevingergras*, *bulgras*, *knopgras* (A).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### ***notatum** Flüggé

Perennial, up to 0.6 m high; long rhizome well developed, almost woody, clad in overlapping leaf sheaths, horizontally creeping, tufted. **Culms** decumbent. **Leaf blades** 60–240 × 4–10 mm. **Flowers**: inflorescence digitate, racemes 2(3), 25–130 mm long; rachis often zigzag; spikelets 2.8–3.7 × 2.0–2.8 mm, glabrous, glossy, apices rounded, arranged in 2 rows; Nov.–Apr. High




**Figure 85.** *Paspalum dilatatum* (Poaceae). Artist: C.D. Bartman

rainfall areas on sandy or clayey soil, often in disturbed places and cultivation. Native to South America. Bahia grass, Bahia paspalum.

MsGr

### **scrobiculatum** L.

Perennial, up to 0.7 m high; occasionally hydrophyte, or shortly rhizomatous, or sometimes stoloniferous, or loosely tufted. **Culms** erect or decumbent. **Leaf blades** 150–200(–380) × 6–8(–10) mm. **Flowers**: racemes digitate, 1–5, 30–80(–150) mm long; rachis flat, linear and almost as wide as raceme; spikelets 2.0–2.5 × 1.8–2.4 mm, glabrous, ovate, arranged in 2 rows; Sep.–May. Moist, semiswampy areas or on fertile well-drained soils, often in disturbed places and abandoned lands. *Creeping paspalum*, *water couch grass*, *koda millet*; *dronkgras*, *slootgras* (A); *isiamuyisane* (Z).

MsGr KarSh

### **vaginatum** Sw.

Perennial, up to 0.6 m high; hydrophyte, rooting at nodes below water level, branching above, or shortly rhizomatous, or stoloniferous. **Culms** mat-forming. **Leaf blades** 40–90 × 2–3(–4) mm. **Flowers**: inflorescence digitate, racemes 2; spikelets 3.0–4.5 × 0.9–1.5 mm, arranged in 2 rows, glabrous, lanceolate with apices acute; internodes short, branching at most nodes; lower glume absent or reduced to rim; upper glume glabrous; Dec.–Apr. In or near rivers, at water edges on sandy soil but most often in saline water. *Seashore paspalum*; *brak paspalum* (A).

DrGr MsGr

## **Pennisetum** Rich. (sthn Afr.: 13 spp.)

### Key to species:

[after Fish & Moeaha in Fish *et al*.: 509 (2015)]

| | | |
|---|---|---|
| 1a | Bristles, at least one or more inner ones, plumose (hairs maybe obscure) | 2 |
| 1b | Bristles glabrous, usually scabrid, rarely smooth | 4 |
| 2a | Spikelets 9–14 mm long; plant rhizomatous, mat-forming | **P. villosum** |
| 2b | Spikelets 2.0–7.5 mm long; plant densely tufted | 3 |
| 3a | Longest bristle 4–12 mm long; rachis ribs rounded; involucre with solitary/ single spikelet, stipe absent | **P. sphacelatum** |
| 3b | Longest bristle 17–40 mm long; rachis ribs angular; involucre with 2–4 spikelets, stipe present | **P setaceum** |
| 4a | Lower lemma apex abruptly cuspidate, usually up to $^{3}/_{4}$ length of spikelet (excluding awn); bristles purple; inflorescence 30–50 mm long | **P. thunbergii** |
| 4b | Lower lemma gradually tapering, usually nearly as long as spikelet; bristle usually white, yellow or straw-coloured, rarely purple; inflorescence 50–150 mm long | **P. sphacelatum** |

### ***setaceum** (Forssk.) Chiov.

Perennial, up to 1 m high; tufted. **Leaf blades** 20–40 × 1–2 mm. **Flowers**: inflorescence a spike, purple, 100–250 mm long; rachis ribs angular; involucre with 2–4 spikelets, stipe present;

longest involucral bristles 17–40 mm long, 4–5 × as long as spikelets, inner bristles plumose; spikelets 4.0–6.5 × 3 mm; Nov.–Jul. Ruderal on stony slopes and dry open places. Native to North Africa. *Fountain grass*; *pronkgras* (A).

DrGr

### **sphacelatum** (Nees) T.Durand & Schinz

Perennial, up to 0.9 m high; densely tufted. **Leaf blades** 100–400 × 2–3 mm, often filiform. **Flowers**: inflorescence a spike, straw-coloured, 50–150 mm long, hairy for some distance below inflorescence; involucre with solitary spikelet, stipe absent; rachis ribs rounded; most involucral bristles 1–2 × as long as spikelets, usually white, yellow or straw-coloured, rarely purple; spikelets 2.5–4.5 × 1 mm; lower lemma gradually tapering, usually nearly as long as spikelet; Nov.–Apr. Wet areas, vleis, usually hillsides, moist or clay soil. *Taaipol*, *bulgras* (A).

DrGr MsGr KarSh Zastr

### **thunbergii** Kunth

Perennial, up to 0.8 m high; loosely tufted. **Leaf blades** 100–400 × 4–7 mm, flat or folded, sparsely to densely pilose. **Flowers**: inflorescence a spike, 30–50 mm long, purple; involucre of up to 20 bristles enclosing 1 spikelet, one bristle longer than rest; spikelets 3 × 1 mm; lower glume absent; upper glume $^{1}/_{5}$–$^{1}/_{4}$ as long as spikelet; lemmas mucronate to nearly awned; lower lemma usually up to $^{3}/_{4}$ spikelet length, abruptly cuspidate, awned, awn up to 0.5–1.5 mm long; anther lobes with minute tuft of hairs at apex; Oct.–Jun. Wet places, riverbanks, vleis. *Thunberg's pennisetum*, *Napier millet*; *kleinmanna* (A).

DrGr MsGr Zastr

### *__villosum__ R.Br. ex Fresen.

Perennial, up to 0.9 m high; tufted and rhizomatous, mat-forming. **Culms** geniculate. **Leaf blades** 8–15 × 3 mm. **Flowers**: inflorescence a spike; involucral bristles nearly all plumose, some 4–5 × as long as spikelet, mostly ± 30 mm long; spikelets 9–14 × 4 mm; inflorescence usually white, 40–100 mm long; Jan.–May. Roadsides and disturbed areas. Native to Ethiopia. *Feathertop*.

DrGr MsGr KarSh

## **Pentameris** P.Beauv. (sthn Afr.: 72 spp.)

### Key to species:

[after Linder *et al*.: 306 (2010); Fish in Fish *et al*.: 518 (2015)]

1a Lemmas not awned, or central awn minute (< 0.5 mm long) or mucronate . . . . . 2
1b Lemmas awned, central awn > 0.5 mm long (at least one lemma well awned) . . . . . 6
2a Inflorescence spike-like . . . . . **P. galpinii**
2b Inflorescence open, if contracted not spike-like . . . . . 3
3a Stalked or crateriform glands present . . . . . 4
3b Glands absent or linear glands or sunken glandular dots present (may be inconspicuous and difficult to see) . . . . . 5

4a Leaf blades and pedicels with stalked glands; glume apex obtuse; inflorescence with ± 100 spikelets . . . . . **P. setifolia**
4b Leaf margins and pedicels without glands; glume apex acute; inflorescence ± 70 spikelets. . . . . **P. galpinii**
5a Inflorescence branches with axils sparsely to densely hairy (sometimes hairy only in lower axils) . . . . . **P. setifolia**
5b Inflorescence branches with axils glabrous . . . **P. aurea** subsp. **pilosogluma**
6a Plant with stalked or crateriform glands on either leaves, sheaths, pedicles or on all, may be very sparse. . . . . 7
6b Plant eglandular, if present, glands linear or sunken, these often obscure . . . . . .11
7a Annual to biennial . . . . . 8
7b Perennial. . . . . 9
8a Annual. . . . . **P. airoides** subsp. **airoides**
8b Biennial . . . . . **P. airoides** subsp. **jugorum**
9a Some spikelets in same inflorescence with one awn, others not awned . . . . . **P. setifolia**
9b All spikelets in the same inflorescence with both lemmas in a spikelet with central awns . . . . . 10
10a Lemma lateral awns 0.5 mm long, central awn 4 mm long; lateral awns shorter than glumes. . . . . **P. galpinii**
10b Lemma lateral awns 1–3 mm long, central awn 6–10 mm long; lateral awns as long as to longer than glumes. . . . . **P. oreodoxa**
11a Spikelets 2.0–6.5 mm long . . . . . 12
11b Spikelets 7.0–13.5 mm long. . . . . 14
12a Only one lemma awned. . . . . **P. setifolia**
12b Both lemmas awned . . . . . 13
13a Lemma only hairy on nerves . . . . . **P. oreodoxa**
13b Lemma hairy all over . . . . . **P. tysonii**
14a Leaves densely woolly hairy on the inside along whole length. . . **P. basutorum**
14b Leaves glabrous. . . . . 15
15a Lateral awns exserted from glumes . . . . . **P. exserta**
15b Lateral awns included in glumes. . . . . **P. tysonii**

## **airoides** Nees subsp. **airoides**

*P. patula* (Nees) Stapf var. *glabrata* Stapf
*Pentaschistis airoides* (Nees) Stapf subsp. *airoides*

Annual, up to 0.35 m high; stalked, crateriform glands present on leaves, pedicels and glumes. **Leaf blades** up to 30 × 2 mm. **Flowers**: inflorescence a panicle; spikelets 2.5–3.5 mm long; lemmas awned, 1.5–1.8 mm long; central awn 5–8 mm long; anthers < 0.5 mm long; Aug.–Dec. On richer soils, and absent from thin, sandstone-derived soils.

DrGr | MsGr | KarSh | Zastr

## **airoides** Nees subsp. **jugorum** (Stapf) Galley & H.P.Linder

*Pentaschistis airoides* (Nees) Stapf subsp. *jugorum* (Stapf) H.P.Linder
*Pentaschistis jugorum* Stapf

Biennial, up to 0.35 m high; tufted, nearly cushion-forming; stalked, crateriform glands present on leaves, pedicels and glumes. **Leaf blades** 40–60 × 1–3 mm. **Flowers**: inflorescence a panicle; spikelets 3.5–5.0 mm long; lemmas awned; central awn 5–8 mm long; anthers 0.5–1.0 mm long; Feb. Shallow soils and disturbed areas in alpine and high montane areas.

DrGr | MsGr | KarSh

**aurea** (Steud.) Galley & H.P.Linder subsp. **pilosogluma** (McClean) Galley & H.P.Linder
*Aira aurea* Steud.
*Pentaschistis aurea* (Steud.) McClean subsp. *pilosogluma* (McClean) H.P.Linder
*Pentaschistis pilosogluma* McClean

Perennial, up to 0.7 m high; tufted, forming large, floppy tussocks; sometimes with obscure, linear glands. **Leaf blades** up to 350 × 5 mm. **Flowers**: inflorescence a panicle, branches with axils glabrous; spikelets 6–7 mm long; lemmas muticous; Dec.–Feb. Along streams and seepages on cave sandstone and basaltic soils.

MsGr

**basutorum (**Stapf) Galley & H.P.Linder
*Pentaschistis basutorum* Stapf

Perennial, up to 0.7 m high; tufted, eglandular. **Leaf blades** up to 600 × 0.5 mm; leaves tough, densely woolly hairy inside. **Flowers**: inflorescence a panicle; spikelets 7–10 mm long; lemmas awned; central awn 10–20 mm long; Dec., Jan. Shallow soil over sandstone.

MsGr Zastr

**exserta** (H.P.Linder) Galley & H.P.Linder
*Pentaschistis exserta* H.P.Linder

Perennial, ± 0.6 m high; tufted, base with horizontal stolons, eglandular. **Leaf blades** up to 300 × 0.5 mm, glabrous, margins scabrid. **Flowers**: inflorescence a panicle; spikelets 7.5–8.5 mm long; lemmas awned, central awn 7–12 mm long, geniculate; lateral awns exserted from glumes; Jan. In seeps and along streams in the montane belt.

MsGr

**galpinii** (Stapf) Galley & H.P.Linder
*Achneria galpinii* Stapf
*Pentaschistis galpinii* (Stapf) McClean

Perennial, up to 0.6 m high; cushion-forming, cushions low, rounded, or sometimes with stolons stalked, crateriform glands on leaf margins and pedicels. **Culms** mat-forming. **Leaf blades** 60–180 × 2–5 mm, basally aggregated. **Flowers**: inflorescence open to spike-like, with ± 70 spikelets, with basal pedicel segments as long as spikelets; spikelets 4–6 mm long; glumes acute, glabrous; lemmas awned or not awned; lateral awns 0.5 mm long (when present), not reaching glume apices; central awn 4 mm long (when present); Jan. Alpine grassland, usually in bare patches on wet basalt, alt. 2–3 000 m.

MsGr

**oreodoxa** (Schweick.) Galley & H.P.Linder
*Pentaschistis oreodoxa* Schweick.

Perennial, up to 0.5 m high; tufted, with stalked glands. **Culms** tending towards cushion formation. **Leaf blades** up to 300 × 4 mm. **Flowers**: inflorescence a panicle; spikelets 4–6 mm long; lemmas awned, lobes acute, nerves hairy; lateral awns 1–3 mm long, not reaching to reaching beyond glume apices; central awn 6–10 mm long, geniculate, erect; Jan. Sour grassland over a wide altitudinal range.

MsGr

**setifolia** (Thunb.) Galley & H.P.Linder
*Pentaschistis setifolia* (Thunb.) McClean

Perennial, up to 0.4 m high; tufted, stalked or sunken glands present on leaves, pedicels and glumes or absent. **Leaf blades** up to 300 × 0.8 mm, curly. **Flowers**: inflorescence a panicle; spikelets 3.5–5.0 mm long, not awned or occasionally one lemma awned; inflorescence with ± 100 spikelets, branches with axils sparsely to densely hairy; glumes usually obtuse, sometimes acuminate; lemmas muticous, often dark coloured; Dec., Jan. Sour grassland over a wide altitudinal range.

| | | DrGr | MsGr | | Zastr |
|---|---|---|---|---|---|

**tysonii** (Stapf) Galley & H.P.Linder
*Pentaschistis fibrosa* Stapf
*Pentaschistis tysonii* Stapf

Perennial, up to 0.5 m high; tufted, often with basal sheath of fibres, eglandular. **Leaf blades** up to 300 × 0.5–2.0 mm, rolled; leaves basal, glabrous. **Flowers**: inflorescence a panicle; spikelets 6–10 mm long; lemmas 3.5 mm long, hairy all over, awned, lateral awns 1–5 mm long, included in glumes; Nov. Sour grassland on mountain slopes.

| | | | MsGr | | |
|---|---|---|---|---|---|

## **Perotis** Ait. (sthn Afr.: 3 spp.)

**patens** Gand.

Annual or short-lived perennial, up to 0.6 m high; loosely tufted. **Leaf blades** 10–70 × 3–12 mm, margins wavy, with neatly spaced hairs, blue-green; dry leaves curled. **Flowers**: inflorescence a single raceme; spikelets 1.2–2.7 mm long, base flat or rounded, not elongated into a stipe; glumes with purple awns; awns 9–17 mm long; Nov.–Apr. Dry, poor or sandy soils, in bare ground, disturbed places. *Bottlebrush grass*, *purple spike perotis*; *katstertgras* (A).

| VreDm | AcGr | DrGr | | | |
|---|---|---|---|---|---|

## **Phalaris** L. (sthn Afr.: 5 spp.)

### Key to species:

[after Nembudani in Fish *et al*.: 564 (2015)]

| | | |
|---|---|---|
| 1a | Plants perennial | 2 |
| 1b | Plants annual | 3 |
| 2a | Sterile florets 2, ± equal in length, 1.0–2.5 mm long; glumes wingless to narrowly winged | **P. arundinacea** |
| 2b | Sterile floret 1, rarely with a much reduced second floret < 0.5 mm long; glumes broadly winged | **P. aquatica** |
| 3a | Sterile floret 1; glumes evenly winged | **P. minor** |
| 3b | Sterile florets 2; glumes unevenly winged | **P. canariensis** |

***aquatica** L.

Perennial, up to 1.5 m high; loosely tufted. **Culms** laterally geniculately ascending. **Leaf blades** 180–350 × 2–15 mm. **Flowers**: panicle compact, spike-like, 15–110 × 10–25 mm, occasionally

interrupted at base; spikelets 4.5–7.5 mm long; glumes broadly winged, margins entire; female-fertile floret densely pubescent; sterile floret usually 1, 0.2–2.2 mm long, rarely with a second sterile floret, < 0.5 mm long; Nov.–Apr. Wet ground by streams and channels or as weed in moist fields. Native to Mediterranean region. *Tawoomba canary grass*, *perennial canary grass*, *harding grass*.




### *arundinacea L.

Perennial, up to 1.5 m high; rhizomes scaly, creeping. **Culms** erect. **Leaf blades** 50–200 × 5–15 mm. **Flowers**: panicle compact, spike-like, 15–110 × 10–25 mm, occasionally interrupted at base; spikelets 3.5–7.5 mm long; glumes wingless to narrowly winged, gradually tapering to apex; female-fertile floret sparsely pubescent; sterile florets 2, ± equal in length, 1.0–2.5 mm long; Nov.–Apr. Marshes, riverbanks, swamp margins and damp hollows in upland areas. Native to northern U.S.A. *Reed canary grass*; *langbeenkanariegras*, *rietkanariegras* (A); *lekolojane* (SS).




### *canariensis L.

Annual, up to 0.6 m high; tufted. **Culms** usually fascicled, erect or geniculately ascending. **Leaf blades** 100–260 × 3–12 mm. **Flowers**: panicle compact, spike-like, 15–40 × 10–15 mm; spikelets 7–8 mm long; glumes prominently winged, wing broadening upwards; female-fertile floret pilose; sterile florets 2, ± equal, 2.5–4.5 mm long, broad and somewhat chaffy; Oct.–Dec. Ruderals of disturbed areas such as waste places, road verges, cultivated lands and pastures. Possibly native to northwest Africa and the Canary Islands. *Birdseed grass*, *common canary grass*; *gewone kanariegras*, *kwarrelsaadgras* (A).




### *minor Retz.

Annual, up to 1 m high; loosely tufted. **Culms** erect or geniculately ascending. **Leaf blades** 50–250 × 5–10 mm. **Flowers**: panicle compact, spike-like, 20–50 × 10–15 mm; spikelets 4–6 mm long; glumes evenly winged, keel denticulate-undulate; female-fertile florets pilose; sterile floret 1, (0.2–0.3)1.0–1.8 mm long; Sep.–Jan. Disturbed areas such as cultivated and fallow lands, roadsides and waste places, often in damp situations. Native to Mediterranean region. *Small canary grass*; *kleinkanariegras* (A).




## **Phragmites** Adans. (sthn Afr.: 2 spp.)

### Key to species:

[after Moeaha in Fish *et al*.: 568 (2015)]

Upper glume 6–9 mm long; leaf deciduous at base of blade, leaving sheath behind on culm; callus hairs 6–10 mm long, acute; leaf blade tapering into a long filiform and flexible apex . . . . . **P. australis**

Upper glume 3–5 mm long, shortly acuminate; leaf deciduous at base of sheath, therefore old culm bare; callus hairs 4–7 mm long; leaf blade apex stiff and pungent . . . . . **P. mauritianus**

**australis** (Cav.) Steud.

*P. communis* Trin.

Perennial, up to 0.6–4.0 m high; long-rhizomatous. **Culms** robust, solitary, not tillering; leaves deciduous at base of blade, sheath persistent on culm. **Leaf blades** up to 35 × 35 mm, tapering into a long filiform and flexible apex; leaves cauline; ligule with fringing hairs equalling or longer than membranous base. **Flowers**: panicle compact, 120–400 mm long; spikelets 10–18 mm long; upper glume 6–9 mm long; lemmas glabrous; callus hairs 6–10 mm long; Dec.–Jun. Riverbeds and wet places. *Common reed*; *fluitjiesriet*, *vinkriet*, *vaderlandsriet* (A).

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**mauritianus** Kunth

Perennial, up to 5 m high; long-rhizomatous. **Culms** robust, tillering from lower nodes, leaves deciduous at base of sheath leaving culm bare. **Leaf blades** up to 30 × 30 mm, apex stiff and pungent; leaves cauline; ligule with fringing hairs equalling or longer than membranous base. **Flowers**: panicle open, lax, 200–400 mm long; spikelets 7–15 mm long; upper glume 3–5 mm long, shortly acuminate; lemmas glabrous; callus hairs 4–7 mm long; Jan.–Jun. Riverbeds. *Lowveld reed*; *laeveldfluitjiesriet*, *dekriet* (A); *rihlanga* (T).

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## **Poa** L. (sthn Afr.: 6 spp.)

### Key to species:

[after Fish in Fish *et al*.: 571 (2015)]

1a Plants annual or biennial; anthers 0.6–0.8(1.0) mm long; leaves flaccid; lemma keels, margins and lateral nerves usually densely hairy, occasionally glabrous or sparsely hairy . . . . . **P. annua**

1b Plants perennial; anthers (1.0)1.2–2.5 mm long; leaves firm; lemma keels and/or margins hairy . . . . . 2

2a Basal sheaths splitting into fibres; rhizomes oblique; lemmas sparsely long hairy near base or glabrous . . . . . **P. binata**

2b Basal sheaths usually not fibrous; rhizome long and wiry; lemma base densely hairy . . . . . **P. pratensis**

***annua** L.

Annual, sometimes biennial, up to 0.3 m high; loosely or compactly tufted. **Leaf blades** 20–50(–140) × 1–5 mm, flaccid. **Flowers**: panicle open, roughly pyramidal, 10–120 mm long; branches solitary or paired, spreading horizontally or almost so at maturity; spikelets 4–6 mm long; spikelets aggregated in upper half of branches, 3–5-flowered; lemma keels, margins and lateral nerves usually densely hairy, occasionally glabrous or sparsely hairy; anthers 0.6–0.8(1.0) mm long; Jul.–Jun. (usually rainy season). Damp places on roadsides, gardens and waste land or other disturbed areas. Native to Europe. *Annual blue grass*, *dwarf meadow grass*; *eenjarige-blougras*, *straatgras* (A); *joang-ba-lintja* (SS).

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**binata** Nees

Perennial, up to 0.6 m high; rhizome oblique, or tufted. **Leaf blades** 30–200 × 1–5 mm; leaves firm; basal sheaths splitting into fibres. **Flowers**: panicle open, ovate to pyramidal, 50–150 mm

long, branches solitary or binate, < their own length apart; spikelets 4–6 mm long; spikelets aggregated on upper half of branches, 3–5-flowered; lemma keels and margins sparsely long hairy from base to near middle (variable in same inflorescence) or glabrous; anthers 1.5–2.5 mm long; Sep.–May. Along mountains and escarpment in moist areas.

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### *pratensis L.

Perennial, up to 0.6 m high; loosely to compactly tufted or with long rhizome, stout and wiry or absent. **Leaf blades** 60–250 × 2–5 mm; upper ligules truncate, rounded to obtuse, up to 2(3) mm long; basal sheaths usually not fibrous. **Flowers**: panicle open, ovate, 50–200 mm long, lowest branches whorled; spikelets 3.0–5.5 mm long; spikelets 2–5-flowered, aggregated on upper part of branches; keels and margins densely hairy to middle, base with long fine woolly hairs; anthers 1.5–2.0 mm long; Sep.–Jan., Apr. Moist shady areas, usually in mountains. Native to Europe. *Kentucky blue grass*, *bulbous blue grass*; *wintergras* (A).

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## **Pogonarthria** Stapf (sthn Afr.: 3 spp.)

### **squarrosa** (Roem. & Schult.) Pilg.

Perennial, up to 1.4 m high; tufted or with a short rhizome. **Leaf blades** 40–330 × 2.0–5.5 mm; leaf sheaths glabrous. **Flowers**: in elongated, digitate racemes, usually falcately curved upwards; spikelets 3.3–7.8 mm long; spikelets 4–10-flowered; lower glume 0.8–1.5 mm long; upper glume 0.8–1.5 mm long; Nov.–May. Open veld or under trees, in light sandy soil, often in disturbed places. *Herringbone grass*, *sickle grass*; *pluimsekelgras* (A); *lefieloane* (SS); *lefheto* (T). Figure 86.

| | AcGr | DrGr | MsGr | KarSh | |
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## **Polevansia** De Winter (sthn Afr.: 1 sp.)

### **rigida** De Winter

Perennial, 0.10–0.41 m high; stoloniferous, mat-forming. **Leaf blades** 10–30 × 1.5–2.0 mm; leaf sheaths loose and overlapping. **Flowers**: panicle contracted, racemes appressed; spikelets 3.5–4.5 mm long, dorsally compressed, callus short, obtuse; glumes persistent, unequal, with a single thick central nerve; lemmas subcoriaceous, acute and not awned; Feb.–May. On lands worn out by traditional pastoralism or on rocky outcrops, often near water; alt. > 1 250 m.

| | | | MsGr | | |
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## **Polypogon** Desf. (sthn Afr.: 4 spp.)

### Key to species:

[after Moeaha in Fish *et al*.: 579 (2015)]

1a Glumes with conspicuous awn 4–8(–10) mm long . . . . . **P. monspeliensis**
1b Glumes not awned or rarely with short inconspicuous awns . . . . . 2




**Figure 86.** *Pogonarthria squarrosa* (Poaceae). Artist: W. Roux.

2a Spikelets 1.5–2.0 mm long; anthers 0.4–0.5 mm; glumes and lemma not awned; panicle ± open, branches ascending . . . . . **P. viridis**
2b Spikelets 1.0–1.4 mm long; anthers 0.25–0.30 mm; glumes sometimes with short awns; lemma apex with a short fine awn; panicle narrowly cylindrical, branches appressed . . . . . **P. griquensis**

**griquensis** (Stapf) Gibbs Russ. & L.Fish
*Agrostis griquensis* Stapf

Annual, up to 0.2 m high; tufted. **Leaf blades** up to 60 × 1.0–1.5 mm. **Flowers**: panicle compacted, narrowly cylindrical, dense, spike-like, branches appressed; spikelets 1.0–1.4 mm long; glumes scabrid on the back, margins minutely hairy, occasionally with short awns; lemma apex with a short fine awn; anthers 0.25–0.30 mm; Oct. Wet places.

DrGr

**monspeliensis** (L.) Desf.

Annual, up to 0.5 m high. **Leaf blades** 50–200 × 2–8 mm. **Flowers**: panicle compacted; spikelets 2–3 mm long, excluding awns; glume with conspicuous awns, awn spreading, 4–8(–10) mm long; lemmas not awned or with short awn up to 2.5 mm long; Sep.–Apr. Damp and disturbed places, often in brackish soils. Native to Europe and Asia. *Rabbit-foot grass*, *annual beard grass*; *brakbaardgras* (A).

VreDm AcGr DrGr KarSh

***viridis** (Gouan) Breistr.
*Agrostis semiverticillata* (Forssk.) C.Christ.
*P. semiverticillatus* (Forssk.) Hyl.

Annual, up to 0.6 m high. **Leaf blades** up to 150 × 7 mm. **Flowers**: panicle ± open, branches ascending; spikelets 1.5–2.0 mm long; glumes and lemmas not awned; anthers 0.4–0.5 mm; Sep.–Apr. Wet places, especially riverbanks. Native to southern Europe. *Water bent grass*.

DrGr

## **Puccinellia** Parl. (sthn Afr.: ± 4 spp.)

### Key to species:

[after Moeaha & Fish in Fish *et al*.: 586 (2015)]

Most lemmas with 5 prominent raised nerves. . . . . **P. angusta**
Most lemmas with nerves inconspicuous . . . . . **P. acroxantha**

**acroxantha** C.A.Sm. & C.E.Hubb.

Perennial, up to 0.6 m high; loosely tufted. **Culms** 2-noded, lowest leaf sheath dull, < 50 mm long, usually not overlapping and enclosing culm and lower part of panicle. **Leaf blades** 50–200 × 1–2 mm. **Flowers**: panicle contracted, linear, branches very slender; spikelets up to 3–5 × 1.5 mm; lemmas 2.0–2.5 mm long, nerves inconspicuous; Jan. Karoo-turf soil of varying salinity, in depressions periodically flushed with fresh water.

KarSh

**angusta** (Nees) C.A.Sm. & C.E.Hubb.

Perennial, up to 0.6 m high; densely tufted. **Culms** 1–noded; lowest leaf sheaths shining, > 50 mm long, overlapping and enclosing culms and lower part of panicle. **Leaf blades** 75–100(–300) × 1.0–1.5(–2.5) mm. **Flowers**: panicle contracted, linear, branches appressed, slender; spikelets 4.0–5.5 × 1.0–1.5 mm; lemmas 2.2–2.8 mm long, with 5 prominent raised nerves; Aug.–Oct. Disturbed areas on strongly saline moist soils. *Finch alkali grass*; *vinkbrakgras* (A).




## **Rendlia** Chiov. (sthn Afr.: 1 sp.)

**altera** (Rendle) Chiov.
*R. nelsonii* (Stapf) Chiov.

Perennial, up to 0.4 m high; tufted, cushion-like. **Leaf blades** 30–250 mm long, < 1.5 mm wide; leaf bases persistent and becoming fibrous with age. **Flowers**: inflorescence one-sided, spike a solitary toothbrush, 20–50 mm long; spikelets 4.0–5.5 mm long; glumes 2 × as long as florets; Sep.–May. Shallow humiferous or well-drained, sandy soils. *Mahem's crest*; *Mahemskuifgras*, *kleinrolblaargras* (A).




## **Schismus** P.Beauv. (sthn Afr.: 4 spp.)

**barbatus** (Loefl. ex L.) Thell.

Annual, up to 0.25 m high; tufted. **Leaf blades** up to 10–50 × 1.5 mm, rarely longer, involute. **Flowers**: panicle contracted, 10–50 mm long; spikelets 4–7 × 1.5 mm; spikelets 5–10-flowered, usually light green, sometimes purple, often long and narrowly lanceolate; glumes usually closed; lemma backs pubescent, hairs usually club-shaped, lobes obtuse, with or without a short (< 1 mm long) mucro arising from sinus; Jun.–Dec. Alluvial soils, disturbed sandy areas. *Winterhaasgras* (A).




## **Schmidtia** Steud. (sthn Afr.: 2 spp.)

**pappophoroides** Steud.
*S. bulbosa* Stapf

Perennial, up to 0.9 m high; stoloniferous, tufted, hairy to nearly glabrous. **Culm** bases swollen, clad by hairy cataphylls. **Leaf blades** 50–160 × 2–7 mm, tapering gradually to a long fine point. **Flowers**: panicle contracted, 60–120 mm long; spikelets 8–15 mm long; Jul.–Jun. (mostly summer). Open veld in a variety of soils and habitats. *Sand quick grass*; *Kalahari sandkweek*, *vaalgras*, *kalkkweek* (A).



## **Setaria** P.Beauv. (sthn Afr.: 18 spp.)

### Key to species:

[after Nembudani & Fish in Fish *et al*.: 614 (2015)]

1a Inflorescence not spike-like, open to contracted; bristles usually solitary. . . . . **S. lindenbergiana**
1b Inflorescence spike-like, cylindrical; bristles usually in clusters of up to 10 . . . . . 2
2a Culm nodes sparsely to densely hairy, rarely glabrous; upper glume (5)7–9(–11)-nerved . . . . . 3
2b Culm nodes glabrous; upper glume 3–7-nerved . . . . . 4
3a Basal sheaths straw coloured to light brown or reddish; rhizome not robust, mostly oblique; spikelets 2.5–3.0(–3.7) mm long; panicle tapering at apex . . . . . **S. incrassata**
3b Basal sheaths very dark brown; rhizomes very robust and branches far apart; spikelets 3.5–5.0 mm long; panicle cylindrical at apex . . . . . **S. nigrirostris**
4a Annual. . . . . 5
4b Perennial. . . . . 7
5a Bristles retrorsely barbed . . . . . **S. verticillata**
5b Bristles antrorsely barbed . . . . . 6
6a Spikelets persistent, upper floret reluctantly disarticulating at maturity; bristles 2–5; upper lemma smooth or rugulose; lower palea absent or very reduced. . . . . **S. italica**
6b Spikelets deciduous as a whole; bristles 6–10; upper lemma rugose to corrugate; lower palea as long as lemma. . . . . **S. pumila**
7a Leaf blade 3–10 mm wide; culm 3–6 mm in diameter . . . . . **S. sphacelata** var. **sericea**
7b Leaf blade 1–4(6) mm wide; culm 1–3 mm in diameter . . . . . 8
8a Bristles mostly pale, dark purple or darkening only towards apices; inflorescence usually 25–45 mm long . . . . . **S. sphacelata** var. **torta**
8b Bristles golden-yellow or reddish brown; inflorescence usually 30–150 mm long . . . . . **S. sphacelata** var. **sphacelata**

### **incrassata** (Hochst.) Hack.

*S. perberbis* De Wit
*S. woodii* Hack. complex

Perennial, up to 2 m high; with oblique creeping rhizome and tufted. **Culm** nodes hairy. **Leaf blades** 150–600 × 3–14 mm; basal sheaths straw coloured to light brown or reddish. **Flowers**: panicle spike-like, tapering at apex, often interrupted in lower part; spikelets 2.5–3.0(–3.7) mm long; bristles several; upper glume (5)7–9(–11)-nerved; Oct.–May. Black clay in moist areas such as swamps and vleis, but also on streambanks, forest margins and rocky hillsides.

DrGr KarSh

### ***italica** (L.) P.Beauv.

Annual, up to 1.5 m high; solitary to densely tufted. **Culm** nodes glabrous; leaves mainly cauline. **Leaf blades** 150–450 × 6–20 mm. **Flowers**: panicle spike-like, 8–24 mm wide; spikelets 2.0–3.5 mm long, lower floret persistent, upper floret reluctantly disarticulating at maturity; bristles 2–5, antrorsely barbed; lower glume 3-nerved; upper glume 5–7-nerved; upper lemma smooth or rugulose; lower palea absent or very reduced; Jan.–Apr. In gardens or cultivation and other disturbed areas. Native to Asia. *Common millet*, *foxtail millet*; *mannakoring*, *witmanna*, *rooimanna*, *geelboermanna* (A); *joang-ba-lipere* (SS).

