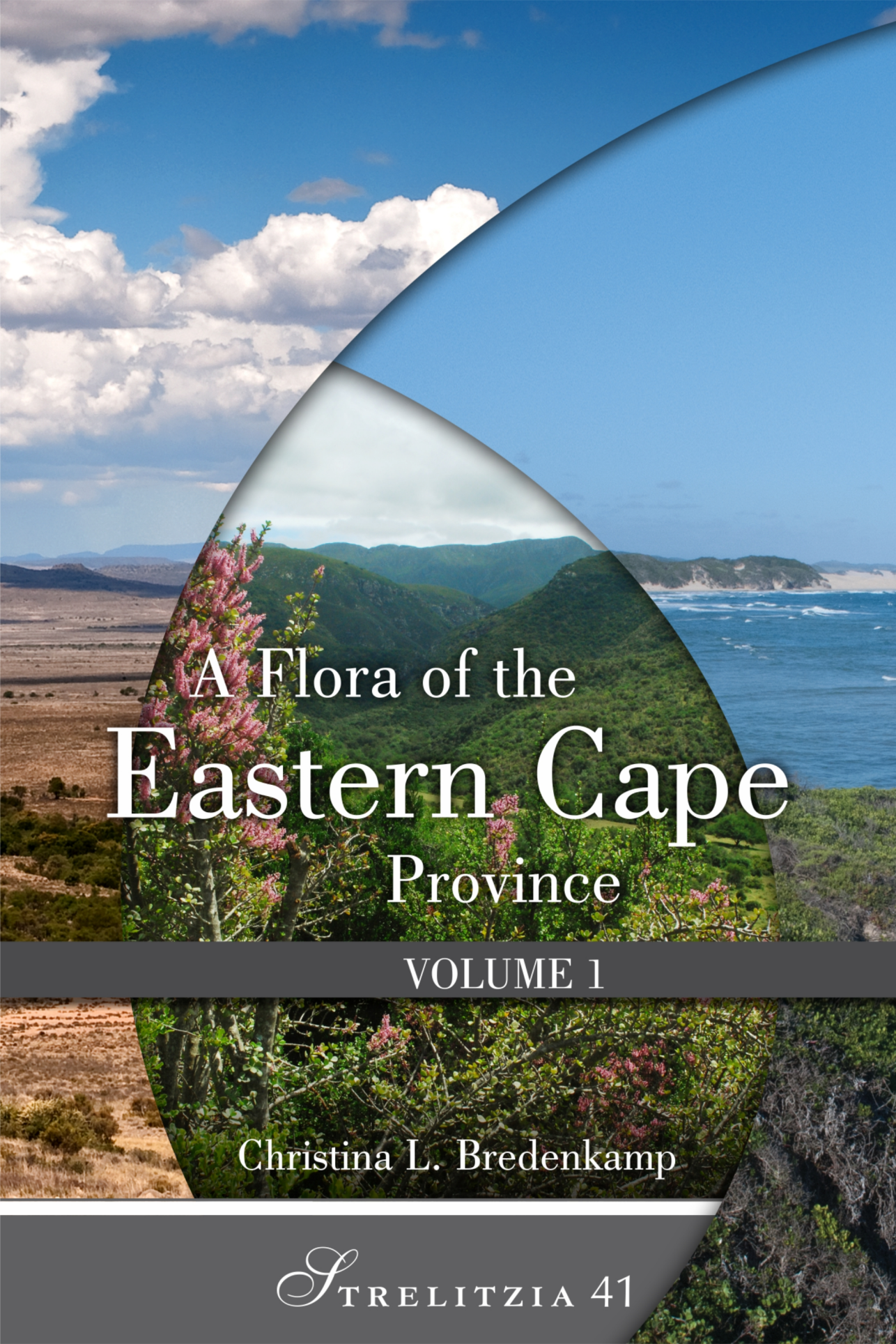
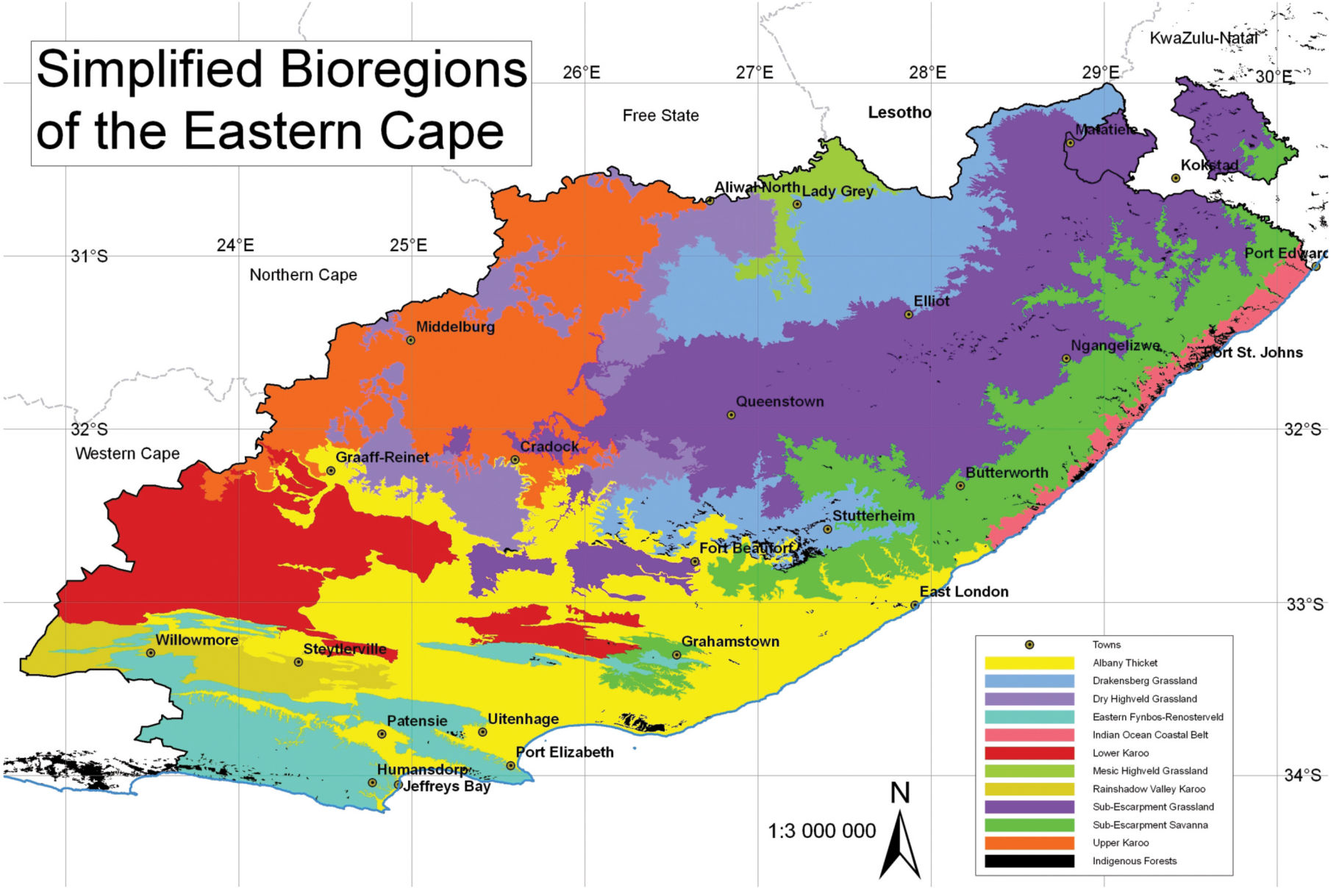

A Flora of the
Eastern Cape
Province
VOLUME 1
Christina L. Bredenkamp
STRELITZIA 41


Simplified Bioregions of the Eastern Cape
KwaZulu-Natal
Free State
Lesotho
Northern Cape
Western Cape
26°E
27°E
28°E
29°E
30°E
24°E
25°E
31°S
32°S
33°S
34°S
Matatiele
Kokstad
Aliwal North
Lady Grey
Port Edward
Elliot
Middelburg
Ngangelizwe
Port St. Johns
Queenstown
Graaff-Reinet
Cradock
Butterworth
Stutterheim
Fort Beaufort
East London
Willowmore
Steytlerville
Grahamstown
Patensie
Uitenhage
Port Elizabeth
Humansdorp
Jeffreys Bay
1:3 000 000
N
Towns
Albany Thicket
Drakensberg Grassland
Dry Highveld Grassland
Eastern Fynbos-Renosterveld
Indian Ocean Coastal Belt
Lower Karoo
Mesic Highveld Grassland
Rainshadow Valley Karoo
Sub-Escarpment Grassland
Sub-Escarpment Savanna
Upper Karoo
Indigenous Forests

STRELITZIA 41

A Flora of the Eastern Cape Province

Christina L. Bredenkamp

Volume 1

SANBI
Biodiversity for Life
South African National Biodiversity Institute

Pretoria
2019

STRELITZIA

This series has replaced *Memoirs of the Botanical Survey of South Africa* and *Annals of the Kirstenbosch Botanic Gardens* which the South African National Biodiversity Institute (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. The logo of SANBI is partly 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.

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Christina L. Bredenkamp

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Foreword

Floristic riches of South Africa's Eastern Cape, a true plant paradise

In a sense, the publication of A Flora of the Eastern Cape Province — the work you are holding in your hands–has brought the *Strelitzia* publication series full circle. Now, more than 90 years after the *Memoirs of the Botanical Survey* of South Africa, one of the forerunners of *Strelitzia*, first appeared shortly after World War I, the topic of this volume is again the flora of the Eastern Cape. The very first volume of the *Memoirs* series dealt with the flora of the Uitenhage and Port Elizabeth districts (Schönland 1919), one of the main metropolitan areas in the Eastern Cape. In a letter dated 5 May 1919, Dr I.B. Pole Evans, the then director of the Botanical Survey of South Africa, recommended to the Secretary of Agriculture, Mr F.B. Smith, the publication of this first *Memoir*. His words, with respect to the manuscript produced by Schönland, beg repeating here: '[it] supplies valuable information regarding an area that comprises an important phytogeographical boundary and with respect to which more exact details have long been wanting.' Over 90 years ago these words were true for the Uitenhage and Port Elizabeth divisions, and they remain true today for the Eastern Cape as a whole. Indeed, ever since the Eastern Cape was first explored botanically, there has been no doubt that the region's flora and conglomerate of vegetation types such as impenetrable thickets, waving grasslands, dense dune scrub, tall forests, and fynbos, constitute an exceptionally rich and unique paradise. With 6 611 species spread across 1 440 genera and 226 families of vascular plants, of which 11.9% are range-restricted to the province, the Eastern Cape is in every sense a botanist's delight.

In the years since the first *Memoir* was published in 1919, 63 volumes of the *Memoirs* and about 40 of the *Strelitzia* series, collectively comprising thousands of scientific, peer-reviewed pages, have been published by the South African National Biodiversity Institute (SANBI) and the various organisations that preceded it. A few other scholarly works on the Eastern Cape were also published as *Memoirs* in the interim (see for example Dyer 1937), and the early work of Schönland (1919) has now been quite magnificently expanded to cover the entire province.

Over the years several illustrious plant scientists and natural historians, both professional and amateur, were fascinated by the terrestrial and aquatic floras of the Eastern Cape and contributed to our knowledge of it; the list is long and includes: Mr John Acocks, Prof. Nigel Barker, Prof. George Bredenkamp, Ms Estelle Brink, Prof. Eileen Campbell, Prof. Richard Cowling, Prof. Neil Crouch, Mr Tony Dold, Dr R. Allen Dyer, Prof. Roy Lubke, Prof. John Manning, Dr Ria Olivier,

Dr Tony Palmer, Mr Pete Phillipson, Dr Robbie Robertson, Prof. Selmar Schönland, Prof. Stanley C. Seagrief, Prof. Braam [A.E.] van Wyk, Prof. Ben-Erik van Wyk, and many others. Even earlier, the collecting activities of pioneer explorers such as Ecklon and Zeyher, and James Bowie added to the cornucopia of artefacts and exsiccatae that subsequent field workers had at their disposal to clarify and confirm the richness of the Eastern Cape flora. To these names must now be added that of Dr Christien Bredenkamp who tirelessly worked for many years to complete the enormous work presented here. Field guides to parts of the Eastern Cape are available, but these can never be comprehensive because the flora is simply too voluminous. The present Flora now fills this gap.

This project was initially conceived as merely a treatise of the flora of the Baviaanskloof, but was soon expanded to cover the entire province, a task not for the faint of heart. Christien did not have an existing volume to update and expand; she had to start this project from scratch, which makes it even more of an achievement. She did not work alone, of course, and had the benefit of drawing on the expertise of several of her colleagues, both from within and beyond SANBI, and she provided the momentum and encouragement to colleagues to get the work completed.

A book like this, which brings together experience gained over a period of time by many experts, undoubtedly requires a range of acknowledgments. From my perspective as the author of the foreword, I have one only: to Dr Christien Bredenkamp and all her co-workers, for accomplishing this – a work providing a comprehensive floristic treatment of one of the richest botanical areas on Earth. Or as Cowling & Pierce (2009) so aptly called this part of South Africa: an Eden, east of the Cape. I am deeply grateful for being able to hold the completed manuscript, if not yet the published book, in my hands. Christien and her colleagues deserve more than – and more than deserve – the accolades due to them.

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SCHÖNLAND, S. 1919. Phanerogamic flora of the divisions of Uitenhage and Port Elizabeth. *Memoirs of the Botanical Survey of South Africa* 1: 1–118. The Government Printing and Stationery Office, Pretoria.

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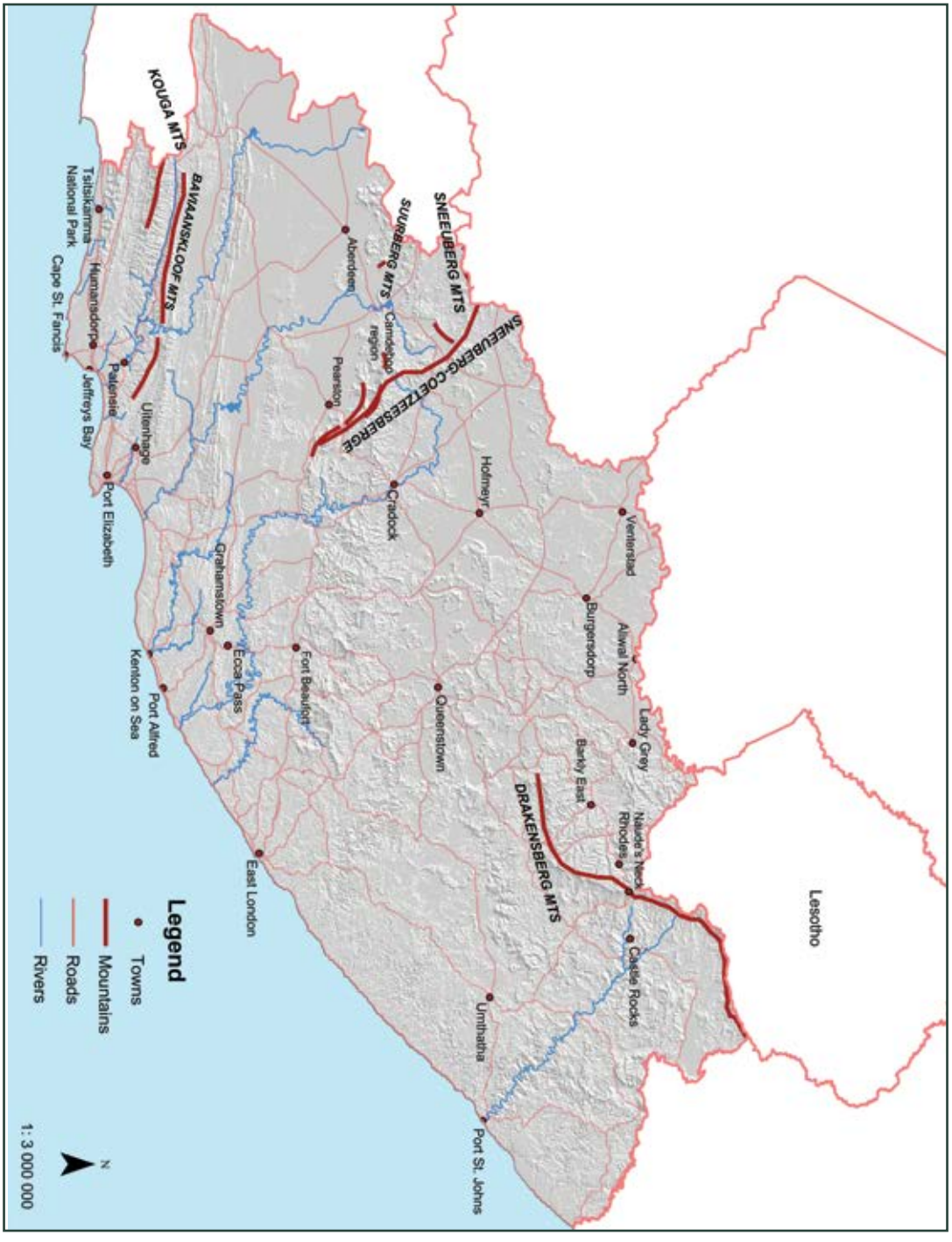


FIGURE 1—Map of the Eastern Cape Province showing selected towns, roads, rivers and mountains. Produced by L.W. Powrie.

Introduction

Preamble: the Eastern Cape – a symphony of biodiversity

Travellers in the Eastern Cape experience an amazing symphony of biodiversity, directed by experience gained over millions of years, into a perfect harmony with geology, geomorphology, soil and climate (Table 1). Man is the ever-amazed explorer standing in awe at the majestic appearances of landmarks within this region, such as the Great Escarpment, the southern Drakensberg, the Gamtoos, Sundays, Buffels and Great Fish River valleys, the Cape Fold Mountains, and the expanse of the adjacent Indian Ocean.

On crossing the Orange River, the explorer enters the Eastern Cape Province from the north and finds himself in the Upper Karoo stretching from Venterstad eastwards to Burgersdorp, Hofmeyr and Cradock and southwards to the Sneeuberg-Coetzeesberge mountain chain of the Great Escarpment. The gentle sloping plains are interspersed with dolerite hills of the Beaufort Group and rocky areas of sedimentary origin (Figures 1, 2 and 3). The landscape is typically dotted by microphyllous dwarf shrubs interspersed by waving pale-white grasses of the genera *Aristida* and *Eragrostis* (Figure 4A).

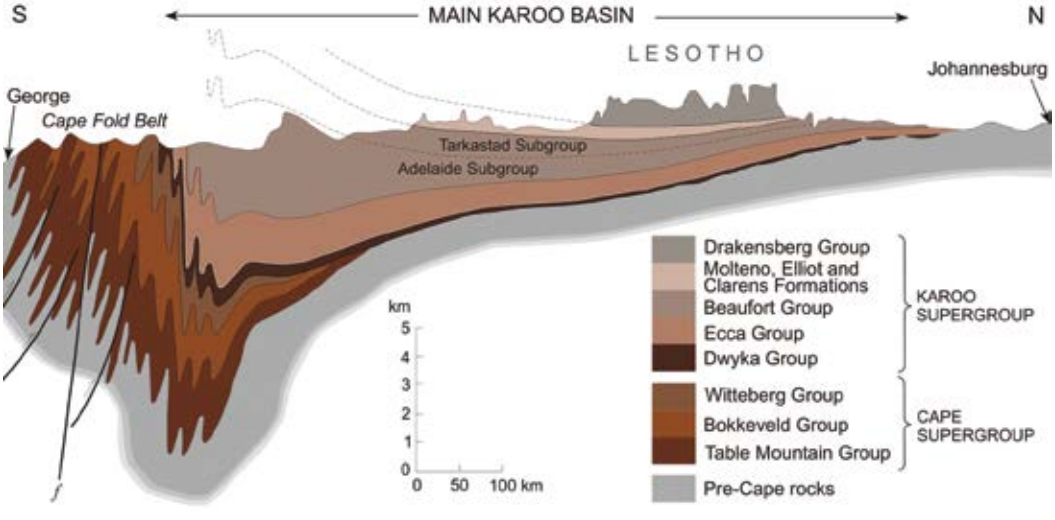


FIGURE 2—Schematic north–south section across the Main Karoo Basin (Johnson et al. 2006). By courtesy of the Geological Society of South Africa.

TABLE 1—Geological time scale in relation to the Karoo and Cape Supergroups, as well as major events in South Africa's geological history (Buckle 1978; Lubke et al. 1988; Johnson et al. 2006; Norman & Whitfield 2006)

Era	Period	*Ma	Supergroups
Quaternary	Recent		
	Pleistocene	2	
		3	
Cenozoic	Pliocene	11	
	Miocene	25	
	Oligocene	40	
	Eocene	65	
		70	
Mesozoic	Cretaceous	135	
	Jurassic	180	
	Triassic		
			Karoo Supergroup
		225	
Palaeozoic	Permian	270	
	Carboniferous		
	Devonian	350	
	Silurian	400	Cape Supergroup
	Ordovician	440	
	Cambrian	500	
		600	
Precambrian	Upper		
	Middle	1 000	
	Lower		
	Azoic	3 000	

*Ma = Age in million years; e.g. 85 Ma indicates about 85 000 000 years ago

	Groups, subgroups and formations	Major events in South Africa's geological history
		Widespread formation of river terraces and raised beaches.
		Development of hominids.
		Deposition of continental sediments in basin areas like the Kalahari.
		Extinction of dinosaurs.
	Zululand, Suurberg and Uitenhage Groups	Deposition of marine sediments.
	Karoo dolerites Drakensberg Group	Rise to dominance of the Angiosperms (Anderson 1999).
	Molteno, Elliot and Clarens Formations	Intrusion of Karoo dolerites, eruption of Drakensberg basalts.
		Cape Fold Mountains raised up.
	Beaufort Group Tarkastad Subgroup Adelaide Subgroup	
	Ecca Group Dwyka Group	Great Ice Age in central and South Africa.
		Crustal warping causing continental basins.
	Witteberg Group and Msikaba Formation	Plant life and amphibians move onto land.
	Bokkeveld Group	Extensive deposition of sediments, e.g. Table Mountain Sandstones.
	Table Mountain and Natal Groups	
		Intrusion of Cape granites.
		Ancient mountain building periods and ancient glaciation.
		Oldest recorded rocks 3 500 million years from South Africa.

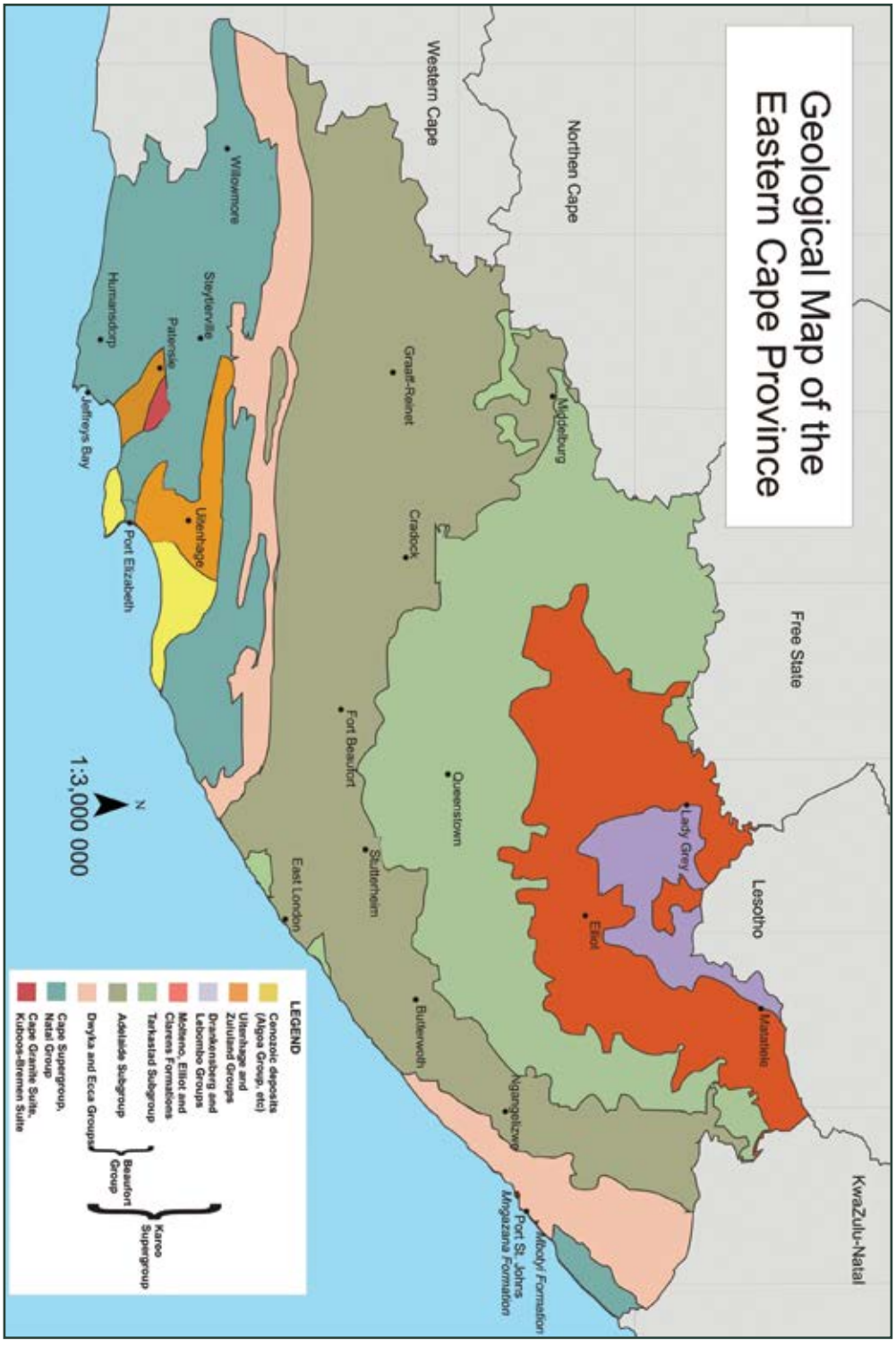


FIGURE 3—Geological map of the Eastern Cape Province. Produced by N.W. Biyela and L.W. Powrie.



FIGURE 4—A, The gently sloping planes of the Upper Karoo; B, The Dry Highveld Grassland. Photos: I.L. Rautenbach.

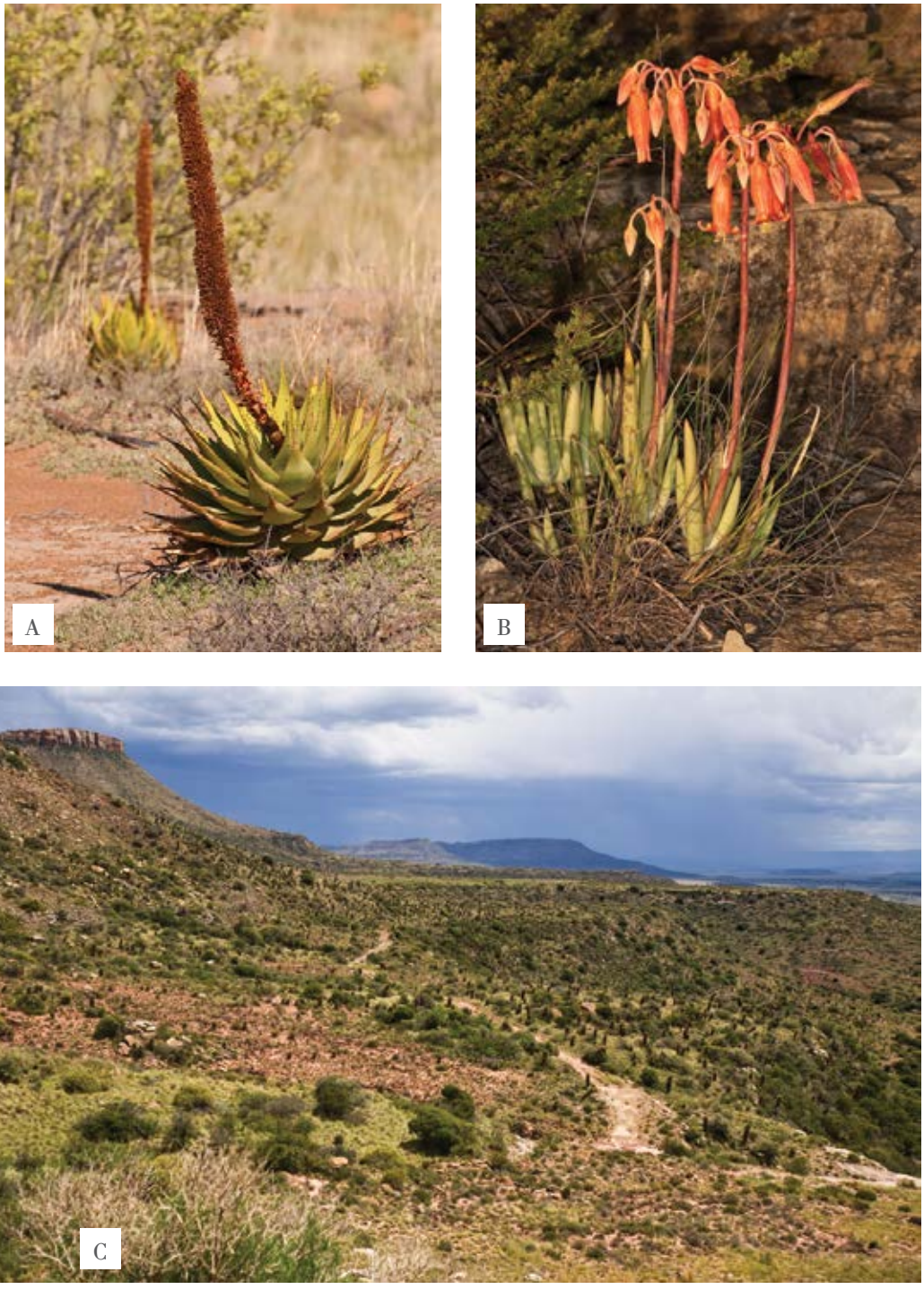


FIGURE 5—A, *Aloe broomii* (Asphodelaceae); B, *Cotyledon orbiculata* (Crassulaceae); C, the moist Mesic Highveld Grassland. Photos: I.L. Rautenbach.





FIGURE 6—Associated plant species of moist Mesic Highveld Grassland. A, *Brunsvigia radulosa*, a jewel in farmland near Karringmelkspruit (Amaryllidaceae); B, *Kniphofia caulescens*, seepage areas in mountain grassland (Asphodelaceae). Photos: S. Veldsman.

Moving to Aliwal North, the explorer encounters sedimentary sand overlaying the Tarkastad Subgroup, while further on, the landscape is characterised by alternating layers of mudstone and sandstone. Here, the Dry Highveld Grassland is sparse with patches of dwarf karroid shrubs interspersed by forbs, succulents and geophytes (Figure 4B, 5A, 5B). Prominent grasses include *Themeda triandra* and *Tetrachne dregei*. To the east a sudden thunderstorm indicates that the



FIGURE 7—Joubert Pass ascending and winding along the slopes of the Witteberg Mountains. Photo: I.L. Rautenbach.

explorer has entered the moister Mesic Highveld Grassland, a more mesic region of the Highveld. This grassland extends into the Eastern Cape as far south as Jamestown and Dordrecht. The traveller is met by undulating plains dominated by grass genera of the tribe *Andropoginae* and broken by sandstone outcrops (Figure 5C, 6). Gazing at the horizon he is amazed by the Witteberg Mountains with Lady Grey nested between the sandstone cliffs of the Elliot and Clarens Formations and the Drakensberg Group. Joubert Pass ascends from the outskirts of Lady Grey, winding upwards and overlooking Pellion Peak, the highest point (2 682 m), often covered by snow in winter (Figure 7–11).



FIGURE 8—Summit of Joubert Pass, facing north over the mountains of Lesotho. Photo: I.L. Rautenbach.



FIGURE 9—Joubert Pass. A, *Bulbine narcissifolia* (Asphodelaceae); B, *Berkheya multijuga* (Asteraceae). Photos: A, J.C. Rautenbach; B, G. Williams.



FIGURE 10—Joubert Pass. A, *Euphorbia clavarioides* (Euphorbiaceae); B, *Lessertia frutescens* (Fabaceae). Photos: A, J.C. Rautenbach; B, I.L. Rautenbach.



FIGURE 11—Joubert Pass. *Gladiolus saundersii* (Iridaceae). Photo: S. Veldsman.



Moving further east, the landscape changes with the ascent into the Drakensberg Mountains from Barkly East to Naude's Neck. The traveller witnesses the different rock types, from basaltic lava flows of the Drakensberg Group, to the fine-grained sand and siltstones of the Clarens Formation. The area forms part of



FIGURE 12—Plants growing between Rhodes and Naude's Neck are typically adapted to Afromontane conditions. *Crinum macowanii* (Amaryllidaceae) on route to Rhodes. Photo: J.C. Rautenbach.

the Afromontane Region (Cowling et al. 2003), where plant species are adapted to altitudes varying between 2 141–2 579 m and to high rainfall of 900–1 200 mm per annum. Frost and winter snow prevail with mean monthly minimum temperatures between 3–9°C, while the maximum mean monthly temperatures range between 19–21°C (Figure 12–15). On reaching the Castle Rock and Luzi River the traveller is astonished by the alternating rocks of the Drakensberg Group and the Clarens, Elliot and Molteno Formations. Except for the picturesque expanse, the mountain crests display patches of alpine vegetation with *Passerina montana* (Thymelaeaceae) prominent, while the slopes are covered in a variety of grasses, forbs, shrubs, small succulents, and geophytes from the Drakensberg Grassland (Figure 16, 17).



FIGURE 13—Close to Naude's Neck *Merxmuellera macowanii* (Poaceae), a yellow tussock grass, occurs in spongy, wet grassland and terracettes (markings caused by snow) are evident against the opposite mountain slopes. Photo: J.C. Rautenbach.

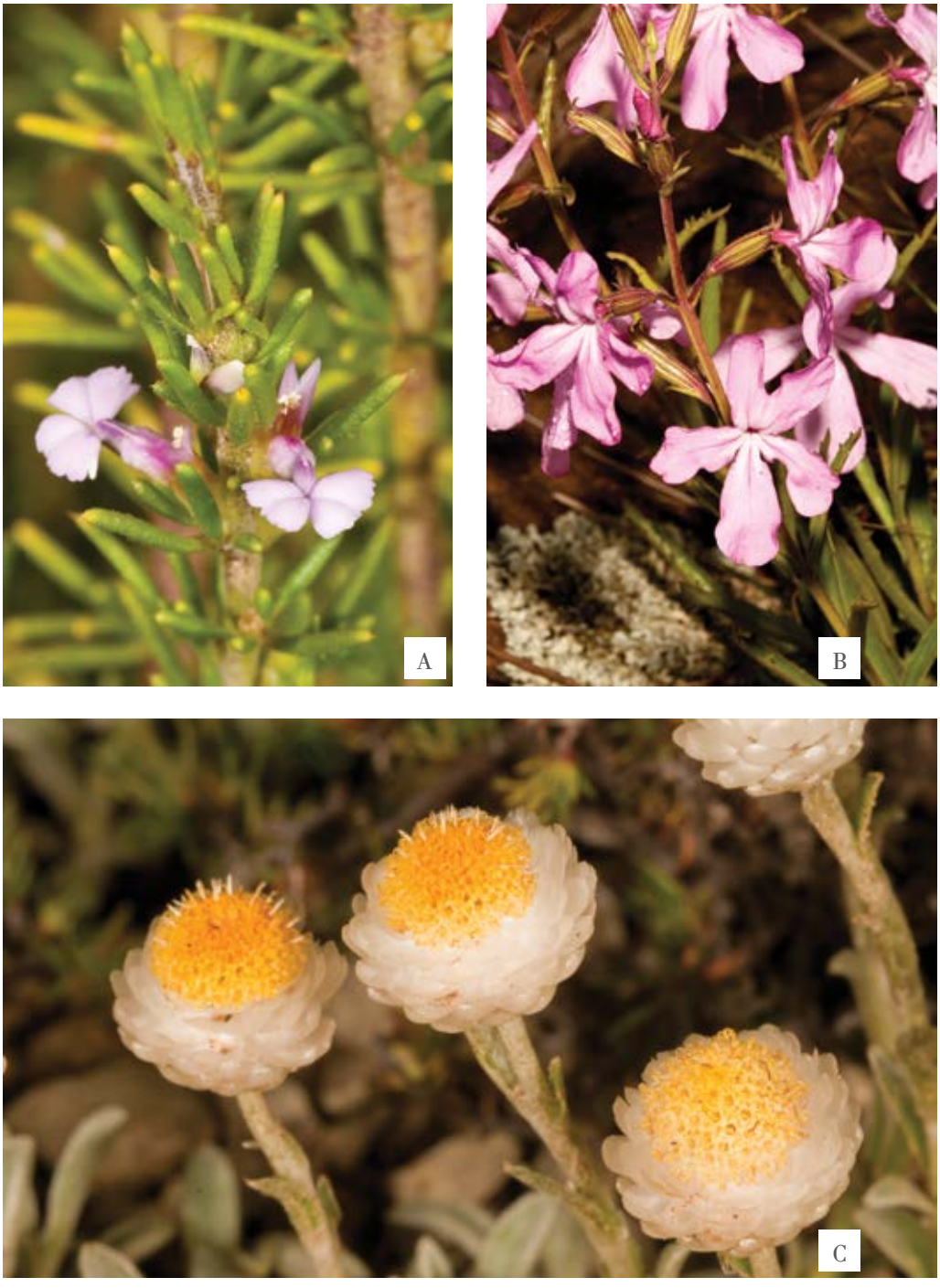


FIGURE 14—Associated plant species of Afromontane conditions, A, *Muraltia alticola* (Polygalaceae); B, *Cycnium racemosum* (Orobanchaceae); C, *Helichrysum chionosphaerum* (Asteraceae). Photos: I.L. Rautenbach.



FIGURE 15—Associated plant species of Afromontane conditions, *Lobelia flaccida* (Campanulaceae). Photo: J.C. Rautenbach.



Directing the journey southwards, one is met by green, rolling hills and slopes covered by short grass of the Sub-Escarpment Grassland. Underlying these grasslands are the grey-green to reddish mudstones and river-channel sandstones of the Beaufort Group mixed with dolerite. Due to a combination of frost, low winter temperatures, thunderstorms, the hilly terrain, the geology and unsuitable land-use practices, the terrain is interspersed by donga erosion. This erosion causes concern, but is gradually being addressed by local farmers (Norman & Whitfield 2006). This landscape stretches past Mthatha to Butterworth (Figure 18, 19).



FIGURE 16—A picturesque view of mountains in the Castle Rock area. Photo: J.C. Rautenbach.

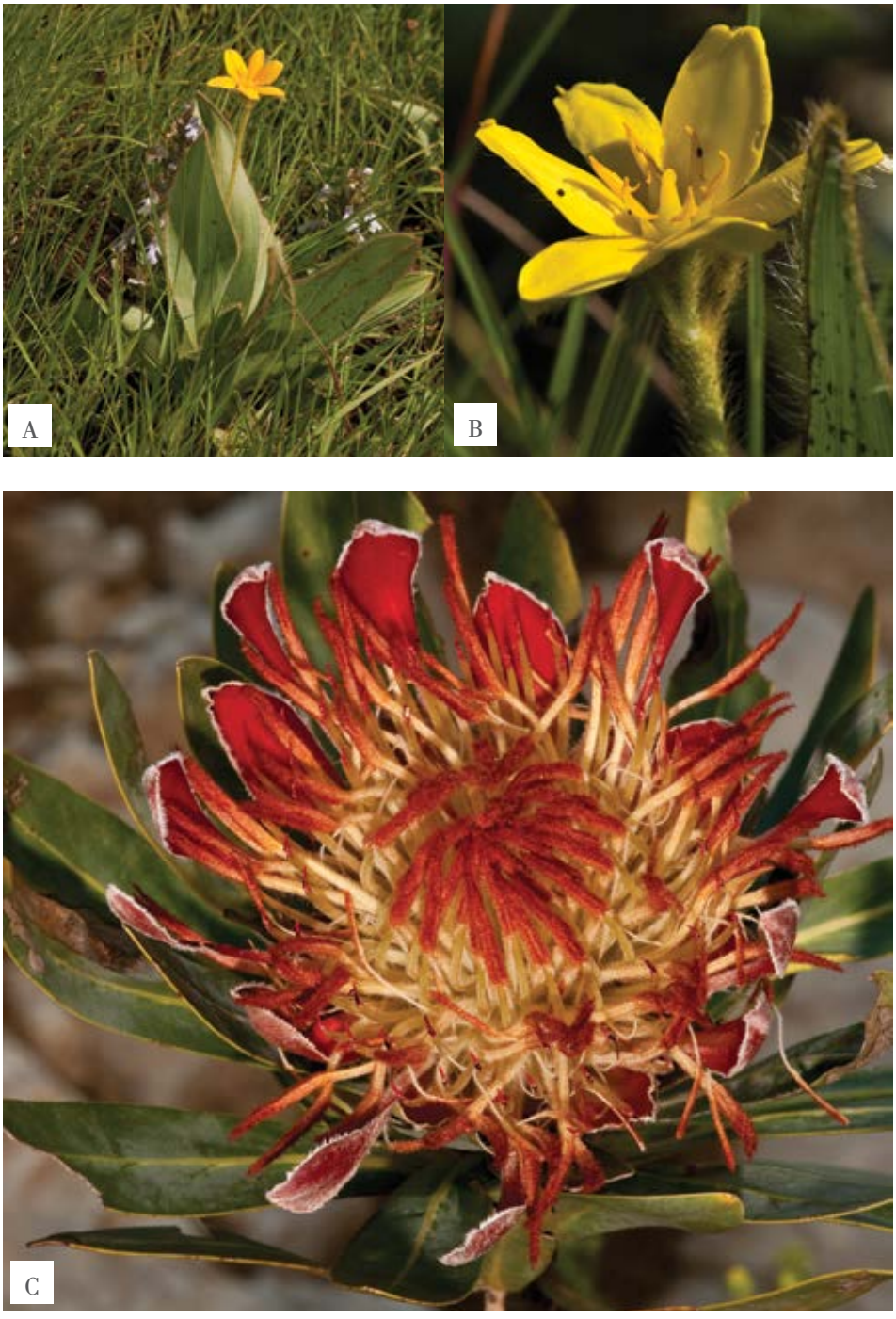


FIGURE 17—A & B, *Hypoxis costata* (Hypoxidaceae); C, *Protea roupelliae* (Proteaceae). Photos: A, J.C. Rautenbach; B & C, I.L. Rautenbach.



FIGURE 18—A, a view of hills and slopes covered by short grass of the Sub-Escarpment Grassland en route to Maclear with the southern Drakensberg lying inland; B, Due to climate, geology and land-use practices, the terrain is often interspersed by dongas between Maclear, Mthatha and Butterworth. Photos: A, I.L. Rautenbach; B, J.C. Rautenbach.



FIGURE 19—Shepherds herding their fold close to Mthatha. Photo: I.L. Rautenbach.

The subtropical eastern seaboard is washed by the warm Mozambique current and experiences a humid climate with year-round rainfall and mean monthly minimum and maximum temperatures between 12–15°C and 22–24°C respectively. Journeying from Mthatha eastwards, conspicuous changes from the



FIGURE 20—Lush Wild Coast vegetation near Port St Johns. A species-rich and multi-layered scarp forest. Photo: I.L. Rautenbach.

mudstones and sandstones of the Beaufort Group to the dark shales and sandstone layers of the Ecca Group at Port St Johns are observed. Mesozoic deposits of sedimentary breccias, conglomerates and interbedded sandstones at Mbotyi make up the Mbotyi Formation, while sandstones and siltstones of the Mngazana River constitute the Mngazana Formation (Shone 2006). The vegetation of the Wild Coast is lush with productive grasslands and luxuriant, indigenous forests.

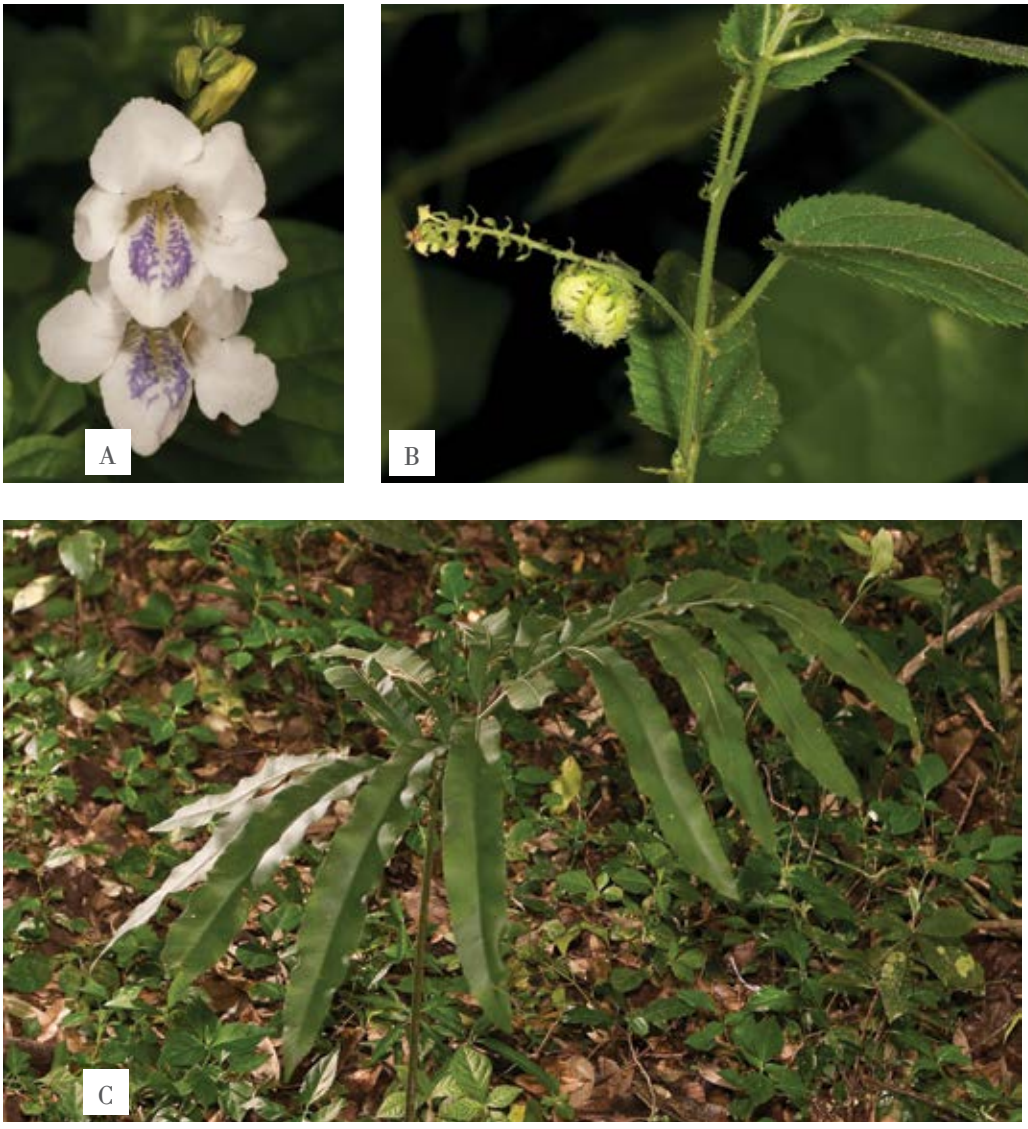


FIGURE 21—Associated plant species of Wild Coast vegetation. A, *Mackaya bella* (Acanthaceae); B, *Tragia glabrata* (Euphorbiaceae); C, *Stangeria eriopus* (Stangeriaceae), single-leaved seedling on forest floor. Photos: I.L. Rautenbach.

Scarp forests occur in Pondoland and southern Transkei, along the coast or in deep gorges, often at low altitudes. These forests are species rich and multi-layered with well-developed canopy and understorey tree layers. Typical plant species include *Phoenix reclinata*, *Strelitzia nicolai*, *Aloidendron barberae*, *Dracaena aletriformis*, *Afrocarpus falcatus*, *Cryptocarya myrtifolia*, *Schotia latifolia*, *Umtiza listeriana* and many others (Figure 20–22), a paradise for the prolific forest birdlife.

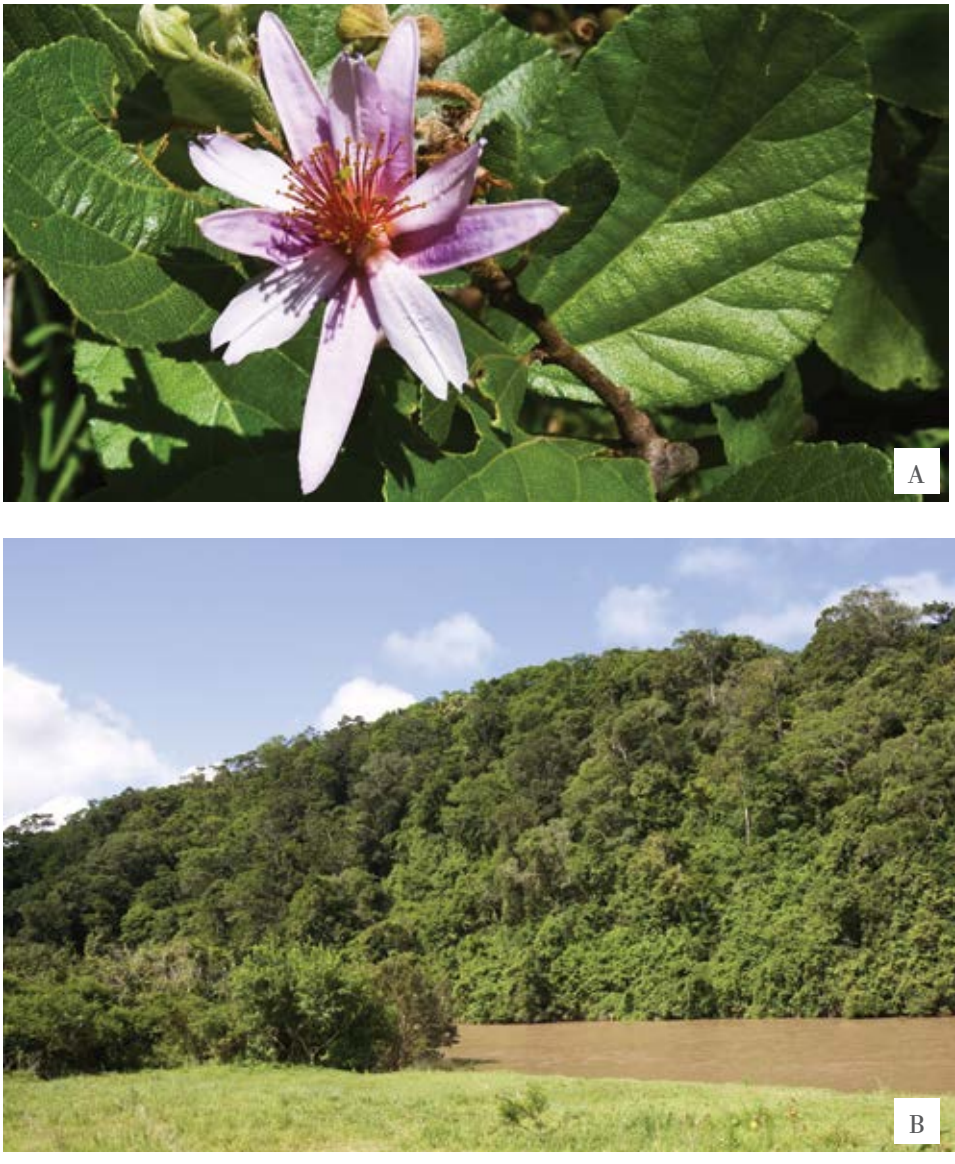


FIGURE 22—A, *Grewia lasiocarpa* (Malvaceae), a forest margin species; B, dense, multi-layered scarp forest lining riverbank. Photos: J.C. Rautenbach.

The southernmost mangrove forests adorn the estuaries and riverbanks along the primary and secondary coastal dunes. The mangrove crabs (*Uca urvillei*) occur with *Bruguiera gymnorrhiza* and thrive on the continually falling leaves. Other species are *Avicennia marina* and *Hibiscus tiliaceus* (Figure 23–25).



FIGURE 23—The southernmost mangrove forests near Port St Johns. Photo: I.L. Rautenbach.





FIGURE 24—A, *Hibiscus tiliaceus* (Malvaceae); B, *Avicennia marina* (Avicenniaceae). Photos: I.L. Rautenbach.



FIGURE 25—A, *Bruguiera gymnorrhiza* (Rhizophoraceae); B, knee-like breathing roots of *B. gymnorrhiza*; C, the mangrove crab, *Uca urvillei*, feeding on the continually falling leaves of *B. gymnorrhiza*. Photos: I.L. Rautenbach.

The geology remains much the same between Mthatha and East London but the vegetation is remarkably different, making the explorer aware of African savanna. Bisho Thornveld occurs in a band parallel to, but inland of, the coast to north of East London. This vegetation type is characterised by a savanna with small trees of *Vachellia natalitia* (Fabaceae) and a sour grass understorey, usually dominated by *Themeda triandra* (Poaceae). It occurs on undulating, moderately steep slopes (Figure 26). Tree succulents are always special to plant lovers, so is *Aloidendron barberae* (Asphodelaceae) that was spotted in the dense coastal forest north of East London (Figure 27).

Travelling from East London southwestwards, thicket country is entered. Thicket is generally described as a relatively impenetrable, dense, woody, semi-succulent and thorny vegetation type with an average height of 2–3 m (Acocks 1953; Everard 1987). Cowling & Pierce (2009) regard this biome as largely endemic to the Eastern Cape and harbouring most of the province's endemic plants, predominantly succulents and geophytes. It is most extensive in the major river valleys, such as the Gamtoos, Sundays, Great Fish and Buffels, and is a hardy vegetation, apparently well adapted to variable rainfall and capable of enduring long droughts. The typical plant types are shrubs (often spiny) with shiny, leathery, evergreen leaves, succulents of all shapes and sizes, and vines or climbers. Grasses are sparse and mostly found in the spaces between the bushes.

Between East London and the Keiskamma River Mouth, the explorer moves through the Beaufort, Dwyka and Ecca Groups of the southeasternmost parts of the Karoo Supergroup. From here, westwards there is an amazing change in geology to the more ancient Cape Supergroup. The rainfall in this area continues through the summer months and the vegetation is lush, reminding of that of the eastern seaboard. Mesic Thicket is the prevailing inland vegetation type and from here eastwards the landscape is characterised by a mosaic of Mesic and Valley Thicket. The Transfish Dune Thicket is a narrow band of thicket occurring along the coast east of the Fish River but it is at its widest in this area because of the summer rainfall (Cowling & Pierce 2009).

Paddling up the Kap River, about 23 km east-northeast from Port Alfred, one is surrounded by plains broken by thicket clumps. These plains drop steeply into valleys of dense thicket with the long, succulent stems of *Euphorbia triangularis* and *E. tetragona* (Euphorbiaceae) characteristically positioned against the slopes, while *Phoenix reclinata* (Arecaceae) fringes the rivers (Figure 28A). Driving onwards and approaching Grahamstown, the folding of the Witteberg Group shales and sandstones can clearly be seen. The Eastern Cape endemic, *Oldenburgia grandis*, a perennial shrub or small tree in the Asteraceae, can be seen on the Zuurberg at the southern commonage of Grahamstown (Figure 28B). From here to Fort Brown, the traveller moves through alternating formations of the Karoo and

Cape Supergroups to the Ecca Pass (Figure 29A) with Ecca sediments uptilted due to the folding of geological formations typical of the Cape Fold Belt. In the immediate vicinity, at your feet, your curiosity is rewarded by numerous small shrubs, herbs and succulents (Figure 29B, 29C, 30). From this vantage point the expanse of thicket is mind blowing. Towards the west, the dominant species in the thicket is *Portulacaria afra* (Didiereaceae, Figure 31A, 31B) with their green



FIGURE 26—Savanna between Mthatha and East London showing undulating, moderately steep slopes with small trees of *Vachellia natalitia* (Fabaceae) and a sour grass understorey, usually dominated by *Themeda triandra* (Poaceae). Photo: I.L. Rautenbach.

and pink tinges fading into the distance. Towards the north, the valley thicket of the Fish River Basin lies ahead, exhibiting vegetation with dry, sturdy, often thorny branches and small, leathery leaves or succulent thorny stems, all adapted to utilise every drop of available water in this tough part of the African continent (Figure 31C–33).



FIGURE 27—*Aloidendron barberae* (Asphodelaceae) in coastal forest north of East London. Photo: J.C. Rautenbach.







FIGURE 28—A, the Kap River in dense thicket with *Phoenix reclinata* (Arecaceae) fringing the river; B, [E]*Oldenburgia grandis* (Asteraceae). Photos: A, R.M. Cowling; B, S.P. Bester.

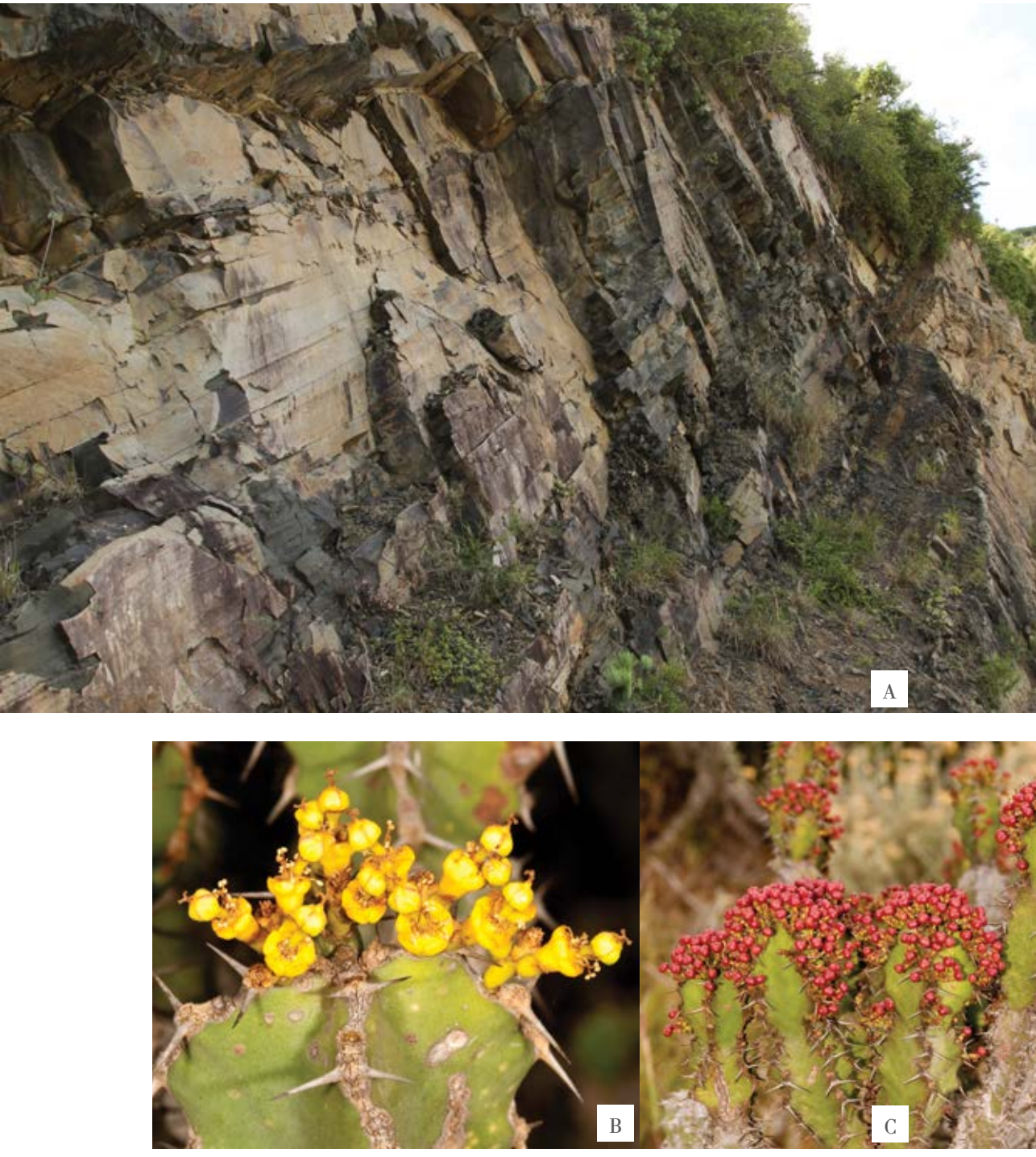


FIGURE 29—A, the Ecca Pass with uptilted Ecca sediments; B & C, [E]*Euphorbia caerulescens* (Euphorbiaceae). Photos: A, G.J. Bredenkamp; B & C, I.L. Rautenbach.



FIGURE 30—*Euphorbia cumulata* (Euphorbiaceae). Photo: I.L. Rautenbach.

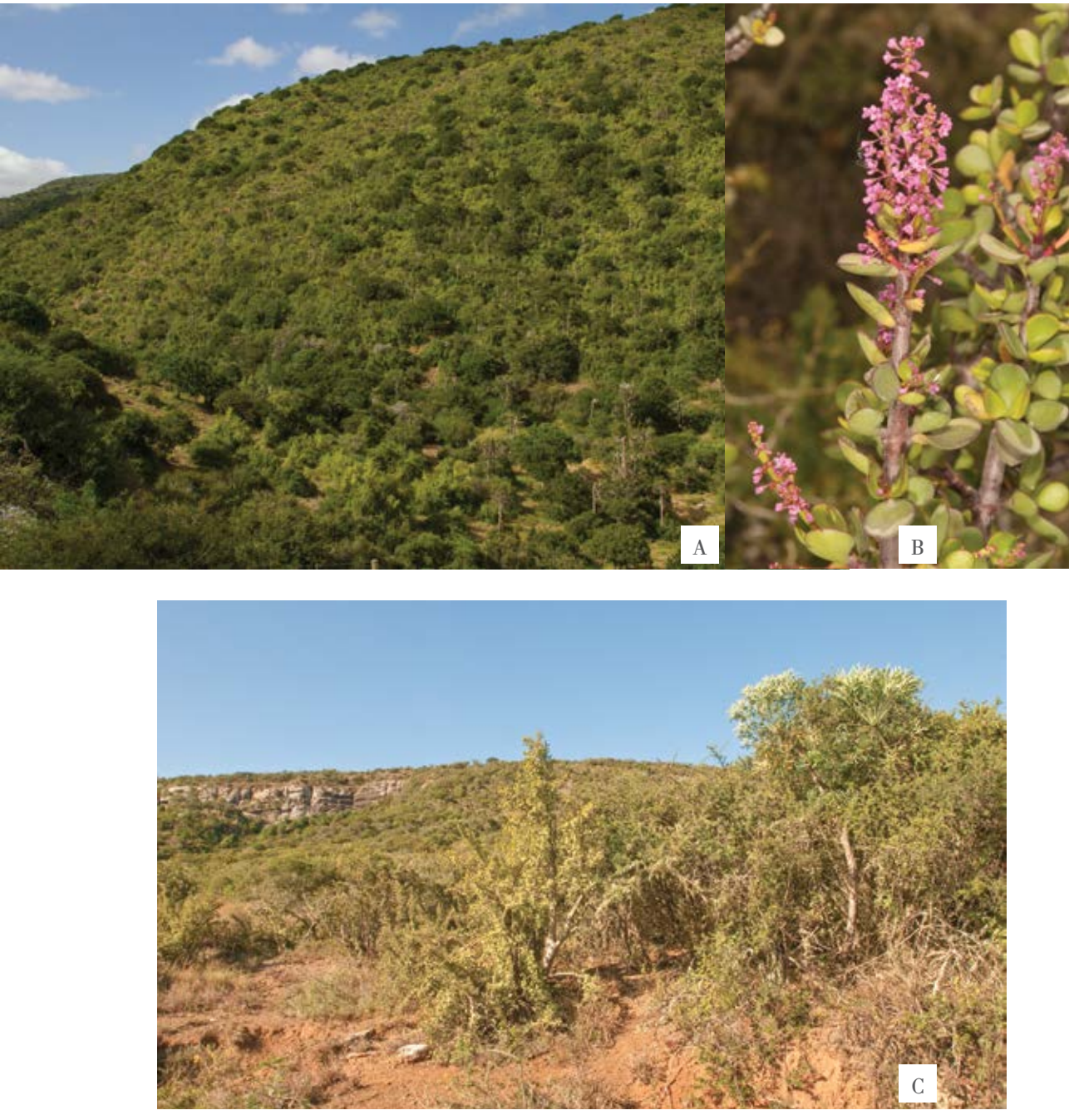


FIGURE 31—A & B, towards the west of the Ecca Pass the dominant species in the thicket is *Portulacaria afra* (Didiereaceae), the spekboom; C, scenery and plant species in the Great Fish River Nature Reserve: valley thicket showing *Portulacaria afra* (Didiereaceae) and *Cussonia spicata* (Araliaceae) amongst typical thicket plants. Photos: A, G.J. Bredenkamp; B & C, I.L. Rautenbach.

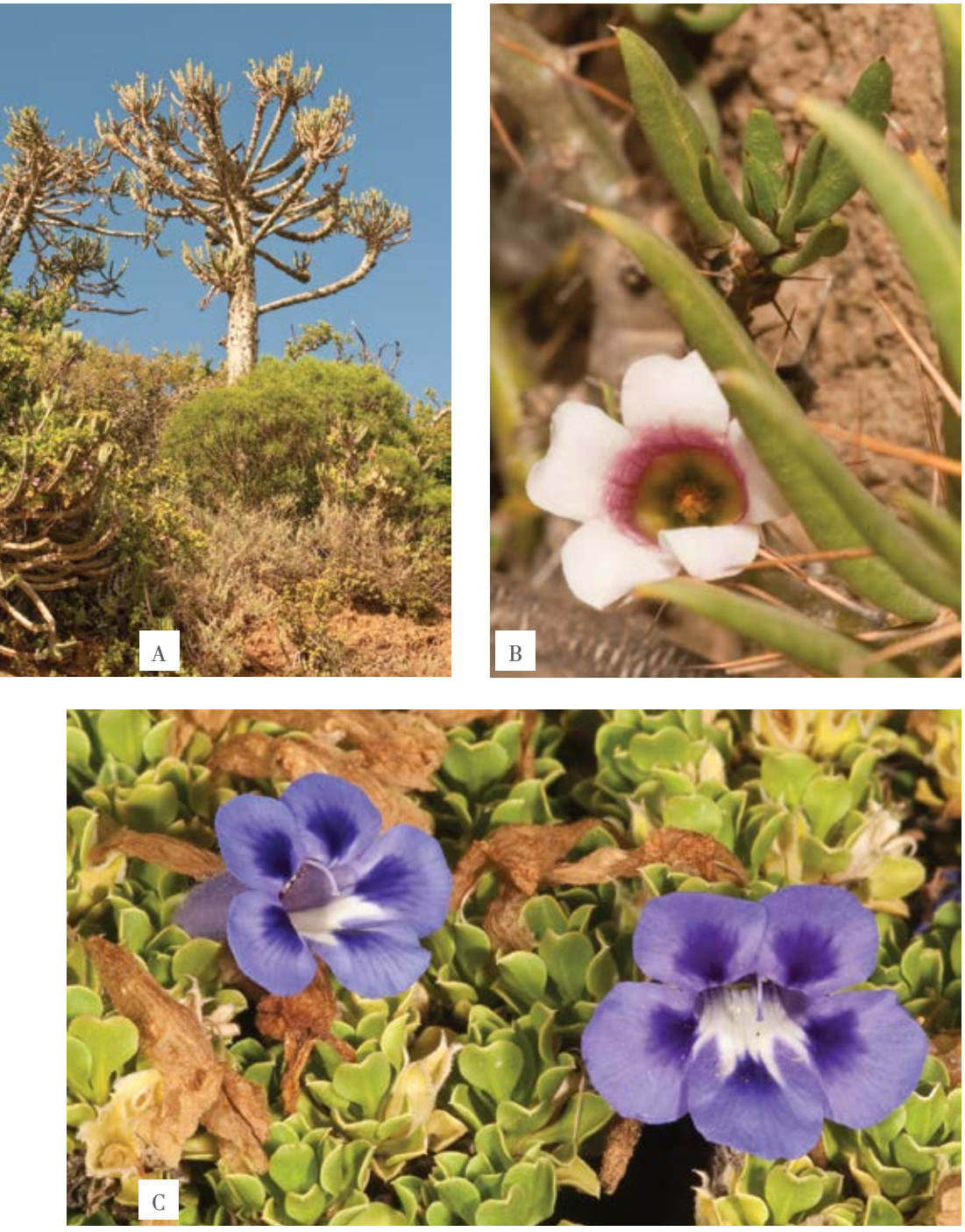


FIGURE 32—A, valley thicket with *Euphorbia tetragona* (Euphorbiaceae); B, *Pachypodium bispinosum* (Apocynaceae); C, *Aptosimum procumbens* (Scrophulariaceae). Photos: I.L. Rautenbach.



FIGURE 33—*Drimia altissima* (Hyacinthaceae). Photo: I.L. Rautenbach.

Algoa Bay is situated in the Cape Supergroup. According to Shone (2006) it is the largest of the 'half-heart-type' basins and has the most diverse sediment fill. It was shaped by the Swartkops and Sundays Rivers. In the geological past the sea reached much further into the interior and was filled with sediment of the mountains of the interior. The thickest of these sediments is the Uitenhage Group, deposited in the late Jurassic and early Cretaceous, currently with a Cenozoic cover. The Enon (lowermost), Kirkwood and Sundays River Formations make up the Uitenhage Group and are distributed in both the Gamtoos and Algoa basins (Figure 34). Driving from Port Elizabeth to Kirkwood, these formations alternate and are exposed at road cuttings. Sedimentation occurs up to today. The coastline between Algoa Bay and Boknes boasts of the most beautiful sand dunes, with those at the Diaz Cross Memorial near Kwaaihoek being the most impressive. Moving in a northeastern direction the coastline becomes rockier, as seen at Kenton on Sea. Two of the most common primary dune plants are *Scaevola plumieri* (Goodeniaceae, scandent in sand) and *Passerina rigida* (Thymelaeaceae, both a resprouter and a reseeder) (Figure 35, 36). Driving northwards, almost as far as Grahamstown, the explorer will be able to recognise older Tertiary dunes that are now lithified to aeolianite and characterised by sandstone that has not yet been compacted (Norman & Whitfield 2006). Needless to say that these ancient dunes form exquisite ecosystems, housing many plant species, especially endemic succulents that are currently threatened, caused by development in the metropolitan Port Elizabeth area (Figure 37).



FIGURE 34—Part of the Enon Formation in the vicinity of Hankey near the Baviaanskloof. Photo: G.J. Bredenkamp.





FIGURE 35—A, the rocky coastline at Kenton on Sea; B, impressive dunes at the Diaz Cross Memorial near Kwaaihoek. Photos: G.J. Bredenkamp.





FIGURE 36—A, *Scaevola plumieri* (Goodeniaceae); B, *Passerina rigida* (Thymelaeaceae). Photos: A, G.J. Bredenkamp; B, I.L. Rautenbach.



FIGURE 37—A view of the Tertiary Dunes near Port Elizabeth. Photo: G.J. Bredenkamp.

Apart from the extraordinary dune flora, Port Elizabeth is also the region where two great biogeographic kingdoms meet: the Cape to the west and the Afrotropical to the east (Cowling & Pierce 2009). This phenomenon can be ascribed to the winter rainfall and dry summers prevailing in the west and summer rainfall increasing eastwards to the extent where it rains in most months and the plants are lush and green as found along the eastern semi-tropical seaboard of the country.

The Fynbos Biome is represented in the narrow, more or less oblong, easternmost belt between, Willowmore, Tsitsikamma, Uitenhage, Port Elizabeth and Port St Francis. The Cape Floral Kingdom expresses itself in an astounding manner, with fynbos abounding on infertile soils derived from the sandstones of the Cape Fold Mountains (Cape Supergroup), as well as coastal sands leached of nutrients. Fynbos is contained in approximately ten mega plant families of which the Proteaceae, Ericaceae and Restionaceae are the most important. The Proteaceae is characterised by large leathery leaves and includes the genera *Protea*, *Leucospermum* and *Leucadendron*. The most diagnostic features of the Ericaceae are the growth form of shrubs and the small, evergreen leaves. *Erica* is a large genus with 770 species in southern Africa and with the greatest diversity in Western and Eastern Cape. *Erica zeyheriana*, *E. sagittata* and *E. sparrmannii* are examples of Eastern Cape endemics occurring in the mentioned area. Plants of the family Restionaceae can be recognised by their wiry and sedge-like appearance. The family has many genera of which *Elegia* (13 spp.), *Hypodiscus* (7 spp.) and *Restio* (18 spp.) are well-represented in the Eastern Cape.

Fynbos displays amazing adaptations to the multiple and exclusive habitats also created in the Eastern Cape mountains. Evolutionary processes in the fynbos continue along the Cape Fold Mountains, the high mountains along the Great Escarpment and also the Drakensberg Mountains as a route to the high mountain ranges in southern tropical Africa.

Remarkable transition is displayed between fynbos and the forest, grassland and thicket biomes, usually driven by geology and climate. Moving northwest from Port Elizabeth, the explorer enters the Baviaanskloof, where the mentioned biomes (Figure 38), as well as transitions between them, are constantly repeated along the road, which forms a transect through the vegetation as it winds its way, ultimately into the karoo flora of Willowmore and Uniondale. Transition between fynbos and grassland is quite common on the slopes and plateaus of mountains where summer rainfall increases. The name coined for the vegetation type when fynbos includes sour grasses is grassy fynbos. A magnificent example is found north of Patensie where the Elandsberg Mountains, covered by grassy fynbos, present a breathtaking view overlooked by the majestic Cockscomb of the Great Winterhoek Mountains (Figure 39, 40).

Elytropappus rhinocerotus (Asteraceae, *renosterbos*) is a component of fynbos, called renosterveld. It is found on relatively fertile soils, is fire-prone and prefers

an increase in summer rainfall. Large stands of *renosterbos* occurred from the Western Cape up to Humansdorp but has been exploited by agricultural practices for many years, to the extent that smaller populations currently occur in reasonably protected areas. One such population was found just north of the Baviaanskloof Mountains en route to Steytlerville, offering a light-green pasture against the backdrop of dry karoo koppies (Figure 41).



FIGURE 38—In the Baviaanskloof, *Euphorbia grandidens* (Euphorbiaceae) in thicket near Patensie. Photo: I.L. Rautenbach.







FIGURE 39—North of Patensie, the Elandsberg Mountains are covered by grassy fynbos, containing the following species: A & B, *Aspalathus teres* (Fabaceae), a rare shrub or small tree; C. *Lanaria lanata* (Lanariaceae). Photos: I.L. Rautenbach.





FIGURE 40—North of Patensie, A & B. *Syncarpha milleflora* (Asteraceae); C, *Leucospermum cuneiforme* (Proteaceae), overlooked by Cockscomb of the Great Winterhoek Mountains. Photos: A & B, I.L. Rautenbach; C, J.C. Rautenbach.



FIGURE 41—*Elytropappus rhinocerotis* (Asteraceae) found just north of the Baviaanskloof Mountains en route to Steytlerville. Photo: I.L. Rautenbach.

Moving eastwards along the coast to Tsitsikamma, the mosaic of fynbos and forest is repeated along the rugged cliffs of the mountains descending abruptly into the ocean. Deep gorges and gullies at the Storms River Mouth and at the Tsitsikamma Nature Reserve form beautiful vistas as they are clothed by forests or alternately by fynbos (Figure 42). The Southern Afromontane Forest contains old and majestic specimens of large trees with their branches clad with moss and lichen species, for example *Usnea* spp. (old man's beard), creating a magical atmosphere in the dim forest light. Typical forest trees are the yellowwoods (*Afrocarpus falcatus*, *Podocarpus latifolius*), *Cunonia capensis*, *Ocotea bullata*, *Pterocelastris tricuspidatus*, *Rapanea melanophloeos* and many others. Conspicuous fynbos elements are *Protea neriifolia* (narrow-leaved sugarbush), *Leucospermum cuneiforme* (wart-stemmed pincushion) and *Leucadendron eucalyptifolium* (gum-leaved conebush) and a magnificent wealth of others (Figure 43–45).



FIGURE 42—A view of the Southern Afromontane Forest at the Tsitsikamma Nature Reserve. Photo: G.J. Bredenkamp.



FIGURE 43—Southern Afromontane Forest alternating with fynbos along the coast between Port Elizabeth and Tsitsikamma: *Protea repens* (Proteaceae). Photo: I.L. Rautenbach.







FIGURE 44—Southern Afromontane Forest alternating with fynbos along the coast between Port Elizabeth and Tsitsikamma: A, *Protea mundii* (Proteaceae); B, *Erica cerinthoides* var. *cerinthoides* (Ericaceae); C, *Leucadendron eucalyptifolium* (Proteaceae). Photos: A & C, I.L. Rautenbach; B, G.J. Bredenkamp.



FIGURE 45—Southern Afromontane Forest alternating with fynbos along the coast between Port Elizabeth and Tsitsikamma: *Leucospermum cuneiforme* (Proteaceae). Photo: J.C. Rautenbach.