DrGr

**lindenbergiana** (Nees) Stapf

*S. phillipsii* De Wit

Perennial, up to 1.2 m high; rhizomes short and creeping, or densely tufted. **Culm** nodes glabrous. **Leaf blades** 100–450 × 1.5–7.0(–10.0) mm, linear, finely plicate, flat or inrolled. **Flowers**: panicle open or loosely contracted; spikelets 2.0–3.5 mm long; bristles solitary; lower glume 3-nerved; lower lemma rugose; Oct.–May. Usually in crevices on rocky or stony hillsides, but also in open woodland and forests. *Tussock grass*, *mountain bristle grass*; *koppiesbuffelgras*, *randjiesgras*, *bergsetaria* (A).

KarSh

**nigrirostris** (Nees) T.Durand & Schinz

Perennial, up to 1.2 m high; rhizome very well developed and much branched, or tufted with few, basal leaves. **Culm** nodes hairy; basal sheaths very robust and dark brown. **Leaf blades** 100–550 × 4–10 mm. **Flowers**: panicle spike-like, usually cylindrical at apex; spikelets 3.5–5.0 mm long; spikelets with distinct dark apices; upper glume (5)7–9(–11)-nerved; Oct.–Apr. Black turf in open grassland or on riverbanks. *Large seed setaria*; *swartsaadmannagras*, *grootsaad setaria* (A).

DrGr MsGr

**pumila** (Poir.) Roem. & Schult.

*S. pallide-fusca* (Schumach.) Stapf & C.E.Hubb.

Annual, up to 0.9 m high; loosely tufted. **Culm** nodes glabrous. **Leaf blades** 45–170 × 5–9 mm. **Flowers**: panicle cylindrical, spike-like, normally 10 × longer than wide; spikelets 2.0–2.8 mm long, deciduous as a whole; spikelets subtended by 6–10 bristles, bristles antrorsely barbed, often bright yellow but sometimes dark purple-brown; lower glume 3-nerved; upper glume 3–7-nerved; upper lemma rugose to corrugate; lower lemma very finely rugose; lower palea as long as lemma; Dec.–Apr. Damp soils in disturbed weedy places and cultivation. *Water setaria*, *garden bristle grass*; *tuin-setaria*, *rooiborselsaadgras* (A); *lehola-la-lipere* (SS).

VreDm DrGr MsGr KarSh

**sphacelata** (Schumach.) Moss var. **sericea** (Stapf) Clayton

Perennial, up to 2 m high; shortly rhizomatous and tufted. **Culms** 4–10-noded, 3–6 mm in diameter, nodes glabrous. **Leaf blades** 100–500 × 3–10 mm; basal sheaths glabrous, or densely to sparsely pubescent, often flabellate. **Flowers**: panicle spike-like, 70–250 mm long; spikelets 1.5–3.5 mm long; bristles golden-yellow to reddish brown; lower glume 3-nerved; upper glume 3–7-nerved; lower lemma rugose; Oct.–Jun. Wide range of habitats ranging from riversides and swampy areas to rocky hillsides.

VreDm DrGr MsGr

**sphacelata** (Schumach.) Moss var. **sphacelata**

Perennial, up to 1 m high; fairly robust, shortly or obliquely rhizomatous, tufted. **Culms** 2–4 noded, 1–3 mm in diameter, nodes glabrous. **Leaf blades** 100–350 × 2–5 mm; sheaths and leaves glabrous, sparsely or densely hairy. **Flowers**: panicle spike-like, 30–150 mm long; spikelets 1.5–3.5 mm long; bristles golden-yellow to reddish brown; lower glume 3-nerved; upper glume 3–7-nerved; lemmas rugose; Oct.–Jun. Wide range of habitats ranging from streamsides and moist places to rocky hillsides, usually on well-drained soils. *Golden Timothy*,

*common bristle grass*, *golden millet*; *gouemannagras*, *gewone-setaria*, *katstertmannagras* (A); *ikununu* (Z).

AcGr | DrGr | MsGr

### **sphacelata** (Schumach.) Moss var. **torta** (Stapf) Clayton

Perennial, up to 0.5 m high; shortly rhizomatous, tufted. **Culms** 1–3 mm in diameter, nodes glabrous; occasionally flat and rooting at nodes. **Leaf blades** 100–300 × 1–3 mm, mostly folded or inrolled; most leaves basal; basal sheaths usually strongly keeled, flabellate, old leaves curly. **Flowers**: panicle spike-like, 25–45 mm long; spikelets 2.5–3.0 mm long; bristles 7–15 per spikelet cluster, usually dark purple-brown but occasionally yellowish; lower glume 3-nerved; lemmas rugose; Sep.–Mar. On rocky outcrops, hillsides, open woods and grassland on well-drained soils. *Creeping foxtail*; *kleinkruipmannagras*, *buffelgras* (A).

VreDm | AcGr | DrGr | MsGr | KarSh | Zastr

### **verticillata** (L.) P.Beauv.

Annual, up to 1 m high; loosely tufted. **Culms** often sprawling. **Leaf blades** 50–300 × 6–22 mm. **Flowers**: panicle spike-like, often shortly branched and interrupted in lower part, 20–150 mm long; spikelets 1.5–2.5 mm long; bristles retrorsely barbed, often entangled; lower glume 1-nerved; upper glume 3–5-nerved; Dec.–May. Ruderal in disturbed areas, cultivation, cattle kraals and along paths, often in damp, shady places. *Bur bristle grass*, *love grass*, *cat's tail*; *steekgras*, *katstertgras*, *klitssetaria* (A).

VreDm | DrGr | KarSh

## **Sorghum** Moench (sthn Afr.: 3 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 630 (2015)]

1a Perennial, rhizomes long; lower glume appressed pubescent . . . . . .**S. halepense**

1b Annual or short-lived perennial, rhizomes absent; lower glume densely to sparsely hairy or glabrous at maturity . . . . . 2

2a Leaf blade < 15 mm wide; raceme branches tardily disarticulating; pedicellate spikelets persistent . . . . . .**S. bicolor** subsp**. drummondii**

2b Leaf blade > 20 mm wide; racemes readily disarticulating; pedicellate spikelets deciduous . . . . . .**S. bicolor** subsp. **arundinaceum**

### **bicolor** (L.) Moench subsp. **arundinaceum** (Desv.) de Wet & Harlan

*S. verticilliflorum* (Steud.) Stapf

Annual or short-lived perennial, up to 2.5 m high; rhizome absent. **Leaf blades** 20–30 mm wide. **Flowers**: panicle open; sessile spikelets 5–7 mm long, pedicellate spikelets 5–7 mm long, deciduous; racemes readily disarticulating; lower glume densely to sparsely hairy, at maturity glossy and often almost glabrous. Disturbed places. *Common wild sorghum*; *wilde graansorghum* (A).

AcGr

**bicolor** (L.) Moench subsp. **drummondii** (Steud.) de Wet
*S. sudanense* (Piper) Stapf

Annual, up to 3 m high; rhizome absent. **Leaf blades** 8–15 mm wide. **Flowers**: panicle compact; sessile spikelets 6–7 mm long, pedicellate spikelets 6–7 mm long, persistent; raceme branches tardily disarticulating; lower glume sparsely hairy, glossy at maturity, often almost glabrous. Disturbed places. Weedy derivative of hybridisation between the crop plant *S. bicolor* subsp. *bicolor* and the presumed wild progenitor *S. bicolor* subsp. *arundinaceum*. *Shatter cane*, *Sudan grass*, *wild-grain sorghum*; *besemkoring* (A); *imfe* (Z).

DrGr | MsGr

***halepense** (L.) Pers.
*S. almum* Parodi

Perennial, up to 2.5 m high; usually strongly long-rhizomatous. **Leaf blades** 10–30 mm wide. **Flowers**: panicle open; sessile spikelets 4.0–5.5(–7.0) mm long, pedicellate spikelets longer; lower glume appressed pubescent; Dec.–May (occasionally at other times). In disturbed places. Native to Mediterranean region. *Egyptian millet*, *Johnson grass*.

AcGr | DrGr | MsGr | KarSh | Zastr

## **Sporobolus** R.Br. (sthn Afr.: 38 spp.)

### Key to species:

[after Mashau: & Fish in Fish *et al*.: 636 (2015)]

1a Inflorescence with primary branches in whorls, or at least lowermost branches in a single whorl . . . . . 2
1b Inflorescence with primary branches not whorled . . . . . 7
2a Plant < 0.18 m high at maturity; leaf blades 10–30 × 2–5 mm, margins with stiff spreading hairs; leaves in a basal rosette; culm 1-noded; spikelets pendulous at maturity; caryopsis discoid; lower glume 1/2 as long as spikelet . . . . . **S. discosporus**
2b Plant with characters not in above combination . . . . . 3
3a Plants annual . . . . . **S. coromandelianus**
3b Plants perennial . . . . . 4
4a Lower glume 1/2–3/4 as long as spikelet . . . . . **S. centrifugus**
4b Lower glume < 1/2 as long as spikelet . . . . . 5
5a Leaf blade rigid, < 30 mm long; rhizomes with very short internodes, creeping horizontally and branching profusely . . . . . **S. ludwigii**
5b Leaf blade not rigid, > 30 mm long; rhizome not horizontally creeping or profusely branched . . . . . 6
6a Basal leaf sheath yellow, hard, glossy and brittle; culm erect; plant seldom stoloniferous; leaf blades < 3 mm wide, often inrolled, 30–140 mm long . . . . . **S. rangei**
6b Basal leaf sheath dull and papery; culm geniculate; plant usually stoloniferous; leaf blades flat, > 3 mm wide, 20–300 mm long . . . . . **S. ioclados**
7a Inflorescence branches not dichotomous; spikelets borne along entire length of branchlets . . . . . 8
7b Inflorescence branches dichotomous to subdichotomous; spikelets at apices of branchlets . . . . . 15
8a Inflorescence narrow, spike-like . . . . . 9

8b Inflorescence linear to open, not spike-like . . . . . 10
9a Leaf blade > 200 mm long; upper glume 1/2 as long as spikelet; spikelets very dense on inflorescence . . . . . **S. africanus**
9b Leaf blade < 200 mm long; upper glume 2/3 as long as spikelet; spikelets somewhat loose on inflorescence . . . . . **S. albicans**
10a Inflorescence pyramidal or ovate, open, not > 3 × longer than wide . . . . .11
10b Inflorescence linear, open or contracted, > 5 × longer than wide. . . . . 14
11a Upper glume 1/2–2/3 as long as spikelet; old leaf sheaths splitting into fibres with age; rhizomes absent. . . . . **S. festivus**
11b Upper glume 2/3–4/5 as long as spikelet; old leaf sheaths not splitting into fibres; rhizomes present . . . . . 12
12a Lemma apex subobtuse; lower glume 1/2 as long as spikelet . . . . **S. tenellus**
12b Lemma apex acute; lower glume 1/2–2/3 as long as spikelet . . . . . 13
13a Glumes keeled along whole length or at apices only, keel scabrid; rhizome long, deeply buried; leaves rigid. . . . . **S. oxyphyllus**
13b Glumes not keeled; rhizome compact with short internodes, creeping horizontally at ground level; leaves fine and curly. . . . . **S. nervosus**
14a Inflorescence ± contracted, primary branches hardly spreading, spikelets very densely clustered on relatively short primary branches; caryopsis 1.1–1.2 mm long . . . . . **S. africanus**
14b Inflorescence open, primary branches spreading, spikelets not densely clustered; caryopsis up to 1 mm long. . . . . **S. fimbriatus**
15a Inflorescence branches with long, stiff hyaline hairs in all or at least some axils (2–15 hairs per axil) . . . . . **S. conrathii**
15b Inflorescence branches lacking hairs in axils. . . . . 16
16a Basal leaf sheaths splitting into fibres at maturity . . . . . **S. festivus**
16b Basal leaf sheaths not splitting into fibres . . . . . 17
17a Plants annual; leaf blades not setaceous, 2–5 mm wide. . . . . **S. engleri**
17b Plants perennial; leaf blades setaceous or up to 3 mm wide . . . . . 18
18a Leaf blades < 35 mm long, broadly obtuse, margins not white cartilaginous, apex rounded; leaves mostly basal, with cauline leaves much shorter than basal ones . . . . . **S. tenellus**
18b Leaf blades 40–120 mm long, broadly triangular, margins conspicuously white cartilaginous, tapering to a fine point; leaves basal and cauline, with cauline leaves usually much longer than basal ones . . . . . **S. acinifolius**

## **acinifolius** Stapf

Perennial, up to 0.4 m high; mat-forming, rhizome long and much branched. **Leaf blades** 40–120 × 3 mm, broadly triangular, tapering to a fine point; cauline leaves usually much longer than basal leaves. **Flowers**: panicle dichotomously branched, axils without hairs; spikelets 1–2 mm long, solitary on branchlet apices; Feb.–May. Brackish calcareous soil in pans or at edge of water. *Limestone dropseed*; *kalkgras* (A).

DrGr

## **africanus** (Poir.) Robyns & Tournay

*S. capensis* (Willd.) Kunth

Perennial, up to 1.5 m high; rhizomatous, tufted. **Leaf blades** 200–400 × 1–4 mm. **Flowers**: panicle dense, not whorled, almost spike-like, branches relatively short and rigid, central axis usually visible; spikelets 2.0–2.8 mm long; lower glume 1/4–1/2 spikelet length; upper glume 1/2 spikelet length; caryopsis ellipsoid, 1.1–1.2 mm long; Oct.–Apr. Mainly in disturbed places and along streams. *Tough dropseed*, *ratstail grass*; *taaipol*, *rotstert* (A); *matshiki* (?).

DrGr MsGr

**albicans** (Nees ex Trin.) Nees

Perennial, up to 0.36 m high; mat-forming, rhizomatous. **Leaf blades** 5–12 × 1 mm. **Flowers**: inflorescence 25–30 mm wide, spike-like, spikelets not densely clustered to hide central axis; spikelets 2.0–2.5 mm long; upper glume $^{2}/_{3}$ as long as spikelet; glumes and lemmas membranous, pale yellow; Feb.–Apr. Limestone pans or dried up depressions.

DrGr | KarSh

**centrifugus** (Trin.) Nees

*S. schlechteri* Schweick.

Perennial, up to 0.9 m high; rhizome sometimes long and creeping. **Leaf blades** 60–300 × 1.0–1.5 mm, filiform; basal sheaths hard, brittle, glossy, yellow or brown. **Flowers**: panicle contracted and unobtrusively whorled; spikelets in lowest whorl often sterile and disarticulating at maturity; spikelets 2.5–4.2 mm long; lower glume slightly shorter than spikelet; upper glume longer than spikelet; Oct.–Apr. High mountainveld or Highveld on humiferous, well-drained soils. *Olive dropseed*; *blousaadgras* (A).

MsGr

**conrathii** Chiov.

Perennial, up to 0.48 m high; tufted, base fibrous. **Leaf blades** 100–180 × 1.0–1.5 mm. **Flowers**: panicle dichotomously branched with long, stiff, hyaline hairs in axils; spikelets 1.5–1.9 mm long, at apices of branchlets; glumes ± equal, $^{1}/_{3}$–$^{1}/_{2}$ spikelet length; Dec.–Mar. Shallow soil on rocky slopes or outcrops.

DrGr

**coromandelianus** (Retz.) Kunth

Annual, up to 0.34 m high; tufted. **Leaf blades** 20–100 × 2–4 mm. **Flowers**: panicle with lowest branches in a single whorl; central axis and branches with viscid patches > 3 × longer than wide; spikelets 1.0–1.5 mm long; lower glume oblong, 0.1–0.5 mm long, < $^{1}/_{3}$ spikelet length; upper glume as long as spikelet; Feb.–Apr. In or near brackish pans, usually on fine clayey soil. *Small dropseed*.

AcGr | DrGr | KarSh

**discosporus** Nees

Perennial or annual, up to 0.18 m high; shortly rhizomatous or tufted. **Leaf blades** 10–30 × 2–5 mm, short and broad, in a basal rosette, margins pectinately ciliate. **Flowers**: panicle open, whorled; spikelets 1.0–1.7 mm long, pendulous at maturity; panicle whorled; lower glume $^{1}/_{2}$ as long as spikelet; caryopsis discoid; Nov.–May. Sandy depressions on cave sandstone or on exposed bedrock; often on clayey soil in bare patches or wet areas. *Farthing grass*, *disc dropseed*; *oortjiesgras* (A).

VreDm | DrGr | MsGr | KarSh | Zastr

**engleri** Pilg.

Annual, up to 0.6 m high; tufted. **Leaf blades** 40–150 × 2–5 mm, flat, basal leaf sheaths not splitting into fibres. **Flowers**: panicle dichotomously branched, without hairs in axils; spikelets

1.0–1.5 mm long, solitary at branchlet apices; Mar.–May. Deep sand on dunes and in dry riverbeds, also on rocky soil and often in shady places.

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**festivus** Hochst. ex A.Rich.

Perennial, up to 0.55 m high; tufted, rhizome absent. **Leaf blades** 20–70 × 1–2 mm; old leaf sheaths splitting into fibres, lacking woolly hairs between them. **Flowers**: panicle dichotomously or not dichotomously branched, without hairs in axils; spikelets 0.8–1.5 mm long; upper glume $^{1}/_{2}$–$^{2}/_{3}$ as long as spikelet; Dec.–May. Exposed bedrock in sand filled depressions, also in vleis, on pan edges and in mopane woodland. *Rooigras* (A).

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**fimbriatus** (Trin.) Nees

*S. fimbriatus* (Trin.) Nees var. *latifolius* Stent

Perennial, up to 1.6 m high; densely tufted and rhizome characteristically oblique. **Leaf blades** up to 300 × 2–4 mm. **Flowers**: panicle fairly dense, open, branches many, not whorled and not spreading > 60°; spikelets 1.4–2.2 mm long; lower glume $^{1}/_{4}$–$^{3}/_{4}$ spikelet length; upper glume ± $^{2}/_{3}$ spikelet length; Dec.–May; caryopsis up to 1 mm long. Sandy well-drained loam near water, often in disturbed areas or in shady spots. *Common dropseed*; *blousaadgras*, *soetvleigras* (A); *matolo–a–maholo* (SS).

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| | AcGr | DrGr | MsGr | KarSh | Zastr |

**ioclados** (Trin.) Nees

*S. marginatus* Hochst. ex A.Rich.

*S. smutsii* Stent

Perennial, up to 1 m high; often mat-forming, rhizomatous and stoloniferous. **Leaf blades** 20–300 × (2)3–12 mm, flat; basal leaf sheaths dull, papery. **Flowers**: panicle whorled; spikelets 1.5–2.5 mm long; lower glume $^{1}/_{4}$–$^{1}/_{3}$ spikelet length; upper glume as long as, or longer than spikelet; Jan.–Apr. Variety of soil types, including black turf and sand, often in disturbed places. *Blousaadgras*, *fynsaadgras* (A).

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**ludwigii** Hochst.

Perennial, up to 0.45 m high; mat-forming, rhizome long, with very short internodes, creeping and profusely branched. **Leaf blades** 10–30 × 2–3 mm, rigid, margins not ciliate. **Flowers**: panicle whorled; spikelets 1.5–2.0 mm long; lower glume $^{1}/_{3}$ spikelet length; upper glume as long as spikelet; Jan.–May. Fine, damp calcareous soils in vleis or near pans. *Brakvleigras*, *krulgras*, *kolgras* (A).

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**nervosus** Hochst.

Perennial, up to 0.5 m high; rhizomes compact with short internodes, creeping horizontally at ground level. **Leaf blades** 40–100 × 1–3 mm; leaves fine and curly; old leaf sheaths not splitting into fibres. **Flowers**: panicle not whorled, pyramidal to ovate, not > 3× longer than

wide; spikelets 1.7–2.4 mm long; spikelets loosely grouped at branchlet apices; glumes not keeled, lower glume 1/2–2/3 spikelet length, upper glume 3/4–4/5 spikelet length; Feb.–May. On flats or in moist depressions in sandy red soil, limestone or shale. Locally common.

KarSh

### **oxyphyllus** L.Fish

Perennial, up to 0.3 m high; mat-forming rhizome long, deeply buried. **Leaf blade** 20–100 × 3.0–4.5 mm, mostly inrolled, rigid; old leaf sheaths not splitting into fibres. **Flowers**: inflorescence ovate, branches not whorled, < 3 × longer than wide; spikelets 1.8–2.9 mm long; glumes unequal, usually keeled along whole length or at least at apex, keel scabrid; lower glume 2/3 to slightly shorter than spikelet; upper glume 3/4 to slightly longer than spikelet; lemmas ovate-elliptic, apex acute; Nov.–Apr. Brackish soils, in or near salt pans.

DrGr KarSh

### **rangei** Pilg.

Perennial, up to 0.46 m high; usually robust, rhizome usually horizontal, or seldom stoloniferous. **Leaf blades** 30–140 mm long, setaceous or up to 3 mm wide, often inrolled; basal leaf sheaths yellow, hard, glossy and brittle. **Flowers**: panicle with lowest branches whorled; spikelets 1.7–2.7 mm long; lower glume < 1/2 spikelet length; upper glume as long as spikelet; Nov.–Mar. Calcareous sandy soil in shallow pans or near watercourses.

AcGr

### **tenellus** (Spreng.) Kunth

Perennial, up to 0.3 m high; mat-forming, rhizome long and profusely branched. **Leaf blades** 5–35 × 1–3 mm, broadly obtuse, apex rounded; leaves mostly basal, cauline ones much shorter, old leaf sheaths not splitting into fibres. **Flowers**: panicle dichotomously branched with spikelets solitary at branch apices; spikelets 1.5–1.8 mm long; lower glume 1/2 as long as spikelet; upper glume 2/3 as long as spikelet; lemma apex subobtuse; Nov.–Apr. Shallow soils at pan edges or in moist depressions. *Pankweek* (A).

AcGr DrGr KarSh

## **Stiburus** Stapf (sthn Afr.: 2 spp.)

### Key to species:

[after Moeaha & Fish in Fish *et al*.: 661 (2015)]

Glumes and lemmas acuminate; inflorescence dark purple to black; spikelets 2.7–4.5 mm long . . . . . **S. alopecuroides**
Glumes and lemmas acute; inflorescence usually light purple to yellow; spikelets 1.7–3.0 mm long . . . . . **S. conrathii**

### **alopecuroides** (Hack.) Stapf

Perennial, up to 0.63 m high; rhizomatous and tufted. **Leaf blades** 90–360 × 2 mm. **Flowers**: panicle compact, rarely overtopping leaves; spikelets 2.7–4.5 mm long; glumes and lemmas

very densely hairy, dark purple to black, apices acuminate; Feb.–May. Open veld, mostly sourveld, at fairly high altitudes, in fertile soil and wet areas. *Pongwa grass*; *koperdraadgras* (A).

MsGr

**conrathii** Hack.

Perennial, up to 0.4 m high; rhizomatous and tufted. **Leaf blades** 30–100 mm long. **Flowers**: panicle compact, overtopping leaves; spikelets 1.7–3.0 mm long; glumes and lemmas hairy, light purple to yellow, apices acute; Aug.–Dec. Damp or wet areas in mountain sourveld.

DrGr MsGr

## **Stipa** L. (sthn Afr.: 7 spp.)

**dregeana** Steud. var. **elongata** (Nees) Stapf

Perennial, up to 1.2 m high; tufted and with short, knotted rhizomes. **Leaf blades** up to 60 × 12 mm. **Flowers**: panicle open; spikelets 5–7 mm long, excluding straight or bent and twisted awn up to 18 mm long; glumes equal, longer than lemmas; panicle open, branches slender, up to 200 mm long, spreading, drooping, with spikelets in upper half only; Aug.–May (mostly in summer). Moist places in forests.

DrGr MsGr

## **Stipagrostis** Nees (sthn Afr.: 27 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 666 (2015)]

| | | |
|---|---|---|
| 1a | Lemma articulation absent | **S. zeyheri** subsp. **sericans** |
| 1b | Lemma articulation present | 2 |
| 2a | Callus minutely bifid | **S. obtusa** |
| 2b | Callus never bifid | 3 |
| 3a | All 3 awns distinctly plumose with long hairs | 4 |
| 3b | Only central awn distinctly plumose | 6 |
| 4a | Lemma articulation near apex of lemma | **S. zeyheri** subsp. **sericans** |
| 4b | Lemma articulation near middle of lemma | 5 |
| 5a | Spikelets up to 14 mm long, including awns; upper glume 7–9 mm long | **S. proxima** |
| 5b | Spikelets 15–30 mm long, including awns; upper glume 10–14 mm long | **S. namaquensis** |
| 6a | Lemma articulation at or just above middle of lemma body | **S. ciliata** var**. capensis** |
| 6b | Lemma articulation at lemma apex | 7 |
| 7a | Glumes with obvious, long hairs, sometimes only along margins | **S. uniplumis** var**. uniplumis** |
| 7b | Glumes puberulous, scabrid or glabrous | 8 |
| 8a | Branching point of awns and a short distance down the column glabrous, scabrid or with hairs < 1.5 mm long | **S. obtusa** |
| 8b | Branching point of awns and a short distance down the column with a dense tuft of hairs > 1.5 mm long | 9 |

9a Inflorescence with many spikelets; glumes usually < 10 mm long; lemma central awn usually straight. . . . . **S. uniplumis** var. **uniplumis**
9b Inflorescence with a few spikelets; glumes > 10 mm; lemma central awn bent at right angles. . . . . **S. uniplumis** var. **neesii**

### **ciliata** (Desf.) De Winter var. **capensis** (Trin. & Rupr.) De Winter

Perennial, up to 1 m high; densely or laxly tufted. **Culms** erect or occasionally geniculate, nodes with long stiff spreading hairs; sheaths hairy but not woolly, or glabrous. **Leaf blades** up to 300 × 1.5 mm; leaves mainly basal. **Flowers**: panicle contracted or open, branches flexuous; spikelets 6.5–12 mm long, excluding awns, variable in size, straw-coloured, often purple at base; glumes equal to subequal, lower glume oblong to narrowly oblong, apex obtuse to truncate, firm; articulation ± in middle of lemma; column length variable; only central awn plumose, hairs usually silvery, occasionally golden; callus 2.0–2.5 mm long, with pungent, naked apex; Aug.–Oct., Feb.– Jun. Coarse sandy soils, especially in riverbeds or on gravel plains. *Tall bushman grass*; *langbeenboesmangras*, *growwe twa* (A).

KarSh

### **namaquensis** (Nees) De Winter

Perennial, robust to slender shrub or dwarf shrub, up to 2 m high; rhizomes long and strong, or densely tufted; plants glabrous and smooth, except for upper and basal leaf sheaths, which are appressed woolly hairy. **Culms** sprawling to erect, branches usually fascicled from nodes, rarely solitary. **Leaf blades** 60–100 mm long, setaceous, break off early, leaving sheaths, and exposing upper part of internode, which is usually dark, with characteristic banded appearance. **Flowers**: panicle elongate, contracted, interrupted, with spikelets clustered; spikelets 15–30 mm long, including awns; glumes straw-coloured; upper glume 10–14 mm long; lemma articulation at ± middle of lemma, a short, twisted beak present; all 3 awns plumose; callus 1.5 mm long, with naked, pungent apex; Feb.–May, Jul.–Dec. Dry river courses, on loose gravelly soils, rarely on sand dunes. *River bushman grass*; *steekriet boesmangras* (A).

KarSh

### **obtusa** (Delile) Nees

Perennial, up to 0.6 m high; compact and densely tufted. **Leaf blades** 10–250 × 1 mm; leaves markedly basal, often curved, glabrous or with scattered, long, bulbous-based hairs; basal sheaths glabrous or hairy, but not with densely matted woolly hairs. **Flowers**: inflorescence usually contracted, interrupted, much branched, branches bearing spikelets to near base; spikelets 11–12 mm long, excluding awns; glumes pallid, firm, with membranous apices and margins, glabrous, scabrid; lemma articulation between apex of lemma and base of column, column length variable, scabrid to and at branching point of awns; only central awn plumose; callus 1.5 mm long, with a naked apex varying from pungent to minutely bifid; Jul.–May. Mainly sandy soils in dry areas. *Kortbeenboesmangras*, *fyn twa* (A). Figure 87.

KarSh

### **proxima** (Steud.) De Winter

Perennial, shrub or dwarf shrub, up to 0.6 m high; long rhizomatous, tufted, culms and leaves with dense appressed hairs in grooves, hairs becoming more dense, longer and more obvious below nodes. **Culms** erect. **Leaf blades** up to 100 mm long, usually less, setaceous, rolled. **Flowers**: inflorescence contracted, branches densely hairy, hairs longer and thicker on swollen part just below spikelet; spikelets up to 14 mm long, including awns; glumes firm, acute; upper glume 7–9 mm long; lemma articulation in ± middle of lemma; column short and stout; all 3

awns plumose down to branching point and just below on column; callus 1.5–2.0 mm long, narrow, very short pungent apex; Nov. Sandy soils in disturbed areas.

KarSh

**uniplumis** (Licht.) De Winter var. **neesii** (Trin. & Rupr.) De Winter
*Aristida uniplumis* Licht. var. *neesii* Trin. & Rupr.

Perennial, up to 0.9 m high; laxly tufted, or with short and branched rhizomes. **Culms** erect. **Leaves** mainly basal, with blades up to 160 mm long, setaceous. **Flowers**: inflorescence contracted with few spikelets; glumes > 10 mm long, glabrous; spikelets 10.0–14.5 mm long, excluding awns; lemmas tuberculate just below articulation point, articulation between apex of lemma and base of column; column well developed and plumed in upper half of its length, with hairs > 1.5 mm long; only central awn plumose, usually hairy to branching point but not apex, diverging at right angles from column; callus 1.0–1.5 mm long, with short hairs along entire length and long hairs at junction of lemma and callus, with a pungent, naked apex; Dec.–May. Mainly gravel soils, sometimes sandy soils on dolomite or over surface limestone, and rocky slopes.

AcGr DrGr KarSh



**Figure 87.** *Stipagrostis obtusa* (Poaceae).

**uniplumis** (Licht.) De Winter var. **uniplumis**

*Aristida uniplumis* Licht. var. *pearsonii* Henrard

*A. uniplumis* Licht. var. *uniplumis*

Perennial or a short-lived perennial, up to 0.9 m high; densely to laxly tufted. **Culms** erect to geniculate, simple or branched well above base. **Leaf blades** up to 200 mm long, setaceous, up to 2 mm wide; leaves mainly basal. **Flowers**: inflorescence contracted or effuse with many spikelets; spikelets 8–10 mm long, excluding awns; glumes usually < 10 mm long, glabrous or long hairy, if hairy, hairs dense or sparsely scattered but at least always present on margins; lemmas tuberculate around point of articulation, articulation between apex of lemma and base of column; column well developed, plumed in upper half, with hairs > 1.5 mm long; only central awn plumose with hairs occurring up to $^1/_3$ above or down to branching point of awns, apex without hairs; callus 0.5–1.2 mm long, with short hairs along entire length and long hairs at junction of lemma and callus, with pungent, naked apex; Dec.–May. Sandy soils and disturbed areas and floodplains. *Bushman grass*; *blinksaadgras*, *beesgras* (A).

AcGr DrGr KarSh

**zeyheri** (Nees) De Winter subsp. **sericans** (Hack.) De Winter

*Aristida capensis* Thunb. var. *dieterleniana* Schweick.

*A. sericans* Hack. *apud* Schinz

Perennial, up to 0.75 m high; robust, densely tufted. **Culms** erect, 1.2–5.0 mm wide. **Leaf blades** up to 300 mm long, setaceous, rolled. **Flowers**: inflorescence extending well above leaves, usually contracted, never effuse, with few spikelets; spikelets up to 14 mm long, excluding awns; glumes pallid, long hairy; lemma articulation at apex of lemma or absent; column stout, with long hairs for some distance below branching point; all 3 awns plumose to branching point of awns, excurrent into a naked apex; callus 1.0–1.5 mm long, naked, with a pungent apex; Jan.–May. Sandy soils on rocky outcrops and disturbed areas such as old lands. *Cape bushman grass*. Figure 88.

DrGr MsGr

## **Tarigidia** Stent (sthn Afr.: 1 sp.)

**aequiglumis** (Gooss.) Stent

Perennial, up to 1.5 m high; densely tufted. **Leaf blades** up to 350 × 3–5 mm. **Flowers**: panicle contracted, spike-like or narrowly conical, with short branches appressed or somewhat spreading below; spikelets 4.0–4.5 mm long; spikelets woolly; glumes equal, ± $^2/_3$ of spikelet length; Jan.–May. Open veld or among rocks.

DrGr

## **Tenaxia** N.P.Barker & H.P.Linder (sthn Afr.: 5 spp.)

### Key to species:

[after Fish & Mashau in Fish *et al*.: 693 (2015)]

Inflorescence a spike-like panicle, spikelets distichous. . . . . **T. disticha**
Inflorescence an open or contracted panicle, spikelets not distichous . . . . . **T. stricta**




**Figure 88.** *Stipagrostis zeyheri* subsp. *sericans* (Poaceae). Artist: W. Roux.

**disticha** (Nees) N.P.Barker & H.P.Linder
*Danthonia disticha* Nees
*Merxmuellera disticha* (Nees) Conert

Perennial, 0.7 m high; tufted. **Leaf blades** up to 100–500 × 3.5 mm. **Flowers**: panicle spike-like, distichous, 20–100 mm long; spikelets up to 18 × 3 mm, including awns, 2(–5)-flowered; glumes 9–20 mm long, 1–3-nerved; lemmas 10–15 mm long, including 7–9 mm long lobes which attenuate into a long bristle; lemmas fringed along margins with tuft of white hairs each side near base; central awn geniculate, 10–16 mm long; Oct.–May. Variety of habitats, from coastal regions to high altitude montane bogs. *Wiry danthonia*; *koperdraadgras*, *suurpol* (A).

MsGr Zastr

**stricta** (Schrad.) N.P.Barker & H.P.Linder
*Danthonia stricta* Schrad.
*Merxmuellera stricta* (Schrad.) Conert

Perennial, up to 0.8 m high; tufted. **Leaf blades** up to 100–450 × 0.5 mm. **Flowers**: panicle open or loosely contracted, interrupted, not distichous, 30–130 mm long; spikelets up to 23 × 10 mm, including awns, 5–7-flowered; glumes 11–22 mm long, 3–7-nerved; lemmas 6–9 mm long, including 3.5–5.5 mm long lobes which terminate in a short, soft bristle; lemma backs with 4, sometimes more, occasionally indistinct tufts of white hairs along each margin near base; central awn 6–12(–17) mm long; Aug.–Mar. Variety of habitats. *Bokbaardgras* (A).