Crossing the Grootrivierberge, the explorer is entering the Lower Karoo, an area of vast plains, yet compelling him to focus on the wealth of small succulents existing in this harsh region. The area comprises the plains east of the Kariega and Buffels rivers. Northwards the mountain chain of the Great Escarpment, linking the Kamdeboo Mts, Suurberg, Tandjiesberg, Aasvoëlberg, Bouershoekberge, Coetzeesberge and Bruintjieshoogte, encompass Aberdeen, Graaff-Reinet and Pearston, the region called Kamdeboo. Finally it also includes the plains south of Aberdeen to Klipplaat and Miller. Features of the landscape are flat or gently sloping pediments composed of mudstones or resistant sandstones of the Beaufort Group (Adelaide Subgroup). The vegetation is dominated by low to moderately high microphyllous shrubs, with waving drought-resistant pale white grasses. The vast array of succulent dwarf shrubs or forbs spotted by the field naturalist, will definitely include species of the following plant families: Apocynaceae (*Pachypodium succulentum*, *Hoodia pilifera* subsp. *annulata*), Asphodelaceae (*Astroloba foliolosa*), Crassulaceae (*Crassula corallina*), Euphorbiaceae (*Euphorbia heptagona*, *E. esculenta*, *E. ferox*, *E. polygona*), Geraniaceae (*Sarcocaulon camdeboense*) and Aizoaceae (*Drosanthemum lique* and *Ruschia cradockensis* subsp. *cradockensis*) (Figure 46–49).



FIGURE 46—The Lower Karoo, a landscape of flat or gently sloping pediments composed of mudstones or resistant sandstones with low to moderately high microphyllus shrubs and multiple succulents. Photo: I.L. Rautenbach.





FIGURE 47—A, *Cadaba aphylla* (Capparaceae), a microphyllus shrub; B, *Euphorbia esculenta* (Euphorbiaceae), a succulent plant. Photos: A, I.L. Rautenbach; B, J.C. Rautenbach.





FIGURE 48—A, *Hoodia pilifera* subsp. *annulata* (Apocynaceae); B, *Sarcocaulon camdeboense* (Geraniaceae). Photos: G.J. Bredenkamp.

The unique South African flora

The South African flora evolved over millions of years with cyclic climate changes, linked with continental movements and uplift, causing severe changes in environment and the extinction of many species. Simultaneously this was also the driving force resulting in the beginning of new species that adapted to the challenges of new environments. The Angiosperms radiated to dominance as long ago as the mid-Cretaceous and reached a phase of maturity in the latter half of the Cretaceous. Currently, under continued global circumstances, plant species, including the predominant Angiosperms, are under threat (Anderson 1999). Therefore, it is imperative to document global diversity, centres of plant diversity and endemism and also to document the presence of extant species. South Africa has a unique flora with 20 456 recorded indigenous vascular plant taxa, forming 6% of the global flora, estimated at 370 000 taxa. Owing to geology, climate and specific environmental conditions, levels of endemism are exceptionally high with about 13 265 taxa representing 65% of the flora (Raimondo et al. 2009).



FIGURE 49—*Pachypodium succulentum* (Apocynaceae). Photo: G.J. Bredenkamp.

Aims of *A Flora of the Eastern Cape Province*

As South Africa is a ratified signatory to the international Convention of Biological Diversity (CBD) held in Rio de Janeiro in 1992, it is obliged to focus attention on the rapid global loss and degradation of natural ecosystems and to contribute towards the conservation of the South African flora. The global significance of the Eastern Cape flora is emphasised by the species richness of its bioregions, centres of endemism and the fact that eight out of ten South African biomes are present in this province. The World Conservation Union (IUCN) and the World Wide Fund for Nature (WWF) recognised approximately 84 Centres of plant diversity in Africa (White 1983; Davis et al. 1994). The Eastern Cape includes two regions of plant endemism, namely the eastern part of the Cape Floristic Region (CFR) and the Maputaland–Pondoland Region (MPR) (1 900 endemics) (Van Wyk & Smith 2001). The latter region includes five centres of endemism: the Maputaland Centre (MC), Pondoland Centre (PC), Albany Centre (AC), Drakensberg Alpine Centre (DAC) and Sneeuberg Centre (SC) (Clark et al. 2009). The following biomes occur in the region: Fynbos, Succulent Karoo, Nama-Karoo, Grassland, Savanna, Albany Thicket, Indian Ocean Coastal Belt and Indigenous Forests, while patches of Azonal Vegetation further contribute to the biodiversity.

This account is a tool to enhance botanical expertise at the tertiary level of education at the four Eastern Cape universities, namely the Nelson Mandela University, Rhodes University, the University of Fort Hare and the Walter Sisulu University, as well as other training colleges. The keys to genera and species, the newest correct names of families, genera and species, author citations, descriptions and bibliography are essential for further in depth taxonomic and ecological research at any of these institutions and at herbaria throughout the province. This Flora can also be used in the fields of agriculture, wildlife management, environmental education, nature conservation and tourism, and impact assessments finally contributing towards the alleviation of poverty in the Eastern Cape. Although the Flora is written for the Eastern Cape Province, it will be an asset to the adjacent provinces, especially as species are shared across the borders.

The project contributed towards benefit-sharing with universities, herbaria and nature reserves in the area. Lectures on the importance and progress of the Flora were presented at conferences of the South African Association of Botanists at both Rhodes University and the Nelson Mandela University. Four collecting trips were undertaken to the Baviaanskloof, the Noorsveld, the Amatole Mountains (Mpofu Game Reserve) and the Witteberg Mountains, requiring networking with Eastern Cape Nature Conservation. Approximately 750 herbarium specimens were collected in fourfold on each field trip. Duplicates were donated to the herbaria of the four Eastern Cape universities, contributing towards capacity building and resulting in improved scientific plant collections.

The project *A Flora of the Eastern Cape Province* is linked to National Government Policy

The mandate of the South African National Biodiversity Institute (SANBI) is written into the National Environmental Management: Biodiversity Act No. 10 (2004). Section 11. *A Flora of the Eastern Cape Province* complies with the following functions of the institute:

- Monitor and report regularly to the minister on the status of the Republic's biodiversity.
- Coordinate and promote the taxonomy of South Africa's biodiversity.
- Manage, control and maintain herbaria and zoological collections.
- Establish, maintain, protect and preserve collections of plants in national botanical gardens and in herbaria
- Collect, generate, process, coordinate and disseminate information about biodiversity and the sustainable use of indigenous biological resources, and establish and maintain databases in this regard.
- Undertake and promote research on indigenous biodiversity and the sustainable use of indigenous biological resources.
- Coordinate programmes to involve civil society in the conservation and sustainable use of indigenous biological resources.
- Advise the minister on the identification of bioregions and the contents of bioregional plans.

Mandate of SANBI: birth of *A Flora of the Eastern Cape Province*

Mandated by the above-mentioned legislation, one of the important goals of SANBI is to provide a series of regional Floras for South Africa. These Floras will also be available electronically on the SANBI website. Regional Floras either published or currently being prepared for publication are:

- Plants of the northern provinces of South Africa: Key and diagnostic characters
- Plants of the Greater Cape Floristic Region, 1: The Core Cape flora
- Plants of the Greater Cape Floristic Region, 2: The Extra Cape flora
- Plants of the Free State: inventory and identification guide
- Plants of KwaZulu-Natal
- A Flora of the Eastern Cape Province
- Plants of the Karoo: A Conspectus of the Nama-Karoo and Adjacent Summer Rainfall Regions of the Northern and Western Cape Provinces of South Africa.

Bioregions of the Eastern Cape Province

A bioregion is a composite spatial terrestrial unit defined on the basis of similar biotic and physical features and processes at the regional scale. It is an intermediate level of vegetation organisation between that of vegetation type and biome. Additionally, bioregions are determined by geology, geomorphology and climate. They are divided into climatic entities with relatively similar climates within the bioregion and distinct climatic differences between bioregions. Each bioregion is underpinned by the vegetation types that make up the bioregion. The focus of a bioregion is mainly on plant diversity, i.e. on floristic composition of vegetation types (Mucina & Rutherford 2006). This bioregion concept is applied after the species descriptions throughout *A Flora of the Eastern Cape Province*.

The Eastern Cape flora is defined according to the political boundaries of the Eastern Cape Province, including Matatiele, two offshore, inland islands and the uMzimkhulu region, all situated within KwaZulu-Natal (see Figure 50, p. 58). The following 12 bioregions occur in the Eastern Cape Province: Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Table 2). Species distribution and bioregions are listed from west to east, and from north to south throughout this account.

TABLE 2—Areas of the bioregions of the Eastern Cape Province. The area of Indigenous Forests was not calculated because of the mosaic of distribution patterns of this bioregion

Bioregions	Area (hectares)
Upper Karoo	2 033 980
Dry Highveld Grassland	1 092 160
Mesic Highveld Grassland	238 763
Drakensberg Grassland	1 722 642
Sub-Escarpment Grassland	3 774 218
Sub-Escarpment Savanna	1 823 228
Indian Ocean Coastal Belt	300 900
Lower Karoo	1 504 957
Albany Thicket	3 030 923
Rainshadow Valley Karoo	403 460
Eastern Fynbos-Renosterveld	1 066 630
Total area mapped for bioregions	**16 991 861**

Distribution and numbers of families, genera, species, taxa and endemics

Distribution data was compiled by the data section at the National Herbarium using the database of the Pretoria Computerised Information Systems (PRECIS). The one degree square grid references used for species distributions and calculations of numbers of taxa are: 3025–3030; 3124–3130; 3222–3229; 3322–3327; 3423–3425. The use of these grid references would include some species from adjacent provinces, this is quite clearly illustrated for the Eastern Fynbos-Renosterveld and Lower Karoo Bioregions. The bioregions in the Matatiele region, the two offshore inland islands and uMzimkhulu region are included in the current account, although some are nested within KwaZulu-Natal. However, for species descriptions, the exact distributions of species were checked using the Specimen PRECIS database extracted for the mentioned grids in Microsoft Office Access. For the estimated numbers of families, genera, species and endemics in the Eastern Cape, see Table 3.

TABLE 3—Numbers of families, genera, species and endemics in the flora of the Eastern Cape (subspecific taxa are not included)[1]

Taxa	Number of families	Number of genera	Number of species	Total number of Angiosperm species	Number of endemic species	Number of exotic species
Ferns and fern allies	29	69	166		2	11
Gymnosperms	5	9	31		9	11
Monocotyledons	41	329	1 752	1 752	180	99
Eudicotyledons	151	1 033	4 662	4 662	596	443
Total	**226**	**1 440**	**6 611**	**6 414**	**787**	**564**

[1]Mosses are excluded.

TABLE 4—Ranking of the 20 largest families, arranged according to number of species, in the flora of the Eastern Cape

Status	Family	Number of genera	Number of species	Number of endemic species	Number of exotic species
1	Asteraceae	154	804	63	76
2	Fabaceae	84	481	50	57
3	Poaceae	129	413	5	78
4	Aizoaceae	44	321	157	0
5	Apocynaceae	61	288	74	5

TABLE 4 (continued)

6	Orchidaceae	33	247	6	0
7	Scrophulariaceae	31	224	28	1
8	Cyperaceae	29	219	1	5
9	Iridaceae	22	211	28	0
10	Asphodelaceae	13	136	47	0
11	Hyacinthaceae	14	126	41	0
12	Crassulaceae	6	118	18	2
13	Ericaceae	1	111	15	0
14	Malvaceae	20	110	6	10
15	Lamiaceae	27	109	13	9
16	Geraniaceae	5	99	20	6
17	Campanulaceae	9	97	16	0
18	Apiaceae	39	93	9	13
19	Euphorbiaceae	18	86	18	5
20	Rubiaceae	35	85	4	5

TABLE 5—List of genera with more than 40 species in this account

Genus	Number of species	Number of endemics	Number of exotics
Helichrysum	128	8	0
Senecio	127	5	1
Erica	111	15	0
Delosperma	85	48	0
Crassula	84	8	1
Indigofera	73	17	0
Pelargonium	62	11	0
Disa	57	3	0
Selago	57	18	0
Euphorbia	54	15	4
Hermannia	52	2	0
Cyperus	48	0	0
Thesium	45	4	0
Asparagus	45	5	0
Searsia	44	1	0
Aspalathus	43	7	0
Lotononis	43	10	0
Moraea	42	3	0

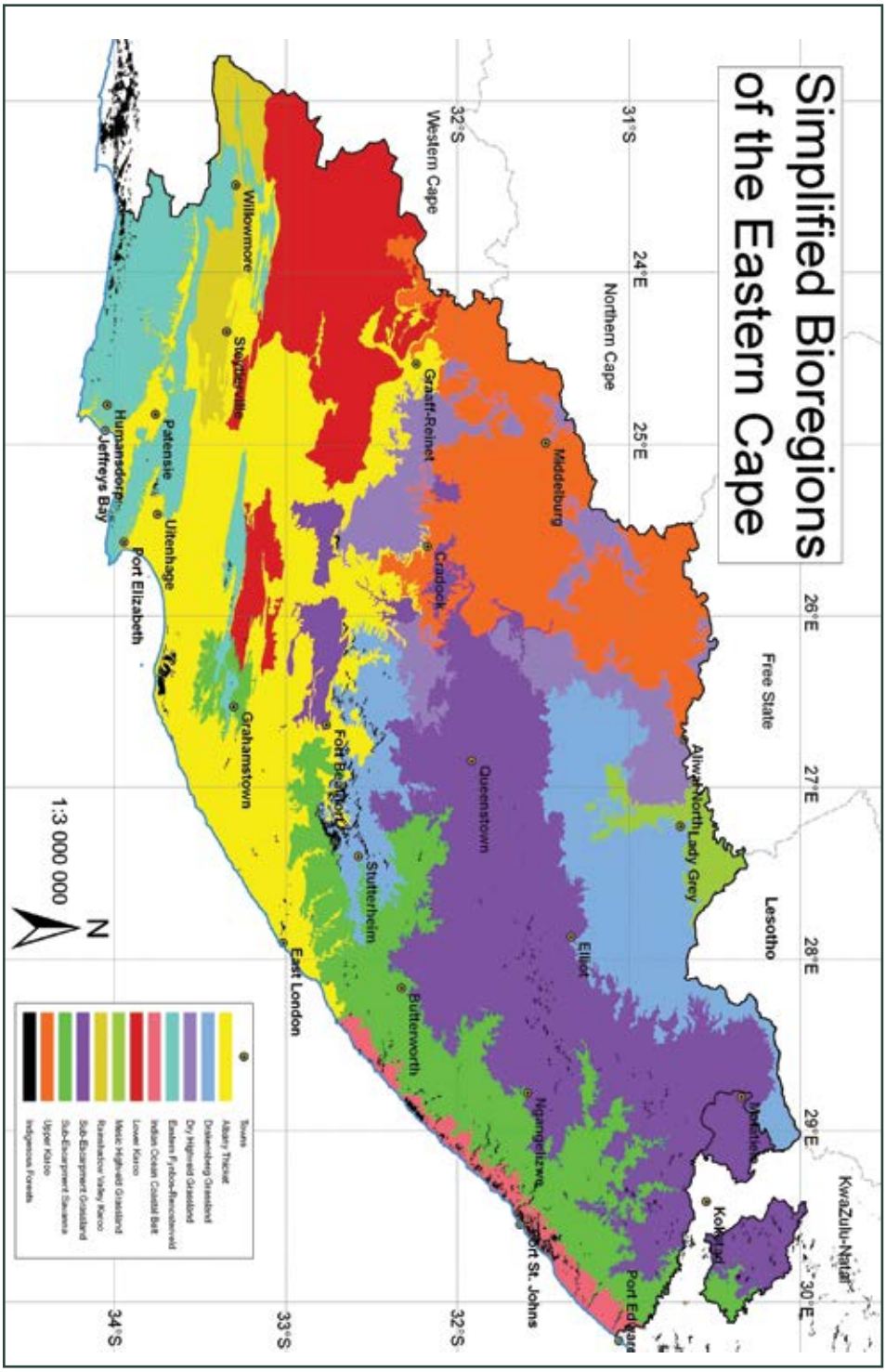


FIGURE 50—Simplified Bioregions of the Eastern Cape. Produced by L.W. Powrie.

Eastern Cape endemics

The total number of endemic species is indicated in Table 3, and numbers of endemic species for the largest families and genera are indicated in Tables 4 and 5. The percentage of endemism for all taxa in the Eastern Cape Province is 11.9%. The percentage of endemic eudicotyledons is 12.8% and that for the monocotyledons is 10.3%. Possible reasons for the relatively low percentages of endemism could be the following:

The Eastern Cape flora has the second largest number of species, in total 6 611, surpassed only by that of the Western Cape. The flora represents eight biomes. With exception of small areas reaching into the Western Cape, the Albany Thicket Biome is almost endemic to the province. Many of the taxa that occur in the distribution ranges of the other seven biomes reach into other provinces as well, resulting in the lower provincial endemism.

The floristic uniqueness of the Albany Thicket Biome, marked by a significant contingent of local endemics, suggests an uninterrupted existence in its current geographic distribution area. Although thicket vegetation was probably constricted several times since the Pleistocene glacial cycles, the establishment of a relatively large non-seasonal rainfall and a fire-protected area may have allowed it to expand to its current content. The lack of environmental pressure and habitat change, normally favouring evolutionary change and speciation, was probably an important factor inhibiting endemism, but the onset of domestic herbivory is the main factor in the degradation of Albany Thicket ecosystems (Mucina & Rutherford 2006).

The vegetation of the Eastern Cape is relatively under-collected, especially in the central, drier areas of the Albany Thicket.

Further research and data capture is still necessary to determine reliable total numbers of species and endemism for the biomes and the provinces.

Exotic species in the Eastern Cape Province

Based on numbers of exotic species in Table 3, the percentage of exotics for all taxa in the Eastern Cape Province is 8.5%. The percentage of exotics for eudicotyledons is 9.5% and that for the monocotyledons is 5.7%. Numbers of exotic species for the largest families and genera are indicated in Tables 4, 5 and 6.

Background of some of the most important exotics, alien weeds and invasive plants in the Eastern Cape

- **Azolla filiculoides* and **Salvinia molesta* (Pteridophyta) are both hydrophytes that regenerate vegetatively, causing these plants to spread prolifically, conse-

quently invading rivers and dams and causing dense mats of vegetation. Both species are declared weeds and currently treated by herbicides and biocontrol.

- Pine trees (Gymnosperms) were planted for timber, shelter, wind breaks and ornamental trees by the early pioneers, as well as forestry and local governments. Originating from cold northern hemisphere countries, these trees are wind pollinated with wind dispersal of the seeds, causing an adaptive advantage over other South African trees. These species have a wide distribution, including the following bioregions: Mesic Highveld Grassland, Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Indigenous Forests, Eastern Fynbos-Renosterveld and Albany Thicket. Pines are declared invaders and have the potential to transform the mentioned natural vegetation. Currently many species of **Pinus* are especially invasive near the coast, where they become the dominant species, causing extensive damage to the environment and coastal vegetation.

- The Poaceae has the largest number of exotic species. As grasses are imperative for agriculture and grazing, research was focused on more hardy and nutritious species, thus introducing **Sorghum halepense*, as well as **Nassella tenuissima* and **N. trichotoma*, soon becoming invasive. **Pennisetum clandestinum* was introduced for lawns, but together with **Arundo donax* and **Cortaderia selloana* these species invaded stream- and riverbanks, causing extensive damage to watercourses.

- The Asteraceae is the largest genus with 76 exotic species including some of the most noxious invasives. **Chromolaena odorata* has invaded the eastern coast of South Africa as far south as Mkambati Nature Reserve. It is a transformer invading forest margins, savanna, plantations, wooded kloofs, watercourses and roadsides and as it is poisonous, it causes fatalities of stock. Environmental damage and decreasing numbers in stock culminated into large economical losses, which is being addressed by herbicide registration and biocontrol.

- The Fabaceae is the second largest family of the eudicotyledons, housing 57 exotic species. All the species of the genus **Acacia* originated from Australia and Tasmania and were cultivated for ornament, a source of honey, dune reclamation, shelter, firewood and construction poles. All species became widespread weeds or invaders. **Acacia cyclops*, **A. elata*, **A. longifolia*, **A. melanoxylon*, **A. podalyriifolia*, **A. pycnantha* and **A. saligna* invaded especially fynbos and coastal areas. **Acacia baileyana*, **A. dealbata*, **A. decurrens* and **A. mearnsii* invaded grassland, forest gaps, roadsides and watercourses. As these plants are mainly transformers, large areas are laid to waste and manual clearing is costly, leaving herbicide registration and biocontrol as the most viable options.

- With the exception of the genus *Rhipsalis* (widespread), the Cactaceae originates from the West Indies, North and Central America, southwestern USA, Mexico, Brazil, Argentina, Uruguay, Peru, Ecuador and Bolivia. The Eastern Cape currently houses 21 of these exotic species. As they are adapted to drier climates of the Americas, they thrive in the following bioregions: Upper Karoo, Lower Karoo, Albany Thicket and Rainshadow Valley Karoo. In these environments they compete against indigenous succulents such as Euphorbias, Aloes and other genera of the Asphodelaceae, as well as succulents from the Apocynaceae. As many species of **Opuntia* have been used as fodder, plants from this genus have invaded the above-mentioned bioregions extensively. Although herbicide registration and biocontrol have been practiced for a few decades, **Opuntia* species have become dominant in areas, especially between Middelburg and Wolwefontein.

TABLE 6—List of families arranged according to the highest number of exotic species, also indicating the most important exotics, alien weeds and invasive plants in this account

Family	Number of species	Number of exotic species	Most important exotics, alien weeds and invasive plants
Pteridaceae	27	2	**Adiantum raddianum*,**Pteris tremula*.
Salviniaceae	2	2	Weeds: **Azolla filiculoides*, **Salvinia molesta*, transformers.
Dryopteridaceae	24	1	**Cyrtomium falcatum*.
Thelypteridaceae	10	1	**Macrothelypteris torresiana*.
Blechnaceae	8	1	**Blechnum zeelandicum*.
Cyatheaceae	3	1	**Sphaeropteris cooperi*.
Athyriaceae	2	1	**Deparia japonica*.
Lygodiaceae	1	1	**Lygodium japonicum*.
Nephrolepidaceae	1	1	**Nephrolepis exaltata*.
GYMNOSPERMS			
Pinaceae	7	7	**Pinus pinea*: special effect weed; all other species are declared invaders, transformers.
Cupressaceae	6	4	**Cryptomeria*, **Cupressus*, **Juniperus* (possibly naturalised). Invader: **Juniperus virginiana*, potential transformer.
ANGIOSPERMS			
Poaceae	414	78	Weeds: **Arundo donax*, **Cortaderia selloana*, **Nassella tenuissima*, **N. trichotoma*, **Pennisetum setaceum*, **P. villosum*. Invaders: **Pennisetum clandestinum*, **P. purpureum*, **Sorghum halepense*.

TABLE 6 (continued)

Asteraceae	811	76	Weeds: **Cirsium vulgare*, **Campuloclinium macrocephalum*, **Chromolaena odorata*, **Montanoa hibiscifolia*, **Xanthium spinosum*, **X. strumarium*.
Fabaceae	481	57	Weeds: **Acacia dealbata*, **A. pycnantha*, **Caesalpinia decapetala*. Invaders: **Acacia baileyana*, **A. cyclops*, **A decurrens*, **A. elata*, **A. longifolia*, **A. mearnsii*, **A. melanoxylon*, **A. podalyriifolia*, **A. saligna*, **Gleditsia triacanthos*, **Prosopis glandulosa* var. *torreyana*, **Senna didymobotrya*, **S. pendula*.
Amaranthaceae	63	30	**Chenopodium*, **Gomphrena*, **Guilleminea*. Weed: **Achyranthes aspera*. Invaders: **Atriplex nummularia*, **Atriplex lindleyi*.
Brassicaceae	59	25	**Barbarea*, **Brassica*, **Coronopus*, **Nasturtium*, **Sinapis*. Weed: **Lepidium draba*. Invader: **Rorippa nasturtium-aquaticum*.
Cactaceae	22	21	All genera introduced, except *Rhipsalis* (widespread). Weeds or invaders: **Cereus jamacaru*, **Echinopsis schickendantzii*, **Harrisia martinii*, **Opuntia aurantiaca*, **O. ficus-indica*, **O. humifusa*, **O. monacantha*, **O. spinulifera*, **O. stricta*.
Solanaceae	46	20	**Nierembergia linariifolia*, **Physalis* spp., **Solanum triflorum*, **S. sarrachoides*, **S. chenopodioides*, many other **Solanum* spp. Weeds: **Cestrum laevigatum*, **Datura ferox*, **D. stramonium*, **Nicandra physalodes*, **Nicotiana glauca*, **Solanum elaeagnifolium*, **S. mauritianum*, **S. sisymbriifolium*. Invaders: **Solanum chrysotrichum*, **S. pseudocapsicum*.
Apiaceae	93	13	**Coriandrum sativum*, **Apium graveolens*, **Daucus carota* subsp. *sativus*.
Caryophyllaceae	37	12	**Scleranthus annuus*. Weeds: **Silene cretica*, **S. gallica*, **S. vulgaris*, **Spergula arvensis*, **Spergularia media*, **S. rubra*, genus **Stellaria*, **Vaccaria hispanica*.
Onagraceae	17	11	Weed: **Gaura sinuata*. Invaders: genus **Oenothera*.

TABLE 6 (continued)

Rosaceae	52	10	**Fragaria vesca*. Weeds: **Rosa rubiginosa*, **Rubus cuneifolius*, **Sanguisorba minor*. Invaders: **Cotoneaster pannosus*, **Crataegus monogyna*, **Duchesnea indica*, **Pyracantha angustifolia*, **Rubus fruticosus*, **R. niveus*.
Boraginaceae	36	10	**Amsinckia retrorsa*, **Heliotropium supinum*, **H. amplexicaule*, **H. curassavicum*, **Myosotis arvensis*, **M. sylvatica*. Weeds: **Echium plantagineum*, **E. vulgaris*, **Anchusa azurea*, **Buglossoides arvensis*, **Lappula heteracantha*.
Myrtaceae	25	10	Weed: **Leptospermum laevigatum*. Invaders: **Callistemon rigidus*, **Eucalyptus camaldulensis*, **E. diversicolor*, **E. grandis*, **E. lehmannii*, **Psidium cattleianum*, **P. guava*.
Plantaginaceae	19	10	**Cymbalaria muralis*, *Plantago rhodosperma*, **Veronica beccabunga*, **V. hederifolia*, **V. persica*. Weeds: **Plantago virginica*, **P. myosuros*.
Verbenaceae	14	8	**Phyla nodiflora*, genus **Verbena*. Weed: **Lantana camara*.
Convolvulaceae	40	7	**Dichondra micrantha*. Weeds: **Convolvulus arvensis*, **Cuscuta*, *campestris*, **C. epithymum*, **C. suaveolens*. Invaders: **Ipomoea indica*, **I. purpurea*.
Polygonaceae	28	7	**Fagopyrum esculentum*, **Fallopia convolvulus*. Weeds: **Persicaria lapathifolia*, **Polygonum aviculare*, **Rumex pulcher*, **R. brownii*. Invader: **Rumex crispus*.
Proteaceae	63	6	**Grevillea robusta*, **Hakea salicifolia*, **Macadamia integrifolia*. Weeds: **Hakea drupacea*, **H. gibbosa*, **H. sericea*.
Euphorbiaceae	86	5	**Euphorbia prostrata*, **E. helioscopia*, **E. peplus*, **E. tirucalli*. Invader: **Ricinus communis*.
Agavaceae	16	5	Genus **Agave*, **Alisma plantago-aquatica*. Invaders: **Agave americana*, **A. sisalana*.
Papaveraceae	9	5	Genus **Fumaria*, **Papaver rhoeas*. Weeds: **Argemone mexicana*, **A. ochroleuca*, **Glaucium corniculatum*.

TABLE 6 (continued)

Fagaceae	4	4	**Castanea sativa*, *genus *Quercus*. Invader: *Quercus robur* potential transformer.
Nyctaginaceae	5	3	Weeds: **Boerhavia erecta*, **B. cordobensis*, Invader: **Mirabilis jalapa*.
Phytolaccaceae	5	3	**Phytolacca americana*. Invaders: **Phytolacca dioica*, **P. octandra*.
Tamaricaceae	4	3	Weeds: **Tamarix chinensis*, **T. ramosissima*. Invader: *Tamarix usneoides* x **T. ramosissima*.
Pittosporaceae	3	2	**Pittosporum crassifolium*. Weed: **Pittosporum undulatum*.
Zingiberaceae	3	2	Weeds: **Hedychium coronarium*, **H. flavescens*.
Haloragaceae	2	2	Weeds: **Myriophyllum aquaticum*, **M. spicatum*.
Alliaceae	15	1	Weed: **Nothoscordum borbonicum*.
Meliaceae	8	1	Invader: **Melia azedarach* transformer.
Passifloraceae	3	1	Weed: **Passiflora coerulea*.
Basellaceae	1	1	Weed: **Anredera cordifolia*.
Cannabaceae	1	1	**Cannabis sativa*.
Casuarinaceae	1	1	Invader: **Casuarina cunninghamiana*.
Liliaceae	1	1	Invader: **Lilium formosanum*.
Myoporaceae	1	1	Invader: **Myoporum tenuifolium* potential transformer.
Pontederiaceae	1	1	Weed: **Eichhornia crassipes*.

Collaboration

The compilation of a monumental work such as *A Flora of the Eastern Cape Province* is best done through collaboration with experts, peer groups, colleagues and trainees. Thus various contributions were made over the period in which this Flora matured. During the initial phase, templates were compiled of all the families, genera and species of the Eastern Cape, that are documented in *Seed plants of southern Africa: families and genera* and *Plants of southern Africa: an annotated checklist*. Completion of the templates was achieved with the assistance of SANBI interns. Selected templates were delegated to 77 contributors, of whom many are specialists on specific taxa. Mention needs to be made of young colleagues at the National Herbarium who were trained to author smaller families. Interns from the National Research Foundation (NRF) were also mentored to assist with the documentation of the *Flora*. All manuscripts were edited by volunteers at SANBI, mostly members of the Botanical Society of South Africa (BotSoc). External funding,

to alleviate printing costs, was obtained from the Systematics Research Funding of the Linnean Society, the Botanical Education Trust and Cape 300 foundation.

Authoring of *A Flora of the Eastern Cape Province*

The *Flora* is based on the most recent systematic approach to families, the latest taxonomic revisions, publications, information from taxonomic websites, literature in the herbarium collection at PRE and collection-based information. Additional information was compiled from various sources:

- Compilation of an Eastern Cape quick guide from specimens collected during fieldwork in the Eastern Cape.
- Distribution information from the Poaceae-GIS Program based on PRECIS information extracted for the Eastern Cape Province.
- Recent books on common names and field guides were constantly used for the compilation of common names. Further information was obtained from an electronic database at PRE composed of various publications recording common names. Of these inscriptions, only the most recent and renowned publications were used.
- South African place names were checked in Raper (2004). Recent changes of place names were accepted where possible, e.g. Umtata to Mthatha.
- Publications constantly used:

COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.
FLORA OF SOUTHERN AFRICA Series.
FLORA OF TROPICAL AFRICA Series
FLORA OF TROPICAL EAST AFRICA Series
FLORA ZAMBESIACA Series.
GERMISHUIZEN, G. & MEYER, N.L. (eds) 2003. Plants of southern Africa: an annotated checklist. *Strelitzia* 14. National Botanical Institute, Pretoria.
GERMISHUIZEN, G., MEYER, N.L., STEENKAMP, Y. & KEITH, M. (eds) 2006. *A checklist of South African plants*. Southern African Botanical Diversity Network Report No. 41. SABONET, Pretoria.
GOLDBLATT, P. & MANNING, J. 2000. Cape plants: a conspectus of the Cape flora of South Africa. *Strelitzia* 9. National Botanical Institute, Pretoria & Missouri Botanical Garden, St. Louis.
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LEISTNER, O.A. (ed.) 2000. Seed plants of southern Africa: families and genera. *Strelitzia* 10. National Botanical Institute, Pretoria.
MABBERLEY, D.J. 2008. *Mabberley's plant-book*, 3rd edn. Cambridge University Press, Cambridge.
RAPER, P.E. 2004. *New dictionary of South African place names*. Jonathan Ball Publishers Cape Town.

How to use this account

Taxonomic arrangement

Alphabetical within major categories Lycopodiophytes, Pteridophytes, Gymnosperms, Angiosperms: Eudicotyledons, Monocotyledons. Families are listed alphabetically.

Keys to the genera

Couplets are numbered 1a–1b, 2a–2b, etc. Part of the key to genera of the Thymelaeaceae is used as an example:

1a Ovary 2-locular; glabrous shrubs with pedicelled flowers in small, terminal umbels.....**Peddiea**
1b Ovary 1-locular; flowers sessile or subsessile:
2a Paloid floral outgrowths either fleshy glands or membranous scales, situated at mouth of hypanthium:
3a Petaloid floral scales free, 4, 5, 8 or 12; mainly shrublets, often ericoid:
4a Stamens 8 or 10; flowers mainly in heads; perigonal hairs absent:
5a Flowers 4-merous.....**Gnidia**
5b Flowers 5-merous.....**Lasiosiphon**
4b Stamens 4; flowers mainly in axils of upper leaves; perigonal hairs surrounding base of petaloid floral scales.....**Struthiola**
3b Petaloid floral scales usually ± united at base or in pairs; erect or scandent shrubs or small trees, with expanded, sometimes membranous leaves; flowers 4-merous, in ebracteate, terminal heads.....**Englerodaphne**
2b Petaloid floral outgrowths absent at mouth of hypanthium:

Genus account

Genus name written in bold capitals with the name of the author abbreviated and not bold.

Synonyms of generic names in italic capitals in brackets directly below.

Common names are given where available. They are written in lower case except for the first name and place names. First the English name and then the other **well-known common names** alphabetically according to language: Afrikaans (A), Northern Sotho (NS), Swati (S), Southern Sotho (SS), Tswana (T), Xhosa (X), Zulu (Z).

Generic distribution and species numbers: the total number of species in the genus, the global distribution and the distribution in South Africa (see Mabberley 2008).

Within each family, genera are listed alphabetically after the key to genera. Larger genera are subdivided formally into subgenera or sections or into informal groups, as an aid to identification at the species level. Grouping of species in larger genera is usually indicated in the form of a dichotomous key.

Species account

The genus name is not repeated. Only the specific epithet is given (lower-case and bold) and the name of the author (not bold). Author citations should be according to Germishuizen et al. (2006) or from Brummitt & Powell (1992), from where the citations were initially consulted.

Synonyms are only given if taxonomic changes have been published since Germishuizen & Meyer (2003). Synonyms are indicated in italics in the line below the specific epithet.

Common names, if available, are written in lower case (not bold) on a new line.

Species description

Presented by a diagnostic, image-making, morphological description of approximately 130 words (sometimes more, depending on complicated morphological structures, e.g. the flowers of the Apocynaceae). It includes **life form**, **habit**, approximate **height** of plant, a description of **leaves**, **inflorescences**, **flowers**, **flowering time** and, if diagnostic, the **fruit**. Information on **habitat**, occurrence in **bioregions** and **geographical distribution** within the **Eastern Cape Province** ordered from **north to south** and from **west to east**. If information on flowering time is lacking, the entry is then omitted. Uncertainty is indicated by the use of a '?' in the appropriate place.

Species arrangement: alphabetically within groups based on morphology, distribution or other diagnostic characters.

Introduced taxa

Families, genera and species that are not native to southern Africa are marked with the symbol * before each entry. We include those which have become naturalised and might be mistaken for part of the native flora. Origin, where known, is also included. In some instances many of these taxa have also become alien invaders or weeds and this is generally stated if the information is known.

Endemic taxa

Genera and species endemic to the Eastern Cape Province flora are indicated with a superscript **E** (^{E}), e.g. ^{E}**pondoensis** Gilg ex C.H.Wright.

Flowering time

The flowering period is indicated in months (e.g. Sept.–Apr.). This was mostly derived from a PRECIS database containing specified data of all plants collected in the Eastern Cape Province. In many instances the information was obtained from literature, especially relative to the Eastern Cape.

Habitat

Information on the habitat of the species is given if available and includes slope, lithology, soil, moisture regime and geological information, e.g. Cape Fold Belt, Beaufort rocks, Eccas, etc.

Bioregions

Bioregions are ordered from northwest to southeast, e.g. Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (see Figure 50, p. 58. Simplified Bioregions of the Eastern Cape).

Distribution within Eastern Cape Province

Species distribution is obtained from PRECIS information, ordered from northwest to southeast and given in brackets, e.g. (Uvongo River, along Pondoland Coast S to East London).

As plants do not adhere to strict borders, the distribution may sometimes include places beyond the borders of the province, but this does not indicate the full distribution of the species.

Infra-specific taxa

Although guidelines stated that no infra-specific taxa were to be included, many contributors added these, based on the following arguments: endemism, newly described taxa, distributions across Eastern Cape Borders and new or disjunct distributions. Infra-specific taxa were mostly described as notes or in the case of more taxa, descriptions conformed to that of the species.

Example

PASSERINA L.

(= *CHYMOCOCCA* Meisn.)

Sparrow-wort, ganna bush; *gonna* (A)

Species ± 20, mostly sthn Afr., but 2 extending into Zimbabwe along the eastern escarpment; N, LIM, NW, M, S, FS, KZN, L, WC, EC.

1a Inflorescences comprising terminal subcapitulate spikes; proliferating growth (inflorescence apex growing out and returning to vegetative growth) uncommon
2a Leaves linear-lanceolate, base diamond-shaped to rounded, apex rounded to acute

montana Thoday

Mountain gonna, false heather; *berggonna* (A)

Shrub or dwarf shrub, 0.2–3.0 m high. **Leaves**: abaxial surface of young leaves glabrous. **Bracts** ovate to obovate, lamina villous on inside, glabrous on outside, obscurely ribbed on each side of main vein, thinly coriaceous, 4.0 × 0.9 mm. **Hypanthium**: neck tomentose, ± 0.8 mm long. **Flowering time** Oct.–Jan. **Fruit** an achene. Bordering on montane forest, rocks and hills; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Aliwal North District E to Kokstad and S to Grahamstown).

quadrifaria Bredenk. & A.E.van Wyk

Low shrub, up to 1 m high. **Leaves**: abaxial surface of young leaves tomentose. **Bracts** ovate to widely ovate, lamina densely hairy on inside, sparsely hairy on outside, ± 3-ribbed on each side of main vein, coriaceous and rugose, ± 4.9 × 1.5 mm. **Hypanthium**: neck tomentose, ± 1.4 mm long. **Flowering time** Aug.–Jan. **Fruit** an achene. High altitudes, summits of peaks and SE-facing rocky slopes; Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (S and W parts of EC, including Kouga, Tsitsikamma and Great Winterhoek Mts).

2b Leaves narrowly oblong to oblong, base sessile, dilated, apex truncate or truncate to rounded, keeled, often appearing humped on the back

truncata (Meisn.) Bredenk. & A.E.van Wyk

(= *Passerina glomerata* Thunb.)

Shrub or dwarf shrub, 0.3–1.5 m high. **Leaves**: adaxial surface concave, tomentose, surface laterally compressed, glabrous. **Bracts** obovate to widely obovate, 3 × 1.4 mm, lamina villous on inside, glabrous on outside, coriaceous, ribbed or ribbed and reticulate-veined on each side of main vein. **Hypanthium**: neck tomentose, ± 0.7 mm long. **Flowering time** Sept.–Nov. **Fruit** an achene. Low-lying plains and mountain ranges; Eastern Fynbos-Renosterveld (Baviaanskloof near Patensie).

1b Inflorescences comprising extended spikes, number of spikes often reduced or many compound, multiflowered spikes present; proliferating growth common
3a Fruit fleshy

rigida Wikstr.

Dune gonna; *duine gonna* (A)

Shrub, 0.3–3.0 m high, growing point nodding, fertile branchlets often pendulous and secund. **Leaves** narrowly lanceolate to ovate, apex acute with main vein visible as a blunt keel. **Bracts** widely ovate, apex acute. **Flower** yellow and membranous. **Hypanthium** glabrous at ovary, tomentose at neck. **Flowering time** July–Dec. **Fruit** a bright yellow berry. Littoral sand dunes above level of spring tide; Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (endemic to coastlines of KZN, EC and WC).

Undescribed species and unpublished names

Undescribed species are included in the taxonomic accounts, but unpublished names are not used. They are replaced by sp. A, sp. B, sp. C, etc.

Species insufficiently known

Species that are insufficiently known or about which there is doubt, are alphabetically arranged after the heading (in bold) 'Species excluded'.

For example:
Species excluded – Poorly known and probably conspecific with one of the above:
S. tuberculosa Lam.

References

A reference list is added at the end of each family account, this includes the **most relevant historical family or genus revisions**, as well as the **most recent family or genus revisions**. Retaining the above-mentioned references, other references in lengthy lists are restricted to after 1990. References are done according to the guidelines of the *Strelitzia* series. Publications constantly used do not need to be included in reference lists, these are listed above (see **Authoring of *A Flora of the Eastern Cape Province***, p. 65).

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Vegetation of the Eastern Cape: navigating a transition zone

R.M. Cowling

Introduction

Biologically, the Eastern Cape is primarily a place of staggering transition. Its western fringes are firmly folded in the winter-wet realm of the temperate Cape; its eastern margin embraces the subtropical grasslands, savannas and forests of the summer rainfall zone. To its north lies the expansive and uncluttered space of the Great Karoo – plains covered with hardy shrubs and ephemeral grass fed by erratic autumn thunderstorms. And at its core is thicket: ancient and intriguing, diverse and enduring. It is also a place of origin and great age, a garden of immense beauty and biological wealth, and both a tension zone and a melting pot of nature and people.

The transitions are many and complex. The rocks of the Cape Supergroup, dominated by erosion-resistant quartzitic sandstones and associated everywhere with elements of the Cape flora, sink beneath the softer rocks of the Karoo Supergroup near the Fish River. Here is a rapid transition from rugged, endemic-rich, fynbos landscapes to softer ones clothed in grassland and thicket. The Cape Supergroup outcrops again on the Pondoland Coast yielding surprises galore: a host of local endemics including several belonging to Cape lineages. Climatically, the province encompasses a transition from the temperate frontal systems of the Cape to the region of summer rains, where moisture is derived from incursions of subtropical air, generating fierce summer thunderstorms. The deeply incised river valleys of the southwestern seaboard embrace a transition from moist, subtropical climes at the coast, to the arid and torrid inland basins, and thence beyond the Great Escarpment, to the frost-bitten plains of the Upper Karoo. On the east coast, the land rises sharply from the lush, subtropical coast – via a series of majestic scarps – to heights of 2 500 m or more on the Southern Drakensberg; all of this in a distance of 150 km.

Consequent on this physiographic complexity is a staggering diversity of vegetation formations, evidenced by the fact that the Eastern Cape is home to eight of South Africa's nine biomes (only the Desert Biome is absent). It is unlikely that any other similar-sized part of the world is blessed with diversity at this level.

The juxtaposition of that many biomes has produced a biological tension zone or 'battle of the biomes': changes in the selective regime, be it fire, grazing or both, can convert fynbos to grassland, grassland to savanna, savanna to thicket and grassland to karoo. These trends are being exacerbated by anthropogenic climate change as increasing levels of atmospheric CO_2 promote the expansion of woody plants almost everywhere. Perhaps we are witnessing today a telescoping of the massive changes in biome distribution that have occurred throughout the past 20 million years.

Given the high biome-level diversity of the province, we would expect a rich flora. And rich it is, with 6 611 species. However, and not surprisingly so, given the transitional and inherently unstable nature of the region's climate both present and past, species endemism – at 11,9% – is only moderate, especially when



FIGURE 51—Upper Karoo Bioregion: Eastern Upper Karoo west of Nieu-Bethesda. Sandy soils derived from Beaufort Sandstone support a sward of *Stipagrostis obtusa* and *Eragrostis lehmanniana*. The shrub stratum includes *Eriocephalus ericoides*, *Chrysocoma ciliata* and *Lycium* spp. Photo: R.M. Cowling.

compared to the fynbos stronghold of the Western Cape. However, at the generic level, diversity in the Eastern Cape is unparalleled in South Africa and, perhaps, elsewhere in the warm temperate-subtropical world. The province supports 1 440 genera, many of which are ancient relicts. Therefore, the phylogenetic diversity of many Eastern Cape landscapes is very high, especially in the southwest where elements of fynbos, thicket, karoo, forest and grassland are bundled together in complex patterns of mosaics and mixtures.

In this chapter, a brief description of the vegetation at the bioregion level is provided. Bioregions are areas that have similar biological and physiographic (soils, climate, topography) features and occupy a level between biome and vegetation type. The Eastern Cape is home to 12 bioregions (Figure 50, p. 58). Owing to space constraints, the descriptions are short: readers should consult Mucina and Rutherford (2006) for details.

Upper Karoo (Figure 51)

The Upper and Lower Karoo bioregions belong to the semi-arid Nama-Karoo Biome, where rainfall is typically meagre, between 150 and 450 mm per year. Rainfall is largely confined to the warmer months, especially in early autumn when the atmospheric conditions that produce summer rain penetrate deep into the western interior of South Africa. Unlike in the winter-rainfall Succulent Karoo, however, rainfall in the Nama-Karoo is highly variable from year to year. The Upper Karoo Bioregion, which is found on the high plateau of the interior, experiences bitingly low temperatures and hard frosts during winter. The soils are mostly clayey and relatively fertile and the typical plant form they support is the karoo bush, a dwarf to low shrub with soft and often aromatic leaves that are shed in times of drought. Ephemeral or weakly perennial grasses that grow in the warmer months are also characteristic. The driving forces that shape the Nama-Karoo are periodic droughts and, in the past, the impact of the large concentrations of nomadic springbok and wildebeest that used to roam across this biome in search of grazing nurtured by the sporadic rains. In comparison to other South African biomes, the flora of the Nama-Karoo is relatively small; consequently, despite the large area covered by the biome, few vegetation types occur there.

Only one vegetation type – Eastern Upper Karoo – has been described from the Upper Karoo Bioregion in the Eastern Cape. Eastern Upper Karoo is typically a very grassy form of Nama-Karoo and grades into the Dry Highveld Grassland Bioregion along its eastern boundary. Typical karoo bushes include *Pentzia incana, Chrysocoma ciliata, Eriocephalus ericoides, Rosenia humilis* and species of *Pteronia* and *Selago*. The grass flora, which may dominate after good warm-season rains or in well-managed veld, comprises mainly *Aristida* spp., *Eragrostis* spp. and – in sandy areas – *Stipagrostis obtusa*.

Dry Highveld Grassland (Figure 52)

Centred on the undulating plains of the western Free State, the Dry Highveld Grassland Bioregion extends in the Eastern Cape southwest of Aliwal North and along the upper slopes and peaks of the Great Escarpment zone of the Upper Karoo. Annual rainfall is relatively low (< 500 mm per annum) so, for the large part, these grassland are sweet. Bordered to the west by the Upper Karoo Bioregion, they have a strong karroid component which may dominate where overgrazing has been severe. Karoo Escarpment Grassland – a vegetation type of the high-lying ground (1 000–2 500 m) of the Sneeuberg and adjacent mountains – is dominated by wiry, tussock-forming *Tenaxia disticha* and other C3 grasses (*Tetrachne*, *Tribolium*, *Helictotrichon*); C4 grasses are mainly the 'white' types – species of *Aristida* and



FIGURE 52—Dry Highveld Grassland Bioregion: Aliwal North Dry Grassland between Aliwal North and Lady Grey. The landscape features undulating plains with *Themeda triandra* and *Tetrachne dregei* as dominant grasses. Doleritic koppies supporting a tall, thicket-like shrubland with several species of *Searsia*, *Euclea crispa*, *Olea europaea* subsp. *africana* and *Diospyros austro-africana* are present throughout this bioregion. Photo: I.L. Rautenbach.

Eragrostis. Fynbos elements (*Elytropappus*, *Erica*, *Cliffortia*) are surprisingly common in high-altitude rocky sites, and include many local endemics. Aliwal North Dry Grassland is associated with the undulating plains (1 300–1 700 m) north of the Stormberg Plateau. Dominant grasses in well-managed sites are *Themeda triandra* and *Tetrachne dregei*. In overgrazed sites, karroid shrubs such as *Pentzia globosa* and *Chrysocoma ciliata* are prominent. Throughout the Dry Highveld Grassland, doleritic koppies support Besemkaroo Koppies Shrubland, a tall, thicket-like shrubland comprising several species of *Searsia*, *Euclea crispa*, *Olea europaea* subsp. *africana* and *Diospyros austro-africana*, among others.

Mesic Highveld Grassland (Figure 53)

The sour grasslands of the moist eastern Highveld extend only marginally into the northern margins of the Eastern Cape where it borders on the Free State



FIGURE 53—Mesic Highveld Grassland Bioregion: the undulating planes and sandstone terraces of the Zastron Moist Grassland south of Lady Grey. The vegetation forms a mosaic of sour and sweet grassland, dominated by *Aristida congesta*, *Cymbopogon pospischilli*, *Digitaria argyrograpta* and numerous *Eragrostis* spp. Rocky outcrops support thicket-like shrublands of *Searsia erosa*, *Olea europaea* subsp. *africana*, *Diospyros* spp. and *Aloe ferox*. Photo: J.C. Rautenbach.

and Lesotho. The vegetation – Zastron Moist Grassland – is found at an average altitude of 1 500 m and is associated with sedimentary rocks of the Karoo Supergroup. Having a relatively low annual rainfall (± 650 mm), this vegetation forms a mosaic of sour and sweet grassland, depending on the fertility of the underlying soils (the richer the soil, the sweeter the grassveld). Dominant grass species include *Aristida congesta*, *Cymbopogon pospischilli*, *Digitaria argyrograpta* and numerous species of *Eragrostis*. The relatively rich forb flora comprises species of *Berkheya*, *Dianthus*, *Senecio* and *Wahlenbergia*. Rocky outcrops support thicket-like shrublands dominated by *Searsia erosa*, *Olea europaea* subsp. *africana*, *Diospyros* spp. and *Aloe ferox*. In its drier, southern realms, overgrazing leads to the invasion of karoo shrubs.

Drakensberg Grassland (Figure 54)

Magnificent and species-rich grasslands form part of South Africa's landscape, mainly in the eastern parts of the country where the rain falls in summer and annual totals range from 400 mm (in the drier west) to > 2 000 mm (along



FIGURE 54—Drakensberg Grassland Bioregion: magnificent and species-rich Southern Drakensberg Highland Grassland en route to Rhodes. Mountain slopes are covered by dense tussock grassland of *Festuca*, *Pentameris*, *Helictotrichon* and *Merxmuellera*. Cold winters and snow on high lying ground cause exposed rocky areas supporting dwarf shrubland. Photo: J.C. Rautenbach.

the eastern mountains). The grassland biome is found on a wide range of soils: infertile ones, especially at high rainfall, support sourveld, which is palatable only during the growing season, whereas more fertile soils and lower rainfall support sweetveld, where the component grasses retain their nutrition and are palatable to livestock throughout the year. In the Eastern Cape, grasslands are the dominant vegetation of the strongly summer rainfall east.

Although grasses are the obvious and characteristic plant type of this biome, bulbs and other herbs often comprise the majority of species in most areas, and most South African grasslands are dominated by summer-growing plants of tropical affinity. Driving forces which influence grassland are regular fire – sometimes annually in the wetter and more productive forms – and the grazing impact of the large number of indigenous animals that once occupied this biome.

The Drakensberg Grassland Bioregion of the Eastern Cape comprises six vegetation types associated with the Amatole, Stormberg and Southern Drakensberg sections of the Great Escarpment. Winters are dry, cold and frosty; snow is common on the high-lying ground. Sourveld prevails and is dominated by *Themeda triandra*, *Tristachya leucothrix*, *Alloteropsis semialata*, *Trachypogon spicatus* and *Eragrostis* spp. At higher altitudes, where summer growing conditions are cooler, temperate C3 species (*Festuca*, *Pentameris*, *Helictotrichon and Merxmuellera*) are common. Amatole Montane Grassland, which supports a rich flora of bulbs and other forbs, clothes the slopes of the Amatole Mountains. Amatole Mistbelt Grassland is found on higher peaks (1 500–1 700 m) of these mountains. Stormberg Plateau Grassland, associated with the relatively fertile soils derived from Stormberg basalts, has a distinctive flora with numerous temperate grasses and a rich forb flora comprising species of *Hebenstretia*, *Gazania*, *Gerbera* and *Diascia*. Southern Drakensberg Highland Grassland occupies the upper slopes (1 400–2 000 m) of the Southern Drakensberg massif underlain by the relatively infertile sandy soils derived from Clarens sandstone; it is tussock grassland dominated by *Festuca* species, a temperate grass genus. uKhahlamba Basalt Grassland, which is only marginally represented in the Eastern Cape, is found on basaltic cliffs and peaks of the upper Drakensberg (2 000–3 300 m) where temperate grasses (*Bromus*, *Pentameris*, *Festuca*) form tussocks that also support a rich forb flora. In fire-protected sites throughout the Drakensberg Grassland Bioregion, there are patches of endemic-rich fynbos of Afromontane affinity. This vegetation (Drakensberg-Amatole Afromontane Fynbos) is dominated by shrubs belonging to *Passerina*, *Cliffortia*, *Erica*, *Euryops*, *Helichrysum*, *Protea* and *Widdringtonia*.

Sub-Escarpment Grassland (Figure 55)

This bioregion, which is associated with the foothills and pediplains below the Great Escarpment, comprises a heterogeneous group of vegetation types. In the moist (± 800 mm per annum) areas, sourveld is the norm. East Griqualand

Grassland (centred on the Kokstad-Matatiele region), Drakensberg Foothill Moist Grassland (extending from Mount Fletcher to Elliot) and Mthatha Moist Grassland (occupying the undulating plains between Mthatha and Butterworth), are dominated by typical sour grasses (*Tristachya*, *Alloteropsis*, *Elionurus*, *Trachypogon*). In communal lands, the veld is severely overgrazed and much has been transformed by cropping, present and past. Tsomo Grassland, which occurs east of the Queenstown Basin, is drier and also heavily impacted by overgrazing, manifested by the ubiquitous invasive shrub, *Euryops floribundus*. Even drier (annual rainfall of ± 500 mm) is Queenstown Thornveld, a mixed *Aristida-Cymbopogon* grassland, dotted with *Vachellia natalitia*. Ridges, hills and inselbergs in this region support Tarkastad Montane Shrubland where thickets of *Aloe ferox*, *Diospyros austro-africana* and *Searsia burchellii* occur in a matrix of mixed grassveld and karroid



FIGURE 55— Sub-Escarpment Grassland Bioregion: Bedford Dry Grassland south of the Boschberg Escarpment near Somerset East. Dominant grasses are *Digitaria argyrograpta* and *Eragrostis curvula*. *Vachellia karroo* invasion is evident. Photo: R.M. Cowling.

shrubs. In the extreme southwest, the plain beneath the Winterberg-Boschberg Escarpment (known locally as the Smaldeel), supports a dense sweetveld, called Bedford Dry Grassland. Dominant species include *Themeda triandra*, *Digitaria argyrograpta*, *Tragus koelerioides* and *Eragrostis curvula*. Southwards, where the rainfall is below 400 mm per annum, karroid shrubs become prominent.

Sub-Escarpment Savanna (Figure 56)

The Eastern Cape incorporates the southwestern margin of the vast savanna biome that covers most of south–central Africa. This tropical to subtropical biome experiences summer rainfall of between 250 mm and > 1 000 mm per annum and is characterised by the presence of two dominant plant types: winter-deciduous trees and summer-growing grasses. Fire and the feeding impact of browsers and grazers, often acting in synergy, shape the appearance and drive the workings of savanna ecosystems. Eastern Cape savannas are the simplest of the subcontinent's fare and, like its grasslands, are confined to the extreme east where *Vachellia natalitia* is the principal – and often the only – savanna tree. In pre-colonial



FIGURE 56—Sub-Escarpment Savanna Bioregion: close to Fort Beaufort, small trees of *Vachellia natalitia* in flower. Photo: G.J. Bredenkamp.

times, the province's largely sweetveld savannas teemed with game: springbok, Burchell's zebra, hartebeest, kudu and eland, as well as the larger cats.

There is only one savanna bioregion in the Eastern Cape, namely Sub-Escarpment Savanna. This bioregion occupies the dissected coastal plain between the Sub-Escarpment Grassland Bioregion and the coastal belt. Eastern Valley Bushveld, a mosaic of grassland, savanna and thicket, occupies the deeply incised valleys inland of the coastal belt. The scenery is often spectacular: the incised meanders of the rivers have cut impressive cliffs into the prevailing Karoo Supergroup rocks. Rainfall varies from ± 600 mm per annum in the south to > 1 000 mm in the north. Given the complex topography, aspect plays an often overriding role in determining moisture regimes. True savanna is dominated by species of *Senegalia* or *Vachellia* whereas thicket patches typically harbour tree euphorbias, *Cussonia spicata*, *Euclea crispa*, *Schotia brachypetala* and many others. Low succulents – including some local endemics – are associated with skeletal soils on steep, north-facing slopes. Grasses include *Hyparrhenia hirta*, *Themeda triandra* and *Heteropogon contortus*. Owing to the steep and inaccessible nature of the landscape, Eastern Valley Bushveld is less impacted than many other vegetation types in the communal lands of the former Transkei.

Bhisho Thornveld occupies the interfluves of the Sub-Escarpment Savanna Bioregion in the Eastern Cape, from Mthatha in the north to East London in the south. Outliers occur southwest of Grahamstown. This is a relatively species-poor vegetation that has been much impacted by humans. The dominant – and in many places only savanna tree – is *Vachellia natalitia*. This species has increased markedly in density over the past several decades – another example of bush encroachment that is so pervasive in many southern African savanna ecosystems. In well-managed veld, the grass stratum is dominated by *Themeda triandra*, *Digitaria eriantha* and *Sporobolus africanus*.

Indian Ocean Coastal Belt (Figure 57)

The Indian Ocean Coastal Belt is, strictly speaking, not a biome but a mosaic of forest, thicket and grassland. It represents an extension into South Africa of the tropical formations of Africa's east coast, doubtless facilitated by the near-tropical conditions associated with the warm Agulhas current that hugs the eastern seaboard of the country. The associated bioregion in the Eastern Cape extends from Pondoland in the north to the Great Kei River in the south – the so-called Wild Coast. Forest and thicket vegetation in this bioregion, namely Scarp Forest and Dune Thicket, is described under Indigenous Forests and Coastal Vegetation (Figure 63, p. 91), respectively. The two grassland vegetation types are described below.

Pondoland-Ugu Sandstone Coastal Sourveld is associated with the infertile, sandy soils derived from the Msikaba Formation (Cape Supergroup) quartzitic

sandstones that outcrop along the Pondoland and southern KwaZulu-Natal coasts. Annual rainfall is high (± 1 000 mm) and although most falls in the summer months, winters are not rainless. The grassland is sour and includes species typical of humid sourveld (e.g. *Themeda triandra*, *Trachypogon spicatus*, *Aristida junciformis*, *Alloteropsis semialata*). Magnificent stands of *Protea roupelliae* still grace the Msikaba Nature Reserve in Pondoland. However, the really special feature of this vegetation is the large number of endemic shrubs and trees found there, many of which have only recently been discovered. The grasslands of the Transkei Coastal Belt extend from Port St Johns to the Great Kei River. They are dominated



FIGURE 57—Indian Ocean Coastal Belt: a mosaic of intact Scarp Forest, secondary thicket and moist grassland on the Wild Coast near Port St Johns. Photo: J.C. Rautenbach.

by *Stenotaphrum secundatum* (especially on coastal sands and dolerite-derived soils) and *Aristida junciformis*. The latter is an indicator of the heavy, continuous grazing to which these grasslands are subjected.

Indigenous Forests (Figure 58)

The forest biome occupies only a small part of South Africa but its largest extent is found in the Eastern Cape. Forest typically requires copious rain – upwards of 800 mm per year – and flourishes in sites that are protected from fire. It favours deep and relatively fertile soils but, like thicket, it can become established on poorer soils in fire-free sites, where its plant components enrich the earth by producing large amounts of organic mulch. The typical plant type is the tree – usually evergreen but sometimes deciduous for a short part of the year – but other characteristic types are ferns (in wetter forms) and vines (in drier ones). Trees are generally long-lived, growing tall and forming a canopy under which successors struggle to develop. Sunlit gaps, in which younger trees are given their chance to grow tall, are created only when the older trees die or are toppled by an unusually strong wind. In the shorter, subtropical forest types, such as the Alexandria forests east of Port Elizabeth, elephant impacts would have undoubtedly played a role in creating gaps in the forest canopy.

Five forest types are found in the Eastern Cape. The extensive forests of the Knysna-Tsitsikamma region – Southern Afrotemperate Forest – extend into the province along the Tsitsikamma coastal platform. These magnificent forests are dominated by emergent podocarps (*Afrocarpus falcatus* and *Podocarpus latifolius*); other dominant trees are *Ocotea bullata*, *Cunonia capensis*, *Olea capensis* subsp. *macrocarpa*, *Pterocelastrus tricuspidatus* and *Platylophus trifoliatus*. Southern Mistbelt Forest occurs patchily on the foothills and ravines of the Amatole and Transkei sections of the Great Escarpment. Common trees include *Afrocarpus falcatus*, *Celtis africana*, *Calodendrum capense*, *Vepris lanceolata* and *Zanthoxylum davyi*. Scarp Forest is found at lower altitudes (> 600 m) than Mistbelt Forest and is hence more tropical in composition. It occurs throughout the former Transkei, from the Kei River to Pondoland. Dominant species are *Buxus macowanii*, *B. natalensis*, *Drypetes gerrardii*, *Englerophytum natalense*, *Harpephyllum caffrum*, *Heywoodia lucens*, *Oricia bachmannii* and *Rinorea angustifolia*. Southern Coastal Forest – a forest of mixed temperate-tropical affinities – is centred on the Alexandria Forest but patches are also found west of Port Elizabeth and on the Albany Coast. Here *Afrocarpus falcatus* – a temperate forest species – co-dominates with the subtropical *Erythrina caffra*. Other common species are *Celtis africana*, *Sideroxylon inerme*, *Mimusops caffra*, *Brachylaena discolor*, *Dovyalis rotundifolia* and *Euclea natalensis*. Mangrove Forest, which is an intertidal vegetation associated with certain estuaries of the Wild Coast between the Kei River and Pondoland, has a small flora dominated by the trees *Avicennia marina*, *Bruguiera gymnorrhiza*, *Rhizophora mucronata* and *Hibiscus tiliaceus*.

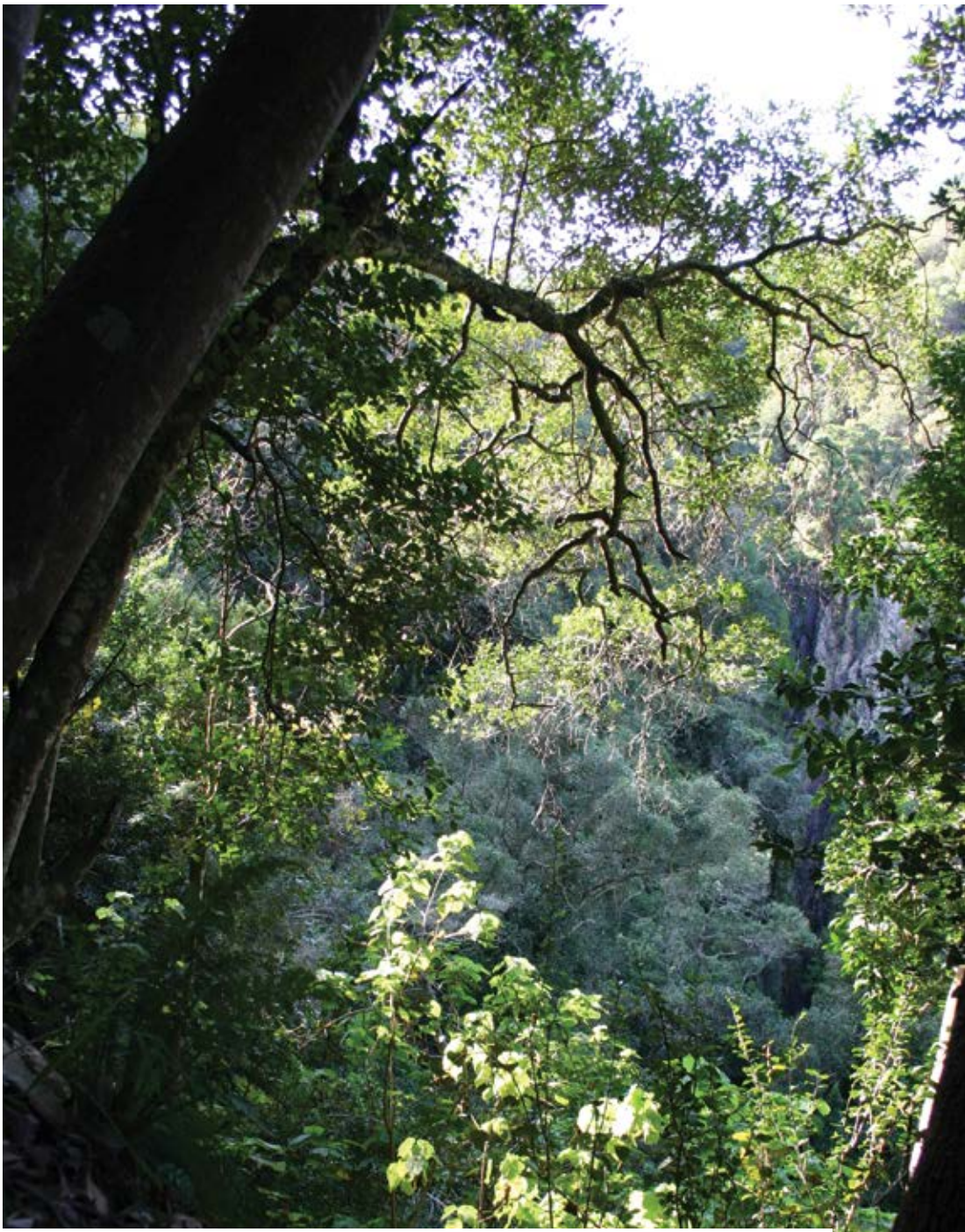


FIGURE 58—Indigenous Forests Bioregion: Southern Afrotemperate Forest in a fire-protected gorge in the Tsitsikamma. Canopy dominants include *Olinia ventosa*, *Podocarpus latifolius*, *Ocotea bullata* and *Pterocelastrus tricuspidatus*. The tall, sunlit shrub is *Sparrmannia africana*. Photo: R.M. Cowling.

Lower Karoo (Figure 59)

The Lower Karoo Bioregion occupies the warmer, sub-escarpment parts of the Nama-Karoo in the Eastern Cape. Like the Upper Karoo, at its wetter, eastern fringes, Lower Karoo grades into Sub-Escarpment Grassland and Savanna, a boundary that is determined in part by biophysical factors and in part by grazing regime. Only one vegetation type falls within the Lower Karoo Bioregion in the Eastern Cape, namely Eastern Lower Karoo. The matrix of karoo shrubs is typical of Nama-Karoo being dominated by *Pentzia incana*, *Rosenia humilis* and *Eriocephalus ericoides*. However, owing to the warmer conditions, Eastern Lower Karoo includes numerous subtropical forms including *Rhigozum obovatum*, *Cadaba aphylla*, *Blepharis* species and other Acanthaceae. Along its fringes with Albany



FIGURE 59—Lower Karoo Bioregion: Eastern Lower Karoo on shallow, stony ground west of Graaff-Reinet. Prominent in the foreground is *Aloe striata* with *Euphorbia mauritanica*. The dwarf shrub stratum is dominated by *Pentzia incana* and *Rosenia humilis*. Patches of arid thicket in the background are comprised of *Searsia longispina*, *Gymnosporia polyacanthus* subsp. *polyacanthus* and *Grewia robusta*. Photo: R.M. Cowling.

Thicket, this vegetation type is dotted with thicket clumps dominated by *Searsia* spp., *Schotia afra* and *Euclea undulata*. Typical of Eastern Lower Karoo are the magnificent stands of *Aloe ferox* and *A. striata*, surely a consequence of overgrazing and the demise of the large numbers of kudu and black rhinoceros that once kept populations of these species in check. Grasses are common and may dominate in well-managed areas where *Themeda triandra* is surprisingly abundant.

Albany Thicket (Figure 60)

The Albany Thicket Bioregion is largely endemic to the Eastern Cape and harbours most of the province's endemic plants, predominantly succulents and bulbs. It is most extensive in the major river valleys, such as the Gamtoos, Sundays, Great Fish and Buffels, and is a hardy vegetation, apparently well adapted to variable rainfall and capable of enduring long droughts. Both in its solid form and as a mosaic – where clumps of it are embedded in a matrix of fynbos, grassland or karoo – thicket grows where the annual rainfall is between 200 and 800 mm, where soils are mostly deep and relatively fertile, and in sites that are protected from fire. The typical plant types are shrubs (often spiny) with shiny, leathery evergreen leaves; succulents of all shapes and sizes; and vines or climbers. Grasses are scarce within the thicket clumps, but may be common in the spaces between them. Thicket burns only under extreme circumstances; instead, browsing by large mammals – especially elephant and black rhino – constitutes the disturbance process that has shaped the biology of thicket plants and the workings of its ecosystems.

Albany Thicket comprises three major vegetation units: Arid Thicket, Valley Thicket and Mesic Thicket. Arid Thicket encompasses the driest realm of the Albany Thicket Bioregion, where the non-seasonal rainfall is between 250 and 350 mm per annum. Its most widespread form is spekboomveld, where the succulent shrub spekboom (*Portulacaria afra*) occupies more than 50% of the cover. Other prominent tree and tall shrub species are *Pappea capensis*, *Euclea undulata*, *Gymnosporia polyacanthus*, *Crassula ovata*, *Rhigozum obovatum*, *Boscia oleoides* and *Searsia longispina*. Dwarf and low succulents mainly comprise species of *Crassula* and various Aizoaceae. Spekboomveld is a dominant component of Mucina and Rutherford's (2006) Groot Thicket and Kamdeboo Escarpment Thicket and is widespread in the drier parts of Gamtoos Thicket. A second form of Arid Thicket is noorsveld of which there are two blocks. Sundays Noorsveld, characterised by dense stands of *Euphorbia caerulescens*, occurs in the Sundays River basin north of the Suurberg Mountains, whereas Great Fish Noorsveld, typified by the occurrence of *E. bothae* (*E. bothae* Lotsy & Goddijn is possibly a hybrid between *E. triangularis* and *E. caerulescens* or back crosses between such hybrids and one of the parents) is associated with the drier parts of the Great Fish River Valley north of Grahamstown.

Valley Thicket is the most species- and endemic-rich form of Albany Thicket. It is widespread in the valleys of the Gamtoos, Sundays and Great Fish rivers. Like

Arid Thicket, it has a high component of succulents. Although *Portulacaria afra* is common, it is never dominant. Characteristic tree succulents include *Aloe africana*, *A. speciosa*, *Euphorbia grandidens* and *E. tetragona*. The evergreen tree and tall shrub component includes *Schotia latifolia*, *Sideroxylon inerme*, *Ptaeroxylon obliquum*, *Pappea capensis*, *Maerua cafra*, *Euclea undulata* and numerous species of *Searsia*. *Asparagus* spp. dominate the rich climber flora. Dwarf and low succulents (*Crassula*, *Delosperma*, *Glottiphyllum*, *Haworthia*, *Gasteria*) are abundant and include many local endemics.

Mesic Thicket is the wettest form of Albany Thicket and shows strong floristic links to forest. It includes the moist forms of Gamtoos Thicket, Sundays Thicket, Great Fish Thicket and encompasses most of Eastern Cape Escarpment Thicket



FIGURE 60—Albany Thicket Bioregion: Valley Thicket in the Fish River Valley north of Grahamstown. The tree euphorbia in the foreground is *Euphorbia tetragona*. Dominant species in the thicket matrix are *Portulacaria afra*, *Schotia afra*, *Pappea capensis* and *Euclea undulata*. Photo: R.M. Cowling.

and all of Buffels Thicket. The cover and diversity of succulents is much lower than in the drier forms of Albany Thicket although two tree succulents, namely *Aloe pluridens* and *Euphorbia triangularis*, are good indicators of Mesic Thicket. Characteristic trees include *Cussonia spicata*, *Olea europaea* subsp. *africana*, *Gymnosporia buxifolia*, *Allophylus decipiens*, *Scutia myrtina* and *Calodendrum capense*. Mesic thicket usually has a well-developed herbaceous understorey comprising *Chlorophytum comosum* and species of *Plectranthus* and *Crassula*.

Rainshadow Valley Karoo (Figure 61)

The Succulent Karoo is a semi-arid ecosystem where the typically low rainfall – between 100 and 300 mm per year – occurs mainly in winter. In contrast to other deserts, however, the rainfall here is unusually reliable, a phenomenon that explains much about the appearance of Succulent Karoo, especially the predominance of small-bodied succulents and the annual displays of colourful flowers. Succulent Karoo vegetation grows on a wide range of soils that are invariably more fertile than those supporting the adjacent fynbos. The characteristic plants



FIGURE 61—Rainshadow Valley Karoo Bioregion: drought-stricken (Dec. 2010) Steytlerville Karoo associated with the arid plains in the lee of the Baviaanskloof Mountains. Non-succulent shrubs are interspersed with many endemic succulents belonging to *Haworthia*, *Euphorbia* and the stapeliads. Low trees *Boscia oleoides* and *Euclea undulata* grow on the rocky hill in the background. Photo: I.L. Rautenbach.

are small (often tiny) shrubs with succulent leaves, and most are members of the vygie family (Aizoaceae), although crassulas and stem succulents (stapeliads and euphorbias) are also common. Forces that drive Succulent Karoo ecosystems are occasional droughts – normally at 10-year intervals – that cause the death of many of the shallow-rooted succulents.

In the Eastern Cape, Succulent Karoo is restricted to the extreme west, in the vicinity of Willowmore and Steytlerville – an extension of the Rainshadow Valley Karoo (or Klein Karoo) of the Western Cape. Owing to a higher incidence of warm-season rain and a fiercer drought regime, Rainshadow Valley Karoo in the province shows strong affinities to vegetation of the Lower Karoo Bioregion, which falls within the Nama-Karoo Biome; the diversity and dominance of succulent Aizoaceae is much lower than in the winter-rainfall Succulent Karoo, summer-growing grasses and non-succulent shrubs are much more abundant. However, Rainshadow Valley Karoo is home to many endemic succulents belonging to *Haworthia*, *Euphorbia* and the stapeliads. There are two main vegetation types. Willowmore Gwarrieveld, a vegetation of stony ridges and hills, is typified by scattered populations of the low tree *Euclea undulata*. Low succulents include many *Euphorbia* species, as well as members of *Drosanthemum* and *Trichodiadema* (both Aizoaceae). Dominant non-succulent, drought-deciduous shrubs are *Pentzia incana*, *Felicia muricata* and *Rhigozum obovatum*. Grasses, which respond to summer rain, are mainly species of *Aristida* and *Eragrostis*. Steytlerville Karoo is associated with the arid plains in the lee of the Baviaanskloof Mountains. The low tree *Boscia oleoides* is commonly found on hill slopes where the dwarf shrub layer is dominated by Aizoaceae including *Malephora uitenhagensis*, *Drosanthemum lique* and *Ruschia spinosa*. Also common are species of *Crassula*, *Lycium* and *Asparagus*.

Eastern Fynbos-Renosterveld (Figure 62)

This bioregion forms the eastern extremity of the Fynbos Biome, most of which falls in the winter-rainfall region of the Western Cape. Fynbos grows on very infertile soils derived from the hard sandstones of the Cape Fold Mountains, as well as on coastal sands that are leached of nutrients or highly alkaline. The vegetation is characterised by the presence of three main plant types: shrubs with small evergreen leaves (ericoids, for example ericas); shrubs with large leathery leaves [proteoids, such as proteas, pincushions (*Leucospermum*) and conebushes (*Leucadendron*); and wiry, sedge-like plants (restioids of the family Restionaceae)]. In the Eastern Cape, more rain in summer means that much of the region's fynbos include abundant sour grasses, and is thus called grassy fynbos. Fire is an essential force for the long-term persistence of fynbos and burns take place at regular intervals of between five and 50 years.

The other component of the Fynbos Biome is renosterveld, a fire-prone shrubland dominated by the small-leaved renosterbos *Elytropappus rhinocerotus*. It differs from fynbos in that it grows on relatively fertile (mainly shale-derived) soils,

lacks proteoids and has few restioids (these are largely replaced by grasses). Its hallmark is a preponderance of bulbs. Large blocks of renosterveld, often with thicket clumps interspersed, were a feature of the Langkloof and the Humansdorp coastal plain before they were cleared for agriculture. Other common species in renosterveld include the grasses *Themeda triandra* and *Ehrharta calycina*, and the shrubs *Oedera genistifolia*, *Pteronia incana* and numerous species of *Helichrysum*.

The wetter fynbos communities are associated with the coastal mountains where abundant rains (750–1 500 mm) fall throughout the year. Characteristic species are the tall proteoids, *Protea mundii* and *Leucadendron eucalyptifolium*. Ericas are abundant but the floras are half or less the size of those from similarly



FIGURE 62—Eastern Fynbos-Renosterveld Bioregion: grassy fynbos on a dissected African land surface south of the Elandsberg Mountains. Prominent in the foreground is the resprouting shrub *Leucadendron salignum*. The herbaceous layer is dominated by *Restio triticeus* and summer-growing grasses *Themeda triandra* and *Trachypogon spicatus*. Photo: R.M. Cowling.

moist habitats in the winter-rainfall part of the Fynbos Biome. Drier sites support proteoid fynbos with *P. neriifolia* and *P. eximia* as dominants. Grassy fynbos, more-or-less endemic to the Eastern Cape, prevails on drier mountain slopes and coastal forelands. Mostly, this vegetation lacks fire-killed proteoids although stands of *P. repens* and *P. lorifolia* are patchily distributed across grassy fynbos landscapes. A hallmark of grassy fynbos is the abundance of two resprouting members of the Proteaceae, namely *Leucadendron salignum* and *Leucospermum cuneiforme*. Grasses are mainly summer-growing species typical of Mesic Highveld Grassland found further east, for example *Themeda triandra* and *Trachypogon spicatus*. While the *Erica* complement is relatively impoverished, *E. pectinifolia* is abundant on sandy soils and *E. demissa* on heavier soils. Dune fynbos, associated with calcareous sands of the coastal margin, has a distinctive flora typified by *Agathosma apiculata*, *Erica chloroloma*, *Restio eleocharis* and many others. Thicket species are often intermingled with the fynbos elements in dune fynbos.

Coastal Vegetation (Figure 63)

This vegetation type comprises a narrow belt – too small to be mapped in Figure 50 (p. 58) – where vegetation structure and composition is determined by coastal processes, namely inundation by seawater and exposure to salt- and sand-laden wind. An example of the former is the salt marsh vegetation of estuaries, which is subject to tidally-driven inundation of sea water. Salt marshes are a common feature of estuaries throughout the Eastern Cape. The dominant plants are dwarf succulents (*Sarcocornia* spp., *Salicornia* spp., *Bassia diffusa*, *Plantago crassifolia*, *Disphyma crassifolium*) and grasses (*Sporobolus africanus*, *Spartina maritima*). Seashore vegetation grows on foredunes and cliffs which are unstable and wind-exposed habitats. Consequently, only the hardiest of plants survive there. Dominant species west of East London include *Drosanthemum candens*, *Pelargonium capitatum*, *Scaevola plumieri*, *Hebenstretia cordata*, *Gazania rigens*, *Trachyandra divaricata*, *Arctotheca populifolia* and *Ehrharta villosa*. On the Wild Coast, *Ipomoea pes-caprae*, *Phylohydrax carnosa*, *Canavalia rosea* and *Chironia decumbens* are prominent.

Dune Thicket occurs on stable coastal dunes throughout the Eastern Cape. Shrub and tree diversity increases northwards as the climate becomes moister and more tropical in nature. Widespread dominants include *Sideroxylon inerme*, *Maytenus procumbens*, *Chrysanthemoides monilifera* and *Searsia glauca*. Species prominent west of East London are *Cussonia thyrsiflora*, *Aloe africana*, *Pterocelastrus tricuspidatus*, *Euclea racemosa* and *Olea exasperata*. East of the Sundays River, *Brachylaena discolor*, *Eugenia capensis*, *Mimusops caffra*, *Euclea natalensis* and *Cordia caffra* enrich Dune Thicket, while *Psydrax obovata*, *Acokanthera oblongifolia*, *Monanthotaxis caffra*, *Deinbollia oblongifolia*, *Harpephyllum caffrum* and many others appear along the Wild Coast.

MUCINA, L. & RUTHERFORD, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

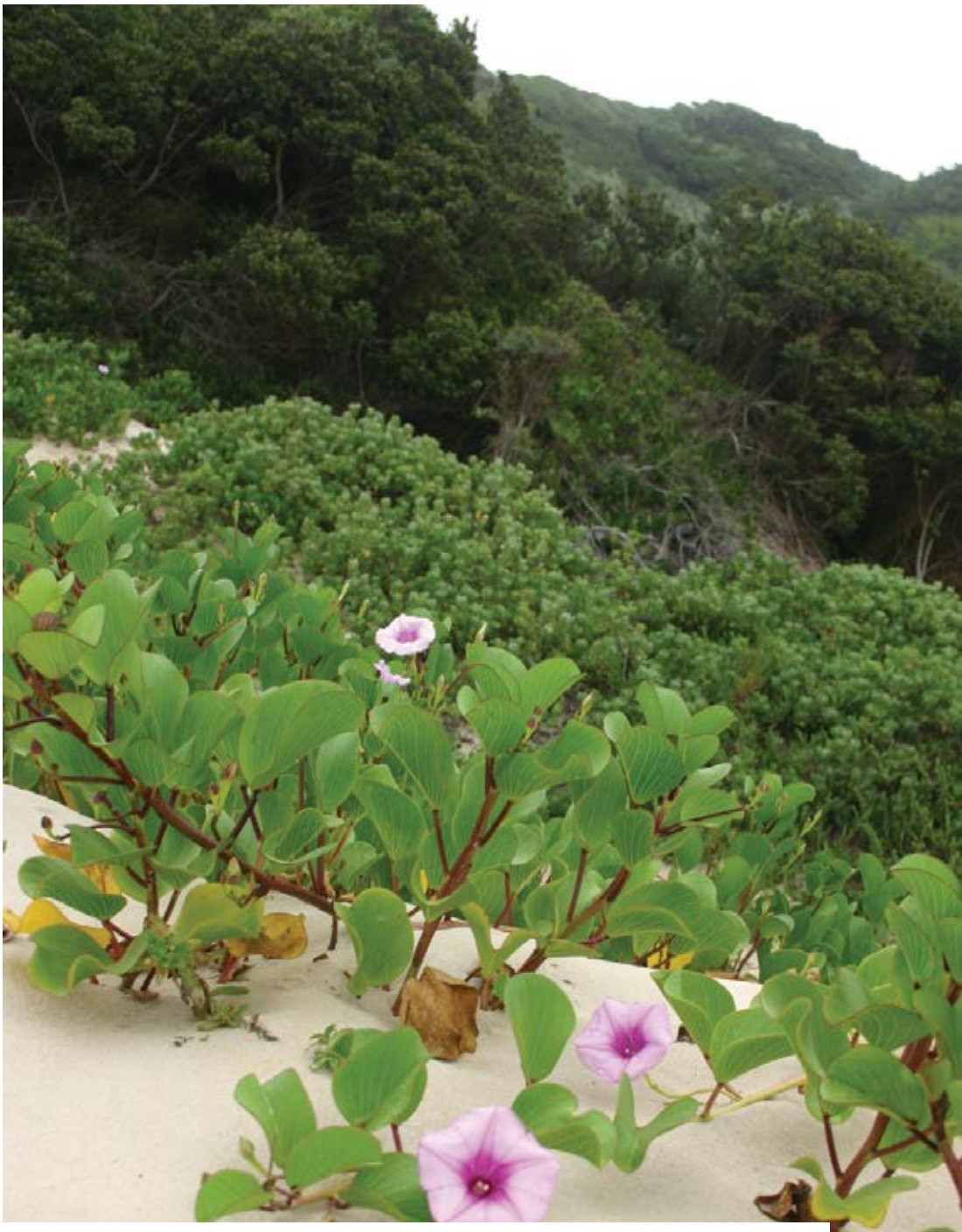


FIGURE 63—Coastal Vegetation: seashore vegetation near the Fish River Mouth with prominent *Ipomoea pes-caprae*. Dune thicket in the background, dominated by *Brachylaena discolor*, *Sideroxylon inerme*, *Mimusops caffra* and *Euclea natalensis*. Photo: R.M. Cowling.

Flora of the Eastern Cape Province

Lycopodiophyta and Pteridophyta

Compiled by J.P. Roux

The classification of the 'pteridophytes', often also referred to as 'ferns and fern allies', has been in flux for long. Until recently this diverse group of plants has been incorporated into a single assemblage or division, the Pteridophyta. This group delineated all non-flowering vascular plants that reproduce by naked spores. The 'fern-allies' generally included the lycopods, horsetails, and whisk ferns. Evidence from the fossil record, however, demonstrates that the Lycopodiophyta or lycopod lineage, which excludes the horsetails and whisk ferns, separated very early from the other groups in the evolution of vascular plants. This differentiation is further supported by molecular data which shows that the true Pteridophyta or ferns are more closely related to seed plants than what they are to the lycopods. It is widely accepted that this split in the plant kingdom occurred during the mid-Devonian, ± 400 million years ago. As a result of recent molecular studies some species were transferred from one genus to another and in several cases some genera were transferred from one family to another. The genera and families as defined here are aligned with recent classifications.

Lycopodiophyta

Key to the Lycopodiophyta families

1a Plants homosporous; lycophylls eligulate..... **LYCOPODIACEAE**
1b Plants heterosporous; lycophylls ligulate:
2a Lycophylls mostly < 5 mm long; sporophylls arranged to form distinct strobili; sporangia borne adaxially at base or near base of lycophylls..... **SELAGINELLACEAE**
2b Lycophylls mostly > 50 mm long; sporophylls not arranged to form strobili; sporangia embedded adaxially at base of lycophylls..... **ISOËTACEAE**

CHRISTENHUSZ, M.J.M., ZHANG, X.-C. & SCHNEIDER, H. 2011. A linear sequence of extant families and genera of lycophytes and ferns. *Phytotaxa* 19: 7–54.

ISOËTACEAE

An ancient nearly cosmopolitan family with a single extant genus. The plants mostly inhabit seasonally or permanently moist habitats including seepage areas and seasonally indurated soils and pools.

ISOËTES L.

Quillwort

Species ± 150; 10 in sthn Afr., N, LIM, M, FS, KZN, L, NC, WC, EC.

labri-draconis N.C.Crouch

Rhizomorph up to 1.5 mm below soil surface, 3-lobed, < 10 mm in diam., lycophyll primordia broadly deltate, trilobed. **Lycophylls** up to 40 in number, up to 140.0 × 1.5 mm, base broadly deltate with scarious margins extending up to 20 mm along the lycophyll; ligule flabellate. **Velum** complete. **Sporangium** oblong-ovate, up to 4 × 2.5 mm. **Megaspores** trilete, black when moist, grey when dry, nearly smooth on distal and prox-

imal surfaces, 380–500 μm in diam. **Microspores** monolete, faintly granular, up to 24 × 32 μm. Ephemeral pans, rock pools and seepage areas; Drakensberg Grassland (Elliot District).

[E]wormaldii Sim

Rhizomorph up to 1.5 mm below surface, 3-lobed, < 15 mm in diam., lycophyll primordia absent. **Lycophylls** up to 70 in number, up to 400 × 3 mm, terete to somewhat flattened, base broadly deltate, winged at base only; ligule elongate. **Velum** absent. **Sporangium** oblong-ovate, up to 4 × 2.5 mm. **Megaspores** trilete, white, tubercular, reticulate on all surfaces, 400–640 μm in diam. **Microspores** monolete, minutely tuberculate, up to 24 × 35 μm. Ephemeral pans and in stagnant ponds; Albany Thicket (Grahamstown to East London).

LYCOPODIACEAE

A family of 1–3, perhaps more genera with a near cosmopolitan distribution, being absent only from arid areas. The greatest species concentration is in the humid tropical montane forests and in humid tropical alpine vegetation.

1a Lycophylls < 3 mm long, arranged in 2 or 4 ranks ..... **Lycopodium**
1b Lycophylls > 3 mm long, spirally arranged:
2a Stems isotomous, without elongate indeterminate main stems; sporophylls and vegetative lycophylls alike, or if smaller, then not ephemeral ..... **Huperzia**
2b Stems anisotomous, differentiated into long indeterminate rhizomatous or trailing main stems and determinate aerial branchlet systems; sporophylls strongly modified, ephemeral:
3a Strobili erect, pedunculate, borne on branchlet systems which arise dorso-laterally on the main stem ..... **Lycopodium**
3b Strobili pendulous and sessile or terminating in simple, erect branches which arise dorsally on creeping stems ..... **Lycopodiella**

HUPERZIA Bernh.

Club-moss

Species ± 300, pantemperate and tropical; 5 in sthn Afr., LIM, M, S, FS, KZN, L, WC, EC.

gnidioides (L.f.) Trevis.

Hard club-moss; *harde wolfsklou* (A)

Stems rooting at base, erect and arching, or pendant, often repeatedly dichotomously branched, up to 400 mm long, up to 2 mm in diam. **Lycophylls** coriaceous, imbricate, narrowly oblong, entire, up to 14 × 3 mm. **Sporophylls** at upper part of ultimate branches, much smaller than sterile lycophylls, coriaceous, imbricate, broadly ovate, up to 3 × 2 mm. **Sporangia** near sporophyll base, yellow-brown, reniform, somewhat flattened, up to 2 mm in diam. On exposed or shaded rock crevices, or epiphytic in forests, alt. 300–1 200 m; Indigenous Forests (Port Edward to Pirie Forest, Knysna to Hogsback).

saururus (Lam.) Trevis.

Stems rooting at base, mostly erect, crowded, simple, but occasionally once or twice dichotomously branched at base, up to 250 mm long, up to 3 mm in diam. **Lycophylls** coriaceous, imbricate, oblong-lanceolate, entire, up to 12 × 1.8 mm. **Sporophylls** at upper part of stems, not differentiated from sterile lycophylls. **Sporangia** near axils of sporophylls, yellow-brown, reniform, somewhat flattened, up to 2 mm in diam. In shaded or exposed rock crevices in mountainous regions, alt. 700–1 800 m; Drakensberg Grassland, Eastern Fynbos-Renosterveld (Winterberge to Amatole Mts).

verticillata (L.f.) Trevis.

Weeping clubmoss; *treur wolfsklou* (A)

Stems rooting at base, pendant, repeatedly dichotomously branched, up to 500 mm long, up to 3 mm in diam. **Lycophylls** firmly herbaceous, loosely imbricate, acicular, entire, up to 6 × 0.5 mm. **Sporophylls** mainly in upper part of ultimate branches, almost indistinguishable from sterile lycophylls. **Sporangia** near axil of sporophylls, yellow-brown, globular, up to 2.5 mm in diam. Epilithic or epiphytic in seasonally moist evergreen forests, alt. 700–1 200 m; Indigenous Forests (Kokstad to Port St Johns, to Hogsback).

LYCOPODIELLA Holub

Club-moss

Species ± 40, pantemperate and tropical, temperate America, tropical Africa and Madagascar; 3 in sthn Afr., LIM, NW, G, M, S, KZN, WC, EC.

caroliniana (L.) Pic.Serm.

Slender club-moss

Stems prostrate, up to 150 mm long, somewhat dorsiventrally flattened, dichotomously branched, up to 3 mm in diam. **Lycophylls** imbricate, lanceolate, lateral leaves spreading horizontally, up to 16 × 4 mm, dorsal lycophylls smaller than lateral lycophylls, appressed. **Strobili** up to 70 × 6 mm, solitary at apex of an erect, unbranched, sparsely leaved peduncle, up to 250 mm long. **Sporophylls** broadly ovate-acuminate, up to 5.5 × 2 mm. **Sporangia** reniform, at sporophyll bases, up to 2.5 mm in diam. In marshes and seepage areas, alt. 0–1 200 m; Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Mkambati to Grahamstown and to Knysna).

cernua (L.) Pic.Serm.

Nodding club-moss, fairy Christmas tree; *wolfsklou* (A)

Stems: main ones prostrate, up to 1 m long, up to 3 mm in diam., terete, firm, with erect, much-branched leafy stems up to 500 mm high, the ultimate lateral branches bearing pendulous strobili at their apices. **Lycophylls** coriaceous, subulate, entire, up to 5 × 0.5 mm. **Strobili** sessile, solitary at branch apices, up to 10 mm long. **Sporophylls** coriaceous, broadly ovate-acuminate, margins lacerate, up to 1.6 × 1 mm. **Sporangia** reniform, at sporophyll bases, up to 0.5 mm in diam. Moist streambanks, road cuttings and seepage areas, alt. 0–1 200 m; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (Kokstad to Port Elizabeth).

LYCOPODIUM L.

Club-moss

Species ± 40, pantemperate and tropical; 2 in sthn Afr., LIM, M, S, FS, KZN, WC, EC.

clavatum L.

Running club-moss, common club-moss; *wolfsklou* (A)

Stems widely creeping, irregularly branched, up to 2 mm in diam., lateral branches erect, up to 180 mm long, sparsely leafy. **Lycophylls** herbaceous, acicular, with a translucent hair point, entire, up to 7 × 1 mm. **Strobili** pedunculate, in groups of 2–5, up to 30 mm long. **Sporophylls** ephemeral, herbaceous, narrowly to broadly ovate, laciniate, up to 4.5 × 2 mm. **Sporangium** reniform, up to 1.3 mm in diam. Moist forest margins, grassy slopes and road cuttings, alt. 50–1 500 m; Sub-Escarpment Grassland, Indian

Ocean Coastal Belt, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Kokstad to Humansdorp).

zanclophyllum J.H.Wilce

Running pine

Terrestrial. **Stems** perennial, prostrate or underground, main stem and repeatedly dichotomously branched aerial stems up to 300 mm high. **Lycophylls** subulate to narrowly lanceolate, decussate, in 4 ranks, up to 7 × 1 mm. **Strobili** pedunculate, up to 50 mm long, in groups of 2–8. **Sporophylls** broadly lanceolate, margins erose to subentire, up to 2.5 × 1 mm. Moist and sheltered rocky slopes and sponges, alt. 400–2 000 m; Eastern Fynbos-Renosterveld (Langeberg Mts, Great Winterhoek Mts and Tsitsikamma Mts).

ØLLGARD, B. 1989. Index of the Lycopodiaceae. *Biologiske Skrifter* 34: 1–135.

SELAGINELLACEAE

A family with a single genus largely occurring in the tropical parts of the world, some species reaching the arctic alpine zone of both hemispheres.

SELAGINELLA P.Beauv.

Spike mosses

Species ± 700; 8 in sthn Afr., N, B, LIM, NW, G, M, S, FS, KZN, L, WC, EC.

Central vein sunken on abaxial lycophyll surface

caffrorum (Milde) Hieron.

Stems widely creeping, forming dense mats or cushions, anisotomously branched, up to 0.8 mm in diam. **Lycophylls** ligulate, dark green when fresh, greyish green when dry, coriaceous, isophyllous, spirally arranged, closely imbricate, narrowly lanceolate-aristate, up to 2 × 0.4 mm, margins strongly fimbriate, arista up to 0.4 mm long. **Strobili** terminal on ultimate branches, up to 14 mm long, heterophyllous. **Sporophylls** isophyllous, arranged in 4 ranks, broadly lanceolate to ovate, lamina held ± at a right angle along sunken midrib, up to 2.5 × 1 mm, margins closely finely fimbriate. **Sporangia** short-stalked, globose, isovalvate; megasporangia few, up to 0.5 mm in diam.; microsporangia many, up to 0.4 mm in diam. Mostly in shallow soil overlaying sheetrock, at boulder bases and on cliffs, exposed or shaded, alt. 30–1 800 m; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Aliwal North and Kokstad S, Port St Johns to Grahamstown).

dregei (C.Presl) Hieron.

Drège's resurrection fern

Stems widely creeping, often forming dense mats, anisotomously branched, branches up to 0.5 mm in diam., lateral branches prostrate or ascending, up to 35 mm tall. **Lycophylls** ligulate, greyish, coriaceous, narrowly lanceolate-aristate, closely imbricate, margins variously fimbriate, up to 2.5 × 0.2 mm. **Strobili** up to 14 mm long, heterophyllous, terminal on ultimate branches, sporophylls anisophyllous. **Sporophylls** coriaceous, dorsally in 2 ranks, ovate-acuminate, up to 2.5 × 1.25 mm, ciliate, aristate, abaxially with a groove along vein. **Sporangia** sessile, reniform, anisovalvate, up to 1 mm in diam. Mostly in shallow soil overlaying sheetrock in grasslands, alt. 30–1 000 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Kokstad to Port St Johns).

Central vein not sunken on abaxial lycophyll surface

kraussiana (Kunze) A.Braun

Stems herbaceous, widely creeping, anisotomously branched, forming loose mats, terete, up to 1 mm in diam. **Lycophylls** ligulate, pale green, spaced to imbricate, herbaceous to thinly herbaceous, median lycophylls sessile, lanceolate to ovate-lanceolate, up to 2.6 × 1 mm, glabrous, lateral lycophylls ± patent, sessile, oblong-elliptic, up to 3.2 × 1.5 mm, serrulate. **Strobili** heterophyllous, sessile, up to 17 mm long. **Sporophylls** in 4 ranks, herbaceous, lanceolate to lanceolate-ovate, up to 1.6 × 0.6 mm, carinate, serrulate. **Sporangia** spheroidal, near axil of sporophylls, isovalvate, up to 0.5 mm in diam. Mostly on moist forest floor, forest margins, and along streambanks, alt. 30–1 300 m; Indigenous Forests (Kokstad to Knysna).

mittenii Baker

Stems herbaceous, widely creeping, anisotomously branched, forming loose mats, terete, up to 0.5 mm in diam. **Lycophylls** ligulate, pale green, imbricate, thinly herbaceous, median lycophylls sessile, lanceolate to ovate, up to 1.5 × 0.8 mm, serrulate, fimbriate towards base, lateral lycophylls ± patent, sessile, ovate to broadly ovate, up to 2 × 1.8 mm, amplexicaul, serrate, fimbriate towards base. **Strobili** heterophyllous, sessile, up to 6 mm long. **Sporophylls** in 4 ranks, herbaceous, lanceolate, up to 1.5 × 0.8 mm, carinate, serrulate. **Sporangia** globose, near axil of sporophylls, isovalvate, up to 0.8 mm in diam. Mostly on moist soil banks, in crevices on cliffs, but also among grasses and rocks, often in partially exposed habitats, alt. 100–2 050 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Mount Fletcher to Port Edward and to Kentani).

pygmaea (Kaulf.) Alston

Pigmy spike moss

Ephemeral. **Stems** herbaceous, erect, up to 130 mm high, anisotomously branched, terete, up to 0.2 mm in diam. **Lycophylls** ligulate, isophyllous, pale green, spaced, thinly herbaceous, sessile, ovate to elliptic, up to 1.5 × 0.6 mm, entire. **Strobili** heterophyllous, sessile, up to 15 mm long. **Sporophylls** in 4 ranks, herbaceous, lanceolate, up to 3 × 1 mm, carinate, recurved, entire. **Sporangia** globose, in axil of sporophylls, isovalvate, up to 0.8 mm in diam. Mostly among scrub or rocks on seasonally moist and shaded soil and slopes, alt. 50–400 m; Albany Thicket, Eastern Fynbos-Renosterveld (Alexandria to Jeffreys Bay).

Pteridophyta

Key to the families

1a Aerial stems obviously jointed, fluted; leaves whorled at nodes, fused at base and forming a short sheath ..... **EQUISETACEAE**

1b Aerial stems not obviously jointed, nor fluted; enations and fronds spirally arranged and never fused to form a sheath:

2a Sporangia variously fused to form distinct synangia:

3a Synangia 2- or 3-locular and borne in axils of 2-fid enations on angular branches ..... **PSILOTACEAE**

3b Synangia with several locules, borne abaxially on foliate pinnules, or arranged to form a distinct fertile spike borne at base of a sterile lamina:

4a Sporangia arranged to form a distinct fertile spike borne at base of a sterile lamina ..... **OPHIOGLOSSACEAE**

4b Sporangia arranged to form a bivalved capsule along a vein abaxially on foliate pinnules ..... **MARATTIACEAE**

SELAGINELLACEAE

2b Sporangia solitary, acrostichoid, or variously grouped to form distinct sporangia, but never fused:
5a Plants free-floating aquatics or seasonally rooted:
6a Plants seasonally rooted; laminae clover-like with 2 opposite pinna pairs; sporangia borne in hard nut-like sporocarps borne on short pedicels ..... **MARSILEACEAE**
6b Plants free-floating aquatics; leaves arranged in whorls or alternately, without clover-like laminae; sporangia not borne in hard nut-like sporocarps..... **SALVINIACEAE**
5b Plants terrestrial, epilithic, or epiphytic:
7a Sporangia thick-walled, with a lateral group of inconspicuous annulus cells; capsule dehisces along an apical slit forming 2 near-equal clam-shaped halves..... **OSMUNDACEAE**
7b Sporangia thin-walled, with a distinct row of indurated annulus cells; capsule dehisces along a variously oriented stomium forming 2 unequal parts:
8a Indurated annulus cells form a distinct apical, subapical, or laterally ring:
9a Lamina segments linear and pectinately arranged..... **SCHIZAEACEAE**
9b Lamina segments various and pinnately arranged:
10a Fronds twining, up to 10 m long; rachis dichotomously branched..... **LYGODIACEAE**
10b Fronds not twining, < 0.5 m long; rachis simple ..... **ANEMIACEAE**
8b Indurated annulus cells form a distinct oblique or vertical bow:
11a Lamina one cell layer thick between veins..... **HYMENOPHYLLACEAE**
11b Lamina more than one cell layer thick between veins:
12a Plants with a fibrous, erect caudex, up to 3 m long and up to 450 mm in diam..... **CYATHEACEAE**
12b Plants with a creeping, decumbent, or erect rhizome and mostly < 0.5 m high:
13a Fronds scrambling, falsely dichotomously branched ..... **GLEICHENIACEAE**
13b Fronds never scrambling, not falsely dichotomously branched:
14a Stipes articulated to phyllopodia:
15a Sori borne at ultimate forking of veins near lamina margins; indusium pouch-shaped ..... **DAVALLIACEAE**
15b Sori borne along veins abaxially on lamina; indusium absent or reniform:
16a Sori with reniform indusia..... **OLEANDRACEAE**
16b Sori exindusiate ..... **POLYPODIACEAE**
14b Stipes not articulated to phyllopodia:
17a Fronds dimorphic ..... **BLECHNACEAE**
17b Fronds monomorphic:
18a Sori linear, J-shaped, along a marginal or near marginal vascular plexus, or on marginal indusial flaps:
19a Scales clathrate ..... **ASPLENIACEAE**
19b Scales not clathrate:
20a Frond hairs mostly acicular:
21a Sori exindusiate; venation free or the basal vein pair meet in the sinus between adjacent lobes..... **THELYPTERIDACEAE** (*Stegnogramma*)
21b Sori indusiate or protected by an often modified lobe margin:
22a Venation free; sori linear and often back-to-back..... **ATHYRIACEAE** (*Deparia*)
22b Venation reticulate; sori subcircular and ± confined to lobe sinuses ..... **DENNSTAEDTIACEAE** (*Blotiella*)
20b Fronds glabrous or hairs not acicular:
23a Sori J-shaped ..... **ATHYRIACEAE** (*Athyrium*)
23b Sori elongated along a marginal vascular plexus, or sporangia borne on marginal indusial flaps:
24a Vestiture primarily composed of hairs ..... **DENNSTAEDTIACEAE**
24b Vestiture primarily composed of scales..... **PTERIDACEAE**
18b Sori circular or sporangia acrostichoid:
25a Sori marginal or near marginal and covered by an often modified recurved lobe margin:
26a Vestiture primarily composed of hairs ..... **DENNSTAEDTIACEAE**
26b Vestiture primarily composed of scales..... **PTERIDACEAE**
25b Sori superficial on laminae or sporangia acrostichoid:
27a Indusium inferior:
28a Pinnae not articulated to rachis; segments glabrous adaxially; rachis winged, ridged adaxially..... **CYSTOPTERIDACEAE**

28b Pinnae articulated (sometimes non-functional) to rachis; rachis not winged, sulcate adaxially ..... **WOODSIACEAE**
27b Indusium absent or superior:
29a Pinnae articulate to rachis ..... **NEPHROLEPIDACEAE**
29b Pinnae not articulated:
30a Lamina vestiture mostly composed of acicular hairs ..... **THELYPTERIDACEAE**
30b Lamina vestiture mostly composed of scales:
31a Venation free ..... **DRYOPTERIDACEAE**
31b Venation reticulate ..... **PTERIDACEAE** (*Acrostichum*)

ANEMIACEAE

A family of 2 genera, with *Mohria* often incorporated into *Anemia*. Whilst Mesoamerica is the centre of diversity for *Anemia*, that of *Mohria* is South Africa. Most species occur in savanna-like vegetation types.

Sporangia borne on 2 basal, dimorphic and highly skeletonised pinnae; frond vestiture composed of pluricellular hairs only ..... **Anemia**
Sporangia borne on almost unmodified distal pinnae; frond vestiture composed of pluricellular hairs and scales ..... **Mohria**

ANEMIA Sw.

Species ± 100, warmer parts of North and South America, a few in Africa, Madagascar and Indian subcontinent; 2 in sthn Afr., LIM, G, M, S, KZN, EC.

dregeana Kunze

Sorghum fern

Rhizome short-decumbent to suberect, up to 4 mm in diam., closely set with stipe bases and ferruginous hairs. **Fronds** crowded, caespitose, hemidimorphic, up to 370 mm long. **Stipe** firm, proximally castaneous, up to 150 mm long, up to 1.6 mm in diam., proximally closely set with hairs. **Lamina**: sterile 1-pinnate, oblong-acuminate to narrow-elliptic, up to 190 × 58 mm, with up to 14 pinna pairs; fertile fronds with a pair of highly modified basal pinnae. **Pinnae** herbaceous, the sterile sessile, broadly ovate to inequilaterally trullate, up to 37 × 20 mm, acute to obtuse, crenate, adaxially and abaxially with hairs similar to, but shorter than those on stipe along the veins; the fertile erect, petiolate, up to 125 mm long, up to 2-pinnate-pinnatifid, lamina highly skeletonised, up to 120 mm long. In evergreen forests and scrub, alt. 50–1 000 m; Indigenous Forests, Indian Ocean Coastal Belt (Kokstad to Grahamstown).

MOHRIA Sw.

Species 7, Africa, Madagascar and Réunion; 6 in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

caffrorum (L.) Desv.

Scented fern; *brandbossie* (A)

Rhizome prostrate, short and stout, or short decumbent, up to 6 mm in diam., stoloniferous, with stipe bases and scales. **Fronds** erect, crowded, the fertile usually longer than the sterile. **Stipe** terete, firm, up to 162 mm long, up to 1.7 mm in diam., the fertile significantly longer than the sterile, closely set with navicular trichomes and scales. **Lamina**: sterile elliptic to obovate in outline, up to 235 mm long; fertile narrowly elliptic to narrowly obovate, up to 270 mm long, 2- or 3-pinnate, with up to 26 pinna pairs. **Pinnae** proximally widely spaced, oblong, up to 30 × 12 mm, proximally short-stalked,

distally sessile, adaxially with trichomes, hairs and narrow scales. **Pinnules** opposite to alternate, 4–9 pairs per pinna, dentate. On seasonally moist slopes, at rock bases and forest margins, alt. 0–1 200 m; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Grahamstown to Knysna).

marginalis (Savigny) J.P.Roux

Rhizome prostrate, up to 3 mm in diam., closely set with persistent stipe bases and scales. **Fronds** crowded, erect. **Stipe** terete, firm, stramineous, up to 36 mm long, up to 1 mm in diam., with navicular trichomes, hairs and narrowly ovate to linear-acuminate scales. **Lamina** oblanceolate to linear-attenuate, up to 130 mm long, up to 2-pinnate, firmly herbaceous. **Pinnae** opposite to distant, proximally widely spaced, overlapping distally, circular to reniform in outline, up to 14 × 8 mm, adaxially sparsely to densely hirsute, hairs straight-walled, abaxially with sinuous-walled hairs, and filiform scales. In rocky areas in seasonally moist grassland, alt. 1 200–1 600 m; Sub-Escarpment Grassland, Drakensberg Grassland (Matatiele to Elliot).

nudiuscula J.P.Roux

Rhizome prostrate, up to 10 mm in diam., closely set with persistent stipe bases and scales. **Fronds** few, crowded, the fertile longer than the sterile, up to 230 mm long. **Stipe** terete, firm, up to 40 mm long, up to 3 mm in diam., the fertile usually longer than the sterile, sparsely to densely set with navicular trichomes and linear to lanceolate scales. **Lamina** often thinly coriaceous, narrowly linear, up to 635 mm long, 1- or 2-pinnate, with up to 34 pinna pairs. **Pinnae** proximally opposite to distant, ovate to narrowly ovate, up to 80 × 15 mm, adaxially glabrous or with navicular trichomes, hairs, and filiform scales, abaxially with navicular trichomes, and filiform scales. **Pinnules** alternate, up to 12 pairs per pinna, basal smaller than next; segments up to 3 pairs per pinnules, shallowly crenulate or obtusely toothed. At base of rocks in grassveld and on cliffs, alt. 800–2 000 m; Mesic Highveld Grassland, Sub-Escarpment Grassland, Drakensberg Grassland (Lady Grey to Kokstad and Elliot).

vestita Baker

Rhizome prostrate, up to 8 mm in diam., closely set with persistent stipe bases and scales. **Fronds** erect, crowded, the fertile generally longer than the sterile, up to 300 mm long. **Stipe** terete, firm, up to 132 mm long, up to 4 mm in diam., the fertile slightly longer than the sterile, with navicular trichomes and filiform scales. **Lamina** herbaceous; sterile narrowly elliptic, up to 380 mm long; fertile narrowly oblanceolate, up to 464 mm long, 2-pinnatifid to 2-pinnate, with 10–29 pinna pairs. **Pinnae** opposite to alternate, ovate, up to 44 × 19 mm, proximally short-stalked, abaxially sparsely to densely scaled. **Pinnules** opposite to alternate, 4–9 pairs per pinna. Mostly at boulder bases and among scrub, alt. 50–1 600 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (Kokstad to Stutterheim).

ROUX, J.P. 1995. Systematic studies in the genus *Mohria* (Pteridophyta: Anemiaceae) VI. Taxonomic review. *Bothalia* 25: 1–12.

ASPLENIACEAE

A family of 2 genera with a worldwide distribution, most species occurring in the tropical parts. *Asplenium* is the most species-rich genus in Africa.

ASPLENIUM L.

Spleenwort

Species ± 720, nearly cosmopolitan; 30 in sthn Afr., widespread.

1a Fronds 1-pinnate to 1-pinnate-pinnatifid
2a Fronds with a distinct terminal pinna

anisophyllum Kunze

Giant spleenwort

Rhizome erect, up to 10 mm in diam., with crowded stipe bases and pale brown, lanceolate scales, up to 12 × 2.5 mm, fimbriate. **Fronds** caespitose, erect to arching, up to 450 mm long. **Stipe** firm, brown, up to 480 mm long, sulcate with a central ridge adaxially. **Lamina** 1-pinnate, elliptic to oblanceolate, or lanceolate, up to 800 × 300 mm, with 10–20 pinna pairs, non-proliferous. **Pinnae** narrowly lanceolate, attenuate, somewhat falcate, crenate to serrate, glabrous adaxially, sparsely scaled along costa and veins abaxially. **Sori** linear, up to 5 mm long. **Indusium** entire, up to 1 mm wide. Plants epilithic or epiphytic in seasonally moist forests, alt. 0–350 m; Indigenous Forests (Port St Johns).

gemmiferum Schrad.

Mother fern

Rhizome short-decumbent, up to 30 mm long, up to 10 mm in diam., with stipe bases and greyish brown scales, lanceolate to oblong-acuminate, up to 7.5 × 1.4 mm, with filiform outgrowths. **Fronds** caespitose, suberect to arching, 4–6 per plant, up to 650 mm long. **Stipe** firm, greyish brown to reddish brown, up to 260 mm long, up to 3 mm in diam., with low dorso-lateral ridges, sulcus centrally ridged higher up, glabrous to subglabrous later. **Lamina** 1-pinnate, ovate, up to 400 × 280 mm, with up to 10 widely spaced pinna pairs, often with a scaled proliferous bud adaxially at base of apical pinna. **Pinnae** firmly herbaceous, lanceolate to oblong acuminate, up to 135 × 35 mm, dentate to crenate, glabrous adaxially, abaxially with dark brown to black filiform scales. **Sori** linear, up to 16 mm long, up to 15 pairs per pinna. **Indusium** entire, up to 1 mm wide. In deep shade on moist forest floor, alt. 50–1 200 m; Indigenous Forests (Port St Johns to King William's Town).

prionitis Kunze

Rhizome erect, up to 60 mm in diam., with stipe bases and dark brown to black, narrowly triangular to subulate scales, up to 8 × 1.5 mm, entire. **Fronds** caespitose, suberect to arching, up to 800 mm long. **Stipe** firm, brown to greenish grey, pale brown when dry, up to 24 mm long, sulcus with a central ridge adaxially, glabrous except for scales at base. **Lamina** 1-pinnate, ovate, oblong or obovate, up to 500 × 290 mm, with 3–8 pinna pairs, non-proliferous. **Pinnae** petiolate, firmly herbaceous, oblong-lanceolate, up to 180 × 45 mm, serrate, glabrous adaxially, subglabrous abaxially. **Sori** linear, 6–20 × 1 mm. **Indusium** entire, up to 1 mm wide. On moist soils in forests, deeply shaded, alt. 0–250 m; Indigenous Forests (Port Edward to Dwessa).

2b Fronds without a distinct terminal pinna
3a Fronds with a proliferous rachis extension

dregeanum Kunze

Drège's spleenwort

Rhizome erect, up to 12 mm long, up to 4 mm in diam., with crowded stipe bases and dark brown scales with paler margins, ovate to broadly ovate, up to 3 × 1.5 mm.

Fronds suberect to arching, up to 340 mm long. **Stipe** greenish brown to greyish brown, with narrow green wings when fresh, sparsely scaled. **Lamina** narrowly elliptic, up to 240 × 55 mm, 1-pinnate-pinnatifid to 2-pinnate, with up to 25 pinna pairs. **Rachis** apex often elongated and terminating in a proliferous bud. **Pinnae** short-petiolate, firmly herbaceous to thinly coriaceous, up to 26 × 13 mm, broadly trapeziform to dimidiate, up to 8 × 2 mm, divided into linear to narrowly elliptic lobes, acroscopically developed, proximal acroscopic lobe always 2–4-fid, glabrous adaxially, abaxially with appressed substellate scales. **Sori** linear, up to 4 mm long, a single sorus per lobe. **Indusium** membranous, elliptic, entire, up to 1 mm wide. Plants epiphytic in seasonally moist evergreen forests, alt. 50–400 m; Indigenous Forests (Lusikisiki to Port St Johns).

sandersonii Hook.

Rhizome erect, up to 5 mm long, up to 2 mm in diam., with brown or reddish brown, lanceolate scales up to 3.5 mm long. **Fronds** caespitose, arching, herbaceous to carnose-coriaceous. **Stipe** stramineous, green or brown, up to 70 mm long, glabrous or with brown, lanceolate, or hair-like scales up to 3 mm long. **Lamina** 1-pinnate, linear-lanceolate, up to 185 × 29 mm; basal pinnae slightly reduced or not, gradually reduced to apex. **Rachis** with narrow green wings and sparse hair-like scales, with a proliferous bud at end of rachis extension, up to 110 mm long. **Pinnae** short-petiolate, obcuneate, rectangular, or rhomboid, patent or curving and deflexed, dimidiate, up to 13 × 7 mm, shallowly to deeply lobed into 5–9 entire, rounded lobes on acroscopic and outer margins, subglabrous. **Sori** up to 2 mm long, oblong, up to 5 per pinna. **Indusium** membranous, oblong, erose. Plants epilithic or epiphytic in moist evergreen forests, alt. 50–100 m; Indigenous Forests (Port Edward to Port St Johns).

3b Fronds without a proliferous rachis extension

boltonii Hook. ex Brause & Hieron.

Bolton's mother fern

Rhizome erect to suberect, up to 5 mm in diam., with stipe bases and reddish brown, lanceolate scales, up to 18 × 2 mm, irregularly with a few marginal outgrowths. **Fronds** caespitose, arching, up to 400 mm long. **Stipe** firm, dark brown, up to 200 mm long, up to 2.2 mm in diam., proximally densely scaled. **Lamina** 1-pinnate, lanceolate, up to 800 × 170 mm, with 13–28 pinna pairs, usually proliferous near frond apex. **Pinnae** herbaceous, lanceolate, falcate, margins incised $^{1}/_{3}$ to costa into narrow, rounded lobes or teeth, glabrous adaxially, sparsely scaled abaxially. **Sori** linear, 3–8 mm long. **Indusium** entire, linear to narrowly elliptic, up to 1 mm wide. In seasonally moist evergreen forests, alt. 660–1 980 m; Indigenous Forests (Kokstad to King William's Town).

erectum Bory ex Willd.

Erect spleenwort

Rhizome erect to suberect, up to 35 mm long, up to 3 mm in diam., with crowded stipe bases and castaneous, lanceolate scales, up to 8 × 1 mm, with scattered filiform outgrowths along margins. **Fronds** caespitose, erect to arching, up to 510 mm long. **Stipe** firm, castaneous, up to 120 mm long, up to 1.8 mm in diam., narrowly green-winged in upper half, with glandular cells and ferruginous, filiform scales, up to 3 mm long, glabrous later. **Lamina** 1-pinnate, narrowly elliptic to oblong-cuneate, up to 390 × 60 mm, with up to 36 petiolate pinna pairs. **Rachis** firm, castaneous, terete, narrowly green-winged. **Pinnae** herbaceous, inequilaterally lanceolate to ovate, often slightly auricled acroscopically, basiscopically narrowly to broadly cuneate, dentate,

up to 30 × 14 mm, glabrous adaxially and abaxially. **Sori** linear, up to 3.5 mm long. **Indusium** linear, entire, up to 3.5 × 0.3 mm. On seasonally moist forest floor, deeply shaded, alt. 0–1 200 m; Indigenous Forests (Kokstad to Tsitsikamma).

inequilaterale Willd.

Lolly spleenwort

Rhizome erect to suberect, up to 20 mm long, up to 4 mm in diam., with crowded stipe bases and dark brown to black, subulate to lanceolate scales, up to 5 × 0.7 mm, entire or with scattered, recurved outgrowths. **Fronds** caespitose, erect, up to 430 mm long. **Stipe** firm, castaneous, terete, up to 210 mm long, up to 1.6 mm in diam., narrowly green-winged to lamina base. **Lamina** 1-pinnate, narrowly elliptic, up to 230 × 68 mm, with up to 17 petiolate pinna pairs. **Rachis** shallowly sulcate adaxially, narrowly green-winged. **Pinnae** inequilaterally lanceolate to trapezoid, mostly alternately, shallowly and deeply dentate, up to 38 × 10 mm, glabrous adaxially and abaxially; petioles up to 1.5 mm long, sessile towards apex. **Sori** linear, up to 4 mm long. **Indusium** transversely narrowly elliptic, entire, up to 4 × 1.2 mm. On seasonally moist forest floor, deeply shaded, alt. 50–150 m; Indigenous Forests (Kokstad to Port St Johns).

lunulatum Sw.

Moon-slice spleenwort

Rhizome erect, up to 4 mm in diam., with dark brown to black, lanceolate-acuminate, entire scales, up to 3.5 mm long. **Fronds** caespitose, erect to arching. **Stipe** firm, dark brown to black, up to 75 mm long, up to 1.2 mm in diam. **Lamina** 1-pinnate, narrowly elliptic to oblong-acuminate, up to 300 × 30 mm, with up to 45 pinna pairs, proliferous on rachis near apex. **Pinnae** herbaceous, oblong-obtuse, falcate, crenate-serrate, glabrous adaxially, sparsely minutely scaled abaxially. **Sori** linear, up to 4 mm long. **Indusium** membranous, ovate-oblong, entire, up to 1 mm wide. Moist forest floors and boulders, alt. 100–800 m; Indigenous Forests (Kokstad to Tsitsikamma).

monanthes L.

Single-sorus spleenwort

Rhizome erect to suberect, up to 4 mm in diam., with stipe bases and castaneous to black, narrowly lanceolate scales, up to 4.5 × 0.8 mm, entire to repand. **Fronds** caespitose, erect, up to 350 mm long. **Stipe** castaneous, nitid, shallowly sulcate distally, up to 95 mm long, up to 1.2 mm in diam., proximally with castaneous, narrowly lanceolate, cuspidate and filiform scales, up to 4 × 0.3 mm. **Lamina** 1-pinnate, narrowly linear, up to 480 × 26 mm, with up to 55 articulated pinna pairs, often proliferous near base. **Pinnae** firmly herbaceous, oblong, dimidiate, becoming cuneate-flabellate or broadly rhomboid towards base, up to 14 × 7 mm, serrate along the upper and outer margins, glabrous. **Sori** linear, solitary (occasionally 2 or 3), set along and near the basiscopic margin, up to 5 mm long. **Indusium** linear, entire to subentire. On seasonally moist forest floor, deeply shaded, alt. 50–800 m; Indigenous Forests (Kokstad to Tsitsikamma).

platyneuron (L.) Britton, Sterns & Poggenb.

Ebony spleenwort

Rhizome erect to suberect, up to 4 mm in diam., with dark brown to black, lanceolate-attenuate scales, up to 3 mm long, subentire. **Fronds** caespitose, erect, up to 245 mm long. **Stipe** dark brown, glossy, up to 55 mm long, initially scaled. **Lamina** herbaceous, 1-pinnate, linear, up to 240 × 26 mm, with up to 50 pairs. **Pinnae** subsessile, linear

to oblong or lanceolate, auriculate acroscopically, irregularly crenate-serrate, glabrous adaxially, sparsely scaled abaxially. **Sori** linear, up to 2 mm long, up to 14 pairs per pinna. **Indusium** membranous, erose, up to 0.5 mm wide. In riverine scrub, forest margins and montane grasslands, alt. 50–1 800 m; Sub-Escarpment Grassland, Drakensberg Grassland, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Matatiele to Tsitsikamma).

protensum Schrad.

Downy mother fern

Rhizome short-decumbent or erect, up to 90 mm long, up to 7 mm in diam., with stipe bases and greyish black scales, ovate, up to 2.2 × 1.2 mm, crenulate. **Fronds** up to 12 per plant, caespitose, suberect to arching, up to 1.1 m long. **Stipe** firm, dark brown to black, up to 250 mm long, up to 3.4 mm in diam., sparsely set with greyish black, ovate to lanceolate scales, up to 4 × 1 mm, crenulate. **Lamina** 1-pinnate, narrowly elliptic, up to 800 × 100 mm, with up to 58 closely spaced pinna pairs, often with a scaled proliferous bud adaxially near lamina apex. **Pinnae** herbaceous, sessile, inequilaterally narrowly trullate to lanceolate, variously pinnatifid into oblong to narrow-cuneate segments, adaxially hirsute along costa and veins, abaxially with ovate to filiform clathrate scales similar to those along rachis. **Sori** linear, up to 4 mm long, up to 10 pairs per pinna. **Indusium** entire, up to 1 mm wide. On rocks along streams in moist evergreen forests, alt. 50–1 600 m; Indigenous Forests (Kokstad to Tsitsikamma).

1b Fronds 2- or more pinnate
4a Stipe and rachis sulcus centrally ridged

flexuosum Schrad.

Rhizome erect, up to 30 mm in diam., with dark brown, lanceolate, short-fimbriate scales, up to 8 mm long. **Fronds** caespitose, thinly coriaceous. **Stipe** greenish, becoming stramineous, at first with scattered, sinuous, hair-like scales. **Lamina** ovate-lanceolate, up to 620 × 190 mm, 1-pinnate to 2-pinnatifid; basal pinnae reduced, with up to 24 pairs, often proliferous adaxially on rachis near frond apex. **Pinnae** ovate-lanceolate, progressively more deeply incised from apex to base into 2- or 3-fid, oblong to oblanceolate lobes, glabrous adaxially, abaxially with hair-like scales up to 1 mm long. **Sori** up to 9 mm long. **Indusium** membranous, entire, up to 0.6 mm wide. In seasonally moist evergreen forests, alt. 0–800 m; Indigenous Forests (Port St Johns to Alexandria).

rutifolium (P.J.Bergius) Kunze

Carrot(-leaved) fern

Rhizome erect to suberect, up to 40 mm long, up to 5 mm in diam., with stipe bases and dark brown, lanceolate to subulate scales, up to 19 × 4.5 mm. **Fronds** caespitose, suberect to arching, up to 570 mm long. **Stipe** firm, castaneous to black, green higher up, up to 200 mm long, up to 2.5 mm in diam., with dark brown to black, narrowly triangular scales, up to 7 × 1 mm. **Lamina** 3-pinnate, narrowly elliptic, up to 400 × 120 mm, with up to 23 pinna pairs. **Pinnae** firmly herbaceous to coriaceous, lanceolate to ovate, up to 80 × 40 mm, with up to 10 pinnule pairs; petioles up to 3 mm long. **Pinnules** flabellate, rhomboid, elliptic or linear, the larger divided into oblong lobes, lobes entire, up to 7 × 2 mm, glabrous adaxially, abaxially sparsely scaled. **Sori** linear, 1 per lobe, medial to supramedial, up to 2 mm long. **Indusium** membranous, linear, entire, up to 2 × 0.6 mm. Plants terrestrial, epilithic or epiphytic, in evergreen forests, alt. 0–800 m; Indigenous Forests (Kokstad to Tsitsikamma).

theciferum (Kunth) Mett.

Carrot(-leaved) fern

Rhizome erect, up to 25 mm long, up to 5 mm in diam., with stipe bases and concolorous or bicolorous, dark brown, lanceolate to ovate scales, up to 4 × 1.4 mm. **Fronds** caespitose, suberect to arching, up to 280 mm long. **Stipe** firm, green, up to 125 mm long, up to 1.3 mm in diam., initially moderately set with ferruginous, ovate to lanceolate scales, up to 4 × 1.2 mm. **Lamina** 1- or 2-pinnate, lanceolate to narrowly ovate, up to 170 × 55 mm, with up to 13 pinna pairs. **Pinnae** basally often more widely spaced, basal 2 or 3 pairs gradually reduced or not, coriaceous, lanceolate, ovate, narrowly elliptic to linear, up to 38 × 15 mm, with up to 4 pinnule pairs; petioles up to 4 mm long. **Pinnules** obliquely spathulate or forked into lobes, up to 10 × 1.2 mm, glabrous adaxially, abaxially sparsely scaled, up to 1.3 mm long. **Sori** cupuliform, borne terminally on each lobe, acentric, up to 1.5 mm long. **Indusium** entire, up to 1 mm wide. Plants epilithic or epiphytic in evergreen forests, alt. 50–1 800 m; Indigenous Forests (Kokstad to Alexandria).

4b Stipe and rachis sulcus not centrally ridged

adiantum-nigrum L.

Black spleenwort, black maidenhair; *lehorometso* (SS)

Rhizome short-decumbent, up to 55 mm long, up to 7 mm in diam., with persistent fleshy trophopodia and reddish brown, narrowly lanceolate-flagellate to oblong-flagellate scales, up to 6 × 1 mm. **Fronds** erect to arching, up to 430 mm long. **Stipe** firm, castaneous, to deep reddish brown, with slightly thickened, often greenish trophopodia, sparsely scaled, up to 280 × 2 mm. **Lamina** up to 2-pinnate-pinnatifid, lanceolate to ovate, up to 230 × 100 mm, with up to 10 widely spaced pinna pairs. **Pinnae** ovate to lanceolate, up to 1-pinnate-pinnatifid, up to 70 × 40 mm; petioles up to 8 mm long. **Pinnules** firmly herbaceous, narrowly trullate to oblong, proximally shallowly lobed, lobes with narrow acute teeth, glabrous adaxially, abaxially with scattered oblong scales along veins. **Sori** linear, up to 4 mm long. **Indusium** entire to erose. In scrub on mountain slopes and along streams, also in forest margins, alt. 50–1 800 m; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Tsitsikamma).

aethiopicum (Burm.f.) Bech.

African spleenwort

Rhizome short-decumbent, up to 7 mm in diam., with ferruginous to dark brown, linear-attenuate, hair-pointed scales, up to 9 × 1.6 mm. **Fronds** caespitose, up to 700 mm long. **Stipe** brown, up to 100 mm long, up to 2 mm in diam., variously scaled. **Lamina** firmly herbaceous to thinly coriaceous, oblong to lanceolate-attenuate, up to 480 × 200 mm, 2-pinnate to 4-pinnatifid, with up to 12 pinna pairs. **Pinnae** divided into narrowly obovate to narrowly oblong segments, irregularly incised, subglabrous adaxially, variously scaled abaxially. **Sori** linear, of irregular lengths, up to 9 mm long. **Indusium** subentire, membranous, up to 0.4 mm wide. On forest floors, in scrub and on cliffs, alt. 0–1 800 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Tsitsikamma).
Various subspecies are recognised.

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

False resurrection fern

Rhizome short-decumbent to erect, up to 10 mm long, up to 4 mm in diam., with crowded stipe bases and clathrate, centrally dark brown to black scales with pale ferruginous margins, ovate to lanceolate, up to 3 × 1 mm, margins proximally denticulate, often also with glands and short or long outgrowths. **Fronds** crowded, caespitose, up to 180 mm long. **Stipe** dark brown to black, firm, up to 30 mm long, up to 1.3 mm in diam., terete or distally adaxially slightly flattened, densely scaled; scales ovate to lanceolate, up to 3.5 × 1.2 mm. **Lamina** narrowly ovate to narrowly obovate, up to 130 × 40 mm, pinnatisect. **Rachis** proximally dark brown to black, adaxially turning green towards lamina apex, proximally terete or adaxially flattened, shallowly sulcate towards lamina apex, mostly narrowly green-winged higher up, proximally moderately scaled adaxially, densely scaled abaxially; segments pale to dark green, firmly herbaceous, patent, alternate, adnate, oblong-obtuse, lanceolate-obtuse, ovate-obtuse, to transversely broadly ovate towards lamina base, decurrent at base, up to 25 × 9 mm, entire or shallowly irregularly lobed, repand, or unevenly shallowly lobed, glabrous adaxially, densely scaled abaxially. **Sori** up to 10 pairs per segment, linear, up to 2.5 mm long. **Indusium** obsolete. Rock crevices, scrub, and forest floor, alt. 50–1 200 m; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (East London to Tsitsikamma).

cordatum (Thunb.) Sw.

Resurrection fern

Rhizome short, up to 4 mm in diam., with dark brown, lanceolate-acuminate, irregularly fimbriate scales, up to 3.5 mm long. **Fronds** caespitose, suberect or spreading, thinly coriaceous, involute when dry, up to 100 mm long. **Stipe** dark brown, up to 15 mm long, densely set with brown ovate-lanceolate, acuminate scales. **Lamina** pinnatifid to 2-pinnate, elliptic to narrowly elliptic, up to 85 × 24 mm. **Pinnae** narrowly oblong, up to 28 × 9 mm, adnate to auriculate, weakly undulate, glabrous adaxially, densely scaled abaxially, scales ovate-acuminate to lanceolate, imbricate. **Sori** linear, up to 2.5 mm long. **Indusium** wanting. Rock crevices and boulder bases in drier situations, alt. 50–1 600 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt, Drakensberg Grassland, Lower Karoo, Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Port St Johns, Willowmore and to Tsitsikamma).

lobatum Pappe & Rawson

Lobed spleenwort

Rhizome erect to suberect, up to 20 mm long, up to 4 mm in diam., with crowded stipe bases and scales; scales atrocastaneous, subulate to narrowly lanceolate, up to 5 × 0.7 mm, with short filiform outgrowths. **Fronds** caespitose, erect to arching, up to 475 mm long. **Stipe** firm, castaneous, terete, up to 120 mm long, up to 1.2 mm in diam., narrowly green-winged for most of the length, initially with hairs and scales, subglabrous later; scales atrocastaneous, subulate to filiform, up to 5 × 0.7 mm. **Lamina** 2-pinnate, narrowly elliptic, up to 360 × 85 mm, with up to 23 petiolate pinna pairs. **Pinnae** basally more widely spaced, ovate to narrowly ovate, up to 45 × 16 mm, with up to 5 pinnule pairs; petioles up to 1 mm long. **Pinnules** herbaceous, sessile, rhomboid to flabellate, coarsely serrate or divided into 2-fid or 3-fid lobes, up to 12 × 10 mm, glabrous adaxially and abaxially. **Sori** linear, up to 3.5 mm long. **Indusium** linear, entire, up to

3.5 × 0.3 mm. Plants terrestrial or epilithic, in evergreen forests, alt. 50–500 m; Indigenous Forests (Mthatha to Tsitsikamma).

simii A.F.Braithw. & Schelpe

Sim's spleenwort

Rhizome short-creeping, up to 7 mm in diam., with tufted fronds and dark brown, narrowly lanceolate scales, tapering to a long hair-point, up to 12 mm long, entire. **Fronds** tufted, erect to arching, up to 160 mm long. **Stipe** dark brown, glabrous at maturity, up to 230 mm long, scaled. **Lamina** 1- or 2-pinnate, linear-lanceolate, up to 280 × 90 mm, with up to 10 pinna pairs. **Pinnae** coriaceous, broadly obcuneate, becoming increasingly more pinnatifid towards base; basal pinnae pinnatifid into distinct obcuneate pinnules; apices acute to acuminate. **Pinnules** petiolate, apices irregularly serrate to incised, glabrous on both surfaces except for small, blackish, twisted scales near lobe bases along the costae and on rachis. **Sori** linear, up to 12 mm long. **Indusium** linear, entire. Plants low-level epiphytes on forest floors, alt. 100–500 m; Indigenous Forests (Port Edward to Tsitsikamma).

splendens Kunze

Splendid spleenwort

Rhizome long-creeping, up to 5 mm in diam., with brown to dark brown, subulate to lanceolate-attenuate scales, up to 6 mm long. **Fronds** spaced up to 20 mm apart, erect or arching. **Stipe** dark brown abaxially, green adaxially, sulcate, up to 235 mm long, glabrous or with brown hair-like scales. **Lamina** 2- or 3-pinnate, ovate-triangular, up to 500 × 225 mm, with 8–16 alternate pairs, lowest pinna pair not or hardly reduced. **Pinnae** petiolate, acute to acuminate, up to 110 × 80 mm, with up to 14 alternate pinnules. **Pinnules** short-petiolate, semi-circular, rhomboid or trapezoid, with rounded or triangular lobes with obtuse to acute dentate apices, up to 14 × 12 mm. **Sori** linear, up to 5 mm long. **Indusium** linear, membranous, entire. Plants terrestrial, epilithic, or low-level epiphytes in evergreen forests, alt. 0–800 m; Indigenous Forests (Kokstad to Grahamstown).

stoloniferum Bory

Running spleenwort

Rhizome up to 5 mm long, up to 2 mm in diam., erect to suberect, with black lanceolate scales, up to 1.5 mm long. **Fronds** caespitose, pale green, thinly herbaceous, arching, up to 140 mm long, regularly with green, stolon-like, efoliate fronds up to 200 mm long, rooting at rachis apex and producing new plants. **Stipe** filiform, green, up to 75 mm long. **Lamina** linear, decrescent towards base and apex, 1-pinnate, up to 150 × 13 mm, with up to 20 pinna pairs. **Pinnae** sessile, cuneate-obovate or rhomboid to rectangular, glabrous, with 3–7 teeth at outer margin. **Sori** 1–3 per pinna, up to 1.5 mm long. **Indusium** narrowly elliptic, entire, up to 0.8 mm wide. At boulder bases in grasslands, on low cliffs, and evergreen forests, alt. 400–1 600 m; Indigenous Forests (Kokstad to Alexandria).

trichomanes L.

Maidenhair spleenwort; *lehorometso* (SS)

Rhizome erect, up to 3 mm in diam., with dark brown to black lanceolate scales with pale margins, up to 4 × 1.5 mm. **Fronds** many, caespitose, erect to spreading, up to 110 mm long. **Stipe** black, wiry, brittle, up to 20 mm long. **Lamina** 1-pinnate, linear, up to 100 mm long, with up to 32 pinna pairs. **Pinnae** sessile, broadly oblong-circular, shallowly crenate, up to 6 × 3.5 mm, herbaceous, glabrous adaxially, sparsely scaled

abaxially, more widely spaced and reduced towards base. **Sori** 2–7 per pinna. **Indusium** oblong, erose. On cliffs and boulders in evergreen forests, at boulder bases and on cliffs, alt. 600–1 800 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Drakensberg Grassland, Upper Karoo (Kokstad to Graaff-Reinet).

varians Wall. ex Hook. & Grev.

Rhizome erect, with black, lanceolate scales, up to 5 mm long. **Fronds** caespitose, erect or arching, up to 165 mm long. **Stipe** green, brown at base, up to 70 mm long, with filiform twisted, hair-like scales towards base. **Lamina** 2-pinnatifid to 2-pinnate, narrowly elliptic, up to 130 × 32 mm, with up to 10 pinna pairs. **Pinnae**: the lower usually only slightly reduced, obovate to oblong, mostly pinnatifid, with acroscopic enlarged basal pinnules, unequally cuneate, up to 25 × 10 mm. **Pinnules** of pinnatifid lobes cuneate, flabellate, with sharply dentate outer margins, glabrous, up to 7.5 × 5 mm. **Sori** up to 4 mm long, 2–6 per pinnules or lobe. **Indusium** linear, membranous. Plants terrestrial or epilithic in seasonally moist, evergreen forests, alt. 50–1 600 m; Indigenous Forests (Kokstad to Somerset East).

ATHYRIACEAE

A family of ± 500 species belonging to 5 genera. The family chiefly occurs in the tropics and temperate parts of the world with East and Southeast Asia and adjacent Himalayas the centre of species diversity.

Rhizome erect to suberect; lamina to 3-pinnate; indusium J-shaped, up to 1 mm long..... **Athyrium**
Rhizome wide-creeping; lamina to 1-pinnate-pinnatifid; indusium linear, up to 3 mm long..... ***Deparia**

ATHYRIUM Roth

Glade ferns

Species ± 180, near cosmopolitan, mostly in E and SE Asia; 3 in sthn Afr., LIM, M, FS, KZN, L, EC.

schimperi Moug. ex Fée

Rhizome shortly creeping, irregularly branched, up to 120 mm long, up to 5 mm in diam., with persistent stipe bases and scales; scales ferruginous, narrowly triangular, up to 9 × 3 mm. **Fronds** erect, crowded, up to 730 mm long. **Stipe** reddish when fresh, drying stramineous, firm, sulcate adaxially, up to 230 mm long, up to 5 mm in diam., scaled at base, near-glabrous higher up, scales ferruginous, filiform to narrowly triangular, up to 8 × 1.6 mm. **Lamina** narrowly elliptic, up to 525 × 245 mm, up to 3-pinnate. **Rachis** reddish when fresh, drying stramineous, sulcate adaxially and often closely set with unicellular glands, sparsely scaled; scales ferruginous, linear to filiform, up to 4 mm long. **Pinnae** short-petiolate, up to 2-pinnate, inequilateral, ovate to lanceolate, up to 135 × 60 mm, acroscopically developed, with up to 4 basal pinna pairs gradually reduced. **Pinnules** up to 1-pinnate, acroscopically developed, inequilaterally narrowly trullate to narrowly ovate, up to 45 × 20 mm; segments firmly herbaceous, dark green, inequilaterally narrowly elliptic to oblong, strongly dentate, glabrous adaxially and abaxially; venation evident. **Sori** J-shaped, or circular, up to 1.5 mm long, on vein branches. **Indusium** pale brown to hyaline, erose, often with few glands near base. At base of cliffs and among boulders in grasslands, alt. 500–1 000 m; Drakensberg Grassland (Hogsback to Stutterheim).

*DEPARIA Hook. & Grev.

Species ± 40, widespread in temperate and tropical parts of the Old World; 1 introduced in sthn Afr., KZN, EC.

japonica (Thunb.) M.Kato

Japanese lady fern; *Japanese damesvaring* (A)

Rhizome creeping, branched, up to 120 mm long, up to 5 mm in diam., with fronds up to 15 mm apart, scales castaneous to ferruginous, lanceolate to narrowly ovate, up to 5 × 1 mm. **Fronds** erect to arching, up to 450 mm long, up to 6 per plant. **Stipe** atro-castaneous, firm, shallowly sulcate adaxially, up to 300 mm long, up to 2.2 mm in diam., with scales and hairs; scales similar to those on rhizome; hairs acicular or cylindrical, up to 0.8 mm long. **Lamina** 1-pinnate-pinnatifid, ovate, up to 310 × 280 mm. **Rachis** sulcate adaxially, densely set with scales and hairs similar to those on stipe. **Pinnae** firmly herbaceous, pinnatifid, basally more widely spaced, basal pinnae not reduced, narrowly lanceolate to oblong-acuminate, up to 168 × 40 mm, basal pinna pair often basiscopically developed. **Pinnules** oblong-cuneate to oblong-obtuse, up to 31 × 10 mm, crenulate, adaxially regularly set with pluricellular acicular hairs along and between veins, abaxially moderately set with acicular hairs along veins; venation evident, pinnately branched, free. **Sori** linear, up to 3 mm long, often back-to-back, usually on acroscopic vein branches. **Indusium** stramineous, linear, up to 3 × 0.3 mm, fimbriate, often with acicular and cylindrical hairs terminating in an enlarged gland-like cell occurring on the surface. Mostly in moist and shaded areas along streams and rivers, but also in sinkholes along drainage lines, alt. 200–400 m; Indigenous Forests (Port Edward to Mkambati).

BLECHNACEAE

A family of ± 150–240 species belonging to 2–9 genera. The family has a nearly world-wide distribution but *Blechnum*, the largest genus in the family, has most representatives in the southern hemisphere.

Rhizome widely creeping, with widely spaced fronds; sori exindusiate ..... **Stenochlaena**
Rhizome erect to short decumbent, with crowded fronds; sori indusiate..... **Blechnum**

BLECHNUM L.

(incl. *DOODIA* R.Br.)

Deer fern

Species ± 160, nearly cosmopolitan; 6 (1 naturalised) in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

Pinnae adnate

attenuatum (Sw.) Mett.

Large deer fern

Rhizome short-decumbent, up to 12 mm in diam., with stipe bases and ferruginous, lanceolate to subulate scales, up to 22 × 2 mm, margins with glands and hairs. **Fronds** arching, dimorphic, the fertile generally overtop the sterile; sterile up to 1.24 m long; fertile short-lived. **Stipe** firm; sterile up to 175 mm long, up to 10 mm in diam.; fertile up to 180 mm long, up to 6 mm in diam., proximally densely set with ferruginous, linear-flagelliform scales, up to 18 × 1.2 mm, margins with glands and hairs. **Lamina** pinnatisect; sterile elliptic, up to 1.2 m × 340 mm; fertile elliptic, up to 650 × 170 mm.

Pinnae sterile herbaceous to subcoriaceous, adnate, linear-attenuate to triangular, entire, with an abruptly widened base, glabrous adaxially and abaxially, up to 195 × 15 mm; fertile herbaceous, adnate, entire or shallowly and irregularly lobed, up to 150 × 2.5 mm, with an abruptly widened base, glabrous adaxially. **Sori** linear, extending from above base to near apex of fertile pinnae. **Indusium** linear, erose. Plants terrestrial, epilithic or epiphytic at moist to wet, shaded streambanks, often in forests, alt. 100–800 m; Indigenous Forests (Kokstad to Knysna).

inflexum (Kunze) Kuhn

Rhizome suberect to erect, up to 140 mm long, up to 6 mm in diam., with stipe bases and ferruginous scales, up to 15 × 1 mm, with marginal outgrowths. **Fronds** erect to suberect, dimorphic, the sterile overtop the fertile; sterile up to 440 mm long; fertile up to 335 mm long. **Stipe** firm, castaneous to stramineous; sterile up to 175 mm long, up to 2.5 mm in diam.; fertile up to 130 mm long, up to 2.5 mm in diam., proximally densely scaled; scales ferruginous, subulate, up to 23 × 3 mm, entire or with retrorse outgrowths. **Lamina** pinnatisect; sterile narrowly elliptic to oblong-acute, up to 340 × 87 mm; fertile narrowly obovate to oblong-acute, up to 340 × 35 mm, with up to 30 petiolated pinna pairs. **Pinnae** herbaceous, adnate; sterile oblong-acute to oblong-obtuse, with an abruptly enlarged base, up to 46 × 10 mm fertile linear, closely spaced, up to 37 × 1 mm, adaxially and abaxially initially closely set with scales similar to, but shorter than, those on rachis, glabrous to subglabrous later. **Sori** linear, extending entire pinna length. **Indusium** linear, repand, with pluricellular projections, up to 1 mm wide. Plants terrestrial, at moist streambanks and forest margins, alt. 600–1 200 m; Drakensberg Grassland, Sub-Escarpment Grassland (Amatole Mts).

Pinnae petiolate

australe L.

Southern deer fern

Rhizome short-decumbent, up to 4 mm in diam., with stipe bases and castaneous, lanceolate to narrowly ovate scales, up to 7 × 1.5 mm, with outgrowths. **Fronds** erect to arching, dimorphic, the fertile generally overtop the sterile; sterile up to 540 mm long; fertile up to 560 mm long. **Stipe** firm; sterile up to 140 mm long, up to 1.2 mm in diam.; fertile up to 150 mm long, up to 1.2 mm in diam., initially sparsely scaled; scales ferruginous to stramineous, lanceolate to ovate, up to 6 × 1.3 mm, with irregular outgrowths. **Lamina** 1-pinnate; sterile narrow-elliptic, up to 395 × 80 mm; fertile narrow elliptic, up to 410 × 80 mm. **Pinnae** herbaceous, adaxially glabrous or with glands, abaxially sparsely set with filiform scales along costa, often also with glands; sterile oblong-acute, often falcate, often acroscopically auricled, mucronate, margins with minute transparent teeth, up to 43 × 9.5 mm; fertile linear, auriculate, mucronate, up to 37 × 2.5 mm. **Sori** linear, extending most of pinna length. **Indusium** linear, repand. Plants terrestrial or epilithic on rock crevices, forest floors, and at boulder bases in grasslands, alt. 100–1 700 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Knysna).

capense Burm.f.

Cape deer fern

Rhizome short-decumbent, irregularly branched, up to 12 mm in diam., with stipe bases and ferruginous to stramineous, adnate, triangular to lanceolate scales, up to 10 × 4 mm, entire. **Fronds** crowded, erect, dimorphic, the fertile generally overtop the sterile; sterile

up to 1.04 m long; fertile up to 1.28 m long. **Stipe** firm, castaneous to ferruginous; sterile up to 400 mm long, up to 7 mm in diam.; fertile up to 655 mm long, up to 8 mm in diam., initially scaled; scales stramineous, linear-flagelliform to filiform, up to 22 × 1.5 mm, entire. **Lamina** 1-pinnate; sterile elliptic, up to 645 × 210 mm, with up to 21 pinna pairs; fertile elliptic, up to 630 × 170 mm, with up to 20 pinna pairs. **Pinnae** herbaceous; sterile oblong-cuneate, up to 116 × 19 mm, serrate; fertile linear, up to 142 × 3 mm, adaxially initially with ferruginous to stramineous, filiform scales, abaxially variously set with scales along costa; scales ferruginous, lanceolate-flagellate to ovate-flagellate, up to 4 × 1.2 mm. **Sori** linear, extending entire length of pinnae. **Indusium** linear, repand to lacerate. Plants terrestrial, forming large stands along streambanks, alt. 100–1 400 m; Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket (Kokstad to Knysna).

punctulatum Sw.

Rhizome short-decumbent, up to 10 mm in diam., with stipe bases and concolorous or bicolorous, linear-flagelliform scales, up to 20 × 2 mm, margins with long outgrowths. **Fronds** caespitose, erect to arching, dimorphic, the fertile generally overtop the sterile; sterile up to 850 mm long; fertile up to 1.09 m long. **Stipe** proximally castaneous; sterile up to 180 mm long, up to 4.5 mm in diam.; fertile up to 145 mm long, up to 5 mm in diam., initially densely scaled. **Lamina** 1-pinnate; sterile narrow-elliptic, up to 800 × 175 mm, with up to 36 pinna pairs; fertile narrow-elliptic, up to 950 × 187 mm, with up to 45 pinna pairs. **Pinnae** herbaceous, attenuate towards base and apex; sterile narrow-triangular to oblong-obtuse, entire, auriculate, adaxially glabrous, abaxially sparsely set with filiform scales, up to 1.3 mm long; fertile linear, up to 96 × 3 mm, entire. **Sori** linear, extending most of length of pinna. **Indusium** near-marginal, linear, repand. Plants terrestrial, epilithic in moist forests or lithophytic, alt. 250–1 200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Knysna).

tabulare (Thunb.) Kuhn

Mountain deer fern

Rhizome erect or decumbent, up to 900 mm long, up to 100 mm in diam., with stipe bases and concolorous and/or bicolorous, lanceolate-flagelliform to linear-attenuate scales, up to 23 × 3 mm, entire or with short outgrowths near base. **Fronds** caespitose, erect, dimorphic, the fertile usually overtop the sterile; sterile up to 1.2 m long; fertile up to 1.25 m long. **Stipe** rigid, proximally castaneous; sterile up to 60 mm long, up to 6 mm in diam.; fertile up to 110 mm long, up to 8 mm in diam., with glands and scales. **Lamina** 1-pinnate; sterile oblong-obtuse to oblong-acute, up to 1 100 m × 300 mm, with up to 14 free pinna pairs; fertile oblong-obtuse, up to 1 140 m × 230 mm, with up to 42 pinna pairs. **Pinnae** coriaceous; sterile oblong-cuneate, up to 190 × 17 mm, entire; fertile linear, up to 215 × 4 mm, adaxially with glands, abaxially with glands and scales; scales initially closely set along costa, ferruginous to stramineous, lanceolate-flagelliform to filiform, up to 11 × 0.5 mm, entire or with scattered outgrowths. **Sori** linear, extending most of pinna length. **Indusium** near-marginal, linear, lacerate. Plants terrestrial on exposed moist slopes, alt. 300–1 200 m; Sub-Escarpment Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Indigenous Forests (Kokstad to Knysna).

BLECHNACEAE

***zeelandicum** Christenh.
(= *Doodia squarrosa* Colenso)

Rhizome erect to suberect, up to 40 mm long, 3 mm in diam., closely set with stipe bases and filiform scales. **Fronds** caespitose, erect to arching, up to 400 mm long. **Stipe** rigid, castaneous, stramineous higher up, up to 170 mm long and 1 mm in diam., sulcate adaxially. **Lamina** pinnatifid to 1-pinnate, narrowly elliptic to oblong-acuminate, up to 250 × 40 mm. **Pinnae** herbaceous; sterile oblong-acute, up to 22 × 7 mm, serrate; fertile up to 42 × 4 mm, serrate. **Sori** linear, up to 4 mm long, medial, along interrupted vascular commissure. **Indusium** linear, entire, opening towards costa. Plants terrestrial, along moist streambanks, alt. 50–150 m; Indian Ocean Coastal Belt, Indigenous Forests (Mtentu River).

STENOCHLAENA J.Sm.

Species 6, palaeotropics; 1 in sthn Afr., M, KZN, EC.

tenuifolia (Desv.) T.Moore
Vine fern

Rhizome widely creeping along ground, or ascending rocks and trees up to 25 m high, up to 8 mm in diam., sparsely scaled. **Fronds** widely spaced, arching; sterile up to 1.8 m long; fertile up to 1.6 m long and mostly borne near rhizome apices, exposed to strong light. **Stipe** up to 600 mm long, up to 6 mm in diam. **Lamina**: sterile imparipinnate, up to 1.5 m long; fertile 1- or 2-pinnate, up to 1.2 m long. **Pinnae**: sterile firmly herbaceous, oblong-acuminate, up to 260 × 30 mm, serrate; fertile linear, up to 100 × 2 mm, entire. **Sori** extending length of pinnae, near marginal; exindusiate. Plants terrestrial, confined to coastal swamp forests, mostly near sea level; Indigenous Forests (Port Edward to Port St Johns).

CYATHEACEAE

A family of ± 650 species belonging to 4 genera. Most species occur in the montane tropics with some extending to the south and north temperate parts of the world.

Scales with narrow central cells and a broad margin of differentially shaped cells ..... **Alsophila**
Scales with all cells essentially similar, with marginal setae ..... ***Sphaeropteris**

ALSOPHILA R.Br.

Tree fern

Species ± 235, Old World tropics and subtropics; 2 in sthn Afr., NW, LIM, G, M, S, FS, KZN, L, WC, EC.

capensis (L.f.) J.Sm.
[= *Cyathea capensis* (L.f.) Sm.**]**

Cape tree fern, forest tree fern, slender tree fern; *bosboomvaring* (A)

Caudex slender, up to 3 m high, up to 100 mm in diam., covered by adventitious roots. **Fronds** up to 16 per plant, caespitose, arching, up to 1.8 m long. **Stipe** greenish brown, up to 80 mm long, up to 8 mm in diam., proximally densely scaled, larger scales bicolorous, central region crustaceous, castaneous, margins membranous, stramineous, narrowly lanceolate-acuminate, up to 12 × 1.5 mm. **Lamina** ovate to elliptic, 2-pinnate-pinnatifid, up to 1.6 × 0.67 m, with up to 14 pinna pairs. **Pinnae** petiolate, basal pinna pair

(aphlebia) curled, ovate, 1- or 2-pinnate, segments thinly herbaceous, much reduced, up to 170 × 110 mm, always forming a tangled mass in the crown, pinnae higher up to 1-pinnate-pinnatifid, lanceolate to oblong-acuminate, up to 340 × 130 mm, with up to 20 petiolate pinnule pairs. **Sori** up to 3 pairs on each segment, circular. **Indusium** cupular to flabellate, repand to irregularly lobed. Plants terrestrial or epilithic in moist forests in ravines, alt. 350–1 200 m; Indigenous Forests (Stutterheim to Alexandria and Knysna).

dregei (Kunze) R.M.Tryon
(= *Cyathea dregei* Kunze)

Common tree fern, eastern tree fern; *gewone boomvaring* (A); *isihihi*, *umgomgom* (X); *isikhomakhoma*, *umphanga* (Z)

Caudex stout, erect, simple, up to 3 m high, up to 450 mm in diam., covered with adventitious roots. **Fronds** up to 30 per plant, caespitose, arching, up to 2.2 m long. **Stipe** greenish brown, variously tuberculate, up to 410 mm long, up to 15 mm in diam., proximally densely scaled; scales castaneous, subulate, up to 25 × 5.5 mm, margins short-fimbriate. **Lamina** elliptic, 1- or 2-pinnate-pinnatifid, up to 2 × 0.7 m, with up to 18 pinna pairs. **Pinnae** 1-pinnate-pinnatifid, oblong-acute to lanceolate, up to 430 × 150 mm, with up to 20 pinnule pairs; petioles up to 5 mm long. **Sori** up to 9 pairs per segment, circular. **Indusium** cupuliform, surrounding receptacle base. Plants terrestrial, at streambanks in grassland, alt. 900–1 200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests (Kokstad to Stutterheim).