MsGr

## **Tetrachne** Nees (sthn Afr.: 1 sp.)

**dregei** Nees

Perennial, up to 0.9 m high; rhizomatous and tufted, base robust or woody. **Culms** branching freely. **Leaf blades** up to 50–125 × 1 mm; leaves curly. **Flowers**: spikes > 4, stout, 10–40 mm long, not spreading far from central axis, ± their own length apart; spikelets 4–6 mm long; Nov.–Mar. Sandy soil on riverbanks, rocky outcrops or mountain slopes, alt > 1 250 m. Infrequent to locally common. *Rabie's cocksfoot*; *kropaargras*, *vreemdegras* (A).

DrGr MsGr KarSh

## **Thamnocalamus** Munro (sthn Afr.: 1 sp.)

**tessellatus** (Nees) Soderstr. & R.P.Ellis
*Arundinaria tessellata* (Nees) Munro

Perennial, up to 0.5 m high; rhizomes stout, woody. **Culms** up to 20 mm in diameter, profusely branched above. **Leaf blades** 50–150 × 8–15 mm, base constricted into a pseudo-petiole; cross-veins conspicuous. **Flowers**: in a single raceme, spatheate; spikelets 16–18 mm long; flowering in local populations after many years, followed by death. Mountainsides, in wet places and sheltered ravines, alt 1 600–2 700 m. *Drakensberg bamboo*; *Drakensberg bamboes* (A); *leqala* (SS). Figure 89.

MsGr



**Figure 89.** *Thamnocalamus tessellatus* (Poaceae). Artist: A.R. Tangerini.

## **Themeda** Forssk. (sthn Afr.: 1 sp.)

### **triandra** Forssk.

*T. triandra* Forssk. var. *burchellii* (Hack.) Stapf
*T. triandra* Forssk. var. *hispida* (Nees) Stapf
*T. triandra* Forssk. var. *imberbis* (Retz.) A.Camus
*T. triandra* Forssk. var. *trachyspathea* Gooss.

Perennial, up to 1.5 m high; rhizomatous. **Leaf blades** up to 300 × 1–8 mm, apices abruptly or gradually tapering; leaf sheaths compressed; ligule a notched membrane. **Flowers**: in a complex, false panicle; spikelets clustered in drooping, triangular units resembling a single spikelet, each unit usually 1-awned, rarely 2- or 3-awned, composed of a single, awned, sessile, bisexual spikelet and 2 pedicelled spikelets, enclosed by an involucre of 4 sterile sessile spikelets; sessile spikelets 5–7 mm long, pedicellate spikelets equal or somewhat longer; spathes reddish; Sep.–Jun. Undisturbed veld. *Red grass*, *angle grass*; *rooigras*, *angelgras* (A); *seboku* (SS); *insinde* (X, Z). Figure 5, p. x; Figure 12C, p. 9; Figure 90.

| VreDm | AcGr | DrGr | MsGr | KarSh | Zastr |
|---|---|---|---|---|---|

## **Trachypogon** Nees (sthn Afr.: 1 sp.)

### **spicatus** (L.f.) Kuntze

*T. capensis* (Thunb.) Trin.

Perennial, up to 1.2 m high; rhizomatous and tufted. **Culm** nodes with a ring of hairs. **Leaf blades** up to 50–200 × 5 mm; ligule membranous, splitting into 3 lobes. **Flowers**: inflorescence a single raceme (rarely up to 5) with velvety awns throughout its length; short-pedicellate spikelets 6–8 mm long, long-pedicellate spikelets slightly longer; Oct.–May. Bushveld and sourveld. *Giant spear grass*, *grey tussock grass*; *reuse-pylgras*, *steekgras* (A); *selokana* (SS); *isitsube* (Z).

| | | DrGr | MsGr | | |
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## **Tragus** Haller (sthn Afr.: 4 spp.)

### Key to species:

[after Nembudani in Fish *et al*.: 705 (2015)]

1a Glume spines curved, not hooked at apex; stoloniferous perennial; anthers 1.8–2.5 mm long. . . . . .**T. koelerioides**
1b Glume spines hooked at apex; annual; culms sometimes rooting at lower nodes; anthers < 1 mm long. . . . . 2
2a Upper glume 5-nerved (space between nerves wide); lowest spikelet in each cluster 2.0–3.8 mm long; anthers 0.4–0.6 mm long . . . . . **T. berteronianus**
2b Upper glume 7-nerved (space between nerves narrow); lowest spikelet in each cluster 3.5–5.0 mm long; anthers 0.6–0.8 mm long . . . . .**T. racemosus**

### **berteronianus** Schult.

Annual, up to 0.6 m high; loosely tufted, sometimes rooting at nodes. **Leaf blades** 10–60 × 2–5 mm. **Flowers**: inflorescence narrowly spike-like; spikelets clustered on peduncles that are



**Figure 90.** *Themeda triandra* (Poaceae). Artist: C.D. Bartman.




**Figure 91.** *Tragus berteronianus* (Poaceae). Artist: W. Roux.

much shorter than spikelets, lowest in each cluster 2.0–3.8 mm long; upper glume 5-nerved, spaces between nerves 2–5× wider than nerves (in middle, tapering sharply at their ends); glume spines hooked at apex; anthers 0.4–0.6 mm long; Jan.–Dec., mostly in summer. Disturbed places. *Small carrot seed grass*, *bur grass*; *kleinwortelsaadgras*, *kousklits* (A). Figure 91.

AcGr DrGr KarSh

**koelerioides** Asch.

Perennial, up to 0.65 m high; rhizomatous, stoloniferous. **Leaf blades** up to 10–50(–80) × 3 mm. **Flowers**: inflorescence narrowly spike-like; spikelets clustered on peduncles that are much shorter than spikelets, lowest in each cluster 3.5–4.8 mm long; glume spines curved, not hooked at apex; anthers 1.8–2.5 mm long; Oct.–May. Open veld, on a variety of soil types. *Creeping carrot-seed grass*, *cushion grass*; *meerjarige-wortelsaadgras*, *kruipgras*, *kophaargras* (A).

AcGr DrGr MsGr KarSh Zastr

**racemosus** (L.) All.

Annual, up to 0.4 m high; culms usually decumbent, sometimes rooting at nodes. **Leaf blades** 20–60 × 2–4 mm. **Flowers**: inflorescence loosely spike-like; spikelets clustered on peduncles that are much shorter than spikelets, lowest in each cluster 3.5–5.0 mm long; upper glume 7-nerved, spaces between nerves ± same width as nerves; glume spines hooked at apex; anthers 0.6–0.8 mm long; Nov.–May. Limestone and sandy soils, often in moist places and disturbed areas. *Large carrot seed grass*, *stalked bristle grass*; *wortelsaadgras*, *klitsgras* (A).

AcGr DrGr MsGr KarSh Zastr

## **Tribolium** Desv. (sthn Afr.: 14 spp.)

### Key to species:

[after Fish & Moeaha in Fish *et al*.: 709 (2015)]

Lemma lobes narrow, acuminate, awned; lemma hairs not in distinct tufts; leaves usually glabrous, if pubescent, then never hispid . . . . . **T. curvum**
Lemma lobes broad, rounded or truncate sometimes acute, not awned; lemma hairs in distinct tufts; leaves and sheaths sparsely hispid . . . . . **T. purpureum**

**curvum** (Nees) Verboom & H.P.Linder
*Danthonia curva* Nees
*Karroochloa curva* (Nees) Conert & Türpe

Perennial, up to 0.4 m high; stoloniferous, tufted. **Leaf blades** up to 250 × 2 mm, flat or folded; usually glabrous, if pubescent, then never hispid; leaf sheaths usually glabrous. **Flowers**: panicle contracted, narrowly ovate or oblong, 15–50 mm long; spikelets ± 5–6 × 1.5 mm; spikelets 3–6-flowered; glumes 3.5–6.0 mm long; lemmas 2.5–3.5 mm long, including lemma lobes, which extend into short, soft bristles; back of lemmas with a row of hairs across middle below awn base, densely pubescent below this, margins not obviously fringed; central awn 4.0–5.5 mm long; palea 2.2–2.5 mm long, pubescent between keels; Oct.–May. Damp or shady habitats. *Oulandegras* (A).

DrGr

**purpureum** (L.f.) Verboom & H.P.Linder
*Avena purpurea* L.f.
*Danthonia purpurea* (Thunb.) Beauv. ex Roem. & Schult.
*Karroochloa purpurea* (L.f.) Conert & Türpe

Perennial, up to 0.22 m high; shortly rhizomatous, tufted. **Leaf blades** up to 40 × 1 mm, rolled, falcate, sparsely hispid; leaf sheath sparsely hispid. **Flowers**: panicle contracted, oblong or globose, 10–20 mm long; spikelets up to 5–7 × 4 mm wide, 3–6-flowered; glumes 4–7 mm long, often tinged with dark purple around keel; lemmas 3.0–3.5 mm long, including truncate lemma lobes; backs of lemmas with many tufts of hairs in a row across middle of back below awn base as well as basal tufts near margins and central nerve; hair tufts up to 2 mm long; central awn 3–4 mm long, geniculate; palea 2.8–3.2, pubescent between margins and keels; Jul.–May. Mountainous areas and short grassland. *Quaggagras* (A).

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## **Tricholaena** Schrad. ex Schult. (sthn Afr.: 2 spp.)

**monachne** (Trin.) Stapf & C.E.Hubb.

Perennial or annual, up to 1 m high. **Culms** glabrous. **Leaf blades** 30–70 × 2.0–3.5 mm, sometimes hairy. **Flowers**: panicle slightly contracted or open; spikelets 2–3 mm long, 1 mm wide, usually glabrous or very rarely hairy; Nov.–Mar. Ruderal, sandy soil. *Blue seed tricholaena*, *blousaadgras* (A).

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## **Trichoneura** Anders. (sthn Afr.: 2 spp.)

**grandiglumis** (Nees) Ekman

Perennial, up to 0.63 m high; tufted. **Culms** slender, erect or ascending. **Leaf blades** 30–200 × 3–7 mm. **Flowers**: panicle open, branches spreading horizontally; spikelets 5–14 mm long; spikelets 4–9-flowered; glumes 5.0–13.5 mm long; Nov.–Apr. Sandy soils on hillsides or open floodplains and in bush clumps, sometimes in disturbed areas. *Tumble weed*, *rolling grass*; *waaigras*, *rolgras* (A); *joang-ba-tsela* (SS). Figure 92.

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## **Triraphis** R.Br. (sthn Afr.: 5 spp.)

**andropogonoides** (Steud.) E.Phillips
*T. rehmannii* Hack.

Perennial, up to 1.22 m high; with long creeping rhizome, base dark brown to reddish; rootstock very well developed; tillers very loosely grouped. **Leaf blades** 200–400 × 2–6 mm. **Flowers**: panicle contracted or open, 120–300 mm long; spikelets 6–10(–15) mm long; spikelets 5–15-flowered, central awn shorter than lemma; anthers 1.2–2.3 mm long; Oct.–May. Well-drained soil on rocky slopes or in deep sand in open grassland. *Koperdraardgras*, *besemgras* (A).

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**Figure 92.** *Trichoneura grandiglumis* (Poaceae). Artist: C.D. Bartman.

## **Tristachya** Nees (sthn Afr.: 6 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 730 (2015)]

Upper lemma lobe not awned, acuminate up to 3–5 mm long; tubercle-based hairs present on glumes and lower lemma. . . . . **T. leucothrix**
Upper lemma lobe awn 5–20 mm long; tubercle-based hairs absent or on glumes only. . . . . **T. rehmannii**

**leucothrix** Nees
*Apochaete hispida* (L.f.) J.B.Phipps
*T. hispida* (L.f.) K.Schum.

Perennial, up to 0.9 m high; tufted. **Leaf blades** 50–400 × 2–6 mm; basal leaf sheaths covered with dense brown hairs at base. **Flowers**: in a compacted panicle; spikelets 24–45 mm long; pedicels connate; glumes and lower lemma with many tubercle-based hairs, rarely hairs absent; upper lemma glabrous or rarely obscurely hairy near apex, lobes not awned, acuminate up to 3–5 mm long, central awn 50–100 mm long; Oct.–Mar. Marshy grassland, mountain sourveld and on hillsides. *Hairy trident grass*; *rooisaadgras*, *harige drieblomgras* (A).

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**rehmannii** Hack.
*Dolichochaete rehmannii* (Hack.) J.B.Phipps

Perennial, up to 0.9 m high; tufted. **Leaf blades** up to 200 × 1–3 mm, curling when old; basal leaf sheaths silky villous. **Flowers**: in a compacted panicle; spikelets 20–30 mm long; pedicels connate; glumes and lower lemma glabrous or with occasional tubercle-based hairs; upper lemma pubescent, lobe awn 10–20 mm long, central awn 50–100 mm long; Nov.–Mar. Shallow stony soils. *Broom trident grass*; *besemgras* (A).

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## **Urelytrum** Hack. (sthn Afr.: 1 sp.)

**agropyroides** (Hack.) Hack.
*U. squarrosum* Hack.

Perennial, up to 1.6 m high; coarse, tufted. **Leaf blades** up to 400 × 1–6 mm, rolled when young and later when old. **Flowers**: inflorescence a solitary raceme; sessile spikelets 7–8 mm long, pedicellate spikelets smaller except for awn; lower glume of pedicellate spikelets with a long, rough recurved awn; Oct.–Jun. Open grassland and stony hillsides. *Centipede grass*, *quinine grass*; *kinagras*, *varkstertgras* (A).

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## **Urochloa** P.Beauv. (sthn Afr.: 6 spp.)

### Key to species:

1a Plants perennial; lower glume with 1–3 stiff hairs on back; upper glume 5-nerved . . . . . **U. mosambicensis**

1b Plants annual; lower glume without stiff hairs on back; upper glume 7–9-nerved . . . . . 2
2a Lower glume 1/3 as long as spikelet; upper glume 9-nerved . . . . **U. panicoides**
2b Lower glume 2/3 as long as spikelet; upper glume 7-nerved . . . . . **U. brachyura**

### **brachyura** (Hack.) Stapf

Annual, 0.2–1.2 m high; coarsely tufted. **Leaf blades** 30–300 × 3–16 mm. **Flowers**: in spaced, digitate inflorescences, racemes (2–)5–6 (–10), 10–60 mm long; spikelets 3.5–6.0 mm long, narrowly ovate; lower glume 2/3 as long as spikelet, 5-nerved, apex narrowly rounded, without stiff hairs on back; upper glume 7-nerved; upper lemma shortly mucronate, mucro ± 1 mm long; Oct.–Apr. Grassland, black turf, clayey soils, shade.

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### **mosambicensis** (Hack.) Dandy

*U. pullulans* Stapf
*U. rhodesiensis* Stent

Perennial, up to 1.5 m high; stoloniferous, tufted. **Leaf blades** 20–300 × 3–20 mm; basal sheaths glabrous or hairy, usually not splitting into fibres. **Flowers**: in spaced, digitate inflorescences, racemes (2)3–15, 20–80 mm long; spikelets 3–5 mm long; lower glume 3-nerved with 1–3 stiff hairs on back; upper glume 5-nerved; awn of upper lemma well developed, 0.5–1.2 mm long; Oct.–May. Variety of soil types, usually in sheltered disturbed places. *White buffalo grass*, *bushveld signal grass*; *buffelgras*, *bosveldbeesgras* (A).

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### **panicoides** P.Beauv.

Annual, up to 0.9 m high; tufted. **Culms** erect or procumbent, often spreading cartwheel-like. **Leaf blades** 20–250 × 5–18 mm. **Flowers**: in spaced, digitate inflorescences, racemes 2–7(–10), 10–90 mm long; spikelets (2.5–)3.5–4.5(–5.5) mm long; lower glume 1/3 as long as spikelet; upper glume 9-nerved; cross-veins often present on upper glume and lemmas; awn on upper lemma 0.3–1.0 mm long; Oct.–May. Weedy or overgrazed places and in gardens and cultivation. *Herringbone grass*, *kuri-millet*; *beesgras*, *kurimanna* (A); *bore-ba-ntja* (SS).

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## **Vulpia** C.C.Gmel. (sthn Afr.: 4 spp.)

### Key to species:

[after Mashau in Fish *et al*.: 745 (2015)]

1a Inflorescence partially enclosed in uppermost leaf sheaths; lower glume often scale-like or to nearly 1/2 as long as upper glume. . . . . **V. myuros**
1b Inflorescence well exserted from leaf sheaths; lower glume 1/4–3/4 as long as upper glume . . . . . 2
2a Lower glume 1/2–3/4 as long as upper glume; spikelets usually secund and often almost perpendicular to central axis . . . . . **V. bromoides**
2b Lower glume 1/4–1/2 as long as upper glume; spikelets mostly appressed to central axis . . . . . **V. muralis**

### *bromoides (L.) Gray

Annual, up to 0.6 m high. **Culms** solitary or many and then loosely tufted. **Leaf blades** 100–200 × 0.5–3.0 mm. **Flowers**: panicle, open or contracted, 20–120 × 15 mm, well exserted from leaf sheaths; spikelets 7–14 mm long, excluding awns, usually secund and often almost perpendicular to central axis; lower glume $^{1}/_{2}$–$^{3}/_{4}$ as long as upper; upper glume 3–10 mm long, acute or shortly awned; callus of lemma rounded; Aug.–Jan. Weedy and disturbed, rocky places such as roadsides and along streams. Native to Europe. *Squirrel tail fesque*.

DrGr MsGr

### *muralis (Kunth) Nees

Annual, up to 0.7 m high. **Culms** solitary or loosely tufted. **Leaf blades** 1–3 mm wide. **Flowers**: panicle open, 20–160 mm long, well exserted from leaf sheaths; spikelets 5–10 mm long, excluding awns, usually appressed to central axis; lower glume $^{1}/_{4}$–$^{1}/_{2}$ as long as upper; upper glume 3–10 mm long, acute; callus of lemma rounded; Sep.–Dec. Dry habitats on calcareous or limestone soils and in disturbed areas such as road verges. Native to Europe.

DrGr

### *myuros (L.) C.C.Gmel.

Annual, up to 0.7 m high; tufted. **Culms** usually densely fascicled. **Leaf blades** 20–150 × 0.5–3.0 mm. **Flowers**: panicle open, 50–120 mm long, partially enclosed in uppermost leaf sheaths; spikelets 6–10 mm long, excluding awns, usually appressed to central axis; lower glume 0.5–2.0 mm long, often scale-like or to nearly $^{1}/_{2}$ as long as upper; upper glume 3–6 mm long, acute; callus of lemma rounded; Sep.–Nov. Disturbed places in wet or damp areas but extending also to more arid regions. Native to western, central and southern Europe. *Rat's-tail fescue*; *langbaardswenkgras*, *wildegars* (A).

KarSh

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# PONTEDERIACEAE

Aquatic, perennial or annual, herbs with branching rhizomes or stems, rooting or free-floating. **Leaves** alternate or in basal rosettes; petioles usually sheathing, often long, sometimes inflated with aerenchyma, often dimorphous; blade of emergent leaves expanded with parallel, curved-convergent veins, submerged leaves linear; sheaths sometimes ligulate; stipule-like structures sometimes present. **Flowers**: solitary or in terminal spikes or racemes subtended by a spathe-like sheath, ebracteate; usually bisexual, regular or irregular; perianth 3 + 3, petaloid, usually forming a short tube; stamens 3 + 3, 3 or 1 (in cleistogamous flowers); filaments free, arising on perianth tube; ovary superior, 3-locular, with many ovules or by reduction, 1-locular with 1 pendulous ovule; style filiform, stigma entire or shortly lobed. **Fruit** a capsule or nut. **Seeds** small, ovoid, longitudinally ribbed. *Water hyacinth family*.

## **Eichhornia** Kunth (sthn Afr.: 1 sp.)

### ***crassipes** (Mart.) Solms

Perennial, aquatic herb, rooting in mud or free-floating; 100–200 mm high but up to 1 m when growing in dense mats. **Roots** many, long and feathery in floating plants. **Leaves** dimorphous; emergent ones with swollen, long petioles; blade obovate, orbicular, spathulate or narrowly ovate; submerged leaves alternate, blade linear with petiole sheathing stem, shortly stipulate. **Flowers**: in well-developed spikes, 8–10-flowered or these reduced to 1 or 2 flowers; stamens 3 + 3, upper included, lower exserted; perianth ± 50 mm in diameter, funnel-shaped with a somewhat curved tube, lobes 6, subequal, spreading, blue or mauve, upper segment with a prominent dark blue, yellow-centred patch; Nov.–Apr. **Fruit** a spindle-shaped capsule, covered with perianth withering, but not falling off. **Seeds** many, small, ovoid, finely ribbed. Invades dams, slow flowing rivers. Declared weed, prohibited as ornamental plant. Native to tropical South America. *Water hyacinth*; *waterhiasint* (A). Figure 13B, p. 10.

VreDm | AcGr | DrGr

# POTAMOGETONACEAE

Herbs with deciduous stems, forming colonies in fresh or occasionally brackish water, submerged except for spikes, which are exserted during anthesis and in some species floating leaf blades. **Roots** in a circle around nodes of rhizome; rhizomes usually well developed, rarely absent, persistent or plants perennating by formation of winter buds. **Leaves** borne in 2 rows. **Flowers**: in terminal spikes, bisexual, regular; perianth segments 4; carpels 4, free, 1-locular. **Fruit** a drupe with a beak. *Pondweed family*.

## **Potamogeton** L. (sthn Afr.: 7 spp.)

Key to species:

1a Leaf margins clearly toothed, usually undulate . . . . . **P. crispus**
1b Leaf margins entire or minutely toothed, usually flat . . . . . 2

2a All or some leaves thread-like to linear, with parallel sides, 0.5–3.0(–4.0) mm wide. . . . . 3
2b All leaves narrowly elliptic to oblong-ovate with convex sides, > 4.0 mm wide . . . . . 5
3a Leaf blade arising from top of a sheath which surrounds stem, elliptic to semicircular in transverse section; midrib indistinct; peduncles long and flexible, usually floating on water surface; flowering spikes interrupted, with flowers in up to 5 pairs or whorls. . . . . **P. pectinatus**
3b Leaf blade arising directly from node, flat in transverse section; midrib distinct; peduncles erect, usually emerging above water; flowering spikes continuous or sometimes interrupted, with flowers not clearly in whorls. . . 4
4a Stipules closed and tubular at base when young; midrib occupying 15–35 % of leaf width at base . . . . . **P. pusillus**
4b Stipules open and tightly inrolled; midrib occupying 30–70% of leaf width at base . . . . . **P. trichoides**
5a Submerged leaves disappearing early, not present in mature plant; floating leaves usually with a discoloured section at junction of petiole and blade . . . . . **P. richardii**
5b Submerged leaves present and persistent; floating leaves without a discoloured section at junction of petiole and blade. . . . . 6
6a All leaves usually without petioles, occasionally some with petioles; leaf blade slightly leathery . . . . . **P. schweinfurthii**
6b All leaves with petioles; leaf blade leathery . . . . . **P. nodosus**

## **crispus** L.

Perennial herb. **Leaves** submerged; blades uniform narrowly linear-ovate, margins clearly toothed, markedly undulate. **Flowers**: spikes few-flowered; Oct.–Dec. Still and flowing fresh water, dams, rivers. **Fruit** 2–4 mm long. *Curled pondweed*, *wavy-leaved pondweed*; *fonteingras*, *krulblaarfonteinkruid* (A); *ikhubalo lomkhondo wempahla* (X); *isaswane* (Z).

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## **nodosus** Poir.

*P. thunbergii* Cham. & Schltdl.

Perennial, aquatic herb, up to 1 m high. **Leaves** submerged ones persistent, usually also floating ones without a discoloured section at junction of petiole and blade, all with petioles; blade elliptic to oblong-ovate, margins smooth, veining indistinct, leathery. **Flowers**: in many-flowered spikes; Nov.–Mar. **Fruit** 3–4 mm long. Mud banks and deep water, pools, rivers. *Pondweed*; *drywende fonteingras*, *fonteinkruid* (A); *ikhubalo lomkhondo wempahla* (X); *ntlo-ea-hlapi*, *sesei* (SS); *ikhubalo lomkhondo wempahla* (X).

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## **pectinatus** L.

Perennial herb. **Leaves** submerged; blade linear, arising from top of a sheath, which surrounds stem, elliptic to semicircular in transverse section; midrib indistinct. **Flowers**: spikes interrupted; peduncles long and flexible, usually floating on water surface; with flowers in up to 5 pairs or whorls; Nov.–Apr. **Fruit** ± 4 mm long. Fresh or brackish water, pans, dams. *Fennel-leaved pondweed*, *sago pondweed*; *fonteingras*, *skedefonteinkruid* (A).

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| VreDm | AcGr | DrGr | MsGr | KarSh | |

**pusillus** L.

*P. panormitanus* Biv.

Perennial or annual, long-rooted herb. **Leaves** all submerged; stipules closed and tubular at base when young; blade linear, usually 2 mm wide, arising directly from node, flat in transverse section; midrib occupying 15–35% of leaf width. **Flowers**: in continuous or sometimes interrupted spikes, 2–4 in a whorl, up to 4 whorls per spike; Nov.–Mar. **Fruit** 2.0–2.5 mm long Fresh water, dams, streams. *Fine-leaved pondweed*, *narrow-leaved pondweed*; *smalblaarfonteingras* (A); *boele*, *joang-ba-metsi-bo-bohola*, *ntlo-ea-hlapi-e-kholo* (SS).

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**richardii** Solms

Perennial, aquatic herb, up to 1 m high. **Leaves** with petioles of two kinds: submerged leaves disappearing early, not present in mature plant; floating or aerial leaves with blade elliptic to oblong-ovate, margins smooth, leathery, veining indistinct, usually with a discoloured section at junction of petiole and blade. **Flowers**: in many-flowered spikes; Nov.–Mar. **Fruit** 4–5 mm long. Mud banks and deep water, pools, rivers.

| | | DrGr | | | |
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**schweinfurthii** A.W.Benn.

Perennial, aquatic herb, up to 0.2 m high. **Leaves** submerged and upper ones floating; all leaves usually without petioles, blade narrowly ovate to oblong elliptic, > 10 mm wide, net-veined, margins entire, smooth or undulate, not or slightly leathery. **Flowers**: in many-flowered spikes; Jul.–Dec. **Fruit** 3–4 mm long. Fresh water, rivers, dams. *Broad-leaved pondweed*; *fonteingras*, *breëblaarfonteinkruid* (A).

| VreDm | | | | | |
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**trichoides** Cham. & Schltdl.

Small, wiry, aquatic herb, up to 0.75 m high. **Leaves** all submerged; stipules open and tightly inrolled; blade linear, usually 1 mm wide, arising directly from node, flat in transverse section; midrib occupying 30–70% of leaf width. **Flowers**: in 4-flowered spikes, continuous or sometimes interrupted; peduncles erect, usually emerging above water; Sep.–Feb. **Fruit** ± 1 mm long. Freshwater ponds. *Fonteingras*, *fonteinkruid* (A).

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# RESTIONACEAE

Rush- or sedge-like, perennial herbs. **Rootstock** tufted or rhizomatous, densely covered with scaly sheaths. **Stems** with leaf sheath at each node. **Leaf sheaths** usually convolute, free at margins, rarely produced at apex into a blade-like extension. **Flowers**: inflorescence a spike, raceme or panicle, frequently different in the sexes; florets unisexual, mainly hidden within bracts; perianth glumaceous, usually of 6 segments in 2 series; stamens 3, opposite inner perianth segments; ovary superior. **Fruit** a capsule or a nutlet. *Cape reed family*.

## POTAMOGETONACEAE

## **Ischyrolepis** Steud. (sthn Afr.: 49 spp.)

**schoenoides** (Kunth) H.P.Linder
*Restio schoenoides* Kunth
*Restio sieberi* Kunth var. *schoenoides* (Kunth) Pillans

Perennial herb, up to 0.6 m high, rhizomatous, dioecious. **Leaf sheaths** acute-acuminate. **Flowers**: male and female inflorescences similar; spikelets several-flowered, 8–15 mm long, slender, spindle-shaped; florets hidden by hard, brown, glossy, overlapping bracts with protruding anthers or 2 style branches; Nov.–Jul. **Fruit** a capsule. Rocky slopes, stony ground. *Mafielo-oa-thaba* (SS).

| | | DrGr | MsGr | | |
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# RUPPIACEAE

Totally submerged perennials or annuals. **Roots** unbranched, 1 or 2 at nodes. **Stolons** poorly developed from stems, branched, elongate, sometimes developing bulbil-like tubers. **Stems** slender, terete, branched. **Leaves** alternate or subopposite, with sheathing base and free blade, without a ligule; blades thread-like, elliptic in transverse section; midrib inconspicuous, bordered by gas channels, lateral veins absent. **Flowers**: in a 2-flowered spike, appearing umbel-like in fruit; peduncles flexible, at first short and surrounded by spathe-like base of subtending leaf, later elongating or not; perianth rudimentary or absent; stamens 2, anthers sessile; ovary superior, carpels 4–12, 1-ovulate, at first sessile becoming stalked at maturity. **Fruit** asymmetrically, pear-shaped drupelets with spongy exocarp. *Ditch grasses*.

## **Ruppia** L. (sthn Afr.: 2 spp.)

**maritima** L.
*R. rostellata* Koch ex Rchb.

Aquatic, grass-like, perennial herb. **Leaves** with blade linear to filiform, apex acute, bright green. **Flowers**: on short, 8–26 mm long, straight peduncles; Sep.–Mar. **Fruit** 2.0–2.8 mm long with short beak; fruiting scape usually short and recurved, occasionally up to twice as long as fruiting stipes. Salt pans or brackish streams. *Beaked tasselweed*.

| | | DrGr | | | |
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# RUSCACEAE

Perennial herbs. **Tuber** globose or irregularly shaped. **Leaves** 1–several, basally concentrated, synanthous or hysteranthous, erect or flat, with a distinct petiole-like base. **Flowers**: in a simple raceme, few–many-flowered; bracts solitary, basal, subtending a single flower; pedicels short or long, articulated at apex; bisexual, regular, diurnal; triangular in outline, rotate, campanulate or recurved, perianth segments 3 + 3, free, dimorphic with outer spreading and inner erect, or all equal to subequal, connate at base only; stamens 3 + 3, hypogynous, adnate to base of perianth segments; filaments filiform to narrowly ovate; anthers peltate, dorsifixed, versatile, subglobose to oval; ovary superior, sessile; style 1, terete; stigma apical, small. **Fruit** a capsule. **Seeds** 6–12, oval to comma-shaped. *Eriospermum family*.

## **Eriospermum** Jacq. ex Willd. (sthn Afr.: 111 spp.)

### Key to species:

[after Perry: 21 (1994)]

| | | |
|---|---|---|
| 1a | Perianth segments equal to subequal; tuber globose with apical growing point, to irregularly shaped with lateral growing point, internally white, yellow, pink or red | 2 |
| 1b | Perianth segments clearly dimorphic; tuber irregularly shaped, with basal to lateral growing point, internally white, pink or red | 3 |
| 2a | Flowers with perianth segments spreading to recurved and ligulate; tuber globose with apical growing point, to irregularly shaped with lateral growing point, internally white, yellow, pink or red | 4 |
| 2b | Flowers cup-shaped to rotate with spathulate perianth segments; tuber irregularly shaped, internally white only | 5 |
| 3a | Leaf prostrate to suberect, blade orbicular to ovate-cordate, contemporary leaf sheath barely exserted | **E. ornithogaloides** |
| 3b | Leaf erect; blade narrowly ovate to elliptic, or if ovate, then with leaf sheath exserted | **E. schinzii** |
| 4a | Inflorescence corymbose, with a large peduncular bract similar to the foliage leaf | **E. corymbosum** |
| 4b | Inflorescence lax, with no visible peduncular bract or bract not similar to the foliage leaf | **E. flagelliforme** |
| 5a | Flowers rotate with perianth segments opening out flat, sometimes becoming recurved | **E. porphyrium** |
| 5b | Flowers cup-shaped with perianth segments not opening out flat | 6 |
| 6a | Outer and inner perianth segments uniformly white to pale green, sometimes with red stippling | **E. cooperi** var. **cooperi** |
| 6b | Outer perianth segments darkly pigmented, either green or brown | **E. cooperi** var. **natalense** |

### **cooperi** Baker var. **cooperi**

Geophyte, up to 0.6 m high. **Tuber** irregularly shaped, internally white. **Leaves** solitary, blade broadly ovate-cordate, up to 150 × 85 mm, usually hairy. **Flowers**: in a lax raceme, produced before leaves; peduncular bract glabrous; pedicels up to 25 mm long; flowers cup-shaped; perianth segments a uniform colour in both whorls, white or pale green with a darker green midvein, sometimes with red stippling towards apex; Oct.–Dec. Mountain grassland, damp streamsides, lightly wooded areas. *White fluffy seed*; *kapokblommetjie* (A); *khongoana-tsa-ngoana*, *khukhu-e-kholo*, *lekoto-la-litšoene*, *tsebe-ea-khomo* (SS); *iNcamashela* (Z).

MsGr

### **cooperi** Baker var. **natalense** (Baker) P.L.Perry

Geophyte, up to 0.6 m high. **Tuber** irregularly shaped, internally white. **Leaf** solitary; blade broadly ovate-cordate, up to 150 × 85 mm, usually hairy. **Flowers**: in a lax raceme, produced before leaves; flowers cup-shaped; outer perianth segments darker pigmented, green or brown; Oct.–Dec. Mountain grassland, alt up to 1 000 m.

MsGr

### **corymbosum** Baker

*E. confusum* Poelln.

Geophyte, up to 120 mm high. **Tuber** globose, skin thin, light brown, interior white; growing point apical or less often lateral, internally white, yellow, pink or red. **Leaf** with blade ovate-cordate, 35 × 20 mm, glabrous, both surfaces bright green. **Flowers**: in a corymbose raceme, produced before leaves, with a large peduncular bract similar to foliage leaf; perianth segments equal to subequal, spreading to recurved and ligulate, pale to bright yellow with a green midvein; Nov.–Feb. Calcareous sandy soils, silty flats or hillsides.