***SPHAEROPTERIS** Bernh.

Tree fern

Species ± 100, mostly in SE Asia, extending to Australia, few in the Neotropics; 1 naturalised in sthn Afr., KZN, WC, EC.

cooperi (Hook. ex F.Muell.) R.M.Tryon

Scaly tree fern, lacy tree fern, Australian tree fern

Caudex erect, simple, up to 5 m high, up to 200 mm in diam., lower part thickened and covered by adventitious roots, with ovate stipe base scars higher up. **Fronds** up to 20 per plant, caespitose, arching, up to 4 m long. **Stipe** greenish brown, up to 950 mm long and 25 mm in diam., initially densely scaled, basal scaled up to 50 × 5 mm, chartaceous, pale brown, margins closely set with short and dark setae. **Lamina** elliptic, up to 3-pinnate, up to 3 × 1.4 m. **Pinnae** 1-pinnate-pinnatifid to 2-pinnate, narrowly ovate to ovate, up to 630 × 230 mm; petioles up to 40 mm long. **Pinnules** pinnatifid to 1-pinnate, oblong-acuminate, up to 120 × 30 mm; segments herbaceous, oblong-obtuse, up to 17 × 3 mm, falcate, denticulate, adaxially with rigid, curved hairs along the costae and costules, abaxially with reddish brown, fimbriate scales along the costae and costules; venation evident, branches once forked. **Sori** up to 11 pairs per segment, circular, up to 1.4 mm in diam. **Indusium** absent, scales with marginal setae around receptacle base. Plants terrestrial, at streambanks and seepage areas in forests, alt. 50–200 m; Indigenous Forests (Tsitsikamma to Humansdorp).

CYSTOPTERIDACEAE

A family of ± 25 species belonging to 4 genera, most of them centred in the northern hemisphere with species extending to high altitudes in the tropics.

CYSTOPTERIS Bernh.

Species ± 12, in temperate zones and alpine regions of the tropics; 1 in sthn Afr., LIM, M, FS, KZN, L, WC, EC.

fragilis (L.) Bernh.

Bladder fern

Rhizome decumbent, branched, up to 65 mm long, up to 4 mm in diam., with persistent trophopodia up to 7 mm long, and scales; scales ferruginous, narrowly-lanceolate, up to 5 × 0.8 mm. **Fronds** closely spaced, erect. **Stipe** ferruginous at base, stramineous higher up, fragile, adaxially sulcate higher up, up to 255 mm long, up to 2 mm in diam., with few-celled uniseriate hairs up to 3 mm long, and oblong to filiform scales near base. **Lamina** lanceolate, up to 255 × 145 mm, up to 3-pinnate. **Rachis** stramineous, green towards apex, adaxially sulcate in basal part, distally ridged and narrowly winged, variously set with hairs similar to those on stipe. **Pinnae** glabrous, basal 1 or 2 pinna pairs reduced or not, up to 2-pinnate, lanceolate to ovate, up to 85 × 45 mm. **Pinnules** pale green, thinly herbaceous, ovate to lanceolate, up to 28 × 18 mm, somewhat acroscopically developed, up to 1-pinnate; segments elliptic to oblong, up to 8 × 6 mm, lobed; lobes acute to emarginated, glabrous adaxially, often with few oblong unicellular hairs along veins and pinnule margins; venation free, evident. **Sori** circular, up to 1.2 mm in diam., receptacle elevated. **Indusium** hyaline, elliptic, clasping receptacle base, with oblong unicellular glands along margin. On moss-covered rocks in forests to sheltered rock crevices on cliffs, alt. 900–1 600 m; Sub-Escarpment Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Kokstad to Grahamstown).

DAVALLIACEAE

A family of ± 50 species belonging to 2 genera. Most species are centred in the tropical and oceanic areas of Asia with few species extending to Africa, Macronesia and SE Europe.

DAVALLIA J.Sm.

Species ± 30, palaeotropics; 1 in sthn Afr., LIM, M, KZN, EC.

chaerophylloides (Poir.) Steud.

Rabbit's foot fern

Rhizome widely creeping, dorso-ventrally flattened, up to 8 mm in diam., with 2 rows of alternating phyllopodia up to 4 mm long, with reddish brown scales that are blackish at point of attachment, narrow-lanceolate, peltate, with short outgrowths formed by projections of 2 adjacent cells, up to 6 × 1 mm. **Fronds** articulated to short phyllopodia, up to 1.1 m long. **Stipe** firm, adaxially convex with dorso-lateral ridges, initially sparsely scaled, glabrous later, up to 380 mm long, up to 3 mm in diam. **Lamina** up to 4-pinnate, broadly ovate to deltoid, up to 750 × 380 mm. **Pinnae**, pinnules, and segments petiolate; alternate and widely spaced, acroscopically developed; segments herbaceous, lanceolate, glabrous, up to 40 × 18 mm, 1-pinnate to pinnatifid. **Sori** mostly borne on distal part of lamina, at ultimate forking of veins, lamina generally extending into a tooth at both sides of sorus, the outer tooth mostly longer than the inner. **Indusium** pouch-shaped, entire. Exposed or shaded rock crevices, alt. 50–150 m; Indian Ocean Coastal Belt (Port Edward to Port St Johns).

NOOTEBOOM, H.P. 1994. Notes on Davalliaceae II. A revision of the genus *Davallia*. *Blumea* 39, 1/2: 151–214.

DENNSTAEDTIACEAE

A family of ± 160 species belonging to 10 genera. The family is cosmopolitan in distribution. Whilst some genera has a chiefly tropical distribution, others are temperate in distribution extending to higher altitudes in the tropics.

1a Venation always free; sori circular, born terminally on anterior vein branches ..... **Hypolepis**
1b Venation regular with some anastomoses:
2a Lamina glabrous ..... **Histiopteris**
2b Lamina variously haired adaxially and/or abaxially:
3a Lamina hairs acicular; sori lunate, confined to segment and lobe sinuses ..... **Blotiella**
3b Lamina hairs not acicular; sori linear, along a continuous or near-continuous vascular commissure along the segment margins..... **Pteridium**

BLOTIELLA R.M.Tryon

Species ± 15, tropical America, Africa and Madagascar; 2 in sthn Afr., LIM, M, S, KZN, WC, EC.

glabra (Bory) R.M.Tryon

Smooth lance fern

Rhizome massive, erect to suberect, up to 300 mm long, up to 25 mm in diam., with closely spaced stipe bases and hairs; hairs ferruginous, acicular, up to 6 mm long. **Fronds** caespitose, arching, up to 6 per plant, up to 2.2 m long. **Stipe** proximally castaneous, up to 930 mm long, up to 10 mm in diam.; initially densely haired, hairs up to 10 mm long. **Lamina** oblong-ovate to elliptic, 1-pinnate-pinnatifid, up to 1.3 × 0.7 m, with up to 12 petiolated pinna pairs. **Pinnae** lanceolate to elliptic-acuminate, pinnatifid, incised to nearly the same depth from apex to base, up to 430 × 200 mm; petioles up to 4 mm long; segments adnate, narrowly lanceolate to oblong-acuminate, up to 105 × 26 mm, lobed; adaxially and abaxially with acicular hairs along veins and segment margins. **Sori** semi-circular to lunate, confined to segment and lobe sinuses, along a C-shaped, up to 3 mm in diam., near-marginal, vascular commissure. **Indusium** a poorly modified, reflexed margin, up to 0.3 mm wide, entire. Plants terrestrial in moist, shaded forest floors, alt. 100–600 m; Indigenous Forests (Port St Johns to Knysna).

natalensis (Hook.) R.M.Tryon

Natal lance fern, lance fern

Rhizome massive, erect. **Fronds** caespitose, arching, up to 2 m long. **Stipe** proximally castaneous, up to 1 m long, up to 10 mm in diam., with soft hairs on a slightly raised base. **Lamina** thinly pubescent, 2-pinnatifid to 2-pinnate, lanceolate, up to 1.5 × 0.7 m. **Pinnae** proximal pinnae petiolate, oblong-acuminate, up to 530 mm long, incised into adnate to sinuate lobes; thinly pubescent. **Sori** subcircular, in marginal sinuses of pinna segments. **Indusium** membranous. Plants terrestrial on wet forest floors and stream-banks, alt. 150–400 m; Indigenous Forests (Port St Johns to Knysna).

HISTIOPTERIS (J.Agardh) J.Sm.

Species ± 1, pantropical and temperate, also in sthn Afr., M, KZN, WC, EC.

incisa (Thunb.) J.Sm.

Rhizome widely creeping, up to 5 mm in diam., sparsely scaled. **Fronds** spaced, arching, up to 2 m long. **Stipe** glabrous, up to 600 mm long, up to 5 mm in diam. **Lamina**

broadly lanceolate, pinnatifid to 2-pinnatifid, up to 1.3 × 0.8 m. **Pinnae** near opposite, sessile; proximal pinnae segments auriculate and developed close to rachis; ultimate lobes oblong, entire to sinuate. **Sori** linear, along margins of ultimate lobes. **Indusium** entire. Plants terrestrial at moist streambanks, alt. 180–800 m; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Kokstad to Plettenberg Bay).

HYPOLEPIS Bernh.

Species ± 40, pantropical; 2 in sthn Afr., LIM, M, S, KZN, WC, EC.

sparsisora (Schrad.) Kuhn

Rhizome widely creeping, terete, up to 8 mm in diam.; initially densely set with brown to ferruginous, acicular hairs, up to 1.5 mm long. **Fronds** up to 110 mm apart, arching, straggling in large plants, up to 3 m long. **Stipe** firm, proximally castaneous to ferruginous, up to 1.2 m long, up to 15 mm in diam.; with soft acicular hairs, often becoming subglabrous or glabrous later. **Lamina** ovate-deltate, up to 4-pinnate-pinnatifid, up to 2.5 × 2 m, with up to 15 petiolated pinna pairs. **Pinnae** ovate to lanceolate, up to 4-pinnate-pinnatifid, basal pinnae conspicuously or not basiscopically developed, up to 1 × 0.5 m; petioles up to 65 mm long; with up to 17 petiolated pinnule pairs. **Sori** near-marginal, proximal on lobes, 1 or 2 pairs per lobe, up to 1.2 mm in diam. when mature. **Indusium** a strongly modified lobe tooth, erose to fimbriate. Plants terrestrial, along streams in forest margins, alt. 200–900 m; Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Plettenberg Bay).

villoso-viscida (Thouars) Tardieu

Rhizome widely creeping, terete, up to 6 mm in diam.; with brown to ferruginous, acicular hairs, up to 2 mm long. **Fronds** up to 90 mm apart on rhizome, erect or arching, straggling in large plants, up to 1.2 m long. **Stipe** ferruginous to purplish, up to 600 mm long, up to 8 mm in diam.; with soft (often fugaceous) or rigid acicular hairs, up to 2 mm long. **Lamina** ovate to deltate, 3-pinnate to 3-pinnate-pinnatifid, with up to 11 petiolated pinna pairs, up to 750 mm long. **Pinnae** ovate to oblong-acuminate, 2-pinnate to 2-pinnate-pinnatifid; petioles up to 43 mm long; with up to 10 petiolated pinnule pairs; segments herbaceous to firmly herbaceous, ovate to ovate-acuminate, pinnatifid to lobed, up to 33 × 28 mm; adaxially and abaxially sparsely to closely set with acicular and glandular hairs. **Sori** near marginal, proximal on ultimate segments, singly or up to 2 pairs per ultimate segment, up to 1.2 mm in diam. when mature. **Indusium** an often strongly modified lobe margin, erose. Plants terrestrial or epilithic at perennial streambanks and seeps, alt. ± 1 500 m; Indigenous Forests (Somerset East to George).

PTERIDIUM Gled. ex Scop.

Bracken fern; *adelaarsvaring* (A)

Species ± 1, cosmopolitan, also in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, WC, EC.

aquilinum (L.) Kuhn

Bracken, bracken fern, eagle fern; *adelaarsvaring* (A)

Rhizome widely creeping, with spaced stipe bases; densely haired, hairs ferruginous, pluricellular, up to 1.7 mm long. **Fronds** widely spaced, erect, the apical part often arching, up to 1.1 m long. **Stipe** rigid, brown, up to 830 mm long, up to 8 mm in diam.; subterranean part closely set with hairs similar to those on rhizome; section

above ground initially closely set with appressed unicellular and pluricellular acicular hairs. **Lamina** oblong-ovate, up to 3-pinnate-pinnatifid, up to 600 × 800 mm, with up to 14 pinna pairs. **Pinnae** up to 2-pinnate-pinnatifid, deltate to broadly ovate, up to 400 × 320 mm; petioles up to 40 mm long; with up to 15 petiolated pinnule pairs; ultimate segments coriaceous, oblong-acute to oblong-obtuse, entire, margins usually revolute, up to 9 × 3 mm; adaxially sparsely haired; abaxially densely haired. **Sori** linear, along a continuous or near-continuous marginal vascular commissure. **Indusium** marginal; the outer linear, stramineous to hyaline, fimbriate, up to 0.9 mm long; the inner indusium partly developed, composed of groups of closely spaced acicular hairs. Plants terrestrial, forming large stands on exposed slopes, alt. 100–1 300 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Tsitsikamma).

ROUX, J.P. 2001. *Hypolepis villoso-viscida* new to the flora of southern Africa. *Bothalia* 31: 195.

DRYOPTERIDACEAE

A family of ± 1 200 species in ± 34 genera occurring worldwide, especially in the old- and new world tropical and subtropical montane areas.

1a Sori exindusiate or indusiate, if indusiate, then peltate:
2a Sporangia acrostichoid, exindusiate..... **Elaphoglossum**
2b Sporangia in round sori, indusiate or exindusiate:
3a Lamina 1-pinnate; venation reticulate..... **Cyrtomium**
3b Lamina 2- or more pinnate; venation free:
4a Basal pinnae never basiscopically developed; stipe and rachis adaxially sulcate..... **Polystichum**
4b Basal pinnae conspicuously basiscopically developed; stipe and rachis sulcus centrally ridged .....
..... **Rumohra**
1b Sori never exindusiate, indusium reniform:
5a Vein branches end in sinuses between teeth..... **Megalastrum**
5b Vein branches end in teeth near margins:
6a Lamina abaxially with short or long, mostly simple uniseriate hairs along the veins..... **Dryopteris**
6b Lamina abaxially with narrow scales along the veins..... **Arachniodes**

ARACHNIODES Blume

East Indian holly ferns

Species ± 50, mostly in central East Asia; 1 in sthn Afr., LIM, M, KZN, EC.

webbiana (A.Braun) Schelpe subsp. **foliosa** (C.Chr.) Gibby, Rasbach, Reichst., Widén & Viane

Rhizome decumbent, up to 100 mm long, 10 mm in diam. **Fronds** closely spaced, arching, up to 900 mm long. **Stipe** brown, firm, up to 440 mm long, up to 4 mm in diam., proximally densely set with brown to reddish brown, lanceolate scales (paleasters), up to 12 × 3 mm, entire. **Lamina** deltoid, up to 460 × 400 mm, up to 4-pinnate, with up to 9 pinna pairs, basal pinna pair largest and strongly basiscopically developed; ultimate segments herbaceous, ovate, up to 13 × 6 mm, dentate, aristate. **Sori** round, up to 1.4 mm in diam. **Indusium** reniform, entire. Mostly on well-drained slopes in forests, alt. 1 200–1 700 m; Indigenous Forests (Kokstad to Hogsback).

DENNSTAEDTIACEAE

CYRTOMIUM C.Presl

Holly ferns

Species ± 12, centred in East Asia, 3 (1 naturalised) in sthn Afr., M, KZN, EC.

*falcatum (L.f.) C.Presl

Japanese holly fern, Asian net-veined holly fern

Rhizome erect to ascending, up to 60 mm long, up to 12 mm in diam., with crowded stipe bases and scales. **Fronds** up to 20 per plant, caespitose, suberect to arching, up to 1.3 m long. **Stipe** dark brown at base, green higher up, firm, proximally convex adaxially, higher up adaxially shallowly sulcate, up to 470 mm long, up to 7 mm in diam., proximally densely scaled, scales ferruginous to castaneous, chartaceous, narrowly elliptic-caudate to narrowly triangular-caudate, margins with twisted filiform outgrowths, larger scales ovate to narrowly ovate, up to 25 × 6 mm, margins with twisted filiform outgrowths. **Laminae** oblong-lanceolate, up to 690 × 210 mm, 1-pinnate, with up to 13 near alternate pinna pairs. **Pinnae** glossy and bright green adaxially, firmly herbaceous to coriaceous, inequilaterally ovate-caudate to lanceolate, often somewhat falcate, acroscopically enlarged and often auriculate, up to 135 × 57 mm, auricle acute, apical pinna as large or larger than lateral pinnae, obliquely ovate-caudate to lanceolate-caudate, often auriculate on one side, narrowly to broadly cuneate, margins irregularly crenate, thickened, glabrous adaxially, abaxially without paleasters and hairs of two types; venation evident adaxially and abaxially, reticulate; petioles up to 6 mm long towards lamina base, sessile higher up. **Sori** more commonly confined to the distal parts of lamina and pinnae, scattered, round, up to 1.2 mm in diam. at maturity. **Indusium** peltate, pale brown, chartaceous, round, up to 1.2 mm in diam. Plants terrestrial or epilithic, confined to rocky coastal areas, alt. 20–200 m; Albany Thicket, Eastern Fynbos-Renosterveld (Port Elizabeth to Tsitsikamma).

luctuosum J.P.Roux

Mourning holly fern

Rhizome ascending to erect, stout, up to 110 mm long, up to 8 mm in diam., with crowded persistent stipe bases and scales; scales ferruginous to castaneous, firmly chartaceous to thinly crustaceous, narrowly triangular, up to 12 × 1.2 mm, margins with short and/or long twisted outgrowths. **Fronds** up to 14 per plant, erect, up to 520 mm long. **Stipe** proximally dark brown, green higher up, firm, up to 210 mm long, up to 3 mm in diam., sulcate adaxially, proximally densely scaled, scales centrally atrocastaneous towards point of attachment and scale apex, margins brown to ferruginous, chartaceous to crustaceous, broadly ovate-caudate to lanceolate-caudate, up to 16 × 7 mm, often somewhat bullate, margins with twisted outgrowths, also with hairs on scale laminae or surfaces. **Laminae** oblong-acute, up to 350 × 130 mm, 1-pinnate, with 4–12 subopposite to alternate pinna pairs that are more widely spaced towards base. **Pinnae** herbaceous, olive-green adaxially, paler abaxially, inequilateral, ovate-acuminate to oblong-acuminate, up to 75 × 34 mm, often somewhat falcate, acroscopically enlarged, mostly with a low, obtuse auricle acroscopically, margins irregularly dentate, thickened, terminal pinna as large or larger than lateral pinnae, glabrous adaxially, abaxially moderately set with conspicuous scales; venation evident or obscure, reticulate; petiolate at lamina base, sessile at apex, petioles up to 3 mm long. **Sori** mostly on distal parts of lamina and pinnae, scattered, round, up to 1.2 mm in diam. at maturity. **Indusium** persistent, peltate, ferruginous, firmly chartaceous, round, laciniate, up to 1 mm in diam., rugose and infundibuliform at

maturity. Plants terrestrial, generally in deep shade near water, but they also grow on drier ravine slopes, alt. 200–1 200 m; Indigenous Forests (Kokstad to King William's Town).

pseudocaryotideum J.P.Roux

Rhizome ascending to erect, stout, up to 80 mm long, up to 7 mm in diam., with persistent stipe bases and scales; scales ferruginous, often castaneous and glossy centrally, chartaceous, narrowly triangular to oblong-acuminate, up to 10 × 1.5 mm, with short, angular and/or curved outgrowths along margins. **Fronds** up to 9 per plant, arching, up to 760 mm long. **Stipe** proximally dark brown, paler higher up, firm, up to 320 mm long, up to 5 mm in diam., sulcate adaxially, proximally densely scaled, scales ferruginous, with castaneous central region near point of attachment or near scale apex, or castaneous throughout, chartaceous, oblong-acuminate to broadly ovate, up to 11 × 6 mm, margins with outgrowths. **Laminae** lanceolate, up to 450 × 130 mm, 1-pinnate, with 6–11 subopposite to alternate pinna pairs reduced in size towards lamina apex. **Pinnae** herbaceous, green adaxially, marginally paler abaxially, inequilateral, lanceolate, up to 135 × 48 mm, falcate, basal 1–3 pinna pairs mostly acroscopically auriculate, auricle variously developed, acute to obtuse, basiscopic margin narrowly to broadly cuneate, acroscopic margin truncate to broadly cuneate, margins irregularly serrate, thickened, terminal pinna oblique, mostly with an auricle developed on one side, frequently on both, the auricles poorly to strongly developed, adaxially with ferruginous, chartaceous, linear to filiform scales similar to, but smaller than those on rachis along the petioles and costae, abaxially with scales along pinna petioles and costae, scales twisted, ferruginous to stramineous, thinly chartaceous, filiform, up to 2.5 mm long, and with scattered ferruginous to stramineous hairs; venation evident or obscure, reticulate; petiolate at lamina base, petioles up to 3 mm long, sessile at apex. **Sori** mostly on distal parts of lamina and pinnae, scattered, medial or inframedial on free vein branches in areolae, round, up to 1.5 mm in diam. at maturity. **Indusium** persistent or deciduous, peltate, pale brown at maturity, firmly chartaceous, round, margins shallowly repand, up to 1.8 mm in diam., often everted. Plants terrestrial, on seasonally moist forest floor, alt. 300–1 400 m; Indigenous Forests (Kokstad to King William's Town).

DRYOPTERIS Adans.

Wood ferns

Species ± 150, nearly cosmopolitan; 6 in sthn Afr., LIM, G, M, S, FS, KZN, L, NC, WC, EC.

Fronds dimorphic

dracomontana Schelpe & N.C.Anthony

Drakensberg shield fern

Rhizome decumbent, up to 50 mm long, 4 mm in diam., with ferruginous to stramineous, lanceolate to subulate scales, entire or with scattered outgrowths. **Fronds** crowded, dimorphic: sterile appressed to ground or held at a small angle; fertile erect, up to 405 mm long. **Stipe** castaneous, variously set with ferruginous to stramineous, ovate to filiform scales, entire or with outgrowths. **Lamina** ovate to oblong-acute, up to 2-pinnate-pinnatifid, with up to 11 petiolated pinna pairs. **Pinnae** ovate to oblong-obtuse, up to 1-pinnate-pinnatifid. **Pinnules** herbaceous to coriaceous, lobed to pinnatifid, ovate to oblong-obtuse, dentate, adaxially glabrous or sparsely glandular, abaxially sparsely to closely glandular. **Sori** round, up to 1.2 mm in diam. **Indusium** reniform, entire

to erose. Plants terrestrial or epilithic, among rocks and at boulder bases, alt. 1 700–2 000 m; Sub-Escarpment Grassland, Drakensberg Grassland, Upper Karoo (Kokstad to Middelburg).

Fronds monomorphic

athamantica (Kunze) Kuntze

Rhizome decumbent, with ferruginous, oblong-acuminate to narrowly lanceolate scales, entire. **Fronds** crowded, erect, up to 1.3 m long. **Stipe** proximally castaneous, with ferruginous, linear-acuminate to oblong-acuminate scales, with filiform outgrowths. **Lamina** narrowly ovate, up to 3-pinnate, with up to 23 petiolated pinna pairs. **Pinnae** inequilaterally broadly ovate, up to 2-pinnate, mostly longest and basiscopically developed; segments herbaceous, inequilaterally narrowly trullate, narrowly triangular, narrowly rhomboid or oblong-obtuse, often shallowly lobed. **Sori** round, up to 1.6 mm in diam. **Indusium** reniform, entire to erose. Plants terrestrial or epilithic, mostly among rocks, at base of rocks, or along drainage lines in grassland, alt. 1 200–1 700 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (Kokstad to Hogsback).

inaequalis (Schltdl.) Kuntze

Loplobed wood fern

Rhizome short-creeping, with spaced stipe bases and stramineous to ferruginous, ovate to linear-acuminate scales, entire, or with hairs and glands. **Fronds** suberect to arching, up to 1.15 m long. **Stipe** proximally castaneous, proximally densely set with stramineous to ferruginous, ovate to narrowly lanceolate, or filiform scales, entire, denticulate or with spaced hairs and glands. **Lamina** narrowly ovate to ovate, 2-pinnate to 2-pinnate-pinnatifid, with up to 14 petiolated pinna pairs. **Pinnae**: basal pinna pair inequilaterally triangular to broadly ovate, or deltate, up to 2-pinnate, basal pair shorter or longer than next pair above, with up to 6 petiolated pinnule pairs; segments herbaceous, narrowly ovate-obtuse to oblong-obtuse, shallowly to deeply lobed, adaxially glabrous or with a few filiform scales along costa, abaxially with uniseriate hairs. **Sori** round, up to 1.6 mm in diam. **Indusium** reniform, glabrous, with glands along margin and/or surface. Plants terrestrial or epilithic on moist forest floors and streambanks, alt. 250–600 m; Indigenous Forests (Port Edward to Tsitsikamma).

lewalleana Pic.Serm.

Rhizome decumbent, with stramineous to ferruginous, ovate-caudate to linear-acuminate scales, entire, repand, or with spaced hairs and glands. **Fronds** suberect to arching, up to 1.2 mm long. **Stipe** proximally castaneous, proximally densely set with stramineous to ferruginous, ovate to narrowly lanceolate, or filiform scales, entire or denticulate. **Lamina** ovate to deltate, 2- or 3-pinnate, with up to 14 petiolated pinna pairs. **Pinnae**: basal pair inequilaterally triangular to broadly ovate, or deltate, up to 2-pinnate, basal pair shorter or longer than next pair above; segments herbaceous, narrowly ovate-obtuse to oblong-obtuse, shallowly to deeply lobed, adaxially glabrous, with glands along and between veins, and/or with filiform scales, abaxially with hairs and scales. **Sori** round, up to 1.6 mm in diam. **Indusium** reniform, repand or rarely lacerate. Plants terrestrial or epilithic, mostly in deep shade in evergreen forests, alt. 200–1 400 m; Indigenous Forests (Kokstad to Amatole Mts).

pentheri (Krasser) C.Chr.

Rhizome decumbent, with stramineous to ferruginous, linear, oblong or narrowly ovate scales, with filiform outgrowths. **Fronds** caespitose, erect to arching, up to 1.8 m long.

Stipe proximally castaneous, densely set with stramineous to ferruginous, narrowly lanceolate to filiform scales, with filiform outgrowths and glands. **Lamina** ovate to ovate-triangular, 2-pinnate to 3-pinnate, with up to 16 petiolated pinna pairs. **Pinnae** basal pinna pair ovate to narrowly ovate, narrowly lanceolate to oblong-acuminate towards lamina apex, with up to 9 petiolated pinnule pairs; segments herbaceous, ovate to oblong-obtuse, lobed, adaxially glabrous, or glandular along and between veins, or with a few hairs along costule, abaxially sparsely glandular, 2-celled hairs, and multicellular hairs. **Sori** round, up to 1.8 mm in diam. **Indusium** reniform, entire, repand, or erose. Plants terrestrial or epilithic, at boulder bases and rock crevices in exposed or partially sheltered conditions and in evergreen forests, alt. 200–1 700 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Drakensberg Grassland (Kokstad to Tsitsikamma).

squamiseta (Hook.) Kuntze

Rhizome erect to suberect, with stipe bases and castaneous, narrowly triangular to subulate scales, with uniseriate hairs and glands. **Fronds** suberect to arching, up to 925 mm long. **Stipe** firm, proximally castaneous, with castaneous, narrowly triangular to subulate scales, entire, or with hairs and capitate glands. **Lamina** ovate, up to 3-pinnate, with up to 10 petiolated pinna pairs. **Pinnae** basal pinna pair strongly basiscopically developed, inequilaterally narrowly ovate, 1-pinnate-pinnatifid to 2-pinnate; segments herbaceous, trapeziform to inequilaterally oblong-obtuse, often acroscopically auricled, lobed to crenulate, adaxially with proximally multistratose, subulate, long hairs along veins, abaxially with proximally multistratose subulate hairs and clavate, pluricellular, uniseriate hairs. **Sori** round, up to 1.5 mm in diam. **Indusium** reniform to subcircular, entire, adaxially glandular. Plants terrestrial, on floor of seasonally moist evergreen forests, alt. 100–1 400 m; Indigenous Forests (Port St Johns to Hogsback).

ELAPHOGLOSSUM Schott

Tongue ferns

Species ± 500, pantemperate and tropical; 8 in sthn Afr., LIM, M, S, FS, KZN, L, WC, EC.

1a Lamina with minute inconspicuous scales

acrostichoides (Hook. & Grev.) Schelpe

Rhizome creeping, branched, up to 3.5 mm in diam., scaled. **Fronds** erect or arching, up to 350 mm long. **Stipe** sparsely scaled. **Lamina** simple, coriaceous, sterile narrowly elliptic, up to 300 × 27 mm, minutely stellate-scaled adaxially, moderately substellate-scaled abaxially. **Sporangia** acrostichoid, exindusiate. Plants terrestrial or epilithic, moist protected or exposed rocks, alt. 300–1 200 m; Sub-Escarpment Savanna, Indigenous Forests, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Kokstad to Grahamstown).

angustatum (Schrad.) Hieron.

Narrow buck tongue fern

Rhizome creeping, branched, up to 8 mm in diam., scaled. **Fronds** erect or arching, up to 350 mm long. **Stipe** moderately scaled. **Lamina** simple, firmly herbaceous, oblanceolate, linear to narrow elliptic, to 300 × 50 mm, with minute stellate scales adaxially, moderately stellate-scaled abaxially. **Sporangia** acrostichoid, exindusiate. Plants epilithic, on moist boulders along streams, alt. 280–700 m; Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld (Port St Johns and Tsitsikamma).

macropodium (Fée) T.Moore

Rhizome widely creeping, up to 6 mm in diam., scaled. **Fronds** erect to arching, up to 360 mm long. **Stipe** sparsely scaled. **Lamina** simple, coriaceous; sterile narrow-elliptic to elliptic, up to 320 × 70 mm, minutely stellate-scaled adaxially and abaxially. **Sporangia** acrostichoid, exindusiate. Plants terrestrial or epilithic, mostly on rocks in deeply shaded evergreen forests, alt. 100–1 400 m; Indigenous Forests (Port Edward to Port St Johns).

1b Lamina variously set with conspicuous scales
2a Scales along lamina midrib and margins only

hybridum (Bory) Brack.

Rhizome short, decumbent to erect, up to 6 mm in diam., scaled. **Fronds** erect to arching, up to 250 mm long. **Stipe** variously scaled. **Lamina** simple, herbaceous, sterile broad to narrow-lanceolate or linear-acuminate, up to 210 × 5 mm, abaxially with dark brown subulate scales along the midrib and margins. Plants terrestrial or epilithic, on moist deeply shaded rocks in evergreen forests, alt. 600–900 m; Indigenous Forests (Engcobo to King William's Town).

2b Scales not confined to lamina midrib and margins

spathulatum (Bory) T.Moore

Spoon tongue fern

Rhizome creeping, up to 2 mm in diam., densely scaled, scales pale brown, narrowly lanceolate, up to 2 × 0.5 mm, entire to shallowly dentate. **Fronds**: sterile herbaceous, simple, entire, spathulate to elliptic, up to 23 × 12 mm, cuneate to decurrent, abaxially densely scaled, scales pale brown, narrowly lanceolate, up to 2 × 0.4 mm, shallowly dentate, with inrolled margins, abaxial surface scales similar to those on adaxial surface, but fewer and smaller; fertile firmly herbaceous with membranous margins, simple, entire, ovate to rotund, up to 11 × 10 mm, usually folded together along midrib, adaxial surface scales less frequent than those on the sterile, lanceolate, shallowly dentate, up to 2.5 × 0.4 mm, scales absent on abaxial surface. **Stipe** terete, firm, pale brown to green; sterile up to 36 mm long; fertile usually longer than the sterile, up to 60 mm long, densely scaled, scales narrowly-lanceolate, up to 2 × 0.3 mm, entire to shallowly dentate with inrolled margins. Plants epilithic, mostly on moss-covered rocks in forests and moist cliffs along streams, alt. 1 000–1 500 m; Sub-Escarpment Grassland, Indigenous Forests (Maclear).

MEGALASTRUM Holttum

Species ± 30, pantropical end temperate regions; 1 in sthn Afr., LIM, G, M, S, KZN, WC, EC.

lanuginosum (Willd. ex Kaulf.) Holttum

Downy forest fern; *fluweel woudvaring* (A)

Rhizome erect, up to 450 mm long, up to 30 mm in diam., with stipe bases and castaneous, linear to filiform scales, up to 13 × 0.5 mm. **Fronds** caespitose, arching, up to 1.9 m long. **Stipe** castaneous to ferruginous, firm, up to 780 mm long, up to 11 mm in diam., with scales and hairs, scales sparse, linear to filiform, up to 3.5 × 0.4 mm, hairs multicellular, acicular or filiform. **Lamina** elliptic, up to 1.2 × 1 m, up to 4-pinnate, with up to 15 petiolated pinna pairs. **Rachis** adaxially sulcate, with scales and hairs similar to those on stipe. **Pinnae** petiolate, basal pair up to 2-pinnate, inequilaterally ovate-deltate,

up to 550 × 430 mm, basiscopically developed. **Pinnules** petiolate, up to 1-pinnate-pinnatifid, proximal acroscopic pinnules lanceolate to oblong-cuneate, up to 110 × 34 mm, proximal basiscopic pinnule inequilaterally ovate, up to 350 × 130 mm; segments petiolate, oblong-cuneate, up to 82 × 19 mm, pinnatifid, with up to 14 ultimate segment pairs; ultimate segments sessile, herbaceous, lobed, denticulate, costule and lamina regularly set with multicellular, acicular hairs up to 1 mm long along veins, and unicellular gland-like hairs between veins, abaxially more closely set with hairs similar to those on adaxial surface, acicular hairs also occur between veins and along margins, up to 1.2 mm long; venation evident, branches terminate in sinuses between teeth. **Sori** round, up to 1 mm in diam. Mostly in deep shade along perennial streams or seepage areas in evergreen forests, alt. 150–1 400 m; Indigenous Forests (Port Edward to Tsitsikamma).

POLYSTICHUM Roth

Shield ferns

Species ± 200, nearly cosmopolitan; 9 in sthn Afr., LIM, G, M, S, FS, KZN, L, WC, EC.

1a Rhizome decumbent; fronds mostly spaced
2a Sori indusiate

incongruum J.P.Roux

Rhizome decumbent, with castaneous to ferruginous scales. **Fronds** suberect to arching, up to 1.8 m long. **Stipe** proximally castaneous, variably set with ferruginous to stramineous, narrowly to broadly ovate-acuminate scales, with marginal outgrowths. **Lamina** ovate to broadly ovate, 2- or 3-pinnate, with up to 27 pinna pairs. **Pinnae** narrowly oblong-attenuate to narrowly ovate-attenuate, 1- or 2-pinnate, with up to 21 free pinnule pairs. **Pinnules** firmly herbaceous to coriaceous, ovate to narrowly trullate, often somewhat falcate, deeply incised to form narrowly elliptic to narrowly obovate ultimate segments, margins serrate to doubly serrate, aristate, adaxially sparsely scaled along costa, abaxially moderately scaled. **Sori** round, up to 1.5 mm in diam. **Indusium** stramineous or stramineous and black-centered, round, repand to erose. Plants terrestrial or epilithic, mostly on seasonally moist forest floors, shaded, alt. 50–1 300 m; Drakensberg Grassland, Indigenous Forests (Amatole Mts to Tsitsikamma).

monticola N.C.Anthony & Schelpe

Mountain shield fern

Rhizome decumbent, with stipe bases and ferruginous, narrowly oblong to narrowly linear scales, entire or with spaced apically or basally directed outgrowths. **Fronds** closely spaced, suberect to arching, up to 840 mm long. **Stipe** castaneous, with larger and smaller scales, larger scales stramineous, usually with a central castaneous section, lanceolate to broadly ovate, with marginal outgrowths. **Lamina** ovate to elliptic, 2-pinnate to 3-pinnatifid. **Pinnae** oblong-attenuate to narrowly oblong-attenuate. **Pinnules** firmly herbaceous, proximal acroscopic pinnule largest, narrowly ovate to ovate, acroscopically auricled, serrate to lobate-serrate, aristate, adaxially with filiform scales along costa, abaxially with narrowly triangular to subulate scales. **Sori** round, up 1.5 mm in diam. **Indusium** round, often black centred, entire to repand. Terrestrial or lithophytic, on forest floors, shaded cliffs and rocks, alt. 600–1 200 m; Sub-Escarpment Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Kokstad to Kouga Mts).

pungens (Kaulf.) C.Presl

Prickly shield fern

Rhizome prostrate, with stipe bases and castaneous to ferruginous, narrowly lanceolate to narrowly ovate scales, subentire to erose. **Fronds** suberect to arching, up to 1.4 m long. **Stipe** castaneous, stramineous higher up, with conspicuous larger and smaller scales, larger scales castaneous, narrowly to broadly ovate, minutely erose to shortly fimbriate. **Lamina** ovate to broadly ovate, 2-pinnate to 3-pinnatifid, with up to 21 pinna pairs. **Pinnae** ovate-attenuate to narrowly oblong-attenuate, 1-pinnate to 2-pinnatifid. **Pinnules** firmly herbaceous, proximal acroscopic pinnule largest, inequilaterally ovate, ovate-oblong to ovate-rhomboid or trullate, often somewhat falcate, each subtended by one or more large, often bullate, broadly ovate scales, mostly deeply incised near to costa forming a nearly free auricle acroscopically, serrate to lobate-serrate, aristate, proximal acroscopic pinnule, adaxially sparsely scaled along the costa, abaxially sparsely to moderately scaled. **Sori** round, up to 1 mm in diam. **Indusium** amorphous to round, entire to repand. Terrestrial or lithophytic, on shaded forest floors and gullies, alt. 250–800 m; Eastern Fynbos-Renosterveld (Tsitsikamma to Humansdorp).

2b Sori exindusiate

transkeiense W.Jacobsen

Rhizome creeping, with stramineous to castaneous, narrowly lanceolate scales, repand to erose. **Fronds** spaced, arching, up to 1.34 m long. **Stipe** firm, proximally castaneous, proximally densely set with castaneous, narrowly to broadly ovate scales, repand, erose, or fimbriate. **Lamina** 2- or 3-pinnate, ovate to broadly ovate, with up to 22 pinna pairs. **Pinnae** narrowly ovate to narrowly oblong-attenuate, with up to 20 pinnule pairs. **Pinnules** herbaceous, shortly petiolate, the proximal acroscopic pinnule largest, ovate, ovate-oblong to ovate-rhomboid, acroscopically auricled, shallowly to deeply incised, lobate-serrate. **Sori** round, up to 1 mm in diam. **Indusium** absent. Terrestrial or lithophytic, in shade on seasonally moist forest floors, alt. 20–1 600 m; Indigenous Forests (Kokstad to Kentani).

1b Rhizome, erect to suberect; fronds crowded

luctuosum (Kunze) T.Moore

Mourning shield fern

Rhizome erect to suberect, with ovate, narrowly ovate to lanceolate scales, with outgrowths along margins and surface. **Fronds** caespitose, suberect to arching, up to 930 mm long. **Stipe** proximally castaneous, densely set with castaneous, ovate scales, with marginal outgrowths. **Lamina** 2- or 3-pinnate, narrowly ovate to ovate, with up to 25 pinna pairs. **Pinnae** narrowly lanceolate, 1-pinnate to pinnatifid. **Pinnules** firmly herbaceous to coriaceous, the proximal acroscopic pinnule largest, often significantly longer than the next, narrowly trullate to rhomboid, somewhat falcate, lobate-serrate, aristate. **Sori** round, up 1.2 mm in diam. **Indusium** round, entire, repand or crenulate. Terrestrial or lithophytic, on forest floors, deeply shaded, alt. 1 000–1 600 m; Indigenous Forests (Kokstad to Amatole Mts).

sinense H.Christ

Chinese shield fern

Rhizome suberect, with castaneous, narrowly linear scales with small widely spaced cellular outgrowths. **Fronds** caespitose, suberect to arching, up to 1.05 m long. **Stipe**

proximally castaneous, variously scaled, larger scales often slightly bullate, stramineous, often centrally darkened or nitid and castaneous to almost black throughout, broadly ovate-acuminate to ovate-acuminate, fimbriate. **Lamina** narrowly elliptic, 2-pinnate, with up to 29 pinna pairs. **Pinnae** narrowly triangular to oblong-attenuate, 1-pinnate, with up to 12 pinnule pairs. **Pinnules** herbaceous to firmly herbaceous, narrowly trullate to trullate, serrate, aristate, adaxially with straight or slightly twisted filiform scales, abaxially with straight or proximally somewhat twisted, subulate-hastate scales. **Sori** round, up to 1 mm in diam. **Indusium** round, often incomplete, repand to erose. Plants terrestrial or lithophytic, mostly at boulder bases and along cliff bases, moist conditions, alt. 1 300–1 800 m; Sub-Escarpment Grassland, Upper Karoo, Mesic Highveld Grassland, Drakensberg Grassland, Lower Karoo, Eastern Fynbos-Renosterveld (Kokstad to Kouga Mts).

transvaalense N.C.Anthony

Transvaal shieldfern

Rhizome short, erect, with crowded stipe bases and castaneous, narrowly linear to narrowly lanceolate scales with short outgrowths. **Fronds** caespitose, suberect to arching, up to 1.05 m long. **Stipe** proximally castaneous, densely set with larger and smaller scales, larger scales castaneous to ferruginous or with the central part castaneous to black, narrowly ovate-acuminate to ovate-acuminate scales, irregularly lacerate-fimbriate. **Lamina** ovate to narrowly ovate, 2-pinnate. **Pinnae** oblong-attenuate, 1-pinnate. **Pinnules** ovate to obliquely transversely rhomboid, acroscopically auriculate, proximal pinnules often pinnatifid, serrate to lobate-serrate, often shortly aristate, adaxially subglabrous, abaxially moderately scaled. **Sori** round, up to 1 mm in diam. **Indusium** round, rarely incomplete, repand to erose. Terrestrial or lithophytic in deeply shaded forests, alt. 200–1 400 m; Indigenous Forests (Kokstad to Tsitsikamma).

RUMOHRA Raddi

Species ± 6, circum-austral; 1 in sthn Afr., LIM, M, KZN, WC, EC.

adiantiformis (G.Forst.) Ching

Seven weeks fern, leather fern, leather leaf fern, Knysna fern, thirty-days fern; *seweweeksvaring*, *Knysnavaring* (A)

Rhizome widely creeping, up to 20 mm in diam., densely scaled. **Fronds** erect or arching, spaced, up to 1.2 m long. **Stipe** scaled, adaxial sulcus centrally ridged. **Lamina** pentagonal, up to 500 × 400 mm, 3-pinnate to 4-pinnatifid, proximal pinnae basiscopically developed; ultimate segments coriaceous, ovate, crenate-dentate, sparsely scaled abaxially. **Sori** round, up to 1.8 mm in diam. **Indusium** peltate, entire. Plants terrestrial or epilithic in forests and rocky ravines, alt. 50–1 200 m; Indigenous Forests (Kokstad to Tsitsikamma).

ROUX, J.P. 1982. The fern genus *Elaphoglossum* Schott ex J.Sm. (Filicales) in South Africa. *Journal of South African Botany* 48: 481–526.
ROUX, J.P. 2000. The genus *Polystichum* (Dryopteridaceae) in Africa. *Bulletin of the Natural History Museum London (Botany)* 30: 33–79.
ROUX, J.P. 2011. The genus *Cyrtomium* (Pteridophyta: Dryopteridaceae) in Africa and Madagascar. *Botanical Journal of the Linnean Society* 167: 449–465.

EQUISETACEAE

A family with a single genus occurring in the temperate regions of the world, except Australasia and Antarctica where no species occur. The plants mostly occur in moist open places such as stream- and riverbanks and marshes.

EQUISETUM L.

Scouring rush

Species 15, worldwide; 1 in sthn Afr., widespread.

ramosissimum Desf.

Horsetail, African horsetail; *perdestert*, *lidjiesgras* (A)

Rhizome creeping, subterranean, jointed, 3–6 mm in diam. **Stems** erect, jointed, up to 1.5 m tall, up to 5 mm in diam., branches borne in whorls at nodes, up to 14 in each whorl, up to 130 mm long, up to 1.5 mm in diam., main stems and branches fluted. **Leaves** membranous to thinly chartaceous, each with a single central vein, whorled, fused into a nodal sheath, up to 1 mm long, ending in acuminate teeth up to 2 mm long, turning black with age. **Sporangia** elongate, thin-walled, dehiscing longitudinally, borne on stalked, peltate sporangiophores forming a strobilus terminally on a main stem or branches, up to 18 mm long, up to 5 mm in diam. On moist stream- and riverbanks, shaded or exposed conditions, alt. 100–1 200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Upper Karoo, Mesic Highveld Grassland, Drakensberg Grassland, Albany Thicket (Umtamvuma to George).

GLEICHENIACEAE

A family of ± 160 species in 6 genera, occurring in montane regions in the tropics, but at lower elevations in southern temperate regions.

Ultimate branches (the branches on each side of an ultimate dormant bud) with pinnatifid pinnae; sori partially immersed in lamina ..... **Gleichenia**

Ultimate branches pectinately pinnatifid; sori superficial on lamina ..... **Sticherus**

GLEICHENIA Sm.

Species ± 10, southern Africa, Malaysia, Australasia, Madagascar; 1 in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, WC, EC.

polypodioides (L.) Sm.

Coral fern, creeping fern

Rhizome widely creeping, up to 2 mm in diam., scaled. **Fronds** widely spaced, axes wiry, falsely dichotomously branched, with a terminal bud in each false dichotomy; ultimate branches with pinnatifid pinnae. **Pinnae** linear, up to 45 × 4 mm, pinnatifid, lobes herbaceous, sessile. **Sori** partially immersed in lamina bearing 2–4 sporangia. Shady or exposed moist areas and rock faces, alt. 100–1 600 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Tsitsikamma).

STICHERUS C.Presl

Species ± 80, tropical and subtropical parts of both the Old and New Worlds; 1 in sthn Afr., LIM, M, S, KZN, EC.

umbraculiferus (Kunze) Ching
[= *Gleichenia umbraculifera* (Kunze) T.Moore**]**

Umbrella fern

Rhizome widely creeping, up to 8 mm in diam., scaled. **Fronds** widely spaced, axes wiry, falsely dichotomously branched, with a terminal bud in each false dichotomy; ultimate branches pectinately pinnatifid, up to 150 × 45 mm; lobes linear, up to 35 × 3.5 mm, grey abaxially, with fimbriate scales along the costa. **Sori** superficial, consisting of 3 or 4 sporangia. Plants terrestrial or epilithic, along moist streambanks and slopes, alt. 1 000–1 600 m.; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (Kokstad to Amatole Mts).

HYMENOPHYLLACEAE

A family of ± 600 species in 9 genera with a nearly worldwide distribution, chiefly in the tropical and wet temperate regions.

1a Rhizomes nearly glabrous, or sparsely covered with light-coloured hairs; involucres usually bivalved ... **Hymenophyllum**
1b Rhizomes covered with reddish to dark-coloured hairs; involucres turbinate:
2a Roots present, many and robust; rhizome up to 3 mm in diam. ... **Abrodictyum**
2b Roots absent or replaced by root-like shoots; rhizome always < 1 mm in diam.:
3a False veinlets parallel to true veins; blade venation catadromous ... **Didymoglossum**
3b False veinlets absent; blade venation anadromous ... **Crepidomanes**

ABRODICTYUM C.Presl

Species ± 25, pantropical; 1 in sthn Afr., LIM, G, M, S, KZN, EC.

rigidum (Sw.) Ebihara & Dubuisson

Rhizome decumbent or erect, up to 3 mm in diam., closely set with reddish brown hairs. **Fronds** erect, closely spaced, up to 270 mm long. **Stipe** rigid, terete, initially set with reddish brown hairs. **Lamina** lanceolate to ovate, 3-pinnate-pinnatifid; blade venation anadromous. **Rachis** narrowly winged. **Sori** borne near pinna or pinnule costa, turbinate, with rounded lobes; receptacle long exserted. Plants terrestrial or epilithic, on deeply shaded, moist streambanks or rocks in evergreen forests, alt. 100–800 m; Indigenous Forests (Port Edward to Flagstaff).

CREPIDOMANES (C.Presl) C.Presl

Species ± 30, palaeotropics and northern temperate regions, LIM, M, S, FS, KZN, WC, EC.

melanotrichum (Schltdl.) J.P.Roux

Rhizome widely creeping, irregularly branched, closely set with dark adhesive hairs. **Fronds** spaced, up to 45 mm long. **Stipe** proximally closely set with dark adhesive hairs. **Lamina** broadly elliptic, up to 2-pinnatifid. **Rachis** winged. **Sori** borne near rachis, turbinate, somewhat dilated, with large rounded lobes; receptacle long exserted. Plants epilithic or epiphytic, mostly in deeply shaded conditions in moist evergreen forests, alt. 50–1 300 m; Indigenous Forests (Kokstad to Tsitsikamma).

HYMENOPHYLLUM Sm.

Filmy ferns

Species ± 250, pantemperate and tropical regions; 6 in sthn Afr., LIM, M, S, FS, KZN, WC, EC.

1a Lamina closely set with stalked stellate hairs

aeruginosum (Poir.) Carmich.
[= *Sphaerocionium marlothii* (Brause) Pic.Serm.]

Brown filmy fern

Rhizome widely creeping, irregularly branched, up to 0.1 mm in diam., with spaced simple hairs. **Fronds** spaced, up to 200 mm long. **Stipe** variously set with stalked stellate hairs. **Lamina** oblong to elliptic, up to 2-pinnatifid, segments linear, up to 1.5 mm wide, with stalked stellate hairs along veins and margins. **Rachis** winged. **Sori** at segment apices, shallow, with rounded lobes; receptacle not exserted. Plants epilithic or epiphytic, mostly in deeply shaded, moist conditions in forests and cliff faces, alt. 300–900 m; Indigenous Forests (Tsitsikamma).

1b Lamina glabrous or with simple hairs
2a Lamina margins entire

capense Schrad.

Cape filmy fern

Rhizome widely creeping, irregularly branched, mostly glabrous, but usually with a tuft of simple hairs at stipe base. **Fronds** spaced, up to 160 mm long. **Stipe** terete, glabrous. **Lamina** oblong, up to 2-pinnatifid, bifurcate to pinnatifid into 3–7 entire lobes. **Sori** on distal acroscopic segments with entire indusial lobes. Plants epilithic or epiphytic, on wet shaded rocks, alt. 800–1 500 m; Indigenous Forests, Eastern Fynbos-Renosterveld (Amatole Mts to Tsitsikamma).

2b Lamina margins dentate

peltatum (Poir.) Desv.

Rhizome widely creeping, irregularly branched, up to 0.1 mm in diam., with scattered simple hairs. **Fronds** spaced, up to 110 mm long. **Stipe** glabrous or with few simple hairs. **Lamina** linear, 2-pinnatifid to 2-pinnate, up to 180 mm long, unequally pinnatifid acroscopically, lobes serrate. **Sori** on proximal acroscopic segments with entire indusial valves. Plants epilithic or epiphytic on wet cliffs and rocks in forests, alt. 200–1 200 m; Eastern Fynbos-Renosterveld, Indigenous Forests (Humansdorp to Tsitsikamma).

tunbridgense (L.) Sm.

Tunbridge filmy fern

Rhizome widely creeping, irregularly branched, up to 0.1 mm in diam., glabrous or with spaced simple hairs. **Fronds** spaced, up to 160 mm long. **Stipe** glabrous or with spaced simple hairs. **Lamina** 2- or 3-pinnatifid, up to 100 mm long, lobes linear, serrate. **Rachis** winged. **Sori** on proximal acroscopic lobes with serrate indusial valves. Plants epilithic or epiphytic on wet shaded rocks and tree trunks in forests, alt. 200–1 200 m; Eastern Fynbos-Renosterveld (Amatole Mts to Tsitsikamma).

DIDYMOGLOSSUM Desv.

Species ± 30, throughout the tropics; 2 in sthn Afr., LIM, M, KZN, EC.

reptans (Sw.) C.Presl

Rhizome widely creeping, irregularly branched, up to 0.1 mm in diam., closely set with adhesive hairs. **Fronds** spaced, up to 40 mm long. **Stipe** closely set with adhesive hairs. **Lamina** elliptic, deeply lobed, up to 35 mm long, lobes uneven, obtuse, with groups of hairs irregularly scattered along the margins, with false veinlets; blade venation catadromous. **Sori** at lamina apices, turbinate, with dilated lobe margins; receptacle long exserted. Plants epilithic or epiphytic on deeply shaded, moist boulders and tree trunks in evergreen forests, alt. 50–150 m; Indigenous Forests (Port St Johns).

EBIHARA, A., DUBUISSON, J., IWATSUKI, K., HENNEQUIN, S. & ITO, M. 2006. A taxonomic revision of Hymenophyllaceae. *Blumea* 51,2: 221–280.

LYGODIACEAE

A family comprising a single genus with a pantropical distribution.

*LYGODIUM Sw.

Species ± 40, pantropical; 2 (1 naturalised) in sthn Afr., KZN, EC.

japonicum (Thunb.) Sw.

Japanese climbing fern

Rhizome creeping, up to 4 mm in diam. **Fronds** up to 10 m long. **Rachis** brown, glabrous, twining, with secondary rachises up to 5 mm long at irregular intervals, dichotomously branched, with an aborted, densely haired bud centrally, ultimate branches with alternate to 2-pinnate. **Pinnae**: sterile up to 40 mm long, proximally basiscopically developed, denticulate; fertile up to 2-pinnate-pinnatifid, with linear fertile segments up to 9 mm long. Plants terrestrial or twining in trees on riverbanks, partially shaded, alt. ± 30 m; Indigenous Forests (Port St Johns).

MARATTIACEAE

A family of ± 130 species in 6 genera, mostly in the tropical regions of the world.

PTISANA Murdock

Species 20, palaeotropics; 1 in sthn Afr., LIM, G, M, S, KZN, WC, EC.

fraxinea (Sm.) Murdock
(= *Marattia fraxinea* Sm.)

Pitted potato fern

Stems large, erect, up to 200 mm in diam., up to 300 m high; roots fleshy. **Fronds** caespitose, arching, up to 2.8 m long, up to 12 per plant. **Stipe** terete, with persistent fleshy stipules and a basal pulvinus, up to 1.7 m long, up to 35 mm in diam. **Laminae** up to 2-pinnate, ovate, up to 1.5 × 1.1 m, with up to 10 pinna pairs. **Rachis** adaxially flattened, narrowly winged towards apex. **Pinnae** alternate, 1-pinnate, oblong-acute, up to 310 × 85 mm; petioles up to 60 mm long; with up to 20 pinnule pairs; pinna rachis with a basal pulvinus, adaxially shallowly sulcate, narrowly winged towards apex. **Pinnules** alternate, dark green, firmly herbaceous, oblong-acuminate, up to 170 × 20 mm,

basiscopically broadly cuneate, acroscopically broadly cuneate to dimidiate, unevenly serrate to crenate, glabrous; costae adaxially raised, shallowly sulcate; venation simple or once forked, free, ending in margins in teeth; petioles up to 3 mm long. **Synangia** elongate, up to 1.5 mm long, submarginal, usually on anadromous vein branches. Plants terrestrial, always in moist conditions in deeply shaded evergreen forests, alt. 500–1 000 m; Indigenous Forests (Kokstad to George).

MURDOCK, A.G. 2008. A taxonomic revision of the eusporangiate fern family Marattiaceae, with description of a new genus *Ptisana*. *Taxon* 57,3: 737–755.

MARSILEACEAE

A family of ± 55 species in 3 genera, mostly in the lowland tropics and temperate montane regions.

MARSILEA L.

Water-clover

Species 50, nearly cosmopolitan; 12 in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

burchellii (Kunze) A.Br.

Burchells' clover; *Burchell-se-waterklawer* (A)

Fronds with slender, glabrous stipes up to 60 mm long. **Pinnae** variable with straight or slightly convex flanks, up to 8 × 5 mm in floating fronds, smaller in terrestrial forms. **Sporocarp**: pedicels free, straight, slender, pilose at first; crowded, small, subcircular, pyriform, up to 2.5 × 1.5 mm, circular to elliptic in dorsiventral cross section, lateral ribs not apparent, raphe present, not very distinct, inferior tooth absent, superior tooth conical, short and obtuse or long and acute. Aquatic perennials in seasonal vleis and seeps, alt. 50–400 m; Lower Karoo, Albany Thicket (Jansenville to East London).

capensis A.Br.

Cape water-clover

Fronds with slender, usually crowded stipes up to 200 mm long. **Pinnae** narrowly obdeltate with slightly convex flanks, up to 10 × 8 mm in floating fronds, smaller in terrestrial forms. **Sporocarp**: pedicels solitary, free, slender; obliquely broad-oblong or irregularly rhombic in lateral view, narrowly elliptic in dorsiventral view, lateral ribs absent, raphe distinct, inferior tooth absent, or very rarely present as a small hump, superior tooth distinct, short, conical, acute or subacute, rarely obtuse, erect or recurved. Aquatic perennial in seasonal vleis, alt. 50–200 m; Indian Ocean Coastal Belt, Albany Thicket (Port St Johns to Port Elizabeth).

macrocarpa C.Presl

Fronds with slender, usually glabrous stipes up to 300 mm long in floating leaves. **Pinnae** narrowly to broadly obdeltate, up to 15 × 12 mm, flanks concave, with brown interstitial streaks beneath. **Sporocarp**: pedicels free, up to 12 mm long; narrowly rectangular in dorsiventral cross section, with a shallow furrow along dorsal and frontal side, lateral ribs distinct, raphe distinct, inferior tooth absent, or a small hump, superior tooth present, short. Aquatic perennial in seasonal vleis, alt. 50–400 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket (Elliot to Port St Johns to Grahamstown).

schelpeana Launert

Fronds with slender, crowded stipes, up to 200 mm long. **Pinnae** narrowly obdeltoid to obdeltoid-obovate, flanks slightly convex, outer margins bilobed, appressed pilose at first. **Sporocarp**: pedicels from stipe base, erect or arching, up to 45 mm long; solitary or crowded, obliquely ovate-oblong to elliptic in lateral view, lateral ribs absent in mature sporocarps, raphe distinct, inferior tooth almost absolute, superior tooth distinct. Aquatic perennial in seasonal vleis, alt. 150–500 m; Sub-Escarpment Savanna, Sub-Escarpment Grassland, Albany Thicket (Butterworth to East London).

LAUNERT, O.E. 1984. A revised key to and new records of African species of the genus *Marsilea*. *Garcia de Orta, Série de botânica* 6,1/2: 119–140.

NEPHROLEPIDACEAE

A family of ± 30 species in a single genus with a cosmopolitan distribution.

NEPHROLEPIS Schott

Species 2, sthn Afr., 1 naturalised, S, KZN, WC, EC.

***exaltata** (L.) Schott

Sword fern; *stoepvaring* (A)

Rhizome short-decumbent to erect, up to 4 mm in diam., stoloniferous and tuber-forming, with stiff wiry roots, tubers ovate to elliptic, up to 22 × 13 mm, densely set with stramineous to ferruginous, peltate, lanceolate scales up to 6 × 1 mm. **Fronds** caespitose, erect to arching, up to 1.1 m long. **Stipe** rigid, brown, adaxially sulcate, up to 140 × 3.5 mm, initially densely scaled, glabrous to subglabrous later; scales stramineous, lanceolate to lanceolate-caudate, up to 8 × 1 mm. **Laminae** 1-pinnate, linear-acute, up to 1.1 m × 80 mm. **Rachis** adaxially sulcate, moderately to densely scaled. **Pinnae** articulated, somewhat imbricate, sessile, oblong-obtuse to oblong-acute, acroscopically auricled, truncate to cordate, up to 38 × 11 mm, dentate. **Costae** adaxially shallowly sulcate; venation obscure, free, pinnately branched, vein branches end in a hydathode in teeth near margins. **Sori** reniform, at end of a shortened acroscopic vein branch, in a single row on both sides of costa. **Indusium** reniform, entire, up to 1.2 mm in diam.; receptacle nude. Naturalised species, mostly in disturbed areas such as road verges and cuttings, plantations, and cultivated areas, alt. 10–150 m; Eastern Fynbos-Renosterveld, Indigenous Forests (Humansdorp to Knysna).

HOVENKAMP, P.H. & MIYAMOTO, F. 2005. A conspectus of the native and naturalised species of *Nephrolepis* (Nephrolepidaceae) in the world. *Blumea* 50,2: 279–322.

OLEANDRACEAE

A family of ± 40 species in a single genus with a nearly pantropical distribution.

OLEANDRA Cav.

Oleander ferns

Species 1, sthn Afr., NW, M, S, FS, KZN, EC.

distenta Kunze

Tangled crevice-creeper, oleander fern; *kranstou* (A)

Rhizome scandent, irregularly branched, up to 1 m long, or longer, up to 3.5 mm in diam., with long unbranched wiry roots, phyllopodia up to 12 mm long and up to 50 mm

apart; scales castaneous, somewhat paler along margins, appressed, imbricate, peltate, lanceolate, up to 5.5 × 1.2 mm, fimbriate. **Fronds** erect or pendant, up to 290 mm long. **Stipe** articulated, articulation swollen, stipe firm, stramineous, adaxially sulcate, up to 22 × 1.2 mm, sparsely scaled. **Laminae** herbaceous, simple, oblong-attenuate to oblong-caudate, entire to shallowly repand, up to 265 × 42 mm, adaxially and abaxially initially set with scales and hairs, scales ferruginous to stramineous, sessile, lanceolate to cordate, fimbriate, up to 2.5 mm long, along the costae, and simple multicellular hairs up to 0.8 mm long, occurring on lamina surface and margins, these soon abraded. **Costae** adaxially shallowly sulcate, pronounced abaxially; venation evident, pinnately forked, free. **Sori** circular, inframedial on acroscopic vein branches, scattered in a line parallel to, and on both sides of costa. **Indusium** castaneous, persistent, reniform, up to 1 mm in diam., entire. Epilithic on exposed or shaded cliff faces, alt. 50–100 m; Indian Ocean Coastal Belt, Indigenous Forests (Port St Johns).

OPHIOGLOSSACEAE

A family of ± 50 species in 5 genera occurring throughout the tropical and temperate parts of the world.

OPHIOGLOSSUM L.

Adder's tongue ferns

Species ± 30, nearly cosmopolitan; 13 in sthn Afr., LIM, NW, M, FS, KZN, L, NC, WC, EC.

1a Rhizome with conspicuous and persistent stipe bases

polyphyllum A.Braun

Rhizome fusiform to linear, up to 15 mm long and 3.5 mm in diam., with conspicuous and persistent stipe bases; roots with proliferous buds. **Leaves** 1 or 2(3). **Stipe** up to 70 mm long, 40–60% of its length subterranean. **Lamina** dull or slightly glaucous green, held at 70–80° from the horizontal, elliptic to narrowly ovate, infrequently ovate, usually slightly folded medially and shallowly concave from above, up to 65 × 18 mm, apex acute to apiculate, base cuneate, margins flat or undulate. **Fertile spike** up to 70 mm long, with up to 23 sporangia pairs, apiculus up to 3 mm long. In a wide range of soils and vegetation types, alt. 50–1 800 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Lower Karoo, Albany Thicket (Matatiele S, Graaff-Reinet to Stutterheim and to Alexandria).

1b Rhizomes without persistent stipe bases
2a Sterile lamina up to 5 mm wide

lusoafricanum Welw. ex Prantl

Rhizome linear, up to 4 mm long, up to 2 mm in diam.; roots with proliferous buds. **Leaves** commonly single, rarely 2. **Stipe** up to 25 mm long, 30–50% subterranean. **Lamina** mid- to bright green, held at 60–90° from the horizontal, elliptic to very narrowly elliptic, rarely oblanceolate, flat or shallowly canaliculate in fertile leaves, up to 30 × 5 mm, apex acute, apiculate, base narrowly cuneate to attenuate, margins even. **Fertile spike** up to 85 mm long, with up to 12 sporangia pairs, apiculus acute, up to 1.3 mm long. In seasonally moist, shallow soils overlaying sheetrock, mostly among short grasses and sedges, alt. 1 600–1 800 m; Sub-Escarpment Grassland (Matatiele District).

2b Sterile lamina always > 5 mm wide

nudicaule L.f.

Slender adder's tongue

Rhizome linear, up to 20 mm long, up to 3 mm in diam.; roots with proliferous buds. **Leaves** 2–5 per plant. **Stipe** up to 18 mm long, 80–100% subterranean. **Lamina** midgreen, held at 10°–30° from the horizontal, elliptic to narrowly ovate, shallowly canaliculate, up to 22 × 9 mm, apex acute, apiculate, base broadly cuneate. **Fertile spike** up to 35 mm long, diverging from stipe from near its base, with up to 9 sporangium pairs, apiculus pronounced. Terrestrial in seasonally moist, clay soils, alt. 100–700 m; Rainshadow Valley Karoo, Albany Thicket, Sub-Escarpment Savanna, Lower Karoo (WC to Grahamstown).

reticulatum L.

Net-veined adder's tongue

Rhizome fusiform to short-linear, up to 18 mm long, up to 4 mm in diam.; roots with proliferous buds. **Leaves** 1 or 2(3). **Stipe** up to 77 mm long, 35–60% of its length subterranean, stipe bases not persistent. **Lamina** bright green, sterile lamina of fertile frond held at 15–50° to the horizontal, sterile lamina held at 50°–80°, broadly ovate, rarely subglobose, sterile lamina of fertile frond usually partially folded, sterile lamina almost flat to slightly concave medially, up to 50 × 48 mm, apex acute to obtuse, usually apiculate, base obtuse, truncate, or cordate. **Fertile spike** up to 180 mm long, with up to 34 sporangia pairs, apiculate. Mostly among grasses, low scrub, and rocks in open woodland, alt. 50–800 m; Indian Ocean Coastal Belt, Albany Thicket (Port St Johns to East London).

vulgatum L.

Common adder's tongue

Rhizome fusiform, up to 25 mm long, up to 3 mm in diam.; roots with proliferous buds. **Leaves** mostly 1. **Stipe** up to 125 mm long, 25–30% of its length subterranean, stipe bases not persistent. **Lamina** midgreen, sterile and fertile lamina held at 60–80° from ground, sterile lamina broadly ovate, usually partly folded, up to 50 × 22 mm, apex acute to apiculate, base narrowly to broadly cuneate. **Fertile spike** up to 70 mm long, with up to 35 sporangia pairs, apiculate. Scattered in seasonally moist grassland, alt. 400–1 300 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Drakensberg Grassland (Kokstad to Grahamstown).

OSMUNDACEAE

A family of ± 15 species in 6 genera. *Osmunda* has a nearly worldwide distribution, but *Todea* is confined to South Africa, New Guinea, Australia and New Zealand.

Sporangia on contracted, apical fertile segments ..... **Osmunda**
Sporangia on non-contracted, basal fertile segments ..... **Todea**

OSMUNDA L.

Species ± 6, pantemperate and tropical mountains; 1 in sthn Afr., LIM, G, M, S, FS, KZN, L, WC, EC.

regalis L.

Royal fern

Stems large, erect, up to 90 mm in diam., up to 200 mm tall, with persistent stipe bases and roots. **Fronds** caespitose, erect, up to 960 mm long, fertile fronds hemidi-

morphic, fertile pinnae apical. **Stipe** proximally laterally winged, terete higher up, up to 380 mm long and 6 mm in diam. **Lamina** 2-pinnate, oblong to narrowly ovate, up to 680 × 270 mm, with up to 11 pinna pairs. **Pinnae** 1-pinnate; sterile oblong-acuminate, up to 215 × 85 mm, with up to 11 pinnule pairs; fertile oblong-acuminate, up to 110 × 17 mm; petioles up to 7 mm long; with up to 11 pinnule pairs. **Pinnules** herbaceous, pale green, sessile; sterile oblong-acuminate to oblong-obtuse, up to 54 × 12 mm, minutely crenulate; fertile pinnules strongly contracted, linear to narrowly oblong, up to 27 × 4 mm; venation evident, pinnately branched, free. **Sporangia** borne at vein endings, short-stalked, capsule massive, globose, annulus poorly differentiated. Plants terrestrial, along streambanks and at boulder bases in grasslands, alt. 200–1 500 m; Indian Ocean Coastal Belt, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Port Edward to Knysna).

TODEA T.Moore

Species 2, South Africa and Australasia; 1 in sthn Afr., LIM, M, S, KZN, WC, NC, EC.

barbara (L.) T.Moore

King fern; *koningsvaring* (A)

Stem usually a massive unbranched, upright caudex, covered by a thick layer of persistent stipe bases and roots. **Fronds** caespitose, erect to arching, many, up to 1.05 m long. **Stipe** rigid, greenish to stramineous, terete, up to 340 mm long and 12 mm in diam., initially set with unbranched uniseriate hairs, narrow hair-like scales, and broad entire scales of which apices terminate in large, ovoid, non-glandular cells, glabrous later. **Lamina** 1-pinnate-pinnatifid, oblong-acute, up to 650 × 200 mm, with up to 22 petiolate pinna pairs. **Rachis** stramineous, terete, glabrous with age. **Pinnae** firmly herbaceous to subcoriaceus, opposite to alternate, proximally more widely spaced, narrowly lanceolate to oblong-acuminate, up to 230 × 43 mm, pectinately lobed; pinna rachis stramineous, narrowly winged towards apex, pronounced adaxially, glabrous; segments cultrate, up to 35 × 6 mm, set at an angle of 40°–50° to pinna rachis, serrate; venation evident, forked once, ending at margins in teeth; petioles up to 5 mm long. **Sporangia** massive, with a thick, short stalk, confined to the not conspicuously contracted basal pinnae and segments, on all parts of veins, appear acrostichoid at maturity; annulus a lateral band of thickened cells, poorly developed. Plants terrestrial, along streambanks in fynbos and forests, alt. 50–800 m; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Port Edward to Knysna).

PSILOTACEAE

A family of ± 5 species in 2 genera, occurring in the temperate and tropical parts of the world.

PSILOTUM L.

Species 2, pantropical; 1 in sthn Afr., LIM, M, S, KZN, L, EC.

nudum (L.) P.Beauv.

Whisk fern; *stoffer varing* (A)

Rhizome up to 1.5 mm in diam., short-creeping, branched, lacking true roots, but with rhizoids. **Aerial stems** green, angular, once of several times equally forked, up to

160 mm long, up to 2 mm in diam., erect or pendent, with rudimentary simple, lance-shaped enations, broadly attached, up to 1.5 mm long. **Synangia** 2- or 3-locular, up to 2.5 mm in diam., borne in axil of forked enations near branch ends, locules dehisce with a longitudinal slit. Epilithic or epiphytic in seasonally moist coastal cliffs and forests, alt. 30–350 m; Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket (Mkambati to East London).

POLYPODIACEAE

A family of ± 1 300 species in 50 to 80 genera. The family is cosmopolitan in distribution but the greatest diversity is in the tropical parts of the world.

1a Fronds with stellate hairs ..... **Pyrrosia**
1b Fronds without stellate hairs:
2a Sori linear ..... **Loxogramme**
2b Sori round to oval:
3a Lamina pinnatifid or unevenly lobed:
4a Fronds mostly < 300 mm long:
5a Venation free; lamina equally pinnatifid ..... **Polypodium**
5b Venation reticulate; lamina unequally lobed ..... **Pleopeltis**
4b Fronds mostly > 300 mm long:
6a Lobe margins entire ..... **Microsorum**
6b Lobe margins shallowly dentate ..... **Polypodium**
3b Lamina simple:
7a Sori without receptacular scales:
8a Sori < 2 mm in diam., many scattered over abaxial lamina surface ..... **Microsorum**
8b Sori mostly > 2 mm in diam., in 2 rows, on either side of the costa ..... **Microgramma**
7b Sori with receptacular scales:
9a Lamina abaxially closely set with clathrate peltate scales ..... **Pleopeltis**
9b Lamina abaxially with few peltate scales mostly along the costa ..... **Lepisorus**

LEPISORUS (J.Sm.) Ching

Species ± 25, confined to the palaeotropics and Hawaii; 2 in sthn Afr., LIM, M, S, FS, KZN, L, WC, EC.

schraderi (Mett.) Ching

Smooth lance-fern; *naakte lansvaring* (A)

Rhizome wide-creeping, up to 2.5 mm in diam., branched, with spaced phyllopodia dorsally; scales clathrate, central region dark, margins paler, ovate-acuminate, peltate, up to 4 × 1.5 mm. **Fronds** monomorphic, erect to arching, simple, up to 290 mm long. **Stipe** articulated to phyllopodia, terete, up to 30 mm long, up to 1.2 mm in diam., or estipitate, glabrous. **Lamina** herbaceous, simple, narrowly elliptic-acuminate to linear-acuminate, up to 260 × 25 mm, entire, adaxially sparsely set with 2-celled hairs, abaxially sparsely set with appressed scales and hairs, scales usually restricted to costae. **Costa** adaxially raised, pronounced abaxially; venation obscure, reticulate, areolae with simple and branched, included and excurrent veinlets ending in a hydathode. **Sori** circular, at a vascular plexus, in a single row parallel to and on both sides of costa on the distal part of lamina, up to 5 mm in diam.; exindusiate; receptacle scales clathrate, peltate, long-stalked, circular to broadly elliptic, denticulate to erose. Plants epilithic or epiphytic in seasonally moist forests, alt. 50–1 500 m; Mesic Highveld Grassland, Indigenous Forests, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Lady Grey to Kokstad and Port Edward, and to Knysna).

PSILOTACEAE

LOXOGRAMME (Blume) C.Presl

Species ± 22, confined to the tropics and warm temperate parts of the world; 1 in sthn Afr., LIM, M, S, FS, KZN, L, EC.

abyssinica (Baker) M.G.Price

Gilled lance-fern; *kiewvaring* (A)

Rhizome wide-creeping, dorsiventrally flattened, up to 1.3 mm in diam., branched, dorsally with 2 alternate rows of phyllopodia up to 2 mm long; scales castaneous, subulate, up to 3 × 1 mm, cordate, entire to denticulate. **Fronds** monomorphic, erect to arching, up to 235 mm long. **Stipe** articulated to phyllopodia, poorly defined, terete, narrowly winged along entire length, up to 28 mm long, basally sparsely scaled. **Lamina** firmly herbaceous, simple, entire, narrowly elliptic-cuneate, to oblong-cuneate, up to 210 × 22 mm, adaxially glabrous, abaxially sparsely set with clavate 2-celled hairs. **Costa** adaxially raised, convex; venation obscure, reticulate, areolae with or without included free veinlets. **Sori** linear, at a vascular plexus, at an acute angle on either side of costae, up to 16 mm long, exindusiate; receptacle with simple, pluricellular, uniseriate hairs ending in a gland-like cell, up to 0.3 mm long. Plants epilithic or epiphytic, mostly in deep shade in seasonally moist forests, alt. 250–500 m; Indigenous Forests (Kokstad to King William's Town).

MICROGRAMMA C.Presl

Clinging vine ferns

Species ± 15, confined to the Neotropics with one species extending to Africa and Madagascar; 1 in sthn Afr., M, S, KZN, EC.

mauritiana (Willd.) Tardieu

Rockrunner; *blinkblaar rotskruiper* (A)

Rhizome wide-creeping, dorsiventrally flattened, up to 5 mm in diam., dorsally with 2 alternate rows of short phyllopodia up to 2 mm long, densely set with appressed scales; scales centrally dark brown with paler margins, peltate, lanceolate, up to 10 × 1.5 mm. **Fronds** hemidimorphic, fertile slightly longer and narrower than sterile, erect, up to 200 mm long. **Stipe** articulated to phyllopodia, adaxially shallowly sulcate, up to 38 × 1 mm, glabrous. **Lamina** herbaceous, simple, entire; sterile ovate-acute, up to 170 × 50 mm; fertile narrowly lanceolate, acute to cuneate, up to 155 × 30 mm, adaxially glabrous, abaxially with appressed scales along costae, scales up to 1.5 mm long. **Costa** adaxially convex, pronounced abaxially; venation obscure, reticulate, areolae with or without simple free included veinlets. **Sori** circular to oval, up to 2.2 mm in diam., positioned at a plexus of predominantly quaternary veins in a single row on either side of the primary vein or costa, up to 3 mm in diam., exindusiate; receptacle with simple or branched, paraphyses, up to 0.7 mm long. Plants epilithic or epiphytic, mostly on cliff faces, alt. 50–100 m; Indian Ocean Coastal Belt (Port Edward to Mkambati).

MICROSORUM Link

Species ± 50, widespread in the temperate and tropical parts of the Old World; 3 in sthn Afr., M, KZN, EC.

punctatum (L.) Copel.

Rhizome short-creeping, up to 4 mm in diam., covered with a thick felt of roots, phyllopodia distinct, apex densely scaled; scales clathrate, pseudopeltate, up to 8 × 2 mm.

Fronds erect to arching, up to 1.5 m long. **Stipe** adaxially flatted, up to 12 × 8 mm, with few scales at base. **Lamina** simple, herbaceous, narrowly elliptic to oblong-acute, up to 1.4 m × 110 mm, adaxially punctate, near glabrous; venation evident or obscure, reticulate, areolae with included veinlets. **Sori** superficial, irregularly scattered, circular, up to 1.5 mm in diam., ± restricted to distal part of lamina; receptacle with 2- or 3-celled paraphyses; exindusiate. Plants epilithic or epiphytic in seasonally moist forests, or in sheltered rock crevices on cliffs, alt. 50–50 m; Indigenous Forests, Indian Ocean Coastal Belt (Port St Johns).

scolopendria (Burm.f.) Copel.