DrGr KarSh

### **flagelliforme** (Baker) J.C.Manning

*E. abyssinicum* Baker

Geophyte, up to 400 mm high. **Tuber** globose with apical growing point, internally white. **Leaf** with blade narrowly ovate, prominent veins. **Flowers**: in a very lax raceme, produced before leaves, with extra long pedicels, with no visible peduncular bract or bract not similar to foliage leaf; perianth segments equal to subequal, spreading to recurved and ligulate, yellow; Sep.–Dec. Grassland, sandy or well-drained soils. *Umathinta* (Z). Figure 93.

DrGr

### **ornithogaloides** Baker

Geophyte, up to 200 mm high; peduncle up to 160 mm long. **Tuber** irregularly shaped, with basal to lateral growing point, internally white, pink or red. **Leaf** one per growing point, prostrate not appressed, blade orbicular to ovate-cordate, up to 35 mm from apex to lobes, 28 mm wide, adaxial surface green, abaxially paler, glabrous, margins red, ciliate; sheath barely exserted. **Flowers**: in a lax raceme, with ± 10 flowers, produced before leaves; perianth segments dimorphic, white with a dark green midvein overlaid with indigo-blue; Nov., Dec. Damp, rocky slopes or flats on sandstone or on peaty soils. *Khongoana-tsa-ngoana*, *khongoana-tšingoana* (SS); *incameshela* (Z).

MsGr



**Figure 93.** *Eriospermum flageliiforme* (Ruscaceae).

### **porphyrium** Archibald

Geophyte, up to 0.7 m high. **Tuber** irregularly shaped, internally white, simple or with stolons. **Leaf** solitary, prostrate, blade broadly ovate-cordate, up to 120 mm long from apex to depression, 90 mm wide, thin, coriaceous, dark green and often purple underneath. **Flowers**: in a dense raceme, narrowly cylindrical to conical, with up to 60 flowers, produced before leaves; flowers rotate with perianth segments opening out flat, perianth segments equal to subequal, cream-coloured or pale green with a green midvein overlaid with purple streaking often covering whole of outer perianth segments; Dec.–May. Habitat variable, mainly in clay or red sandy soil.

| | | DrGr | | KarSh | |
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### **schinzii** Baker

Geophyte, up to 500 mm high. **Tuber** irregularly shaped, with basal to lateral growing point, internally white, pink or red, up to 40 × 28 mm, warty but not forming stolons. **Leaf** solitary, erect; blade ovate to narrowly ovate, 50–100 × 20–60 mm, apiculate, margins reddish, glaucous, glabrous or sparsely hairy on abaxial surface towards base; sheath exserted. **Flowers**: in a lax 10–20-flowered raceme, produced before leaves; anthers turquoise or green; perianth segments dimorphic, white or cream-coloured with a dark green midvein and sometimes red-streaked; Nov.–Feb. In full sun in quartz rocks or calcareous clay, in grassland or in disturbed ground.

| | | DrGr | | | |
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# TYPHACEAE

Herbs with creeping rhizomes; growing in fresh water or marshes. **Leaves** mostly basal, arranged in 2 ranks, long, linear, with a flattened blade. **Flowers**: many in a very dense, long, cylindrical spike; unisexual; male flowers in upper and female flowers in lower part; perianth reduced to bristles or scales; stamens 3; ovary superior, on a short stalk. **Fruit** covered with silky hairs. *Bulrush family*.

## **Typha** L. (sthn Afr.: 2 spp.)

### **capensis** (Rohrb.) N.E.Br.

*T. latifolia* L. subsp. *capensis* Rohrb.

Perennial herb, up to 2 m high, monoecious. **Stem** erect, simple, terminated by dense, cylindrical flower spikes. **Leaves** distichous, linear, apex obtuse, 0.4–1.5 m × 4–20 mm.



**Figure 94.** *Typha capensis* (Typhaceae).

TYPHACEAE

**Flowers**: in a cylindrical spike with upper male portion 150–300 mm long, lower female portion shorter; brown or yellowish brown; Sep.–Apr. Marshes, dams. *Bulrush*, *cat's tail*; *papkuil*, *palmiet* (A); *motsitla* (SS); *umkhanzi*, *ingcongolo* (X); *iBhuma* (Z). Figure 94.

DrGr KarSh Zastr

# VELLOZIACEAE

Plants with fibrous, often erect stems; stems covered with persistent leaf sheaths. **Leaves** spirally set, crowded at ends of stems; blade linear, fibrous, forming a sheath round stem. **Flowers**: showy, solitary or a few between fascicles of leaves; bisexual, regular; perianth segments 3 + 3, free or basally united; stamens 6; ovary inferior, **Fruit** a capsule. **Seed** reddish brown. *Black-stick lily family*.

## **Xerophyta** Juss. (sthn Afr.: 9 spp.)

### **viscosa** Baker

*Vellozia viscosa* (Baker) Baker

Perennial herb, up to 400 mm high; forming large mats on rock crevices. **Leaves** with blade regularly deciduous, linear, ± 150–180 mm long, keel and margins with short, stiff hairs. **Flowers**: solitary on a long peduncle, penduncles speckled with black glands; stigmas 4–5 × style base; ovary viscose; perianth glandular on outside, white, pink or mauve; Oct.–Apr. Grassland, rock crevices. *Small black-stick lily*; *bobbejaanstert* (A); *lefiroana*, *lethepu*, *mariroane* (SS). Figure 95.

MsGr

# XYRIDACEAE

Herbs of moist or marshy places; rhizome swollen, short, thick and ± vertical. **Leaves** linear, basal, often in 2 ranks, forming sheath at base. **Flowers**: small, subtended by overlapping papery bracts and clustered in heads on a stiff, erect, unbranched shoot; sepals 3; petals 3, free, stalked, yellow, fragile; stamens 3, opposite and fused to petals; ovary superior, usually 3-locular. **Fruit** a capsule. *Yellow-eyed grass family*.

## **Xyris** L. (sthn Afr.: ± 9 spp.)

Key to species:

Leaf bases not hardened and not persistent; keels of lateral sepals entire; leaves 2–8, arranged in 2 rows, arising from a small base or rarely from small rhizomes . . . . . **X. capensis**

Leaf bases hardened, persistent, usually shiny and dark brown; keels of lateral sepals toothed, rough or with hairs; leaves clustered, arising from compact, creeping rhizomes. . . . . **X. gerrardii**



**Figure 95**. *Xerophyta viscosa* (Velloziaceae).

## XYRIDACEAE

**capensis** Thunb.

*X. rubella* Malme

Tufted, annual or occasionally perennial herb, up to 300 mm high. **Leaves** distichous, 2–8, arranged in 2 rows, arising from a small base or rarely from small rhizomes; bases brownish, not persistent. **Flowers**: scape terete, green above, lower half golden-brown and shiny; heads almost spherical, 5–12 mm long, ± 5–10-flowered; lateral sepals > 5 mm long; bracts entire, dark brown to blackish brown; lateral sepals brownish, keels entire; Oct.–May. Marshes, on riverbanks, grassy seepage areas. *Common xyris*; *hloho-tsa-makaka*, *kaka-hlothoana* (SS); *udoyi oluncane* (Z).

VreDm | DrGr | MsGr

**gerrardii** N.E.Br.

Tufted, perennial herb, up to 300 mm high. **Leaves** clustered on compact rhizomes; blade linear, flat, soft; bases dark brown, persistent. **Flowers**: heads obovoid, flattened at tip, 6–8-flowered; bracts blackish brown; lower bracts larger, terminating in scarcely projecting sharp points; bract margins papery, splitting, appearing raggedly toothed; keels of lateral sepals with fine hairs and blunt teeth; Nov.–Jan. Mountain swamps, along rivers.

DrGr | MsGr

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# ZANNICHELLIACEAE

Aquatic herbs, monoecious or dioecious. **Roots**: rhizomes creeping, matted, bracteate. **Leaves** alternate, opposite or ternate; blade, linear, strap-shaped or tubular. **Flowers**: solitary or in umbel-like inflorescences; unisexual; perianth absent or present, flask-shaped or rarely of 3 small scales; male flower with 2 (rarely 1 or 3) united anthers; carpels free. **Fruit** a drupelet. *Horned pondweed family*.

## **Zannichellia** L. (sthn Afr.: 1 sp.)

**palustris** L.

Submerged, annual or perennial herb, brittle, forming dense mats resembling fine grass. **Stems** erect, thin, up to 500 mm long. **Leaves** with basal leaf sheaths free from leaf, mostly opposite, upper ones clustered in pseudowhorls. **Flowers**: inflorescence umbellate; green; Oct.–May. **Fruit** a bean-shaped drupelet, 2 mm long, crested and knobbed on convex side, apex pin-shaped with style and stigma base being persistent. Fresh or brackish water, pans. *Horned pondweed*.

DrGr | KarSh

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# GLOSSARY

## Terms and illustrations

### A

**a-** (*prefix*): without, lacking.

**abaxial**: applied to the side or surface facing away from the axis or stem (compare **adaxial**).

**abortion**: suppression of parts which are usually present.

**abscission**: the normal shedding from a plant of an organ that is mature or aged.

**acarodomatium** (*pl*. **acarodomatia**): a small cavity of very varying form, found on almost any vegetative part of the plant, which is inhabited, or thought to be inhabited, by mites; commonest types are small pockets or pits in axils of main veins with midrib on lower leaf surface.

**acaulescent**/**acauline**: stemless or seemingly so.

**accrescent**: increasing in size, e.g. the calyx of some plants in the fruiting stage.

**accumbent**: lying against, as the **cotyledons** with their edges against the **radicle**.

**achene**: a small dry fruit, not splitting when ripe, formed from a **superior** ovary of one **carpel** and containing a single seed, with the seed coat free from the fruit wall, as in *Clematis* (Ranunculaceae) (compare **cypsela**).

**acicular**: very narrow, stiff and pointed, needle-like.

**acinaciform**: scimitar-shaped; shaped like a short, curved, single-edged sword.

**acrocarpic**: gametophyte producing sporophyte at apex of a stem or main branch (compare **pleurocarpic**). Acrocarpous mosses generally grow erect in tufts (rather than mats) and are sparsely branched.

**acropetal**: referring to organs developing from the base toward the apex.

**acroscopic**: facing towards the apex.

**acrostichoid**: with sporangia spread over whole abaxial surface of fertile lamina, as in *Elaphoglossum* (Dryopteridaceae).

**actinomorphic**: applied to flowers which are radially symmetrical, i.e. capable of being bisected into similar halves in more than one vertical plane, forming mirror images (= **regular**) (compare **irregular**, **zygomorphic**).

**aculeate**: armed with **prickles**, as distinct from **spines**.

**aculeolate**: with small **prickles**.

**acumen**: a slender, tapering point.

**acuminate**: having a long, slender, sharp point with a terminal angle < 45°, with margins straight to convex.

**acute**: sharp-pointed, with a terminal angle 45°–90° with margins straight to convex.

**adaxial**: applied to the side facing the stem or axis (compare **abaxial**); see also **ventral**.

**adnate**: fused to an organ of a different kind, e.g. an ovary to the calyx tube.

**adpressed**: see **appressed**.

**adventitious**: applied to plant organs produced in an unusual or irregular position or at an unusual time of development, as in adventitious buds, roots or shoots.

**aerenchyma** (*adj*. **aerenchymatous**): tissue of thin-walled cells and large intercellular spaces, found especially in water- and marsh plants.

**aestivation**: the manner in which sepals and petals are arranged in a bud (compare **vernation**).

**aggregate fruit**: a cluster of fruits formed from the free **carpels** of one flower, e.g. the many small **drupes** in the 'fruit' of *Rubus* (Rosaceae) (compare **syncarp**).

**air canals**: narrow vertical interstices separating columns of **chlorophyllose** cells in the assimilation tissue.

**air chambers**: wide polyhedral air cavities, mostly enclosed by unistratose echlorophyllose or **chlorophyllose** cell plates in the assimilation tissue.

**air pores**: minute, regular spaces or simple or compound, delimited stomata in dorsal covering of thallus, functioning in gas exchange.

**alar cells**: group of cells at the basal margins of a leaf, at insertion; occasionally strongly differentiated; e.g. *Sanionia* (Amblystegiaceae).

**alate**: **winged**, as in certain stems or seeds; having wing-like extensions.

**allopatric** (of two or more taxa): having different ranges of distribution (compare **sympatric**).

**alternate**: applied to leaves and other organs inserted singly at different levels along the axis.

**alternipetalous**: applied to floral parts arising alternately with the petals.

**alternisepalous**: applied to floral parts arising alternately with the sepals.

**alveolate**: honeycombed; having deep angular sides, like the cavities of a honeycomb.

**alveolus** (*pl*. **alveoli**): small angular or polygonal areas bordered by ridges and forming a pattern or network; applied to ornamentation in many spores; some workers, however, prefer to use the term 'areola'.

**amplexicaul**: stem-clasping, as when the base of the leaf is dilated and embraces the stem.

**ampullaceous**: swollen out in flask-shape.

**anacampylotropous**: applied to an **ovule** intermediate in structure between **anatropous** and **campylotropous**.

**anantherous**: of a filament without anther.

**anastomosis** (*vb*. **anastomose**): union of one vein with another, the connections forming a network; applied to ornamentation in some spores.

**anatropous**: applied to an **ovule** that is inverted, so that the **funicle** is basally attached near the adjoining **micropyle** area, and the **chalaza** is at the opposite end.

**ancipitous**/**ancipital**: 2-edged; flattened or compressed, as in stems of certain Poaceae.

**androecium** (*pl*. **androecia**): the **stamens** and accessories of one flower; **antheridia** grouped together.

**androgynophore**: a stalk supporting both **androecium** and **gynoecium** of a flower above the level of insertion of the **perianth**.

**androphore**: a stalk bearing the **androecium**.

**andropodium**: the structure on which the stamens arise (in some Podostemaceae).

**anemochoric**: dispersed by wind.

**anemophilous**: pollinated or dispersed by wind (compare **entomophilous**, **hydrophilous**, **ornithophilous**).

**angiosperm**: a seed-bearing plant whose ovules, and hence seeds, develop within an ovary (compare **gymnosperm**).

**angustiseptate**: with narrow partitions (compare **latiseptate**).

**anisophyllous**: either bearing two distinct types of leaves, e.g. *Racopilum* (Racopilaceae); or having stem and branch leaves obviously dissimilar, e.g. *Thuidium* (Thuidiaceae) (compare **isophyllous**).

**anisopolar**: proximal and distal spore faces differently ornamented.

**annual**: a plant whose life span ends within one year after germination.

**annular**: arranged in a circle.

**annular thickenings**: ring-like thickenings extending over both tangential and radial cell walls in liverwort capsules.

**annulate**: ring-shaped; having an **annulus**.

**annulus**: a ring of differentiated cells between the mouth of the **capsule** and the **operculum**, aiding in dehiscence.

**anomocytic**: of a **stoma** surrounded by a limited number of cells that are indistinguishable from those of the remainder of the **epidermis**.

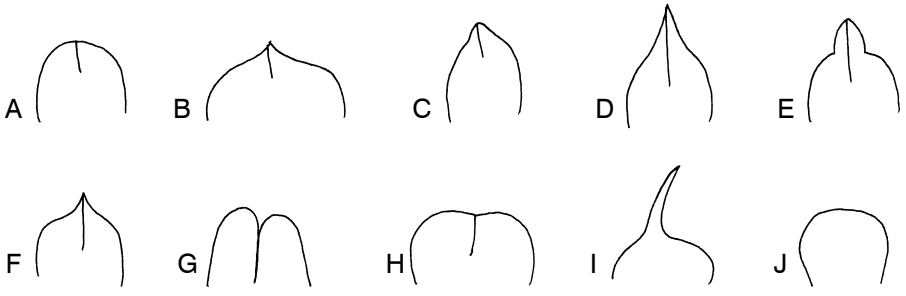



**Figure 96.** Leaf blade apices: A, rounded; B, obtuse; C, acute; D, acuminate; E, attenuate (drip-tip); F, mucronate; G, emarginated; H, retuse; I, caudate; J, truncate.

**antepetalous** (e.g. of **stamens**): **opposite** the petals.

**anterior** (applied to floral organs): in a position most remote from the axis (compare **posterior**/**posticous**).

**antesepalous** (e.g. of **stamens**): **opposite** the sepals.

**anthela** (*adj*. **anthelate**): a **panicle** in which the lateral axes overtop the main axis.

**anther**: the part of the stamen which contains the pollen, usually comprising four **microsporangia** or **pollen sacs**, two in each half or lobe of the anther; the tissue separating the two sacs in each half usually disintegrates before **anthesis**, resulting in a 2-thecous/bithecous/2-locular/2-celled anther.

**anther canal** (in orchids): the narrow **basal** portion of a **pollinium**.

**anther slits**: see **gynostegial grooves**.

**anther wings** (in Apocynaceae): see **gynostegial grooves**.

**antheridiophore**: specialized antheridium-bearing branch, the male gametangiophore, e.g. in *Marchantia* (Marchantianceae).

**antheridium**: the male sex organ, a globose to broadly cylindric, stalked structure containing sperms (antherozoids); see **perigonium**.

**anthesis**: period during which the flower is open.

**anthocarp**: a false fruit formed by the union of floral parts with the fruit (as in Nyctaginaceae).

**anthophore**: a short stalk between calyx and petals, e.g. in *Dianthus* (Caryophyllaceae).

**anticous**/**antical**: applied to that which is most remote or turned away from the axis; occasionally employed for **introrse**, as applied to anthers (compare **posticous**).

**antrorse**: bent or directed towards the apex or forward (compare **retrorse**).

**apex** (*pl*. **apices**): tip; topmost part or terminal end.

**aphlebia**: stipular outgrowths which occur on the **rachis**.

**apicule**/**apiculum**/**apiculus** (*adj*. **apiculate**): a short, abrupt point. (**mucronate** is shorter; **cuspidate** is longer and stouter).

**apocarpous**: with **carpels** free from one another.

**apolar spores**: spores with no obviously distinct polarity, lacking a conspicuous **triradiate** mark (compare **polar spore**).

**apophysis** (*pl*. **apophyses**): the rounded, exposed thickening on the scales of certain pine cones.

**appendiculate**/**appendaged**: with short, transverse projections (appendiculae); hanging in small fragments; see also **trabeculate**.

**appressed**: lying close to and flat along the surface.

**approximate**: with reference to bracts in *Erica* (Ericaceae), towards terminal part of pedicels.

**aquatic**: living in water.

**arachnoid**: cobwebby by soft and fine entangled hairs which are longer than in **tomentose**.

**araneose**/**araneous**: see **arachnoid**.

**arborescent**: having the shape or characteristic of a tree.

**archegoniophore**: a specialized archegonium-bearing branch, the female gametangiophore, e.g. in *Marchantia* (Marchantiaceae).

**archegonium** (*pl*. **archegoina)**: the female sex organ, a flask-shaped structure producing an egg; see **perichaetium**.

**arcuate**: curved like a bow.

**areolate**: divided into distinct spaces.

**areolation**: the cellular network of a leaf or thallus.

**areole**: a small pit or raised spot, often bearing a tuft of hairs or spines; a space marked out on a surface; a small area in a leaf between small veins.

**argyrocomous**: silver-leaved.

**aril**: an appendage covering or partly enclosing the seed and arising from the **funicle** (stalk) of the seed.

**arillode**: a false **aril**; a fleshy coat derived from the orifice or **micropylar** rim of the outer **integument** instead of the stalk of an ovule.

**arillus** (*pl*. **arilli**; *adj*. **arillate**): see **aril**.

**arista** (*pl*. **aristae**): a bristle-like appendage as on **glumes** of many Poaceae; a bristly **awn**.

**aristate**: with a long, bristle-like point.

**article**: one of the segments of a jointed fruit, such as a **loment**, or **internodes** of the branchlets of e.g. in Chenopodiaceae.

**articulate(d)**: with thickened joints, jointed or separating at a certain point and leaving a clean scar.

**ascending**: pointing obliquely upward.

**attenuate**: slenderly tapering.

**articulation**: a joint, e.g. between the **column** and the lower part of the **lemma** in *Aristida* (Poaceae).

**ascendent**/**ascending**: growing erect after an oblique or ± horizontal beginning.

**ascending** (of **aestivation**): sepals or petals arranged in the bud so that the upper margins of the lowest member overlap the lower margin of the member above it.

**asperous**: rough, harsh to the touch.

**asperulate**/**asperulous**: slightly rough to the touch.

**ategmic** (of a seed): without covering.

**atrocastaneous**: dark chestnut-coloured; dark brown.

**attenuate**: tapering gradually.

**aulacospermous** (of seeds): furrowed.

**auricle** (*adj*. **auricled**/**auriculate**): an ear-like lobe or appendage at the base of a leaf or other organ.

**auriculate**: with auricles.

**autogamous**: self-fertilising.

**autoicous**: with archegonia and antheridia in separate inflorescences on the same plant; **cladautoicous**: with the male inflorescence on a separate branch; **gonio-autoicous**: with the male inflorescence bud-like and axillary on the same stem or branch as the female inflorescence; **pseudautoicous**: with dwarf male plants epiphytic on the female; **rhizautoicous**: with the male inflorescence on a very short branch attached to the female stem by rhizoids and appearing to be a separate plant.

**awn**: a fine bristle usually terminating an organ, as at the tip of the **glumes** and **lemmas** of many Poaceae; usually formed by an excurrent costa in leaves of *Tortula* (Pottiaceae).

**axil**: the angle between leaf or bract and the axis bearing it.

**axile placentation**: **placentation** with the **ovules** borne on the axis or the inner angle of the locules of a **syncarpous** ovary (see also **marginal** and **parietal placentation**).

**axillary**: arising from the **axil**.

**axillary hairs**: uniseriate filaments found in leaf axils, generally inconspicuous and concealed by the leaf bases.

**axis** (of an inflorescence): that part of the stem or branch on which the individual flowers are borne.

## B

**baccate**: berry-like.

**barbate**: bearded.

**barbed**: with rigid points or lateral bristles pointing backwards.

**barbellate**: shortly **barbed**.

**basal**: at the base.

**basal membrane**: a short tube or cylinder of the peristome generally supporting numerous teeth.

**basifixed**: fixed by its base, e.g. of an anther (compare **dorsifixed**, **medifixed**, **versatile**).

**basiscopic**: toward the **basal** or **proximal** (as opposed to **distal**) end; facing basally.

**beak**: a prominent terminal projection, especially of a **carpel** or fruit; a slight narrowing of the **lemma** below the **awns**, as distinct from a longer straight **column**, e.g. in *Aristida* (Poaceae).

**bearded**: with long awns or with tufts of stiff hairs.

**berry**: a juicy fruit with soft **pericarp**, the seeds immersed in pulp (compare **drupe**, **pyrene**).

**bi-** (*prefix*): twice; two; having two.

**bicallose**: with two **callosities**.

**bicarpellate** (of an ovary): with two carpels.

**bicolorous**: 2-coloured.

**bifacial** (of a leaf): **dorsiventral**, having a distinct upper and lower surface.

**bifarious**(**ly**): see **distichous**.

**bifid**: cleft into two parts for ± half the length.

**bifoliate**: having two leaves.

**bifoliolate**: having two **leaflets**.

**bifurcate**: divided or forked into two basically equal parts.

**bilabiate**: 2-lipped, as when two or three lobes of a calyx or corolla stand separate as an upper lip from the others forming a lower lip.

**bilocular**: with two **locules** or compartments.

**binate**: in pairs.

**bipinnate**: when the primary divisions (pinnae) of a **pinnate** leaf are themselves pinnate.

**biramous**: with two branches.

**biseriate**: arranged in two rows or **whorls**.

**bisexual**: having both sexes in the same **flower** or **inflorescence**.

**bitegmic**: of an ovule having two **integuments**.

**biternate** (of a leaf): with two orders of leaflets, each **ternately** compound.

**bithecate** (of an anther): with two **thecae**.

**bivalved**: having two **valves**.

**blade**: the expanded part of a leaf or petal (see also **lamina**, **limb**).

**bloom**: a powdery or waxy covering.

**bordered**: having margins differentiated from the rest of the lamina in shape, size, colour, or thickness of cells; see **limbidium**.

**bothrospermous** (of seeds): pitted.

**botryoid**: like a cluster of grapes.

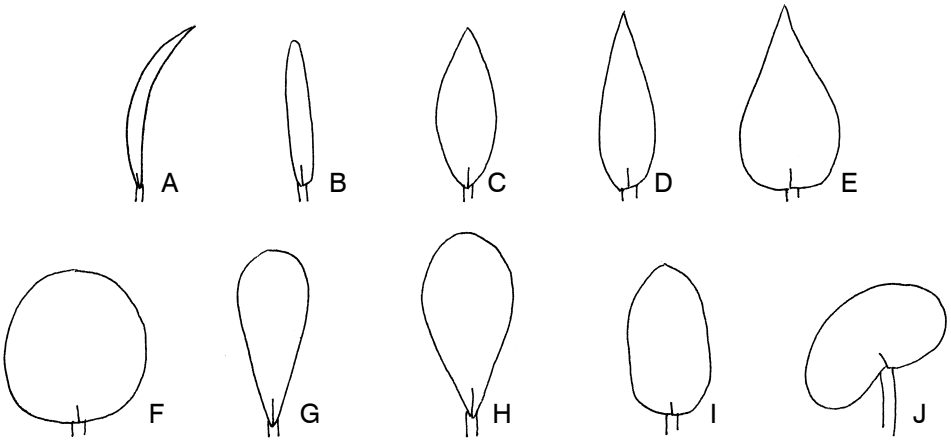



**Figure 97.** Leaf outline: A, filiform; B, linear; C, elliptic; D, narrowly ovate (lanceolate); E, ovate; F, rounded; G, narrowly obovate; H, obovate; I, oblong; J, reniform.

**brachyblast**: a **spur shoot** or short branch.

**bract**: a leaf-like structure, different in form from the foliage leaves and without an axillary bud, associated with an **inflorescence** or a **flower**.

**bracteal cup**: cup-shaped structure formed by fused bracts (e.g. in Viscaceae).

**bracteate**: possessing or bearing **bracts**.

**bracteole** (*adj*. **bracteolate**): small bract borne on the **pedicel** or **calyx** of a flower.

**bractiform**: looking like a **bract**.

**bristle**: a stiff, strong **trichome**, similar to a pig's bristle, as in the **perianth** of some Cyperaceae.

**brochidodromous** (of a leaf): with a single primary vein, the secondary veins not terminating at the margin but joined together in a series of prominent upward arches or marginal loops on each side of the primary vein.

**bud**: an undeveloped shoot that can give rise to a branch or flower.

**bulb**: a storage organ, usually underground, made up of a usually much abbreviated stem and fleshy leaf bases.

**bulbiform**: bulbil-shaped.

**bulbil**: a small deciduous **bulb** (or **tuber**) formed around the mother bulb or in the **axil** of a leaf, and functioning to propagate the plant vegetatively.

**bulbous-based**: with an inflated base.

**bullate**: having a blistered or puckered surface; (of a leaf surface): prominently raised, like a bubble, between the veins.

**bur(r)**: a rough or prickly **propagule** consisting of a seed or fruit and associated floral parts or bracts.

**buttress**: a flange of tissue protruding from the base of the main trunk of a tree.

## C

**caducous**: falling off early.

**caespitose**: tufted, growing in cushions or sods.

**calcarate**: having a spur.

**calceiform**: shaped like a slipper.

**callose**/**callous**: hard and thick in texture; bearing **callosities**.

**callosity**: a leathery or hard thickening of part of an organ.

**callus** (*pl*. **calli**): a thickened part, such as the thickened extension at the base of the **lemma** at the point of its attachment to the **rachilla**.

**calycine**: belonging to the **calyx**.

**calyculus** (*pl*. **calyculi**; *adj*. **calyculate**): the bracts around the **calyx** or an **involucre** resembling an outer calyx (see also **epicalyx**).

**calyptra** (*pl*. **calyptrae**): a membranous hood over the developing sporophyte, developed from the upper part of the archegonium; in true mosses ruptured near the base, carried upward by the elongation of the seta, and continuing growth to

form a cap over the capsule; see **epigonium**. In liverworts ruptures near the apex and remains at base of seta.

**calyx** (*pl*. **calyces**): the outer envelope of the flower, consisting of free or united **sepals**.

**calyx tube**: when the **sepals** are partly united, the lower portion is referred to as the tube and the upper free part as the **limb** usually divided into calyx teeth, lobes or segments (see also **hypanthium**).

**campanulate**: bell-shaped.

**campylotropous**: of an **ovule** orientated transversely (i.e. with its axis at right angles to its stalk and with a curved **embryo sac**).

**canaliculate**: channelled.

**cancellate**: lattice-like.

**cancellina** (*pl*. **cancellinae**): sharply defined, large, empty, and usually hyaline basal leaf cells of the Calymperaceae.

**canescent**: ± grey-pubescent or hoary.

**cano-** (*prefix*): greyish white (usually applied to hair covering).

**capillary**: resembling a hair; very slender.

**capitate**: (1) like the head of a pin, as the **stigma** of some flowers; (2) collected into compact head-like clusters, as the inflorescences of Asteraceae.

**capituliform**: shaped like a **capitulum**.

**capitulum** (*pl*. **capitula**): a dense head-like inflorescence usually of sessile flowers (see also **head**).

**capsule**: a dry fruit composed of two or more united **carpels** and either splitting when ripe into flaps called **valves** or opening by slits or pores; the spore case, or sporangium, often differentiated into an upper spore-bearing urn and a sterile basal portion, the neck.

**carina** (*adj*. **carinal**): a keel; the two partially united **anterior** (lowest) petals of a **papilionaceous** flower, or the single, similar-shaped, anterior petal in many Polygalaceae.

**carinate**: keeled.

**carnose**: fleshy.

**carpel**: an organ (generally believed to be a modified foliar unit) at the centre of a flower, bearing one or more **ovules** and having its margins fused together or fused with other carpels to enclose the ovule(s) in an **ovary**, and consisting also of a **stigma** and usually a **style** (see also **suture**).

**carpellate**: possessing **carpels**.

**carpocephalum**: specialized, often radially symmetrical receptacle bearing **sporangia**, held aloft by a stalk.

**carpophore**: the stalk of a **carpel** or of a **mericarp**.

**carpopodium**: the stalk of a fruit.

**carrier**: see **corpuscle**.

**cartilaginous**: hard and tough, as the skin of an apple-pip.

**caruncle** (*adj*. **caruncular**/**carunculat**e): an outgrowth from **integuments** at or near the **hilum** of certain seeds (see also **strophiole**).

**caryopsis**: a 1-seeded, dry, indehiscent fruit with the seed coat adnate to the fruit wall, derived from a 1-loculed **superior ovary** (characteristic of Poaceae) (compare **achene**).

**castaneous**: chestnut-coloured; dark brown.

**cataphyll**: small scale leaf, e.g. on **rhizomes** of flowering plants.

**catenulate**: chain-like.

**catkin**: a dense, often pendulous **spike** of small unisexual flowers which have no conspicuous **perianth**.

**caudate**: abruptly ending in a long tail-like tip or appendage.

**caudex**: a short, thickened, often woody, vertical or branched perennial stem, usually subterranean or at ground level (e.g. in Agavaceae).

**caudicle**: the stalk of a **pollen mass** connecting it to the **corpuscle**, in Asclepiadaceae and Orchidaceae (also known as **translator arm**).

**caulescent**: with an obvious leafy stem; having an evident stem above ground.

**cauliflorous**: producing flowers from old wood (compare **ramiflorous**).

**cauliform**: having the form of a main stem of a plant.

**cauline**: arising from or inserted on the stem.

**cavernous**: with numerous cavities in the tissue.

**central strand**: a small group of elongate cells forming a central axis of some stems, usually thin-walled or coloured in transverse section.

**centric** (of a leaf): filiform to cylindrical with a ± continuous palisade layer (see also **unifacial**).

**centripetal**: as in **inflorescences**, blooming from the outside inward or from the base upward.

**cernuous**: nodding or drooping.

**chalaza** (*adj*. **chalazal**): basal region of the **ovule** where it joins the **funicle**; region of a seed opposite the **micropyle**.

**chamaephyte**: a perennial plant, generally woody or partly woody, with the mean height of the renewal buds ≤ 0.7 m from the ground.

**chartaceous**: papery in texture, opaque and thin.

**chasmogamous**: pollinated when the flower is open (compare **cleistogamous**).

**chasmophyte**: plant growing in rock crevices.

**chlorenchyma**: **parenchyma** cells containing chloroplasts.

**chlorocyst**: small, elongate, green cells enclosed by layers of hyaline cells in the leaves of *Syrrhopodon* (Calymperaceae).

**chlorophyllose**: containing chlorophyll; green (compare **hyaline**).

**choripetalous**: having separate and distinct petals (= **polypetalous**) (compare **gamopetalous**, **sympetalous**).

**cilia** (*sing*. **cilium**): short epidermal outgrowths, such as hairs or scales ± confined to the margins of an organ; delicate, thread-like structures alternating with the segments of the inner peristome of many mosses.

**ciliate**: with a fringe of hairs along the edge.

**ciliolate**: minutely **ciliate**.

**cincinnus** (*pl*. **cincinni**; *adj*. **cincinnate**): a tight, unilateral **scorpioid cyme**.

**circinnate**: spirally coiled, with the tip innermost.

**circumscissile**: applied to an organ opening as if cut circularly around the upper part, which then comes off like a lid.

**cirrhiferous**: producing **tendrils**.

**cirrhose**: having **tendrils**.

**cistolith**: see **cystolith**.

**cladautoicous**: see **autoicous**.

**cladocarpous**: form of pleurocarp in which sporophytes are borne terminally on short lateral branches (e.g. in Bryophyta).

**cladode**: a flattened, foliaceous stem having the form and function of a leaf, but arising in the axil of a minute, bract-like caducous, true leaf (compare **phyllode**).

**clathrate**: latticed or pierced with apertures like a trellis.

**clavate**: club-shaped or thickened towards the end.

**clavellate**: diminutive of **clavate**, thickened towards the apex.

**claviform**: club-shaped.

**claw** (*adj*. **clawed**): the narrow base of a petal, sepal or bract.

**cleft**: incised almost to the midrib or base.

**cleistocarpic**: referring to indehiscent capsules lacking an operculum or valves and hence opening irregularly (compare **stegocarpic**); e.g. cleistocarpous capsule of *Archidium* (Archidiaceae).