Creeping dune fern; *ruikbossie* (A)

Rhizome widely creeping, dorsiventrally flattened, up to 10 mm in diam., with narrowly lanceolate scales up to 4 mm long, older parts of rhizome nude. **Fronds** erect, up to 400 mm long, widely spaced. **Stipe** firm, terete to adaxially shallowly sulcate, up to 200 mm long, ± glabrous. **Lamina** coriaceous, broadly elliptic to broadly oblong, up to 400 mm long, deeply pinnatifid into narrowly oblong lobes, lobes up to 220 × 30 mm, glabrous or nearly glabrous adaxially and abaxially. **Costa** prominent abaxially. **Sori** somewhat sunken, circular to oval, 4–5 mm in diam., in 1 or 2 rows on either side of costae, adaxially embossed. Plants terrestrial, epilithic or low-level epiphytes on coastal cliffs and in dune scrub, alt. 50–100 m; Indian Ocean Coastal Belt, Indigenous Forests (Port Edward to Port St Johns).

PLEOPELTIS Humb. et Bonpl. ex Willd.

Species ±10, mostly neotropical; 3 in sthn Afr., LIM, G, M, S, FS, KZN, L, WC, EC.

macrocarpa (Bory ex Willd.) Kaulf.

Shield sorus polyploidy, scaly lance-fern, scaly polypody

Rhizome wide-creeping, up to 2 mm in diam., branched, dorsally with spaced phyllopodia up to 2 mm long; scales appressed, clathrate, ovate, up to 2 × 1 mm, cordate-imbricate to peltate. **Fronds** monomorphic, erect to arching, up to 295 mm long. **Stipe** articulated, convex adaxially, up to 52 × 1.2 mm; scales similar to, but slightly paler than those on rhizome, also with circular, appressed, peltate scales. **Lamina** firmly herbaceous, simple, entire, linear-cuneate, attenuate, up to 210 × 14 mm, adaxially moderately to sparsely set with hairs and scales, hairs 2-celled, scales appressed, clathrate, peltate, circular to lanceolate, up to 1.5 × 0.5 mm, abaxially moderately to densely set with hairs and scales similar to, but slightly larger than those on adaxial surface; venation obscure, reticulate, with or without simple or branched free veinlets. **Sori** circular to oval, up to 4 mm in diam., 1 per primary areole, exindusiate; receptacle with long-stalked, clathrate, peltate scales up to 1.6 mm in diam., erose. Plants epilithic or epiphytic in forests and forest remnants, alt. 50–1 500 m; Sub-Escarpment Grassland, Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Elliot and Port St Johns, and to Knysna).

polypodioides (L.) E.G.Andrews & Windham subsp. **ecklonii** (Kunze) J.P.Roux

Ecklon's polypody; *Ecklon-se-polypodie* (A)

Rhizome wide-creeping, up to 2 mm in diam., branched, with spaced phyllopodia up to 40 mm apart, up to 2 mm long, with appressed clathrate scales; scales peltate, lanceolate,

up to 4.5 × 0.7 mm. **Fronds** monomorphic, erect or arching, up to 280 mm long. **Stipe** articulated, terete, up to 110 × 1.2 mm, with appressed scales; scales peltate, circular to broadly ovate, up to 3 × 1.5 mm. **Lamina** firmly herbaceous to coriaceous, pinnatifid, pectinate, up to 170 × 78 mm, lobes spaced, alternate, linear-obtuse to linear-acute, up to 40 × 5 mm, adaxially with 2-celled hairs, abaxially variously set with appressed scales; scales brown, circular-caudate to ovate-caudate, up to 1.5 × 0.5 mm, erose; venation obscure, free, pinnately branched in lobes, branches forked once or twice, ending in a hydathode near margins. **Sori** circular, up to 1.5 mm in diam., on distal part of lobes, in a single row parallel to margin, on both sides of costule, exindusiate; receptacle set with simple, pluricellular, uniseriate hairs, apical cell somewhat enlarged, up to 0.3 mm long. Plants epilithic or epiphytic in forests and forest remnants, alt. 50–800 m; Indigenous Forests (Kokstad to Port Elizabeth).

×**simiana** (Schelpe & N.C.Anthony) N.R.Crouch & Klopper

Rhizome wide-creeping, branched, up to 2 mm in diam., with spaced phyllopodia up to 2 mm long, densely scaled; scales centrally dark brown to black, with reddish brown margins, lanceolate, up to 3 × 0.8 mm, peltate, denticulate. **Fronds** erect to arching, widely spaced, up to 300 mm long. **Stipe** firm, terete, up to 80 mm long, up to 1.2 mm in diam. **Lamina** firmly herbaceous, narrowly elliptic, up to 230 × 85 mm, irregularly pinnatisect to irregularly lobed, adaxially with few scattered ovate, peltate scales up to 1.5 mm long near costa, abaxially variously set with broadly ovate to subrotund peltate scales up to 2 mm long, scales dark at point of attachment, margins pale. **Costa** pronounced adaxially and abaxially, shallowly sulcate adaxially. **Sori** circular to elliptic, up to 3 mm long; exindusiate. Plants epilithic, epiphytic or in deep shade in seasonally moist forests, alt. 300–1 400 m; Indigenous Forests (Kokstad to Stutterheim).

POLYPODIUM L.

Species ±80, cosmopolitan; 2 in sthn. Afr., FS, KZN, L, WC, EC.

ensiforme Thunb.

Rhizome short-creeping, up to 5 mm in diam., with spaced phyllopodia up to 5 mm long, densely scaled; scales centrally dark brown, margins paler and fimbriate, lanceolate, up to 4 × 0.6 mm. **Fronds** articulated, spaced, erect, up to 450 mm long. **Stipe** firm, terete, sparsely scaled at base, glabrous higher up. **Lamina** coriaceous, oblong to ovate, deeply pinnatifid; lobes linear, up to 135 × 10 mm, acute to obtuse, weakly serrate to shallowly crenate, glabrous adaxially and abaxially. **Costa** convex adaxially and abaxially; venation reticulate, without included veinlets. **Sori** round, up to 3 mm in diam., in a single line on either side of costae. Plants epiphytic or epilithic in forests and on cliff faces, alt. 50–150 m; Indigenous Forests, Indian Ocean Coastal Belt (Port St Johns).

vulgare L.

Common polyploidy

Rhizome widely creeping, up to 180 mm long, up to 4 mm in diam., irregularly branched, with phyllopodia up to 10 mm apart and up to 2 mm long; scales stramineous to reddish brown, lanceolate to ovate, up to 4 × 1.2 mm, adnate, margins with short, closely set projections. **Fronds** articulated, up to 570 mm long. **Stipe** stramineous, firm, up to 155 mm long, up to 1.2 mm in diam., glabrous, terete, often narrowly winged in upper $^1/_3$. **Lamina** oblong, up to 450 × 70 mm, pectinately pinnatifid, basal lobes generally more widely spaced than those higher up, basal lobe pair reflexed or not, lobes herbaceous, pale

to midgreen, oblong-obtuse, up to 36 × 8 mm, widening towards base, minutely denticulate, with clavate, 2- or 3-celled hairs occurring abaxially and/or adaxially. **Costa** and costules ridged adaxially; venation free, forked, ending in a hydathode near margins. **Sori** in a single row on either side of costules circular to oval, up to 2 mm in diam., discrete, but confluent when mature in smaller plants; exindusiate; receptacle nude. **Spores** yellow to pale brown. Plants mostly epilithic in moist protected rock crevices on shaded cliffs, alt. 600–1 800 m; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Lady Grey to Kokstad S, from Grahamstown to Knysna).

PYRROSIA Mirb.

Tongue ferns

Species ± 51, confined to the palaeotropics; 2 in sthn Afr., M, KZN, EC.

africana (Kunze) F.Ballard

Rhizome short-creeping, up to 4 mm in diam., with phyllopodia up to 3 mm long, up to 25 mm apart, densely scaled near apex, older parts glabrous; scales reddish brown, lanceolate, up to 4 × 0.8 mm. **Fronds** articulated to phyllopodia, erect to arching, closely to widely spaced, up to 450 mm long. **Stipe** terete, up to 30 mm long, up to 2.5 mm in diam., distally winged. **Lamina** simple, narrowly elliptic, attenuate, up to 450 × 30 mm, coriaceous to carnose, entire, dark green adaxially and initially closely set with stellate hairs, hairs soon abraded and surface glossy, abaxially set with a velvet-like cover of whitish stellate hairs; venation obscure, reticulate. **Sori** round, up to 2 mm in diam., irregularly scattered on distal part of lamina; exindusiate. Plants epilithic or epiphytic in coastal forests, alt. 30–100 m; Indian Ocean Coastal Belt, Indigenous Forests (Port Edward to East London).

PTERIDACEAE

A family of ± 1 000 species in 50 to 60 genera. Whilst some genera are cosmopolitan in distribution, others are restricted to tropical and/or temperate parts of the world.

1a Fronds simple or pentagonal:
2a Laminae simple, linear ..... **Vittaria**
2b Laminae pedate-pinnatifid ..... **Doryopteris**
1b Fronds variously pinnately compound:
3a Laminae 1-pinnate; pinnae coriaceous; sporangia acrostichoid ..... **Acrostichum**
3b Laminae pinnately divided; sporangia arranged along a vein, or variously clustered to form distinct sori:
4a Sporangia in short lines along veins; abaxially with a yellow farina..... **Pityrogramma**
4b Sporangia confined to a marginal or near marginal vascular commissure, the sporangia confined to apices of free vein branches, or sporangia occur on indusial flaps away from veins:
5a Sporangia borne on reflexed marginal flaps..... **Adiantum**
5b Sporangia borne near marginally and often covered by a modified margin:
6a Ultimate fertile segments with a distinct entire to serrate sterile apex ..... **Pteris**
6b Ultimate fertile segments without a distinct sterile apex:
7a Pinnae and/or ultimate segments articulated..... **Pellaea**
7b Pinnae and/or ultimate segments not articulated ..... **Cheilanthes**

ACROSTICHUM L.

Leather ferns

Species 3, pantropical to warm-temperate; 1 in sthn Afr., KZN, EC.

aureum L.

Coast leather fern

Rhizome short-creeping to erect, stout, up to 6 mm in diam., with firm subulate scales up to 10 mm long. **Fronds** crowded, erect, up to 1.8 m long. **Stipe** firm, up to 0.5 m long, up to 5 mm in diam., sulcate. **Lamina** 1-pinnate, up to 1.5 × 0.4 mm, with a free, conform, terminal pinna. **Pinnae** coriaceous, oblong to cultrate, entire to irregularly undulate, acuminate to truncate, up to 350 × 45 mm, glabrous at maturity, larger pinnae short stalked; fertile pinnae borne towards frond apex; venation reticulate. **Sporangia** acrostichoid. Plants terrestrial, on estuarine banks and brackish swamps, alt. 5–30 m; Indian Ocean Coastal Belt (KZN to Mtentu River Mouth).

ADIANTUM L.

Maidenhair ferns

Species ± 150, pantropical distribution; 7 in sthn Afr., N, LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

aethiopicum L.

Southern maidenhair

Rhizome slender, widely creeping and branched, with spaced stipe bases and scales; scales pale brown, lanceolate, up to 2.5 × 0.5 mm. **Fronds** erect to arching, up to 280 mm long. **Stipe** castaneous, terete, up to 90 mm long. **Lamina** ovate, up to 200 × 150 mm, up to 3-pinnate. **Rachis** and lower order axes dark brown to black and glossy. **Pinnae** alternate, basal pinnae largest, broadly ovate, up to 85 × 60 mm; petioles up to 5 mm long; ultimate segments thinly herbaceous, pale green, glabrous, cuneate to rounded rhomboid, often somewhat lobed, up to 13 × 14 mm, outer margins minutely dentate; venation evident, veins end in teeth; with petioles up to 1.2 mm long. **Sori** 1 or 2 per segment, on outer margins; indusial flaps glabrous, orbicular to deeply reniform, ± 2 mm in diam. Plants in deep shade on forest floors, alt. 0–200 m; Indigenous Forests (Alexandria).

capillus-veneris L.

Black maidenhair fern

Rhizome creeping, branched, up to 4 mm in diam., variously scaled; scales reddish brown, clathrate, subulate, up to 5 × 0.7 mm. **Fronds** erect, arching, or pendant, up to 420 mm long. **Stipe** firm, terete, dark brown to black, glossy, up to 215 mm long and 1.2 mm in diam., initially sparsely set with scales similar to those on rhizome. **Lamina** ovate to broadly ovate, up to 270 × 240 mm, up to 3-pinnate. **Rachis** and lower order axes dark brown and glossy. **Pinnae** alternate, basal pinna pair largest, unequally broadly ovate to narrowly elliptic, up to 140 × 80 mm, up to 2-pinnate, often basiscopically developed; petioles up to 23 mm long. **Pinnules** broadly ovate to narrowly elliptic, up to 62 × 40 mm, petioles up to 8 mm long; ultimate segments thinly herbaceous, pale to dark green, glabrous, narrowly to broadly cuneate, up to 26 × 25 mm, outer margins variously lobed, lobes oblong, obtuse, denticulate, venation evident, forked, branches end in teeth, petioles up to 3 mm long. **Sori** borne along outer lobe margins. **Sporangia** confined to veins in straight or nearly straight soral flaps up to 5 × 1 mm. Plants terrestrial or epilithic, mostly in seepage areas on cliffs, alt. 0–1 500 m; Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Port Edward S, from Graaff-Reinet to Port St Johns, and to Knysna).

poiretii Wikstr.

Maidenhair fern

Rhizome shortly creeping, branched, up to 2.5 mm in diam., producing slender stolon-like branches up to 50 mm long, variously scaled; scales reddish brown, narrowly lanceolate, up to 5 × 1.2 mm. **Fronds** crowded, erect or arching, up to 750 mm long. **Stipe** firm, terete, dark brown, glossy, up to 360 mm long and 1.5 mm in diam., initially sparsely set with scales similar to those on rhizome. **Lamina** ovate to deltate, up to 400 × 280 mm, up to 5-pinnate. **Rachis** and lower order axes dark brown and glossy. **Pinnae** alternate, basal pinna pair largest, ovate to deltate, up to 225 × 115 mm, up to 4-pinnate; petioles up to 34 mm long. **Pinnules** ovate to elliptic, up to 90 × 55 mm, petioles up to 22 mm long; segments petiolate, ovate to elliptic, up to 42 × 22 mm; ultimate segments articulated to petioles up to 4 mm long, reniform, basal margins straight or broadly cuneate, thinly herbaceous, glabrous, up to 12 × 16 mm, lobed, outer lobe margins denticulate; venation evident, branches end in sinuses between teeth. **Sori** up to 7 per ultimate segment. **Sporangia** confined to veins in reniform soral flaps up to 4 × 1 mm. Plants terrestrial or epilithic, mostly in seasonally moist forests, alt. ± 150–800 m; Indigenous Forests (Kokstad to Stutterheim).

***raddianum** C.Presl

Delta maidenhair fern

Rhizome shortly creeping and irregularly branched, up to 2 mm in diam. **Fronds** erect to arching, up to 640 mm long. **Stipe** terete and firm, dark brown to black and glossy, up to 350 mm long, up to 1.2 mm in diam. **Lamina** ovate to broadly, up to 300 × 200 mm, up to 3-pinnate, with up to 12 pinna pairs. **Rachis** and lower order axes dark brown and glossy. **Pinnae**, pinnules and segments petiolate; ultimate segments thinly herbaceous, glabrous, up to 10 × 10 mm, base mostly cuneate or narrowly cuneate, mostly longer than wide, outer margins variously lobed, outer lobe margins denticulate, venation evident, forked, ending in sinus between teeth, petioles up to 2 mm long. **Sori** borne along outer margin of ultimate segment lobes, up to 5 per ultimate segment. **Sporangia** confined to veins or near veins on membranous, near circular soral flaps up to 2 mm in diam. Plants terrestrial or epilithic, mostly in disturbed areas, exposed or shaded, alt. 0–1 500 m; Upper Karoo, Indigenous Forests (Aliwal North to Port St Johns).

CHEILANTHES Sw.

Lip ferns

Species ± 150, near cosmopolitan; 24 in sthn Afr., widespread.

Lamina not conspicuously basiscopically developed

contracta (Kunze) Mett. ex Kuhn

Rhizome creeping, up to 4 mm in diam., with spaced stipe bases and subulate scales with an atrocastaneous central region and narrow pale borders, up to 2 × 0.2 mm. **Fronds** erect, up to 280 mm long. **Stipe** firm, atrocastaneous, terete, up to 150 mm long, up to 1.2 mm in diam., with multicellular hairs up to 0.6 mm long. **Lamina** firmly herbaceous, narrowly lanceolate to oblong-acute, up to 150 × 40 mm, 2-pinnate to 3-pinnatifid, with up to 17 petiolated pinna pairs. **Rachis** and lower order axes densely pilose with multicellular hairs. **Pinnae** petiolate, lanceolate, up to 25 × 10 mm. **Pinnules** petiolate, lanceolate, up to 5 × 2 mm, divided into as many as 7 sessile lobes, adaxially and abaxially

with scattered multicellular hairs; venation obscure. **Sori** discrete, minute. **Indusium** minute or absent. Plants on exposed rocky slopes and in light shade of scrub in fynbos and thickets, alt. 50–1 200 m; Albany Thicket, Eastern Fynbos-Renosterveld (East London to Grahamstown and Tsitsikamma).

hirta Sw.

Parsley fern; *pietersielievaring* (A)

Rhizome short-decumbent to suberect, up to 4 mm in diam., with stipe bases and bicolorous subulate scales, up to 4 × 0.6 mm, entire to shallowly repand. **Fronds** erect, caespitose, up to 12 per plant, up to 360 mm long. **Stipe** firm, castaneous, terete, up to 92 mm long and 1.2 mm in diam., hirsute, proximally with scales similar to those on rhizome, hairs stiff, ferruginous, multicellular, up to 1.7 mm long. **Lamina** herbaceous, linear-acuminate to narrowly lanceolate, up to 3-pinnate, up to 280 × 65 mm, with up to 19 pinna pairs. **Rachis** terete, with hairs similar to those on stipe. **Pinnae** petiolate, ovate, up to 50 × 20 mm, up to 2-pinnate. **Pinnules** petiolate, ovate to broadly ovate, up to 11 × 7 mm, up to 1-pinnate, usually with a single pair of segments; segments ovate to oblong-obtuse, up to 4 × 1.3 mm, crenate, adaxially and abaxially hirsute; venation obscure. **Sori** at free vein endings; receptacle nude; exindusiate, sporangia protected by recurved segment margin. Plants mostly among rocks and in low scrub in grasslands, but often also along forest margins, alt. 50–2 200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad S, from Middelburg to Port St Johns, and to Tsitsikamma).

parviloba (Sw.) Sw.

Rhizome short-creeping, up to 4 mm in diam., with crowded stipe bases and scales; scales with a castaneous central region and paler entire margins, lanceolate to subulate, up to 2 × 0.35 mm. **Fronds** erect, up to 350 mm long. **Stipe** castaneous, rigid, terete, up to 150 mm long, with few scales at base, pilose with patent or appressed, 1–3-celled hairs up to 0.5 mm long. **Lamina** herbaceous to coriaceous, narrow-elliptic to oblong-attenuate, up to 250 × 50 mm, 2-pinnate to 3-pinnatifid, basal pinnae reduced. **Rachis** and lower order axes castaneous, terete, closely set with glandular hairs up to 0.5 mm long. **Pinnae** narrowly lanceolate to oblong-attenuate, up to 30 × 8 mm. **Pinnules** narrowly oblong to narrowly deltate, up to 5 × 2 mm, pinnatifid into oblong, often bilobed segments, glabrous abaxially, adaxial closely set with glands, viscid; venation obscure. **Sori** at apices of ultimate lobes. **Indusium** absent. Plants in shaded and exposed rock crevices, or at rock bases on ridges, alt. 50–1 500 m; Indian Ocean Coastal Belt, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Port Edward to Willowmore).

Lamina conspicuously basiscopically developed

bergiana Schltdl.

Bergius's lip fern, forest lip fern; *woud lipvaring* (A)

Rhizome short, erect, up to 4 mm in diam., with stipe bases and bicolorous subulate scales, up to 9 × 0.6 mm, entire. **Fronds** caespitose, 6–8 per plant, arching, up to 800 mm long. **Stipe** castaneous, firm, proximally terete, distally shallowly sulcate, up to 380 mm long, up to 4 mm in diam., with scales and hairs; scales ferruginous, linear-acuminate to filiform, up to 3 × 0.2 mm, entire; hairs multicellular, acicular, up

to 1 mm long. **Lamina** pentagonal, up to 300 × 290 mm, up to 4-pinnate-pinnatifid, with up to 12 petiolated pinna pairs. **Rachis** shallowly sulcate, with hairs similar to those on stipe. **Pinnae** petiolate, herbaceous to thinly herbaceous, up to 3-pinnate-pinnatifid, basiscopically developed, inequilaterally broadly ovate, up to 180 × 125 mm, with up to 12 pinnule pairs, distal pinnae narrowly ovate to lanceolate; ultimate segments pinnatifid, ovate to oblong-acuminate, up to 10 × 0.5 mm, divided into oblong lobes, shallowly crenate, adaxially and abaxially moderately set with multicellular acicular hairs along costule and veins; venation evident. **Sori** discrete; receptacle nude. **Indusium** membranous, lunate, entire to subentire, up to 0.6 mm in diam. Plants in deep shade on moist forest floor, often forming large stands, alt. 50–1 400 m; Indigenous Forests (Kokstad to East London, and to Tsitsikamma).

capensis (Thunb.) Sw.

Cape lip fern

Rhizome erect to short-decumbent, up to 45 mm long, up to 3 mm in diam., with stipe bases and filiform to narrowly lanceolate scales, up to 5 × 0.4 mm, entire or with short marginal outgrowths. **Fronds** caespitose, up to 6 per plant, arching, up to 210 mm long. **Stipe** atrocastaneous, glossy, up to 130 mm long, up to 1 mm in diam., proximally terete, flatted towards lamina base, with few hairs up to 2 mm long. **Lamina** ovate to deltate, up to 110 × 80 mm, with up to 4 petiolated pinna pairs. **Rachis** proximally atrocastaneous, green towards apex, sulcate adaxially, narrowly winged, with few pluricellular hairs. **Pinnae** proximal 1–3 pairs short-petiolate, petioles winged, pale to midgreen; herbaceous, inequilaterally ovate to elliptic, up to 45 × 30 mm, proximal 2 pinna pairs somewhat basiscopically developed, 1-pinnate-pinnatifid to pinnatifid, glabrous adaxially and abaxially; pinna rachis narrowly winged. **Pinnules** sessile, narrowly to broadly ovate, up to 19 × 9 mm; venation evident, vein branches terminate in sinuses between teeth. **Sori** at vein endings. **Indusium** flabellate, up to 1.2 mm wide, hyaline, erose, discrete or continuous. Plants mostly in light shade of scrub and at boulder bases on moist slopes, alt. 50–1 400 m; Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Stutterheim to Tsitsikamma).

eckloniana (Kunze) Mett.

Ecklon's lip fern, resurrection fern; *Ecklon-se-lipvaring* (A)

Rhizome short-decumbent, up to 3 mm in diam., with stipe bases and subulate to narrowly lanceolate scales, up to 3 × 0.8 mm, shallowly serrate. **Fronds** caespitose, erect, up to 400 mm long. **Stipe** castaneous, firm, terete, up to 260 mm long, up to 2.3 mm in diam., densely set with stramineous to ferruginous hairs and scales; hairs multicellular, up to 0.6 mm long; scales subulate to acicular, up to 4.5 × 0.4 mm. **Lamina** firmly herbaceous, oblong-acuminate to narrowly lanceolate, up to 3-pinnate, up to 345 × 130 mm, with up to 16 petiolated pinna pairs. **Rachis** terete, with scales and hairs similar to those on stipe. **Pinnae** petiolate, up to 2-pinnate, on lower half of lamina basiscopically developed, inequilaterally deltate to broadly ovate, up to 87 × 39 mm, with up to 5 pinnule pairs, distal pinnae lanceolate. **Pinnules** petiolate, up to 1-pinnate, with up to 2 segment pairs; segments sessile, narrowly ovate to oblong-obtuse, up to 6 × 2 mm, obtusely lobed, adaxially initially with hairs and filiform scales, glabrous later, abaxially densely set with hairs and scales; venation obscure. **Sori** discrete; receptacle nude. **Indusium** membranous, linear, repand. Plants mostly at boulder bases and along rocky ridges, often in low scrub, exposed or lightly shaded, alt. 50–2 200 m; Upper Karoo, Dry Highveld Grass-

land, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Lower Karoo, Sub-Escarpment Savanna, Albany Thicket (Aliwal North to Kokstad S, from Middelburg to Flagstaff, Graaff-Reinet to Butterworth, and to Grahamstown).

inaequalis (Kunze) Mett. var. **buchananii** (Baker) Schelpe

Rhizome short-creeping, up to 4 mm in diam., with stipe bases and ferruginous, linear-lanceolate scales up to 14 mm long. **Fronds** caespitose, arching, up to 250 mm long. **Stipe** atrocastaneous, terete, up to 140 mm long, up to 1.4 mm in diam., with scales at base and pale multicellular hairs higher up. **Lamina** firmly herbaceous, ovate-deltate, up to 120 × 100 mm, up to 3-pinnatifid basally, with up to 6 petiolate pinna pairs. **Pinnae** petiolate, unequally deltate, up to 50 × 35 mm, proximal 3 pinna pairs basiscopically developed, deeply pinnatifid into oblong to narrowly oblong, subentire crenate or pinnatifid segments, obtuse, adaxially pilose, abaxially pilose to densely tomentose with 3–5-celled hairs, ferruginous with age; venation obscure. **Sori** along margins of ultimate segments, discrete. **Indusium** absent; sporangia protected by a recurved segment margin. Plants in shaded or exposed sandstone rock crevices and cliffs, alt. 50–200 m; Indian Ocean Coastal Belt (Port Edward to Port St Johns).

induta Kunze

Rhizome creeping, up to 5 mm in diam., with spaced stipe bases and ferruginous, lanceolate scales with a dark central stripe, up to 3 × 0.4 mm, entire. **Fronds** erect, closely spaced, up to 480 mm long. **Stipe** castaneous to atrocastaneous, up to 290 mm long, up to 2 mm in diam., broadly sulcate, variously set with glands, multicellular hairs, and filiform scales; scales up to 3 mm long. **Lamina** herbaceous, lanceolate to narrowly ovate, up to 250 × 85 mm, 3-pinnate to 4-pinnatifid, with up to 14 petiolated pinna pairs. **Pinnae** petiolate, inequilaterally ovate, somewhat basiscopically developed, up to 95 × 30 mm. **Pinnules** lanceolate, up to 16 × 7 mm; ultimate segments deeply pinnatifid into rounded oblong segments, adaxially glabrous or with scattered multicellular hairs, abaxially sparsely to densely tomentose with pale to ferruginous hairs; venation obscure. **Sori** at apex of ultimate segments. **Indusium** absent, sporangia protected by a recurved margin. Plants mostly in light shade at base of rocks or in rock crevices, alt. 1 000–1 500 m; Upper Karoo, Dry Highveld Grassland (Middelburg to Graaff-Reinet).

involuta (Sw.) Schelpe & N.C.Anthony

Rhizome erect to short-decumbent, up to 15 mm long, up to 4 mm in diam., with stipe bases and castaneous, acicular to linear scales, up to 9 × 0.5 mm, entire. **Fronds** erect, caespitose, up to 160 mm long. **Stipe** atrocastaneous to black, firm, terete, adaxially flattened to shallowly sulcate higher up, up to 115 mm long, up to 1.2 mm in diam., with patent scales and 2- or 3-celled hairs; scales filiform, acicular or subulate, up to 8 × 0.4 mm, attached parallel to frond axes and often widening at base, entire. **Lamina** lanceolate, up to 130 × 75 mm, up to 2-pinnate-pinnatifid, with up to 10 pinna pairs. **Rachis** dark brown, glossy, sulcate, with scales and multicellular hairs. **Pinnae** petiolate, ovate to narrowly ovate, up to 45 × 25 mm, basiscopically developed, up to 1-pinnate-pinnatifid, with up to 6 petiolated pinnule pairs. **Pinnules** petiolate, deltoid, broadly ovate to narrowly trullate, up to 20 × 18 mm, often auriculate, pinnatifid; segments green to greyish green, firmly herbaceous, elliptic to narrowly trullate, up to 10 × 4 mm, often hastate, glabrous adaxially and abaxially; venation obscure. **Sori** marginal, continuous, interrupted at segment apices and often absent from sinuses. **Indusium** linear, up to 0.2 mm wide, entire, repand or erose. Plants generally in exposed or shaded rock crevices, often sheltered by low scrub, alt. 50–1 500 m; Sub-Escarpment Grassland,

Sub-Escarpment Savanna, Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket (Kokstad to Cradock and Alexandria to East London).

multifida (Sw.) Sw.

Rhizome short-creeping, up to 6 mm in diam., with stipe bases and subulate to subulate-caudate scales, up to 5 × 1 mm, entire. **Fronds** closely spaced, erect, up to 540 mm long, up to 8 per plant. **Stipe** castaneous, proximally terete, sulcate in upper half, up to 295 mm long, up to 3 mm in diam., basally with scales similar to those on rhizome, higher up with few filiform scales and hairs up to 5 mm long, soon glabrous. **Lamina** firmly herbaceous to thinly coriaceous, pentagonal, up to 230 × 170 mm, up to 3-pinnate-pinnatifid, with up to 12 pinna pairs. **Rachis** and lower order axes sulcate, glabrous. **Pinnae** petiolate, inequilaterally broadly ovate to ovate, basiscopically developed, up to 130 × 88 mm, up to 2-pinnate-pinnatifid, with up to 10 petiolated pinnule pairs. **Pinnules** petiolate, up to 1-pinnate-pinnatifid, inequilaterally broadly ovate to ovate, basiscopically developed, with up to 5 petiolated segment pairs; segments short-stalked, pinnatifid, narrowly ovate to oblong-obtuse, up to 14 × 7 mm; ultimate segments sessile, oblong-obtuse, shallowly lobed, up to 3 × 2 mm, glabrous adaxially, abaxially closely set with 2-celled clavate hairs; venation obscure. **Sori** discrete; receptacle nude. **Indusium** membranous, pale, semi-circular, entire to lacerate. Plants at boulder bases, in rock crevices and in shallow soil pockets overlaying sheet rock, in exposed or partially shaded conditions, alt. 50–1 600 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Drakensberg Grassland, Dry Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Tsitsikamma).

quadripinnata (Forssk.) Kuhn

Four-pinnate lip fern; *vierveerlipvaring* (A)

Rhizome short-decumbent, up to 9 mm in diam., with stipe bases and castaneous, subulate scales up to 10 × 0.8 mm, entire. **Fronds** crowded, erect, up to 980 mm long, up to 8 per plant. **Stipe** rigid, castaneous, basally terete, sulcate in upper half, up to 800 mm long, up to 7 mm in diam., basally with scales similar to those on rhizome, higher up sparsely set with scales and hairs. **Lamina** firmly herbaceous to coriaceous, pentagonal, up to 500 × 580 mm, up to 4-pinnate, with up to 15 petiolated pinna pairs. **Rachis** and lower order axes rigid, adaxially sulcate, initially with multicellular hairs, glabrous later. **Pinnae** inequilaterally broadly ovate to triangular, up to 365 × 230 mm, up to 3-pinnate, basiscopically developed, with up to 17 petiolated pinnule pairs. **Pinnules** narrowly ovate to linear-acute, up to 2-pinnate, with up to 9 petiolated segment pairs; segments triangular to oblong-acute, up to 35 × 25 mm, up to 1-pinnate; ultimate segments narrowly elliptic, oblong-obtuse, or hastate, up to 12 × 5 mm, crenate, somewhat revolute when fertile, glabrous adaxially and abaxially; venation often immersed adaxially, or obscure, branches terminate in sinuses between teeth. **Sori** confined to enlarged free vein apices, or sporadically along a commissure formed by a few adjacent vein endings; receptacle with 3- or 4-celled simple, hair-like paraphyses. **Indusium** membranous, continuous, entire to erose, up to 0.6 mm broad. Plants at boulder bases, in rock crevices, in low scrub and along forest margins, in shaded or exposed conditions, alt. 100–1 800 m; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Upper Karoo, Sub-Escarpment Savanna, Albany Thicket (Lady Grey to Kokstad S, from Middelburg to Maclear, Graaff-Reinet to Komga, and to Grahamstown).

viridis (Forssk.) Sw.

Common lip fern; *raamvaring* (A)

Rhizome short-decumbent, up to 7 mm in diam., with closely spaced stipe bases and ferruginous scales, subulate-caudate, up to 6 × 1 mm, entire to denticulate. **Fronds** caespitose, erect, up to 940 mm long, up to 6 per plant. **Stipe** castaneous, rigid, basally terete, sulcate in upper half, up to 360 mm long, up to 5 mm in diam., basally with scales and hairs, glabrous higher up. **Lamina** firmly herbaceous, pentagonal, up to 480 × 420 mm, up to 3-pinnate, with up to 14 petiolated pinna pairs. **Rachis** castaneous, adaxially sulcate, with ferruginous, 2- or 3-celled patent hairs where pinnae branch from rachis. **Pinnae** inequilaterally triangular to ovate, up to 270 × 120 mm, up to 2-pinnate, basiscopically developed, with up to 9 petiolated pinnule pairs. **Pinnules** inequilaterally developed, broadly ovate to lanceolate, often acroscopically auricled, up to 1-pinnate, basiscopically developed; segments sessile or petiolate, closely set with ferruginous, 2- or 3-celled patent hairs, segments simple, lanceolate to broadly ovate, up to 0.8 mm long, often acroscopically auricled, crenate, adaxially glabrous, abaxially glabrous or variously set with 2–6-celled hairs, costa often moderately haired; venation immersed adaxially, evident abaxially, branches terminate in sinuses between teeth. **Sori** forming a continuous line along a near-marginal vascular commissure; receptacle with 3–5-celled simple, hair-like paraphyses. **Indusium** membranous, continuous, entire to repand, up to 0.7 mm wide. Plants at boulder bases, in rock crevices, in scrub and in leaf litter on floor of evergreen forests, in exposed or deeply shaded conditions, alt. 50–1 500 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Tsitsikamma).

DORYOPTERIS J.Sm.

Oak-leaved ferns

Species ± 25, distributed throughout tropical parts of world; 2 in sthn Afr., NW, G, M, S, KZN, EC.

concolor (Langsd. & Fisch.) Kuhn,

Geranium fern, oak-leaved fern; *malvablaar varing* (A)

Rhizome short, erect to suberect, up to 3 mm in diam., with crowded stipe bases and bicolorous subulate scales, up to 5 × 0.8 mm, denticulate. **Fronds** caespitose, erect, up to 260 mm long, up to 12 per plant. **Stipe** atrocastaneous, rigid, basally terete, sulcate in upper half, up to 160 mm long, up to 1.2 mm in diam., initially with hairs and scales, glabrous later; hairs ferruginous, 2-celled; scales bicolorous, subulate, up to 2 × 0.8 mm. **Lamina** herbaceous, pentagonal, 2-pinnatifid, up to 140 × 127 mm, basal segment basiscopically developed, inequilaterally broadly triangular, up to 72 × 66 mm, pinnatifid, acroscopic segment on basal pinna up to 17 mm long, basiscopic segment on basal pinna up to 57 mm long, shallowly crenulate to deeply lobed; lobes oblong-acuminate, up to 6 mm wide, upper segments simple or deeply lobed, glabrous adaxially, abaxially with 2-celled hairs; venation evident, free in sterile fronds. **Sori** discrete, or along a marginal vascular commissure; receptacle with 1- or 2-celled broadly elliptic to clavate paraphyses. **Indusium** membranous, marginal, discrete or continuous, entire, up to 0.5 mm wide. Plants in deep shade in leaf litter and on rocks in seasonally moist evergreen forests, alt. 50–1 000 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous

Forests, Albany Thicket (Kokstad to Port St Johns S, from Bedford to King William's Town, and to Alexandria).

PELLAEA Link

Cliff brakes

Species ± 35, largely confined to the southeastern United States of America, Mexico, Africa, Madagascar and the Indian subcontinent; 7 in sthn. Afr., LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

calomelanos (Sw.) Link

Hard fern; *blou-groen bergvaring* (A)

Rhizome short-decumbent, with crowded stipe bases, multicellular hairs and subulate scales; scales ferruginous, up to 10 × 1 mm. **Fronds** caespitose, erect, up to 410 mm long, up to 12 per plant. **Stipe** atrocastaneous to black, nitid, rigid, terete, up to 150 mm long, up to 2 mm in diam., initially with hairs and scales similar to those on rhizome, glabrous later. **Lamina** firmly herbaceous to coriaceous, ovate to deltate, up to 340 × 145 mm, up to 3-pinnate, with up to 13 pinna pairs. **Rachis** atrocastaneous to black, nitid, terete, glabrous. **Pinnae** petiolate, up to 2-pinnate, ovate to rectangular-acute, up to 110 × 50 mm, with up to 6 pinnule pairs. **Pinnules** petiolate, up to 1-pinnate, ovate, up to 45 × 22 mm, with up to 2 segment pairs; segments petiolate, articulated, glaucous, cordate, hastate or pentagonal, up to 20 × 20 mm, entire, glabrous adaxially and abaxially; venation obscure. **Sori** forming a continuous line along a marginal vascular commissure; receptacle with 3- or 4-celled paraphyses. **Indusium** membranous, continuous, marginal, entire to shallowly crenulate, up to 0.4 mm wide. Plants at boulder bases, in rock cervices, or in shallow soil pockets overlaying sheet rock, in exposed or partially shaded conditions, alt. 50–2 000 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket; Eastern Fynbos-Renosterveld (Albert District to Kokstad S, from Middelburg to Port Edward, Graaff-Reinet to Kentani District, and to Humansdorp).

leucomelas (Mett. ex Kuhn) Baker

Rhizome short-creeping, up to 3 mm in diam., with crowded stipe bases and subulate scales with a thickened castaneous-ferruginous central region and narrow ferruginous margins, up to 4 mm long, subentire. **Fronds** crowded, erect, up to 300 mm long. **Stipe** atrocastaneous to black, nitid, basally terete, flattened to shallowly sulcate higher up, up to 110 mm long, up to 1.2 mm in diam., glabrous except for a few scales similar to those of rhizome at base. **Lamina** narrowly ovate-deltate, up to 160 × 60 mm, 2- or 3-pinnate. **Rachis** and lower order axes sulcate, atrocastaneous, nitid, glabrous or with scattered minute hairs. **Pinnae** petiolate, basal pinna pair largest, ovate to lanceolate, up to 35 × 17 mm. **Pinnules** coriaceous, articulated to short petiolules, oblong, elliptic, to broadly hastate, up to 10 × 9 mm, entire, cordate to truncate; venation obscure. **Sori** a continuous marginal line. **Indusium** pale, carnose-coriaceous, entire, < 0.2 mm wide. Plants in rock crevices and at boulder bases on northern aspect slopes of Lange- and Outeniqua mts, alt. 600–1 000 m; Eastern Fynbos-Renosterveld (Tsitsikamma to Port Elizabeth).

PITYROGRAMMA Link

Goldback and silverback ferns

Species 16, mostly neotropical; 2 (1 naturalised) in sthn Afr., M, S, KZN, EC.

calomelanos (L.) Link var. **aureoflava** (Hook.) Weath. ex L.H.Bailey

Golden fern; *goue varing* (A)

Rhizome short, suberect, branched, up to 5 mm in diam., scales ferruginous, sessile, linear-acuminate to narrowly lanceolate, up to 4 × 0.6 mm, entire. **Fronds** caespitose, suberect to arching, up to 810 mm long. **Stipe** firm, castaneous, nitid, terete, distally adaxially flattened, up to 410 mm long, up to 4 mm in diam., proximally moderately scaled, sparsely scaled to glabrous distally. **Lamina** firmly herbaceous, ovate to lanceolate, up to 465 × 220 mm, up to 2-pinnate, with up to 19 pinna pairs. **Rachis** castaneous, nitid, adaxially shallowly sulcate, glabrous or set with 2-celled clavate hairs. **Pinnae** alternate, narrowly lanceolate to linear acuminate, up to 122 × 36 mm, pinnatifid to 1-pinnate; petioles up to 7 mm long. **Pinnules** sessile or short-petiolate, inequilateral, oblong-acuminate to narrowly trullate, or hastate, up to 21 × 8 mm, basiscopically narrowly cuneate, acroscopically narrowly to broadly cuneate, often auricled, entire to shallowly crenate, glabrous adaxially, abaxially closely set with 2- or 3-celled hairs producing a yellow farina; venation obscure adaxially and abaxially, pinnately branched. **Sori** in short lines along veins; receptacle with 2- or 3-celled hairs; exindusiate. Plants naturalised terrestrial or epilithic, mostly occurring along road cuttings or disturbed sites, alt. 50–200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Kokstad to Butterworth).

PTERIS L.

Brakes

Species ± 250, tropical and temperate parts of the world; 6 (1 naturalised) in sthn Afr.,; LIM, NW, G, M, S, FS, KZN, L, WC, EC.

buchananii Baker ex Sim

Rhizome widely creeping, up to 10 mm in diam.; scales dark brown, ovate, up to 12 mm, entire. **Fronds** erect, widely spaced, up to 1.5 m long. **Stipe** stramineous to brown, glabrous, up to 1 m long, up to 8 mm in diam. **Lamina** herbaceous, broadly deltate, up to 500 × 500 mm, 4-pinnatifid. **Pinnae**: basal pinnae nearly as long as lamina and basiscopically developed; ultimate lobes often slightly falcate, adnate to rachis and decurrent, glabrous, up to 26 × 5 mm; sterile lobes and apices of fertile lobes serrate; costules spinous adaxially; veins anastomosing along broadly winged parts of costae and costules. **Indusium** membranous, entire to repand, up to 1 mm wide. Plants mostly in moist and seepage areas in and along forest margins, alt. 50–250 m; Indian Ocean Coastal Belt, Indigenous Forests, Eastern Fynbos-Renosterveld (Port Edward to Knysna).

catoptera Kunze

Long-tipped brake; *langpunt pteris* (A)

Rhizome erect to suberect, up to 80 mm long, up to 7 mm in diam., with stipe bases and scales; scales castaneous to ferruginous, often with a slightly darker central region, lanceolate, up to 9 × 2.2 mm. **Fronds** erect, up to 1.84 mm long, arching, up to 12 per plant. **Stipe** firm, proximally castaneous, stramineous to greenish distally, up to 980 mm long, up to 8 mm in diam., proximally adaxially flattened, sulcate distally, proximally sparsely set with scales similar to, but slightly larger than those on rhizome, glabrous distally. **Lamina** oblong-ovate, up to 860 × 630 mm, 2-pinnate, with up to 17 pinna pairs. **Rachis** stramineous to yellow, adaxially sulcate, glabrous. **Pinnae** opposite

to alternate, basal pair largest, with up to 3 pinnules basiscopically, strongly inequilaterally triangular, up to 340 × 205 mm, distal pinnae oblong-acuminate, pectinately lobed; pinna rachis, costa and costules adaxially with prickles up to 2.2 mm long; petioles up to 17 mm long. **Pinnules** sessile, basiscopically decurrent, pectinate, up to 195 × 70 mm; lobes herbaceous, linear-obtuse, up to 45 × 4 mm, entire; terminal lobe often elongated, linear-attenuate, up to 47 × 3.5 mm, entire to repand; costa adaxially with prickles up to 0.6 mm long where veins branch from the costa; venation free, forked once. **Sori** linear, continuous along proximal part of lobes, along a near-marginal vascular commissure; receptacle paraphysate. **Indusium** firm, linear, up to 15 × 0.4 mm, entire. Plants terrestrial or epilithic in moist forests, alt. 50–400 m; Indian Ocean Coastal Belt, Indigenous Forests (Port Edward to Port St Johns).

cretica L.

Cretan brake, avery fern; *Kreta ruigtevaring* (A)

Rhizome shortly decumbent, sparsely branched, up to 6 mm in diam., with closely spaced stipe bases and scales; scales castaneous, linear, subulate or narrowly lanceolate, up to 5 × 1 mm. **Fronds** closely spaced, erect to arching, dimorphic, up to 14 per plant, fertile longer than sterile; sterile up to 510 mm long; fertile up to 750 mm long. **Stipe** proximally castaneous, stramineous higher up, adaxially shallowly sulcate; sterile up to 360 mm long; fertile up to 575 mm long, up to 2.2 mm in diam. **Lamina** ovate; sterile up to 285 × 200 mm; fertile up to 305 × 250 mm; 1-pinnate, basal pinnae 2-pinnate, with up to 4 pinna pairs. **Rachis** stramineous, sulcate adaxially, glabrous. **Pinnae** herbaceous, opposite to alternate, basal pinnae largest, with up to 2 pinnules basiscopically, strongly inequilaterally triangular, sterile up to 155 × 75 mm, fertile up to 205 × 90 mm, distal pinnae simple, linear-attenuate, sterile up to 18 mm wide, fertile up to 10 mm wide, cuneate to inequilaterally cuneate, basiscopically decurrent along rachis, serrate, fertile entire, except for sterile apex; pinna rachis adaxially shallowly sulcate, sulcus confluent with that of rachis; petioles up to 4 mm long. **Pinnules** sessile, simple, linear-attenuate, sterile up to 90 × 11 mm, fertile up to 135 × 9 mm, acroscopically narrowly cuneate, basiscopically cuneate to decurrent; costa adaxially shallowly sulcate, without costular prickles; venation evident, simple or once forked. **Sori** linear, continuous along a marginal vascular commissure, extending most of length of fertile pinnae and pinnules; receptacle with paraphyses simple, pluricellular, up to 0.5 mm long. Plants terrestrial, mostly along forest margins and at boulder bases, alt. 50–1 500 m; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket (Lady Grey to Kokstad S, from Humansdorp to East London).

dentata Forssk.

Pungent brake, toothed brake; *saagtand pteris* (A)

Rhizome erect to suberect, simple or sparsely branched, up to 70 mm long, up to 12 mm in diam., with stipe bases and scales; scales ferruginous, chartaceous, oblong-acuminate, to narrowly lanceolate, up to 6 × 1 mm, margins with long, simple and branched hairs. **Fronds** caespitose, up to 1 m long, suberect to arching, up to 7 per plant. **Stipe** firm, up to 410 mm long, up to 4.5 mm in diam., proximally castaneous, stramineous to yellowish distally, adaxially sulcate, variously set with hairs and scales. **Lamina** pentagonal in smaller fronds, ovate when mature, up to 620 × 480 mm, 2-pinnate, with up to 9-pinnate or lobed pinna pairs. **Rachis** stramineous to yellow, adaxially sulcate, glabrous.

Pinnae opposite to alternate, basal pair largest, overlapping, up to 330 × 200 mm, distal pinnae spaced or slightly overlapping, narrowly ovate, up to 210 × 72 mm, pectinately lobed; petioles up to 17 mm long. **Pinnules** alternate, proximal basiscopic longest, narrowly ovate, up to 180 × 50 mm, pectinately lobed; lobes herbaceous, linear-acute, up to 55 × 6 mm, often somewhat falcate, widening towards base, basiscopically decurrent, serrate in sterile fronds, entire in fertile parts; costa adaxially shallowly sulcate, with or without short inconspicuous prickles; venation evident, forked once, free in sterile parts, anastomose and forming a near-marginal vascular commissure in fertile parts; petioles up to 7 mm long. **Sori** linear, continuous along a near-marginal vascular commissure, along proximal part of lobes; receptacle paraphysate. **Indusium** a recurved margin bearing stomata proximally, thinly herbaceous, linear, up to 0.5 mm wide, entire to repand. Plants terrestrial in moist evergreen forests, alt. 50–300 m; Indigenous Forests (Mthatha to Knysna).

*tremula R.Br.

Shaking brake

Rhizome short, suberect to erect, up to 90 mm long, closely set with stipe bases and scales; scales castaneous, narrowly lanceolate, up to 5 × 1 mm. **Fronds** caespitose, arching, up to 1 m long. **Stipe** firm, castaneous, up to 540 mm long, up to 4 mm in diam., shallowly sulcate adaxially, near glabrous. **Lamina** lanceolate to narrowly ovate, up to 440 × 270 mm, up to 2-pinnate-pinnatifid. **Rachis** sulcate adaxially, glabrous. **Pinnae** near opposite, basal pinnae inequilaterally broadly ovate, up to 190 × 150 mm, basiscopically developed; petioles up to 12 mm long. **Pinnule** narrowly lanceolate, up to 110 × 60 mm, lobed to 1-pinnatifid; lobes herbaceous, oblong-acute, up to 20 × 3 mm, basiscopically decurrent, serrate; venation evident, free in sterile frond; petioles up to 5 mm long. **Sori** linear, proximal on lobes, up to 13 mm long, along a marginal vascular commissure. **Indusium** linear, up to 13 × 0.8 mm, entire to repand. Plants terrestrial, mostly in disturbed areas along roads, alt. 50–250 m; Eastern Fynbos-Renosterveld (Humansdorp to Knysna).

vittata L.

Chinese ladder brake; *leervaring* (A)

Rhizome shortly decumbent, closely branched, up to 7 mm in diam., with crowded stipe bases and scales; scales ferruginous to stramineous, subulate to narrowly lanceolate, up to 8 × 1.4 mm, entire. **Fronds** caespitose, erect to arching, up to 1.7 m long, up to 8 per plant. **Stipe** firm, stramineous, proximally adaxially flattened, sulcate distally, up to 470 mm long, up to 6 mm in diam., proximally densely set with stramineous scales. **Lamina** elliptic-oblong, up to 1.2 m × 300 mm, 1-pinnate, with up to 60 free pinna pairs. **Rachis** stramineous, adaxially sulcate, closely set with stramineous pluricellular hairs up to 0.3 mm long. **Pinnae** sessile, alternate, reduced towards base, linear-attenuate, up to 140 × 9 mm, base inequilateral, acroscopically broadly cuneate to cordate, serrate, adaxially sparsely set with 3–5-celled hairs up to 0.3 mm long, abaxially closely set with 3–5-celled hairs up to 0.4 mm long along the costa and veins; costa adaxially shallowly sulcate, pronounced abaxially; venation evident, forked once or twice, free in sterile fronds. **Sori** linear, continuous along a marginal vascular commissure extending from near base to near pinna apex; receptacle paraphysate. **Indusium** brown, linear, up to 0.7 mm wide, repand. Plants terrestrial or epilithic, mostly in light shade along watercourses and in forest margins, alt. 50–1 500 m; Indigenous Forests, Sub-Escarpment Grassland (Elliot to Jeffreys Bay).

VITTARIA J.E.Sm.

Bootlace ferns

Species ± 60, pantropical distribution; 1 in sthn Afr., LIM, M, S, KZN, WC, EC.

isoetifolia Bory

Bootlace fern, ribbon fern; *vetervaring* (A)

Rhizome short-decumbent, up to 2 mm in diam., set with roots, short, closely spaced, persistent stipe bases and scales; scales ferruginous to castaneous, sessile, subulate, cuneate to cordate, dentate, up to 8 × 1 mm. **Fronds** crowded, pendent, up to 720 mm long. **Stipe** poorly differentiated, up to 4 mm long, initially sparsely set with scales similar to, but smaller than, those on rhizome. **Lamina** carnose-coriaceous, simple, linear, entire, up to 716 × 3 mm, glabrous adaxially and abaxially; venation obscure. **Sori** along a near-marginal vascular commissure, sunken in 2 submarginal grooves extending entire length of lamina; receptacle paraphysate. Plants epilithic or epiphytic, mostly in moist evergreen forests, but also in sheltered rock crevices, alt. 0–400 m; Indian Ocean Coastal Belt, Indigenous Forests (Port Edward to Alexandria).

SALVINIACEAE

A family of ± 17 species in 2 genera, mostly in the lowland temperate and tropical regions.

Leaves alternate, up to 1.2 mm long, papillate adaxially ..... ***Azolla**
Leaves whorled, up to 25 mm long, with egg-beater-like hairs on adaxial surface of floating leaves ..... **Salvinia**

*AZOLLA Lam.

Mosquito fern

Species 7, pantemperate and tropical; 2 naturalised in sthn Afr., N, B, LIM, G, KZN, NC, WC, EC.

filiculoides Lam.

Water fern, red fern, large mosquito fern, floating fern

Free-floating, aquatic plant; ± circular, with planarly arranged branches; branching alternate, up to 15 mm long, up to 0.2 mm in diam., internodes up to 1.5 mm long, glabrous; roots born singly at branching points of stems, long, simple. **Leaves** imbricate, 2-lobed, borne alternately on stems, upper lobe carnose, broadly ovate to somewhat inequilaterally broadly ovate, up to 1.2 × 1 mm, with a chlorophyllous, adaxially papillate, central portion with a narrow hyaline margin, lower lobe 1 cell thick except for small area near point of attachment, inequilaterally broadly ovate, up to 1.2 × 1 mm, glabrous, obtuse, hyaline. **Sporocarps** borne in pairs at base of branches; initially covered by involucre of dorsal leaf lobe, lack a dehiscence zone; plant monoecious, with separate mega- and microsporocarps: megasporocarps contain a solitary megasporangium, with a solitary megaspore; microsporocarps contain many microsporangia, each containing ± 64 microspores. Dams, vleis and backwaters of rivers and streams, alt. 100–1 600 m; Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Middelburg to Graaff-Reinet, Port Elizabeth to Grahamstown).

SALVINIA Ség.

Species ± 10, temperate and tropical, 1 naturalised in sthn Afr., KZN, WC, EC.

*molesta D.S.Mitch.

Kariba weed

Plants free-floating aquatic. **Rhizome** without roots, monopodially branched, flexuose, terete, up to 2.2 mm in diam., closely set with brown hair complexes. **Leaves** borne in whorls of 3, dimorphic, each whorl consist of 2 green and floating laminate leaves, and 1 pendant and submerged leaf; floating leaves sessile, pale yellowish green to pale green, softly herbaceous, 2-lobed, conduplicate, lobes near quadrangular to inequilaterally transversely broadly obovate, up to 25 × 27 mm, entire, adaxially closely set with hyaline pluricellular hairs, hairs egg-beater-like, abaxially with hyaline or pale brown, hair complexes similar to those occurring on stems; venation reticulate; areolae without included veinlets; submerged leaves with petioles up to 7 mm long, up to 2 mm in diam., closely set with hair complexes similar to those occurring on abaxial surfaces of floating leaves. **Soral branches** simple, up to 40 mm long, central axis proximally dark brown, paler towards apex, up to 1 mm in diam., with several alternately arranged sporocarps. **Sporocarps** broadly ovate to ampulliform, up to 2.2 mm long, up to 2 mm in diam., bearing either megasporangia or microsporangia, enclosed by a well-developed indusium bearing hair complexes similar to those on stems; petioles up to 4 mm long. In exposed stagnant inland waters, alt. 50–250 m; Albany Thicket (Port Elizabeth).

SCHIZAEACEAE

A family of ± 30 species in a single genus with a pantropical distribution.

SCHIZAEA Sm.

Grass-fern, toothbrush fern

Species ± 30, distribution pantropical; 2 in sthn Afr., LIM, M, S, FS, KZN, L, WC, EC.

pectinata (L.) Sw.

Curly grass-fern, toothbrush fern, cockscomb fern; *grasvaring* (A)

Rhizome subterranean, short-decumbent, branched, up to 2 mm in diam., with castaneous hairs up to 4 mm long. **Fronds** erect, crowded, dimorphic. **Stipe** not differentiated from sterile lamina. **Lamina** coriaceous; sterile lamina simple, narrowly linear, up to 320 × 1.2 mm, sparsely set with castaneous, unicellular fusiform hairs; fertile lamina with an apical fertile portion up to 16 mm long. **Rachis** recurved; segments conduplicate, up to 15 pairs, pectinately arranged, simple or once forked, longer towards middle, up to 8 × 0.6 mm, margins long fimbriate. **Sporangia** in a single row on either side of fertile segment costa, sessile, almost symmetric, ovoid or ellipsoid, with a subapical annulus. **Spores** brown, ellipsoidal to subglobose, monolete, foveolate, exospore up to 95 µm long. Plants terrestrial in seasonally moist grasslands and rocky ridges, alt. 50–800 m; Indian Ocean Coastal Belt, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld. (Port Edward to Knysna).

tenella Kaulf.

Rhizome subterranean, decumbent, branched, up to 3 mm in diam., with golden-brown hairs up to 4 mm long. **Fronds** erect, crowded, dimorphic. **Stipe** not differentiated

from lamina, abaxially with a single row of conspicuous stomata on either side of midrib. **Lamina** coriaceous; sterile lamina simple, narrowly linear, up to 300 × 0.8 mm, glabrous; fertile lamina distally pinnatifid. **Rachis** straight; segments conduplicate, up to 15 pairs, pectinately arranged, simple, longer towards base, up to 5 × 0.6 mm, margins long-fimbriate, glabrous adaxially and abaxially. **Sporangia** in a single row on either side of fertile segment costa, sessile, almost symmetric, ovoid or ellipsoid, with a subapical annulus. Plants terrestrial in moist rock crevices along streams, waterfalls and cliff faces, alt. 50–600 m; Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Port Edward to Knysna).

THELYPTERIDACEAE

A family of ± 1 000 species in 5 or more genera. Cosmopolitan in distribution with centres of diversity in the neotropics and SE Asia.

1a Costae adaxially convex ..... ***Macrothelypteris**
1b Costae adaxially shallowly sulcate:
2a Vein branched in pinna lobes forked, simple towards the lobe apex ..... **Thelypteris**
2b Vein branches in pinna lobes all simple:
3a Sori linear, up to 3 mm long ..... **Stegnogramma**
3b Sori circular, up to 1 mm long:
4a Lamina proliferous near apex ..... **Pneumatopteris**
4b Lamina not proliferous:
5a Rhizome widely creeping, up to 6 mm in diam.; fronds widely spaced ..... **Cyclosorus**
5b Rhizome short and erect or short-decumbent, > 6 mm in diam.; fronds closely spaced or crowded:
6a With a single pair of veins anastomosing below the sinus and the excurrent vein terminating in the sinus between adjacent lobes ..... **Christella**
6b Basal vein pair end in the sinus between the pinna lobes, or above the sinus ..... **Amauropelta**

AMAUROPELTA Kunze

Species ± 200, mostly in neotropics, few in Africa and the Malagasy region; 3 in sthn Afr., LIM, M, S, KZN, WC, EC.

bergiana (Schltdl.) Holttum

Bergius's wood fern; *Bergius-se-woudvaring* (A)

Rhizome erect to suberect, up to 70 mm long, up to 5 mm in diam., with crowded stipe bases and scales; scales castaneous to ferruginous, lanceolate, up to 7 × 2 mm. **Fronds** caespitose, erect to arching, up to 740 mm long. **Stipe** purple-brown, firm, adaxially sulcate, up to 155 mm long, up to 3 mm in diam., basally with scales similar to those on rhizome, densely set with unicellular acicular or hooked hairs up to 0.4 mm long. **Lamina** 1-pinnate-pinnatifid, narrow-elliptic to lanceolate, up to 575 × 190 mm, with several pinna pairs gradually reduced towards base. **Pinnae** herbaceous, those at base more widely spaced than those higher up, sessile, oblong-cuneate, up to 105 × 18 mm, deeply lobed, lobes dentate to crenulate, up to 8 × 4 mm, adaxially with unicellular acicular hairs along and between veins, abaxially closely set with unicellular acicular and hooked hairs on and between veins; venation evident, basal vein pair of adjacent lobes ends in sinus between lobes. **Sori** circular, up to 1 mm in diam., up to 9 pairs per lobe. **Indusium** brown, reniform to subcircular, up to 1 mm in diam., with unicellular acicular hairs along margin and on surface; receptacle nude. Plants mostly in moist conditions along streams in evergreen forests, alt. 100–1 500 m; Indigenous Forests (Pirie and Tsitsikamma Forests).

SCHIZAEACEAE

[E]knysnaensis N.C.Anthony & Schelpe

Knysna wood fern; *Knysna woudvaring* (A)

Rhizome erect, up to 130 mm long, up to 15 mm in diam., with crowded stipe bases. **Fronds** caespitose, arching, up to 700 mm long. **Stipe** pale brown, firm, up to 90 mm long, up to 2.2 mm in diam., sulcate adaxially, with dark brown scales at base, lanceolate, up to 7 × 2 mm, thinly pubescent with minute white hairs. **Lamina** 1-pinnate-pinnatifid, narrow-elliptic, up to 620 × 180 mm, with several pairs of basal pinnae gradually reduced and deflexed. **Pinnae**: middle ones herbaceous, linear-attenuate to narrowly triangular, up to 90 × 18 mm, pinnatifid into oblong lobes up to 9 × 3 mm, crenate, basal acroscopic and basiscopic lobes largest and overlapping rachis; lobes adaxially and abaxially with acicular hairs along margins, costule and veins, abaxially also with yellow capitate glands along costule, veins and lamina surfaces; venation free, basal pair end above sinus between lobes. **Sori** circular, up to 0.8 mm in diam. **Indusium** brown, up to 0.7 mm in diam., with minute capitate yellow glands and whitish hairs. Plants in shaded damp places in forests, alt. 150–400 m; Indigenous Forests (Tsitsikamma endemic).

CHRISTELLA H.Lév.

Species ± 110, throughout tropical and temperate parts of the world; 6 in sthn Afr., N, LIM, NW, G, M, S, KZN, WC, EC.

dentata (Forssk.) Brownsey & Jermy

Downy wood fern; *donsige moerasvaring* (A)

Rhizome decumbent, up to 200 mm long, up to 6 mm in diam., with crowded stipe bases and scales; scales ferruginous, lanceolate, up to 10 × 1.5 mm. **Fronds** closely spaced, up to 10 mm apart, erect to arching, up to 1.5 m long. **Stipe** purple-brown, firm, adaxially sulcate, up to 90 mm long, up to 2.2 mm in diam., basally with ferruginous, lanceolate scales, up to 6 × 1.8 mm. **Lamina** 1-pinnate-pinnatifid, elliptic, up to 1 050 m × 450 mm, at least 4 basal pinna pairs gradually reduced. **Pinnae** herbaceous, oblong-cuneate, up to 220 × 25 mm, basal pinnae often acroscopically auricled, deeply lobed; lobes oblong-acute, up to 13 × 4.5 mm, often somewhat falcate, adaxially moderately set with unicellular acicular hairs along costa, veins and lamina, abaxially densely set with unicellular acicular hairs up to 0.6 mm long, along and between veins; venation evident, with a single vein pair anastomosing below sinus, with excurrent vein terminating in sinus between adjacent lobes. **Sori** circular, up to 7 pairs per lobe. **Indusium** brown, reniform, up to 1 mm in diam., with unicellular, acicular hairs along margins and surface; receptacle nude. Plants mostly in moist or wet areas along streams and forest margins, shaded or exposed, alt. 50–1 500 m; Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Savanna (Port Edward to King William's Town).

gueinziana (Mett.) Holttum

Common wood fern; *Gueinzius-se-moerasvaring* (A)

Rhizome short-decumbent to erect, up to 6 mm in diam., with crowded stipe bases and scales; scales ferruginous, lanceolate, up to 11 × 3.5 mm. **Fronds** caespitose, erect to arching, up to 890 mm long. **Stipe** proximally castaneous, stramineous higher up, firm, adaxially sulcate, up to 280 mm long, up to 4 mm in diam., basally with scales similar to those on rhizome, densely set with fine, acicular hairs up to 0.5 mm long. **Lamina** 1-pinnate-pinnatifid, elliptic, up to 610 × 210 mm, 4 or more basal pinnae gradually reduced. **Pinnae** herbaceous, linear-cuneate, up to 103 × 15 mm, proximal acroscopic

and basiscopic lobes often enlarged, deeply lobed; lobes oblong-obtuse, up to 9 × 3 mm, entire, often somewhat falcate, adaxially with unicellular glands and acicular hairs, those along costa and veins longer than those between veins, abaxially sparsely set with unicellular oblong glands between veins, closely set with hyaline acicular hairs up to 0.5 mm long, on and between veins; venation evident, basal pair ending in sinus between adjacent lobes. **Sori** circular, up to 1 mm in diam., up to 9 pairs per lobe. **Indusium** brown, persistent, semi-circular to reniform, up to 1 mm in diam., with unicellular oblong glands and unicellular acicular hairs along margins and surface; receptacle nude. Plants mostly along streambanks and in damp areas along forest margins, alt. 50–1 600 m; Indigenous Forests (Port Edward to Tsitsikamma).

CYCLOSORUS Link

Species ± 3 spp., pantropical; 1 in sthn Afr., LIM, M, S, KZN, WC, EC.

interruptus (Willd.) H.Itô

Rhizome wide-creeping, up to 6 mm in diam., irregularly branched, with spaced stipe up to 300 mm apart; scales castaneous, ovate to lanceolate, up to 6 × 1.5 mm. **Fronds** erect, up to 1.7 m long. **Stipe** purple-brown at base, stramineous higher up, firm, adaxially sulcate, up to 780 mm long, up to 5 mm in diam., basally with scales similar to those on rhizome, near glabrous higher up. **Lamina** 1-pinnate, narrowly elliptic, up to 800 × 450 mm, basal pinnae often slightly reduced. **Pinnae** herbaceous to thinly coriaceous, linear-cuneate, up to 225 × 28 mm, lobed up to 4 mm from costa; lobes triangular-obtuse to triangular-cuspidate, entire, adaxially variously set with unicellular acicular hairs along costa, veins and pinna margins, abaxially closely set with unicellular acicular hairs along costa, veins and area between veins; venation evident, with a single pair of veins from adjacent lobes anastomosing below sinus, excurrent vein terminates in sinus between lobes, second vein pair terminates in sinus or just above. **Sori** circular, up to 1 mm in diam. **Indusium** brown, reniform, up to 0.6 mm in diam., with unicellular acicular hairs along margin and surface; receptacle nude. Plants in marshes, vleis and along streams and rivers, in riparian scrub and among *Phragmites*, exposed or partially shaded, alt. 50–600 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld (Port Edward to Humansdorp).

***MACROTHELYPTERIS** (H.Itô) Ching

Species 9, palaeotropics; 1 naturalised in sthn Afr., KZN, EC.

torresiana (Gaudich.) Ching

Lace fern, Mariana maiden fern, Torre's fern

Rhizome short-creeping, up to 40 mm long, up to 5 mm in diam., scaled. **Fronds** caespitose, arching, up to 1.4 m long. **Stipe** stramineous, firm, up to 580 mm long, up to 9 mm in diam., with castaneous scales at base. **Lamina** deltate-acuminate, up to 1.2 × 0.5 m, 4-pinnatifid, secondary rachises narrowly winged, with translucent unicellular hairs scattered sparsely along veins adaxially and abaxially. **Pinnules** lanceolate-deltate, wider and more deeply incised on acroscopic margin, pinnatifid almost to costule; ultimate segments lobed, up to $^1/_3$-way to midvein, obtuse, margins entire to dentate. **Sori** circular, up to 1 mm in diam. **Indusium** small, bearing a few capitate hairs. Plants terrestrial or epilithic on exposed slopes and road cuttings, alt. 50–200 m; Indigenous Forests, Indian Ocean Coastal Belt (Port Edward to Mtentu River).

THELYPTERIDACEAE

PNEUMATOPTERIS Nakai

Species ± 70, from West Africa to Hawaii and Queensland; 1 in sthn Afr., LIM, M, S, KZN, EC.

unita (Kunze) Holttum

Mother wood fern; *moeras moedervaring* (A)

Rhizome short, erect to suberect, up to 90 mm long, up to 7 mm in diam., with closely spaced stipe bases and scales at apex; scales castaneous, broadly ovate, up to 3.5 × 3 mm. **Fronds** caespitose, erect to arching, up to 1.7 m long. **Stipe** proximally castaneous, stramineous higher up, firm, adaxially sulcate, up to 565 mm long, up to 6 mm in diam., with few scales similar to those on rhizome. **Lamina** 1-pinnate, narrowly elliptic to oblong-cuneate, up to 1 400 m × 460 mm, several basal pinna pairs gradually reduced. **Rachis** proliferous near apex. **Pinnae** herbaceous, linear-cuneate, up to 230 × 29 mm, obtusely lobed; lobe margins entire to shallowly crenulate, adaxially glabrous, abaxially moderately to closely set with unicellular, acicular hairs along costa and veins, sparsely scaled along costa; venation evident, with up to 4 pairs of veins from adjacent lobes anastomosing below sinus, excurrent vein terminating in sinus between lobes. **Sori** circular to elongate, up to 8 pairs per lobe; exindusiate; receptacle nude. Plants among rocks, along perennial streams or seepage areas in evergreen forests, usually in deep shade, alt. 50–120 m; Indigenous Forests (Port St Johns).

STEGNOGRAMMA Blume

Species ± 15, mostly in palaeotropics, few in neotropics; 1 in sthn Afr., LIM, M, S, KZN, WC, EC.

pozoi (Lag.) K.Iwats.

Pozo's marsh fern; *Pozo-se-woudvaring* (A)

Rhizome suberect to erect, up to 55 mm long, up to 6 mm in diam., with stipe bases and scales; scales castaneous, triangular to broadly ovate, up to 2.5 × 1.5 mm. **Fronds** caespitose, erect to arching, up to 660 mm long. **Stipe** castaneous to ferruginous, firm, adaxially shallowly sulcate, up to 230 mm long, up to 2.5 mm in diam., sparsely set with scales similar to those on rhizome, also with unicellular acicular hairs of two lengths. **Lamina** 1-pinnate-pinnatifid, narrow-elliptic, up to 435 × 200 mm, basal 3 or 4 pinna pairs slightly and gradually reduced. **Pinnae** herbaceous, proximally widely spaced, linear-cuneate, up to 105 × 18 mm; lobes obtuse, up to 6 × 6 mm, shallowly crenulate, adaxially with unicellular hairs along costa, veins and lamina between veins, also with 3-celled hairs, abaxially with stiff, unicellular hairs along costa, veins and on lamina between veins, longer hairs restricted to costa and veins, and 3–5-celled hairs; venation evident, basal vein pair end in sinus between lobes. **Sori** linear, up to 3 mm long, exindusiate; receptacle nude. Plants confined to banks of perennial streams and marshy areas in deep shade in evergreen forests, alt. 50–800 m; Indigenous Forests (Kokstad to Tsitsikamma).

THELYPTERIS Schmidel

Species ± 3, in the north and south temperate regions of the world; 1 in sthn Afr., N, B, LIM, NW, G, M, S, KZN, L, WC, EC.

confluens (Thunb.) C.V.Morton

Marsh fern, bog fern; *moerasvaring* (A)

Rhizome wide-creeping, irregularly branched, up to 2.2 mm in diam., with stipe bases up to 70 mm apart and scales; scales castaneous, ovate to broadly ovate, up to 2.2 × 1.3 mm. **Fronds** erect, up to 950 mm long. **Stipe** basally castaneous, stramineous higher up, shallowly sulcate adaxially, up to 465 mm long, up to 2.5 mm in diam., sparsely set with scales similar to those on rhizome, closely set with pale unicellular acicular hairs. **Lamina** 1-pinnate-pinnatifid, narrow-elliptic to oblong-cuneate, up to 385 × 175 mm, basal pinnae not or slightly reduced. **Pinnae** petiolate, herbaceous, proximally more widely spaced, linear-cuneate, up to 100 × 17 mm, pinnatifid; lobes oblong-obtuse to oblong-acute, up to 9 × 4 mm, entire, adaxially with unicellular acicular hairs along costa and veins, and scales along costa, scales pale brown, lanceolate to ovate, up to 1.5 × 0.5 mm, abaxially with glands, hairs and scales, glands occur along and between veins, hairs occur along costa, veins and lamina margins, scales broadly ovate, up to 1.2 × 1 mm, occurring along costa and veins; venation evident, vein branches forked, simple near lobe apex. **Sori** circular, up to 1 mm in diam. **Indusium** stramineous, reniform to irregularly shaped, with obovate and acicular hairs along margin and surface; receptacle nude. Plants among grasses and sedges in marshes, vleis and in seepage areas along streams, usually in exposed conditions, alt. 50–800 m; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (East London to Humansdorp).

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WOODSIACEAE

A family of ± 25 species in 3 genera mostly in the montane tropical regions of the world.

WOODSIA R.Br.

Species ± 30, widespread in the north-temperate zone and mountainous regions of South America and sthn Afr.; 1 in sthn Afr., LIM, FS, KZN, L, EC.

burgessiana Gerr. ex Hook. & Baker

Cliff fern

Rhizome erect to suberect, up to 30 mm long, up to 4 mm in diam., branched, with stipe bases and scales; scales centrally dark brown to black, glossy, with narrow reddish brown margins, lanceolate to subulate, up to 6 × 2 mm. **Fronds** erect, crowded, up to 330 mm long. **Stipe** basally dark brown, stramineous to greenish higher up, terete or adaxially flattened, up to 85 mm long, up to 2 mm in diam., basally with clavate glands, uniseriate hairs and scales; scales up to 4 × 0.6 mm. **Lamina** 1-pinnate-pinnatifid, narrowly elliptic, up to 125 × 60 mm, pinnae gradually reducing in size and more widely spaced towards lamina base. **Rachis** greenish to stramineous, sulcate adaxially, with multicellular, uniseriate hairs and capitate glands. **Pinnae** pale green, herbaceous, narrowly triangular, lanceolate to elliptic, up to 36 × 25 mm, pinnatifid; segments oblong, up to 8 × 4.5 mm; lobes dentate, adaxially with few-celled hairs and capitate glands, abaxially with multicellular hairs along and between veins and along lamina margins; venation evident, forked, free. **Sori** circular, up to 1.2 mm in diam., in a single line on either side of costule, up to 4 pairs per lobe. **Indusium** translucent or pale brown, thinly chartaceous, surrounding the receptacle, of diffuse form, scale-like to cupulate, lacerate, often

with glands and/or hairs on the outer surface. Plants mostly associated with screes, cliffs, and boulders in moist grasslands, alt. 700–1 200 m; Sub-Escarpment Grassland, Drakensberg Grassland (Kokstad to Hogsback).

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Gymnosperms

CUPRESSACEAE

Compiled by H.F. Glen

1a Female cone scales hard to count, fleshy or many:
2a Female cones fleshy ..... ***Juniperus**
2b Female cone scales dry, ± 20 ..... ***Cryptomeria**
1b Female cone scales relatively few, dry, woody, easily counted:
3a Female cones ovoid to oblong, with 4 (rarely 6) ± oblong scales ..... **Widdringtonia**
3b Female cones subspherical to globose, usually with 8 peltate scales ..... ***Cupressus**

*CRYPTOMERIA D.Don

Japanese cedar; *sugi* (Japanese)

Species 2 or more, China and Japan; 1 naturalised in sthn Afr., FS, KZN, EC.

japonica (L.f.) D.Don

Evergreen, buttressed, monoecious tree, up to 50 m high in the wild, up to 30 m high in cultivation; bark reddish brown, shredding. **Branchlets** hairless, deciduous. **Leaves** up to 20 mm long, spirally arranged in 5 ranks, persisting for 4 or 5 years, awl-shaped, blunt, margins incurved. **Male cones** ± 7.5 mm long, terminal, in clusters of 20 or more, orange or red when ripe. **Female cones** on short branchlets, surrounded by small rosettes of leaves; mature cones solitary, spherical, ± 15 mm long; scales 20–30, with 2 or 3 lobes and a recurved, triangular point on back. **Seeds** triangular, very narrowly winged. Possibly naturalised (or cultivated?) in forests; Indigenous Forests (Hogsback).

*CUPRESSUS L.

Cypress; *sipres* (A)

Species ± 13, warm north temperate regions; 1 naturalised in sthn Afr., FS, EC.

arizonica Greene

Arizona cypress

Tree or large shrub; branchlets terete or quadrangular, in decussate arrays. **Leaves** opposite, in 4 ranks; adult leaves appressed to divergent, scale-like, rhomboid, free portion of long-shoot leaves up to 4 mm long; abaxial gland present or absent. **Male cones** with 4–10 pairs of sporophylls, each sporophyll with 3–10 pollen sacs. **Female cones** maturing in 1–2 years, generally persisting closed for many years, or until opened by fire; globose or oblong, 10–40 mm in diam.; scales in 3–6 pairs, valvate, peltate, thick and woody, persistent. **Seeds** 5–20 per scale, lenticular or faceted, narrowly 2-winged. Naturalised; Mesic Highveld Grassland (Lady Grey).

Three other very similar species are recorded from cultivation in the EC. One of these, *C. sempervirens* (funeral cypress) may be naturalised at Hogsback. This species is most easily distinguished from *C. arizonica* by its narrower outline and greener foliage.

*JUNIPERUS L.

Juniper

Species ± 50, northern hemisphere, cultivated as ornamentals or timber trees; ± 2 naturalised in sthn Afr., LIM, G, FS, L, EC.

bermudiana L.

Bermuda cedar

Monoecious or dioecious shrub or tree with thin, shredding bark; branchlets terete or 3–6-angled, variously oriented but not in flattened sprays. **Leaves**: juvenile leaves needle-like, usually in whorls of 3, spreading, acute to mucronate, with 1 or 2 pale bands on upper surface; adult leaves opposite, in 4 ranks, closely appressed to divergent, scale-like to subulate, free portion up to ± 10 mm long; abaxial gland visible or not, usually elongate, sometimes exuding white crystalline deposit. **Male cones** with 3–7 pairs or trios of sporophylls. **Female cones** maturing in 1–2 years, globose to ovoid, fleshy, 3–20 mm in diam., remaining closed, usually glaucous; scales persistent, in 1–3 pairs, peltate, tightly coalesced, usually thick and fleshy. **Seeds** 1–3 per scale, round to faceted, wingless. Naturalised, roadsides; Albany Thicket (Grahamstown–East London Road).

virginiana L.

Red/pencil cedar; *rooi-/potloodseder* (A)

Evergreen, dioecious tree, up to 18 m high; bark grey to reddish brown, peeling in strips. **Leaves**: juvenile leaves needle-like, usually in opposite pairs; adult leaves overlapping, scale-like, acute ± 1.5 mm long. **Female cones** ± globose, fleshy, 6 mm in diam., remaining closed, usually dark blue. Proposed declared invader, from North America, naturalised, roadsides; Mesic Highveld Grassland, Sub-Escarpment Grassland (Lady Grey and Elliot Districts).

WIDDRINGTONIA Endl.

Species 3, tropical and sthn Afr., with 1 extending into tropical Africa, LIM, M, KZN, WC, EC.

Female cone scales not warty at margins; leaves oblong, triangular in section

nodiflora (L.) Powrie

Mountain Cape-cedar; *bergsipres* (A)

Monoecious tree, up to 9 m high, often less in EC; bark dark grey, flaking in strips. **Leaves**: juvenile leaves 10–20 × 2 mm, spreading; adult leaves scale-like, oblong, triangular in section. **Male cones** very small, usually of 6 pairs of broadly ovate scales. **Female cones** clustered, of 4 valves, outer margins warty, sometimes irregularly warty but not along margins. **Fruit** cones may take more than a year to ripen, and then persist for several years, may be found on trees all year. Streambanks, forest, fynbos; Sub-Escarpment Grassland, Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket (Mount Ayliff E to Baziya Mtn, southwards to Katberg, Storms River, Humansdorp, Uitenhage and Howison's Poort).

Female cone scales warty at margins; leaves ovate, semi-circular in section

[E]schwarzii (Marloth) Mast.

Willowmore Cape-cedar; *Baviaanskloof-seder* (A)

Monoecious tree, up to 25 m high, often 7–12 m, bark reddish grey, flaking in thin strips. **Leaves**: juvenile leaves 10–20 × 2 mm, spreading; adult leaves scale-like, ovate, decussate, semi-circular in section. **Male cones** very small, usually of 6 pairs of oblong scales. **Female cones** clustered, of 4 valves, rough, margins with regular tubercles. **Fruit** cones may take more than a year to ripen, and then persist for several years, may be found on trees all year. Stream- and riverbeds, in kloofs; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Indigenous Forests (Willowmore, Baviaanskloof).

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PINACEAE

Compiled by H.F. Glen & A. Tapson

*PINUS L.

Species ± 80, northern hemisphere, many cultivated; several occur as escapees, 8 naturalised in sthn Afr., mainly in the moister parts of the region, M, S, FS, L, NC, WC, EC.

1a Fascicle sheath up to 14 mm long
2a Apophysis flat
3a Cones sessile; spring shoots uninodal; branchlets glabrous

pinea L.

Stone pine, umbrella pine

Tree, 15–25 m high; straight (stems often wide-spreading); bark rough, forming large plates, reddish brown to orange. **Crown** umbrella-shaped. **Leaves**: 2 needles per fascicle; fascicle sheath persistent; 10–12 mm long, light yellowish brown; needle 50–250 mm, rigid, slightly twisted. **Spring shoots** twisted, pale green to yellowish. **Winter buds** light brown, 6–12 mm long, apex pointed; not resinous. **Branchlets** slender, pale brown. **Male strobili** brown, ovoid. **Cones** terminal on branchlets; single, rarely in pairs to threes, indehiscent, ripening in third year, symmetrical, heavy, ovoid or globose, 80–150 × 12 mm; scales 35 × 20 mm, thick, pale brown. **Seeds** large, 10–15 × 7–11 mm, coat hard; winged. Special effect weed from northern Mediterranean, roadsides; Drakensberg Grassland (Rhodes, Maclear, between Tarkastad and Fort Beaufort).

3b Cones pedunculate; spring shoots multinodal; branchlets pubescent

halepensis Mill.

Aleppo pine

Tree, 20–25 m high; bark grey, fissured, exposing reddish brown inner bark. **Crown** dome-shaped or flat-topped. **Leaves**: 2 needles per fascicle; sheath persistent, fragile, 8 mm long; needle 50–l50 mm; slender; often curved or twisted (apex short, horny, pointed). **Spring shoots** smooth, glaucous, glabrous; young twigs ridged. **Winter buds** 8 mm long, conical, not resinous. **Branchlets** slender, smooth; leaves spread sparsely along branchlets. **Cones** pendent on branchlets, singly, in pairs or in threes; indehiscent; often serotinous; persistent for several years; pedunculate; glossy yellowish, reddish or purplish brown; symmetrical, ovoid, 60–120 × 40–70 mm; scales 25 × 16 mm; lustrous, red-brown. **Seeds** 6–7 mm long, black, winged. Origin Mediterranean, cultivated, declared invader, transformer (category 2); Mesic Highveld Grassland, Eastern Fynbos-Renosterveld, Albany Thicket, Indigenous Forests (Lady Grey, Seymour, Grahamstown and Port Alfred).

CUPRESSACEAE

2b Apophysis raised
4a Needles > 150 mm long, pendent; cone apophysis slightly raised

patula Schltdl. & Cham.

Patula pine

Tree, 30–35 m high; bark rough, reddish. **Crown** wide, very open with long, horizontal to drooping branches. **Leaves**: 3 or 4(5) needles per fascicle; sheath persistent, 10–15 mm long; needle 150–250 mm long or more, slender, pendent on branchlets. **Spring shoots** multinodal, ± pruinose. **Male strobili** crowded in small, tight, pale yellow clusters. **Cones** 1–12 or more clustered on stem or branches; indehiscent, long, serotinous, cones not opening for years; very persistent, sessile, asymmetrical, curved, reflexed, long-conical to conical, 70–100 × 50–70 mm; scales hard, stiff, not opening widely, scales on base of cone not opening for years. **Seeds** 5 × 3 mm, dark brown or almost black, winged. Origin central America, declared invader, transformer (category 2); Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Weza State Forest to Grahamstown).

4b Needles up to 150 mm long, ± erect; cone apophysis markedly raised

radiata D.Don

Monterey pine, radiata pine

Tree, 25–40 m high, straight; bark deeply furrowed into broad flat ridges, covered with thick appressed scales, black-brown. **Crown** formed from 1–many erect stems, profusely branched. **Leaves**: (2)3 needles per fascicle; fascicle sheath persistent, 8–12 mm long; needle 50–150 mm, rather slender. **Spring shoots** multinodal. **Branchlets** brown, glabrous. **Cones** spreading, 1–5 in a whorl, indehiscent, serotinous, persistent, sometimes for 40 years, sessile or shortly pedunculate; shiny light brown, very asymmetrical, obliquely ovoid-conical, 70–150 × 60–120 mm; lower scales ending almost flattened, obscurely keeled. **Seeds** 6 mm long, blackish, winged. Origin southwestern parts of North America, declared invader, transformer (category 2); Drakensberg Grassland, Indigenous Forests, Eastern Fynbos-Renosterveld (Hogsback, Tsitsikamma to Grahamstown District).

1b Fascicle sheath 15 mm long or more
5a Cones sessile or appearing so
6a Needles thick; cone scale umbo armed with a prickle or spine; trunk crooked or twisted

pinaster Aiton

Cluster pine; *trosden* (A)

Tree, 20–35 m high; bark rough with deep black fissures. **Crown** open below, dense on top, spreading. **Leaves**: 2 needles per fascicle; fascicle sheath persistent, 20–30 mm long; needle 50–250 mm long, stiff, rigid, smooth. **Spring shoots** uninodal or multinodal. **Branchlets** bright reddish brown, pubescent, glabrous or covered with scale scars; leaves terminally clustered. **Male strobili** scattered on lower parts of new shoots. **Cones** terminal on branchlets; 1–6 or more in a whorl; indehiscent, serotinous for several years; purplish when young, then shiny nut-brown; broadly ovate to conical, 100–200 × 50–80 mm; scales 40 × 20 mm, rhomboidal, smooth, lustrous nut- or rufous-brown. **Seeds** 10 mm long, oblong-ovoid, apex bluntly notched, greyish brown. Origin Mediterranean, cultivated, invasive near coast, declared invader, transformer (category 2); Indigenous Forests, Eastern Fynbos-Renosterveld (Hogsback, Grahamstown, between Humansdorp and Port Elizabeth).

6b Needles slender; cone scale umbo unarmed; trunk straight

patula Schltdl. & Cham. (see 4a above)

5b Cones pedunculate; winter bud scale margins fringed; cone scale umbo unarmed; apophyses projecting horizontally beyond outline of cone; branchlets relatively stiff

canariensis Sweet ex C.K.Spreng.

Canary pine

Tree, 24–30 m high; bark thick, slightly fissured, dividing into irregular scales, rough, reddish. **Crown** round, broad, up to 3 m in girth. **Leaves**: 3 needles per fascicle; fascicle sheath persistent; needle 150–250 mm or more; slender, drooping on branchlets, bright green. **Spring shoots** uninodal, pruinose, yellow or greyish brown, glabrous; young twigs prominently ridged. **Winter buds** large, ovoid, apex acute; scales lanceolate. **Branchlets** slender, prominently ridged, yellow, glabrous; older branchlets drooping. **Cones** long-pedunculate; ovate, ovoid or oblong-ovate; 100–200(–250) mm long; scales lustrous nut-brown; scale apophysis pyramidal. **Seeds** 1.5 mm long, dark grey or fuscous brown, winged. Origin Canary Islands and subtropical Himalayas, invading grassland, declared invader, potential transformer (category 2); Mesic Highveld Grassland (Lady Grey District).

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PODOCARPACEAE

Compiled by H.F. Glen

Branchlets slender, often square; leaves twisted at base, blade oriented in vertical plane; fruiting pedicels not swollen..... **Afrocarpus**
Branchlets stout, terete (round); leaves not twisted at base, blade oriented in horizontal plane; fruiting receptacle swollen, at least slightly ..... **Podocarpus**

AFROCARPUS C.N.Page

Species 7, all African forest trees; 1 in sthn Afr., LIM, M, S, KZN, WC, EC.
[after Page (1990)]

falcatus (Thunb.) C.N.Page

Small-leaved yellowwood; *Outeniekwa-geelhout* (A)

Monoecious, evergreen tree, 10–35(–45) m high; bark brown, smooth or narrowly longitudinally fissured, flaking or adhering, forming plate-like scales. **Buds** glabrous, pointed, slender, sessile. **Twigs** glabrous, stout, dull, brown or green. **Stems** square or round. **Leaves** alternate, simple, sessile. **Blade** (10–)20–40(–45) × (1.2–)2.0–4.0(–6.0) mm, linear, lanceolate, elliptical or oblong, apex acute, base cuneate or truncate. **Cones** axillary, erect. **Fruiting cones** fleshy, glabrous, (12–)13–17(–20) × 15–20 mm, roundish, smooth, relatively thin, leathery, yellow or green. Forests, sandstone, stream- and riverbanks, kloofs; Indigenous Forests (Mount Frere E to Mount Ayliff, southwards to Queenstown, Lusikisiki, Somerset East, Kentani, Tsitsikamma, Humansdorp, Port Elizabeth, Grahamstown and East London). The very similar *A. gracilior* (Pilg.) C.N.Page occurs northwards to Kenya.

PODOCARPUS L'Hér. ex Pers.

Species nearly 100, mainly in montane forest of tropics and subtropics and at lower altitudes in temperate regions mainly in southern hemisphere; 3 in sthn Afr., LIM, M, S, FS, KZN, WC, EC.

Leaves sessile, drooping, usually over 90 mm long; fruiting receptacles only slightly swollen, not brightly coloured

henkelii Stapf ex Dallim. & Jacks.

Drooping-leaved yellowwood; *Henkel-se-geelhout* (A)

Monoecious, evergreen tree, 20–35 m high; bark grey, narrowly longitudinally fissured, flaking, forming plate-like scales and small ridges. **Buds** glabrous, pointed, slender, sessile. **Twigs** glabrous, stout, dull, grey. **Stems** angular or round. **Leaves** alternate, simple, sessile. **Blade** (50–)90–120(–170) × (5.0–)6.5–8.0(–10.0) mm, linear, lanceolate or oblong, apex acute and mucronate, base cuneate, margins revolute. **Cones** axillary, erect. **Fruiting cones** fleshy, glabrous, (12–)17–22(–25) × (11–)15–20(–21) mm, ellipsoid; receptacle green, slightly swollen. **Rind** smooth, leathery, yellow or green. Moist, evergreen forests; Indigenous Forests (Mount Ayliff, Tonti-, Weza- and Gxwaleni Forests, Maclear and E to uMzimkhulu).

Leaves petiolate, spreading, usually < 60 mm long; fruiting receptacles swollen, fleshy, pink to purple

latifolius (Thunb.) R.Br. ex Mirb.

Broad-leaved yellowwood; *opregtegeelhout* (A)

Monoecious, evergreen tree, 10–33 m high; bark brown to grey, narrowly longitudinally fissured, flaking, forming plate-like scales. **Buds** glabrous; terminal bud 2.0–3.5 mm long. **Twigs** glabrous, stout, dull, green. **Stems** angular or round. **Leaves** alternate, simple; petioles glabrous or nearly so. **Blade** (20–)35–60(–100) × 5–13 mm, linear or oblong, apex and base acute, margins sometimes revolute. **Fruiting cone** 7–11 mm long, ellipsoid; receptacle swollen, fleshy, red to purplish. Humus-rich soil in forests; Indigenous Forests (Maclear E to uMzimkhulu, southwards to Mount Ayliff, Port Edward, Port St Johns, Hogsback and Kentani, also from Tsitsikamma to Humansdorp and Grahamstown).

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STANGERIACEAE

Compiled by P.J.H. Hurter

STANGERIA T.Moore

Stangeria; *bobbejaankos* (A); *umfingwani*, *umncuma* (X); *imfingo* (Z)

Species 1, mostly restricted to coastal regions, southern Mozambique, KZN, EC.

eriopus (Kunze) Baill.

Fern-like, perennial, tuberous geophyte. **Leaves** pinnate, 0.25–2.50 m long, depending on habitat, coriaceous; petioles smooth; leaflets in several to many opposite or subopposite pairs, proximal pairs stalked, distal pairs decurrently fused on rachis, midrib conspicuous with dichotomously forked lateral veins, upper margins serrate. **Cones** all year; male cones, cylindric, velutinous becoming glabrescent, yellow-brown at maturity; female cones elliptic, velutinous becoming glabrescent, dark green at maturity. Grassland and forests from littoral zone to escarpments; Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket (Oribi Gorge S through Port St Johns and Port Alfred to East London).

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ZAMIACEAE

Compiled by P.J.H. Hurter

ENCEPHALARTOS Lehm.

Species ± 45, central and sthn Afr.; ± 30 in sthn Afr., mainly in the higher-rainfall, eastern parts of the area, LIM, NW, M, S, KZN, EC.

1a Median leaflets < 9 mm wide, entire, needle-like, linear or lanceolate
2a Leaflets needle-like, margins revolute

ghellinckii Lem.

Drakensberg cycad; *Drakensbergse broodboom* (A); *isiDawu*, *umPhanga*, *umGuza* (X)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 1–3 m tall, unbranched or branched from base, covered by alternating series of woolly bracts and persistent swollen truncated leaf bases. **Leaves** petiolate, pinnate with incurved rachis; leaflets pungent-pointed, entire, revolute; reduced in size towards base of rachis. **Cones** Nov.–Feb., 1–5, appear sessile, densely woolly. **Male cones** oblanceoloid. **Female cones** cylindric to ovoid, broader than male. Long grass on eastern slopes of foothills of Drakensberg Mts; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Kokstad E to Bizana, also in KZN, but extinct in FS).

2b Leaflets linear or lanceolate, margins not revolute
3a Median leaflets orientated incubously
4a Crown and cataphylls densely covered by reddish brown wool

friderici-guilielmi Lehm.

White-haired cycad; *withaarbroodboom* (A); *umPhanga*, *umGuza* (X)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 1–5 m tall, unbranched or branched from base, covered by alternating series of woolly bracts and persistent swollen truncated leaf bases. **Leaves** petiolate, pinnate with rachis straight and perpendicular to trunk; leaflets pungent-pointed, entire, margins markedly thickened; reduced in size towards base of rachis. **Cones** June–Dec., appear sessile, densely woolly. **Male cones** 3–12, lanceoloid. **Female cones** 3–6, cylindric to ovoid, broader than male. Short grassland on hill slopes, warm summers, winter frost or snow; Sub-Escarpment Grassland (Kokstad S to Cathcart).

4b Crown and cataphylls glabrous

laevifolius Stapf & Burtt Davy

Kaapsehoop cycad; *Kaapsehoopse broodboom* (A); *umPhanga*, *umGuza* (X)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 1–5 m tall, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis straight or recurved; leaflets pungent-pointed, entire, margins not markedly thickened; reduced in size towards base of rachis. **Cones** May–Nov., 1–5, appear sessile, velutinous yellowish white. **Male cones** oblanceoloid. **Female cones** cylindric to ovoid, broader than male. Steep rocky slopes in short grassland or thicket; Sub-Escarpment Savanna (recorded near Mzamba, probably extinct at this locality and in KZN, S).

3b Median leaflets orientated succubously

[E]cycadifolius (Jacq.) Lehm.

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–1.5 m tall, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis incurved; leaflets pungent-pointed, entire, margins not markedly thickened; reduced in size towards base of rachis. **Cones** Aug.–Mar., 1 or 2, appear sessile, velutinous yellowish white. **Male cones** oblanceoloid. **Female cones** cylindric to ovoid, broader than male. Grassland, warm summers, winters with frost and snow, alt. 1 800 m; Dry Highveld Grassland (high mountains around Bedford and Cradock).

1b Median leaflets > 10 mm wide, entire, lobed or dentate, also oblong, ovate or lorate
5a Median leaflets lobed
6a Leaflets glaucous
7a Leaflets convex in cross section

[E]horridus (Jacq.) Lehm.

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–2.0 m tall, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; median leaflets lobed, pungent-pointed, margins not markedly thickened; reduced in size towards base of rachis. **Cones** Feb.–Nov., appear sessile, reddish green. **Male cones** 1 or 2, oblanceoloid. **Female cone** 1, cylindric to ovoid, broader than male. Stony hillsides in full sun, rainfall throughout the year; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage to Port Elizabeth).

7b Leaflets concave in cross section

[E]trispinosus (Hook.) R.A.Dyer

umPhanga, *umGuza* (X)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–2.0 m tall, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; terminal leaflets (at least) lobed, pungent-pointed, margins not markedly thickened; reduced in size towards base of rachis. **Cones** Feb.–Oct., 1 or 2, appear sessile, yellowish green. **Male cones** oblanceoloid. **Female cones** cylindric to ovoid, broader than male, facets verrucose. Dense thicket, full sun, summer rainfall; Albany Thicket (Fort Beaufort S to Grahamstown and East London).

6b Leaflets green
8a Veins of leaflets very prominent on abaxial surface

[E]latifrons Lehm.

Albany cycad; *Albanybroodboom* (A)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–3.5 m tall, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; median leaflets lobed, pungent-pointed, margins markedly rolled under abaxial surface; reduced in size towards base of rachis. **Cones** all year, 1–5, appear sessile, dark green. **Male cones** oblanceoloid. **Female cones** cylindric to ovoid, broader than male, facets beaked, markedly verrucose. Dense thicket, between rocks or grassland; Albany Thicket (Grahamstown, functionally extinct).

8b Veins of leaflets not prominent on abaxial leaf surface

[E]arenarius R.A.Dyer

Alexandria cycad; *Alexandriabroodboom* (A)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–3.5 m long, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; median leaflets lobed, pungent-pointed, margins not markedly rolled under abaxial surface; reduced in size towards base of rachis. **Cone** Feb.–Dec., single, appears sessile, green. **Male cone** lanceoloid. **Female cone** cylindric to ovoid, broader than male, facets flattish, glabrous. Sand dunes close to coast; Albany Thicket, Indigenous Forests (Alexandria).

5b Median leaflets entire or dentate, oblong or ovate
9a Median leaflets glaucous
10a Median leaflets orientated incubously

[E]princeps R.A.Dyer

Kei cycad; *Keibroodboom* (A); *umPhanga*, *umGuza* (X)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–3.5 m long, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; median leaflets entire, pungent-pointed; reduced in size towards base of rachis. **Cone** Feb.–Dec., single, appears sessile, pale green. **Male cone** lanceoloid. **Female cone** cylindric to ovoid, broader than male, facets markedly verrucose, central facet raised. Grassland between dolerite rocks; Sub-Escarpment Savanna (Kei River and tributaries).

10b Median leaflets orientated succubously

lehmannii Lehm.

Karoo cycad; *karoobroodboom* (A)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–2.5 m long, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; median leaflets, entire, pungent-pointed; reduced in size towards base of rachis. **Cone** Feb.–Dec., single, appears sessile, maroon or green. **Male cone** oblanceoloid. **Female cone** cylindric to ovoid, broader than male, facets glabrous, central facet not raised. Hills and mountains in dry thicket abounding in Euphorbiaceae, e.g. Noorsveld; Albany Thicket, Lower Karoo, Rainshadow Valley Karoo (Pearston S, from Willowmore to Steytlerville and Uitenhage).

Frequently hybridises with *E. longifolius* and *E. horridus*.

9b Median leaflets green
11a Median leaflets orientated incubously

[E]longifolius (Jacq.) Lehm.

Suurberg cycad; *Suurbergbroodboom* (A)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–3.5 m long, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; median leaflets entire, pungent-pointed; reduced in size towards base of rachis. **Cone** May–Dec., single, appears sessile, green. **Male cone** oblanceoloid. **Female cone** cylindric to ovoid, broader than male, facets markedly verrucose, central facet raised. Fynbos and grassy mountain slopes; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland (Somerset East S, from Joubertina to Humansdorp District, Uitenhage and Grahamstown).

11b Median leaflets orientated succubously
12a Petioles unarmed

[E]altensteinii Lehm.

Eastern Cape cycad; *Oos-Kaapse broodboom* (A); *umPhanga*, *umGuza* (X)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–3.5 m long, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; median leaflets dentate or entire, pungent-pointed, not reduced in size towards base of rachis. **Cones** Mar.–Oct., 1–5, appear sessile, yellowish green. **Male cones** oblanceoloid. **Female cones** cylindric to ovoid, broader than male, facets markedly verrucose, central facet concave. Grassland, cliffs and dense coastal bush; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (KZN Border, S through King William's Town to Bushman's River).

Frequently hybridises with *E. trispinosus*.

12b Petioles armed

natalensis R.A.Dyer & I.Verd.

Natal cycad; *Natalbroodboom* (A); *umPhanga*, *umGuza* (X); *isigqiki-somkhovo* (Z)

Plant dioecious, palm-like. **Stem** aerial or decumbent, 0.5–3.5 m long, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; median leaflets

dentate or entire, pungent-pointed; reduced in size towards base of rachis. **Cones** Mar.–Oct., appear sessile, yellowish green to brown. **Male cones** 1–5, oblanceoloid. **Female cones** up to 4, cylindric to ovoid, broader than male, facets markedly verrucose, central facet concave. Rock faces of mountains and gorges; Indian Ocean Coastal Belt, Indigenous Forests (along Mtamvuna River).

5c Median leaflets entire, lorate
13a Length of median leaflets > 110 mm long

villosus Lem.

Plant dioecious, palm-like. **Stem** subterranean, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases (pulvini). **Leaves** petiolate, pinnate with rachis recurved; median leaflets dentate or entire, pungent-pointed; reduced in size towards base of rachis. **Cones** Mar.–Oct., 1–5, appear sessile, yellowish green. **Male cones** oblanceoloid, 400–820 mm long. **Female cones** cylindric to ovoid, 300–760 mm long, broader than male, facets glabrous. Forest and coastal bush in summer rainfall areas of 900–1 300 mm per year; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (KZN, S to East London).

13b Length of median leaflets < 110 mm long

caffer (Thunb.) Lehm.

Plant dioecious, palm-like. **Stem** subterranean, unbranched or branched from base, covered by alternating series of woody bracts and persistent, swollen, truncated leaf bases. **Leaves** petiolate, pinnate with rachis recurved; median leaflets dentate or entire, pungent-pointed; reduced in size towards base of rachis. **Cone** Mar.–Oct., single, appears sessile, yellowish green. **Male cone** cylindric, oblanceoloid to ovoid. **Female cone** cylindric to ovoid, broader than male, facets glabrous. Sour grassland of EC Coast; Indian Ocean Coastal Belt, Dry Highveld Grassland, Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland, Albany Thicket (recorded in KZN but probably extinct, S to Humansdorp).

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Angiosperms (flowering plants) Eudicotyledons

ACANTHACEAE

(Order Lamiales)

Compiled by T. Makholela & K. Balkwill

1a Seeds not borne on retinacula ..... **Thunbergia**
1b Seeds borne on retinacula:
2a Corolla 1-lipped, with adaxial suture slit; stamens 4, all monothecous:
3a Calyx with 5 lobes; seed surface convoluted, without hygroscopic structures ..... **Sclerochiton**
3b Calyx with 4 lobes; seed surface with feathery hygroscopic structures ..... **Blepharis**
2b Corolla 2-lipped, subregular or regular, adaxial suture not slit; if 4 stamens present, then at least 2 are 2-thecous:
4a Seeds with hygroscopic uniseriate hairs; corolla aestivation contorted or occasionally imbricate, but then not ascending; fertile stamens 4, or if 2, then pollen with many pseudocolpi (*Dyschoriste*) or globose with deep reticulations and pores (*Barleria*):
5a Stamens not didynamous; calyx lobes 4, upper and lower lobes larger than lateral lobes..... **Barleria**
5b Stamens didynamous; calyx usually of 5 lobes, or if 4 lobes, then of equal size:
6a Corolla regular; fruit with inelastic placental base:
7a Corolla contorted in bud; disc cupular; inflorescence a highly congested dichasial cyme surrounded by bracts ..... **Crabbea**
7b Corolla quincuncial in bud; disc annular; inflorescence not as above ..... **Ruellia**
6b Corolla distinctly 2-lipped, or if corolla subregular, then fruit with elastic placental base:
8a Fruit with elastic placental base; corolla obscurely 2-lipped ..... **Phaulopsis**
8b Fruit with inelastic placental base; corolla clearly 2-lipped:
9a Fertile stamens 2..... **Dyschoriste** (= *Chaetacanthus*)
9b Fertile stamens 4 ..... **Ruellia**
4b Seeds without hygroscopic, uniseriate hairs (although they may have tubercles or hygroscopic glochidiate hairs); corolla aestivation ascending; fertile stamens 2, or if 4, then pollen colporate with shallow reticulations (*Asystasia*, *Salpinctium*):
10a Corolla with a distinct rugula in upper lip:
11a Pollen spheroidal with a pusticulate ring of exine around equator; anthers in species with cream-coloured flowers attached at right angles to filaments ..... **Isoglossa**
11b Pollen prolate; anthers attached parallel to filaments:
12a Corolla orange, red or yellowish brown, lower lip $>$ 25 mm long and $<$ 10 mm wide..... **Metarungia**
12b Corolla white, cream-coloured, lilac, pink, purple or blue, lower lip $<$ 25 mm long, or if longer, then $>$ 10 mm wide:
13a Corolla tube longer than lips:
14a Style with branches longer than broad; inflorescence terminal as well as axillary..... **Rhinacanthus**
14b Style with very short (broader than long) branches; inflorescences axillary.... **Justicia** (= *Siphonoglossa*)
13b Corolla tube shorter than lips:
15a Seeds single in each locule, smooth, shiny ..... **Monechma**
15b Seeds paired in each locule, rough and often tuberculate (sometimes a single, smooth, shiny seed borne in an indehiscent capsule):
16a Calyx lobes shorter than tube; staminal channels present in upper lip of corolla and at least half as long as lip ..... **Duvernoia**
16b Calyx lobes longer than tube; staminal channels absent or less than half as long as upper lip:
17a Inflorescence pedunculate and diffuse; anticous corolla lip deeply divided, palate 2 smooth tumuli (small mounds)..... **Justicia** (= *Siphonoglossa*)
17b Inflorescence sessile, or if pedunculate, then strobilate; palate rugose:
18a Lower anther thecae muticous or shortly tailed; lips of corolla nearly equally long, upper lip deeply hooded ..... **Adhatoda**

18b Lower anther thecae with short or long tails; upper lip of corolla shorter than lower; upper lip shallowly hooded ..... **Justicia** (= *Siphonoglossa*)
10b Corolla with or without indistinct rugula in upper lip:
19a Corolla not resupinate; seeds usually > 3 mm in diam.; anther thecae parallel; inflorescences terminal thyrses or monochasia or single axillary flowers:
20a Stamens 4:
21a Corolla 2-lipped; pollen with processes associated with pores ..... **Salpinctium**
21b Corolla campanulate above, ± 2-lipped; pollen without processes associated with pores ..... **Asystasia**
20b Stamens 2:
22a Anthers monothecous ..... **Ruttya**
22b Anther 2-thecous in chasmogamous flowers:
23a Inflorescence with small bracts, calyx easily visible ..... **Mackaya**
23b Inflorescence with large bracts obscuring calyx ..... **Ecbolium**
19b Corolla resupinate; seeds < 3 mm in diam.; stamens only 2 and staminodes absent; anther thecae superposed (except where monothecous); inflorescence axillary, variously reduced 'umbel' of condensed monochasia:
24a Anthers monothecous ..... **Hypoestes**
24b Anthers 2-thecous ..... **Dicliptera** (= *Peristrophe*)

ADHATODA Mill.

Species many, Old World tropics; 2 in sthn Afr., mainly KZN and EC.

[E]andromeda (Lindau) C.B.Clarke

Valsmoeraskruid (A); *umusa omncane* (Z)

Perennial herb, 0.2–0.3 m high. **Leaves** glabrate, sometimes ternate, narrowly elliptic to ovate, sparsely strigose, hairs 1- or 2-celled. **Sepals** shortly and sparsely strigose, hairs 1- or 2-celled. **Ovary** shortly strigose in upper $^1/_3$. **Flowering time** Oct.–Feb. Rocky grasslands, slopes, valleys, mountains, alt. 550–1 950 m; Sub-Escarpment Grassland (Kokstad).

[E]densiflora (Hochst.) J.C.Manning

Perennial herb, 0.15–0.25 m high. **Leaves** binate, pubescent, hairs 3- or 4-celled. **Sepals** pubescent, hairs 3- or 4-celled, elliptic to broadly ovate. **Ovary** completely pubescent, rarely hairy in upper $^1/_3$ only. **Flowering time** Sept.–Dec. Rocky grasslands, appearing in spring after fire, alt. 25–1 065 m; Sub-Escarpment Grassland (Kokstad).

ASYSTASIA Blume

Species ± 70, Africa to East Indies and Australia; 8 in sthn Afr., N, B, LIM, NW, G, M, S, KZN, EC.

gangetica (L.) T.Anderson

Perennial herb, 0.2–2.0 m high (when scandent). **Inflorescence** a helicoid cyme. **Calyx** with filiform eglandular and stalked glandular trichomes abaxially common, strigose and sessile glandular trichomes adaxially. **Corolla** creamy white, constricted basally, narrow part as long as calyx lobes. **Stamens**: filaments and connectives with glandular trichomes. **Stigma** bifid with short, rounded lobes. **Flowering time** all year. **Seeds** verrucose, D-shaped. Roadsides, croplands, dunes, grassland or as a forest herb if undisturbed, alt. 5–950 m; Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Indigenous Forests (KZN Border, Uvongo, Stutterheim).

varia N.E.Br.

Perennial herb, becoming decumbent, 0.1–0.6 m high. **Inflorescence** a scorpioid cyme. **Calyx** with stalked, glandular trichomes with pigmented head cells. **Corolla** light purple,

narrow throughout, longer than calyx lobes. **Stamens**: anthers, filaments and connectives glabrous. **Stigma** spathulate. **Flowering time** Oct.–Feb. **Seeds** discoid with a reticulate pattern of elongated tubercles. Forest floor, alt. 10–795 m; Indian Ocean Coastal Belt, Indigenous Forests (Port St Johns, Port Edward).

BARLERIA L.

Purple pride

Species 250, cosmopolitan, mainly tropics; ± 60 in sthn Afr., N, B, LIM, NW, G, M, S, FS, KZN, NC, EC.

Rare in winter-rainfall area.

1a Capsule 2-seeded; bracts, bracteoles and sepals entire (section Somalia*)*

meyeriana Nees

Perennial herb, 0.2–0.9 m high, scabrid hairy, innovations not covered with a white tomentum. **Leaves** lanceolate to ovate, 3–4× as long as broad, obtuse at apex, denticulate. **Corolla** 5-lobed. **Flowering time** Dec.–May. **Fruit** a glabrous capsule. Rocky grassland and bushveld, alt. 60–1 980 m; Sub-Escarpment Savanna (KZN Border; Horseshoe Dam, Oribi Gorge Reserve, Umtamvuna Nature Reserve).

1b Capsule 4-seeded or 2-seeded; bracts, bracteoles and sepals pungent or innocuous, spinoso-dentate, dentate or entire (section Eubarleria*)*
2a Style base with a ring of short curly white hair; plants usually spinous

irritans Nees

Perennial, dwarf shrub, 0.25–0.35 m high, glabrescent. **Leaves** ovate. **Bracts** narrow with a few spines on margins. **Sepals** ovate-lanceolate. **Flowering time** Dec.–May. Karroid scrub and dry bush, alt. 80–1 200 m; Upper Karoo, Lower Karoo, Eastern Fynbos-Renosterveld (Graaff-Reinet S to Steytlerville, Uitenhage and Grahamstown).

[E?]**jasminiflora** C.B.Clarke

Perennial herb, 0.1–0.2 m high; hairy branches, spreading from a woody root. **Leaves** oblong, subsessile. **Bracts** with a few bristles on margins. **Sepals** elliptic to ovate, spine-tipped. Known only from type; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage to Humansdorp, between Galgebosch and Melk River).

pungens L.f.

Perennial, dwarf shrub, 0.05–0.45 m high, hirsute. **Leaves** ovate. **Bracts** broad, pinnatifid toothed near base. **Sepals**: outer ones broadly ovate. **Flowering time** Dec.–Aug. Coastal scrub, alt. 5–640 m; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage, Grahamstown).

stimulans E.Mey. ex Nees

Skerpioenbos (A)

Perennial, dwarf shrub, 0.1–0.2 m high. **Bracts** and bracteoles usually longer than sepals, margins entire or denticulate. **Sepals**: outer ones white to green, acuminate into a mucro. **Flowering time** Sept.–May. Karoo scrub, alt. 395–1 100 m; Albany Thicket (Uitenhage).

2b Style base glabrous or with a few tawny hairs, but never as above
3a Stigmas subconfluent, capitate (subsection Cryptophytae*)*

ovata E.Mey. ex Nees

Perennial herb, 0.2–0.8 m high. **Sepals** outer ones entire or somewhat dentate, with long hairs on inner face, anticous sepal entire or slightly notched, inner ones more than half as long as outer, densely hairy adaxially. **Stamens** usually 4, perfect, filaments hairy. **Flowering time** Nov.–Apr. Grassland, alt. 500–1 465 m; Sub-Escarpment Savanna (KZN Border; Oribi Gorge, Umtamvuna Nature Reserve).

3b Stigmas unequal, one branch filiform, the other reduced (subsection Innocuae*)*

gueinzii Sond.

Perennial shrub, creeper or herb, 0.3–1.2 m high. **Flowers** purple, cymes 1–few-flowered, unilateral. **Sepals** outer ones ovate or obovate, denticulate to dentate. **Flowering time** Nov.–Sept. Forests and thickets, alt. 45–2 225 m; Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket, Indigenous Forests (Kokstad S, from Stutterheim to Grahamstown and East London).

obtusa Nees

Bush violet; *bosviooltjie* (A); *idololenkonyane* (Z)

Perennial shrub, dwarf shrub or herb, 0.25–1.00 m high. **Inflorescence** many-flowered. **Sepals** outer ones broadened towards apex. **Style** base glabrous. **Flowering time** Feb.–Dec. **Capsule** slightly longer than calyx when ripe. Bush and forest margins, alt. 5–1 585 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Lower Karoo, Albany Thicket, Dry Highveld Grassland, Eastern Fynbos-Renosterveld (Kokstad to Port Edward S, from Queenstown to Graaff-Reinet, Stutterheim and Uitenhage).

BLEPHARIS Juss.

Species ± 80, Africa to East Indies, also Mediterranean; ± 45 in sthn Afr., widespread, mostly in arid parts.

1a Corolla limb 5-lobed (subgenus Acanthodium*)*
2a Stems with 2 leaves at a node, spikes terminal on branches

capensis (L.f.) Pers.

Perennial, dwarf shrub, 0.2–1.0 m high; young branches minutely puberulous. **Bracts**: fertile ones 4–10(–14) mm wide, glabrous if > 10 mm wide. **Bracteoles** 0.5–1.5 mm wide. **Sepals** glabrous to minutely puberulous (very rarely pubescent), ventral 4–6(–10) mm wide, if > 6 mm, then teeth ± 0.5 mm long. **Flowering time** mainly Dec.–Apr. Karoo vegetation often on hills and stony slopes, alt. 30–1 400 m; Upper Karoo, Dry Highveld Grassland, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Middelburg S, from Graaff-Reinet to Cradock and Uitenhage to Grahamstown).

[E]hirtinervia (Nees) T.Anderson

Perennial, dwarf shrub, 0.3–0.6 m high; young branches puberulous or densely so. **Bracts**: fertile ones 9–16 mm wide, upper puberulous to densely pubescent. **Bracteoles** 2–4 mm wide. **Sepals** sparsely puberulous to densely pubescent, ventral (7–)8–12 mm wide with 2 apical teeth 1.5–4.0 mm long. **Flowering time** all year. Coastal sand dunes with open bushveld, karroid bush, alt. 10–90 m; Albany Thicket (Uitenhage, Grahamstown).

2b Stems with 4 leaves at a node, spikes normally appearing lateral due to development of lateral branches
3a Stems and/or some or all petioles with prickles or spines

[E]ilicina Oberm.

Perennial, prostrate, dwarf shrub or herb; branches up to 250 mm long, minutely puberulous. **Bracts**: fertile ones on each side with 3–6 teeth. **Sepals** glabrous to minutely sparsely puberulous with bulbous-based hairs, dorsal with rounded to acute apex with distinct central tooth. **Corolla**: limb 10–17 mm wide. **Flowering time** Sept., Oct., Feb. **Fruit** a capsule, ± 15 mm long. **Seeds** 4. Gentle hill slopes, alt. 25–450 m; Albany Thicket, Eastern Fynbos-Renosterveld (Patensie).

[E]procumbens (L.f.) Pers.

Perennial herb, 0.2–1.0 m long. **Leaves**: petioles with 2–4 teeth up to 7 mm long within 2 mm of stem. **Bracts** thin and papery with many bristles. **Flowering time** July–Mar. Scrub and coastal bush, alt. 15–350 m; Albany Thicket, Eastern Fynbos-Renosterveld (Patensie, Uitenhage, Grahamstown and Humansdorp).

3b Stems and petioles not with prickles or spines
4a Dorsal sepal with spathulate (rarely ligulate) apical part and truncate, wavy, irregularly toothed apex, with 3 main veins repeatedly branched near apex

[E]dilatata C.B.Clarke

Perennial, dwarf shrub or herb; branches up to 350 mm long. **Bracts**: fertile ones lower and middle 18–23 mm long, with spinose apex 4–6 mm long. **Sepals** glabrous to minutely puberulous along veins, ciliate, dorsal 17–22 mm long, 3–5 veined from base. **Corolla** 20–25 mm long, limb 10–15 mm wide. **Flowering time** Jan.–May. Riverine and valley bushland on sandy soil, alt. 150–650 m; Upper Karoo, Lower Karoo, Albany Thicket, Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (Middelburg, Graaff-Reinet, Cradock, Stutterheim).

[E]sinuata (Nees) C.B.Clarke

Decumbent, shrubby herb or shrub; branches up to 350 mm long. **Bracts** minutely puberulous or minutely sericeous-puberulous all over. **Flowers** in 4–18-flowered pedunculate spikes. **Sepals** minutely puberulous to puberulous all over, dorsal 20–26 mm long, 5(–7)-veined from base, apical part ligulate. **Corolla**: limb deeply and broadly emarginate. **Flowering time** Nov.–Apr. Thorntree bushland (karoo), dry succulent *Euphorbia* bushland, alt. 25–600 m; Albany Thicket (Grahamstown).

obtusisepala Oberm.

Perennial or shrubby herb; with trailing stems from woody rootstock, stems up to 450 mm long. Close to *B. sinuata* but dorsal sepal 17–25 mm long, 5-veined from base, apical part spathulate. **Corolla** limb truncate or slightly retuse. Habitat not recorded, alt. 750–1 525 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (KZN border).

4b Dorsal sepal ligulate or subligulate, apical part which narrows to an acute and mucronate 1–3 toothed apex, with 3 main veins unbranched or with single branch

mitrata C.B.Clarke

Klapperbossie (A)

Perennial, dwarf shrub, 0.1–0.2 m high, usually with internodes < 20 mm long and often with spikes hidden in erect leaves. **Bracts**: fertile ones obovate or broadly so, with 3 or 4(–7) pairs of lateral spines; lower and middle fertile bracts 22–35 mm long, with

spinose apex (6–)8–18 mm long. **Sepal**: ventral one 8–13 mm long, with or without apical teeth up to 1.5(–2.0) mm long. **Corolla** 23–37 mm long, limb 12–18 mm wide. **Flowering time** all year. Cracks in vertical rock faces on sandy to gravely or clayey soils, alt. 365–2 100 m; Upper Karoo (Middelburg).

1b Corolla limb 3-lobed (subgenus Blepharis*)*

integrifolia (L.f.) E.Mey. ex Schinz

Prostrate, hairy shrublet or herb, 0.1–0.4 m high. **Bracts** uniformly and minutely sericeous-puberulous or sparsely so (rarely subglabrous), puberulous-pubescent along midrib and at base of bristles and often puberulous- or pilose-ciliate. **Sepals** distinctly (at least 2 mm) longer than bracts. **Corolla**: limb 4–8(–10) mm wide. **Filaments** 2–6 mm long. **Flowering time** Oct.–Apr. Grassy slopes, alt. 30–1 065 m; Sub-Escarpment Grassland, Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Kokstad SW, from Cradock to Stutterheim and Uitenhage to Grahamstown).

CHAETACANTHUS Nees see **DYSCHORISTE** Nees

CRABBEA Harv.

Species ± 12, Africa; 7 in sthn Afr., N, B, LIM, NW, G, M, S, FS, KZN, L, EC.

Inflorescences pedunculate

nana Nees

Perennial herb, 0.1–0.3 m high. **Bracts** thinly hairy with triangular apex, margins entire or with mostly straight spines. **Flowering time** Dec.–Apr. River valleys, recently burned grassland, alt. 15–1 675 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Matatiele S to Ngangelizwe and Fort Beaufort, E to East London).

Inflorescences sessile

acaulis N.E.Br.

Perennial herb, 0.03–0.08 m high; stemless with ± 6 almost stalkless leaves flat on ground, surrounding a single inflorescence. **Corolla** white; tube broadly cylindric. **Flowering time** Jan.–May. Rocky grassland, alt. 1 280–2 135 m; Sub-Escarpment Grassland (Kokstad).

hirsuta Harv.

Perennial herb, 0.05–1.25 m high. **Stems** erect, often zigzag and sprawling. **Leaves** very varied in size and shape. **Corolla** white; tube gradually widening. **Flowering time** Dec.–May. Bushveld, rocky grassland, afromontane vegetation, alt. 5–2 100 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket (KZN Border to Matatiele, Kentani, Amalinda).

DICLIPTERA Juss.

(= *PERISTROPHE* Nees) (Manning & Goldblatt 2012)

Species ± 170, Africa to East Indies; 11 in sthn Afr., N, B, LIM, KZN, EC.

1a Only one 'umbel-like group of monochasial cymes' borne in each axil

[E]capensis Nees

Herb, up to 0.5 m high, frequently stoloniferous. **Inflorescence**: axis (0.5–)1.6–6.1(–15.0) mm long. **Bracts**: tertiary ones broadly obovate, broadly elliptic or broadly ovate, windows absent. **Corolla** purple or white, (13–)15–18(–20) mm long; tube (5–)7–9(–10) mm long; lip in upper position (7–)8–10(–11) × (2.0–)2.3–3.7(–4.5) mm; lip in lower position (7–)7–10(–12) × (2.5–)2.9–4.4(–6.0) mm. **Flowering time** Mar.–Dec. **Seeds**: testa with no hooks on tubercles. Addo Bush and other kinds of bushveld, alt. 30–660 m; Indigenous Forests, Sub-Escarpment Savanna (Fort Beaufort, Grahamstown).

1b Often more than one 'umbel-like group of monochasial cymes' in each axil
2a Tertiary bracts elliptic or obovate

extenta S.Moore

Herb, up to 0.5 m high, readily stoloniferous. **Inflorescence** with 1 or 2 umbels in each axil, axis (3.0–)8.6–33.4(–75.0) mm long. **Bracts**: tertiary ones with windows absent. **Corolla** white, (17–)21–27(–37) mm long; tube (7–)9–12(–14) mm long; lip in upper position 10–14(–21) × (2.5–)3.1–5.6(–8.5) mm; lip in lower position 11–15(–23) × (3.5–)4.2–6.8(–8.0) mm. **Flowering time** Feb.–Nov. **Seeds**: testa with hooks on tubercles. Forest floors in relatively damp forests along escarpment or East Coast, alt. 30–1 550 m; Indigenous Forests (Stutterheim, Willowmore, Humansdorp District, East London).

2b Tertiary bracts lanceolate or ovate
3a Corolla white, occasionally light lilac

heterostegia Nees

Herb, up to 0.5 m high. **Inflorescence**: number of umbels increasing to 5 through season, axis (1.0–)2.1–5.9(–31.0) mm long. **Bracts**: tertiary ones with windows absent. **Corolla** white, (14–)15–18(–21) mm long; tube (7–)8–10(–11) mm long; lip in upper position (5–)6–9(–11) × (1.6–)2.1–3.5(–4.5) mm; lip in lower position (6–)7–9(–11) × (3.0–)3.2–5.1(–6.8) mm. **Flowering time** Mar.–Oct. **Seeds**: testa with hooks on tubercles. Herbaceous layer on forest floor in dune forest, alt. 15–660 m; Indigenous Forests (Port St Johns).

3b Corolla purple
4a Stems, leaves and tertiary bracts with smooth, green appearance

leistneri K.Balkwill

Perennial herb, 0.3–1.0 m high. **Inflorescence** 2 umbels in each axil, axis (0.7–)0.9–4.0(–5.3) mm long. **Bracts**: tertiary ones narrowly elliptic to narrowly ovate. **Corolla** light purple; tube (5.0–)6.5–8.8(–9.7) mm long; lip in upper position (8–)9–11(–12) × (1.6–)1.8–2.5(–3.3) mm; lip in lower position (7–)9–11(–12) × (2.3–)3.2–4.9(–5.8) mm. **Flowering time** Nov.–June. **Seeds**: testa with no hooks on tubercles. Riverbanks, alt. 1 370–1 465 m; Sub-Escarpment Grassland (Fort Beaufort).

4b Stems and/or leaves and/or bracts glandular, pubescent or glandular-pubescent with a rough appearance

cernua (Hook.f. ex Nees) J.C.Manning & Goldblatt
(= *Peristrophe cernua* Hook.f. ex Nees)

Perennial suffrutex, 0.3–1.8 m high. **Leaves** ovate, acuminate. **Inflorescence** monochasial cymes. **Bracts** lanceolate, pubescent. **Corolla** purple with dark purple honey-guides

on lip in upper position; lower lip ovate; upper lip narrowly elliptic. **Disc** cupular, 2 short stubby awns. **Flowering time** Feb.–Nov. **Fruit** stalked, clavate. **Seeds** rough and tuberculate. Riverine scrub, alt. 30–1 065 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Albany Thicket (Queenstown to Port St Johns and SW to Patensie).

clinopodia Nees

Perennial herb or suffrutex, sometimes scandent, 0.2–1.2 m high. **Inflorescence** with 3–many 'umbels' in each axil, axis (0.2–)0.7–2.8(–19.0) mm long. **Bracts**: tertiary ones narrowly obovate or narrowly elliptic, windows present. **Corolla** purple, (16–)24–31 (–40) mm long; tube (8–)11–14(–18) mm long; lip in upper position (8–)12–18(–26) × (1.6–)2.1–3.4(–5.0) mm; lip in lower position (8–)13–18(–24) × (3.0–)3.8–5.9 (–10.0) mm. **Flowering time** Feb.–Oct. **Seeds** testa with no hooks on tubercles. Forest edge, riverine bush, bushveld, grass, sea-facing slopes, alt. 25–1 830 m; Indigenous Forests, Sub-Escarpment Savanna (Port St Johns, Butterworth).

DYSCHORISTE Nees

(= *CHAETACANTHUS* Nees) (Manning & Goldblatt 2012)

Species ± 5, sthn Afr., LIM, NW, G, M, S, FS, KZN, WC, EC.

setigera (Pers.) J.C.Manning & Goldblatt

[= *Chaetacanthus setiger* (Pers.) Lindl.]

Perennial shrub or dwarf shrub. **Leaves** opposite, obovate, obtuse, axillary leaves sparsely glandular-hairy. **Inflorescence** an axillary, sessile cyme, white, sometimes blue. **Flowering time** Aug.–Jan. Grassland, renosterveld, alt. 5–2 040 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Albany Thicket (Matatiele S, Queenstown E to Port St Johns and to Patensie).

sp. A

Like *D. setigera*, but leaves associated with inflorescence, glabrous or sparsely eglandular-hairy. **Flowering time** Sept.–Dec. Eastern Fynbos-Renosterveld, Albany Thicket, Indigenous Forests, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Humansdorp, Uitenhage, Fort Beaufort to Butterworth).

DUVERNOIA E.Mey. ex Nees

Species 2, Mozambique and sthn Afr., M, S, KZN, EC.

adhatodoides E.Mey. ex Nees

Bastergeelhout (A)

Perennial shrub or tree, 2–6 m high; branches flattened, velutinous strigose and often glandular when young. **Flowers** in threes on each side of axis at nodes; penduncles terete. **Bracts** oblanceolate to elliptic, 10–20 mm long, persistent. **Corolla**: upper lip more than twice as long as broad, shallow. **Flowering time** Dec.–Sept. Forest margins and understorey of forests, alt. 15–1 830 m; Indigenous Forests (Port St. Johns).

ECBOLIUM Kurz

Species 22, Africa to India; 3 in sthn Afr., N, M, S, KZN, EC.

[E]**flanaganii** C.B.Clarke

Perennial, erect shrublet or shrub, 0.3–0.7 m high. **Stems** rounded, with 4 furrows and many longitudinal ribs. **Bracts** more than twice as long as wide. **Flowering time**

May–Dec. **Fruit** a 3-seeded capsule (one locule always developing both ovules into seeds). **Seeds** ± 5 × 4 mm. Riverbanks, alt. 5–450 m; Sub-Escarpment Savanna, Albany Thicket (Butterworth, Grahamstown, East London).

HYPOESTES Sol. ex R.Br.

Species 150, Africa to Asia, East Indies and Australia; 3 in sthn Afr., widespread.

1a Most inflorescences borne on peduncles, bracts not fused into calyx-like structure, > 20 mm long

triflora (Forssk.) Roem. & Schult.

Perennial herb, 0.2–1.2 m high. **Leaves** with cystoliths predominantly boomerang-shaped. **Calyx** 5-lobed; tube 0.75–1.00 mm long. **Corolla** almost glabrous; lip in lower position obovate. **Seeds** verrucose. **Flowering time** Dec.–Oct. Afromontane forests, alt. 490–2 000 m; Sub-Escarpment Grassland, Indigenous Forests (Kokstad, Fort Beaufort, Stutterheim).

1b Inflorescence borne on peduncles, bracts not fused into calyx-like structure, < 10 mm long
2a Inflorescence appearing verticillate, bracts aristate

aristata (Vahl) Sol. ex Roem. & Schult.

Perennial suffrutex, 0.25–1.50 m high. **Leaves** with cystoliths not predominantly boomerang-shaped. **Calyx** 4-lobed; tube 1.5–4.0 mm long. **Corolla** pubescent; lip in lower position lanceolate. **Flowering time** Dec.–Oct. **Seeds** smooth or asperous. Sand dunes, succulent, alt. 2–1 900 m; Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Port Edward to Port St Johns S, from Keiskammahoek to Mazeppa Bay, Patensie to Uitenhage, Port Elizabeth, Grahamstown and East London, and to Skoenmakerskop).

2b Inflorescence not appearing verticillate, bracts obtuse

forskaolii (Vahl) R.Br.

Perennial herb, 0.2–1.0 m high. **Leaves** with cystoliths not predominantly boomerang-shaped. **Calyx** 5-lobed, 14.1–21.8 mm long. **Corolla** pubescent and glandular; lip in lower position trullate. **Flowering time** Mar.–July. **Seeds** asperous. Dry habitats, alt. 3–1 950 m; Indigenous Forests, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad S, from Queenstown to Port Edward, Somerset East to Qora River Mouth, Baviaanskloof to Port Elizabeth, Grahamstown and East London, and to Humansdorp).

ISOGLOSSA Oerst.

Species ± 50, Old World tropics; 15 in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, WC, EC, mainly northern parts of sthn Afr.

bolusii C.B.Clarke

Monocarpic herb or shrub, 0.2–1.2 m high, much branched; young stems bifariously with fine eglandular hairs. **Leaves** ovate, apex acuminate, base cuneate or curved, secondary veins 3 or 4. **Inflorescence** terminal, slender, interrupted. **Bracts** elliptic to oblong. **Flowering time** Mar.–Nov. Forest, alt. 30–1 130 m; Drakensberg Grassland, Indigenous Forests (Katberg).

ciliata (Nees) Lindau
Shrub or herb, 0.3–1.3 m high; branches pubescent; young stems bifarious hairy with fine eglandular hairs. **Leaves** glabrous, ovate, elliptic, apex obtuse to acuminate, base cuneate, secondary veins 4 or 5. Inflorescence axillary, compact. **Bracts** spathulate. **Flowering time** Mar.–July. Shade of trees or shrubs, alt. 40–400 m; Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket (Kentani S, Port Alfred, East London).

cooperi C.B.Clarke
Probably a variety of *Isoglossa hypoestiflora*.

delicatula C.B.Clarke
Monocarpic shrub or herb, 0.35–1.50 m high; branches slender, bifariously pubescent with long wispy hairs. **Leaves** sparsely hairy, ovate, elliptic, thinly textured, apex acuminate, base cuneate, secondary veins 4 or more. **Inflorescence** terminal, axillary, interrupted. **Bracts** ovate, deltoid. **Flowering time** Mar.–Aug. Forests, forest edges, savanna, alt. 400–800 m; Indigenous Forests (Stutterheim, Butterworth, Port St Johns).

densa N.E.Br.
Known only from type. Believed to be same species as *Isoglossa ciliata*.

eckloniana (Nees) Lindau
Buckweed, *sewejaarbossie* (A)
Monocarpic shrub or herb, 0.3–1.8 m high. **Leaves** very sparsely hairy, ovate, apex acute to acuminate, base cuneate to rounded, secondary veins 5 or 6 on either side of midrib. **Inflorescence** terminal and axillary. **Bracts** ovate. **Flowering time** Apr.–June. Forests, forest margins, alt. 800–1 400 m; Indigenous Forests (Kentani, Uitenhage, Alexandria).

hypoestiflora Lindau
Perennial shrub or herb, 0.5–4.0 m high. **Leaves** ovate, glabrous, soft, apex acuminate, base attenuate, secondary veins 4 or 5, looping towards margins. **Inflorescence** terminal; flowers loose. **Bracts** linear, oblong, spathulate. **Flowering time** Jan.–May. Forests, alt. 10–1 200 m; Sub-Escarpment Savanna, Indigenous Forests (Hogsback, Kentani).

macowanii C.B.Clarke
Monocarpic, dwarf shrub or herb, 0.2–0.7 m high; branches glabrescent. **Leaves** ovate, smooth textured, apex acute, base cuneate, round, secondary veins 3 or 4. **Inflorescence** terminal, axillary, interrupted. **Bracts** elliptic, broadly lanceolate. **Flowering time** Mar., Apr. Forests, forest edges, alt. 700–1 000 m; Indigenous Forests (Somerset East).

origanoides (Nees) Lindau
Dwarf shrub or herb, 0.3–1.5 m high; young stems bifariously hairy. **Leaves** ovate, apex acute, base cuneate, rounded, secondary veins 4 or 5. **Inflorescence** terminal. **Bracts** narrowly obovate, acuminate. **Flowering time** Dec.–May. Forests, alt. 10–700 m; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Komga S, from Sundays River to Grahamstown and to Tsitsikamma).

ovata (Nees) Lindau
Perennial herb, 0.2–0.9 m high; branches rigid. **Leaves** ovate, glabrous, apex acuminate, acute, base obtuse, slightly cuneate, secondary veins 4 or 5. **Inflorescence** terminal. **Bracts** rounded. **Flowering time** Feb.–Apr. Grassland, alt. 10–765 m; Sub-Escarpment Grassland, Albany Thicket (Bizana S, from Komga to Alexandria and East London).

[E]prolixa (Nees) Lindau

Monocarpic herb or climber, 0.3–2.0 m high. **Leaves** ovate, elliptic, apex acuminate, base cuneate, obtuse, secondary veins 4 or 5. **Inflorescence** mainly axillary. **Bracts** narrowly elliptic-lanceolate. **Flowering time** Mar.–May. Forests or bush clumps, alt. 30–1 400 m; Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket (Mount Ayliff SE to Port St Johns S, from Butterworth to East London).

stipitata C.B.Clarke

Monocarpic shrub, dwarf shrub or herb, 0.2–1.5 m high; branched from base. **Leaves** ovate, broadly elliptic, apex acute, acuminate, base obtuse to rounded, secondary veins 3–5. **Inflorescence** terminal, axillary, markedly interrupted. **Bracts** spathulate, acuminate. **Flowering time** Aug. Forests and forest edges, alt. 50–1 830 m; Indigenous Forests (Dwesa Nature Reserve).

woodii C.B.Clarke

Bushbuck-food; *kiesieblaar* (A); *ugomane*, *umbmane* (Z)

Monocarpic shrub, 1–3 m high. **Leaves** large, ovate, apex acuminate, base obtuse; secondary veins 5 or 6. **Inflorescence** terminal and axillary. **Bracts** obovate, apex acuminate. **Flowering time** Apr., May. Forests or coastal dunes, alt. 5–1 280 m; Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket (Port Edward, Alexandria, East London).

sp. A

Monocarpic herb, 0.3–0.6 m high. **Leaves** ovate, apex acute, acuminate, base cuneate, rounded, secondary veins 3 or 4. **Inflorescence** terminal, not interrupted. **Bracts** narrowly elliptic, narrowly obovate. **Flowering time** Mar., Dec. Scrub or grassland, alt 185–490 m; Indian Ocean Coastal Belt, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Port St Johns S, from Fort Beaufort to Butterworth and to Grahamstown).

sp. B

Monocarpic shrub, dwarf shrub or herb, 0.2–1.5 m high. **Stems** glaucous with fine curved hairs. **Leaves** elliptic, ovate, apex acute, base rounded, secondary veins 3 or 4. **Inflorescence** terminal or axillary without interruptions. **Bracts** spathulate, acuminate. **Calyx**: lobes and bracts with dense, silky, stalked, glandular trichomes. Habitat not recorded, alt. 5–500 m; Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore E to Bathurst and Peddie).

JUSTICIA L.

(= *SIPHONOGLOSSA* Oerst. in part) (Manning & Goldblatt 2012)

Species ± 420, cosmopolitan in warm areas; 23 in sthn Afr., N, B, LIM, NW, G, M, S, FS, KZN, NC, WC, EC.

1a Corolla tube longer than lips

leptantha (Nees) Lindau

[= *Gendarussa leptantha* Nees, *Siphonoglossa leptantha* (Nees) Immelman]

Perennial, dwarf shrub or herb, 0.2–0.6 m high. **Flowers** solitary in uppermost axils. **Corolla** 13–31 mm long, white to lilac, with pink speckles. **Flowering time** all year. Undershrub in forest or scrambling in bush, alt. 15–1 295 m; Indigenous Forests, Sub-Escarpment Savanna (Queenstown to Port Edward and SW to Willowmore).

nkandlaensis (Immelman) J.C.Manning & Goldblatt
(= *Siphonoglossa nkandlaensis* Immelman)

Perennial herb, 0.2–0.5 m high. **Corolla** 34–45 mm long, purple or yellow green. **Flowering time** Feb., Mar. Forest margins or forest paths; Indigenous Forests (Stutterheim).

1b Corolla tube shorter than lips
2a Inflorescence terminal or with peduncles > 10 mm long; bracts clearly differentiated from leaves
3a Inflorescence axillary with long peduncles
4a Flowers yellow; leaves broadly ovate

campylostemon (Nees) T.Anderson
Isipheka, *ubomane* (Z)

Perennial shrub or herb, 0.3–3.0 m high. **Leaves** glabrous to sparsely pubescent, ovate to lanceolate. **Inflorescence** of compound cymes on long peduncles, axillary, paired at nodes. **Bract** 1. **Bracteoles** 2. **Flowering time** Dec.–Sept. **Fruit** a 4-seeded capsule. Stony soil, alt. 5–1 680 m; Indigenous Forests (Kokstad to Ndindindi Forest S, from Tabankulu Forest to Mount Thesiger, Cradock to Kentani District and Grahamstown to East London).

4b Flowers white or cream-coloured; leaves narrowly elliptic to obovate

[E]bolusii C.B.Clarke
Perennial shrub, 0.5–1.0 m high. **Leaves** glabrous to pilose, ovate to oblong, sometimes ovate or obovate. **Inflorescence** axillary cymes, stoutly peduncled. **Bract** 1. **Bracteoles** 2. **Flowering time** all year. **Capsule** 1-seeded. Coastal forests at river mouths, alt. 15–580 m; Indigenous Forests (N of Elliot to Ngangelizwe S, from Stutterheim to Butterworth and to East London).

3b Inflorescence terminal; flowers borne in sessile cymes
5a Bracts broadly ovate, white and green; flowers white to cream-coloured

betonica L.
Perennial herb or soft shrublet, 0.13–1.00 m high. **Leaves** glabrous, lanceolate, broadly ovate, rarely slightly obovate. **Inflorescence** terminal, appearing strobilate, aggregate of sessile cymes usually reduced to a single flower each. **Bract** 1. **Bracteoles** 2. **Flowering time** all year. **Fruit** a 4-seeded capsule. Forest edges, alt. 15–580 m; Sub-Escarpment Savanna, Indigenous Forests (Port St Johns to Fort Beaufort).

5b Bracts lanceolate or ligulate, green; flowers yellow

flava (Vahl) Vahl
Impela (Z)

Perennial, dwarf shrub or herb, 0.1–1.0 m high. **Leaves** nearly glabrous to densely white-pilose, especially on veins and margins when very young, lanceolate to broadly ovate. **Inflorescence** a terminal, dense aggregate of sessile cymes in axils of reduced floral leaves. **Bracts** and bracteoles similar to floral leaves but smaller. **Flowering time** all year. **Fruit** a 4-seeded capsule. Savanna, woodland, alt. 25–1 400 m; Indigenous Forests, Sub-Escarpment Savanna (KZN border).

2b Inflorescences in axils; sessile bracts leaf-like
6a Corolla blue or mauve
7a Corolla blue; leaves thinly textured; flowers mainly in upper axils on stems

petiolaris (Nees) T.Anderson
Perennial, dwarf shrub or herb, 0.25–1.30 m high. **Leaves** glabrous to pilose, broadly elliptic, ovate to lanceolate. **Inflorescence** aggregates of sessile cymes in axils of reduced

floral leaves in upper shoot axils. **Bracts** and bracteoles narrowly spathulate to strap-shaped. **Flowering time** Oct.–Apr. **Fruit** a 4-seeded capsule. Undergrowth in forests or bush clumps, alt. 15–550 m; Indigenous Forests (Butterworth S to Port Elizabeth and Grahamstown).

7b Corolla mauve; leaves usually thinly textured; flowers spread over branches

capensis Thunb.

Perennial shrub, scrambler or herb, 0.2–2.0 m high. **Leaves** glossy and glabrous to densely velvety, slightly obovate to occasionally ovate. **Inflorescence** scattered, axillary, sessile cymes. **Bract** and bracteoles very narrowly triangular. **Flowering time** Sept.–July. **Fruit** a 4-seeded capsule. Forest, forest edge, alt. 5–715 m; Indigenous Forests, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (N Queenstown to Ngangelizwe and SW to Patensie).

6b Corolla white, cream-coloured or pale lilac
8a Flowers single in axils, on short peduncles
9a Leaves < 10 mm long

orchioides L.f.

Perennial shrub or dwarf shrub, 0.15–0.75 m high. **Leaves** glabrous, with a few, long, white–opaque hairs or pubescent, ovate to lanceolate. **Inflorescence** of scattered, axillary cymes reduced to single pendunculate flower. **Bract** absent. **Bracteoles** 2. **Flowering time** Dec.–Feb. **Fruit** a 1-seeded capsule. Open areas with stony, sandy or calcareous soil, alt. 30–1 370 m; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage).

Two subspecies recognised:

[E]**orchioides** L.f. subsp. **orchioides**
orchioides L.f. subsp. **glabrata** Immelman: distributed in NW, FS, WC, EC.

9b Leaves > 10 mm long

cuneata Vahl

Perennial, dwarf shrub, 0.2–1.6 m high. **Leaves** glabrous, pubescent or densely and minutely puberulous, broadly ovate to obovate. **Inflorescence** of axillary cymes, reduced to a single pendunculate flower. **Bract** absent. **Bracteoles** 2. **Flowering time** July–Feb. **Fruit** a 1-seeded capsule. Coastal scrub, karoo vegetation, alt. 20–85 m; Eastern Fynbos-Renosterveld, Albany Thicket (Steytlerville District, Uitenhage).

8b Flowers usually 2 or more in axils

protracta (Nees) T.Anderson

Perennial, dwarf shrub or herb, 0.6–2.0 m high. **Leaves** with short to long multicellular hairs, often glandular on margins, or glabrous or puberulous, narrowly lanceolate to broadly ovate, oblong to obovate. **Inflorescence** scattered, axillary cymes. **Bracts** leaf-like. **Bracteoles** 2. **Flowering time** all year. **Fruit** a 4-seeded capsule. Forests, forest edges, savanna, alt. 5–1 830 m; Sub-Escarpment Grassland, Indigenous Forests (Kokstad S, from Queenstown to Stutterheim and to Humansdorp).

MACKAYA Harv.

Species 1, sthn Afr., LIM, M, S, KZN, EC.

bella Harv.

Muphanza (Venda)

Perennial tree or shrub, 1–3 m high. **Leaves** opposite, petioled, elliptic-obovate, acuminate, obtuse, usually narrowed at base, margins lobulate, subentire, with nerves distinct beneath, glabrous. **Flowers** alternate in a terminal raceme. **Bracts** subulate. **Calyx** divided almost to base, acuminate. **Flowering time** June–Dec. Forests, alt. 5–1 980 m; Indigenous Forests, Indian Ocean Coastal Belt (Port St Johns).

METARUNGIA C.Baden

Species 3, Africa; 2 in sthn Afr., LIM, M, S, KZN, EC.

[E]galpinii (C.Baden) C.Baden

Perennial shrub, 2–3 m high; young stems woolly, more densely so on two sides. **Leaves** large, sessile to subsessile. **Flowers** in spikes, 70–170 mm long. **Bracts** 25–41 × 15–21 mm, with broad, scarious margins. **Bracteoles** highly reduced to absent. **Calyx** 15–25 mm long, velutinous. **Corolla** pilose to velutinous. **Flowering time** Feb., Mar., May, July. Forests along rivers, alt. 30–100 m; Albany Thicket, Indigenous Forests (East London).

MONECHMA Hochst.

Species ± 40, mainly Africa, also India; 19 in sthn Afr., N, B, LIM, NW, M, S, FS, KZN, NC, WC, EC.

1a Calyx lobes 4

divaricatum (Nees) C.B.Clarke

Wild lucerne; *wildelusern* (A)

Perennial shrub or suffrutex, 0.2–1.0 m high; branches often at a wide angle to main stem, hairy and/or glandular. **Leaves** linear-oblanceolate, elliptic-oblong, obovate, obtriangular, variously hairy to subglabrous. **Bracteoles** leaf-like, ciliate, hairy or glandular-hairy. **Seeds** round, plump, flattened on one side, pale, dark brown, dark blotches. **Flowering time** all year. Karoo scrub, alt. 100–1 850 m; Albany Thicket, Lower Karoo (Graaff-Reinet).

1b Calyx lobes 5

2a Stems and leaves white- or grey-puberulous, or plant rarely glabrescent; corollas white, often with purple veins

incanum (Nees) C.B.Clarke

Blouganna, *boegoe-ankerkaroo*, *netvetbossie*, *skaapbloubossie* (A)

Perennial shrub or dwarf shrub, 0.2–1.0 m high; branches often arched, densely white-tomentose with T-shaped hairs, angular or ribbed. **Leaves** narrowly oblanceolate, elliptic or obovate, indumentum felty, under high magnification hairs T-shaped. **Bracteoles** small, linear, densely tomentose. **Flowering time** all year. **Seeds** ± spherical if single, or flattened if paired, beige or grey, darkly mottled. Karoo scrub, alt. 900–1 420 m; Albany Thicket, Sub-Escarpment Grassland (Fort Beaufort).

2b Stems and leaves not white- or grey-puberulous; corollas mauve, purple, blue, greenish, white or bicoloured

spartioides (T.Anderson) C.B.Clarke

Maklikbreekbos (A)

Perennial shrub or dwarf shrub, 0.2–2.0 m high; branches mostly smooth, terete, with long internodes (up to 70 mm long); young stems with rafter-branching (branches regularly spaced, borne at wide angle, resembling roof rafters); older stems with cluster-branching (several successive year's growth at a single node). **Leaves** linear to rounded, glabrous or hairy. **Bracteoles** small, narrowly triangular with eglandular and glandular hairs. **Flowering time** all year. **Seeds** plump and ± spherical when only one develops, yellow or beige with dark blotches. Stony habitats, karoo scrub, alt. 185–1 675 m; Albany Thicket, Rainshadow Valley Karoo (northern Graaff-Reinet SW, from Willowmore to Port Elizabeth and Grahamstown).

2c Stems with minute, white, deflexed hairs becoming glabrate; leaves becoming nearly glabrous; corollas white

[E?]acutum C.B.Clarke

Perennial, dwarf shrub, 0.15–0.35 m high. **Leaves** narrowly lanceolate, acute, subsessile. **Flowers** many in upper axils forming an interrupted spike. **Bracteoles** linear lanceolate. Insufficiently known, near *M. arenicola* = *M. cleomoides*. Known only from description and types; Albany Thicket, Eastern Fynbos-Renosterveld (Humansdorp).

PERISTROPHE Nees see **DICLIPTERA** Juss.

PHAULOPSIS Willd.

Species ± 20, Africa to India; 3 in sthn Afr., N, LIM, M, S, KZN, EC.

imbricata (Forssk.) Sweet

Perennial herb, 0.25–0.60 m high; branches with a variable tendency to root at lower nodes, with or without woody rootstock. **Leaves** petiolate, broadly ovate to ovate or subelliptic, slightly to distinctly anisophyllous, acuminate to acute apex. **Corolla** > 8 mm long, if shorter, then plant with woody rootstock at base. **Flowering time** Jan.–Nov. Forests in disturbed areas/openings, alt. 15–1 370 m; Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt (KZN border; Uvongo and Port St. Johns).

RHINACANTHUS Nees

Species ± 22, Africa to Asia; 3 in sthn Afr., N, LIM, M, S, KZN, EC.

gracilis Klotzsch

Perennial herb, 0.4–1.0 m high. **Leaves** with rounded or cuneate bases, lower surfaces of young leaves sparingly hairy. **Inflorescence** an open, compound, 1-sided cyme. **Corollas** white or mauve with purple speckles. **Flowering time** Feb.–Apr. **Seeds** rough. Cave sandstone and other bushveld habitats, alt. 5–1 065 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (KZN border, Kokstad and Uvongo River Reserve S, from Port St Johns to Butterworth and Grahamstown).

RUELLIA L.

Species ± 150, America, Africa, Asia and Australia; ± 15 in sthn Afr., N, B, LIM, NW, G, M, S, FS, KZN, WC, EC.

Ovaries and capsules hairy

malocophylla C.B.Clarke

Perennial, erect herb, 0.1–0.3 m high. **Stems** very densely and softly hairy. **Leaves** 21.0–59.0 × 8–40 mm, broadly ovate to elliptic, softly textured. **Bracts** 11–25 × 3–11 mm, spoon-shaped. **Flowers** solitary, axillary. **Calyx** bilabiate, 7–11 mm long, lobes narrowly triangular, not becoming spindly-setaceous. **Flowering time** Aug.–Feb. **Fruit** 14–18 × 6–8 mm, broadly obtrullate or clavate, lower stalk usually shorter than half the length of upper portion; hairs short, velvety, deflexed and not appressed. **Seeds** buff-olive-coloured, both surfaces glabrous, shiny. Shady areas ranging from fairly open grassland and thorntree veld, through low scrub, shrubland and bushveld to streamside vegetation, alt. 225–1 280 m; Sub-Escarpment Savanna (KZN border; Umtamvuna Nature Reserve).

Ovaries and capsules glabrous

baurii C.B.Clarke
(= *R. woodii* C.B.Clarke) (Cadman 1987)

Perennial herb, 0.05–0.20 m high. **Stems** very densely villose-tomentose, appearing white-woolly. **Leaves** 23–66 × 12–24 mm, broadly ovate, thinly textured. **Bracts** 12–30 × 1.25–5.00 mm, linear with tapered ends to narrowly elliptic, much longer than calyx. **Flowers** solitary (or occasionally borne in clusters of 3), axillary. **Calyx** equally divided; lobes linear-triangular to narrowly triangular or occasionally lanceolate, 8–11 mm long. **Flowering time** Sept., Oct. **Fruit** 15–17 × 5–6 mm, fusiform, lower portion 5 mm long, glabrous. **Seeds** brown, both surfaces glabrous. Shaded areas in grassland or open woodland; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Kokstad).

cordata Thunb.

Perennial, dwarf shrub or herb, 0.1–0.6 m high. **Stems** with scattered hairs on faces and ring of eglandular hairs at nodes. **Leaves** 10–50 × 3–38 mm, lanceolate to ovate or elliptic, thinly textured, almost hairless except for sparse, stiff hairs along margins and sometimes along midrib. **Bracts** 4–28 × 1–7 mm, linear to narrowly elliptic or leaf-like, broadly ovate or elliptic. **Flowers** solitary, axillary. **Calyx** bilabiate, 4.5–9.0 mm long, lobes linear triangular to narrowly triangular or triangular, variously hairy. **Flowering time** Sept.–Jan. **Fruit** 10–18 × 4–6 mm, obtrullate to narrowly clavate or clavate, glabrous. **Seeds** pale buff-olive-coloured, both surfaces glabrous, shiny. Valley bushveld or karroid grassland on poor rocky soils, alt. 15–1 705 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Kokstad S, from Queenstown to Port St Johns and to East London).

RUTTYA Harv.

Species 3, Africa; 1 in sthn Afr., LIM, M, S, KZN, EC.

ovata Harv.

Perennial shrub, 0.9–2.0 m high, sometimes scandent, young parts sparingly pubescent; branches rather thick. **Leaves** ovate, narrowed suddenly into a petiole. **Inflorescence** dense, of many abbreviated cymes, appearing almost cymose from many long narrow

sepals. **Corolla** with broad, shallow tube, 2-lipped, white with reddish spots. **Flowering time** all year. Forest edges and bushveld, alt. 15–1 435 m; Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt (KZN Border, Gibraltar Rock and Port St Johns).

SALPINCTIUM T.J.Edwards

Species 3, sthn Afr., M, S, KZN, EC.

[E]**stenosiphon** (C.B.Clarke) T.J.Edwards

Perennial herb, 0.1–0.4 m high. **Leaves** cordate, ovate to trullate, venation reticulate with 4–6 pairs of lateral veins. **Inflorescence** a sparse, 1-sided cyme. **Flowers** 5–12, 5–10 mm apart. **Calyx** glabrous or with sessile, glandular trichomes outside, very sparsely glandular within. **Corolla** with slender tube, pale lilac, 2-lipped. **Ovary** glabrous. **Flowering time** Nov.–Mar. **Seeds** reniform, compressed with irregular tubercles and a discontinuous peripheral ridge. In shade of taller bushy vegetation, alt. 435–835 m; Sub-Escarpment Grassland, Albany Thicket (Fort Beaufort).

SCLEROCHITON Harv.

Species ± 12, Africa; 6 in sthn Afr., LIM, M, S, KZN, EC.

harveyanus Nees

Perennial shrub, 0.5–3.0 m high. **Flowers** not scented. **Bracteoles** 4–6 mm long, with scarious margins. **Sepals** with scarious margins. **Corolla**: limb blue to purple, horizontal. **Flowering time** Nov.–Sept. **Fruit** a 10–14 mm long capsule. Evergreen montane and submontane forests, gallery forests, alt. 90–1 700 m; Indigenous Forests (Kokstad to Queenstown, Port St Johns and Stutterheim).

odoratissimus Hilliard

Perennial shrub, 1.5–2.0 m high. **Flowers** strongly scented. **Bracteoles** 5–9 mm long, without scarious margins. **Sepals** without scarious margins. **Corolla** limb white (rarely with a pink tinge), deflexed. **Flowering time** Dec.–Feb. **Fruit** a 15–17 mm long capsule. Open forests and forest edges, gully forests, streambanks, alt. 550–1 525 m; Indigenous Forests (Fort Beaufort, Stutterheim).

SIPHONOGLOSSA Oerst. see **JUSTICIA** L.

THUNBERGIA Retz.

Species ± 100, Old World tropics; 11 in sthn Afr., N, B, LIM, NW, G, M, S, FS, KZN, WC, EC.