**cleistogamous**: (of pollination) occurring when the flower is closed (compare **chasmogamous**).

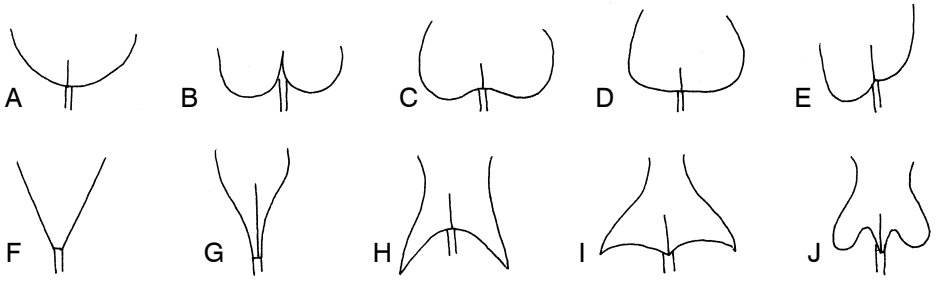



**Figure 98.** Leaf blade bases: A, rounded; B, lobate; C, cordate; D, truncate; E, oblique; F, cuneate; G, decurrent; H, sagittate; I, hastate; J, cuneate-lobed.

**club-shaped**: gradually thickened from a slender base.

**coalesce**: to fuse.

**cobwebby**: entangled with fine filaments (see also **arachnoid**).

**coccus** (*pl*. **cocci**; *adj*. **coccous**): a 1-carpel unit of a **schizocarp** or lobed fruit, becoming separate at maturity (e.g. in Euphorbiaceae).

**cochleariform**: rounded and deeply concave, shaped like the bowl of a spoon.

**collateral**: standing side by side.

**collenchymatous**: with cell walls more strongly thickened at the corners; thickenings called trigones.

**colleter**: a mucilaginous secretory hair, often occurring in tufts near the base of the leaf **lamina** and on the **calyx** (e.g. in Apocynaceae).

**colliculate**: covered with little rounded elevations.

**colpate** (of a pollen grain): having elongate, longitudinal apertures.

**colporate** (of a pollen grain): having compound apertures (*adj*. of **colporus**).

**colporus** (of a pollen grain): a compound aperture consisting of an ectocolpus with one or more endoapertures.

**colpus** (*pl*. **colpi**) (of a pollen grain): a usually longitudinal, ± distinct aperture (compare **sulcus**).

**columella**: the central sterile tissue in a capsule around which the spores develop.

**column**: (1) the adnate **stamen** and **style** forming a solid central body, as in orchids; (2) the tube of connate **filaments**, as in Malvaceae; (3) a straight structure between the apex of the **lemma** and the branching point of the **awns**, as in *Aristida* and *Stipagrostis* (Poaceae) (see **beak**).

**coma**: a tuft of hairs at the end of some seeds; a terminal crown of leaves or bracts, e.g. in *Eucomis* (Hyacinthaceae).

**commissural**: of a joint or seam, such as that between two adhering **sepals**.

**commissure**: the faces of cohering **carpels** (e.g. in Apiaceae); the place of joining or meeting.

**comose**: bearing a tuft of **trichomes**, usually apically; used by bryologists to refer to larger and more crowded leaves forming tufts at the stem tips; e.g. *Campylopus* (Dicranaceae).

**complanate**: flattened together or compressed in one plane.

**complicate**: folded lengthwise.

**complicate-carinate**: sharply folded along a keel.

**compound**: the opposite of **simple**; composed of several similar parts, as a leaf of several leaflets; **compound fruit**: the fruits of separate flowers becoming united into a mass; **compound umbel**: each **ray** again bearing an **umbel**.

**compressed**: flattened lengthwise from side to side or from front to back.

**concolor**/**concolorous**: of uniform colour (e.g. upper and lower leaf surface with the same colour) (compare **discolorous**).

**concrescent**: growing/grown together.

**conduplicate**: folded together lengthwise.

**condyle**: an intrusion of the placenta which forms grooves or cavities in the **endocarp** of the developing fruit (e.g. in Menispermaceae).

**confervoid**: composed of threads; (of **pollen**): united in strings.

**conflorescence**: a modified, condensed inflorescence, as found in *Eucalyptus* (Myrtaceae).

**connate**: applied to parts of the same series which are united so closely that they cannot be separated without tearing.

**connective**: the part of an anther which connects its two **thecae**.

**connivent**: applied to parts converging so as to be nearer together above than below.

**conoidal**: ± conical.

**conservation** (of a name): the decision of an International Botanical Congress that a validly published name shall be used even though to do so is contrary to the International Code of Botanical Nomenclature (**I.C.B.N.**).

**constricted**: abruptly narrowed.

**contorted** (of **sepals** and **petals**): twisted in the bud so that each overlaps the adjoining one on one side and is overlapped by the other adjoining one on the other side, like a furled umbrella; irregularly twisted.

**contractile roots**: a specialised type of root, often found in bulbous plants, that undergoes contraction and thereby pulls the bulb or shoot parts deeper into the soil.

**convexity**: the condition of being convex or having a curvature that bulges towards the point of observation.

**convolute**: rolled up lengthwise (also used in the sense of **contorted**).

**cordate**: applied to the base of a leaf when it is ± deeply notched; heart-shaped.

**coriaceous**: firm, tough, the consistency of leather.

**corm**: a tuberous bulb-like **rootstock**.

**cormous**: possessing a **corm**.

**cornate**: bearing a horn.

**corniculate**: bearing or terminating in a small horn-like protuberance or process.

**cornute**: bearing a horn.

**corolla**: the inner envelope of the flower, consisting of free or united **petals**.

**corona**: a crown; (in the flower of some Apocynaceae and others): a circle of appendages between the **corolla** and **stamens**, often united in a ring or crown; in some members of the Apocynaceae the corona consists of one or two (sometimes three) alternating rows different in size and shape, the outer row nearest to the corolla lobes, the inner row nearest to the **staminal column**.

**coroniform**: shaped like a crown.

**corpuscle**/**corpusculum** (*pl*. **corpuscula**): a small, ± spherical, slightly 2-parted, hard, usually brown to black, sticky body with two flexible arms (**caudicles**), each carrying one **pollinium**, in Apocynaceae.

**cortex**: the unspecialised tissue in stems and roots between the vascular bundles and the epidermis; in mosses differentiated outer layers of a stem or branch, occasionally surrounding a central strand.

**cortical**: referring to the outer cells of stem or branches, frequently differentiated into inner and outer layers.

**corticolous**: growing on bark.

**corymb** (*adj*. **corymbose**): a ± flat-topped **racemose inflorescence** in which the branches or **pedicels** start from different points but all reach to about the same level.

**cosmopolitan**: occurring in all major floristic zones of the world.

**costa** (*pl*. **costae**): the nerve or midvein of a single leaf or the **rachis** of a **pinnately compound** leaf.

**costate**: with a **costa**.

**costule**: the midrib of a **pinnule** or **pinna** segment.

**cotyledon**: the primary leaf of an **embryo**.

**craspedodromous venation**: leaf venation characterised by a single primary **vein**, with the lateral veins terminating at the margin.

**crassat**e: coarse, gross, dense, thick.

**crenate** (*noun* **crenation**) (of a margin): notched with regular blunt or rounded teeth; scalloped.

**crenulate**: crenate with very small teeth; minutely scalloped.

**crescentic**/**crescentiform**: biconcave, resembling the shape of the moon in its first or last quarters.

**crested**: having a crest, elevated appendage or ridge on the summit of an organ.

**cribrose**: finely perforated.

**crinite**: bearded with long, weak hairs.

**crisped** (*adj*. **crispate**): wavy, curled (like crisp bacon); often used more loosely to mean variously curled, twisted and contorted.

**crista** (*adj*. **cristate**): a crest or ridge.

**cruciform**: cross-shaped.

**crustaceous**: of brittle texture.

**cryptopore**: immersed stoma, with the guard cells sunken below the level of the exothecial cells and often ± covered by them (compare **phaneropore**).

**cucullate**: hooded or hood-shaped; a cucullate calyptra is conic and split up one side, resembling a monk's hood; also used to describe leaves concave at the tips (cf. **mitrate**), e.g. *Campylopus* (Dicranaceae).

**culm**: the stem of Cyperaceae and Poaceae.

**cultrate**/**cultriform**: shaped like a knife blade.

**cuneate** (of the base of a leaf): tapering gradually, i.e. wedge-shaped.

**cuneiform**: wedge-shaped; triangular, with the narrow part at the point of attachment.

**cupular**/**cupuliform**: applied to a shallow, open structure, as the **involucre** of an acorn.

**cupulate**: cup-shaped, rounded and swollen; e.g. capsule of Gigaspermaceae.

**cupule/cupulum** (*pl*. **cupula**): a cup-shaped structure at the base of some fruits formed by the fusion of **involucral bracts** at their bases, e.g. the acorn of oaks, a structure at the base of the fruits of some palms, the cup-shaped involucre of some Asteraceae; a series of free **trichomes** apically on **achenes** of Asteraceae which become fused with age.

**cushion**: a closely packed aggregate of plants with stems ± erect, but somewhat radiating at edges; e.g. *Grimmia* (Grimmiaceae).

**cusp**: an abrupt, sharp, often rigid point.

**cuspidate**: abruptly tipped with a sharp rigid point.

**cuticle**: a noncellular layer of waxy or fatty materials on the outer wall of epidermal cells.

**cutin** (*adj*. **cutinous**): a waxy, waterproof substance that is the main constituent of the plant **cuticle**.

**cyathiform**: cup-shaped.

**cyathium**: an **inflorescence** resembling a single flower, composed of unisexual flowers surrounded by **bracts** and often by **glands**, typical of *Euphorbia* (Euphorbiaceae).

**cygneous**: curved downward like a swan's neck.

**cymbiform**: concave and broadly boat-shaped.

**cyme** (*adj*. **cymose**): a **determinate inflorescence** in which each flower, in turn, is formed at the tip of a growing axis, and further flowers are formed on branches arising below it (compare **indeterminate** inflorescence).

**cymule**: a small **cyme** or portion of one, usually few-flowered.

**cypsela** (*pl*. **cypselae**): an **achene** derived from a 1-loculed, **inferior** ovary; as in the indehiscent fruits of Asteraceae (compare **achene**).

**cystolith**: mineral concretion, usually of calcium carbonate, in the epidermis of e.g. Acanthaceae and Urticaceae, showing up as streaks or protuberances, particularly in dried material.

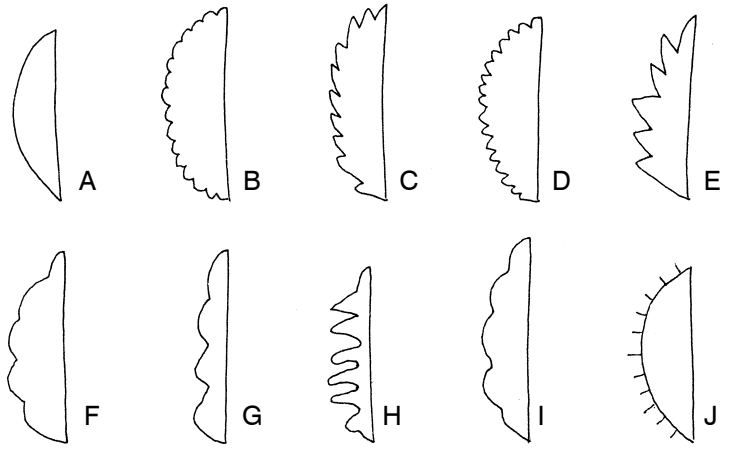



**Figure 99.** Leaf blade margins: A, entire; B, crenate; C, serrate; D, serrulate; E, dentate; F, shallowly lobed; G, deeply lobed; H, pinnatifid; I, undulate; J, ciliate.

# D

**deciduous**: falling off at the end of the season of growth (compare **evergreen**).

**declinate**: angled downwards or forwards (compare **decurved**).

**decompound**: applied to leaves that are several times divided or **compound**.

**decrescent**: decreasing, gradually growing less.

**decumbent**: spreading horizontally at first but then growing upwards; lying prostrate but with ascending tips.

**decurrent**: with the edges of the leaf extending down the stem or petiole as raised ridges or narrow wings.

**decurved**: angled downwards and curved or curled.

**decussate**: in opposite pairs, with each pair at right angles to the one above and below it.

**deflexed**: bent abruptly downwards or outwards (compare **inflexed**).

**dehiscent**/**dehiscing** (*noun* **dehiscence**): opening spontaneously when ripe as in **capsules** and **anthers**.

**deliquescent**: dissolving or melting away.

**deltate**: shaped like an equal-sided triangle.

**deltoid**: shaped ± like an equal-sided triangle.

**dendritic**/**dendroid**: tree-like; resembling the shape of a tree; having a branched appearance.

**dentate** (of a margin): prominently toothed, the teeth directed outwards.

**denticulate**: finely toothed/**dentate**.

**deoperculate**: referring to a capsule after the operculum has fallen.

**depauperate**: poorly developed.

**depressed**: ± flattened from above downwards or at least at the top.

**determinate** (of an **inflorescence**): with a **bud** or **flower** terminating the growth of the main axis (compare **indeterminate**).

**dextrorse**: turned toward the right (compare **sinistrorse**).

**di-** (*prefix*): two-.

**diad** (of a pollen grain): two fused together (compare **monad**, **tetrad**).

**diadelphous**: having the **stamens** united into two groups, or all but one united in a group and one free (e.g. many Fabaceae) (compare **monadelphous**).

**diadem**: a crown.

**diaphanous**: very thin and transparent.

**dichasium** (*adj*. **dichasial**): a **determinate** type of **cymose** inflorescence having a central, older flower which develops first and a pair of opposite lateral branches bearing younger flowers (compare **monochasium**).

**dichlamydeous**: said of a flower having two whorls of **perianth** parts.

**dichotomous**: forking regularly into two equal branches.

**dicotyledon**: a flowering plant having two **cotyledons** in the seed (compare **monocotyledon**).

**dictyostelic**: with vascular bundles concentrically arranged with large overlapping **leaf gaps**, in the trunk.

**didymous**: 2-lobed; (of **anthers**): distinctly 2-lobed but with almost no connective.

**didynamous** (of **stamens**): with four in two pairs of unequal length, e.g. in Acanthaceae and Lamiaceae.

**diffuse**: loosely and openly branching or spreading.

**digitate**: like the fingers of a hand, with the members arising from the same point.

**digitiform**: shaped like a finger.

**dimidiate**: having one of two sides or parts more developed than the other.

**dimorphic**/**dimorphous**: of two forms.

**dioecious**: with unisexual flowers, the male and the female flowers on separate plants (compare **monoecious**).

**dioicous**: with archegonia and antheridia on separate plants.

**diploid**: having two of the basic sets of chromosomes in the nucleus (compare **haploid**).

**disarticulate**: breaking apart at the joints.

**disc**: (1) an enlargement of the **receptacle** within the calyx or within the corolla or stamens, usually in the form of a ring, cup or cushion, often lobed or even cut up into so-called (nectary) **glands**; (2) **disc floret**: the central florets as compared with the **ray florets** in a head of the Asteraceae.

**disciform** (of heads of Asteraceae): with central flowers perfect with tubular **corollas**, and the marginal flowers **pistillate** or neuter but without **ligules**, their corollas tubular or wanting.

**discoid**: (1) like a disc or plate; (2) applied to the heads of Asteraceae without **ray** flowers.

**discolorous**: of a leaf in which the two surfaces are unlike in colour (compare **concolorous**).

**dissepiment**: a partition (**septum**) within an ovary or fruit, derived from fusion of adjacent **carpels**.

**distal**: farther from the point of attachment or origin (compare **proximal**).

**distichous**: regularly arranged one above the other in two opposite rows, one on each side of the stem or **rachis**.

**diurnal**: happening during the day.

**divaricate**: widely divergent or spreading in different directions, and often ± horizontal.

**divergent**: turned in different directions.

**divisural line**: the median line of a peristome that is usually zigzag, sometimes furrowed.

**dizonasulculate** (of a pollen grain): with two ring-like **sulci** around the equator.

**domatium** (*pl*. **domatia**): small swelling/pocket on the lower surface of the leaf of some woody dicotyledons in the axils of the primary veins, usually partly enclosed by leaf tissue or hairs.

**dorsal lamina**: in *Fissidens* (Fissidentaceae) the portion of the leaf blade at the back of the costa, opposite the sheathing base (cf. **vaginant laminae**).

**dorsal plates**: the outer surface of exostome teeth.

**dorsal**: relating to or situated on the face turned away from the axis; the lower surface of a leaf; the upper surface of a thallus, facing away from the substrate; or the outer surface of a peristome tooth (compare **ventral**).

**dorsifixed**: attached at or by its back, said e.g. of an **anther** to the **filament**.

**dorsiventral**: flattened and having distinct **dorsal** and **ventral** surfaces, the two usually different, as in many leaves.

**drupe** (*adj*. **drupaceous**): an indehiscent, fleshy fruit, usually 1-seeded, in which the **pericarp** is clearly tripartite: a tough **exocarp**, a fleshy **mesocarp** and a hard **pericarp**, found e.g. in plum or cherry, and in the **aggregate** '**fruit**' of e.g. *Rubus* (Rosaceae); **drupaceous** often refers to a fruit that is drupe-like but not strictly a drupe (compare **berry**, **pyrene**).

**drupelet**: a small **drupe**.

**druse**: an aggregate of crystals within a cavity.

**drusiform**: globular cluster of crystals e.g. in Asteraceae.

**duplicate**: folded twice.

# E

**e-** (*prefix*): often implying absence of something, e.g. in **ebracteate**, **eglandular**.

**ebracteate**: without **bracts**.

**ecalcarate**: without a spur.

**ecallose**: without **callus**/**calli**.

**ecalyculate**: without a **calyculus**.

**ecaudate**: without a tail-like tip or appendage.

**echinate**: covered with **prickles** like a hedgehog; roughened by blunt, spiny projections.

**echinolophate** (of a pollen grain): **lophate** with **echinate** ridges.

**echinulate**: covered with small, pointed **spines**.

**ecostate**: without a costa.

**effuse**: spreading out loosely, especially of an inflorescence.

**efoliate**: without leaves.

**eglandular**: having no glands.

**elaiosome**: an appendage of a seed, usually rich in oil, attractive to animals (especially ants) and hence an aid to dispersal by such animals.

**elater** (*pl*. **elaters**): a differentiated, elongate cell usually with **helical** wall thickenings, in most liverwort capsules admixed with spores.

**elaterophore**: tissue bearing **elaters**.

**eligulate**: without a ligule.

**ellipsoid**: an elliptic solid.

**elliptic**: in the form of a flattened circle more than twice as long as broad.

**elliptical**: essentially oblong with convex sides or ends.

**emarginate**: notched at the extremity.

**embryo**: the rudimentary plant still enclosed in the seed, consisting of the **radicle** from which the root develops, the **cotyledons** (one, two, rarely more), which become the earliest leaves, and the **plumule**, the bud from which the stem and further leaves develop.

**emergent**/**emersed**: with part of the plant aerial and the rest submersed; with part extending out of the water; partially exposed, referring to capsules only partly exposed beyond tips of **perichaetial** leaves.

**endemic**: having a natural distribution confined to a particular geographical region.

**endocarp** (*adj.* **endocarpal**): the innermost layer of the wall of a fruit.

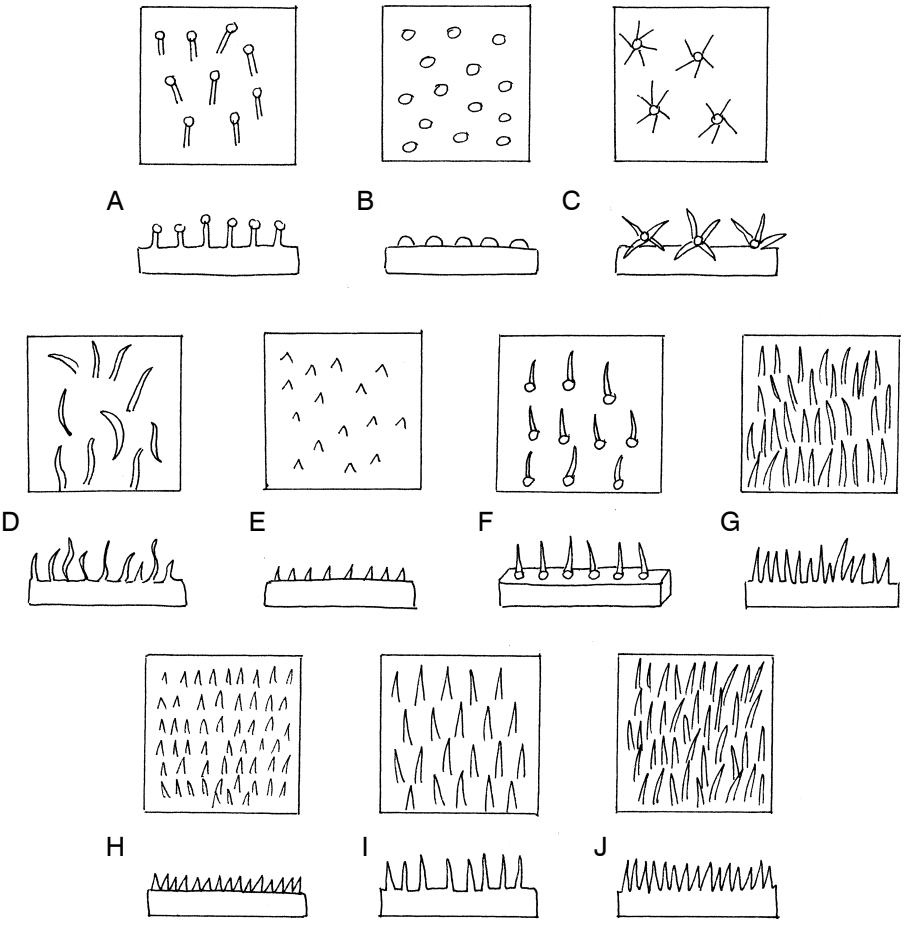



**Figure 100.** Leaf blade indumentum: A, stipitate glandular hairy; B, sessile glandular hairy; C, stellately hairy; D, villous; E, scabrid; F, setaceous; G, puberulous; H, puberulent; I, hirsute; J, tomentose.

**endosperm**: formerly called **albumen**, the nutritive material (mealy, oily, fleshy or horny), formed in the embryo sac after fertilisation and stored within the seed and often surrounding the embryo (compare **perisperm**).

**endostome**: the inner **peristome** (usually consisting of segments, frequently alternating with **cilia**, above basal membrane); e.g. Diplolepideae. .

**endothecium** (*adj*. **endothecial**): the inner lining of the **theca** of an **anther**.

**enervate**: without **nerves**.

**ensiform**: sword-shaped.

**entire**: without teeth, ± smooth, generally referring to leaf margins.

**entomophilous** (of pollination): effected by insects (compare **anemophilous**, **hydrophilous**, **ornithophilous**).

**epaleate**: without **paleae**.

**epapillate**: without **papillae**.

**epappose**: without a **pappus**.

**epi-** (*prefix*): on, upon, above, over.

**epicalyx**: an **involucre** of **bracts** arising below the flower, resembling an extra **calyx**, as in some Malvaceae (see also **calyculus**).

**epicarp**: the outer layer of the wall of a fruit (see also **pericarp**).

**epichile** (of an orchid flower): apical portion of a longitudinally 2- or 3-partite **lip**.

**epidermis** (*adj*. **epidermal**): the outermost layer of cells of an organ, usually only one cell thick; the outer cell layer of the **thallus** in those species with defined **stomata**, sometimes becoming **cavernous**.

**epigeal**: describing seed germination in which the **cotyledons** emerge from the seed and are elevated above the soil surface (compare **hypogeal**).

**epigonium**: protective envelope of the developing sporophyte before it ruptures into two parts, a **vaginula** that encircles the base of the seta and foot of the sporophyte, and a **calyptra** that covers the capsule.

**epigynous**: applied to the flower when the sepals, petals and stamens are apparently borne above the ovary, the latter being enclosed in an adnate **receptacle** or **calyx tube** (compare **hypogynous**, **perigynous**).

**epilithic**: living on rocks (= **lithophytic**).

**epipetalous**: borne on the **petals**.

**epiphyllous**: growing on leaves of higher plants.

**epiphyte** (*adj*. **epiphytic**): a plant that grows on another plant but without deriving nourishment from it, i.e. not parasitic, as some ferns and orchids growing on trees.

**episepal**: an **epicalyx** segment.

**episepalous** (of **stamens**): borne on the **sepals**.

**epithelium**: the outer cell layer(s) of the thallus in those species of *Riccia* (Ricciaceae) with minute spaces for air pores.

**epitropous**/**epitropic** (of an **anatropous** ovule): with its **raphe** facing the **placenta** when **pendulous**, facing away from it when **ascending**.

**equitant** (*literally* riding, astride); (of leaves): folded sharply in half along the midline so that the adaxial surface is hidden and the margins overlap both margins of a similarly folded leaf on the opposite side of the stem, thus creating a 2-ranked arrangement typically found in Iridaceae (compare **obvolute**).

**erect**: upright.

**erect-spreading**: patent, spreading at an angle of 45° or less; cf. **spreading**.

**ericoid**: resembling plants of the family Ericaceae, especially their small, tough leaves.

**erose**: applied to a margin which is irregularly notched, eroded, gnawed or jagged.

**estipitate**: having no **stipe**.

**estrophiolate**: having no **strophiole**.

**evagination**: something that is inside out.

**evanescent**: disappearing quickly.

**ex-** (*prefix*): often implying absence of something, e.g. **exstipulate**.

**exalbuminous**: without **albumen**/**endosperm**.

**exannulate**: without an **annulus** or other ring-like structure.

**excrescence**: an outgrowth or protuberance, e.g. on the stem of a tree.

**excurrent**: extending beyond the apex or margin of a leaf into a **mucro** or **awn**; referring to a **costa** that extends beyond the apex.

**exfoliate**: peeling off in layers or shreds.

**eximbricate**: not **imbricate**.

**exindusiate**: lacking **indusia**.

**exine**: outer wall of spores and **pollen** grains, usually divided into different layers.

**exocarp**: the outer layer of the **pericarp**.

**exostome**: the outer peristome, consisting of teeth; e.g. Diplolepideae.

**exothecium**: the outermost layer of the capsule wall, consisting of exothecial cells.

**exserted**: projecting beyond, as the stamens from the tube of the corolla (compare **included**); referring to capsules projecting above tips of **perichaetial** leaves.

**exstipulate**: without **stipules**.

**extra-axillary**: beyond or outside the **axil**.

**extra-floral** (of nectaries): not within the flower.

**extrastaminal** (e.g. of the **corona**): outside the **stamen** whorl.

**extrorse**: of an **anther** which opens outwardly towards the circumference of the flower (compare **introrse**).

## F

**facultative** (of **parasites**): optional (compare **obligate**).

**falcate**: curved like the blade of a sickle.

**falcate-secund**: strongly curved and turned to one side.

**family**: a group of one to many genera believed to be related phylogenetically, usually clearly separable from other such groups; the major taxonomic group between genus and order.

**farinose**: covered with mealy powder resembling flour.

**fascicle** (*adj*. **fascicled**/**fasciculate**): a cluster of flowers, leaves, etc. arising at about the same point.

**fastigiate**: strictly erect and ± parallel to other members, e.g. with reference to stems or branches.

**faucal**: of the throat of a **gamopetalous** corolla.

**fenestrate**: having openings or translucent areas ('windows').

**ferrugin(e)ous**: rust-coloured.

**fetid**: see **foetid**.

**fibril**: submicroscopic thread or fibre that constitutes the form in which cellulose occurs in the cell wall.

**fibrillose**: covered with small fibres.

**-fid** (*suffix*): indicating number of parts into which an organ is cleft (divided up to ± the middle).

**filament**: the stalk of a **stamen** supporting the **anther**; a thin thread.

**filamentous**: thread-like.

**filiform**: slender and elongate, filamentous, thread-like.

**fimbriate**: fringed.

**fimbrils**: minute fringes.

**flaccid**: soft, limp, flabby.

**fimbriate**: with the margin bordered by long, slender, hair-like processes.

**fimbrillate**/**fimbrilliferous**: minutely **fimbriate**.

**fistular**: hollow throughout its length, like a pipe but closed at the ends.

**flabellate**: fan-like.

**flaccid**: weak, limp, lax or flabby, tending to wilt (compare **turgid**).

**flag leaf**: the first leaf below the inflorescence.

**flanks**: sides of thallus.

**flexuose**/**flexuous**: zigzag or bent alternately in opposite directions.

**floccose**: covered with woolly hairs which tend to rub off and adhere in small masses.

**floral**: belonging to or associated with a flower.

**florescence**: **inflorescence** with a cluster of flowers terminating the main axis, but not terminating with a flower and hence apex of florescence remaining **indeterminate** forming exclusively lateral flowers.

**floret**: small individual flowers that make up a (dense) inflorescence, as those in the **heads** of Asteraceae or the **spikelets** of Poaceae.

**floricane**: a flowering and fruiting stem, especially of brambles, e.g. *Rubus* spp. (Rosaceae).

**flower**: the sexual reproductive structure of angiosperms, typically consisting of **gynoecium**, **androecium** and **perianth** and the **axis**/**receptacle** bearing these parts.

**foetid**/**fetid**: having a disagreeable odour.

**foliaceous**: leaf-like.

**foliar**: of or relating to a leaf.

**foliolate**: having **leaflets**.

**follicle** (*adj.* **follicular**): a fruit formed from a single **carpel** opening usually only along the inner (i.e. ventral) **suture** to which the seeds are attached.

**foot**: the basal absorbing organ of the sporophyte.

**forb**: a non-woody plant other than a grass, sedge, rush, etc. (compare **herb**).

**-form** (*suffix*): superficially resembling; e.g. an umbelliform inflorescence is one that resembles, but is not a true **umbel**.

**fornix** (*pl.* **fornices**): a small scale.

**foveate**: pitted.

**foveolate**: marked with small pits.

**free**: neither adhering nor united; **free-basal placenta**: one in which the ovules are attached to a central column arising from the base of the ovary cavity and not

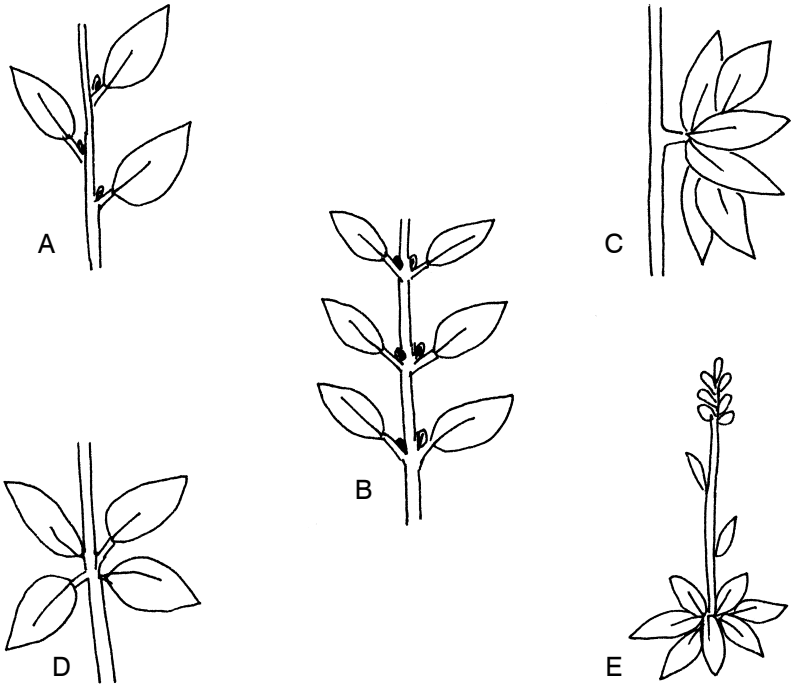



**Figure 101.** Leaf arrangement: A, alternate; B, opposite; C, clustered; D, ternate; E, rosulate.

reaching the top, e.g. in Primulaceae; **free-central placenta**: the same but reaching to the top of the cavity, e.g. in most Caryophyllaceae.

**frond**: leaf of a fern, palm or cycad, or the **thallus** of e.g. Lemnaceae; the branched part of a dendroid or frondose moss.

**frondose**: closely and regularly branched in one plane (pinnate), resembling a fern frond; e.g. *Thuidium* (Thuidiaceae).

**fruit**: the capsule or more loosely the **sporophyte**.

**frutescent**: becoming shrub-like (woody).

**fruticose**: shrub-like.

**fugaceous**: lasting only for a short time.

**fugitive**: moving from place to place; evanescent, quickly fading or perishable, volatile.

**fulvous**: tawny.

**funicle**/**funiculus**: the stalk which attaches the **ovule** to the **placenta**.

**funnelform**: funnel-shaped, gradually widening upwards.

**furcate**: forked.

**fuscous**: of a brownish grey colour.

**fusiform**: spindle-shaped, thick but tapering towards each end.

## G

**galea**: a **petal** shaped like a helmet; the strongly concave upper lip (petal) of some **bilabiate** corollas.

**galeate**: helmet-shaped; having a **galea**.

**gametangium** (*pl*. **gametangia**): i.e. **archegonium**, **antheridium** which is vessel(s) bearing gametes.

**gamete**: a **haploid** cell or nucleus that fuses with another, of opposite sex, in sexual reproduction.

**gametoecium**: **gametangia** and surrounding bracts.

**gametophore**: the leafy phase of the gamete-bearing generation, produced from buds on the **protonema**.

**gametophyte**: a plant, or phase of a plant's life cycle, that bears **gametes**; in mosses, the green, leafy plant.

**gamopetalous**: with the **petals** united, either entirely or at the base into a tube, cup or ring (see also **choripetalous**, **sympetalous**; compare **polypetalous**).

**gamosepalous**: with united **sepals**.

**gamotepalous**: with united **tepals**.

**gasteriform**: shaped like a belly; of a perianth tube, e.g. in *Gasteria* (Asphodelaceae): basally inflated.

**gemma** (*pl*. **gemmae**): an **adventitious bud** capable of reproducing the plant; a process found on pollen grains.

**gemmate**: bud-like.

**gemmiferous**: bearing **gemmae**.

**geniculate**: bent like a knee.

**genome**: a complete **haploid** set of chromosomes, as present in a **gamete**.

**genotype**: the total complement of hereditary factors (genes) acquired by an organism from its parents and available for transmission to its offspring (compare **phenotype**).

**genus** (*pl*. **genera**): a group of species believed to be related phylogenetically and usually clearly separable from other such groups, or a single species without close relatives; the major taxonomic rank between species and family.

**geocarpic**/**geocarpous**: referring to the development of fruits in the ground originating from flowers which developed and were pollinated above ground.

**geophyte**: a perennial plant, usually herbaceous, with renewal buds located on the plant below the soil surface, as on **bulbs** or **rhizomes**.

**geoxylic**: of a woody plant with numerous stems arising from a subterranean **rhizome**.

**gibbosity** (usually of a **calyx** or **corolla**): a pouch-like swelling or hump.

**gibbous**: with a **gibbosity**.

**glabrate**: glabrous, but obviously having previously had an **indumentum**.

**glabrescent**: becoming **glabrous** or nearly so.

**glabrous**: devoid of hairs, smooth.

**gland** (*adj*. **glandular**/**glandulose**): (1) secreting structure on the surface or embedded in the substance of a leaf, flower, etc., or raised on a stalk (glandular hairs or stipitate glands); (2) a warty protuberance or fleshy excrescence (often on petiole, inflorescence, or within the flower); (3) (see **corpuscle**).

**glaucous**: pale bluish green or with a pale bloom.

**globose**: ± spherical or rounded.

**glochid**/**glochidium** (*pl*. **glochidia**; *adj*. **glochidiate**): barbed bristle or hooked hair.

**glomerate**: compactly clustered.

**glomerule** (*adj*. **glomerulate**): a small compact cluster.

**glumaceous**: resembling the **glumes** of Poaceae.

**glume**: a **bract**, usually chaffy, in the **spikelets** of Cyperaceae, Poaceae and similar plants.

**glutinous**: with a sticky exudate.

**gonio-autoicous**: see **autoicous**.

**granulose**/**granulate**: finely covered with very small granules; roughened with minute, blunt projections.

**graminaceous**: pertaining to or resembling grasses.

**gregarious**: growing close together but not in tufts or mats.

**guide cells**: large, empty, rather thin-walled cells in a median row as viewed in the cross section of the **costa** of many mosses.

**guide rails**: see **gynostegial grooves**.

**gymnosperm**: a seed plant with the ovules borne on the surface of a **sporophyll** (compare **angiosperm**).

**gymnostomous**: lacking a peristome.

**gynobase**: a dilation or prolongation of the receptacle which bears **carpels**/**nutlets** (e.g. in Boraginaceae).

**gynobasic** (of the **style**): arising apparently from the base of the **gynoecium**, e.g. between the lobes of the ovary, as in Boraginaceae and Lamiaceae.

**gynodioecious**: having bisexual flowers and female flowers on separate plants (compare **gynomonoecious**).

**gynoecium** (*pl*. **gynoecia**): the female part of the flower, consisting, when complete, of **ovary**, **style** and **stigma**; also called **pistil**; in liverworts often consisting of archegonia, surrounding calyptra and involucre. (see **perichaetium**).

**gynomonoecious**: having bisexual and female flowers on the same plant (compare **gynodioecious**).

**gynophore**: a stalk supporting the **gynoecium** and formed by an elongation of the **receptacle**.

**gynostegial corona**: collective term for the **staminal** and **interstaminal coronas**, both of which are associated with the **gynostegium**.

**gynostegial grooves**: the grooves between the lateral margins of adjacent anthers fused to the **style head**, in Apocynaceae (also known as **anther slits**, **anther wings** or **guide rails**) (see also **gynostegium**).

**gynostegium** (*pl*. **gynostegia**): a structure formed by the union of the **stamens** with part of the **pistil**, as in Apocynaceae.

**gynostemium** (*pl*. **gynostemia**): the **column** in the centre of flowers of Orchidaceae formed by the union of the stamen with part of the **gynoecium**.

# H

**habit**: the aspect or general appearance of a plant.

**habitat**: the environment in which a plant lives.

**hair type B** (in tribe Gnaphalieae: Asteraceae): with one basal cell and a very long terminal cell.

**hair-point**: see **awn** and **aristae**, e.g. *Grimmia laevigata* (Grimmiaceae).

**half-inferior** (of an **ovary**): partly below and partly above the level of attachment of **perianth** and s**tamens**.

**halophilous**: salt-loving.

**halophyte**: a plant that grows in very salty soil.

**haploid**: having a single set of unpaired chromosomes, as in the nucleus of one of the **gametes**.

**hapteron** (*pl*. **haptera**): flattened organ, without vascular tissue, attaching the **thalli** of Podostemaceae to the substrate by a cement-like substance.

**hastate**: applied to the base of a leaf when it has two ± triangular lobes diverging laterally.

**hastula** (in palms with **palmate** leaves): the outgrowth from the top of the leaf stalk (**rachis**).

**haustorium** (*pl*. **haustoria**): a specialised root of parasitic plants capable of penetrating host tissue and thus absorbing nutrients.

**head**: a dense **inflorescence** of sessile or nearly sessile flowers on a compound **receptacle** (see also **capitulum**).

**helical**: shaped like a helix/spiral.

**helicoid**: coiled; (of a **cymose** inflorescence): branching repeatedly on the same side.

**heliophilous**: sun-loving.

**helophytic**: growing in marshes.

**hemidimorphic**: with some part of the leaf dimorphic.

**herb**: any vascular plant that never produces a woody stem (compare **forb**).

**herbaceous**: not woody; soft in texture.

**hermaphrodite** (*adj*. **hermaphroditic**): an organism or structure possessing both male and female reproductive organs, e.g. a flower with both stamens and pistil (= **bisexual**).

**heteroblastic**: having the adult parts of the plant (especially the leaves) distinctly different in form from the juvenile parts.

**heterocarpic**/**heterocarpous**: having carpels or fruit of more than one kind.

**heterocarpy**: having two kinds of fruit.

**heterodistylous**: said of a species in which two kinds of plants occur, those with long styles and those with short styles.

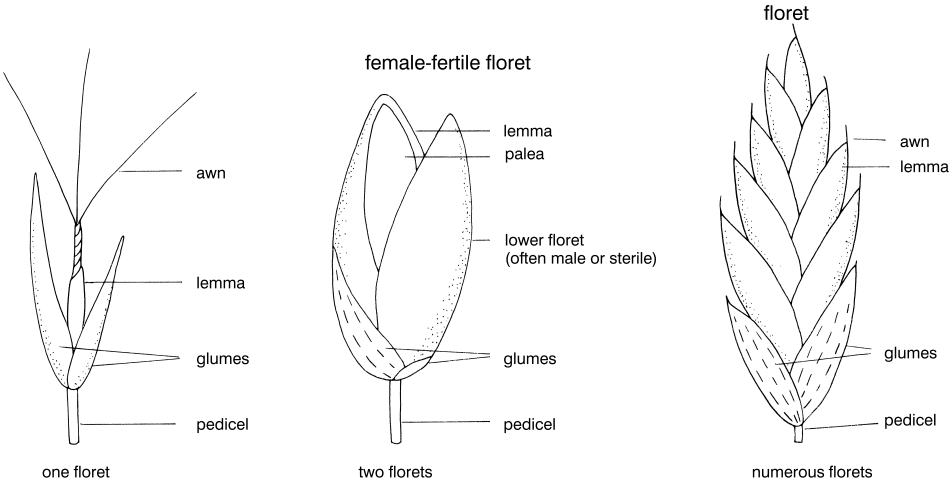



**Figure 102.** Diagrams of generalised grass spikelets (after Fish, L., Mashau, A.C., Moeaha, M.G. & Nembudani, M.I. 2015. Identification guide to southern African grasses. *Strelitzia* 36: 11).

**heterogamous**: of different sexes; (of a flower head, as in some Asteraceae): having two kinds of **florets**, those of the **ray** florets being neuter or unisexual and those of the **disc** florets bisexual; of **spikelet** pairs in Poaceae: consisting of a sterile and a female-fertile spikelet (compare **homogamous**).

**heterogeneous**: dissimilar (compare **homogeneous**).

**heteroicous**: with several forms of inflorescence on the same plant (or on various plants of the same species); also called **polyoicous**.

**heteromallous**: pointing in all directions (compare **homomallous**).

**heteromorphic**: of different forms (compare **homomorphic**).

**heterophyllous**: having leaves of different forms.

**heterosporous**: having two types of **haploid** spores (compare **homosporous**).

**heterostylous**: applied to a species which has flowers with **styles** differing in length or shape (compare **homostylous**).

**heterothetic** (of a compound raceme): composed of a terminal as well as lateral racemes.

**hilum** (*adj*. **hilar**): the scar left on the seed where it was attached to the **funicle** or **placenta**.

**hippocrepiform**: horseshoe-shaped.

**hirsute**: with rather coarse, stiff hairs (compare **villous**).

**hirsutulous**: minutely **hirsute**.

**hispid**: with short, stiff hairs; bristly pubescent.

**hispidulous**: minutely **hispid**.

**hoary**: covered with white or greyish white, very short, closely interwoven hairs, usually referring to plants with leaves long hair-pointed; e.g. *Grimmia* (Grimmiaceae).

**holonectary** (e.g. in Mesembryanthemaceae): a nectary forming a continuous ring.

**homogamous**: applied to a flower head/**capitulum** with all the flowers of the same kind; or to spikelet pairs in Poaceae that are of the same sexuality (compare **heterogamous**).

**homogeneous**: uniform (compare **heterogeneous**).

**homomallous**: pointing the same way (compare **heteromallous**).

**homomorphic**/**homomorphous**: uniform in shape (compare **heteromorphic**).

**homonym** (in nomenclature): a name spelled exactly like a validly published name for a taxon of the same rank based on a different type.

**homosporous**: having only one type of **haploid** spore (compare **heterosporous**).

**homostylous**: species in which the flowers have **stigmas** and **anthers** held at the same level relative to each other on all plants (compare **heterostylous**).

**hood** (in flowers of Asclepiadoideae: Apocynaceae): a concave segment of the **corona**.

**host**: an organism on which a **parasite** lives and by which it is nourished (also applied, loosely, to a plant supporting an **epiphyte**).

**humifuse**: lying or spreading on the ground.

**hyaline**: colourless and almost transparent.

**hyalocyst**: large, empty, colourless water-storage cell, surrounded by a network of green chlorocysts; see also **leucocyst**.

**hyalodermis**: a cortex of large, empty, colourless cells (**hyalocysts**).

**hydathode**: a minute pore or specialised structure through which water is discharged from a leaf by guttation; sometimes differentiated as secretory **trichomes**.

**hydroids**: tracheid-like conductive cells in the axial strand of many mosses, sometimes also in the **costa** but not usually in contact with the central strand.

**hydrophily** (*adj*. **hydrophilous**) (of pollination): effected by water.

**hydrophyte** (*adj*. **hydrophytic**): a plant living in water or in a very moist habitat; an aquatic plant.

**hygrochastic**: applied to plants in which opening of the fruit and dispersion of the spores or seeds are caused by absorption of water.

**hygrophytes** (*adj*. **hygrophytic**): marsh plants or plants that need a large supply of moisture for their growth.

**hygroscopic**: readily absorbing and retaining moisture from the atmosphere, resulting in changes in form or position of certain cells or structures.

**hymenostomaceous**: peristome lacking but capsule mouth closed by an ephemeral membrane developed from the top of the **columella**.

**hypanthium** (*pl*. **hypanthia**): a cup or tube bearing floral parts above the base, and often above the top of the ovary of a flower, e.g. in many Myrtales or Onagraceae (see also **calyx tube**).

**hypochile** (of an orchid flower): the basal part of a longitudinally 2- or 3-partite **lip**.

**hypocotyl**: the part of the stem of an **embryo** or young seedling below the cotyledonary node.

**hypocrateriform**: see **salverform**.

**hypogeal**: growing or remaining below ground; describing seed germination in which the **cotyledons** remain below the soil surface (compare **epigeal**).

**hypogynium** (*pl*. **hypogynia**): portion of the **receptacle** below the ovary, e.g. in Cyperaceae.

**hypogynous**: having the flower parts attached below the base of the ovary and free from it; flowers with this arrangement have a **superior** ovary (compare **epigynous**, **perigynous**).

**hypophysis**: a swollen neck at the base of the capsule (also called **apophysis**).

**hypsophyll**: leaf borne at the upper level of a plant, as with various floral bracts; some possibly have a protective function.

**hysteranthous** (of leaves): appearing after the flowers (compare **synanthous**).

## I

**I.C.B.N.** = International Code of Botanical Nomenclature.

**idioblast**: a uniquely differentiated cell, distinct in size and contents from the other cells around it in the same tissue.

**illegitimate** (of a validly published name): contrary to one or more articles of the **I.C.B.N.**

**imbricate**: (1) overlapping like tiles; (2) applied to parts in a flower bud where one **sepal** or **petal** is wholly internal and one wholly external and the others are overlapping at the edge only.

**immaculate**: without spot or stain; pure, unblemished, undefiled.

**immarginate**: not **margined** or bordered.

**immersed**: completely covered; referring to capsules exceeded by the tips of the perichaetial leaves.

**imparipinnate**: having an uneven number of **pinnae**, by virtue of having one terminal **pinna**.

**imperforate**: not perforated.

**inaperturate** (of a pollen grain): without germinal pores.

**incised**: margin cut rather deeply and sharply.

**included**: not projecting (compare **exserted**).

**incrassate**: thickened.

**incumbent**: resting or lying (on); (of the orientation of an **embryo**): with the **cotyledons** lying face to face and folded downwards beside the **radicle** (as in some Brassicaceae); (of anthers): lying against the inner face of the **filament**.

**incurved**: bent or curved inwards or upwards; curved towards the **adaxial** surface of leaf margins; (compare **recurved**).

**indefinite**: variable in number; numerous; many; (of stamens): more than twice as many as the petals or sepals; (of an inflorescence): not terminating in a flower, i.e. having a continuing terminal growing point.

**indehiscent**: not opening when ripe.

**indeterminate**: (1) (of an **inflorescence**): the lateral or lower flowers mature first while the primary axis continues to grow, hence the terminal flower is the last to open, therefore a **racemose** inflorescence (compare **cymose**) (2) (of growth): (= **monopodial**) the condition in which the terminal bud persists and produces successive lateral branches.

**indumentum**: any covering of a surface such as hairs, wool, scales.

**induplicate**: with margins (of **petals** or **sepals**) folded inwards but not overlapping.

**indurated**: hardened.

**indusium** (*pl*. **indusia**; *adj*. **indusiate**): a thin flap of tissue covering the **sorus** in ferns.

**inferior**: beneath or below, as in a **calyx** which is below the **ovary**, the latter then being **superior**; as in an ovary which appears to be below the calyx, the latter being adherent to the ovary.

**inflexed**: bent sharply inwards, upwards or forwards (compare **deflexed** or **reflexed**).

**inflorescence**: the arrangement of the flowers; in mosses a cluster of sex organs and the leaves or bracts surrounding them; see also **perichaetium** and **perigonium**.

**infra-** (*prefix*): below; beneath.

**infructescence**: the arrangement of fruits on a plant.

**infundibular**/**infundibuliform**: funnel-shaped.

**innovation**: a new shoot; a branch formed after the maturity of sex organs, usually at the base of an inflorescence.

**inrolled**: see **involute**.

**insectivorous**: catching, and presumably feeding on, insects.

**inserted**: attached, included.

**insertion**: the place of attachment of a leaf, branch or peristome.

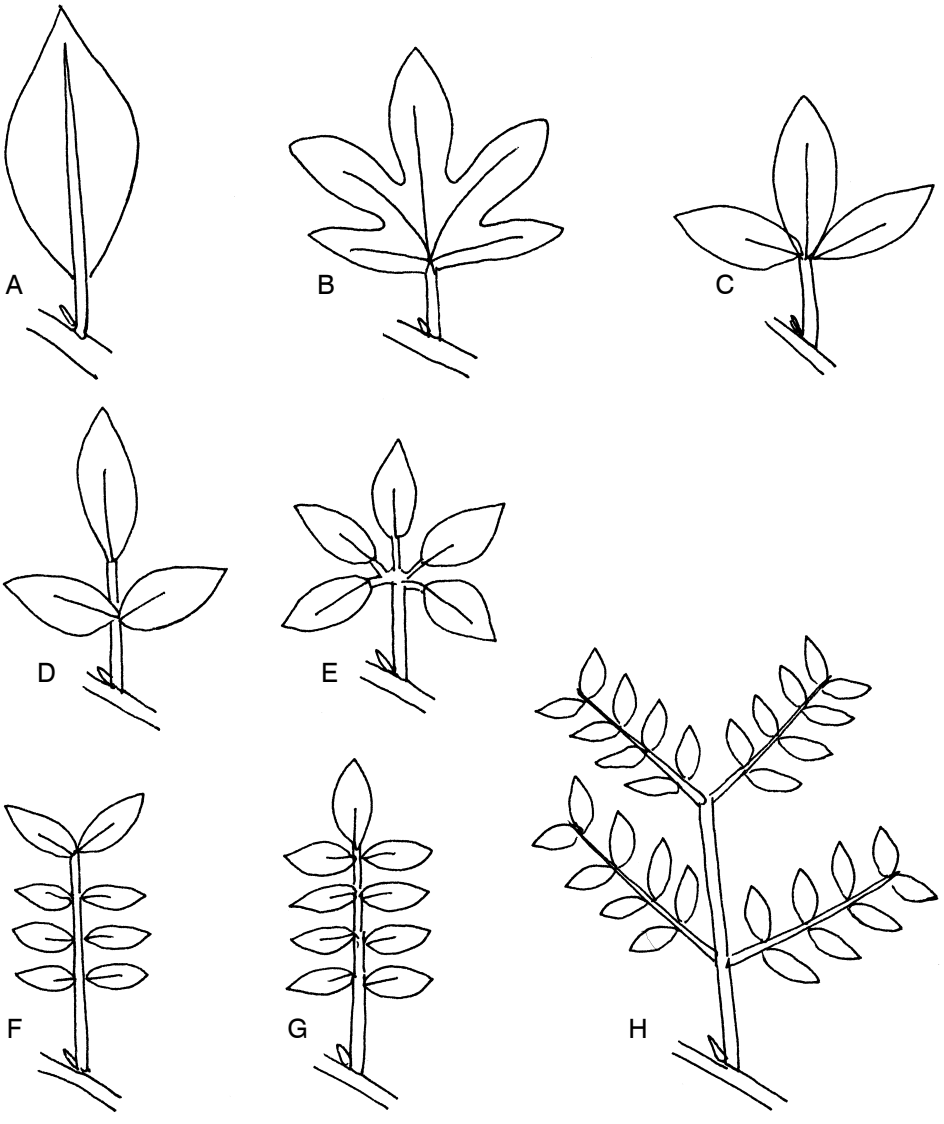



**Figure 103.** Leaf types: A, simple; B, palmatifid; C, 3-foliolate (leaflets sessile); D, 3-foliolate (terminal leaflet with petiolule); E, palmate; F, paripinnate; G, imparipinnate; H, bipinnate.

**integument**: one of the outer layers of tissue of an **ovule**.

**intercalary** (of growth): between apex and base, not apical.

**internode**: the portion of a stem between two nodes (compare **node**).

**interpetiolar**: applied to **stipules** placed between the **petioles** of opposite leaves (often **connate**).

**intersepalar**: between the **sepals**.

**interstaminal corona**: fleshy lobes, often connate into a tube, attached to the base of the **staminal column** in the interstaminal areas (compare **gynostegial corona**, **staminal corona**).

**interstice**: space between structures.

**interstitial**: situated in **interstices** or spaces between structures; interstitial growth: a type of growth occurring in organs that do not have specific or localised **meristematic** regions; all-over growth, as in some fruits.

**intrapetiolar**: between the **petiole** and the stem (compare **interpetiolar**).

**intrastaminal**: between the **stamens**.

**introduced**: not indigenous; not native to the area in which it now occurs (compare **adventive**, **naturalised**).

**introflexed**: see **inflexed**.

**introrse**: applied to an **anther** opening towards the centre of the flower.

**intruse**: projecting or pushed out, in or forward.

**invested**: covered tightly; the focus is on the tight fit, e.g. an **integument** invests a seed.

**involucel**: **involucre** of bracteoles surrounding a secondary inflorescence such as the base of an **umbellule**.

**involucrate**: having an **involucre** of some kind.

**involucre**/**involucrum** (*adj*. **involucral**): a number of bracts, e.g. those surrounding the base of a flower head/**capitulum** or of an **umbel**.

**involucre**: a protective sheath of tissue of thallus origin surrounding archegonium or sporophyte.

**involute**: having the edges of the leaves rolled towards the **adaxial** surface (compare **revolute**).

**irregular** (of a flower, calyx or corolla): bilaterally symmetrical, symmetrical about one plane only, usually the plane that bisects the flower vertically along the longitudinal axis (= **zygomorphic**); (compare **actinomorphic**, **regular**).

**isobilateral** (= **isolateral**) (of a leaf): having structurally similar upper and lower surfaces.

**isodiametric**: about as broad as long (including square, rounded, or hexagonal).

**isophyllous**: stem and branch leaves similar (compare **anisophyllous**).

**isopolar** (of a pollen grain): with the equatorial plane dividing the grain into similar halves, i.e. the proximal and distal faces are similar.

**isosporous**: having spores with a unimodal distribution of size.

**isotomous**: with ± equal shoots (Pteridophyta).

**isthmus** (*pl*. **isthmi**): a narrow part or organ connecting two larger parts.

## J

**jaculator**: persistent, hook-like funicle as in Acanthaceae.

**jugate**: coupled or yoked together, applied especially to the **leaflets** of a **pinnate** leaf.

**julaceous**: smoothly cylindric, like a catkin, referring to stems or branches with crowded and imbricate leaves.

**juxtacostal**: adjacent to costa.

## K

**keel**: (*syn*. **carina**): a ridge like the keel of a boat; in Fabaceae a boat-shaped structure formed by the fusion of the two **anterior petals**.

**keeled**: ridged along the middle of a flat or convex surface.

**kneed**: having a knee-like joint.

## L

**labellum**: a **lip** (see there).

**lacerate**: cut irregularly; appearing torn, as in certain leaves and **ligules**.

**lacinia** (*pl*. **laciniae**): a slender lobe.

**laciniate**: cut into slender, pointed lobes; dissected into fine, deep, irregular divisions (**laciniae**); ciliate-fringed.

**lacinulate**: finely **laciniate**.

**lacrimiform**: teardrop-shaped.

**lactifer**: a latex duct which may or may not produce milky latex.

**lacuna** (*pl*. **lacunae**): (1) an internal air space or chamber, usually between cells, as in leaf, stem and root tissues; also any space within a cell; (2) a **leaf gap** as viewed in cross sections of stem nodes.

**lacunar**: referring to or arising from **lacunae**.

**lacunose**: full of **lacunae**; having air-cells.

**laevigate**: see **levigate**.

**lageniform**: shaped like a Florence flask.

**lamella** (*pl*. **lamellae**; *adj*. **lamellate**): a thin plate or layer; green ridges or plates on the costa or lamina of some moss leaves.

**lamina** (*pl*. **laminae**): the limb, blade or expanded part of a leaf, sepal or petal.

**laminal cells**: cells of the upper $^1/_4$–$^1/_3$ of a leaf, between the margin and costa (compare **basal cells**).

**lanate**: woolly.

**lanceolate**: lance-shaped; ± 4 × as long as broad, broadest in the lower half and tapering toward the apex.

**lanuginose**: cottony, similar to **lanate**, but with shorter **trichomes** (hairs).

**lateral**: at the side (compare terminal).

**latex**: a viscous fluid exuded from the cut surfaces of leaves and stems of certain plants.

**latiseptate**: with broad partitions (compare **angustiseptate**).

**latrorse** (of **anthers**): opening laterally, i.e. towards adjacent anthers.

**lax**: soft or loose; usually referring to large, thin-walled cells, but also the nature and spacing of leaves on stem, or stems in tufts.

**leaf gap**: gap left in the vascular system at the node of a stem at the point where the vascular element supplying the leaf, branches off.

**leaflet**: the ultimate member of a **compound** leaf.

**legume**: a simple fruit, consisting of a single **carpel**, usually dry and usually opening along both **sutures** into two halves, e.g. in the Fabaceae; any member of the Fabaceae.

**lemma**: the lower of two **bracts** enclosing the florets of Poaceae.

**lenticels** (*adj*. **lenticellate**): corky spots on the bark through which gaseous exchange occurs.

**lenticular**: shaped like a biconvex lens.

**lepidote**: clothed with small, scurfy scales.

**leptoid**: conductive cell, somewhat similar to sieve tubes in form and function, found in the axial strand of stems and setae of Polytrichaceae and in setae of many other mosses.

**leptome**: a phloem-like tissue consisting of leptoids and parenchymatous cells.

**leucocyst**: large, empty, hyaline leaf cells e.g. in Calymperaceae, see also **hyalocyst**.

**levigate**: having a smooth, polished surface.

**liana**/**liane**: a woody climber with rope-like stems.

**lid**: operculum.

**ligneous**: of or resembling wood.

**lignified**: woody, due to the deposition of lignin in cell walls.

**lignotuber** (*adj*. **lignotuberous**): a woody swelling at the base of the shoot system below or just above the ground, containing **adventitious** buds from which new shoots develop if the top of the plant is cut off or burned.

**ligulate**: strap-shaped, narrow, moderately long, with parallel sides, applied e.g. to the **ray** florets in many Asteraceae.

**ligule**: (1) a thin, membranous and/or hairy appendage at the top of the leaf sheath as in Poaceae; (2) the **limb** of **ray florets** in Asteraceae; (3) small membranous flap adaxially near leaf base in Pteridophyta.

**limb**: the upper, usually expanded part of the calyx or corolla above the tube, throat or claw.

**limbate**: with a limbidium; e.g. *Fissidens* (Fissidentaceae).

**limbidium**: a border of elongate, incrassate, marginal leaf cells that are distinct from other laminal cells; e.g. *Fissidens* (Fissidentaceae).

**linear**: long and very narrow in relation to the length and with parallel edges (narrower than **ligulate**, compare **lorate**).

**lineolate**: marked with fine lines.

**lingulate**: tongue-shaped.

**lip**: (1) one of two divisions of a **gamosepalous calyx** or a **gamopetalous corolla** when it is cleft into an upper (posterior) and a lower (anterior) portion (see **bilabiate**); (2) of an orchid: the lowest petal (the inner median perianth lobe), usually enlarged and different in form from the two lateral ones (= **labellum**).

**lithophyte** (*adj*. **lithophytic**): a plant that grows on rocks (= **epilithic**).

**lithosol**: consists of partially weathered rock fragments.

**lobe**: any division or segment of an organ (usually rounded); specifically a part of a leaf, petal or calyx cut less than halfway to the centre.

**lobulate**/**lobuled**: having small lobes.

**lobules**: small lobes.

**locellate**: divided into small secondary compartments.

**locular**: having chambers; thus: **unilocular** = 1-chambered; **bilocular** = 2-chambered, etc.

**locule**/**loculus**: a chamber or cell of an ovary or fruit or anther containing ovules or seeds or pollen grains.

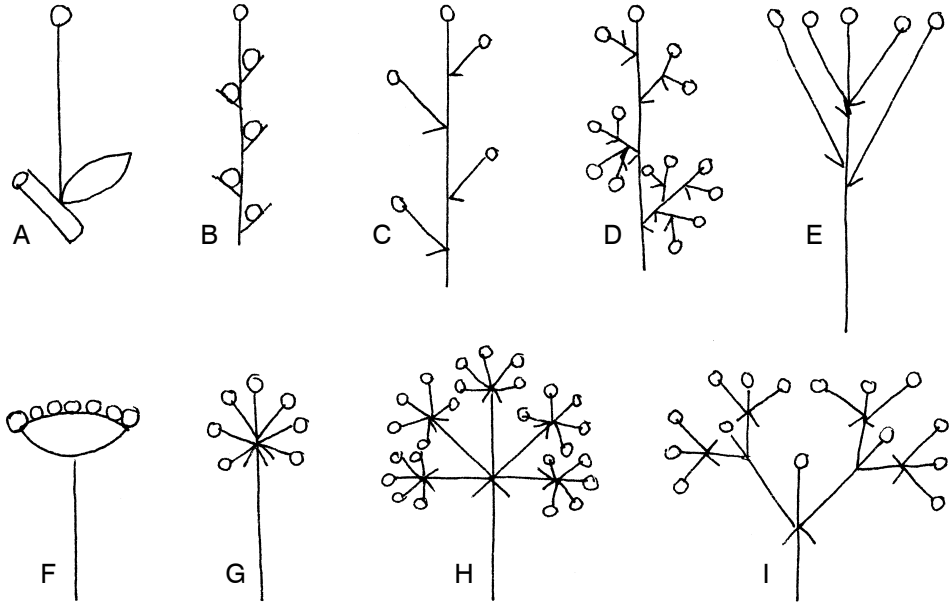



**Figure 104.** Inflorescence types: A, flower solitary; B, spike; C, cyme; D, compound cyme; E, corymb; F, capitulum; G, umbel; H, compound umbel; I, compound dichasium.

**loculicidal**: referring to the dehiscence of a fruit which splits down the middle of the cells or **locules** (i.e. the midrib or dorsal suture) and not at the line of junction of the **carpels**, e.g. in most Liliaceae (in wide sense) (compare **septicidal**).

**lodicule**/**lodicula** (*pl*. **lodiculae**): a small scale outside the stamens in flowers of the Poaceae.

**loment**/**lomentum**: modified **legume** fruit with constrictions between the seeds, which at maturity separates at the constrictions into 1-seeded segments.

**lophate** (of a pollen grain): with the outer **exine** raised in a pattern of ridges.

**lophomorphic**: crested.

**lorate** (*syn*. **loriform**): strap-shaped; moderately long with parallel sides (compare **linear**).

**lumen**: the cavity of a plant cell.

**lunate**/**luniform**: shaped like the waxing moon; crescent-shaped.

**lunulate**: finely **lunate**.

**lyrate**: applied to a leaf which is pinnately lobed or cut into small segments below, but with a much larger terminal lobe.

**lysigenous**: originating by dissolution of cells.

# M

**maculate** (*noun* **maculation**): spotted or blotched.

**mallee**: scrub vegetation composed mainly of ***Eucalyptus* spp. (Myrtaceae) about 2–10 m high in dry, subtropical parts of southwest and southeast Australia.

**mam(m)illate**: having small nipple-shaped projections.

**mammilla** (*pl*. **mammillae**): a bulging protuberance.

**mammillose** (*adj*. **mammillate**): convex with a blunt central projection.

**marcescent**: withering without falling off.

**marginal placentation**: the type of **placentation** found in a **gynoecium** consisting of a single **carpel** or of two or more free carpels and where the margins of the carpel(s) have become united to form a suture along which the ovules are borne (see also **axile** and **parietal placentation**).

**marginal**: occurring at or very close to the margin.

**marginate**/**margined**: having a margin of distinct colour or texture.

**marmorate**: marbled, having coloured veins.

**massula** (*pl*. **massulae**): hardened mucilage enclosing group of microspores in *Azolla* (Salviniaceae).

**mat**: a densely interwoven, horizontal form of growth; e.g. *Brachythecium* (Brachytheciaceae).

**medial**/**median**: of or situated in the middle.

**medifixed**: fixed by the middle, e.g. of an anther (compare **basifixed**, **dorsifixed**, **versatile**); (of a hair): ± T-shaped with the stem much shorter than the crossbar.

**medulla**: the pith of a stem.

**megaspore**: the larger of the two kinds of spores produced in the sexual life cycle of a **heterosporous** plant, giving rise to the female **gametophyte**.

**membranaceous**/**membranous**: of thin, translucent texture.

**mentum**: an extension of the base of the **column** in the flower of some Orchidaceae.

**mericarp**: one segment of a fruit that breaks at maturity into units derived from the individual carpels, e.g. in Apiaceae or Malvaceae (see also **schizocarp**).

**meridional**: running in a north-south direction, from apex to base.

**meristem** (*adj*. **meristematic**): growing region of a plant in which cells, which have retained their embryonic characteristics, or have reverted to them secondarily, divide to produce new cells.

**-merous** (*suffix*): indicating number of parts, e.g. flowers 5-merous where floral organs are present in fives.

**mesocarp**: the fleshy portion of the wall of a succulent fruit inside the skin and outside the stony layer, if any, surrounding the seed(s) (see also **pericarp**).

**mesochile** (of flowers of certain Orchidaceae): the middle portion of a longitudinally 2- or 3-partite **lip**.

**mesomorphic**: having characteristics suited to growing in environments that are neither very dry nor very wet.

**mesophyll**: photosynthetic tissue of a green plant.

**mesophyte** (*adj*. **mesophytic**): plants which grow in environments that are neither very wet nor very dry; plants intermediate in moisture requirements between **hydrophytes** and **xerophytes**.

**micrometre**: one thousandth of a millimetre, micron (abbreviated: μm).

**micropyle**: a minute canal through the **integument**(**s**) of an ovule through which the pollen tube enters and which persists as a pore in the seed coat.

**microsporangium** (*pl*. **microsporangia**) (in an **anther**): the chamber in which the pollen is formed (= **pollen sac**) (see **anther**).

**microspore**: the smaller of the two kinds of spores produced in the sexual life cycle of a **heterosporous** plant, giving rise to the male **gametophyte**.

**midrib**: the principal, usually central nerve of a leaf or leaf-like part; midvein or single costa.

**mitre-shaped**/**mitriform** (*adj*. **mitrate**): conic and undivided or equally lobed at base, shaped like a bishop's cap.

**monadelphous** (of stamens): in one bundle, e.g. in certain Fabaceae and Malvaceae.

**moniliform**: like a string of beads.

**mono-** (*prefix*): one; single.

**monocarpic**: applied to a plant which flowers and fruits only once and then dies (compare **polycarpic**).

**monochasium** (*pl*. **monochasia**; *adj*. **monochasial**): a **cyme** reduced to single flowers on each axis (the laterals of the **dichasium** having been lost by reduction).