1a Herbaceous shrublets or single-stemmed herbs

atriplicifolia E.Mey. ex Nees

Natal primrose; *isiphondo esincane* (Z)

Perennial herb or shrublet, sparsely to densely pubescent, 0.2–1.0 m high. **Leaves**: blades highly variable in shape, ovate to narrowly ovate. **Corolla** dull white to light yellow. **Stigma** 2-lobed, one below the other. **Flowering time** Aug.–June. Subordinate species in grassland in loam and sandy soil, alt. 10–2 075 m; Indigenous Forests, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Kokstad S, from Queenstown to Port Edward and to Grahamstown).

natalensis Hook.

Perennial, dwarf shrub, 0.5–1.2 m high. **Corolla** purplish blue. **Anthers** with curved spurs. **Stigma** funnel-shaped. **Flowering time** Oct.–Mar. In shade along margins of forests and woodland or pine plantations, rarely in direct sunlight, alt. 40–1 525 m; Sub-Escarpment Savanna, Indigenous Forests (KZN border, Mtamvuna Gorge and to Port St Johns).

1b Herbaceous climbers (sometimes rather a scrambler)
2a Leaves with petioles not winged; fruit glabrous or sparsely pubescent

capensis Retz.

Perennial herb or scrambler, pubescent, 0.5–1.5 m high. **Leaves** broadly ovate to round, acute, obtuse or emarginate. **Corolla** greenish yellow. **Anther**: thecae not spurred. **Flowering time** Oct.–Apr. Sandy soil in grassland along coast, stony soil of false fynbos, alt. 90–1 065 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Elliot to Port Edward and SW to Uitenhage).

dregeana Nees

Haarbossie (A); *isiphondo* (Z)

Perennial herb or creeper, 0.4–1.0 m high. **Leaves** ovate, sparsely pubescent. **Corolla** with inner and outer surface of tube dull orange-yellow; lobes 13–25 × 13–27 mm. **Flowering time** Nov.–Feb. Streambanks and margins of forests, alt. 5–765 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket (Kokstad SW to Queenstown and to Patensie).

purpurata Harv. ex C.B.Clarke

Perennial herb or climber, sparsely pubescent, 0.5–1.5 m high. **Leaves** hastate, dark green with conspicuous dark purplish veins abaxially. **Corolla** white. **Flowering time** Nov.–Mar. Margins of forests or in open parts in tropical coastal forests, alt. 10–275 m; Indigenous Forests (KZN Border, Oribi Gorge Nature Reserve and Port Edward S to Stutterheim and Butterworth).

2b Leaves with petioles winged; fruit densely pubescent

alata Sims

Black-eyed Susan

Herbaceous creeper, pubescent, 0.2–1.8 m high. **Corolla** orange, inner surface of corolla tube dark purplish black. **Flowering time** all year. **Seeds** with trichomes adhering in wing-like protuberances. Along margins of forests in humic soil, alt. 15–1 340 m; Sub-Escarpment Savanna, Indigenous Forests (Kokstad, Grahamstown, East London).

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ACHARIACEAE

(Order Malpighiales)

Compiled by C.L. Bredenkamp, M. Struwig & R.H. Archer

Phylogenetic relationships within the Flacourtiaceae, Salicaceae and Achariaceae have been assessed with *rbc*L, *trn*L-F and *ndh*F DNA sequences and several groups have been identified. The first group retains the family name Salicaceae as the name has nomenclatural priority, and the second group has the conserved name Achariaceae (Soltis et al. 2000; Chase et al. 2002).

1a Woody shrubs or trees:
2a Stamens 8–12 ..... **Kiggelaria**
2b Stamens 16 or more ..... **Rawsonia**

1b Herbaceous shrublets, climbers or perennial herbs:
3a Acaulescent perennial herbs with radical leaves ..... **Guthriea**
3b Herbaceous shrublets or climbers:
4a Male flowers in short racemes; corolla lobes ciliate, not winged; herbaceous climbers ..... **Ceratiosicyos**
4b Male flowers solitary or few together in axils; corolla lobes usually slightly winged or keeled; herbaceous shrublets ..... **Acharia**

ACHARIA Thunb.

Monotypic, sthn Afr., endemic to KZN and EC.

tragodes Thunb.

Shrubby herb, ± 0.2 m high. **Leaves** simple, petioled, palmately lobed, toothed; stipules linear. **Flowers** solitary or few, cernuous. **Male flowers**: sepals 3 or 4, linear, recurved; corolla 3- or 4-lobed, pubescent, persistent, campanulate, lobes ovate, slightly winged or keeled; stamens 3 or 4, free. **Female flowers**: larger than male flowers; sepals 3 or 4, hairy, lanceolate; corolla pubescent; campanulate, winged; style 3–5-lobed. **Flowering time** Sept.–May. **Fruit** 3–5-valved capsule, corolla and style persistent. Mountain slopes, light shade, clay or soil; Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Amatole Mts S to Albany and Bathurst).

CERATIOSICYOS Nees

Monotypic, endemic to sthn Afr., N, LIM, M, KZN, WC, EC.

laevis (Thunb.) A.Meeuse

Shrub or climber, with or without tendrils, ± 0.4 m high. **Leaves** palmately 5–7-lobed, lobes acuminate and serrate; long-petioled. **Male flowers** in short racemes; sepals 4 or 5, linear, spreading; corolla 4- or 5-lobed, campanulate, lobes ovate-oblong, ciliate; stamens 5, arising at base of corolla tube, alternating with ellipsoid glands, filaments slightly dilated upwards, anthers oblong, cohering. **Female flowers** solitary; calyx rudimentary; corolla as for male; glands 5, linear, ± $^{3}/_{4}$ length of corolla tube; ovary shortly stalked; styles 4, short, 2-lobed. **Flowering time** Feb.–May. **Fruit** 4- or 5-valved, elongate, ribbed capsule. Forests, sand, quartzite, partial shade; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Mount Currie SE to Engcobo and Port St Johns, southwards across Amatole Mts to Joubertina, Humansdorp, Grahamstown, Alexandria Forest and Bathurst).

GUTHRIEA Bolus

Monotypic, endemic to sthn Afr., KZN, L, WC, EC.

capensis Bolus

Perennial herb, ± 0.15 m high, acaulescent, subhorizontal rhizome, fleshy roots. **Leaves** rosulate, simple, ovate or cordate, petiolate, discolorous, crenate. **Flowers** solitary, pedicelled. **Male flowers**: sepals 5, linear, almost as long as corolla; corolla 5-lobed, profusely veined, campanulate, lobes reflexed; stamens 5, filaments arising in throat of corolla, flattened, anthers didymous. **Female flowers**: sepals 4 or 5, linear, adnate to corolla for half their length; corolla 4- or 5-lobed, campanulate, lobes transversely oblong, erect; ovary sessile; style broadly linear, 4- or 5-lobed. **Flowering time** Sept.–Apr. **Fruit** 4- or 5-valved capsule, corolla persistent. Moist, mountainous areas, stony soil or rocky; Mesic

Highveld Grassland, Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Dry Highveld Grassland (Barkly East S to Graaff-Reinet).

KIGGELARIA L.

Wild peach; *wilde perske* (A); *mphahlašilo* (S); *umkhokhokho* (X); *isiklkalu* (Z)

Species probably only 1, tropical to sthn Afr., LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

africana L.

Tree or shrub, up to 17 m high, unarmed, dioecious. **Leaves** alternate, petiolate, elliptic or ovoid, variously toothed, sometimes discolorous; hairy pockets in axils of main veins; stipules absent. **Flowers** unisexual. **Male flowers** in axillary cymes, on longish pedicels; stamens 8–10, free; filaments short, anthers 2-thecous. **Female flowers** solitary on long pedicels; sepals 5-parted, narrowly elliptic, valvate, deciduous, puberulous; petals 5, often very similar to sepals, elliptic, imbricate, puberulous; ovary sessile, ellipsoid; style short and thick, divided into 5 branches. **Flowering time** Aug.–Dec. **Fruit** globose, woody, several-seeded capsule; valves 2–5, pubescent, sometimes tuberculate. Forests, stony soil or rocky, kloofs, along streams, scrub and even mountains of the Karoo; widespread in all bioregions, except Mesic Highveld Grassland (Burgersdorp E to Port Edward, southwards to Hankey and Grahamstown districts).

RAWSONIA Harv. & Sond.

Forest peach; *bosperske* (A); *umlongo* (X); *umsathanina* (Z)

Species probably only 2, tropical and sthn Afr.; 1 in sthn Afr., B, LIM, M, S, KZN, EC.

lucida Harv. & Sond.

Evergreen shrub or small tree, 0.45–15.00 m high. **Leaves** alternate, shortly petioled; blade usually elliptic, coriaceous, margins spinulose-serrate; stipules deciduous, scars present. **Flowers** bisexual or male, in axillary, spike-like racemes; sepals 4 or 5, free, unequal, imbricate, concave; petals similar to sepals but larger, petaloid scale opposite each petal; stamens many, in several rows, inner hypogynous, outer attached to base of scales; ovary superior, 1-locular, thick fleshy wall; style almost absent; stigmas 4 or 5. **Flowering time** Sept.–Apr. **Fruit** a globose berry. Forests; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Grassland (Mthatha E to Port St Johns).

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AIZOACEAE

(Order Caryophyllales)

Aizooideae and Sesuvioideae compiled by M. Struwig & C.L. Bredenkamp

Mesembryanthemoideae & Ruschioideae compiled by P.M. Burgoyne & C.L. Bredenkamp

The Aizoaceae, as accepted here, includes the subfamilies Aizooideae (= Tetragonioideae Lindl.), Sesuvioideae, Mesembryanthemoideae and Ruschioideae (Klak et al. 2007; Klak 2010). The families Molluginaceae and Gisekiaceae are recognised as separate families and are treated as such in this publication.

Key to subfamilies

Petaloid staminodes absent.....subfamilies **Aizooideae** and **Sesuvioideae**
Petaloid staminodes present ..... subfamilies **Mesembryanthemoideae** and **Ruschioideae** (p. 196)

Subfamilies Aizooideae and Sesuvioideae

1a Fruit indehiscent, a winged or horned nut; plants often andromonoecious.....**Tetragonia** (Aizooideae)
1b Fruit a capsule; inflorescence of bisexual flowers only:
2a Ovary locules 1; placentation parietal.....**Trianthema** (Sesuvioideae)
2b Ovary locules 2 or more; placentation basal or ovules pendulous:
3a Capsules 5–10-locular; 2–many ovules in each locule; distinct expanding keels present.....
.....**Aizoon** (Aizooideae)
3b Capsules 2–5-locular; 1 pendulous ovule in each locule; expanding tissue rudimentary to absent:
4a Stamens as many as perianth lobes.....**Plinthus** (Aizooideae)
4b Stamens twice the number of the perianth lobes, in pairs alternating with the perianth lobes.....
.....**Galenia** (Aizooideae)

AIZOON L.

Spekvygie (A)

Species ± 25, Mediterranean extending to India and Afghanistan; 11 in sthn Afr., often introduced as weeds into suitable climates, N, B, S, FS, KZN, NC, WC, EC.

Stems and leaves with spreading hairs

canariense L.

Herb, up to 0.4 m high, prostrate annual or short-lived perennial; stems and leaves covered with stiff, spreading hairs. **Leaves** alternate, oval or spathulate, margins entire; petioles as long as or longer than blade. **Flowers** bisexual, sessile, in flattened axillary clusters. **Perianth** 5-lobed, yellowish inside, greenish or reddish and pilose outside; sepals small, upcurving. **Stamens** 12–15 in bundles. **Ovary** 5-locular; styles and stigmas 5. **Fruit** a pentagonal capsule, red or pink, depressed centrally, split into 5 valves. **Seeds** reniform, concentrically ridged, dark brown. Stony soil or rocky, clay, sand or gravel, well drained, full sun; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Indigenous Forests (Middelburg S to Port Alfred District).

glinoides L.f.

Herb, succulent, 0.15–0.60 m high; prostrate, branches in one plane, stems covered with long, erect spreading hairs. **Leaves** alternate, obovate, broadly elliptical, densely hairy when young but partly glabrescent; petioles shorter than blade. **Flowers** bisexual, solitary in axils, bright yellow. **Perianth**: outer segments acute or acuminate, inner segments wider, mucronate, hairs outside. **Flowering time** Jan., Dec. **Fruit** a depressed-pentagonal capsule, smooth above, pale-coloured. **Seeds** concentric ridges broken or replaced, black. Stony soil or rocky, gravel or sand, well drained; Upper Karoo, Albany Thicket, Lower Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Hofmeyr District S to Port Alfred).

Stems and leaves with appressed silvery hairs

rigidum L.f

Shrub, ± 0.6 m high; prostrate, white or grey, woody, old stems smooth, younger stems with soft, appressed, long hair. **Leaves** alternate, sometimes crowded, secund, elliptic, densely covered with long, white hairs; petioles short. **Flowers** bisexual, sessile, solitary in axils, yellow. **Perianth**: segments acute, externally covered with appressed hairs like those on leaves. **Stamens** many. **Ovary** 5-locular. **Flowering time** Dec., Jan. **Fruit** a rounded, pentagonal capsule, sharply angled on upper edges. Gravel or sand, well drained, partial shade to full sun; Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Queenstown S to Humansdorp).

GALENIA L.

Brakbos, *Vanwyksbossie* (A)

Species ± 30, S tropical Africa and sthn Afr., N, B, FS, NC, EC.

Flowers in terminal cymes branching to all sides; fruit not or tardily dehiscent

africana L.

Geelbrakbos, *kraalbossie* (A)

Shrub, 0.5–1.5 m high; stems pale-coloured, glabrous, young stems with short, appressed hairs. **Leaves** opposite, yellowish green, older leaves bright yellow, epidermis with papillae and hairs with glands giving plant a sticky touch, linear-oblanceolate. **Inflorescence** a cyme, borne above plant; bracteoles leaf-like, not longer than flowers. **Flowers** bisexual, yellow-green. **Perianth** 4-lobed; outer cucullate, inner flat with a cylindrical, mucronate point. **Anthers** orange or yellow, rarely red. **Styles** 2, thick. **Flowering time** Sept.–Dec. **Fruit** tardily dehiscent or not. Gravel, well drained, full sun; Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Mountain Zebra National Park S to Willowmore).

procumbens L.f.

Dwarf shrub, 0.3–1.0 m high; erect to procumbent, much branched, yellow, glabrous or with a few appressed hairs on youngest parts. **Leaves** opposite, often crowded on lateral branches, small, falcate, deciduous, usually deeply concave above, oblanceolate, recurved. **Inflorescence** a lax cyme on branch shorter than surrounding leafy shoot, terminally monochasial; bracteoles short. **Flowers** bisexual, white or tinged with pink inside. **Perianth** 4-lobed, outer cucullate, inner with acute, sharply incurved apex. **Anthers** orange, rarely red. **Styles** 2. **Fruit** flattened, indented at top, lateral bulges

round. Stony soil or rocky, gravel or sand, dolerite, well drained, full sun; Upper Karoo, Dry Highveld Grassland (Middelburg S to Cradock).

Flowers in secund arrangement in cymes; fruit dehiscent

glandulifera Bittrich

Perennial herb, ± 0.2 m high; main stem erect, lateral stems decumbent, ending in cymes; internodes and leaves with bladder cells and oblong, ovoid, bottle-shaped, secretory glands on multiseriate stalks. **Leaves** opposite on main stem, alternate on lateral ones. **Inflorescence** a monopodial cyme; bracts with their axillary shoot up to terminal flower. **Flowers** bisexual, sessile, magenta or purple inside. **Perianth** 5-lobed; nectary a flat disc at base of filaments. **Fruit** centrally depressed, expanding sheets and keels open valves slightly after wetting. **Seeds** reniform, dark brown to black, small tubercles. Stony soil or rocky, gravel; Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Spioenkop, Willowmore District).

herniariaefolia (C.Presl) Fenzl

Dwarf shrub, 0.10–0.75 m high; prostrate, dark green or brownish, stems woody, upper branches alternate with flowering branches, young stems with scattered hairs, older glabrescent. **Leaves** alternate, small, linear-lanceolate, obtuse. **Inflorescence** a cyme. **Flowers** bisexual, sessile, in secund lateral branches. **Perianth** 4-lobed, hairy outside, white inside. **Anthers** pink. **Styles** 4. **Fruit**: valves leathery, glabrous, $^{1}/_{2}$ as long as perianth, 4-locular. **Seeds** black and shiny. Sandy soil; Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (Steytlerville S to Port Elizabeth).

meziana K.Müll.

Dwarf shrub, 0.01–0.02 m high; branches prostrate; young internodes finely papillate. **Leaves** opposite, alternate in inflorescence, scaly-papillate on both sides, spathulate. **Inflorescence** a cyme. **Flowers** bisexual, in axillary groups, slightly hairy on outside. **Perianth** 5-lobed. **Stamens** 5 or 10. **Fruit** 3- or 4-locular. Calcrete; Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (Paterson District).

[E]pallens (Eckl. & Zeyh.) Walp.

Dwarf shrub, ± 0.15 m high; branches procumbent, woody, opposite; internodes densely covered with yellowish hairs. **Leaves** alternate, obovate to subspathulate; young leaves opposite and covered with dense, yellowish hairs. **Inflorescence** a cyme. **Flowers** bisexual, mostly in groups of 3, lateral ones with short pedicels. **Perianth** 4-lobed. **Fruit** 4-locular. Habitat not recorded; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage District).

papulosa (Eckl. & Zeyh.) Sond.

Herb, 0.1–0.8 m high; ascending to decumbent branches, green or yellow-green, stems and leaves covered with round, glistening papillae without hairs or scales. **Leaves** alternate, rarely opposite, petiolate, obovate to cuneate, covered with big, coarse, round papillae. **Inflorescence** lax, secund cymes; bracts longer than flowers; bracteoles thick, ± as long as flowers. **Flowers** bisexual, papillose on outside, incurved at apex. **Perianth** 5-lobed. **Anthers** yellow. **Styles** 3(5). **Fruit** mostly 5-locular. Habitat not recorded; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket (Willowmore S to Patensie).

prostrata G.Schellenb.

Dwarf shrub, 0.5–0.8 m high; slender, prostrate, many-stemmed, grey-green, young internodes covered with white, appressed hairs. **Leaves** opposite, rhomboid, acute, thinly

covered with appressed hairs. **Inflorescence** a cyme. **Flowers** bisexual, solitary and sessile in lower bracts, in groups in upper bracts, pink inside. **Perianth** 4- or 5-lobed, outer with hairs extending into a long, terete protrusion beyond actual leaf apex. **Anthers** pink. **Styles** (3)4(5). **Fruit** 5-locular. Sand, well drained, full sun; Sub-Escarpment Grassland, Albany Thicket (Queenstown S, Colchester).

pubescens (Eckl. & Zeyh.) Druce

Dwarf shrub, 0.03–1.50 m high; prostrate, young parts with short, appressed hairs, older parts glabrescent. **Leaves** alternate, papillate, hairy, obovate-spathulate; petioles short. **Inflorescence** a cyme. **Flowers** bisexual, on alternate, secund, lateral branches, solitary or with a pair of branchlets from base, pinkish inside; bracts like leaves but smaller. **Perianth** 5-lobed, appressed hairs outside. **Anthers** pink. **Styles** (3)5. **Flowering time** Dec., Jan. **Fruit** 5-locular. Stony soil or rocky, sand; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Hofmeyr District S, from Cradock to Komga and Greater Addo Elephant National Park to East London).

sarcophylla Fenzl

Dwarf shrub or herb, 0.05–0.30 m high; prostrate to suberect branches, glistening from coarse papillae, hairy, greyish green, older plants red or yellow. **Leaves** lower ones opposite and petiolate; upper ones alternate and sessile, obovate or spathulate. **Inflorescence** a secund cyme; bracts thick, obtuse, longer than flower; bracteoles ± as long as flowers. **Flowers** bisexual. **Perianth** 5-lobed; covered with scales outside. **Anthers** yellow. **Styles** 3. **Fruit** 3- or 4-locular. Habitat not recorded; Albany Thicket, Eastern Fynbos-Renosterveld (Seymour S, Suurberg in Greater Addo Elephant National Park).

secunda (L.f.) Sond.

Dwarf shrub, 0.1–0.5 m high; prostrate, many stemmed; young internodes covered densely with white, appressed, branched hairs; branches secund. **Leaves** alternate, densely hairy, obovate, acute. **Inflorescence** a lateral, secund cyme, resembling fronds in shape; bracts leaf-like; bracteoles very short. **Flowers** bisexual, solitary or in groups of 2–5, hairy outside, yellow or white inside. **Perianth** 5-lobed. **Anthers** yellow. **Styles** 5. **Flowering time** June–Jan. **Fruit** rounded, depressed at top, 5-locular. Sand, gravel or clay, dolerite, full sun; Upper Karoo, Lower Karoo, Dry Highveld Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Graaff-Reinet District S, from Suurberg in Greater Addo Elephant National Park to Kowie).

squamulosa (Eckl. & Zeyh.) Fenzl

Perennial, dwarf shrub, 0.2–0.5 m high; decumbent or prostrate branches, base woody, stems covered with flat, spreading scales. **Leaves** opposite, alternate in flowering region, with spreading scales, oblong to obovate. **Inflorescence** a terminal cyme; bracts leaf-like. **Flowers** bisexual, sessile, solitary, yellow inside. **Perianth** 5-lobed, covered with scales outside. **Anthers** yellow. **Styles** 2. **Fruit** 2-locular. Gravel, well drained, partial shade; Albany Thicket (Kenton on Sea to Port Alfred).

subcarnosa Adamson

Perennial herb, ± 0.14 m high; prostrate, forming circular mats or patches 100–250 mm in diam., young stems and leaves pruinose or finely papillate with a few appressed scales. **Leaves** small, thick, acute or subacute, concave above, narrowed to base. **Inflorescence** a cyme. **Flowers** bisexual, on short, alternate, secund, lateral branches; bracts like small

leaves. **Perianth** 5-lobed, finely papillate. **Styles** 5. **Ovary** 5-angled, broader than deep. **Fruit** pentangular, broader than high, 5-locular. In rocky places; Upper Karoo, Dry Highveld Grassland (Middelburg District).

PLINTHUS Fenzl

Karoo ganna, *silwerganna* (A)

Species 5 or 6, Africa; all in sthn Afr., N, B, LIM, FS, NC, EC.

karooicus I.Verd.

Dwarf shrub, 0.02–0.30 m high; low growing and much branched, base woody, young internodes with biforked hairs. **Leaves** opposite and alternate, small, imbricate, pubescent, linear or linear-lanceolate. **Flowers** bisexual, axillary, 2 or 3 in a group; 2 or 3 bracts and bracteoles. **Perianth** 4-lobed, long, cucullate, ovate. **Stamens** 4, alternate with lobes, filaments as long as or longer than perianth. **Styles** 2-partite to base, branches diverging. **Fruit** 2-locular, with only 1 seed developing. Stony soil or rocky; Upper Karoo (Middelburg District).

TETRAGONIA L.

Grootlooilootganna, *kinkelbos*, *klapperbrak*, *klimopkinkelbossie* (A)

Species 50–60, Asia, Africa, Australia, New Zealand, temperate South America; ± 40 in sthn Afr., N, FS, NC, WC, EC.

1a Stamens more than twice as many as perianth segments; ovary wholly inferior
2a Wings of fruit thin, smooth or papillose; the stem woody
3a Leaves not succulent

arbuscula Fenzl

Dwarf shrub, 0.25–0.60 m high; woody, branches erect, side branches ascending; stem pale, raised decurrent lines from leaf base. **Leaves** petiolate, linear to lanceolate, some longer and broader. **Flowers** axillary, solitary or in groups of 2 or 3, bisexual; pedicles as long as or longer than bracts. **Perianth** ovate, bright yellow inside. **Stamens** many, bright yellow; anthers oblong. **Stigmas** 1–3(–5). **Flowering time** Jan.–Sept. **Fruit** pendulous, rounded at base, cordate at top; wings thin and smooth. Sand, shale, well drained, full sun; Upper Karoo, Dry Highveld Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Middelburg District S, Uitenhage District).

fruticosa L.

Dwarf shrub, up to 0.2 m high; prostrate, stem woody, younger with decurrent ridges, older glabrescent. **Leaves** narrow to base but not petiolate, linear, revolute or rolled, papillose below. **Flowers** 2–5 per cyme, bisexual, male and transitional; pedicles spreading. **Perianth** yellowish and tinged with red, densely papillose outside. **Stamens** many. **Styles** 3 or 4, 1 or 2 in transitional flowers. **Flowering time** Aug.–Dec. **Fruit** 4-winged, round at base, flat and emarginate at top, distinct tubercle or small ridge between wings in upper half, finally black. Sand or gravel, well drained, full sun; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore E to Port Alfred).

spicata L.f.

Dwarf shrub, 0.25–1.00 m high; stems woody at base, papillate-hairy when young, glabrescent later. **Leaves** petiolate, lanceolate, linear, ovate, oblong, flat or revolute at edges. **Flowers** 2–5 in cyme, bisexual and male flowers together; pedicles hairy-papillate. **Perianth** papillose-hirsute outside. **Stamens** 12–15; anthers bright yellow.

Styles 1–3, longer than stamens but shorter than perianth, dark coloured. **Fruit** 4-winged, flat or indented on top, narrow at base, distinct tubercle or ridge between wings. Sandy soil; Albany Thicket, Sub-Escarpment Savanna (Kenton on Sea).

2b Wings of ripe fruit rather rigid, papillose; the stem woody at base only

decumbens Mill.

Perennial herb, ± 0.5 m high; prostrate, covered with glistening papillae and some hairs, woody when old, terete but with narrow decurrent lines. **Leaves** narrow to base but not petiolate, oblong, obovate or nearly orbicular, edges recurved or revolute, papillose-hirsute. **Flowers** 3–5 per cyme. **Perianth** densely papillose, 4-lobed. **Stamens** many, yellow. **Styles** 4 or 5, or less in transitional flowers. **Flowering time** Dec., Jan. **Fruit** with 4 rigid wings, flat on top, small intermediate ridge between wings, yellow. Sandy soil; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Port St Johns S along coast to Port Elizabeth).

3b Leaves succulent

robusta Fenzl

Dwarf shrub, 0.1–1.0 m high; branches ascending; stems 2–3 mm in diam., pale-coloured when young, powdery, terete and with decurrent lines when older. **Leaves** sessile, base with clasping sheath, oblanceolate, ovate or oblong, revolute or rolled, papillate. **Flowers** 2–5 per cyme, sessile or on very short pedicles. **Perianth** 4-lobed, densely papillose. **Stamens** 15; anthers bright yellow. **Styles** 1(2). **Fruit** wings thin, papillate when young, then powdery and glabrous, deeply notched at top, olive-green turning brown. Habitat not recorded; Lower Karoo (along Bosduiwerivier).

1b Stamens twice as many as perianth segments or fewer; ovary bulging above insertion of perianth

acanthocarpa Adamson

Annual herb, 0.1–0.5 m high; branches prostrate. **Leaves** petiolate, elliptic or rhombic, papillate. **Flowers** axillary, solitary, pedicellate. **Perianth** 4-lobed, thin, erect, rather triangular. **Stamens** 4, alternate with and shorter than perianth segments; anthers rounded. **Styles** (2)3(4). **Ovary** inferior, coarsely papillose, bulging as a flattened cone above insertion of perianth. **Fruit** without ridges, truncate at base, covered with spines, spines and fruit papillose. Habitat not recorded; Upper Karoo, Lower Karoo (Middelburg District S to Aberdeen District).

echinata Aiton

Annual herb, up to 0.4 m high; prostrate, slightly succulent, raised decumbent lines from leaf base, papillose. **Leaves** petiolate, oval, rhombic or deltoid, occasionally almost orbicular. **Flowers** 2–4 per cyme, subsessile; pedicles very short. **Perianth** 3–5-lobed, densely papillose, erect, triangular. **Stamens** 3–5, alternate with perianth but occasionally paired; anthers oval. **Styles** 3. **Ovary** inferior, densely papillose, with 3–5 obtuse projections opposite perianth. **Fruit** 3–5 projecting ridges with spiny outgrowths, rounded or truncate at top, papillose. Sandy soil; Sub-Escarpment Grassland, Upper Karoo, Dry Highveld Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Cradock, Fort Beaufort, King William's Town).

TRIANTHEMA L.

Muisvygie (A)

Species ± 17, cosmopolitan in the tropics and subtropics; 6 in sthn Afr., N, B, LIM, M, FS, KZN, NC, EC.

parvifolia E.Mey. ex Sond.

Annual herb, up to 0.4 m high; prostrate, woody at base, anisophyllous, papillate or glabrous, internodes unequal, often reddish. **Leaves** oblong, obovate to subrotund, smooth, sheath broad; petioles as long as blade. **Flowers** 3–15, face upwards, sessile; bracts membranous, broad, obtuse to acuminate-apiculate. **Perianth**: lobes triangular, edge membranous, with minute mucro behind apex. **Stamens** 5. **Fruit** operculum conical, apically truncate, with a narrow, thickened ring halfway between edge and apex. Loamy soil; Lower Karoo (Rietbron).

Subfamilies Mesembryanthemoideae and Ruschioideae

Klak et al. (2007) present a phylogeny for Mesembryanthemoideae (Aizoaceae), sampling nearly all species and subspecies of the subfamily. The analysis is based on *cptrn*L-F, *rbc*L-*atp*B, *rps*16, nearITS1 and morphology. The larger genera *Phyllobolus* and *Mesembryanthemum* are not monophyletic. Although some clades can be circumscribed with morphological (often homoplasious) synapomorphies, several clades are impossible to characterise morphologically. They recognise a single genus, *Mesembryanthemum*, in Mesembryanthemoideae. The genera *Aptenia*, *Aridaria*, *Brownanthus*, *Phyllobolus*, *Prenia*, *Psilocaulon* and *Sceletium*, also occurring in the Eastern Cape, are reduced to synonymy.

Keys to the genera according to Chesselet et al. (2000). Adapted from Klak et al. (2007) and Klak (2010), the mentioned genera are treated in the manuscript as follows:

Key 1 – including fruit and flower characters

1a Placentation axile (subfamily **Mesembryanthemoideae**):

2a Annuals or biennials (**Psilocaulon group**, sometimes annual or biennial):

3a Leaves broad or narrow, epidermal bladder cells conspicuous or flattened ..... **Mesembryanthemum**: **Aitonis group**

3b Leaves often very broad, epidermal bladder idioblasts conspicuous ..... **Mesembryanthemum**: **Cryophytum group**

2b Perennials:

4a Leaves flat:

5a Leaves persisting as membranous skeletons with margins and veins intact and enclosing young buds ... **Mesembryanthemum** (= *Sceletium*): **Sceletium group**

5b Leaves not drying skeleton-like:

6a Leaves shortly fused at base, glaucous, covered with a thick wax layer that rubs off easily; the green parts of the stem become dry and remain on the slightly woody stem as a thick whitish layer..... **Mesembryanthemum** (= *Prenia*): **Prenia group**

6b Leaves not fused at base, shiny green, without visible wax layer; stems green and succulent, 4-angled or cylindrical ..... **Mesembryanthemum** (= *Aptenia*): **Aptenia group**

4b Leaves terete, subterete, or semi-terete:

7a Branches usually constricted at nodes; leaf bases sheathing, persistent; staminodes usually petaloid:

8a Leaf sheaths fringed with conspicuous, deflexed hairs at base (or in *B. marlothii* at apex of leaf sheaths) ..... **Mesembryanthemum** (= *Brownanthus*): **Brownanthus group**

8b Leaf sheaths nude at base, inconspicuous .... **Mesembryanthemum** (= *Psilocaulon*): **Psilocaulon group**

7b Branches very rarely constricted at nodes; leaf bases not conspicuously persistent; staminodes filamentous, usually absent in *Aridaria* and *Phyllobolus*:

9a Bladder cells scarcely visible; branches and peduncles woody or wiry; cymes distinctive, dichasial; flowers usually nocturnal ..... **Mesembryanthemum** (= *Aridaria*): **Aridaria group**

9b Bladder cells usually evident; young branches and peduncles externally herbaceous; flowers 1–3-nate; flowers usually diurnal (**Mesembryanthemum** = *Phyllobolus*):

10a Prostrate to erect shrubs to minute geophytes; stems corky or woody, long or much shortened; roots often thickened ..... **Phyllobolus group**

10b Erect shrubs up to 1 m high; stems woody; roots not thickened ..... **Phyllobolus splendens group**
1b Placentation parietal (subfamily **Ruschioideae**):
11a Fruit indehiscent, juicy and edible..... **Carpobrotus** (tribe Ruschieae)
11b Fruit capsular:
12a Locules of the capsule without covering membranes:
13a Nectary composed of 5 or 6 (in *Corpuscularia*) pits or hollows, sometimes surmounted by rudimentary glands ..... **Stomatium** (tribe Ruschieae)
13b Nectary not composed of pits or hollows:
14a Capsule dehiscing in dry conditions; capsule breaking up into separate segments..... ..... **Conicosia** (tribe Apatesieae)
14b Capsule dehiscing in wet conditions; valves with expanding keels, widely spreading or recurved when fully expanded:
15a Nectary composed of separate glands, which in *Mossia* are so close as to form an almost annular nectary:
16a Capsule very small, with thin walls, sometimes breaking up into 5 parts, or whitish with 6 locules:
17a Leaves glistening, finely papillose to hairy ..... **Delosperma** (tribe Ruschieae)
17b Leaves rough or smooth in texture, greyish to silvery green..... **Corpuscularia** (tribe Ruschieae)
16b Capsule not as above:
18a Compact plants with internodes enclosed:
19a Leaves very smooth; bracts present..... **Carruanthus** (tribe Ruschieae)
19b Leaves usually rough or smooth; bracts absent:
20a Leaves rough, covered by small, raised, hard, white tubercles, often flowering in late afternoon or at night..... **Rhinephyllum** (tribe Ruschieae)
20b Leaves usually smooth, without white tubercles, often flowering in afternoon .... **Peersia** (tribe Ruschieae)
18b Plants ± loosely branched with internodes visible:
21a Plants creeping; leaves with feint dark spots..... **Mossia** (tribe Ruschieae)
21b Plants occasionally creeping; leaves often with visible water storage cells **Delosperma** (tribe Ruschieae)
15b Nectary annular:
22a Sepals and petals united to form a calyx tube and corolla tube ..... **Conophytum** (tribe Ruschieae)
22b Sepals and petals free at base:
23a Peduncle with bracts:
24a Leaves acutely keeled upwards; sepals 6..... **Conophytum** (tribe Ruschieae)
24b Leaves not acutely keeled; sepals 5 ..... **Nananthus** (tribe Ruschieae)
23b Peduncle bractless:
25a Compact plants with internodes enclosed in leaf sheaths ..... **Lithops** (tribe Ruschieae)
25b Plants with elongated branches, some of the internodes visible..... **Neohenricia** (tribe Ruschieae)
12b Locules of capsule with covering membranes, which are sometimes incomplete:
26a Locules without closing bodies (closing bodies occasionally present in *Drosanthemum* and *Trichodiadema*):
27a Nectary composed of separate glands, which rarely may be contiguous and form an almost annular nectary:
28a Leaves usually crowned with spreading or erect bristles, or their vestiges .... **Trichodiadema** (tribe Ruschieae)
28b Leaves without terminal bristles (tubercle in locules of capsule very rarely present) .... **Drosanthemum** (tribe Ruschieae)
29a Plants creeping:
30a Petals yellow ..... **Chasmatophyllum** (tribe Ruschieae)
30b Petals white ..... **Mossia** (tribe Ruschieae)
29b Plants not creeping:
31a Leaves dentate, teeth ending in a bristle ..... **Faucaria** (tribe Ruschieae)
31b Leaves entire ..... **Rabiea** (tribe Ruschieae)
27b Nectary annular or indistinct:
32a Petals yellow ..... **Lampranthus** (tribe Ruschieae)
32b Petals rose-purple, pink, red, pallid or white:
33a Stigmas 8–14:
34a Leaf keels entire ..... **Smicrostigma** (tribe Ruschieae)

34b Leaf keels lacerate ..... **Erepsia** (tribe Ruschieae)
33b Stigmas 5 or 6:
35a Herbaceous parts ± papillose ..... **Drosanthemum** (tribe Ruschieae)
35b Herbaceous parts not papillose:
36a Flowers in conspicuously branched, pedunculate cymes; rootstock remarkably large and sometimes tuberous ..... **Mestoklema** (tribe Ruschieae)
36b Flowers and rootstock not as above..... **Lampranthus** (tribe Ruschieae)
26b Locules of capsule with closing bodies (sometimes obscure or absent in *Aloinopsis* and *Antimima*):
37a Stigmas 5 or 6:
38a Petals purple-red, pink or white:
39a Placental tubercle 2-lobed ..... **Disphyma** (tribe Ruschieae)
39b Placental tubercle not 2-lobed:
40a Some or all of the peduncles spinescent ..... **Ruschia** subgenus **Spinosa**
40b Peduncle not spinescent:
41a Valves of the expanded capsule winged..... **Cylindrophyllum** (tribe Ruschieae)
41b Valves of the expanded capsule wingless:
42a Leaves toothed to a greater or lesser extent, or with 1 or 2 mucros at apex ..... **Ruschia** (tribe Ruschieae)
42b Leaves not toothed, with or without mucros at apex:
43a Roots tuberous..... **Marlothistella** (tribe Ruschieae)
43b Roots not as above ..... **Antimima** (tribe Ruschieae)
38b Petals yellow, golden or orange-red:
44a Wings of the locules of the expanded capsules erect ..... **Orthopterum** (tribe Ruschieae)
44b Wings not erect:
45a Leaves usually triquetrous:
46a Filaments papillate; stigmas 5; keels of valves in expanded capsule diverging from base; closing bodies large ..... **Bergeranthus** (tribe Ruschieae)
46b Filaments epapillate; stigmas 5 or 6; keels parallel below; closing bodies small .... **Machairophyllum** (tribe Ruschieae)
45b Leaves not triquetrous, one of a pair often slightly differing in form from the other:
47a Closing bodies with a dividing line in the middle ..... **Rhombophyllum** (tribe Ruschieae)
47b Closing bodies not as above ..... **Hereroa** (tribe Ruschieae)
37b Stigmas > 6 (or 6 in some species of *Khadia*):
48a Plants dwarf, compact:
49a Peduncle bractless..... **Glottiphyllum** (tribe Ruschieae)
49b Peduncle with bracts:
50a Rootstock (where known) tuberous:
51a Leaves velvety, appearing dust-covered, long-triangular..... **Deilanthe** (tribe Ruschieae)
51b Leaves rough-textured, spoon-shaped..... **Aloinopsis** (tribe Ruschieae)
50b Rootstock not tuberous:
52a Nectary usually composed of separate glands..... **Machairophyllum** (tribe Ruschieae)
52b Nectary annular:
53a Petals pallid, rose, rose-purple or deep red..... **Cylindrophyllum** (tribe Ruschieae)
53b Petals yellow, golden or orange-red ..... **Pleiospilos** (tribe Ruschieae)
48b Plants with ± elongated branches with at least some of the internodes visible:
54a Peduncle with bracts ..... **Leipoldtia** (tribe Ruschieae)
54b Peduncle bractless:
55a Leaves of a pair dissimilar and unequal in length, the large > 50 mm long, sometimes with a marginal tooth or hump, or with conspicuous white margins..... **Glottiphyllum** (tribe Ruschieae)
55b Leaves of a pair similar and about equal in length, < 50 mm long, entire and without white margins ..... **Malephora** (tribe Ruschieae)

Key 2 – based mainly on vegetative characters

1a Ovary always with an axile placenta; nectary represented usually by 4 or 5 shell-shaped depressions (koilomorphic); fruit with expanding keels, if present, reaching from central axis to apex of valves; fruit rarely a woody nut (subfamily **Mesembryanthemoideae**):
2a Annuals or biennials (**Psilocaulon group** sometimes annual or biennial):

3a Leaves broad or narrow, epidermal bladder cells conspicuous or flattened..... **Mesembryanthemum**: **Aitonis group**
3b Leaves often very broad, epidermal bladder idioblasts conspicuous..... **Mesembryanthemum**: **Cryophytum group**
2b Perennials:
4a Leaves flat:
5a Leaves becoming skeleton-like with lignified veins and margins, persistent and enclosing young buds.. **Mesembryanthemum** (= *Sceletium*): **Sceletium group**
5b Leaves not drying skeleton-like:
6a Leaves shortly fused at base, glaucous, covered with a thick wax layer that rubs off easily; the green parts of the stem become dry and remain on the slightly woody stem as a thick whitish layer..... **Mesembryanthemum** (= *Prenia*): **Prenia group**
6b Leaves not fused at base, shiny green, without visible wax layer; stems green and succulent, 4-angled or cylindrical..... **Mesembryanthemum** (= *Aptenia*): **Aptenia group**
4b Leaves ± cylindrical:
7a Stems constricted at nodes, green, with persistent, succulent primary cortex:
8a Leaf sheaths fringed with conspicuous, deflexed hairs at base..... **Mesembryanthemum** (= *Brownanthus*): **Brownanthus group**
8b Leaf sheaths nude at base, inconspicuous..... **Mesembryanthemum** (= *Psilocaulon*): **Psilocaulon group**
7b Stems continuous, not constricted at nodes, only the young stages green, primary cortex not persistent:
9a Bladder cells scarcely visible; branches and peduncles woody or wiry..... **Mesembryanthemum** (= *Aridaria*): **Aridaria group**
9b Bladder cells usually conspicuous; young branches and peduncles externally herbaceous (**Mesembryanthemum** = *Phyllobolus*):
10a Perennial shrublets or subshrubs; stems corky or lignified, at least towards base; roots often thickened..... **Phyllobolus group**
10b Perennial, erect shrubs up to 1 m high; stems woody; roots not thickened..... **Phyllobolus splendens group**
1b Ovary with placenta parietal to basal, very rarely axile; nectaries crest-shaped, either as separate glands or united into a ring (lophomorphic), rarely ± absent; fruit with expanding keels never reaching the centre of the fruit; fruit, if not opening when wetted, then rarely opening when drying out, fleshy or breaking up into mericarps (subfamily **Ruschioideae**):
11a Leaves flat, wider than thick, petiolate..... **Group A**
11b Leaves three-dimensional, triquetrous, trigonous, terete, not wider than thick:
12a Plants creeping, with procumbent stems..... **Group B**
12b Plants compact, caespitose or shrubby:
13a Plants compact and tufted, all internodes completely concealed by leaves..... **Group C**
13b Plants caespitose, shrubby, or if basally compact then with additional long shoots:
14a Plants caespitose, internodes short but visible, procumbent, stems not rooting..... **Group D**
14b Plants shrubby, long shoots ascending, erect or climbing, sometimes with a compact centre:
15a Shrubs or shrublets without spines..... **Group E**
15b Shrubs or shrublets with spines..... **Group F**

Group A – plants with ± flat leaves
(Leaves wider than thick)

1a Leaves soft and smooth, leaf surface mesomorphic:
2a Plants anisophyllous, i.e. the leaves of a pair are unequal in size; capsules multilocular, with firm, undulating covering membranes, with or without reduced valve wings..... **Glottiphyllum** (tribe Ruschieae)
2b Plants isophyllous, i.e. the leaves of a pair are equal in size; capsules 5-locular, without covering membranes, but with broad, triangular valve wings..... **Delosperma** (tribe Ruschieae)
1b Leaves hard, with warts or white dots, or velvety and dust-covered, leaf surface xeromorphic:
3a Leaves with fine white, often raised dots, leaf apex tapering..... **Nananthus** (tribe Ruschieae)
3b Leaves with warts, particularly along the distal broadened margin, leaf apex broadly rounded:
4a Leaves velvety, dust-covered..... **Deilanthe** (tribe Ruschieae)
4b Leaves tuberculate or punctuate..... **Aloinopsis** (tribe Ruschieae)

Group B – plants with creeping growth form

(Plants procumbent, rooting at the nodes, only short branches, usually with tufted leaves, growing erect)

The genera *Rhinephyllum* and *Cylindrophyllum* are included as they may comprise creeping forms.

1a Internodes on the main stems long, woody or spongy; adventitious roots fibrous:
2a Internodes with prominent hairs (elongated bladder cells)..... **Drosanthemum** (tribe Ruschieae)
2b Internodes with papillate or smooth surface:
3a Fruit a berry ..... **Carpobrotus** (tribe Ruschieae)
3b Fruit a hygrochastic capsule:
4a Leaf surface mesomorphic; leaves soft:
5a Capsule multilocular..... **Malephora** (tribe Ruschieae)
5b Capsule 5- or 6-locular:
6a Capsule with parallel expanding keels ..... **Delosperma** (tribe Ruschieae)
6b Capsule with diverging expanding keels:
7a Closing bodies large, bipartite ..... **Disphyma** (tribe Ruschieae)
7b Closing bodies absent; locule closed by funicles..... **Lampranthus** (tribe Ruschieae)
4b Leaf surface xeromorphic; leaves firm:
8a Leaves with teeth along margins and keel ..... **Chasmatophyllum** (tribe Ruschieae)
8b Leaves without teeth at margins or keel (but mucronate):
9a Capsules multilocular ..... **Leipoldtia** (tribe Ruschieae)
9b Capsules usually 5- or 6-locular:
10a Leaves small, < 15 mm long ..... **Mossia** (tribe Ruschieae)
10b Leaves larger, > 20 mm long ..... **Ruschia** (tribe Ruschieae)
1b Internodes on the main stem short; adventitious roots thickened and fleshy:
11a Leaves ± sharply triquetrous ..... **Bergeranthus** (tribe Ruschieae)
11b Leaves ± club-shaped, terete but widening distally ..... **Neohenricia** (tribe Ruschieae)

Group C – plants with a compact growth form

(Internodes of these plants are very short and not visible because they are enclosed by the sheathing leaf bases)

Flowering stones

1a Leaves of a pair highly connate (> 50%):
2a Plants sunken into the ground or in crevices:
3a Fruit with basal bracteoles ..... **Conophytum** (tribe Ruschieae)
3b Fruit without basal bracteoles ..... **Lithops** (tribe Ruschieae)
2b Plants above ground, clumpy ..... **Conophytum** (tribe Ruschieae)
1b Leaves of a pair less connate (< 30%):
4a Plants with a persistent primary stem forming a head with closely arranged foliage leaves (similar to a rosette, but not flat); inflorescences developed laterally and mainly basally.....
..... **Conicosia** (tribe Apatesieae)
4b Plants without a distinct persistent primary stem and without a head as described above:
5a Leaf surface mesomorphic; with bladder cells or smooth:
6a Leaves anisophyllous, tongue-shaped ..... **Glottiphyllum** (tribe Ruschieae)
6b Leaves isophyllous, ± terete or flattish:
7a Leaf apex with a diadem (a group of spreading bristles with a corky base).....
..... **Trichodiadema** (tribe Ruschieae)
7b Leaf apex without a diadem ..... **Delosperma** (tribe Ruschieae)
5b Leaves xeromorphic, without bladder cells, firm, smooth to papillate:
8a Leaves triquetrous-acuminate, i.e. tapering from base into a pointed apex; leaves slender; developing a fleshy stem with age (corm):
9a Plants subterraneous on loamy or silty flats; leaf apex emerging..... **Nananthus** (tribe Ruschieae)

9b Plants with the leaves completely above ground, in rocky, stony or shaly ground:
10a Flowers and fruit on stalked dichasia projecting beyond the leaves ..... **Bergeranthus** (tribe Ruschieae)
10b Flowers ± solitary, not carried above the leaves:
11a Capsule with tiny closing bodies; plants with a thickened rootstock..... **Rabiea** (tribe Ruschieae)
11b Capsule with large closing bodies; plants developing corms with age .... **Marlothistella** (tribe Ruschieae)
8b Leaves trigonous, hunched (± gibbose), semi-globose-terete, tongue-shaped, or club-shaped but never triquetrous-acuminate as above:
12a Plants sunken into the ground:
13a Several subsequent pairs of foliage leaves on a shoot forming a rosette:
14a Leaves small, < 8 mm wide ..... **Neohenricia** (tribe Ruschieae)
14b Leaves larger, > 10 mm wide..... **Aloinopsis** (tribe Ruschieae)
13b One pair of foliage leaves per shoot (two only during active growth or in cultivation)..... ..... **Lithops** (tribe Ruschieae)
12b Plants in clumps above the ground:
15a Leaves with well-developed papillae, i.e. velvety to the touch:
16a Capsules < 10-locular ..... **Antimima** (tribe Ruschieae)
16b Capsules > 10-locular ..... **Aloinopsis** (tribe Ruschieae)
15b Leaves without papillae, epidermal cells sometimes elevated but never velvety to the touch:
17a Leaves without a distinct keel, although sometimes hunched (± gibbose), therefore oval to round in cross section:
18a Capsules 5–8-locular..... **Cylindrophyllum** (tribe Ruschieae)
18b Capsules with > 10 locules ..... **Pleiospilos** (tribe Ruschieae)
17b Leaves keeled, therefore triangular in cross section:
19a Capsule multilocular (> 10):
20a Closing bodies small..... **Machairophyllum** (tribe Ruschieae)
20b Closing bodies large..... **Pleiospilos** (tribe Ruschieae)
19b Capsules 5–8-locular:
21a Capsules with covering membranes:
22a Leaves with an extensive, often emarginate hunch superseding apex of upper side of leaf..... ..... **Rhombophyllum** (tribe Ruschieae)
22b Leaves only moderately hunched (gibbous) ..... **Hereroa** (tribe Ruschieae)
21b Capsules without covering membranes, sometimes with a rim:
23a Valve wings absent or narrow..... **Carruanthus** (tribe Ruschieae)
23b Valve wings broader than expanding keels, rectangular:
24a Valve wings stiff and woody, stretching over the locules ..... **Faucaria** (tribe Ruschieae)
24b Valve wings flexible:
25a Leaves rounded-trigonous, sides concave, rarely straight; flowers with hypanthium .... **Stomatium** (tribe Ruschieae)
25b Leaves sharply triangular, sides straight to concave; flowers without a hypanthium:
26a Margins of leaves with teeth (sometimes few); leaves bright green..... **Orthopterum** (tribe Ruschieae)
26b Margins of leaves entire; leaves whitish ..... **Conophytum** (tribe Ruschieae)

Group D – plants with caespitose growth form

(Internodes are short, the main shoots prostrate; adventitious roots are absent or only rarely formed)

1a Leaves mesomorphic, with or without bladder cells:
2a Leaves of a pair anisophyllous..... **Glottiphyllum** (tribe Ruschieae)
2b Leaves of a pair isophyllous:
3a Internodes smooth..... **Delosperma** (tribe Ruschieae)
3b Internodes with hairs derived from elongated bladder cells..... **Drosanthemum** (tribe Ruschieae)
1b Leaves xeromorphic, firm, smooth to papillate, velvety:
4a Leaves of a pair united into a fleshy body (corpuscle) ..... **Conophytum** (tribe Ruschieae)
4b Leaves of a pair free for most of their length:
5a Leaves finger-shaped to terete, not keeled:
6a Leaves small, < 6 mm in diam., with spirally arranged warts ..... **Neohenricia** (tribe Ruschieae)
6b Leaves larger, > 8 mm in diam., without warts ..... **Cylindrophyllum** (tribe Ruschieae)

5b Leaves trigonous to triquetrous, keeled:
7a Leaves sharply triquetrous, ± awl-shaped..... **Bergeranthus** (tribe Ruschieae)
7b Leaves trigonous:
8a Covering membranes absent or narrow rims:
9a Leaves with teeth along margins, rarely only horny ..... **Stomatium** (tribe Ruschieae)
9b Leaves without teeth, surface rough from hard white tubercles, or smooth:
10a Leaves rough, covered by small, raised, hard, white tubercles, often flowering in late afternoon or at night ..... **Rhinephyllum** (tribe Ruschieae)
10b Leaves usually smooth, without white tubercles, often flowering in afternoon ... **Peersia** (tribe Ruschieae)
8b Covering membranes complete:
11a Closing bodies small, hook-shaped ..... **Ruschia** (tribe Ruschieae)
11b Closing bodies large or bipartite:
12a Covering membranes undulate with dorsal appendages..... **Antimima** (tribe Ruschieae)
12b Covering membranes straight, ± flat:
13a Leaves with an extensive, often emarginate hunch superseding apex of leaf.....
..... **Rhombophyllum** (tribe Ruschieae)
13b Leaves not or only moderately hunched ..... **Hereroa** (tribe Ruschieae)

Group E – shrubs or shrublets without spines
(Plants with woody, rarely succulent, persistent stems)

1a Leaves soft, with or without bladder cells:
2a Internodes with prominent hairs (elongated bladder cells)..... **Drosanthemum** (tribe Ruschieae)
2b Internodes without prominent distant hairs:
3a Leaf apex with apical diadems (groups of spreading bristles with a corky base).....
..... **Trichodiadema** (tribe Ruschieae)
3b Leaf apex without diadems, although sometimes with elongated bladder cells:
4a Covering membranes absent ..... **Delosperma** (tribe Ruschieae)
4b Covering membranes present:
5a Capsules > 10-locular ..... **Malephora** (tribe Ruschieae)
5b Capsules 5–8-locular:
6a Inflorescences mostly as solitary flowers..... **Lampranthus** (tribe Ruschieae)
6b Inflorescences distinctly differentiated from the vegetative part, very floriferous, bracteate and bracteolate ..... **Mestoklema** (tribe Ruschieae)
1b Leaves firm:
7a Leaves continuous with succulent, green internodes:
8a Capsules 5–7-locular..... **Ruschia** (tribe Ruschieae)
8b Capsules > 8-locular:
9a Capsules 10- or more-locular ..... **Leipoldtia** (tribe Ruschieae)
9b Capsules 8-locular ..... **Smicrostigma** (tribe Ruschieae)
7b Leaves clearly distinct from the wooden internodes:
10a Leaves longer than internodes, dominating the aspect (succulent shrubs):
11a Capsules without covering membranes..... **Corpuscularia** (tribe Ruschieae)
11b Capsules with covering membranes ..... **Hereroa** (tribe Ruschieae)
10b Leaves shorter than internodes, aspect dominated by woody stems (woody shrubs):
12a Capsules 5-locular (rarely up to 10 locules)..... **Erepsia** (tribe Ruschieae)
13a Capsules with closing bodies:
14a Valve wings absent ..... **Ruschia** (tribe Ruschieae)
14b Valve wings present..... **Antimima** (tribe Ruschieae)
13b Capsules without closing bodies:
15a Valve wings broad:
16a Leaf surfaces rough or smooth:
17a Leaves covered by small, raised, hard, white protuberances, often flowering in late afternoon or at night ..... **Rhinephyllum** (tribe Ruschieae)
17b Leaves usually smooth, without white protuberances, often flowering in afternoon.....
..... **Peersia** (tribe Ruschieae)

16b Leaf surfaces very smooth, glabrous..... **Lampranthus** (tribe Ruschieae)
15b Valve wings narrow ..... **Erepsia** (tribe Ruschieae)
12b Capsules > 8-locular:
18a Capsules without closing bodies..... **Erepsia** (tribe Ruschieae)
18b Capsules with closing bodies..... **Leipoldtia** (tribe Ruschieae)

Group F – shrubs or shrublets with spines

1a Capsules 6–9-locular:
2a Valve wings rectangular, broader than expanding keels; more spines than fruit per inflorescence; closing bodies large; internodes often shorter than leaves ..... **Leipoldtia** (tribe Ruschieae)
2b Valve wings reduced to awns or absent; few spines per inflorescence; closing bodies medium-sized, hook-shaped ..... **Ruschia** (tribe Ruschieae)
1b Capsules 5-locular (very rarely 4- or 6-locular):
3a Closing bodies absent..... **Mestoklema** (tribe Ruschieae)
3b Closing bodies present..... **Ruschia** subgenus **Spinosa** (tribe Ruschieae)

ALOINOPSIS Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Mimicry plant (striped mesemb), streepvygie (A)

Species ± 8, sthn Afr., Karoo regions, NC, WC, EC.

[E]**rosulata** (Kensit) Schwantes

Compact, caespitose shrublet, up to 0.05 m high, thick taproot tapering to an apex. **Leaves** broadly spathulate, punctate, apex rounded, 2 or 3 pairs per branch, borne flat on ground. **Flowers** solitary, petals pale yellow to pale orange with central red stripe. **Flowering time** June, July. **Capsules** 9- or 10-locular, no closing bodies and valve wings tapering to awns. Flats and plains of weathered karoo shales or siltstones; Lower Karoo, Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Willowmore E to Steytlerville).

[E]**rubrolineata** (N.E.Br.) Schwantes

Compact, caespitose shrublet, up to 0.07 m high, thick taproot tapering to an apex. **Leaves** ovate-acute, upper surface flat, punctate, apex acute. **Flowers** solitary, yellow or orange with central red stripe on each petal. **Flowering time** June–Sept. **Capsules** 10- or 11-locular, closing bodies absent, valve wings abruptly tapering to awns. Flats and hills of karoo sediments; Upper Karoo, Dry Highveld Grassland, Lower Karoo, Rainshadow Valley Karoo, Albany Thicket (Graaff-Reinet E to Cradock and S to Willowmore).

[E]**schooneesii** L.Bolus

Compact, caespitose shrublet, up to 0.05 m high, stems reduced, thick taproot tapering to an apex. **Leaves** clavate, rough with dark tannin idioblasts, apex rounded. **Flowers** solitary, yellow to orange with central red stripe on each petal. **Flowering time** June–Sept. **Capsules** 9- or 10-locular, no closing bodies, valve wings abruptly tapering to awns. Flats of karoo sediments; Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore E to Steytlerville).

ANTIMIMA N.E.Br. emend. Dehn

Subfamily Ruschioideae, tribe Ruschieae

Cushion-, paper-, stone mesemb; *klipvygie*, *kussingvygie*, *papiervygie* (A)

Species ± 103, sthn Afr., N, NC, WC, EC.

maxwellii (L.Bolus) H.E.K.Hartmann

Dwarf, caespitose shrublet, up to 0.2 m high, fibrous, thick taproot tapering to an apex, long shoots formed in favourable conditions from a compact center. **Leaves** borne upright, one pair forming a sheath enclosing base of subsequent leaf pair, glaucous with darker tannin idioblasts, apex blunt. **Flowers** solitary; petals pink with central red stripe; anthers arranged in central cone over stigmas. **Flowering time** June–Dec. **Capsules** 5-locular with large white closing bodies. Flats and slopes of karoo sediments; Lower Karoo, Rainshadow Valley Karoo (WC to Willowmore).

[E]**BERGERANTHUS** Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Tuft mesemb; *polvygie* (A)

Species ± 10, sthn Afr., EC.

[E]addoensis L.Bolus

Perennial, compact, dwarf shrublet forming mats, up to 0.8 m in diam., central plants dying out, leaving a ring of younger plants up to 0.1 m high (including inflorescences), roots thick. **Leaves** glaucous, lanceolate, opposite, smooth, apex acute, mucronate, central pair borne erect, outer pair spreading. **Flowers** borne in well-developed cymes, yellow, opening in late afternoon, closing at night. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular with triangular closing bodies, expanding sheets broad, expanding keels broad, valve wings absent. Flats of Addo Bush and mesic and xeric succulent thicket; Albany Thicket, Eastern Fynbos-Renosterveld (Kirkwood to Uitenhage and Port Elizabeth).

[E]albomarginatus A.P.Dold & S.A.Hammer

Perennial, caespitose shrublet, single or in clumps, up to 0.08 m high, with roots thickened. **Leaves** opposite, ovate, acuminate, shiny glaucous, smooth, apex mucronate, central pair borne erect, outer pair decumbent. **Flowers** borne in cymes, yellow, apex tinged pinkish below, opening in late afternoon, closing at night. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular with rounded closing bodies, expanding sheets reduced, expanding keels broad, valve wings absent. Recorded only from exposed dolerite hills, thicket; Albany Thicket (Kat River Valley S of Seymour).

[E]artus L.Bolus

Perennial, caespitose shrublet forming dense clumps, becoming cushion-like with age, up to 0.05 m high, with thickened rootstock, succulent. **Leaves** opposite, broadly lanceolate, shortly acute, base truncate, central pair borne upright, outer pair spreading, smooth bright pale green, apex mucronate. **Flowers** borne in cymes, nocturnal, yellow, tinged red below. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular with rounded closing bodies, expanding sheets reduced, expanding keels lanceolate, valve wings absent. Dolerite or sandstone outcrops, alt. > 1 000 m, in poor soil, rock faces along the eastern escarpment; Drakensberg Grassland, Sub-Escarpment Grassland (Cala and near Whittlesea).

[E]concavus L.Bolus

Perennial or annual, dwarf, caespitose shrublet, single or in loose clumps, up to 0.1 m in diam., up to 50 mm high, roots thickened. **Leaves** opposite, ovate, shortly acute, yellow-green, smooth, apex ending in awns. **Flowers** borne in cymes, yellow, apex tinged

reddish below, opening in late afternoon, closing at night. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular, closing bodies pyriform, expanding sheets reduced, expanding keels linear, acute, valve wings absent. Open calcareous sandstone outcrops within 10 km of coast; Albany Thicket (near East London between Kiwane in west and Cintsa in east).

[E]**katbergensis** L.Bolus

Perennial, caespitose, dwarf shrublet, single or in loose clumps, up to 0.2 m in diam., up to 50 mm high, with roots thickened. **Leaves** opposite, lanceolate, shortly acute, tapering abruptly to base, yellow-green, bladder cells, apex mucronate, central and outer pairs borne upright. **Flowers** borne in cymes, yellow, tinged reddish below, opening around midday, closing towards evening. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular, closing bodies pyriform, expanding sheets reduced, expanding keels linear, acute, valve wings absent. Flats and hills of escarpment sandstone; Sub-Escarpment Grassland, Dry Highveld Grassland, Upper Karoo, Drakensberg Grassland (widespread along escarpment, Burgersdorp to NE of Mthatha and S to W of Cradock).

[E]**leightoniae** L.Bolus

Perennial, caespitose, dwarf shrublet, single or closely dispersed, up to 0.05 m high, roots thickened. **Leaves** ovate, acuminate, tapering abruptly to base or truncate, dull grey-green, bladder cells, apex mucronate, sometimes tinged red, central; spreading, outer ones decumbent. **Flowers** borne in cymes, yellow, tinged reddish below, opening in late afternoon, closing at night. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular, closing bodies pyriform, expanding sheets broad, expanding keels broad, valve wings absent. Exposed dolerite outcrops; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (a single disjunct population near Mthatha S, from Stutterheim to King William's Town and Komga Districts).

[E]**multiceps** (Salm-Dyck) Schwantes

Perennial, caespitose, dwarf shrublet, up to 0.08 m high, roots thickened, succulent. **Leaves** broadly lanceolate, acuminate, dark green, bladder cells, apex mucronate, central pair borne upright, outer pair spreading to decumbent. **Flowers** borne in cymes, yellow, tinged reddish below, opening in late afternoon, closing at night. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular, closing bodies attenuate-triangular, expanding sheets broad, expanding keels broad, valve wings absent. Fine-grained soils of karoo sediments in flats and hills of grassy fynbos, xeric and mesic thicket and grassland; Sub-Escarpment Savanna, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Michell's Pass near Hogsback S, between Kirkwood, Port Elizabeth and Alexandria and to Humansdorp).

[E]**nanus** A.P.Dold & S.A.Hammer

Perennial, caespitose, dwarf shrublet, growing singly or loose clumps, 0.1 m in diam., up to 50 mm high, roots thickened, succulent. **Leaves** lanceolate, shortly acute, curving inwards, pale green, smooth, apex mucronate. **Flowers** solitary or in cymes, yellow, opening in late afternoon, closing at night. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular, closing bodies broadly triangular, expanding sheets reduced, expanding keels lanceolate, acute, valve wings absent. Open grassland on exposed dolerite outcrops; Upper Karoo, Dry Highveld Grassland (Graaff-Reinet and Grootvlei near Somerset East).

[E]**scapiger** (Haw.) Schwantes

Perennial, caespitose, dwarf shrublet, single or in loose clumps, up to 0.1 m high, thickened rootstock. **Leaves** lanceolate, central ones borne upright, outer ones spreading, curving outward, apex mucronate, keel chinned, smooth, pale yellow-green. **Flowers** solitary, yellow, tinged reddish below, opening in late afternoon, closing at night. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular, closing bodies pyriform, expanding sheets on distal half of keel only, expanding keels lanceolate, valve wings absent. Flats and hills of xeric and mesic thicket; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Alice S to Port Elizabeth).

[E]**vespertinus** (A.Berger) Schwantes

Perennial, caespitose, dwarf shrublet, single or occasionally in loose clumps, up to 0.06 m high, roots thickened, succulent. **Leaves** lanceolate to attenuate, acute, dark to glaucous-green, bladder cells, apex mucronate, central ones borne upright, outer ones spreading. **Flowers** solitary, yellow, tinged red below, opening in late afternoon, closing at night. **Flowering time** spring to early autumn, peaking in Nov., Dec. **Capsules** 5-locular, closing bodies rounded, expanding sheets reduced, expanding keels linear, valve wings absent. Open patches of ground on flats and hills of bushveld, grassland and karoo; Albany Thicket, Eastern Fynbos-Renosterveld, Lower Karoo, Sub-Escarpment Grassland and Sub-Escarpment Savanna (Halesowen near Cradock S to Kleinpoort and E to Fort Brown).

CARPOBROTUS N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Brack salad, ice plant, salad bush, salt salad, sour fig; *brakslaai*, *slaaibos*, *soutslaai*, *suurvy* (A)

Species ± 13, Australia, Chile, sthn Afr. from WC to Mozambique, naturalised in Mediterranean climates; 7 spp. in sthn Afr., KZN, NC, WC, EC.

deliciosus (L.Bolus) L.Bolus

Perennial, prostrate, mat-forming shrublet with branches up to 1.5 m long, radiating from central rootstock and rooting at nodes. **Leaves** green to glaucous, almost straight or subacinaciform, apex incurved smooth, borne upright, keel and margins smooth to cartilaginous sometimes tinged red. **Flowers** solitary, purple, pink or white, up to 80 mm in diam.; pedicels up to 120 mm long, receptacle globose not tapering into pedicel; stigmas shorter than stamens. **Flowering time** June–Jan. **Fruit** a fleshy, indehiscent berry. Sandy soil near the sea to well-drained soils of grassland; Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Indigenous Forests [Steytlerville E to East London (Bonza Bay, Nahoon and Cove Rock) S, from Humansdorp to Skoenmakerskop].

dimidiatus (Haw.) L.Bolus

Perennial, prostrate, mat-forming shrublet with winged stems reaching 2 m in length, up to 200 mm high, radiating from central rootstock. **Leaves** acinaciform, deep green, smooth. **Flowers** solitary, bright deep pink, up to 60 mm diam.; pedicels laterally compressed, with receptacle tapering into the pedicel; stigmas shorter than stamens. **Flowering time** July–Jan. Coastal dunes but also well-drained coastal habitats; Indian Ocean Coastal Belt (Mkambati Nature Reserve S to Port St Johns, Kentani, Dwessa Forest Reserve and Kei River Mouth).

edulis (L.) L.Bolus subsp. **edulis**

Perennial, prostrate, mat-forming shrublet with winged stems reaching 3 m in length, up to 0.2 m high, radiating from central rootstock. **Leaves** triquetrous almost straight, keel and margins serrate, deep green, smooth. **Flowers** solitary, pale yellow turning pink with age, up to 60 mm diam., with receptacle tapering into pedicel; stigmas as long as stamens. **Flowering time** Aug.–Oct. Well-drained flats and hills; Upper Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Cradock S, from Joubertina E to Port Elizabeth, Grahamstown and East London).

CARRUANTHUS (Schwantes) Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Snap trap mesemb; *slagystervygie* (A)

Species ± 2, sthn Afr., WC, EC.

[E]peersii L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.08 m high. **Leaves** succulent, trigonous, keel forming a chin, smooth, margins toothed. **Flowers** 1 or 3, yellow, opening in the afternoon closing towards evening. **Flowering time** spring to early summer. **Capsule**s 5-locular, closing bodies absent, expanding keel divergent, valve wings narrow. Rocky slopes of karoo sediments in full sun or in shade of shrublets; Albany Thicket, Eastern Fynbos-Renosterveld, Lower Karoo, Rainshadow Valley Karoo (Willowmore District).

CHASMATOPHYLLUM (Schwantes) Dinter & Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Yellow mountain mesemb, yellow swallowtail mesemb; *geel bergvygie*, *geel swaelstertvygie* (A)

Species ± 8, sthn Afr., N, NW, G, M, FS, L, NC, WC, EC.

musculinum (Haw.) Dinter & Schwantes

Perennial, caespitose to compact dwarf shrublet, up to 0.05 m high, roots horizontal fibrous, nodes also forming roots. **Leaves** succulent, trigonous to triquetrous, borne upright with up to 4 teeth on keel and margins, rough with white warts and tannin idioblasts, apex blunt to acute or toothed. **Flowers** solitary, yellow, tinged with red on lower apex, opening in late afternoon, closing at night. **Flowering time** Aug.–Jan. **Capsules** mostly 5-locular, covering membranes filling half the locule, closing bodies absent, expanding keels diverging at apex, valve wings present. Rocky flats and hills of karoo sediments in poor gravels; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Sub-Escarpment Grassland, Lower Karoo, Drakensberg Grassland (Lady Grey southwards, from Graaff-Reinet to near King William's Town).

[E]nelii Schwantes

Perennial, dwarf shrublet, up to 0.1 m high, with upright stem branching at apex, taproot semi-terete thickened. **Leaves** succulent, semi-ovate to elongate semi-terete, rough with white warts, toothed on the keel and margins. **Flowers** solitary, opening in late afternoon, yellow with apex reddish on outside. **Flowering time** spring to early summer. Rocky flats and hills of sandstone and dolerite origin; Albany Thicket, Upper Karoo (Graaff-Reinet District).

[E]stanleyi (L.Bolus) H.E.K.Hartmann

Perennial, caespitose, dwarf shrublet, up to 0.15 m high, branches upright, nodes tinged white at top, clearly demarcated, roots thick, woody. **Leaves** trigonous, keel with a prominent tooth, margins occasionally toothed, rough with white warts and tannin idioblasts. **Flowers** solitary, yellow with reddish apex, opening in afternoon. **Flowering time** spring to late summer. **Capsules** with covering membranes complete or reduced, closing body absent, expanding keels parallel for most part, valve wings very broad. Flats or hills comprising poor soils derived from karoo sediments; Lower Karoo, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket (Aberdeen to Willowmore).

[E]willowmorense (L.Bolus) L.Bolus

Perennial, dwarf shrublet, forming loose mats, up to 0.08 m high. **Leaves** succulent, semi-ovate, glaucous-green, rough with white warts, apex rounded. **Flowers** solitary, yellow. **Flowering time** Nov.? **Capsules** not known. Steytlerville Karoo, renosterveld valley bushveld transition, in fynbos, quartzite and shale colluvium; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Willowmore District).

CONICOSIA N.E.Br.

Subfamily Ruschioideae, tribe Apatesieae

Pig root, porcupine root; *varkwortel*, *ystervarkwortel* (A)

Species ± 2, sthn Afr., N, NC, WC, EC.

pugioniformis (L.) N.E.Br. subsp. **muirii**

Perennial shrublet with prominent leafy heads, up to 0.3 m high, thin taproot. **Leaves** opposite, linear, smooth, up to 170 mm long, apex acute, basal; deciduous. **Flowers** solitary, pale yellow, up to 60 mm in diam. **Flowering time** Sept.–Dec. **Capsules** xerochastic, expanding tissue absent, seed pockets breaking up as schizocarps containing seeds, dispersed as tumble fruits. Sandy flats not too far from the coast; Albany Thicket, Rainshadow Valley Karoo (WC and Humansdorp District).

CONOPHYTUM N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Buttons, little toes, dumplings; *knoppies*, *toontjies* (A)

Species ± 106, sthn Afr., N, NC, WC, EC.

truncatum (Thunberg) N.E.Br. var. **truncatum**

Perennial, dwarf shrublet, forming a compact cushion, up to 150 mm in diam., up to 30 mm high. **Leaves** highly succulent, forming bodies comprising 2 leaves, round in cross section, cylindric, truncate concave to convex, sometimes concave at fissure, glaucous, smooth to papillate, spotty from tannin idioblasts. **Flowers** solitary, nocturnal, white or pale yellow tipped orange or dirty pink. **Flowering time** autumn. **Capsules** pale brown, 4–6-locular, covering membranes reduced to a ledge or absent, closing bodies absent, valve wings prominent, expanding keels parallel. Rocky hills and ridges of karoo sediments; Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Willowmore District to east of Steytlerville).

[E]CORPUSCULARIA Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Species ± 8, sthn Afr., EC.

[E]angustifolia (L.Bolus) H.E.K.Hartmann

Perennial, dwarf shrublet, forming dense cushions, up to 50 mm high, 100 mm in diam., taproot thickened. **Leaves** succulent, glaucous green, triquetrous, acute, mucronate, smooth with epidermis cells uniform, longer on keels and margins. **Flowers** solitary, white with pink apex. **Flowering time** spring to summer. **Capsules** honey-coloured, 4–6-locular, covering membranes reduced to ledges, closing bodies absent, valve wings broad, expanding keels parallel, diverging at apex. Among rocks; Albany Thicket, Sub-Escarpment Savanna (Grahamstown).

[E]angustipetala (Lavis) H.E.K.Hartmann

Perennial, dwarf shrublet, up to 120 mm high, 150 mm in diam. **Leaves** succulent, opposite, trigonous, keel rounded near apex, smooth with uniform epidermis cells, longer on keels and margins. **Flowers** solitary, white with cream-coloured centre. **Flowering time** spring to summer. **Capsules** honey-coloured, 4–6-locular, covering membranes reduced to ledges, closing bodies absent, valve wings broad, expanding keels parallel, diverging at apex. Rocky outcrops in shallow soils; Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (Albany District and Grahamstown).

[E]appressa (L.Bolus) H.E.K.Hartmann

Perennial, dwarf shrublet, forming dense cushions up to 0.1 m high, taproot thickened, fibrous. **Leaves** succulent triquetrous, imbricate, smooth with uniform epidermis cells, apex sharp, mucronate. **Flowers** solitary, cream-coloured to pale yellow. **Flowering time** spring and summer. **Capsules** honey-coloured, 4–6-locular, covering membranes reduced to ledges, closing bodies absent, valve wings broad, expanding keels parallel, diverging at apex. Stony outcrops; Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Albany District).

[E]britteniae (L.Bolus) H.E.K.Hartmann

Perennial or annual, dwarf caespitose shrublet, up to 0.1 m high, taproot thickened, fibrous, succulent. **Leaves** triquetrous, smooth, apex apically rounded to sharply pointed. **Flowers** solitary, white with pink-tinged apex. **Flowering time** spring and summer. **Capsules** honey-coloured, 10- or 11-locular, covering membranes covering $^{1}/_{3}$ of locule, closing bodies absent, valve wings broad, expanding keels parallel, diverging at apex. Rocky outcrops at the grassy margins of bush clumps; Albany Thicket, Eastern Fynbos-Renosterveld, Lower Karoo, Sub-Escarpment Savanna (Albany District and Bathurst).

[E]cymbiformis (Haw.) Schwantes

Perennial shrublet, up to 0.3 m high. **Leaves** boat-shaped, ovate to spheroid before expansion, subtriquetrous. A poorly known species.

[E]gracillima (L.Bolus) Niederle

(= *Delosperma gracillimum* L.Bolus)

See Niederle (2012).

Perennial compact to caespitose dwarf shrublet, up to 0.2 m high, thickened rootstock succulent. **Leaves** triquetrous, smooth with uniform epidermis cells, apex acutely pointed.

Flowers solitary, white. **Flowering time** spring and summer. **Capsules** honey-coloured, 4–6-locular, covering membranes reduced, closing bodies absent, valve wings broad, expanding keels parallel, diverging at apex. Rocky outcrops in grassy or shrubby areas; Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Albany District).

E lehmannii (Eckl. & Zeyh.) Schwantes

Perennial, compact to caespitose, dwarf shrublet, forming clumps up to 250 mm diam., up to 0.1 m high, forming longer imbricate shoots; roots fibrous. **Leaves** succulent, glaucous, trigonous, smooth, apex blunt. **Flowers** solitary, white to cream-coloured becoming straw-coloured with age. **Flowering time** Oct.–Dec. **Capsules** honey-coloured, 4–6-locular, covering membranes reduced, closing bodies absent, valve wings very broad expanding keels parallel, diverging at apex, extending beyond valves. Rocky outcrops in karroid scrub; Albany Thicket, Eastern Fynbos-Renosterveld (restricted to area around Port Elizabeth).

E taylori (N.E.Br.) Schwantes

Perennial, compact dwarf shrublet, forming upright long branches up to 0.2 m high, thickened taproot but also rooting at nodes, succulent. **Leaves** smooth, sharply triquetrous, apex blunt. **Flowers** solitary, white with pink-suffused apex. **Flowering time** spring and summer. **Capsules** honey-coloured, 4–6-locular, covering membranes reduced, closing bodies absent, valve wings broad, expanding keels parallel, diverging at apex. Rocky outcrops and crevices between bush clumps; Albany Thicket, Eastern Fynbos-Renosterveld, Lower Karoo, Sub-Escarpment Savanna (Uitenhage and Albany District).

CYLINDROPHYLLUM Schwantes

Subfamily Ruschioideae, tribe Ruschieae

North-facing mesemb; *noorsvygie* (A)

Species ± 5, sthn Afr., Karoo regions, NC, WC, EC.

E calamiforme (L.) Schwantes

Perennial, compact dwarf shrublet, forming clumps, up to 0.8 m diam., up to 0.3 m high; taproot thickened. **Leaves** succulent, upright, subterete, arched-ascending, glaucous to bright green, apex blunt, rough, tinged red, borne flat on ground. **Flowers** solitary, pale yellow to cream-coloured. **Flowering time** spring. **Capsules** hard, woody, 6–10-locular, covering membranes steeply angled into each valve, closing bodies small, valve wings narrow, expanding keels parallel, diverging only at apex. Stony slopes and flats of karoo sediments; Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Graaff-Reinet to Somerset East S, from Willowmore to Jansenville).