**monochlamydeous**: with a perianth of a single **whorl** of similar parts (**tepals**).

**monocotyledon**: a flowering plant having a single **cotyledon** in the seed (compare **dicotyledon**).

**monoecious**: with male and female flowers separate but borne on the same individual plant.

**monoicous**: with antheridia and archegonia on the same plant, including **autoicous**, **paroicous**, **polyoicous** and **synoicous** (compare **dioicous**).

**monolete**: with the dehiscence line unbranched, as in bilateral spores.

**monomerous**: formed of a single member.

**monomorphic**/**monomorphous**: of one form only.

**monophyletic**: derived from a single ancestral line (compare **polyphyletic**).

**monopodial** (of growth): with a persistent terminal growing point producing many lateral organs successively (compare **sympodial**).

**monosulcate** (of a pollen grain): having a single longitudinal groove or **sulcus**.

**monothecous** (of an anther): having one **theca**.

**monovalent**/**univalent**: a single, unpaired chromosome during meiosis.

**morchelliform**: shaped like a morel (a fungus of the genus *Morchella*, which has a pitted cap).

**mucilage** (*adj*. **mucilaginous**): a gelatinous substance which absorbs water and increases in bulk.

**mucous**: slimy.

**mucro**: a short, abrupt point.

**mucronate**: ending abruptly in a short stiff point which is a continuation of the midrib.

**mucronulate**: finely **mucronate**.

**multifid**: divided into many lobes or segments.

**muricate**: rough, with short hard tubercles or pointed protuberances.

**muriculate**: finely **muricate**.

**muticous**: blunt, without a point or awn.

**mycorrhiza**: a symbiotic union between a fungus and a plant root.

**mycotrophic**: of a plant possessing mycorrhiza.

**myxogenic**: capable of forming mucus (when wetted).

# N

**naked** (of seeds): exposed on the surface of a sporophyll (not enclosed within an ovary); (of flowers): without perianth.

**nanandrous**: producing dwarf males.

**-nate** (*suffix*): indicating number of parts in a group, e.g. leaves 3-nate = three leaves in a group or cluster.

**naturalised**: introduced and reproducing itself without human assistance (compare **adventive**, **introduced**).

**navicular**/**naviculate**/**naviculiform**: boat-shaped.

**neck**: the sterile basal portion of a capsule, sometimes considerably differentiated, (compare **urn**) cf. **hypophysis**; e.g. *Trematodon* (Bruchiaceae).

**nectar guides**: floral orientation cues directing a pollinator to the nectar.

**nectary**/**nectarium** (*adj*. **nectariferous**): any structure that secretes nectar.

**nematodontous**: having a peristome consisting essentially of whole dead cells with ± evenly thickened walls (e.g. Polytrichaceae).

**nerve**: the principal or more conspicuous **veins** or ribs of a leaf or other organ; **costa** in mosses.

**net-veined**: with the smaller veins connected like meshes of a net; reticulate.

**nigropunctate**: with black dots.

**nitid**: glossy, lustrous, smooth and clear.

**nitrophilous**: of a plant that grows well in soil rich in nitrogen.

**node**: the point on the stem at which a leaf or leaves and accompanying organs arise (compare **internode**).

**nodose**: having knots or being knobby, usually in reference to roots, especially in the legumes (Fabaceae); cell wall thickenings of i.e. Grimmiaceae.

**nodulose**: minutely knobbed.

**nut**: a 1-seeded indehiscent fruit, with a hard, dry **pericarp** (the shell).

**nutlet**: a little **nut**.

## O

**ob-** (*prefix*): inverse or inversely, e.g. **obovate** = inversely **ovate**.

**obconic**: inversely **conical**, with the point of attachment at the small end.

**obcordate**: ± heart-shaped but with the narrow end below, and the broad end deeply notched.

**obdiplostemonous** (of a flower): with the stamens in two alternating whorls, the outer whorl opposite the petals and the inner opposite the sepals.

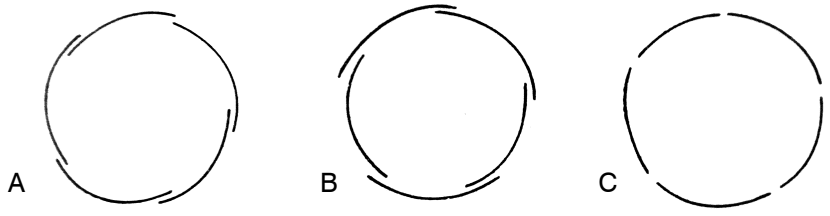



**Figure 105.** Aestivation types: A, contorted; B, imbricate; C, valvate.

**oblanceolate**: inversely **lanceolate**; with the broadest portion nearest the apex and tapering toward the base.

**oblate**: wider than long, transversely broadly **elliptic**.

**obligate** (of parasites): unable to survive without the **host** (compare **facultative**).

**oblique**: of unequal sides, slanted, e.g. applied to a leaf with the two sides of the blade unequal at the base.

**obloid**: a solid, near **elliptic** shape depressed at the poles.

**oblong**: much longer than broad, with nearly parallel sides, nearly rectangular.

**obovate**: **ovate** with the broadest part above.

**obovoid**: solid shape of **obovate** outline.

**obscure**: indistinct.

**obsolete**: reduced to a rudiment, or completely lacking (compare **rudimentary**, **vestigial**).

**obtrullate**: inversely **trullate**; angular-obovate, i.e. shaped like an inverted trowel, broadest above the middle with two equal sides meeting at base and two shorter straight sides meeting at apex.

**obturator**: a small protuberance, generally of placental origin, which grows into the space between **nucellus** and **integument**, or between the ovule and the ovary wall.

**obtuse**: blunt or rounded at the end.

**obvolute**: of a leaf folded along the midline with one margin overlapping one margin of a similarly folded leaf on the opposite side, i.e. half-**equitant**.

**ocellate**: with a small eye; marked with 2-coloured spots having a centre of one colour surrounded by a broad ring of another.

**ocrea** (*pl*. **ocreae**; *adj*. **ocreate**): a tubular **stipule** sheathing the stem (e.g. in *Polygonum*—Polygonaceae).

**-oid** (*suffix*): indicates likeness, resemblance or similarity; or something having the form or nature of something else; e.g. **racemoid**: resembling a **raceme**; **petaloid**: resembling a **petal**.

**oil cell**: cell characterised by the inclusion of a large oil body or organelle containing terpenes.

**opaque**: not transparent; dull, not shining.

**operculate**: with a cap or lid.

**operculum**: (1) a lid, cap or cover; i.e. the lid covering the mouth of a moss capsule, falling at maturity to release the spores; (2) the thickened tips of **integuments** of certain angiosperm ovules.

**opposite**: (1) pertaining to leaves or branches when two are borne at the same **node** on opposite sides of the stem; (2) one part before another, as a stamen in front of a petal.

**orbicular**: flat with a ± circular outline.

**orifice**: opening.

**ornithophilous** (of pollination): effected by birds.

**orthotropous** (of an ovule): erect so that the **micropyle** points away from the **placenta**.

**osseous**: bony.

**ossiform-celled**: with cells shaped like a bone or dumb-bell.

**ostiole**: an opening or pore, e.g. at the apex of the figs of *Ficus* (Moraceae).

**oval**: broadly **elliptic**.

**ovary**: that part of the **pistil** (the usually enlarged base) which contains the **ovules** and eventually becomes the fruit.

**ovate**: with the outline of an egg: scarcely twice as long as broad, with the broader end below the middle.

**oviform**: egg-shaped.

**ovoid**: solid shape of **ovate** outline.

**ovule**: the immature seed in the ovary before fertilisation.

## P

**pachycaul**: thick stemmed and sparsely branched.

**palate**: in **sympetalous** corollas, the raised projection of the lower lip which closes or very nearly closes the throat.

**palea** (*pl*. **paleae**; *adj*. **paleate**): (1) one of the chaffy scales or thin colourless bracts amongst the flowers on the **receptacle**, in Asteraceae; (2) the inner of two bracts enclosing the **floret**, in Poaceae; scale(s) encircling **androecia** and **gynoecia** in mosses.

**paleaceous**: with small membranous scales; chaffy.

**pallid**: pale in colour.

**palmate** (of a leaf): shaped like the palm and fingers of a hand (see **digitate**), referring to the female receptacle in some *Marchantia* species (Marchiantiaceae).

**palmatifid** (of a leaf): with the margin **palmately cleft** to less than halfway to the base.

**palmatilobed** (of a leaf): **palmately** divided to about halfway to the midrib.

**palmatipartite** (of a leaf): **palmately** divided almost to the midrib.

**palmatisect** (of a leaf): **palmately** divided down to the midrib.

**pandurate**/**panduriform**: fiddle-shaped.

**panduriform**: shaped like the body of a violin (obovate with a rounded sinus on either side)

**panicle** (*adj*. **paniculate**): a compound **raceme**; an **indeterminate** inflorescence in which the flowers are borne on branches of the main axis or on further branches of these.

**pantoporate** (of a pollen grain): with apertures scattered over the whole surface.

**papilionaceous**/**papilionoid**: applied to flowers with a 'butterfly-like' appearance, as in many Papilionoideae—Fabaceae and Polygalaceae.

**papilla** (*pl*. **papillae**): a soft, nipple-shaped protuberance; a type of **trichome**.

**papillate**: having **papillae**.

**papillose**: covered with minute, nipple-like protuberances.

**pappus**: the ring of hairs or scales around the top of the fruit (as in Asteraceae) and perhaps representing the calyx limb.

**papule**: a pimple or small pustule.

**papulose**: covered with **papillae**.

**papyraceous**: (1) papery; (2) white as paper.

**paracarpous** (of an ovary): with **carpels** joined by the margins only.

**paracytic**: of a **stoma** accompanied on either side by one or more subsidiary cells parallel to the long axis of the pore and guard cells.

**paraphyletic** (of a group of taxa): derived from a single ancestral taxon, but which does not contain all the descendants of the most recent ancestor.

**paraphyllia**: small, green, filiform, lanceolate, leaf-like or sometimes branched scales; often produced on stems or branches of pleurocarpous mosses; e.g. *Thuidium* (Thuidiaceae).

**paraphyses**: sterile, hair-like, basally attached structures; hyaline or yellowish, septate hairs mingled with the **antheridia** (and often with **archegonia**).

**parasite**: an organism living on or in a different organism and deriving nourishment from it (compare **epiphyte**, **saprophyte**).

**parchment-like**: like skin or leather.

**parenchyma**: plant tissue consisting of mature living cells that are relatively unspecialised in function.

**parenchymatous**: composed of ± short cells joined end to end (compare **prosenchymatous**).

**parietal placentation**: **placentation** with the **ovules** borne on the inner surface of the wall of the **ovary** or on intrusions of the wall that form incomplete partitions or false septa (compare **axile** and **marginal placentation**).

**paripinnate**: of a **pinnate** leaf without an odd terminal leaflet.

**paroicous**: with **antheridia** and **archegonia** in the same inflorescence but not mixed, the **antheridia** in the axils of uppermost and **perichaetial** leaves.

**-partite** (*suffix*): cleft nearly but not quite to the base.

**patelliform**: shaped like a kneecap.

**patent**: spreading out widely, e.g. patent branches.

**pauciserrate**: sparsely **serrate**.

**pectinate**: like a comb.

**pedate**: resembling **palmate**, but the side lobes further divided.

**pedicel** (*adj*. **pedicellate**/**pedicelled**): the stalk of an individual flower or bearing **gametangia**.

**peduncle** (*adj*. **pedunculate**/ **peduncled**/**peduncular**): the stalk of an **inflorescence**; the common stalk (**rachis** or **axis**) of several **pedicellate** or **sessile** flowers.

**pellucid**: clear, translucent or transparent.

**peltate**: applied to a leaf, or sometimes some other organ with a stalk, of which the stalk is attached to its under surface instead of to its edge.

**pendent** (of ovules): arising on and hanging down from an apical **placenta**.

**pendulous**: somewhat drooping, inclined more than horizontally; with stems and branches hanging, a growth form common in forests.

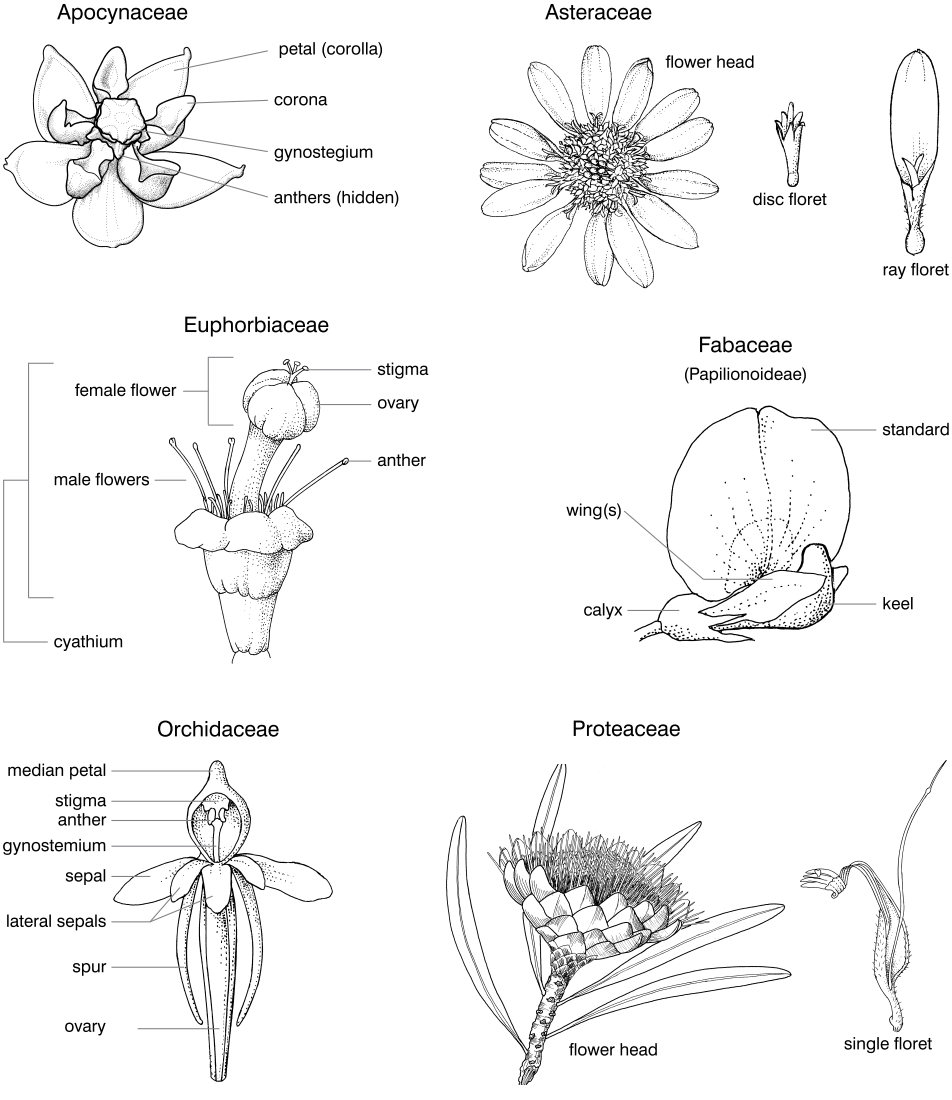



**Figure 106.** Families with specialised flowers (after Koekemoer, M., Steyn, H.M. & Bester, S.P. 2013. Guide to plant families of southern Africa. *Strelitzia* 31: 15).

**penicillate**: with a tuft of hairs at the end.

**penninerved**: **pinnately** nerved.

**penni-parallel-veined**: **pinnately** parallel-veined.

**pentamerous**: having parts in fives or multiples of five.

**percurrent**: referring to a **costa** that extends to the apex; cf. **excurrent**.

**perennial**: a plant whose life span extends over more than two growing seasons.

**perfoliate** (of a sessile leaf or bract): having its base completely wrapped around the stem.

**perianth**: the floral envelope, consisting of **calyx** or **corolla** or both.

**pericarp**: the wall of the ripened ovary; its layers may be fused into one, or ± divisible into **epicarp**, **mesocarp** and **endocarp**.

**perichaetium** (*pl*. **perichaetia**; *adj*. **perichaetial**): the female inflorescence, consisting of leaves and the enclosed **archegonia**.

**periderm**: secondary protective tissue derived from the **phellogen**, and replacing the epidermis.

**perigone** (*adj*. **perigonal**): see **perianth**.

**perigonium** (*pl*. **perigonia**): the male inflorescence, a cluster of leaves and the enclosed **antheridia**.

**perigynium** (*pl*. **perigynia**): the **hypogynous setae** of Cyperaceae; the flask or **utricle** of *Carex* (Cyperaceae); any hypogynous **disc**.

**perigynous**: applied to the flower when the sepals, petals and stamens arise on an open **receptacle** surrounding the ovary but are not **adnate** to it (compare **epigynous**, **hypogynous**).

**perisperm**: nutritive tissue in an **angiosperm** seed, formed from the **nucellus** (compare **endosperm**).

**peristome**: a single (haplolepidous) or double (diplolepidous) circular structure inside the mouth of the capsule; in diplolepidous mosses the outer peristome (**exostome**) consists of teeth, the inner peristome (**endostome**) consists of segments, sometimes alternating with cilia, and often rising from a basal membrane.

**persistent**: remaining attached to the plant beyond the expected time of falling.

**personate** (of a flower, e.g. in Scrophulariaceae): with a 2-lipped corolla in the form of a face, with an arched upper lip and a lower lip that protrudes into and nearly closes the throat of the corolla.

**petal**: see **corolla**.

**petaloid**/**petaline**: resembling **petals**.

**petiolate**: having a **petiole**.

**petiole** (*adj*. **petiolar**): leaf stalk.

**petioled**: having a **petiole**.

**petiolode**: the axis-like structure below the lamina and petiole (if any); it often bears the inflorescences at its distal end and sometimes shows powers of late elongation; it sometimes also produces roots (*Streptocarpus*—Gesneriaceae).

**petiolule** (*adj*. **petiolulate**/**petioluled**): the stalk of a **leaflet**.

**phalloid**: resembling a phallus.

**phaneropore**: superficial stoma, with the guard cells at the same level as other exothecial cells and not sunken in chambers (compare **cryptopore**)

**phellem**: cork.

**phellogen**: cork cambium.

**phenotype**: the physical characteristics of an organism; the outward expression of characteristics conferred on an organism by its **genotype**.

**photonastic**: 1-sided growth in length of an organ due to the unrestricted action of light.

**phyllary**: an individual **bract** of the **involucre**, e.g. in the inflorescence of Asteraceae.

**phylloclade** (*syn*. **cladode**): a flattened foliaceous stem having the form and function of a leaf but arising in the axil of a minute, bract-like, often caducous, true leaf.

**phyllode**: a flattened **petiole** or leaf **rachis** with the form and functions of a leaf (compare **cladode**).

**phyllodioicous**: **nanandrous**; with dwarf male plants resting on leaves or tomentum of the larger female plants.

**phyllotaxy**: the arrangement of leaves on a stem.

**phytomelanous** (especially in seeds): black.

**piliferous**: hair-pointed; e.g. **awn**.

**pilose**: hairy with rather long, soft, simple hairs.

**pin flower**: in **heterostylous** plants, the flower type having the longer style (compare **thrum flower**).

**pinna** (*pl*. **pinnae**): a primary division of a **pinnate** leaf.

**pinnate**: like a feather in appearance; (of a compound leaf): with the leaflets arranged along each side of a common **rachis**; (of the venation of a leaf): with a middle vein and secondary veins arising from it on each side.

**pinnate-parallel** (of the venation of a leaf): **pinnate** with the secondary veins running parallel to each other.

**pinnatifid**: with the margin **pinnately** cleft but not to the midrib.

**pinnatilobate**/**pinnatilobed**: **pinnately** divided to about halfway to the midrib.

**pinnatipartite**: **pinnately** divided almost to the midrib.

**pinnatisect**: **pinnately** divided down to the midrib.

**pinnule**: the secondary or tertiary division of a leaf which is twice or thrice **pinnate**.

**pistil head**: see **style head**.

**pistil**: see **gynoecium**.

**pistillate**: pertaining to a flower with one or more **carpels** but no functional stamens; unisexual and female.

**pistillode**: a sterile **pistil**, often rudimentary.

**pitted**: punctate, with small openings or pores through the walls of adjoining cells, sometimes marked by conspicuous depressions in thick-walled cells (also called **porose**).

**placenta**: the part of the ovary, sometimes but not always thickened or raised, to which the ovules are attached (see also **free**).

**placentation**: the arrangement of **placentas**, and hence of ovules, within an ovary.

**placentiferous**: bearing a **placenta**.

**plane**: flat, referring to leaf margins.

**plesiomorphic** (of a character): common to the group under discussion and its ancestors.

**pleurocarpic**: producing the **sporophytes** laterally from a **perichaetial** bud or a short, specialized branch rather than at the stem tips (compare **acrocarpic**); pleurocarpous mosses are usually prostrate, creeping and freely branched and grow in mats rather than tufts.

**plicate**: folded back and forth longitudinally like a fan.

**plumose**: like a feather; with fine hairs branching from a central axis, e.g. the **pappus** of some Asteraceae.

**pluri-** (*prefix*): many-.

**pluriseriate**: in several to many rows.

**pod**: see **legume**.

**polar spore**: spores with a discernible to conspicuous **triradiate mark** on the **proximal** face.

**polarised** (of **endothecial** tissue of Asteraceae): with thickenings restricted to the horizontal cell walls.

**pollen carrier**: see **corpuscle**.

**pollen mass**: pollen grains cohering into a single body; (= **pollinium**).

**pollen presenter**: a structural modification, usually a swelling, of the style around or below the stigma which enables pollen, shed in the bud, to be retained (e.g. in Proteaceae and Rubiaceae).

**pollen sac**: the chamber in an **anther** in which pollen is formed (see **anther**).

**pollen**: the **microspores** of seed plants shed from **anthers**.

**pollinarium** (*pl*. **pollinaria**): the complex structure found in the flowers of many Apocynaceae where the pollen masses of two adjacent **thecae** are united for dispersal as a unit. The pollinarium consists of a small, ± globose, sticky body, the **corpuscle**, which has two thin, elastic arms, the **caudicles**, each bearing one **pollinium**.

**pollinium** (*pl*. **pollinia**): a cohesive mass of pollen grains which are shed together and transported as a unit during pollination (e.g. in Apocynaceae and Orchidaceae).

**polycarpic**: applied to a plant which flowers and fruits often (compare **monocarpic**).

**polyforate** (of a pollen grain): with many pores.

**polygamo-dioecious**: with bisexual and male flowers on the same plant, and bisexual and female flowers on others.

**polygamo-monoecious**: with bisexual flowers and unisexual flowers of both sexes on the same plant.

**polygamous**: having unisexual and bisexual flowers on the same or on different individuals.

**polymorphic**: having more than two distinct morphological variants.

**polyoicous**: with **antheridia** and **archegonia** in separate inflorescences mixed together on the same plants (also called **heteroicous**).

**polypetalous**: of flowers with petals free from each other (compare **gamopetalous**).

**polyphyletic**: composed of members that originated independently from more than one evolutionary line (compare **monophyletic**).

**polyploid**: having more than two of the basic sets of chromosomes in the nucleus (compare **diploid**, **haploid**).

**polysetous**: having more than one sporophyte produced from a single **gametoecium** (e.g. in Bryophyta).

**pome**: a fleshy (false) fruit, formed from an inferior ovary in which the **receptacle** or **hypanthium** has enlarged to enclose the true fruit.

**porate** (of a pollen grain): with rounded apertures (compare **colpate**, **colporate**).

**pore**: small opening or pit in the walls of some cells e.g. on pollen grains, sometimes conspicuous as depressions in thickened walls between adjacent cells; **porose** cell walls may be minutely or quite obviously perforated.

**poricidal**: opening by pores.

**poriferous**: having many pores.

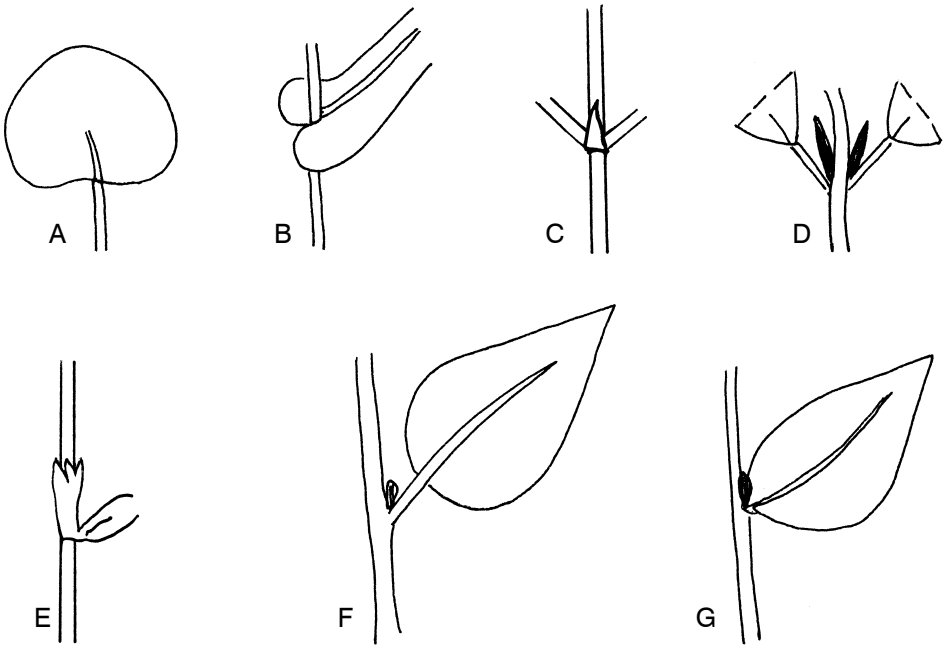



**Figure 107.** Leaf attachments: A, leaf peltate; B, leaf amplexicaule; C, interpetiolar stipule; D, intrapetiolar stipule; E, ligule; F, leaf petiolate; G, leaf sessile.

**porose**: pitted.

**porrect**: directed outward and forward; perpendicular to the surface.

**posterior**: in position nearest to the axis (compare **anterior**/**anticous**).

**postical**: belonging to the under surface or back.

**posticous**: on the **posterior** side, next to the axis (compare **anticous**).

**pouch**: a bag, sack or receptacle of moderate size.

**praemorse**: apparently bitten off at the end.

**precocious**: appearing or developing early; often used of flowers which appear before the leaves.

**prehensile**: adapted for grasping, especially by wrapping around a support.

**prickle**: a sharp outgrowth from the bark or surface layer containing no conducting tissue.

**primary stem**: the main stem, often creeping or rhizome-like with reduced or scale-like leaves.

**primocane**: the first season's shoot or cane of a biennial woody stem, as in many brambles (*Rubus* spp.—Rosaceae).

**processes**: see **segment**.

**procumbent**: trailing or lying on the ground without rooting at the nodes.

**prolate** (of a pollen grain): having a polar axis of greater length than the equatorial diameter.

**proliferous**: bearing **adventitious buds** on the leaves or in the flowers, capable of rooting and forming separate plants.

**propagule**/**propagulum** (*pl*. **propagula**): reduced bud, branch, or leaf serving in **vegetative** reproduction.

**prophyll**: a leaf formed at the base of a shoot, usually smaller than those formed subsequently.

**prorate**: with leaf cell ends projecting above the surface of the lamina giving a **papillose** appearance or with **papillae** (**mammillae**) borne at one or both ends of a cell (e.g. *Philonotis* (Bartramiaceae).

**prosenchyma**: a tissue made up of elongate cells with tapered ends.

**prosenchymatous**: with narrow, elongate cells overlapping at the ends (compare **parenchymatous**).

**prostome** (preperistome): a rudimentary structure outside and usually adhering to the **peristome** teeth.

**prostrate** (*syn*. **procumbent**): trailing to lying on the ground without rooting at the nodes.

**protandrous**/**proterandrous**: with the **anthers** ripening before the **stigmas** (compare **protogynous**).

**proteranthous**: having flowers appearing before the leaves.

**proterogynous**: see **protogynous**.

**protogynous**: having the female sex organs maturing before the male ones (compare **protandrous**).

**protonema** (*pl*. **protonemata**): green, branched filaments produced on germination of spores and giving rise to a leafy gametophyte; in *Andreaea* (Andreaeaceae), the protonema is ± thallose rather than filamentous; secondary protonemata are sometimes produced from broken leaves or stems of mosses.

**protrusion**: something that projects or thrusts outwards or forwards.

**protuberance** (*adj*. **protuberant**): a bulge or swelling.

**proximal**: nearer to the point of attachment or origin (compare **distal**).

**pruinose**: having a whitish, waxy, powdery bloom on the surface.

**psammophilous**: sand-loving.

**psammophyte**: a plant which grows in sand or sandy soil.

**pseud-**/**pseudo-** (*prefix*): false, not genuine, not the true or typical.

**pseudanthium**: an inflorescence resembling a single flower (e.g. a **cyathium**).

**pseudautoicous**: see **autoicous**.

**pseudo-aril**: false aril; see **arillode**.

**pseudobulb**: a solid, above-ground, thickened or bulbiform stem, characteristic of some orchids.

**pseudocolpus** (of a pollen grain): a **colpus**-like streak.

**pseudodichotomous**: referring to the forking of the axis into two, ± equal branches of the thallus, but not by equal division of an apical cell; false dichotomy.

**pseudo-indusium**: false indusium.

**pseudoparaphyllia**: small, unistratose, lanceolate or filiform structures resembling **paraphyllia**, often found in **pleurocarpous** mosses, in small numbers around branch primordia.

**pseudoperianth**: tissue of thallus origin surrounding the archegonial cluster, **calyptra** and later the **sporophyte**, e.g. in *Asterella* (Aytoniaceae) and *Marchantia* (Marchantiaceae).

**pseudopetiolate**: subsessile.

**pseudopodium**: an elongation of the gametophytic axis below the sporophyte in *Andreaea* (Andreaeaceae), serving the function of a seta; also applied to a similar extension of a stem tip bearing clusters of gemmae.

**puberulent**: minutely **pubescent**.

**puberulous**: slightly **pubescent**.

**pubescent**: covered with soft, short, erect hairs.

**pulverulent**: powdery.

**pulvinate**: cushion-shaped.

**pulvinus**: a swollen base or apex of the **petiole** or **petiolule**, often glandular or responsive to touch; a cushion.

**punctate**: marked with dots or translucent glands.

**puncticulate**: very finely **punctate**.

**punctiform**: reduced to a mere point.

**punctulate**: marked with small dots.

**pungent**: ending in a sharp, rigid point.

**pusticulate**: finely **pustulate**.

**pustule** (*adj*. **pustulate**): a slight elevation like a pimple or blister.

**putamen**: the shell of a **nut**; the hardened **endocarp** of a **drupe**.

**pyrene**: a nutlet or kernel, the stone (**endocarp** plus seed) of a **drupe** or similar fruit (compare **berry**, **drupe**).

**pyrenoid**: proteinaceous structure found within the chloroplast of certain algae and bryophytes, considered to be associated with starch deposition.

**pyriform**: pear-shaped.

**pyrophyte**: a plant adapted to survive severe fires.

## Q

**quadr-**/**quadra-**/**quadri-** (*prefix*): four-.

**quadrate**: square.

**quincuncial** (applied to calyx or corolla lobes in the bud): a variant of **imbricate aestivation** with two lobes outside, two lobes inside, and one lobe which is overlapped on one side only.

## R

**raceme** (*adj*. **racemose**): an **indeterminate** inflorescence in which the flowers are borne on **pedicels** along an unbranched axis or **peduncle**, the terminal flowers being the youngest and last to open (centripetal development).

**racemiform**: having the shape of a **raceme**.

**rachilla** (*pl*. **rachillae**): (1) the **rachis** (axis) of the spikelet in Cyperaceae and Poaceae; (2) a secondary axis, as in a **compound** leaf.

**rachis** (*pl*. **rachises** or **rachides**) (= **rhachis**): (1) the axis of an inflorescence in which flower stalks occur at short intervals from each other, as in Poaceae; (2) the axis of a **pinnately** compound leaf, corresponding to the midrib of a simple leaf.

**radial** (of **endothecial** tissue of Asteraceae): with thickenings ± evenly distributed in the walls of the cells, particularly in the radial walls.

**radiate**: applied to flower heads of Asteraceae with **ray** florets.

**radical**: applied to leaves which arise so close to the base of the stem as to appear to arise on the root.

**radicant**: rooting, in particular of a stem that produces **adventitious** roots.

**radicles**: slender, non-chlorophyllose threads attaching the plants to the substrate, often covering stems, occasionally growing from leaf tips; the radicles of mosses usually have oblique cross-walls; cf. **rhizoids**.

**radicular**: related to the **radicle**.

**radiculose**: covered with rhizoids.

**ramification**: the scheme of branching or separation into branches.

**ramiflorous** (of flowers and fruits): borne below the current leaves on recently formed woody branches (compare **cauliflorous**).

**raphe** (*adj*. **raphal**): the part of a stalk of an **anatropous ovule** that is fused along the side of the ovule.

**raphides**: mineral substances in the form of needle-shaped crystals, within the cells of plants.

**ray**: (1) the florets of the margin of a flower head of the Asteraceae when different from those of the centre or disc; (2) one of the radiating branches of an **umbel**.

**recaulescence** (*adj*. **recaulescent**): a condition where the bract subtending a flower is not situated on the main axis on which the flower arises but on the pedicel.

**receptacle** (*adj*. **receptacular**; *syn*. **torus**): the extremity of the axis on which the parts of the flower, **sepals**, **petals**, **stamens** and **pistil**, or the **sporangia** of ferns, are inserted; a disc, or wart-like mass of tissue, bearing **antheridia** or **archegonia** and found directly on the thallus or raised on a stalk.

**recurved**: curved or curled downwards or backwards.

**reduplicate** (of sepals or petals): with margins **valvate** and **reflexed**.

**reflexed**: bent downwards or backwards.

**refuse**: with a slight indentation of a broad apex.

**regular** (= **actinomorphic**) (of a flower, calyx or corolla): radially symmetrical, i.e. capable of being dissected into similar halves in more than one vertical plane forming mirror images (compare **irregular**, **zygomorphic**).

**regular**: symmetric.

**reniform**: kidney-shaped.

**repand**: with the margin uneven or wavy, with shallow undulations; not as deep as **sinuate**.

**repent**: lying or creeping along the ground.

**replicate**: folded abaxially along the middle, as along the midrib of a leaf.

**replum**: a longitudinal partition in an ovary, formed between **parietal placentas** (e.g. in Brassicaceae).

**resin** (*adj*. **resinous**): plant exudate, often sticky, insoluble in water.

**resiniferous**: yielding **resin**.

**resupinate**: upside down because the pedicel or ovary is twisted through 180° (as in flowers of Orchidaceae and Lobeliaceae).

**reticulate**: having a network-like pattern; net-veined, with the smallest veins of a leaf connected together like the meshes of a net.

**retinaculum** (*pl*. **retinacula**): (1) the persistent, hook-like **funicle**, as in the fruits of the Acanthaceae; (2) the structure to which the **pollinium** is attached, as in the Asclepiadaceae and Orchidaceae (see **corpuscle**).

**retrofracted**: bent abruptly backwards.

**retrorse**: bent abruptly backwards, away from the apex (compare **antrorse**).

**retuse**: notched.

**revoluble**: rolling away, referring to an annulus which falls in a broken ring.

**revolute**: rolled back from the margin (compare **involute**).

**rhachilla**: see **rachilla**.

**rhachis**: see **rachis**.

**rhipidium** (*pl*. **rhipidia**; *adj*. **rhipidial**): a ± fan-shaped **cyme** with the lateral branches developed alternately on one side and then on the other.

**rhizautoicous**: see **autoicous**.

**rhizoid furrow**: a longitudinal, rhizoid-bearing channel or groove on the **postical** surface of a stalk in liverworts.

**rhizoids**: simple or branched, septate filaments, dead at maturity, anchoring the plant and sometimes ± covering the stem; cf. **radicles**. Fig. 2: 1 in Magill (1981); 1-celled in liverworts and usually hyaline, smooth or pegged.

**rhizome** (*adj*. **rhizomatous**): a rootstock or root-like stem prostrate on or under the ground, sending rootlets downwards, and branches, leaves or flowering shoots upwards, always distinguished from a true root by the presence of buds, leaves or scales.

**rhombic**/**rhomboid**: ± diamond-shaped; having straight margins and being widest in the middle.

**rhomboidal**: longer than hexagonal, oblong-hexagonal. Fig. 1: 33 in Magill (1981)

**riparian**: of, inhabiting or situated on the bank of a river or stream.

**rootstock**: a short swollen structure at the junction of the root and the shoot system of a plant.

**rosette**: a crowded, circular cluster of leaves or other organs.

**rostellum** (in Orchidaceae): a projection of the upper edge of the **stigma** in front of the **anthers**; a small beak.

**rostrate**: beaked (see **beak**).

**rostrum**: any **beak**-like extension.

**rosulate**: with the leaves in a circle or **rosette**.

**rotate**: wheel-shaped; of a corolla with a short tube and spreading **limb**.

**rotund**: with a shape between **orbicular** and broadly elliptic.

**rounded**: margins and apex forming a smooth arc.

**ruderal**: a plant that grows on waste ground.

**rudimentary**: poorly developed and not functional (compare **obsolete**, **vestigial**).

**rufescent**: becoming reddish.

**rufous**: rusty or brownish red.

**rugose**: wrinkled; covered with coarse **reticulate** lines.

**rugula** (*pl*. **rugulae**): a fine wrinkle or fold, e.g. in the upper lip of some Acanthaceae.

**rugulose**: finely wrinkled.

**ruminate**: mottled in appearance, e.g. of bark, or of the food reserves in a seed.

**runcinate**: **pinnatifid** with the lobes pointing towards the base.

**runner**: a slender, prostrate or trailing stem which produces roots and sometimes erect shoots at its nodes (compare **stolon**).

## S

**saccate**: pouched.

**sagittate**: applied to the base of a leaf or an anther with two acute, straight lobes directed downwards like in an arrowhead.

**saliciform**: like the genus *Salix* (Salicaceae); willow-like.

**salverform**/**salver-shaped**: shaped like a trumpet, e.g. of a **sympetalous corolla**, with a slender tube and an abruptly spreading **limb**.

**samara**: an indehiscent, 1-seeded fruit or **mericarp** with wings (e.g. Malpighiaceae).

**samaroid**: applied to a fruit resembling a **samara**.

**saponins**: a group of soap-like, toxic substances.

**saprophyte**: an organism deriving its nourishment from dead organic matter and usually lacking chlorophyll (compare **epiphyte**, **parasite**).

**saprophytic**: obtaining food from nonliving organic matter.

**sarcotesta**: the fleshy outer coat of a seed.

**saxicolous**: living or growing among or on rocks.

**scaberulous**/**scabrellous**: minutely **scabrous**, slightly rough to the touch.

**scabrid**/**scabrous**: rough to the touch, usually from the presence of very short harsh hairs.

**scabridous**/**scabridulous**: somewhat rough to the touch.

**scalariform**: having a ladder-like pattern.

**scale**: (1) reduced or rudimentary leaf, usually **sessile** and **scarious** and seldom green; (2) a kind of **indumentum** in the form of small, flat discs attached by the centre; (3) any thin, usually small and dry structure.

**scalloped**: see **crenate**.

**scalpelliform**: asymmetric and resembling the blade of scalpel.

**scandent**: climbing.

**scape**: a naked flower stalk arising from the ground with **radical** or **rosulate** leaves.

**scapigerous**: possessing a **scape**.

**scapose**: bearing one or more flowers on a **scape**; in the form of a **scape**.

**scarious**: dry and thin, scale-like or membranous.

**schizocarp** (*adj*. **schizocarpic**/**schizocarpous**: a dry, dehiscent fruit which splits into two or more separate carpels (**mericarps**) at maturity, found e.g. in Apiaceae and Malvaceae.

**schizogenous**: originating by separation of cell walls along the middle lamella.

**scimitar-shaped**: see **acinaciform**.

**sclereid**: sclerenchyma cell having thick, lignified secondary walls.

**scleroid**: having a hard texture.

**scleromorphic**: hard and with a large amount of fibrous tissue, adapted to withstand arid conditions and fire.

**sclerophyllous**: with leaves stiffened by sclerenchyma.

**sclerotic**: having **sclereids**.

**scorpioid** (of a **cymose** inflorescence): with the main axis coiled in bud, the flowers being usually 2-ranked, i.e. with single flowers alternately right and left (compare **helicoid**).

**scrobiculate**: pitted; marked by minute or shallow depressions.

**scutate**: like a small shield.

**scutelliform**: shaped like a dish.

**sectile** (of **pollinia**): compartmented.

**secund**: with parts or organs (branches, leaves or flowers) all directed to one side.

**segment**: a part or division of an organ.

**sepal**: see **calyx**.

**sepaloid**/**sepaline**: resembling sepals.

**septal** (of a **nectary**): occurring in the partitions of the ovary where the **carpel** walls are incompletely fused, especially in **monocotyledons**.

**septate**: divided by one or more partitions.

**septicidal**: referring to the dehiscence of a ripe **capsule** which splits open through the **septa** or **carpel** margins (compare **loculicidal**).

**septifragal**: referring to the **dehiscence** of a ripe **capsule** where the **valves** or backs of the **carpels** break away leaving the **septa** intact.

**septum** (*pl*. **septa**; *adj*. **septal**): dividing cross wall or partition; an internal partition of an ovary or fruit.

**seriate**: in rows or whorls, e.g. uni-, bi-, multiseriate; applied to ranks of leaves on a stem, rows of cells or papillae, cf. **stratose**.

**sericeous**: silky, with closely appressed, soft, straight hairs.

**serrate**: toothed like a saw, with regular, pointed teeth.

**serrature**: the toothing of a **serrate** leaf.

**serrulate**: minutely serrate.

**sessile**: without a stalk; (of a **stigma**): the **style** is absent and the stigma is therefore sessile on the ovary).

**seta** (*pl*. **setae**): a bristle or stiff hair; in mosses a stalk supporting the capsule.

**setaceous**: having bristle-like hairs; bristly.

**setiferous**: bearing **setae**.

**setiform**: looking like a **seta**.

**setose**: beset with bristles.

**setulose**: a diminutive of **setose**.

**sexine**: the outer and/or sculptured layer of the **exine** of a pollen grain.

**sheath**: the (lower) portion of the leaf clasping the stem.

**sheathing**: surrounding and clasping the stem, the base of the **seta** or the **capsule**.

**shoulder**: the area where a leaf base is abruptly narrowed to the upper lamina.

**sigmoid**/**sigmoidal**: double-curved in opposite directions, like the letter S.

**siliceous**: containing silica.

**silicula** (*pl*. **siliculae**): a short **siliqua**, not much longer than broad.

**siliqua**/**silique** (*pl*. **siliquae**/**siliques**): a dry, dehiscent fruit formed from a superior ovary of two carpels, with two **parietal placentas**, divided into two compartments by a thin partition (**replum**), opening by two **valves** which fall away from a frame on which the seeds are borne (e.g. in Brassicaceae).

**simple**: of one piece or series, the opposite of **compound**, e.g. simple leaf: not divided into leaflets; (of a hair or inflorescence): not branched.

**sinistrorse**: twisted to the left (compare **dextrorse**).

**sinuate**/**sinuous**: with the margin uneven, with rather deep undulations (compare **undulate**).

**sinuolate**: minutely wavy.

**sinus** (*pl*. **sinuses**): (1) a curve; (2) a recess between the teeth or lobes on a margin; (3) the recess formed by the basal lobes of a leaf or other organ.

**siphonostele** (*adj*. **siphonostelic**) (in a dicotyledonous stem): the cylinder of conducting tissue surrounding the central **parenchyma**.

**sobole**: a shoot, especially from the ground.

**soboliferous**: bearing **soboles**.

**solitary**: borne singly or alone.

**sorus** (*pl*. **sori**; *adj*. **soral**): a cluster of spores and/or **sporangia**.

**spadix** (*pl*. **spadices**): a flower **spike** with a fleshy or thickened axis, e.g. in Araceae.

**spathe** (*adj*. **spathaceous**/**spatheate**): a large bract enclosing a **spadix**, or one or more bracts enclosing a flower or inflorescence.

**spathella** (*pl*. **spathellae**): (1) a capsule-like structure enclosing the flower buds in some Podostemaceae, rupturing irregularly as the pedicel elongates at **anthesis**; (2) formerly used term for the glumes of Poaceae; (3) small bracts as found in the inflorescences of Restionaceae.

**spatheole**: a secondary **spathe** within a **compound inflorescence** in the Andropogoneae —Poaceae.

**spathulate**: spoon-shaped, broadly rounded above and long and narrow below.

**spatulate**: see **spathulate**.

**species**: a **taxon** comprising one or more populations of individuals capable of interbreeding to produce fertile offspring.

**spheroid**/**spheroidal**: approximately spherical.

**spicate**: arranged in a **spike**.

**spiciform raceme**: **spike**-like **raceme**.

**spiculate**: having a surface covered with fine points or crystals.

**spicule**: a small **spike**.

**spike**: an inflorescence with the flowers **sessile** along a simple undivided axis or **rachis**.

**spikelet**: a small **spike** composed of one or more flowers enclosed by **glumes**, in Cyperaceae and Poaceae.

**spine shield**: in some Euphorbieae—Euphorbiaceae, the hardened bases along the angles of the stems and branches, from which the **spines** of certain species are produced.

**spine**: a sharp-pointed, hardened structure modified from another organ (leaf, branch, stipule, etc.), or from part of an organ.

**spinescent**: spine-tipped, having **spines**.

**spinose**: spiny or having **spines**.

**spiral** (of leaves or floral organs): borne at different levels on the axis, in an ascending spiral.

**spiraperturate** (of a pollen grain): with one or more spiral apertures.

**-sporangiate** (of an **anther**): containing a given number of **microsporangia**/**pollen sacs** (e.g. 4-sporangiate: containing four pollen sacs, as commonly found in 2-**thecate** anthers) (see **anther**).

**sporangiophore**: a **sporophyll** bearing a ring of **sporangia** facing the axis of the **strobilus** (e.g. in *Equisetum*).

**sporangium** (*pl*. **sporangia**): a hollow, unicellular or multicellular, sac-like, spore-producing structure.

**spores**: minute, mostly spherical, nearly always unicellular bodies produced in the capsule as a result of reduction division, giving rise on germination to **protonemata**.

**sporocarp**: an organ enclosing the **sori** or **sorus** in **heterosporous** ferns.

**sporophore**: any structure bearing spores.

**sporophyll**: a modified leaf or leaf-like structure which bears **sporangia**.

**sporophyte**: the spore-bearing generation; produced by the fertilisation of an egg; remaining attached to the **gametophyte** and partially dependent on it, typically consisting *of foot*, *seta* and *capsule*.

**spreading**: an angle of 45° or more; cf. **wide-spreading, erect-spreading, squarrose**.

**spur shoot**: a (very) short lateral branch (= **brachyblast**).

**spur**: a slender, usually hollow extension of some part of the flower.

**spurious**: not genuine or real, false.

**squama** (*pl*. **squamae**): a scale, usually derived from a leaf.

**squamella**: diminutive of **squama**, a scale of the second order or reduced in size, as in the **disc** of Asteraceae.

**squamiform**: scale-like.

**squarrose**: spreading at right angles.

**squarrose**: spreading or recurved at some point above the base, e.g. as in the **phyllaries** of some Asteraceae which are sharply curved downward or outward.

**squarrose-recurved**: spreading at right angles, with the tips curved downward.

**stamen** (*adj*. **staminal**): in **angiosperms**, the pollen-producing structure in a flower usually consisting of an **anther** and a **filament**.

**staminal column**: see **androphore**.

**staminal corona**: fleshy outgrowth of tissue, attached dorsally to the **staminal column** at the base of the filament or on the backs of the anthers (compare **gynostegial corona**, **interstaminal corona**).

**staminate**: having stamens (usually implying that **carpels** are absent).

**staminode** (*adj*. **staminodial**): an abortive or vestigial **stamen** without a perfect anther.

**staminophore**: a structure bearing stamens.

**standard**: the large posterior petal (outside in the bud) of a **papilionaceous** corolla (= **vexillum**).

**stegocarpic**: referring to capsules with **operculum** differentiated (compare **cleistocarpic**); e.g. stegocarpous capsules of *Ditrichum* (Ditrichaceae) and *Barbula* (Pottiaceae).

**stele**: the portion of the plant body which comprises the vascular system (xylem and phloem) and its associated ground tissue (e.g. pericycle, interfascicular regions and pith).

**stellate**: resembling a star in shape; (of hairs): with several arms radiating horizontally.

**stereids**: slender, elongate, thick-walled fibre-like cells found in groups (stereid bands) in the costa of some mosses.

**stereome** (of **involucral bracts** of some Asteraceae): the thickened region in the lower part.

**stigma** (*adj*. **stigmatic**/**stigmatose**): the point or surface of the **pistil** which receives the pollen, either sessile (when there is no style) or on the top or surface of the **style** or its branches.

**stipe**: the stalk supporting a **carpel** or **gynoecium** or fern frond.

**stipel**/**stipella** (*pl*. **stipellae**): small secondary **stipule** at the base of a leaflet.

**stipi(ti)form**: looking like a **stipe**.

**stipitate**: supported on a special stalk, or **stipe**, e.g. an ovary (e.g. in Capparaceae).

**stipule** (*adj*. **stipular**): leaf-like or scale-like appendage of a leaf, usually at the base of the petiole.

**stipuloid**: **stipule**-like.

**stolon**: a **runner** that roots.

**stoloniferous**: having **stolons**; trailing over the soil surface and rooting at the nodes.

**stoloniform**: referring to slender, elongate, spreading branches or stems, with smaller bract-like leaves.

**stoma** (*pl*. **stomata**): a minute pore in the epidermis of leaves, providing for gaseous exchange between the tissues and the atmosphere; opening in the **capsul**e wall, usually in the neck, surrounded by guard cells.

**stomatose**: possessing **stomata**.

**stone cell**: a ± isodiametric **sclereid**.

**storage tissue**: the ventral ± ½– ⅔ or more of the thallus, composed of cells sometimes interspersed with oil or **sclerotic** cells or **mucilage** cavities.

**stramineous**: straw-like or straw-coloured.

**strangulate**: deeply constricted, as below the mouth of a **capsule**.

**stratose**: in distinct layers; uni-, bi-, multi-stratose; e.g. bistratose leaves have laminal cells in two layers, cf. *seriate*.

**stria** (*pl*. **striae**): see **striation**.

**striate**: marked with fine, longitudinal ridges (**striae**).

**striation** (*adj*. **striate**): one of a number of parallel longitudinal lines, grooves or ridges.

**strict**: straight and rigid.

**strigillose**: finely **strigose**.

**strigose**: with short stiff hairs appressed to the surface.

**strigulose**: minutely **strigose**.

**striolate**: finely ridged.

**strobiliform**: resembling a **strobilus**.

**strobilus** (*pl*. **strobili**): a cone-like structure containing the reproductive organs of one or both sexes, as in **gymnosperms** and certain fern-allies.

**strophiole**: an appendage to the **hilum** of some seeds (see also **caruncle**).

**strumose**: with a goitre-like swelling (or struma) at the base, applied to some **capsules**.

**strumulose**: with a small or indistinct swelling at one side of the **capsule** base.

**strut**: a rod or bar connecting parts of a structure.

**style head**/**pistil head**: the dilated apical part of the style or **gynostegium**, particularly in Apocynaceae.

**style**: narrow upper part of an **ovary** supporting the **stigma**.

**stylidium**/**stylodium**: a style-like **stigma**.

**stylopodium**: a disc-like enlargement of the base of the **style** (e.g. in some Brassicaceae).

**sub-** (*prefix*): implying 'almost', e.g. **subacute**: almost acute; **subentire**: having a very slightly uneven margin.

**suberous**: corky.

**substereid**: almost with the characters of a **stereid**, walls not as strongly thickened.

**subtend**: to have a **bud** or similar part growing in its **axil**.

**subula**: a long, slender point.

**subulate**: awl-shaped, narrow and tapering gradually to a fine point.

**succulent**: a plant which accumulates water in fleshy, water-storing stems, leaves or roots; juicy, fleshy in reference to texture or appearance.

**suffrutescent**: like a **suffrutex**.

**suffrutex**: a perennial plant which is slightly woody only at the base.

**suffruticose**: shrubby.

**sulcate**: grooved, furrowed, strongly plicate, with deep longitudinal folds.

**sulculus** (*pl*. **sulculi**; *adj*. **sulculate**) (of a pollen grain): an elongated latitudinal ecto-aperture not situated at a pole (compare **sulcus**).

**sulcus** (*pl*. **sulci**) (of a pollen grain): an elongated latitudinal ecto-aperture situated at the distal or proximal pole of a pollen grain (compare **colpus**, which is usually a longitudinal aperture; compare **sulculus**, which is not situated at a pole).

**superficial cells**: outer cells of the **costa** in surface view; cf. *surface cells*.

**superior**: applied to an **ovary** when the sepals, petals and stamens are inserted below it (**hypogynous**); also when the **receptacle** bearing the calyx, corolla and stamens is prolonged so as to be separate from the ovary, but forms a cup surrounding it (**perigynous**) (compare **inferior**).

**supra** (*prefix*): above, on the upper side.

**surface cells**: outer cells of the **costa** as seen in cross section; i.e. *superficial cells* in cross section.

**suture**: the line of junction or seam of union, commonly used of the line of opening of a **carpel**; the dorsal (outer or anterior) suture of a carpel represents the midrib of the carpellary leaf; the ventral (inner) suture represents the united margins on which the ovules and placentas are borne.

**sward**: lawn; continuous grass cover produced by **stoloniferous** species.

**syconium**: a multiple fruit, or **syncarp**, with a hollow centre, e.g. the figs of *Ficus* (Moraceae).

**sympatric** (of two or more taxa): having coincident or overlapping ranges of distribution (compare **allopatric**).

**sympetalous**: having petals which are partly or completely fused (*syn*. **choripetalous**, **gamopetalous**) (compare **polypetalous**).

**sympodial** (of growth): without a single persisting growing point; changing direction by frequent replacement of the growing apex by a lateral growing point below it (compare **monopodial**).

**synandrium**: an **androecium** of a male flower with united anthers.

**synangium** (*pl*. **synangia**): a number of fused **sporangia** (Pteridophyta).

**synanthous** (of leaves): appearing together with the flowers (compare **hysteranthous**).

**syncarp**/**syncarpium**: a structure consisting of several united, usually fleshy fruits; (compare **aggregate fruit**).

**syncarpous**: composed of two or more united **carpels**.

**synflorescence**: a compound **inflorescence**.

**synoicous**: with **antheridia** and **archegonia** in the same inflorescence.

**synthecate** (of anthers): with the two **thecae** having merged into one, e.g. in some Scrophulariaceae.

**systylious**: with the operculum remaining attached to the tip of the columella after dehiscence.

# T

**tannin**: a complex yellowish or brownish aromatic compound found in many plants.

**tanniniferous**: producing **tannins**.

**taproot**: the main, descending root of a plant that has a single dominant root axis.

**taxon** (*pl*. **taxa**): a group or category, at any level, in a system for classifying organisms.

**tectum** (of a pollen grain): the outermost closed layer of the **sexine**, formed by union of the heads of the bacula.

**teeth**: divisions of a single **peristome**; or of the **exostome** of a moss with a double **peristome**; divisions of the **endostome** are called **segments**; see **tooth** and **dentate**.

**tendril** (*adj*. **tendrillar**/**tendrillous**): a long, slender, coiling, modified leaf, or rarely stem, by which a climbing plant attaches to its support.

**tendrilliform**/**tendrilloid**: resembling a **tendril**.

**teniola**: intramarginal border of linear cells in the leaves; e.g. in Calymperaceae.

**tenui-** (*prefix*): slender, thin.

**tenuous**: thin or slender in form.

**tepal**: any of the members of a **perianth** that is not clearly differentiated into **calyx** and **corolla**.

**terete**: cylindrical, circular in transverse section.

**terminal**: at the apex or **distal** end (compare **lateral**).

**ternate**: arranged in a **whorl** or cluster of three.

**ternately compound** (of a leaf): with **leaflets** in threes.

**terrestrial**: on or in the ground.

**terricolous**: growing on soil.

**tessellate**: having a chequered pattern, e.g. with depressions.

**tessellated**: chequered, in a pattern of squares, applied to the basal membrane of the peristome of *Tortula* (Pottiaceae).

**testa**: the outer coat of a seed.

**tetra-** (*prefix*): four-.

**tetrad scar**: a triangular to almost circular feature occasionally obvious on the distal face of some spores, resulting from the contact between spores in a *tetrad* during cell wall deposition; e.g. *Trematodon* (Bruchiaceae).

**tetrad**: a group of four spores or pollen grains derived from a spore mother cell or pollen grain mother cell as a result of meiosis, and remaining fused at maturity, e.g. in Ericaceae (compare **monad**).

**tetradynamous**: having six **stamens**, two of which are shorter than the others, as in most Brassicaceae.

**tetragonous**: 4-angled.

**tetramerous**: having four members in a whorl.

**tetrandrous**: having four **stamens**.

**tetrasporangiate** (of an **anther**): having four **microsporangia** or **pollen sacs**.

**thalloid**: resembling or shaped like a **thallus**.

**thallus (thallose)**: a ± flattened vegetative body, without differentiation into a stem and leaves; see also **protonema**.

**theca** (*pl*. **thecae**; *adj*. **thecous**/**thecate**): one half of an **anther**, usually containing two **pollen sacs**/**microsporangia**.

**thorn**: a modified plant organ, especially a stem, that is stiffened and ends in a pungent point.

**throat** (of a tubular **corolla**): the top of the tube, where the lobes arise from the tube.

**thrum flower**: in **heterostylous** plants, the flower type having the shorter **style** (compare **pin flower**).

**thyrse**: a **panicle** with the secondary and ultimate axes **cymose**, i.e. the main axis is **indeterminate** and the lateral branches are **determinate** in their growth.

**thyrsoid**: like a **thyrse**.

**tiller**: a shoot growing from the base of a grass (Poaceae) stem; to produce tillers.

**tomentellous**/**tomentulose**: minutely **tomentose**.

**tomentellum**: a fine, short **tomentum**.

**tomentose**: densely covered with short, soft, felted hairs.

**tomentum**: a covering of woolly, densely matted hairs; wool.

**tooth**: a division of the peristome; see **teeth**; also applied to irregularities or projections at the margins of leaves; see **dentate**.

**toothed**: see **dentate**.

**tortuose**: bent, twisted or winding.

**torulose**: cylindrical with contractions or swellings at intervals.

**torus**: see **receptacle**.

**trabeculate**: cross-barred.

**trace**: a strand of vascular tissue connecting the stem with a leaf or reproductive organ.

**translator arm**: see **caudicle**.

**translator**: see **corpuscle**.

**trapeziform**: a figure of four straight, unequal sides.

**tri-** (*prefix*): three; thrice.

**triad**: a group of three.

**triangular-globular**: applied to a polar spore, the inner face of which has 3 facets separated by the arms of a triradiate mark; the outer face is convex.

**trichome**: an epidermal outgrowth, such as a hair or scale.

**trichotomous**: forking regularly into three.

**trifid**: deeply divided into three parts.

**trifoliate**: having three leaves.

**trifoliolate**: having three **leaflets**.

**trigone**: generally triangular intracellular wall thickenings, at the point where 3 (or more) cells meet, often in **epidermis** of liverworts.

**trigonous**: triangular in cross section and with obtuse angles (compare **triquetrous**).

**trilete** (e.g. of spores): having three scar lines forming a 'Y', or basically tetrahedral.

**trimerous**: in threes, e.g. of a flower with 3 sepals, 3 petals, etc.

**tripartite**: divided into 3 parts.

**tripinnate** (of leaves): thrice **pinnately** divided.

**triporate**: with 3 pores.

**triquetrous**: triangular in cross section and with acute angles, therefore with 3 distinct longitudinal ridges (compare **trigonous**).

**triradiate mark**: prominent ridges in the shape of a 'Y' on the proximal face of a spore.

**tristichous** (of leaves on a stem): arranged in 3 vertical rows.

**tristylous** (said of a **heterostylous** species): having three style lengths (short, mid, long); the flowers of any one plant having styles of the same length.

**trullate**/**trulliform**: trowel-shaped; having its widest axis below the middle and with straight margins.

**truncate**: abruptly cut off or squared off at the apex.

**tuber**: (1) a thickened branch of an underground stem, which produces buds; (2) a swollen root or branch of a root acting as a storage organ.

**tubercle**: a small, wart-like outgrowth.

**tuberculate**: covered with wart-like protuberances or knobs.

**tuberous**: swollen; (of roots): **tuber**-like.

**tuft** (*adj*. **tufted**): clump, cluster.

**tuft domatium**: a **domatium** supplied with or consisting of hairs.

**tumid**: swollen, enlarged.

**tumulus** (*pl*. **tumuli**): a small mound.

**tunic** (*adj*. **tunicate**) (of a **bulb** or **corm**): a loose membranous or fibrous outer skin which does not develop from the **epidermis**.

**turbinate**/**turbiniform**: shaped like a top; obconical.

**turf**: growth form with stems erect, parallel, often in extensive colonies.

**turgid**: swollen due to a high water content (compare **flaccid**).

**turriform**: shaped like a tower; e.g. *Asclepias* (Apocynaceae).

**turion**: (1) a young shoot or sucker which is produced from an underground stem; (2) a perennating winter bud which is separated from the parent and gives rise to a new plant in spring.

**tussocky**: tufted as in some grasses or grass-like plants.

# U

**umbel** (*adj*. **umbellate**): a **racemose** inflorescence in which all the divergent pedicels or **rays** arise in a cluster at the top of the peduncle and are of about equal length; **compound umbel**: each ray bears an umbel, each of the latter called a partial umbel; **simple umbel**: each ray terminates in a flower.

**umbellule**: a secondary **umbel** in a compound umbellate inflorescence.

**umbo** (*adj*. **umbonate**): a blunt or rounded projection arising from a surface, as on a pine cone scale.

**umbonate**: convex with an abrupt, rounded central point.

**uncinate**: terminating in a hooked point.

**undulate**: wavy on the margin (compare **sinuate**).

**unguiculate** (of petals): having a narrow **claw**-like base.

**ungulate**: tongue-shaped; oblong with a slightly broadened apex.

**uni-** (*prefix*): one-.

**unifacial**: 1-faced; (of leaves): folded sharply in half along the midline so that the **adaxial** surface is hidden; or filiform to ± cylindrical with a ± continuous palisade layer (see also **centric**).

**unifarious** (of the **indumentum** of a stem): restricted to one side or vertical line.

**unifoliate**: having only one leaf.

**unifoliolate**: of a **compound** leaf which is reduced to a single, usually terminal, **leaflet**; the **petiolule** is distinct from a **petiole**.

**unilateral** (of stamens): with **anthers** grouped on one side of the **style**.

**unilocular** (of an ovary or fruit): having only one internal cavity.

**unisexual**: bearing only male or only female reproductive organs.

**united**: fused together.

**unitegmic** (of an **ovule**): with one **integument**.

**unithecate**/**unithecous** (of an **anther**): with one **theca**.

**urceolate**: urn-shaped, with a short swollen tube contracted near the top and then slightly expanded in a narrow rim.

**urn**: spore-bearing portion of a **capsule** (compare **neck**).

**urticate**: to cause a burning or itching sensation.

**utricle**: bladder-shaped structure, applied (1) to the traps of *Utricularia* (Lentibulariaceae); (2) to the fruits of e.g. some Cyperaceae, such as *Carex*, and of Lemnaceae.

## V

**vagina**: sheath.

**vaginant laminae**: in *Fissidens* (Fissidentiacea), the equitant laminae at base of the leaf that clasp the stem and the base of the leaf above it; cf. **dorsal lamina**.

**vaginula**: the ring or sheath enveloping the base of the seta, derived from the base of the **archegonium** and remaining after the separation of the **calyptr**a; see **epigonium**.

**vallecular** (of grooves between ridges): e.g. in the fruits of Apiaceae and Asteraceae.

**valvate**: having the edges of **petals** or **sepals** touching without overlapping.

**valve** (*adj*. **valvar**): one of the parts produced by the splitting of a **capsule** when ripe.

**vascular**: specialised for the conduction of fluids; **vascular plant**: plant containing specialised conducting tissues.

**vegetative** (of plant organs or parts): having non-reproductive functions, e.g. leaves, roots, stems, etc.

**veins**: strands of **vascular** tissue (compare **nerves**).

**velamen**: water-retaining outer layer of the aerial roots of some epiphytes, especially Orchidaceae.

**velum**: a veil; a membranous covering.

**velutinous**: velvety.

**velvety**: with a coating of fine soft hairs.

**venation**: the arrangement of **veins** of a leaf or other organ.

**venose**: having veins.

**venter**: the swollen basal portion of an **archegonium**, containing the egg.

**ventral** (of a lateral organ): the upper or inner face or the surface facing the axis; (of a **thallus**): the surface facing the substrate (compare **dorsal**).

**ventricidal**: of the dehiscence of a fruit which splits down the **ventral** (axile) side of the locules.

**ventricose**: swollen or bulging on one side; unequally inflated.

**vermiculate**: with minute worm-like ornamentation; e.g. spores of *Riccia macrocarpa* (Ricciaceae).

**vermiform**: shaped like a worm.

**vernation**: the arrangement of unexpanded leaves in a bud (compare **aestivation**).

**verrucate**: warty.

**verruciform**: resembling a wart.

**verrucose**: warty.

**verruculate**: irregularly roughened.

**verruculose**: finely warty.

**versatile** (of an **anther**): swinging freely about the point of attachment to the **filament** which is ± in the middle of the back (compare **basifixed**, **dorsifixed**, **medifixed**).

**verticil**: a whorl or circular arrangement of similar parts around an axis, at the same level.

**verticillaster**: a false **whorl** of opposed dense **cymes**, especially in Lamiaceae.

**verticillate**: arranged in one or more **whorls**.

**vescicle**: a small sac or cavity; a spherical body.

**vescicular**: pitted with many **vescicles**.

**vestigial**: of an organ now degenerate and of little or no utility (compare **obsolete**, **rudimentary**).

**vestiture**: any covering on a surface, e.g. plant **trichomes**.

**vexillum** (*adj*. **vexillary**): the uppermost (or posterior) **petal** of a **papilionaceous** flower (= **standard**).

**vibratile**: capable of vibration.

**villous**: beset with long, weak hairs (compare **hirsute**).

**virgate**: with many long, slender, ± straight, ascending, almost parallel stems.

**viscid**: sticky, glutinous.

**viscidium** (in Orchidaceae): a **viscid** part of the **rostellum**, which is clearly defined and removed with the **pollinia** as a unit, and serves to attach the pollinia to an insect or other pollination agent.

**viscidulous**: slightly sticky.

**viscous** (of a liquid): thick and sticky.

**vitta** (*pl*. **vittae**): aromatic oil tubes in the fruit of some Apiaceae.

**viviparous**: with seeds or buds germinating or sprouting while attached to the parent plant.

**voluble**: twining or twisting.

## W

**weft**: a loosely interwoven, often ascending growth form; e.g. *Thuidium* (Thuidiaceae).

**whorl** (*adj*. **whorled**): (1) a group of three or more parts at a **node**, e.g. leaves or branches; (2) a circle of floral organs, e.g. stamens, petals, carpels.

**whorled**: arranged in a ring or circle.

**wide spreading**: spreading at a wide angle, but < 90°; cf. **spreading.**

**wing** (*adj*. **winged**): (1) any flat membranous expansion; (2) a thin flange of tissue extended beyond the normal outline of a stem or petiole; (3) one of the two lateral petals of a **papilionaceous** flower; (4) one of the **petaloid** sepals of the flower in Polygalaceae.

**wing**: loosely applied to the lamina of a thallus or to the thin, flat expansion at the margin of the spore.

## X

**xerochastic**: applied to plants of which the fruits burst by desiccation and their seeds or spores are scattered.

**xeromorphic** (of plants or plant parts): having characteristics that serve as protection against excessive loss of moisture.

**xerophyte** (*adj*. **xerophytic**): a plant that is adapted to dry or arid habitats.

## Z

**zygomorphic**: applied to flowers which are bilaterally symmetrical, i.e. capable of being bisected into identical halves in one plane only, forming mirror images; (= **irregular**) (compare **actinomorphic**, **regular**).

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* Indicates alien invasive plants.

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*Searsia erosa* (Photographer: Pieter Zietsman)



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