DEILANTHE N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Potato mesemb, hares ear mesemb; *patatvygie*, *haasoorvygie* (A)

Species ± 3, sthn Afr., Karoo regions, FS, NC, WC, EC.

E peersii (L.Bolus) N.E.Br.

Perennial, caespitose, dwarf shrublet, forming clumps, up to 85 mm in diam., up to 50 mm high; rootstock succulent, thickened. **Leaves** succulent spreading, borne flat

on ground, dorsiventrally flattened, grey-green or dull green, velvety, apex blunt. **Flowers** solitary, yellow, opening from 20:00, closing at 02:00. **Flowering time** Aug., Sept. **Capsules** 8–12-locular, covering membranes not complete, closing body not completely closing valve opening, valve wings broad at base, tapering to an awns at apex. Flats and hills of karoo shales or siltstones; Eastern Fynbos-Renosterveld, Lower Karoo, Rainshadow Valley Karoo (Willowmore District).

DELOSPERMA N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Stone-, rock-, sheep mesemb; *klipvygie*, *rotsvygie*, *skaapvygie* (A); *intelezi* (Z)

Species ± 158, arid regions of Namibia to summer rainfall areas of the rest of sthn Afr., into Zimbabwe, Madagascar, Reunion, also Kenya, Ethiopia and north into Arabia; ± 141 in sthn Afr., B, LIM, NW, G, M, FS, KZN, L, NC, WC, EC.

[E]**aberdeenense** (L.Bolus) L.Bolus

Perennial, dwarf shrublet, forming a loose mat, up to 0.1 m high, with decumbent branches. **Leaves** succulent, cylindrical with a grooved or flat upper surface, bladder cells ending in hairs, apex blunt or acute. **Flowers** solitary or in cymes, pink, borne on a hairy pedicel. **Flowering time** Sept.–Jan. **Capsules** honey-coloured, valve rims high, valve wings much broader than expanding keels; expanding keels parallel for most of their length, diverging at apex, covering membranes reduced to a ledge. Flats or hills of karoo sediments; Lower Karoo (Aberdeen).

[E]**acuminatum** L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, with upright to decumbent stems, roots thickened, fibrous, up to 200 mm long. **Leaves** succulent, semi-terete, imbricate, pale green, apex acuminate. **Flowers** solitary or 2 per node, deep red to copper. **Flowering time** spring to late summer. **Capsules** 5-locular with high valve rims, closing bodies absent, covering membranes reduced to a ledge, expanding keels as broad as valve wings. Rocky flats and hills of karoo sediments with sparse scrub; Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Lower Karoo, Sub-Escarpment Savanna (Fort Beaufort to Uitenhage and Albany District).

[E]**adelaidense** Lavis

Perennial, dwarf shrublet, forming dense clumps, up to 0.3 m high, adventitious roots fibrous. **Leaves** succulent, linear to elongate-obovate, dorsiventrally flattened or thick, papillae on surface forming long hairs, apex apically recurved. **Flowers** solitary or ternate, deep pink. **Flowering time** spring to late summer. **Capsules** 5-locular, with no closing bodies, covering membranes absent or reduced to minute ledges, large valve wings, expanding keels parallel for their entire length, locules forming pockets. Flats and hills of karoo sediments; Albany Thicket, Sub-Escarpment Savanna (Fort Beaufort to Komga).

aereum (L.Bolus) L.Bolus

Upright, perennial, much-branched, dwarf shrublet forming loose clumps, up to 0.2 m high. **Leaves** succulent siccoid (in a dry state), thickest in middle with keel, canaliculate, finely papillate, apex recurved. **Flowers** solitary or ternate, bronze, centre purple. **Flowering time** spring to late summer. **Capsules** with no closing bodies, expanding keels parallel, covering membranes incomplete, valve wings double width of expanding keels.

Habitat, bioregions and distribution not known, one specimen recorded as a result of Mesemb Mapping Project.

[E]**affine** Lavis

Perennial or annual, dwarf caespitose shrublet, up to 0.6 m high, sometimes scrambling in other plants. **Leaves** succulent, linear-lanceolate, erect to recurved from middle upper surface flat, glabrous except for a few long hairs on margins of leaf base, nodes with distinct triangle of tissue where leaves join, apex sharp and recurved when young, becoming more blunt and straight with age. **Flowers** solitary or in cymes, white. **Flowering time** spring to late summer. Flats and hills of shaly karoo sediments in scrub and thicket situations; Sub-Escarpment Grassland, Albany Thicket, Drakensberg Grassland, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Lower Karoo, Sub-Escarpment Savanna (Queenstown S, from Graaff-Reinet to Adelaide and from Steytlerville to Port Elizabeth, Greater Addo Elephant National Park, Grahamstown and Bathurst).

[E]**algoense** L.Bolus

Probably in synonymy in genus *Corpuscularia*.

[E]**aliwalense** L.Bolus

Perennial, compact, dwarf shrublet, with branches at first compact, later spreading to ascending, to 9 mm high. **Leaves** succulent, lower ones narrowly obovate to elliptic, upper ones linear, covered by glassy round bladder cells, narrowing towards apex. **Flowers** solitary; petals deep pink. **Flowering time** Aug.–Jan. **Capsules** honey-coloured, closing bodies absent, valve rims high, covering membranes reduced to parallel ledges, expanding keels parallel for most of their length, diverging at apex and gradually grading into expanding sheets, valve wings rounded, locules forming rounded chambers. Stony situations in karroid scrub; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland (Aliwal North E to Lady Grey, Barkly East, Rhodes and Wodehouse districts).

[E]**alpina** (N.E.Br.) S.A.Hammer & A.P.Dold

Perennial, dwarf shrublet, forming a cushion with upright branches, up to 0.04 m high but usually smaller; roots tuberous. **Leaves** succulent, semi-terete or subtrigonous, ascending, flat above, convex below, covered with glassy bladder cells, apex blunt. **Flowers** solitary, white. **Flowering time** Nov.–Jan. **Capsules** fragile, honey-coloured, 4- or 5-locular, closing bodies absent, covering membranes reduced to a ledge widest at centre, expanding keels parallel to apex, valve wings absent or reduced. In soil-filled crevices on rock surfaces of doleritic scree slopes; Sub-Escarpment Grassland, Drakensberg Grassland (Fort Beaufort and Hogsback).

basuticum L.Bolus

Perennial, caespitose, dwarf shrublet, forming compact low cushions, up to 0.1 m high, ± 150 mm diam., branches densely foliate, adventitious roots fibrous. **Leaves** succulent, glaucous, covered by fine bladder cells, semi-terete to terete, rounded lower surface and canaliculated above, older leaves persistent grey, apex rounded, blunt. **Flowers** solitary, pink. **Flowering time** spring to late summer. **Capsules** pale honey-coloured, 4- or 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel to apex, valve wings broad. Basalt outcrops at high altitudes; Drakensberg Grassland, Mesic Highveld Grassland (Lesotho S to Lady Grey).

[E]**brevipetalum** L.Bolus

Perennial, dwarf, caespitose shrublet, up to 0.15 m high, with branches decumbent, with very large tuberous root. **Leaves** succulent, subterete, channelled above, borne upright with evenly spaced bladder cells, apex acuminate. **Flowers** solitary or in loose cymes, cream-coloured or white with pale pink centre. **Flowering time** spring to late summer **Capsules** pale honey-coloured, 4- or 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, diverging at apex, valve wings very broad. Grassy flats and hills of karoo sediments; Albany Thicket (Grahamstown).

brevisepalum L.Bolus

Perennial, dwarf shrublet, up to 0.09 m high, with upright branches becoming caespitose with age, succulent. **Leaves** terete, flat above, rounded below, covered evenly by glassy bladder cells, apex blunt with larger bladder cells present, borne flat on ground. **Flowers** white in 2- or 3-ternate cymes. **Flowering time** spring to late summer. **Capsules** pale honey-coloured, 4- or 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, diverging at apex, valve wings broad, narrowing towards apex. Mountainous rocky and grassy slopes of karoo sediments; Sub-Escarpment Grassland, Upper Karoo, Dry Highveld Grassland (Queenstown SW to Cradock and Somerset East).

[E]**brunnthaleri** (A.Berger) Schwantes

Perennial, upright shrublet, up to 0.4 m high. **Leaves** succulent, subtriquetrous, bladder cells even, apex acute. **Flowers** in cymes of 3–7, deep pink. Habitat not recorded; Albany Thicket (Uitenhage).

[E]**caespitosum** L.Bolus

Perennial, prostrate, dwarf shrublet with decumbent branches, up to 0.15 m high. **Leaves** succulent, spindle-shaped, upper surface grooved, covered by even bladder cells, apex rounded. **Flowers** solitary or in cymes, white. **Flowering time** spring to late summer. **Capsules** pale honey-coloured, 4- or 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings not much broader than expanding keels. Rocky areas on flats and hills of karoo sediments, also near the sea; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Mthatha S to Komga, Kentani, Kei and Qolora River Mouths and East London).

[E]**calycinum** L.Bolus

Perennial, dwarf shrublet, with central stems decumbent bearing upright flowering stems up to 0.15 m high, forming loose clumps. **Leaves** succulent, semi-terete, smooth, apex acute. **Flowers** in cymes of 3 or more, magenta. **Flowering time** spring to late summer. **Capsules** pale honey-coloured, 4- or 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings not too broad. Flats hills of karoo shales or siltstones; Albany Thicket, Lower Karoo, Sub-Escarpment Savanna (Albany District).

carterae L.Bolus

Perennial, dwarf shrublet, growing upright to decumbent, up to 0.2 m high, adventitious roots with thickened portions. **Leaves** succulent, spindle-shaped, with bladder cells evenly spaced, apex acute, concave above, rounded below. **Flowers** solitary or 2- or

3-ternate, white with pale pink filamentous staminodes arranged in a cone of stigmas. **Flowering time** spring to late summer. **Capsules** pale honey-coloured, 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings as broad as expanding keels. Stony situations in grassland or scrubland of karoo sediments; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (between Dordrecht and Queenstown S, from Indwe to Lady Frere and Lupatana and from King William's Town to East London).

[E]cloeteae Lavis

Perennial, dwarf shrublet, forming loose clumps, up to 0.2 m high. **Leaves** succulent, linear to acuminate, upper surface flat, lower surface keeled especially near stems, apex acute to recurved in older leaves. **Flowers** solitary or ternate, deep crimson. **Flowering time** spring to late summer. **Capsules** pale honey-coloured, mostly 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings broad. Stony areas in karroid scrub; Lower Karoo, Albany Thicket, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (Graaff-Reinet to Fort Beaufort and Greater Addo Elephant National Park).

[E]concavum L.Bolus

Perennial, densely branched shrublet, up to 0.12 m high, with large thickened tuberous rootstock. **Leaves** succulent, terete, grooved above, rounded below, bladder cells evenly scattered over leaf surface, apex tapering to a blunt point. **Flowers** white, solitary to ternate, calyx lobes longer than petals. **Flowering time** Sept.–May. **Capsules** pale honey-coloured, mostly 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings broad. Flats and hills of karoo sediments; Albany Thicket, Upper Karoo, Lower Karoo (Graaff-Reinet District, Sneeuberg Summit).

congestum L.Bolus

Perennial, dwarf shrublet, forming loose clumps becoming caespitose with age, up to 0.15 m high. **Leaves** succulent, densely arranged, terete, apex acute, glabrous, shiny green with evenly spaced glassy bladder cells. **Flowers** borne in congested cymes, white or pale lemon with age. **Flowering time** spring to late summer. **Capsules** pale honey-coloured, mostly 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings broad, narrowing towards apex. Rocky situations on mountains and hills at high altitude; Drakensberg Grassland (foothills of Drakensberg, Barkly East District).

cooperi (Hook.f.) L.Bolus

Perennial, dwarf shrublet, caespitose or forming loose clumps of 0.4 m in diam., up to 0.2 m high, adventitious roots fibrous. **Leaves** succulent borne upright, semi-terete to trigonous, covered by even rows of prominent, domed, glassy bladder cells, apex tapering to a blunt point. **Flowers** solitary or in cymes, bright pink. **Flowering time** spring to late summer. **Capsules** pale honey-coloured, mostly 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings very broad. Open areas where competition with other species is low; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland (foothills of Drakensberg near Wodehouse and Barkly East districts).

crassuloides (Haw.) L.Bolus

Perennial, dwarf shrublet. with decumbent branches, up to 0.05 m high, with long thickened, fibrous roots. **Leaves** succulent, semi-terete, spindle-shaped with even small blad-

der cells, upper surface grooved, lower surface rounded, apex tapering to a blunt point. **Flowers** solitary, white withering to pale yellow. **Flowering time** spring to late summer. **Capsules** pale honey-coloured, mostly 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings broad. *Cymbopogon-Themeda* veld, gentle slope, Dohne Sourveld, amongst rocks; Drakensberg Grassland, Sub-Escarpment Grassland (Hogsback and Stutterheim districts).

deleeuwiae Lavis

Perennial, caespitose, dwarf shrublet, up to 0.08 m high, with a thickened, tuberous rootstock. **Leaves** succulent, upper surface flat, lower surface convex, keeled, tapering to a blunt or acute apex, rough with glassy rounded bladder cells elongating into hairs. **Flowers** solitary, mauve-pink with a white center, pedicels and calyx hairy. **Flowering time** spring to late summer. **Capsules** pale brown, mostly 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings broad. Rocky outcrops with shallow soil at high altitudes; Drakensberg Grassland, Dry Highveld Grassland, Mesic Highveld Grassland, Sub-Escarpment Grassland (Drakensberg Mts S to Barkly East).

[E]**dunense** L.Bolus

Perennial, dwarf shrublet, with decumbent branches reaching up to 300 mm long, up to 100 mm high, whole plant glabrous, roots thickened, succulent. **Leaves** with triquetrous margins with acute angles, apex recurved. **Flowers** solitary or 3-nate, deep crimson with white staminodes. **Flowering time** spring to late summer. **Capsules** pale brown, mostly 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings broad. Coastal dunes; Albany Thicket (East London).

[E]**dyeri** L.Bolus

Perennial, dwarf shrublet, forming loose clumps or becoming caespitose with exposure, up to 0.15 m high, adventitious roots wiry. **Leaves** succulent, ovate to lanceolate, upper surface grooved, lower surface convex, covered by rows of rounded bladder cells enlarging at margins, apex blunt. **Flowers** solitary, golden-yellow shades of orange or deeper crimson with paler centre. **Flowering time** Oct.–Dec. **Capsules** pale brown, mostly 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings narrow. Rocky ridges in short grassland on mountain slopes; Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket (SE of Tarkastad E to Cathcart and S to Hogsback).

[E]**echinatum** (Lam.) Schwantes

Perennial, dwarf shrublet, forming loose clumps, up to 0.25 m high. **Leaves** highly succulent, ovate, rounded at keel and margins, rough with hardened bladder cells ending in a hair, apex blunt. **Flowers** solitary, pale yellow or white with yellow centre. **Flowering time** spring to late summer. **Capsules** pale brown, mostly 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings narrow. Open areas in bushy scrub; Albany Thicket, Eastern Fynbos-Renosterveld (Greater Addo Elephant National Park SW to Uitenhage and Port Elizabeth districts).

[E]**ecklonis** (Salm-Dyck) Schwantes

Perennial, dwarf shrublet, up to 0.45 m high, branches covered with fine hairs. **Leaves** succulent, connate at base, triquetrous with a flat upper surface, recurved, covered by short papillae. **Flowers** white, in terminal cymes. **Flowering time** spring to late summer. **Capsules** pale brown, shallow, mostly 5-locular, closing bodies absent, covering mem-

branes reduced to a ledge, expanding keels parallel, valve wings narrow. Flats, hills and forest margins; Albany Thicket (Somerset East to Komga S, from Uitenhage, Swartkops River, Grahamstown, and Port Alfred to East London).

erectum L.Bolus

Perennial, erect shrublet, up to 0.2 m high. **Leaves** grooved on upper surface, rounded on lower surface, covered by rounded papillae. **Flowers** 1–3, deep bright pink. **Flowering time** spring to late summer. **Capsules** shallow, 5-locular. Poorly known species.

esterhuyseniae L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.15 m high, with woody root, succulent. **Leaves** borne erect, club-shaped to oblanceolate, rough with rounded papillae, apex blunt. **Flowers** solitary, white. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a ledge. Rocky situations in mountainous areas; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Uniondale to SE of Willowmore and western parts of Baviaanskloof).

ficksburgense Lavis

Perennial, dwarf shrublet, up to 0.25 m high, with fibrous roots borne horizontally, succulent. **Leaves** oblanceolate, covered by rounded bladder cells elongated into hairs, apex blunt. **Flowers** 1–3, white becoming pale pink with age. **Flowering time** spring to late summer. **Capsules** pale brown, shallow, 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings narrow. Open rocky areas at higher altitudes; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland (Lady Grey District).

floribundum L.Bolus

Densely branching, perennial, dwarf shrublet, up to 0.35 m high. **Leaves** succulent, semi-terete, upper surface grooved, covered with rounded bladder cells, apex blunt. **Flowers** in rich cymes, pink with white centre. **Flowering time** spring to late summer. **Capsules** 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, broad, valve wings broad. Black turf in valleys to sandy slopes on hills, often on roadsides; Lower Karoo, Dry Highveld Grassland (Aliwal North District).

[E]**fredericii** Lavis

Perennial, dwarf shrublet up to 0.3 m high. **Leaves** triquetrous, epidermis smooth, apex acute. **Flowers** in rich cymes, pale brick-red becoming darker with age. **Flowering time** spring to late summer. Sandy flats; Albany Thicket (Addo and Uitenhage districts).

[E]**frutescens** L.Bolus

Perennial, dwarf shrublet, up to 2 m high. **Leaves** opposite, velvety, apex acute, recurved. **Flowers** in cymes, white. **Flowering time** spring to late summer. **Capsules** pale brown, shallow, 5-locular, closing bodies absent, covering membranes reduced. Rocky slopes on shale or siltstone; Albany Thicket, Lower Karoo, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Graaff-Reinet and Adelaide districts S, Willowmore and Albany districts).

[E]**giffenii** Lavis

Perennial or annual, dwarf shrublet, up to 0.45 m high, with woody rootstock, succulent. **Leaves** linear, joined at base with elongated bladder cells turning to hairs, apex acute. **Flowers** 1–3, pink. **Flowering time** spring to late summer. **Capsules** pale brown, shallow, 5-locular. Rocky areas on hill slopes; Sub-Escarpment Savanna (Fort Hare to Kei River Bridge).

[E]gramineum L.Bolus
Perennial, much-branched, dwarf shrublet, up to 0.25 m high, with upright stems, rootstock woody. **Leaves** semi-terete, erect to ascending, bladder cells, apex acute. **Flowers** solitary, white. **Flowering time** spring to late summer. **Capsules** pale brown, shallow, 5-locular, closing bodies absent. Rocky areas in grassland; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland (Cradock District, Mountain Zebra National Park).

[E]grantiae L.Bolus
Perennial, mat-forming, dwarf shrublet, up to 0.15 m high, up to 0.3 m in diam., roots fibrous. **Leaves** lanceolate, acute to acuminate; leaves and sepals covered with rounded bladder cells. **Flowers** 1–3, white to pale or bright pink; sepals tinged red. **Flowering time** spring to late summer. **Capsules** pale brown, shallow, 5-locular, closing bodies absent, covering membranes reduced. Rocky open areas in grassland; Sub-Escarpment Grassland, Upper Karoo, Drakensberg Grassland (Elliot District S, from Tarka to Hogsback and Cathcart districts).

[E]gratiae L.Bolus
Perennial, upright shrublet, up to 0.6 m high, with woody stems dark red; smooth huge tuberous rootstock. **Leaves** succulent, subterete, siccoid (in a dry state), covered with tiny glassy idioblasts, apex recurved. **Flowers** in complex cymes; petals pink; anthers white. **Capsules** 5-locular, covering membranes reduced, valve wings ending in a sharp apex. Well-drained, rocky areas; Drakensberg Grassland, Albany Thicket (Tarka District S, from Port Elizabeth to Albany District near Grahamstown).

hollandii L.Bolus
Perennial, mat-forming, dwarf shrublet, up to 0.15 m high, branches up to 0.35 m long, sometimes rooting at nodes. **Leaves** 3-angled upper surface flat, epidermis very smooth, apex acute to recurved. **Flowers** 1–3, white. **Flowering time** spring to late summer. **Capsules** very pale brown to grey, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings twice as broad as expanding keels. Sandy coastal bush; Albany Thicket (Uitenhage E to Albany District, Riebeek East and Grahamstown).

imbricatum L.Bolus
Perennial, dwarf shrublet with procumbent branches, up to 0.2 m long. **Leaves** grooved on upper surface, domed below, acute to acuminate in side view, surface covered in rounded bladder cells arranged in rows. **Flowers** 1–3, deep pink. **Flowering time** spring to late summer. **Capsules** pale brown, shallow, 5-locular, closing bodies absent, covering membranes reduced to a ledge, expanding keels parallel, valve wings broader than expanding keels. Distribution poorly known.

[E]invalidum (N.E.Br.) H.E.K.Hartmann
Perennial, dwarf shrublet, up to 0.3 m high, branches decumbent. **Leaves** semi-cylindrical, with low bladder cells. **Flowers** in cymes, white. Habitat not recorded; Sub-Escarpment Grassland (Queenstown District).

[E]karrooicum L.Bolus
Perennial, dwarf shrublet, up to 0.25 m high, branches decumbent, roots thickened. **Leaves** semi-terete, with low bladder cells. **Flowers** 1–3, white. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent. Slopes of karoo shales or siltstones; Sub-Escarpment Grassland, Upper Karoo, Dry Highveld Grassland, Albany Thicket (Queenstown S, Graaff-Reinet District, Sneeuberg Summit).

[E]katbergense L.Bolus
Perennial, dwarf shrublet, up to 0.2 m high, with decumbent branches and tuberous roots. **Leaves** lanceolate, rough with bladder cells. **Flowers** solitary, white to pale pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Sandstone outcrops; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Drakensberg Grassland (Tarka District to Stutterheim).

kofleri Lavis
Perennial, dwarf shrublet, up to 0.3 m high, with thickened rootstock, stems upright, much branched. **Leaves** spindle-shaped, covered with small bladder cells. **Flowers** 1 or 3, white. **Flowering time** spring to late summer. **Capsules** very pale brown to grey, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Basalt outcrops or soils derived from basalt at high altitude; Mesic Highveld Grassland, Drakensberg Grassland (Lady Grey and Barkly East districts).

lavisiae L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.15 m high, with thickened stem roots. **Leaves** linear, acute, slightly canaliculate on top, with bladder cells distant. **Flowers** solitary to 3-nate, deep pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings a bit broader than expanding keels. Shallow soil on rocky sandstone outcrops at high altitude; Drakensberg Grassland, Sub-Escarpment Grassland (Barkly East District E to Ntsikeni Nature Reserve).

[E]laxipetalum L.Bolus
Perennial, dwarf shrublet, up to 0.2 m high, branches lax. **Leaves** trigonous with rounded apex, bladder cells distant. **Flowers** in cymes of 3, white. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a very narrow ledge, valve wings broad, expanding keels broad. Steep slopes and overhanging rock ledges; Sub-Escarpment Savanna, Albany Thicket (Albany District).

[E]leightoniae Lavis
Perennial, dwarf shrublet, up to 0.15 m high, stems erect, roots thickened. **Leaves** acuminate to acute, bladder cells rounded. **Flowers** solitary, pale pink. **Flowering time** late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Habitat not recorded; Albany Thicket [Ciskei District (area between Great Fish and Keiskamma rivers)].

[E]liebenbergii L.Bolus
Perennial, dwarf shrublet, up to 0.15 m high, stems and leaves pubescent, roots succulent. **Leaves** semi-terete, canaliculate above, bladder cells present. **Flowers** in cymes, white. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a very narrow ledge, valve wings narrow. Habitat not recorded; Drakensberg Grassland (Maclear District).

lineare L.Bolus
Perennial, dwarf shrublet, up to 0.2 m high, branches erect to decumbent. **Leaves** linear to semi-terete, sometimes obscurely keeled, concave on top, acute, with densely arranged, rounded bladder cells. **Flowers** solitary to 3-nate, white with pink centre. **Flowering time** late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering mem-

branes reduced to a narrow ledge. Riverine forest along banks of streams; Indigenous Forests (Mtentu River).

litorale (Kensit) L.Bolus
Perennial, dwarf shrublet, up to 0.15 m high, glaucous, branches decumbent. **Leaves** subfalcate, triquetrous, margins white, apex acute, mucronate, epidermis smooth. **Flowers** solitary to 3-nate, white. **Flowering time** late summer to autumn. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Coastal limestone flats; Eastern Fynbos-Renosterveld (Port Elizabeth and Humansdorp districts).

lootsbergense Lavis
Perennial, dwarf shrublet, up to 0.2 m high, erect branches. **Leaves** semi-terete, rounded bladder cells bearing ascending hairs, apex blunt. **Flowers** solitary to 3-nate, pinkish purple to pale pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Flats and hills of karoo sediments; Upper Karoo, Dry Highveld Grassland (Middelburg and Graaff-Reinet districts).

[E]**luteum** L.Bolus
Perennial, dwarf shrublet, up to 0.2 m high, stems erect sometimes needing support from other plants, stems smooth. **Leaves**: epidermis smooth, apex acute to subobtuse. **Flowers** in cymes, yellow. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings a bit broader than expanding keels. Karroid scrub; Albany Thicket (Uitenhage and Albany districts).

maxwellii L.Bolus
Perennial, dwarf shrublet, up to 0.25 m high, erect. **Leaves** subfalcate, acutely keeled, flat on top, smooth. **Flowers** solitary or irregularly 3-nate, white. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings much broader than expanding keels. Flats and hills of karoo sediments; Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Willowmore District).

monanthemum Lavis
Perennial, dwarf shrublet, up to 0.2 m high, roots woody. **Leaves** flat or slightly concave above, rounded below, with rounded bladder cells, apex abruptly acute. **Flowers** solitary, deep pink. **Flowering time** Jan.–Apr. **Capsules** not known. Mountain grassland; Drakensberg Grassland (between Barkly East and Rhodes).

[E]**muirii** L.Bolus
Perennial, suberect, dwarf shrublet, up to 0.15 m high. **Leaves** semi-terete, covered with low dense bladder cells, apex acute to acuminate. **Flowers** solitary or 2-ternate, pink. **Flowering time** Nov.–Jan. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Flats and hills of karoo sediments; Albany Thicket (East London District).

multiflorum L.Bolus
Perennial, dwarf shrublet, up to 0.4 m high, all parts velvety. **Leaves** semi-terete to almost terete, with recurved apex. **Flowers** lax, rich, terminal cymes, brick-red-pink. **Flowering time** Sept.–June. **Capsules** pale brown, 5-locular, closing bodies absent,

covering membranes reduced to a narrow ledge, valve wings twice as broad as expanding keels. Flats and hills of karoo shales or siltstones; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp and Hankey districts).

nubigenum (Schltr.) L.Bolus
Perennial, dwarf shrublet, up to 0.1 m high, with creeping branches forming mats, roots succulent. **Leaves** oval, flat on upper surface, all herbaceous parts minutely papillate. **Flowers** solitary, bright yellow. **Flowering time** summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Rock crevices at high altitudes; Drakensberg Grassland (Barkly East District).

obtusum L.Bolus
Perennial, dwarf shrublet, up to 0.2 m high, branches decumbent. **Leaves** slightly grooved on top, rounded below, covered with rounded bladder cells, apex blunt to abruptly acute. **Flowers** in cymes, deep crimson. **Flowering time** Nov.–Feb. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Shallow soil on rocky sandstone outcrops at high altitude; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt [Barkly East District E to Transkei (area between KZN and the Great Kei River)].

ornatulum N.E.Br.
Perennial, erect, dwarf shrublet, up to 0.4 m high, all parts velvety. **Leaves** semi-terete to almost terete, with recurved apex. **Flowers** in rich, terminal cymes, coppery- to magenta-purple. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings twice as broad as expanding keels. Hills and flats of karoo sediments; Upper Karoo, Dry Highveld Grassland, Albany Thicket (Graaff-Reinet District southwards to Addo and Port Elizabeth).

[E]parviflorum L.Bolus
Perennial, much-branched, dwarf shrublet, up to 0.1 m high, woody stems. **Leaves** trigonous, very smooth, apex apiculate. **Flowers** solitary, yellow. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent. Sandy coastal flats; Albany Thicket (Uitenhage and Alexandria districts).

patersoniae (L.Bolus) L.Bolus
Perennial, dwarf shrublet, up to 0.2 m high, all parts velvety. **Leaves**: lower leaves triquetrous, recurved, margins ciliolate. **Flowers** solitary to 3-nate, white, pale pink or apricot. **Flowering time** spring to summer. **Capsules** pale brown, 5-locular, closing bodies absent. Rocky outcrops near sea; Albany Thicket, Eastern Fynbos-Renosterveld (Port Elizabeth SW to Humansdorp).

[E]peersii Lavis
Perennial, dwarf shrublet, up to 0.4 m high. **Leaves** smooth, triquetrous, flat on top, rounded below, apex mucronate, mucro slightly recurved. **Flowers** solitary to 3-nate, bright pink with paler centre. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Flats and hills of karoo sediments; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Willowmore and Steytlerville districts).

[E]**peglerae** L.Bolus

Perennial, dwarf shrublet, up to 0.3 m high, branches decumbent, woody. **Leaves** ovate, acute, obtusely keeled, slightly concave above, very smooth. **Flowers** 3-nate, pink-purple. **Flowering time** late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings twice as broad as expanding keels. Ecology not recorded; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Transkei and Albany districts).

pilosulum L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, forming loose rounded clumps; roots fibrous. **Leaves** terete, rough with bladder cells ending in a hair, apex blunt. **Flowers** solitary to 3-nate, deep pink. **Flowering time** spring to late summer. Rocky outcrops at high altitude; Drakensberg Grassland, Sub-Escarpment Grassland (northern parts of Transkei, between Elliot and Maclear).

[E]**platysepalum** L.Bolus

Perennial, dwarf shrublet, up to 0.4 m high, branches upright, woody. **Leaves** smooth, flat, oblong to ovate or lanceolate to ovate, keel with prominent midrib. **Flowers** ternate to 2-nate, deep pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings twice as broad as expanding keels. Karroid scrub, lower southern slopes at Keerom; Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Prince Albert District, Baviaanskloof Mts, Keerom Farm).

pondoense L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, branches erect. **Leaves** sulcate, almost semi-terete, acute, inconspicuously papillate. **Flowers** in congested cymes, palest straw-yellow. **Flowering time** summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Coastal hills; Indian Ocean Coastal Belt (Port Edward District).

[E]**prasinum** L.Bolus

Perennial, dwarf shrublet, up to 0.3 m high, branches smooth, woody with age, succulent. **Leaves** almost linear. **Flowers** solitary, pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular. Succulent karoo and thicket, mountain slopes in rocky soil; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Steytlerville District E to Port Elizabeth, Albany District and Alexandria).

repens L.Bolus

Perennial, dwarf shrublet, up to 0.1 m high, creeping branches forming mats. **Leaves** semi-terete, slightly concave above, base narrowed abruptly into a petiole, covered by rounded bladder cells, apex blunt. **Flowers** solitary, deep crimson. **Flowering time** Dec.–Feb. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Rocky ridges and ledges; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt [between Cala and Engcobo E, Maclear, Ugie and Tsolo eastwards to Pondoland (historical region on EC Coast in area of Mzimvubu River)].

[E]**robustum** L.Bolus

Perennial shrub, up to 0.25 m high, stems woody, smooth. **Leaves** obtusely keeled, flat on upper surface. **Flowers** in rich cymes, orange. **Flowering time** spring to late summer.

Capsules pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Flats and hills of karoo sediments; Upper Karoo, Albany Thicket (Cradock, Grahamstown).

[E]**rogersii** (Schönland & A.Berger) L.Bolus

Perennial, dwarf shrublet, up to 0.3 m high, stems low, laxly branched, decumbent to ascending. **Leaves** covered with soft hairs, oblong-lanceolate to oblong-ovate, flat or slightly concave on top. **Flowers** solitary, yellow. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a ledge. Rocky outcrops of karoo sediments; Indian Ocean Coastal Belt, Albany Thicket (Port St Johns to Mkambati Nature Reserve S, from Mpofu Game Reserve to Fort Beaufort and Kouga Dam to Grahamstown).

[E]**saxicola** Lavis

Perennial, dwarf shrublet, up to 0.1 m high, caespitose, forming low clumps. **Leaves** spreading, linear, acute, bladder cells ending in hairs, apex acute, recurved. **Flowers** solitary, deep pink, paler centre. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent. Coastal cliffs; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp).

scabripes L.Bolus

Perennial, dwarf shrublet, up to 0.1 m high, low-growing, laxly branched. **Leaves** thin, separated by long internodes, slightly concave above, rounded below, acute, bladder cells rounded, dull. **Flowers** solitary to 2-nate, deep pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings twice as broad as expanding keels. Rocky outcrops; Drakensberg Grassland, Sub-Escarpment Grassland (Barkly East and Maclear districts).

[E]**stenandrum** L.Bolus

Perennial, dwarf shrublet, up to 0.3 m high, all herbaceous parts softly hairy, roots fibrous. **Leaves** bright green, flat on top, sides convex, bladder cells ending in soft hairs, apex acute to recurved. **Flowers** solitary to 3-nate, deep pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent. Inland or coastal shale cliffs; Indian Ocean Coastal Belt (Pondoland, Coffee Bay and Hole-in-the-Wall).

[E]**subclavatum** L.Bolus

Perennial, dwarf shrublet, up to 0.25 m high, stems decumbent, rootstock tuberous. **Leaves** smooth, ascending, flat or concave on top with age, obtusely keeled or almost rounded below, apex recurved. **Flowers** solitary to 3-nate, deep crimson. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings twice as broad as expanding keels. Karroid scrub; Albany Thicket, Sub-Escarpment Grassland (Bedford, Fort Beaufort and southwards to Grahamstown and Alexandria).

subincanum (Haw.) Schwantes

Perennial, dwarf shrublet, up to 0.6 m high, branches erect, woody, all parts velvety. **Leaves** trigonous, apex recurved. **Flowers** in rich cymes, white to pale pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent. Rocky outcrops of karoo sediments; Albany Thicket, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Jansenville S, from Willowmore to Steytlerville).

subpetiolatum L.Bolus
Perennial, dwarf shrublet, up to 0.05 m high, stems compact at first, later creeping. **Leaves** obtuse to abruptly acute, narrowed towards base as if petiolate, concave above. **Flowers** solitary, white to pale pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings narrower than expanding keels. Rocky sheets; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Maclear S, from Elliot and Cala E to Mkambati Nature Reserve).

[E]**sulcatum** L.Bolus
Perennial, glabrous, dwarf shrublet, up to 0.2 m high, stems erect, internodes 20–30 mm long. **Leaves** terete, apex recurved. **Flowers** solitary, reddish purple. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent. Grassy slopes; Albany Thicket (Alexandria to Bushman's River).

testaceum (Haw.) Schwantes
Perennial, dwarf shrublet, up to 0.6 m high, all parts velvety, stems erect. **Leaves** semi-terete, apex recurved. **Flowers** in rich cymes, orange to brick-red with age. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent. Flats and hills of karoo sediments; Upper Karoo, Dry Highveld Grassland, Albany Thicket, Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Middelburg southwards to Graaff-Reinet, Uitenhage and Humansdorp).

tradescantioides (A.Berger) L.Bolus
Perennial, dwarf shrublet, up to 0.1 m high, stems decumbent, rooting at nodes. **Leaves** smooth, oblong-ovate, acute, flat on top or slightly concave in middle, bladder cells flat. **Flowers** solitary, occasionally 2- or 3-nate, deep purple. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings narrow. Rocky outcrops; Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Mkambati Nature Reserve S, to King William's Town and East London).

[E]**truteri** Lavis
Perennial, glabrous, dwarf shrublet, up to 0.1 m high, branches decumbent, mat-forming. **Leaves** connate at base, elliptical to ovate or oblong above, acute. **Flowers** solitary, white. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Rocky outcrops; Dry Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket (Somerset East E to King William's Town and southwards to Port Elizabeth, Uitenhage and Grahamstown).

[E]**uitenhagense** L.Bolus
Very glabrous, perennial, dwarf shrublet, up to 0.2 m high, stems decumbent. **Leaves** flat on top and sides, apex acute. **Flowers** irregularly 2-ternate, white. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Coastal flats; Albany Thicket (Uitenhage).

[E]**uncinatum** L.Bolus
Perennial, dwarf shrublet, up to 0.1 m high, stems prostrate, forming mats. **Leaves** glaucous, smooth, terete, apex apiculate, recurved. **Flowers** 3-nate, white. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent. Coastal flats; Albany Thicket (between Uitenhage and Port Elizabeth).

uniflorum L.Bolus

Perennial, dwarf shrublet, up to 0.1 m high, stems richly branched, prostrate. **Leaves** semi-terete, smooth but keel and margins often ciliolate. **Flowers** solitary, pink to reddish copper. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge. Among shrubs; Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Pondoland to Ciskei).

velutinum L.Bolus

Perennial, dwarf shrublet, up to 0.1 m high, stems decumbent, forming loose mats, woody with age. **Leaves** ovate to broadly ovate, narrowed near base, apiculate, flat on top, pale green. **Flowers** solitary, white becoming pale pink with age. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a ledge. Shady, humus-rich areas; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Pondoland).

[E]**verecundum** L.Bolus

Perennial, dwarf shrublet, up to 0.3 m high, stems laxly branched. **Leaves** very smooth, glossy, imbricate or spreading, keel acute, slightly concave above, sides flat to slightly convex, acute to acuminate, apiculate. **Flowers** solitary to 3-nate, purple-pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a ledge. Rocky outcrops of karoo sediments; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Port Elizabeth E to Grahamstown).

[E]**vernicolor** L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, compact at first becoming lax with age. **Leaves** bright green, sublanceolate or narrowly obovate and abruptly acute narrow near base, flat on top, obtusely keeled, apiculate, margins sometimes ciliate. **Flowers** solitary, pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a ledge. Karroid scrub; Lower Karoo, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Riebeek East southwards to Grahamstown and Alexandria).

[E]**versicolor** L.Bolus

Perennial, dwarf shrublet, up to 0.4 m high, rootstock thickened, stems erect, smooth. **Leaves** glabrous to glabrescent, semi-terete, apex acute, apiculate. **Flowers** solitary to 2-nate, yellow, gold-coloured, copper-coloured, red or deep pink. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a narrow ledge, valve wings narrow. Karroid scrub; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Uitenhage E, from north of Addo to Grahamstown).

vinaceum (L.Bolus) L.Bolus

Perennial, dwarf shrublet, up to 0.05 m high, stems creeping, forming lax mats. **Leaves** semi-terete, acute, covered by rounded bladder cells. **Flowers** solitary, crimson. **Flowering time** spring to late summer. **Capsules** pale brown, 5-locular, closing bodies absent, covering membranes reduced to a ledge. Poorly known species.

DISPHYMA N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Wishbone plant

Species ± 5, Australia, New Zealand, Tasmania and SA, NC, WC, EC.

crassifolium (L.) L.Bolus

Perennial, dwarf shrublet, up to 0.1 m high, stems decumbent forming mats rooting at nodes. **Leaves** smooth, bluntly 3-angled, apple-green, tinged red when stressed. **Flowers** solitary or 2- or 3-nate, white to pale or bright pink. **Flowering time** May–Sept. **Capsules** pale brown, 5-locular, closing bodies large, bifid. Rocky or sandy areas on the coast, rarely inland; Eastern Fynbos-Renosterveld, Albany Thicket (Tsitsikamma E to Swartkops River, Kenton on Sea and Port Alfred, and to Humansdorp and Seaview near Port Elizabeth).

DROSANTHEMUM Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Mountain mesemb, dew mesemb; *bergvygie*, *douvygie* (A)

Species ± 109, sthn Afr., N, FS, L, NC, WC, EC.

barkerae L.Bolus

Perennial, dwarf shrublet, up to 0.6 m high, stems upright, intricately branched, woody with age. **Leaves** globose, bladder cells papillate. **Flowers** solitary, bright pink. **Flowering time** Oct.–Mar. **Capsules** pale brown, 5-locular, covering membranes complete, closing bodies absent. Mountain slopes; Eastern Fynbos-Renosterveld (Kouga Mts).

[E]candens (Haw.) Schwantes

Perennial, dwarf shrublet, up to 0.2 m high, stems decumbent, forming loose mats, rooting at nodes. **Leaves** cylindrical, covered with glassy bladder cells. **Flowers** solitary, borne on erect side stems, pink. **Flowering time** all year. **Capsules** 5-locular, bell-shaped, valve wings broad, closing bodies bifid. Coastal sandy or rocky areas, sometimes disturbed; Eastern Fynbos-Renosterveld, Albany Thicket (W of Humansdorp to Bushman's River Mouth).

capillare (Thunb.) Schwantes

Perennial, dwarf shrublet, up to 0.2 m high, stems smooth, maroon, woody with age. **Leaves** ovate, apically thicker, bladder cells rounded. **Flowers** solitary, deep pink. **Flowering time** summer. **Capsules** pale brown, 5-locular, covering membranes complete, expanding keels basally distant, parallel, closing body absent. Rocky hills; Eastern Fynbos-Renosterveld (Humansdorp).

delicatulum (L.Bolus) Schwantes

Perennial, dwarf shrublet, up to 0.1 m high, stems upright woody. **Leaves** subglobose, bladder cells rounded, glassy. **Flowers** solitary, pale pink. **Flowering time** Oct., Nov. **Capsules** smallest in genus, 5- or 6-locular, expanding keels parallel at base, diverging widely at apex, covering membranes complete, valve wings broad, semi-lunate, closing bodies absent. Flats and hills of karoo sediments; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Willowmore and Steytlerville Districts).

floribundum (Haw.) Schwantes
Perennial, dwarf shrublet, up to 0.2 m high, stems sprawling, young ones hispid. **Leaves** subterete, bladder cells glassy. **Flowers** solitary, bright pink with white centre. **Flowering time** Sept.–Dec. **Capsules** 5-locular. Rocky slopes; Upper Karoo, Dry Highveld Grassland, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Middelburg S, from Willowmore E to Grahamstown and King William's Town).

[E]fourcadei (L.Bolus) Schwantes
Perennial, dwarf shrublet, up to 0.25 m high, stems woody, smooth, upright. **Leaves** cymbiform, bladder cells glassy, rounded, terminating in a protrusion. **Flowers** solitary, purple. **Flowering time** Oct.–Dec. **Capsules** 6-locular, base funnel-shaped, covering membranes complete, expanding keels diverging widely, valve wings absent on type material. Rocky hills; Albany Thicket, Eastern Fynbos-Renosterveld (Hankey and Humansdorp districts).

gracillimum L.Bolus
Perennial, dwarf shrublet, up to 0.2 m high, stems scrambling succulent. **Leaves** terete to subterete, bladder cells distant, glassy, rounded. **Flowers** solitary, deep purple. **Flowering time** May–Aug. **Capsules** 5-locular, covering membranes not complete, valve wings narrower than expanding keels. Grassy mountain slopes or scrambling in karroid scrub; Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore, Baviaanskloof and Kouga Mts eastwards to Addo and to Cape St Francis).

hispidum (L.) Schwantes
Perennial, dwarf shrublet, up to 0.6 m high, stems upright basally smooth, woody, apex hispid. **Leaves** terete, obtuse, bladder cells glassy. **Flowers** solitary, magenta. **Flowering time** Sept.–Jan. **Capsules** 5-locular. Pioneer on disturbed areas; Upper Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (widespread in drier parts).

[E]intermedium (L.Bolus) L.Bolus
Perennial, dwarf, caespitose shrublet, up to 0.2 m high, stems sprawling, hispid. **Leaves** semi-terete, bladder cells glassy, globose. **Flowers** solitary, pinkish purple. **Flowering time** Aug., Sept. **Capsules** 5-locular, borne on long pedicel, closing bodies present, covering membranes complete, valve wings rectangular, broader than expanding keels. Rocky outcrops near coast; Albany Thicket, Eastern Fynbos-Renosterveld (Addo SW, to west of Humansdorp).

[E]jamesii L.Bolus
Perennial, dwarf shrublet, up to 0.25 m high, stems erect, woody, smooth with age. **Leaves** semi-terete, bladder cells glassy to glaucous and dull with age. **Flowers** in cymes, pink. **Flowering time** summer. **Capsules** 6-locular, covering membranes complete, valve wings semi-lunate, closing body absent. Plains and hills of karoo sediments; Upper Karoo, Dry Highveld Grassland, Albany Thicket, Sub-Escarpment Savanna (Halesowen and Cradock districts S to Uitenhage and Grahamstown).

[E]lique (N.E.Br.) Schwantes
Perennial, dwarf shrublet, up to 0.45 m high, stems erect. **Leaves** cylindrical, obtuse, papillate. **Flowers** solitary to 3-nate, purple. **Flowering time** Oct.–Feb. **Capsules** 5-locular. Flats and hills of karoo sediments; Upper Karoo, Lower Karoo, Rainshadow

Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Graaff-Reinet S, from Willowmore to Uitenhage and Humansdorp).

[E]subspinosum (Kuntze) H.E.K.Hartmann

Perennial, dwarf shrublet, up to 0.4 m high, with branches up to 1 m long. **Leaves** flat, obovate. **Flowers** in cymes, red. **Capsules** 5-locular, closing bodies absent. Habitat not recorded; Lower Karoo, Dry Highveld Grassland, Upper Karoo, Eastern Fynbos-Renosterveld (Aberdeen E to Cradock and S to Willowmore).

vespertinum L.Bolus

Perennial, dwarf shrublet, up to 0.3 m high, stems laxly branched. **Leaves** opposite, subglobose to subcylindrical, bladder cells rounded, dull. **Flowers** solitary, white or pale pink. **Flowering time** Oct.–Apr. **Capsules** 5-locular, covering membranes complete, valve wings broad, expanding keels diverging, closing body absent. Flats or hills of karoo sediments; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Willowmore).

EREPSIA N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Always mesemb; *altydvygies* (A) referring to the flowers that are open day and night

Species ± 33, sthn Afr., in mountainous regions of WC, EC.

aristata (L.Bolus) Liede & H.E.K.Hartmann

Perennial, upright shrublet, up to 0.6 m high, succulent. **Leaves** smooth, glaucous, covered with tannin idioblasts, borne upright, laterally compressed, sharply keeled, keel finely serrulate. **Flowers** solitary, red or yellow. **Flowering time** Sept.–Nov. **Capsules** 5-locular, woody, valve wings absent, covering membranes with a closing ledge, closing body absent. Rocky outcrops; Eastern Fynbos-Renosterveld, Albany Thicket (Knysna to Uitenhage and Addo).

FAUCARIA Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Tiger jaw mesemb; *tierbekvygie* (A)

Species ± 8, sthn Afr., Karoo regions of WC and EC.

bosscheana (A.Berger) Schwantes

Perennial, compact, dwarf shrublet, up to 0.05 m high, forming compact clusters. **Leaves** ovate-lanceolate, toothed or not, keel and margins white. **Flowers** solitary, yellow. **Flowering time** autumn. **Capsules** woody, 5(6)-locular, valve covers gaping, locules hidden by lamellae thus appearing empty, valve wings present, typical closing bodies and covering membranes absent. Rocky outcrops in open areas; Albany Thicket, Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Graaff-Reinet S to Willowmore and Steytlerville).

[E]britteniae L.Bolus

Perennial, dwarf shrublet, up to 0.1 m high, forming compact clusters. **Leaves** keeled forming a chin, margins with 6–13 even teeth, glaucous with white dots. **Flowers** solitary, yellow, open in afternoon. **Flowering time** autumn. **Capsules** woody, 5(6)-locular, locules hidden by lamellae thus appearing empty, typical closing bodies and covering membranes absent, valve wings present, tops raised. Rocky areas comprising karoo

sediments; Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Fort Beaufort S to Grahamstown).

felina (L.) Schwantes

Perennial, dwarf shrublet, up to 0.05 m high, compact clusters. **Leaves** ovate-rhomboid, smooth to warty, keel oblique, dark green, margins with 3–10 even teeth. **Flowers** solitary, yellow, open in afternoon. **Flowering time** Mar.–June. **Capsules** 5-locular, locules hidden by lamellae thus appearing empty, valve wings present, typical closing bodies and covering membranes absent. Rocky flats and hills of karoo sediments; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Cradock S, from Willowmore to Port Elizabeth).

[E]**gratiae** L.Bolus

Perennial, dwarf shrublet, up to 0.05 m high, forming compact clusters. **Leaves** crowded, ovate-triangular, keeled, margins unevenly toothed, thin white margins and keel, surface glaucous with white dots. **Flowers** solitary, yellow, open in afternoon. **Flowering time** autumn. **Capsules** 5-locular, locules hidden by lamellae thus appearing empty, valve wings present, typical closing bodies and covering membranes absent, tops raised. Grassland in shallow, rocky soil; Lower Karoo, Albany Thicket, Sub-Escarpment Savanna (Pearston S, Riebeek East and Grahamstown).

[E]**nemorosa** L.Bolus ex L.E.Groen

Perennial, dwarf shrublet, up to 0.1 m high, forming clusters. **Leaves** oblong-lanceolate, keel asymmetrical, margins toothless or with 2–4 reduced teeth, epidermis dull glaucous-green without white dots. **Flowers** solitary, dirty yellow, open in afternoon. **Flowering time** autumn to winter. **Capsules** 5-locular, locules hidden by lamellae thus appearing empty, valve wings present, typical closing bodies and covering membranes absent, tops raised. Hidden under karroid scrub; Albany Thicket (Alicedale).

[E]**subintegra** L.Bolus

Perennial, dwarf shrublet, up to 0.05 m high, clumped, stem-forming with age. **Leaves** oblong-ovate, 1–3 low teeth on margins, epidermis bright green with no white dots. **Flowers** solitary, yellow, open in afternoon. **Flowering time** autumn. **Capsules** 5-locular, locules hidden by lamellae thus appearing empty, valve wings present, typical closing bodies and covering membranes absent, tops raised. Rocky situations in thicket; Sub-Escarpment Savanna, Albany Thicket (King William's Town S to Peddie and East London).

[E]**tigrina** (Haw.) Schwantes

Perennial, dwarf shrublet, up to 0.05 m high, compact clumps. **Leaves** ovate-rhomboid, keeled, 9 or 10 even teeth on margins ending in long bristles pointing backwards, epidermis with white dots turning reddish or purple in season. **Flowers** solitary, yellow, open in afternoon. **Flowering time** autumn. **Capsules** 5-locular, locules hidden by lamellae thus appearing empty, valve wings present, typical closing bodies and covering membranes absent. Sandstone outcrops near scrub patches; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Grahamstown).

[E]**tuberculosa** (Rolfe) Schwantes

Perennial, dwarf shrublet, up to 0.05 m high, compact clumps **Leaves** ovate-rhomboid, keeled, 3–6 stout teeth on margins without bristles, epidermis with many white dots on upper surface, with many white raised warts. **Flowers** solitary, yellow, open in after-

noon. **Flowering time** autumn. **Capsules** 5-locular, locules hidden by lamellae thus appearing empty, valve wings present, typical closing bodies and covering membranes absent. Grassland; Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (between Bedford and Fort Beaufort and to Grahamstown).

GLOTTIPHYLLUM N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Tortoise food; *skilpadkos* (A)

Species ± 17, sthn Afr., Karoo regions of WC, EC.

carnosum N.E.Br.

Perennial, dwarf shrublet, up to 0.05 m high, compact-forming clumps, 3–5 decumbent branches per plant. **Leaves** trigonous-terete with gibbose lower portion, often with one pair keeled, surface glaucous covered by a thick wax layer. **Flowers** sessile, solitary, yellow. **Flowering time** autumn. **Capsules** pale brown, 6–8-locular, tops high, valves thick and spongy, valve wings absent, expanding keels ending in awns, covering membranes complete, closing bodies present. Sandstone slopes; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Willowmore).

depressum (Haw.) N.E.Br.

Perennial, dwarf shrublet, up to 0.1 m high, short stems decumbent. **Leaves** succulent, smooth, bright green, often hooked at apex. **Flowers** sessile, solitary, yellow. **Flowering time** Feb.–July. **Capsules** pale brown, 6–8-locular, tops high, valves thick and spongy, valve wings broad or reduced to awns, covering membranes complete, closing bodies present. Under karroid shrubs; Lower Karoo, Rainshadow Valley Karoo, Albany Thicket (Little Karoo to Kouga Mts).

difforme (L.) N.E.Br.

Perennial, mat-forming, dwarf shrublet, up to 0.2 m high. **Leaves** succulent, bright green, smooth, decussate, markedly anisophyllous, margins white, 2 large teeth on upper surface. **Flowers** pedicellate, solitary, yellow. **Flowering time** winter and spring. **Capsules** pale brown, 6–8-locular, tops high, valves thick and spongy, valve wings absent, expanding keels ending in awns, covering membranes complete, closing bodies present. Rocky areas on karoo sediments; Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket, Rainshadow Valley Karoo (Aberdeen E to Jansenville S, from Willowmore to Steytlerville).

[E]**grandiflorum** (Haw.) N.E.Br.

Perennial, compact, dwarf shrublet, up to 0.1 m high. **Leaves** highly succulent, decumbent, smooth, strap-shaped with rounded apex. **Flowers** almost sessile, solitary, yellow. **Flowering time** June, July. **Capsules** pale brown, mostly 9-locular, tops high, valves thick and spongy, valve wings absent, expanding keels ending in awns, covering membranes complete. Rocky areas on karoo shales or siltstones; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Somerset East S, from Kirkwood E to Grahamstown and Alexandria).

longum (Haw.) N.E.Br.

Perennial, dwarf shrublet, up to 0.1 m high, compact to caespitose. **Leaves** ascending to decumbent, smooth, bright green, strap-shaped with rounded apex. **Flowers** stalked, solitary, yellow. **Flowering time** winter. **Capsules** pale brown, 9–11-locular, tops flat,

valves thick and spongy, valve wings absent, expanding keels ending in awns, covering membranes complete, closing bodies present. Under karroid shrubs; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket, Sub-Escarpment Savanna (Willowmore to Grahamstown).

nelii Schwantes

Perennial, dwarf shrublet, up to 0.05 m high, stems and leaves decumbent. **Leaves** distichous with rounded apex, bright green, margins clear. **Flowers** stalked or stalkless, solitary, yellow. **Flowering time** autumn. **Capsules** pale brown, 8–10-locular, tops high, valve wings ending in awns. Open quartz patches; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (W of Willowmore).

[E]oligocarpum L.Bolus

Perennial, dwarf shrublet, up to 0.05 m high. **Leaves** distichous with rounded apex, glaucous with thick wax layer. **Flowers** mostly sessile, solitary, yellow. **Flowering time** winter. **Capsules** pale brown, 6-locular, tops high, valves thick and spongy, wings and awns absent. Rocky quartz patches with karroid scrub; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Jansenville S, from Willowmore E to Steytlerville).

peersii L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, forming mats, stems ascending later decumbent with age. **Leaves** trigonous-terete, bright green becoming reddish in dry season, erect, highly anisophyllous, decussate, margins white. **Flowers** stalked, solitary, yellow. **Flowering time** winter. **Capsules** pale brown, 8-locular, top high, valves without wings or awns. Stony flats of karoo shales and siltstones; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Western Cape E towards Willowmore and Steytlerville).

HEREROA (Schwantes) Dinter & Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Night mesemb; *nagvygie*, *slaapvygie* (A)

Species ± 28, sthn Afr., N, FS, G, mainly Karoo regions of NC, WC and EC.

[E]calycina L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.05 m high, stems reduced, forming small dense clumps, roots succulent. **Leaves** subfalcate to incurved, epidermis rough, cells of keel and margins almost denticulate. **Flowers** pedicellate, solitary, yellow. **Flowering time** winter and spring. **Capsules** 5-locular, dark brown, woody. Flats and hills of karoo shales or siltstones; Sub-Escarpment Grassland, Dry Highveld Grassland, Upper Karoo (Queenstown to Graaff-Reinet).

crassa L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.3 m high, stems woody, upright. **Leaves** glaucous, covered by wax, thick, falcate, keel rounded, apex blunt, older leaves black with age. **Flowers** solitary to 3-nate, yellow with reddish apex. **Flowering time** spring. **Capsules** 5-locular, covering membranes complete, expanding keels diverging widely ending in an awn, valve wings very narrow, placental closing bodies small. Flats and hills of karoo sediments; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Beaufort West SE to Willowmore and Steytlerville).

granulata (N.E.Br.) Dinter & Schwantes
Perennial, caespitose, dwarf shrublet, up to 0.05 m high, roots thick, fibrous. **Leaves** acinaciform, dull green with tannin idioblasts scattered over leaf surface. **Flowers** pedicellate, solitary, yellow. **Flowering time** spring and summer. **Capsules** 5-locular. Flats and hills of karoo shales or siltstones; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Riversdale E to Uitenhage).

[E]herrei Schwantes
Perennial, caespitose, dwarf shrublet, up to 0.05 m high, roots thick, fibrous. **Leaves** acinaciform, dull green with tannin idioblasts scattered over leaf surface. **Flowers** solitary, yellow. **Capsules** 5-locular, covering membranes with a gap where they meet, expanding keels dark brown, parallel, valve wings very narrow. Habitat not recorded; Upper Karoo, Albany Thicket, Lower Karoo (Graaff-Reinet).

latipetala L.Bolus
Perennial, dwarf shrublet, up to 0.1 m high, with roots succulent. **Leaves** falcate. **Flowers** in cymes, pale yellow to gold-coloured, reddish on outer surface. **Capsules** 5-locular, closing bodies present, valve wings narrow. Karoo sediments; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Prince Albert and Willowmore).

willowmorensis L.Bolus
Perennial, dwarf, caespitose shrublet, up to 0.1 m high, branches woody, upright. **Leaves** ascending, curved, apex blunt, curved inwards. **Flowers** solitary to 3-nate, yellow. **Flowering time** spring and summer. **Capsules** 5-locular, top almost flat, covering membranes complete, closing bodies small. Flats and hills of karoo shales or siltstones; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Willowmore).

LAMPRANTHUS N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Brack mesemb; *brakvygie* (A)

Species ± 85, sthn Afr., introduced in Australia; N, KZN, NC, WC, EC.

[E]algoensis L.Bolus
Erect, perennial, dwarf shrublet, up to 0.35 m high, stems woody with age. **Leaves** acuminate, glaucous, apex recurved. **Flowers** solitary, scarlet, white towards centre. **Flowering time** late winter to spring. **Capsules** 5-locular, covering membranes complete, valve wings broad, closing bodies absent, expanding keels broad, parallel with serrulate inner margins. Stony soil in scrub; Eastern Fynbos-Renosterveld, Albany Thicket (Port Elizabeth).

disgregus N.E.Br.
Perennial, dwarf shrublet, up to 0.6 m high, stems decumbent or erect. **Leaves** semiterete to terete, smooth. **Flowers** solitary, rose-purple to almost red. **Capsules** 5-locular, covering membranes well developed, valve wings broad. Habitat not recorded; Albany Thicket (Port Elizabeth, Uitenhage).

fugitans L.Bolus
Perennial, dwarf shrublet, up to 0.25 m high, stems decumbent, forming small loose mats, rooting at nodes. **Leaves** glaucous, triquetrous, margins often tinged red. **Flowers** large, solitary, deep pink to pinky purple. **Flowering time** spring to late summer.

Capsules deep brown, woody, 5-locular, valve wings broad, closing bodies absent, dense clumps of funicular hairs closing locule. Rocky outcrops of Table Mountain Sandstone with dense cover of leaf litter near bush clumps; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Pondoland).

[E]hollandii (L.Bolus) L.Bolus

Erect, perennial, dwarf shrublet, up to 0.2 m high. **Leaves** trigonous, smooth. **Flowers** in irregular cymes, bright pink or pinkish purple. **Flowering time** spring and summer. Rocky outcrops near sea; Eastern Fynbos-Renosterveld, Albany Thicket (Port Elizabeth and Alexandria).

[E]lavisii (L.Bolus) L.Bolus

Erect, perennial, dwarf shrublet, up to 0.35 m high, stems dark brown. **Leaves** trigonous, acute, smooth. **Flowers** in cymes, bright pink. **Capsules** 5-locular. Habitat not recorded; Eastern Fynbos-Renosterveld (Humansdorp).

[E]macrocarpus (A.Berger) N.E.Br.

Perennial, dwarf shrublet, robust, branches spreading. **Leaves** subtriquetrous. **Flowers** ternate, rose-purple. **Flowering time** Oct.–Dec. **Capsules** 5-locular. Habitat not recorded; Upper Karoo, Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Grassland (Cradock SE to Grahamstown).

[E]macrosepalus (L.Bolus) L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, branches sprawling to prostrate. **Leaves** triquetrous, basally fused, blunt to shortly acuminate. **Flowers** solitary, bright pink. **Flowering time** Sept.–Jan. **Capsules** woody, 5-locular. Habitat not recorded; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp).

[E]mutans (L.Bolus) N.E.Br.

Erect, perennial, dwarf shrublet, up to 0.2 m high, branches virgate. **Leaves** subcylindrical, smooth, apex recurved, apiculate. **Flowers** often ternate, pink with yellow centre; pedicels long. **Flowering time** Oct., Nov. **Capsules** woody, 5-locular. Habitat not recorded; Albany Thicket, Eastern Fynbos-Renosterveld (Port Elizabeth to Humansdorp).

[E]praecipitatus (L.Bolus) L.Bolus

Perennial, dwarf shrublet, up to 0.3 m high, stems woody hanging over cliffs. **Leaves** semi-terete, smooth. **Flowers** solitary to ternate, white. **Flowering time** spring to summer. **Capsules** 5-locular. Rocky cliffs; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Grahamstown).

[E]productus (Haw.) N.E.Br.

Erect, perennial, dwarf shrublet, up to 0.4 m high, stems red when young, turning woody and dark with age. **Leaves** trigonous, glaucous. **Flowers** in few-flowered cymes, pale pink to white. **Capsules** not known. Stony plains or rocky outcrops; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Kirkwood to Uitenhage and E to Grahamstown).

spectabilis (Haw.) N.E.Br.

Perennial, dwarf shrublet, up to 0.3 m high, branches angular and purple when young becoming terete and brown with age. **Leaves** trigonous, glaucous. **Flowers** solitary, bright purple. **Flowering time** spring to early summer. **Capsules** not known. Mountain fynbos, against slopes, grassland; Eastern Fynbos-Renosterveld, Albany Thicket,

Sub-Escarpment Savanna (Kareedouw E to Suurberg within the Greater Addo Elephant National Park, Grahamstown and Port Alfred).

[E]stayneri (L.Bolus) N.E.Br.
Perennial, dwarf shrublet, up to 0.2 m high, branching profusely. **Leaves** triquetrous, smooth, glaucous. **Flowers** ternate, pinkish purple. **Flowering time** spring and summer. **Capsules** woody, 5-locular. Habitat not recorded; Albany Thicket, Sub-Escarpment Grassland (Bedford).

stipulaceus (L.) N.E.Br.
Perennial, dwarf shrublet, up to 0.5 m high, stems erect, red when young becoming darker and woody with age. **Leaves** subterete, subfalcate, glaucous. **Flowers** solitary, purple. **Flowering time** Feb.? **Capsules** not known. Western aspects of rocky slopes, amongst bushes, in shade; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Steytlerville, Baviaanskloof).

uniflorus (L.Bolus) L.Bolus
Perennial, dwarf shrublet, up to 0.8 m high, stems pale brown, branching profusely. **Leaves** clavate, incurved, glaucous, obtuse. **Flowers** solitary, ebracteate, bright pink. **Flowering time** Nov.–Apr. **Capsules** pale brown, 5-locular, covering membranes flat, expanding keels parallel, but distant, valve wings broad. Stony flats; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (from Calvinia SE to Willowmore).

[E]zeyheri (Salm-Dyck) N.E.Br.
Perennial, dwarf shrublet, up to 0.45 m high, branches upright. **Leaves** terete, mucronate, bright green, smooth. **Flowers** solitary, bright purple. **Flowering time** Sept.–Nov. **Capsules** woody, 5-locular. Habitat not recorded; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage District).

LEIPOLDTIA L.Bolus

Subfamily Ruschioideae, tribe Ruschieae
Cushion mesemb; *kussingvygie* (A)
Species ± 13, sthn Afr., N, NC, WC, EC.

schultzei (Schltr. & Diels) Friedrich
Perennial, dwarf shrublet, up to 0.7 m high, stems decumbent or salutatory. **Leaves** trigonous. **Flowers** in cymes, deep pink to purple. **Flowering time** Apr.–Sept. **Capsules** 10-locular. Rocky flats and hills; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (from WC to Humansdorp).

LITHOPS (N.E.Br.) N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae
Cattle-hoof mesemb, stone plant; *beeskloutjies* (A)
Species ± 60, sthn Afr., N, Karoo regions of NC, WC, EC.

localis (N.E.Br.) Schwantes
Perennial, dwarf, acaulescent succulent. **Leaves** windowed, speckled. **Flowers** solitary, yellow sometimes white. **Flowering time** Apr., May. **Capsules** pale brown, 5- or 6-locular. Rocky karroid scrub; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (from WC to Steytlerville).

MACHAIROPHYLLUM Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Dagger mesemb; *dolkvygie* (A)

Species ± 4, sthn Afr., fynbos and renosterveld of WC, EC.

bijliae (N.E.Br.) L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, stemless, basally branched with age. **Leaves** opposite, trigonous, linear-lanceolate, smooth, glaucous. **Flowers** solitary, nocturnal, yellow, paler in centre. **Flowering time** Aug.–Nov. **Capsules** 5–10-locular, valves with short narrow wings, expanding keels serrate to lacerate, parallel at base, diverging at apex with terminal awns, covering membranes complete, closing bodies small. Rocky quartzitic outcrops in fynbos and renosterveld, alt. > 800 m; Rainshadow Valley Karoo, Dry Highveld Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Swartberg Mts E to Somerset East, from Baviaanskloof and Kouga Mts to Suurberg).

[E]**stayneri** L.Bolus

Perennial, dwarf, densely compact shrublet, up to 0.05 m high, forming mats. **Leaves** trigonous, linear-lanceolate, smooth, glaucous. **Flowers** nocturnal, in few-flowered, dichasially-branched inflorescence, yellow, tinged orange outside, paler at base. **Flowering time** Aug., Sept. **Capsules** 6–8-locular. Habitat not recorded; Albany Thicket, Eastern Fynbos-Renosterveld (Suurberg Pass).

MALEPHORA N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Finger mesemb; *vingerkanna* (A)

Species ± 17, sthn Afr., arid regions of FS, NC, WC, EC.

latipetala (L.Bolus) H.Jacobsen & Schwantes

Perennial, dwarf shrublet, up to 0.3 m high, stems erect becoming decumbent, not rooting at nodes, internodes angled, purple-red becoming brown with age. **Leaves** terete, connate at base, apically acute, glaucous. **Flowers** solitary, gold-coloured. **Flowering time** spring to late summer. **Capsules** 9- or 10-locular. Flats and hills of karoo sediments; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (WC east to Willowmore).

lutea (Haw.) Schwantes

Perennial, dwarf shrublet, up to 0.3 m high, stems rooting at nodes. **Leaves** compressed-trigonous, obtuse, longer than internodes, glaucous, smooth. **Flowers** solitary, bright yellow. **Capsules** 8–10-locular. Habitat not recorded; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Little Karoo to Port Elizabeth).

luteola (Haw.) Schwantes

Perennial, dwarf shrublet, up to 0.2 m high, sprawling, stems not rooting at nodes. **Leaves** apiculate, recurved, glaucous. **Flowers** solitary, yellow. **Flowering time** Aug., Sept. **Capsules** 8–10-locular. Valley bushveld/false macchia, sandstone and quartzite; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Little Karoo E to Uitenhage, Addo and Sunday's River Valley).

mollis (Aiton) N.E.Br.
Dwarf shrublet, up to 0.6 m high, forming large clumps. **Leaves** apically recurved. **Flowers** solitary or in cymes of 3, yellow. **Flowering time** all year. **Capsules** 7–10-locular. Flats and hills of karoo shales or siltstones; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (WC to Willowmore).

[E]thunbergii (Haw.) Schwantes
Dwarf shrublet, up to 0.1 m high, trailing stems. **Leaves** trigonous to terete, smooth, apex acute. **Flowers** solitary, yellow. **Flowering time** Aug.–Nov. **Capsules** not known. Flats and hills of karoo shales or siltstones; Albany Thicket (Kirkwood).

uitenhagensis (L.Bolus) H.Jacobsen & Schwantes
Mat-forming, dwarf shrublet, up to 0.2 m high, stems creeping. **Leaves** terete, smooth. **Flowers** solitary, yellow to copper. **Flowering time** Apr.–Sept. **Capsules** 8–12-locular, valve wings broader than expanding keels. Flats and hills of karoo shales or siltstones; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (WC east to Uitenhage).

MARLOTHISTELLA Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Species ± 2, sthn Afr., Karoo regions of NC, WC, EC.

stenophylla (L.Bolus) S.A.Hammer.
Perennial, dwarf shrublet, up to 0.1 m high, forming dense cushions with thickened fleshy roots. **Leaves** erect, triangular-oblong, punctate, up to 45 mm long, recurved, apex acute. **Flowers** solitary, up to 35 mm in diam.; petals pink with a darker central stripe; pedicels 15 mm long. **Flowering time** July, Aug. (midwinter). **Capsules** 5-locular, covering membranes, closing bodies large, expanding keels divergent. Stony grassland or quartzite flats; Upper Karoo, Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (WC east to Willowmore).

MESEMBRYANTHEMUM L.

Subfamily Mesembryanthemoideae (see both keys 1 (p. 196) and 2 (p. 198) under Keys to genera; groups arranged alphabetically)

(= *APTENIA* N.E.Br., *ARIDARIA* N.E.Br., *BROWNANTHUS* Schwantes, *PHYLLOBOLUS* N.E.Br., *PRENIA* N.E.Br., *PSILOCAULON* N.E.Br., *SCELETIUM* N.E.Br.)

Occurring in Mediterranean regions worldwide, possibly introduced; 103 spp. in arid parts of sthn Angola and sthn Afr., N, FS, NC, WC, EC.
(adapted from Klak et al. 2007)

Aitonis group

Prostrate, ascending or erect annual or biennial. **Leaves** flat and broad or narrow, with conspicuous or flattened bladder cells. **Flowers** with androecial parts free or shortly fused towards bases. **Fruit** 5-locular, valve wings inflexed over valves or reflexed and fused in pairs. **Seeds** small (0.5–1.2 mm long), brown with rough testa.

aitonis Jacq.
Prostrate or ascending annual or biennial, up to 0.4 m high, internodes terete. **Leaves** succulent, flat, ovate to lanceolate-spathulate, glassy bladder cells on leaf surface,

margins may turn red. **Flowers** white or pale yellow, sometimes tinged pink at apex. **Flowering time** Sept.–Jan. **Capsules** pale golden-brown, 4- or 5-locular, valve wings inflexed over valves. Pioneer of disturbed sites or roadsides; Lower Karoo, Upper Karoo, Drakensberg Grassland, Indian Ocean Coastal Belt, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Graaff-Reinet E to Kei River Mouth S, from Willowmore to Uitenhage, Port Elizabeth, Grahamstown and East London).

Aptenia group

Prostrate to scandent or climbing perennial. **Stems** with persistent green succulent cortex, 4-angled or cylindrical. **Leaves** opposite, not fused at base, shiny green, without visible wax layer; broad and flat or rarely almost cylindrical. **Fruit** 4-locular, with or without valve wings, valve wings inflexed over valves. **Seeds** rough, testa cells centrally papillose.

cordifolium L.f.

Brack mesemb; *brakvygie* (A)

Perennial, scrambling, prostrate, mat-forming or weakly erect, succulent herb, up to 0.25 m high. **Stems** 4-angled. **Leaves** opposite, flat, heart-shaped with glassy bladder cells. **Flowers** pink, up to 20 mm diam. **Flowering time** Dec.–Apr. **Capsules** without valve wings. Shade or semi-shady areas; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Coffee Bay S, from Bedford to Komga, Willowmore to East London and Tsitsikamma to Humansdorp).

geniculiflorum L.

Prostrate to erect or scrambling perennial, up to 0.6 m high. **Stems** 4-angled. **Leaves** sessile, deciduous, channelled or almost cylindrical. **Flowers** pale yellow or white, up to 30 mm diam. **Flowering time** Sept.–May. **Capsules** with valve wings. Arid karoo plains; Albany Thicket, Upper Karoo, Dry Highveld Grassland, Lower Karoo, Rainshadow Valley Karoo (Graaff-Reinet E to Cradock and Somerset East, and S to Steytlerville).

[E]**haeckelianum** A.Berger

Perennial, prostrate or scrambling, up to 0.3 m high. **Stems** 4-angled. **Leaves** flat, ovate to lanceolate. **Flowers** pale yellow, up to 25 mm in diam. **Flowering time** Oct.–Jan. **Capsules** with valved wings. Karroid flats to coastal scrubland; Albany Thicket (Hankey E to Port Elizabeth, Uitenhage Kirkwood and Alexandria).

Aridaria group

Low growing or up to 1 m high, erect, shrubby perennial. **Stems** woody, with thickened rootstock. **Leaves** almost cylindrical, epidermis bladder cells much flattened (scarcely visible), deciduous. **Flowers** large (up to 40 mm in diam.), usually nocturnal. **Fruit** 4-locular, valve wings inflexed over valves. **Seeds** rough, testa cells centrally papillose.

noctiflorum L. subsp. **defoliatum** (Haw.) Klak
(= *Mesembryanthemum defoliatum* Haw.)

Perennial, upright shrublet with woody stems, up to 1 m high, sometimes sprawling over other plants. **Flowers** white or cream-tinged copper-coloured, salmon or yellow. **Flowering time** Sept.–Jan. **Capsules** with a conical upper portion; seeds dark brown with crest small, indistinct or absent. Flats and hills of karoo shales or siltstones; Upper Karoo, Dry Highveld Grassland, Albany Thicket (from NC to Albany).

noctiflorum L. subsp. **stramineum** (Haw.) Klak
(= *Mesembryanthemum stramineum* Haw.)

Perennial, upright shrublet, up to 1 m high, with woody stems. **Flowers** white suffused with shades of pink, copper or yellow, opening at dusk. **Flowering time** Sept.–Nov. **Capsules** with a hemispherical upper portion; seeds dark brown with a large crest, closing ± completely once opened. Flats or hills of karoo sediments; Upper Karoo, Rainshadow Valley Karoo, Albany Thicket (Griqualand West to Steytlerville).

Brownanthus group

Mouse mesemb; *muisvygie* (A)

Decumbent to erect, perennial shrub, at least youngest stems succulent and green, articulate, epidermis of stems with closely packed, xeromorphic bladder cells. **Leaves** deciduous or marcescent; leaf sheaths fringed with conspicuous, deflexed hairs at base; epidermal bladder cells mesomorphic. **Flowers** small, 5–10(–20) mm in diam.; petals white or cream-coloured; sepals remaining erect during anthesis. **Fruit** 4- or 5-locular, valve wings inflexed over valves, lower part of fruit shallow.

vaginatum Lam.

Perennial, dwarf shrublet, 0.3 m high, forming small mats. **Leaves** succulent, decussate, almost cylindrical or channelled, apex blunt, covered with dull glassy idioblasts, a ring of down pointing hairs at leaf base less than half as long as internodes. **Flowers** in few-flowered cymes, white or cream-coloured. **Flowering time** early spring to late summer. **Capsules** 5-locular, without seed bags. Pioneer frequenting roadsides, flats and hills of karoo sediments; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (Calvinia to Willowmore District and Steytlerville).

Cryophytum group

Prostrate to ascending annual or biennial herb. **Leaves** flat and often very broad, margins often undulating, epidermis with conspicuous bladder idioblasts. **Flowers** cream-coloured to pale yellow with many fine petals, filamentous staminodes and stamens. **Fruit** 5-locular, valve wings inflexed over the valves. **Seeds** rough or rarely smooth, testa cells centrally papillose.

crystallinum L.

Prostrate annual, forming large mats, up to 0.5 m high. **Leaves** flat, ovate-spathulate, covered in large, glassy bladder cells. **Flowers** cream-coloured, sometimes tinged pink at apex. **Flowering time** Feb.–Nov. **Capsules** pale golden-brown, 4- or 5-locular, valve wings inflexed over valves. Pioneer of stony flats and hills, mainly winter rainfall areas; Upper Karoo, Sub-Escarpment Grassland, Rainshadow Valley Karoo, Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (Cradock to Bedford S, from Willowmore to Steytlerville, Uitenhage and Port Elizabeth).

Phyllobolus group

Perennial, prostrate to erect shrub to minute geophyte, stems corky or woody, long or much shortened, roots often thickened. **Leaves** almost cylindrical or flattened, deciduous, marcescent or persistent, epidermal bladder cells mostly distinct. **Flowers** (10–) 20–40 mm in diam., reproductive parts in several species concealed, usually diurnal. **Fruit** 4- or 5-locular, valve wings inflexed over valves. **Seeds** with a rough testa, testa cells convex and arranged in concentric rows.

canaliculatum Haw.

Geophyte with decumbent branches, up to 0.05 m high, with thickened tuberous roots. **Leaves** narrowly ovate to linear, cylindrical or channelled, decussate, becoming alternate towards inflorescence, covered with dull, glassy bladder cells. **Flowers** solitary, pale yellow to shades of pink or mauve. **Flowering time** spring to midsummer. **Capsules** pale golden-brown, 5-locular, valve wings inflexed over valves, covering membranes absent. Limestone or sandy flats near coast; Eastern Fynbos-Renosterveld, Albany Thicket (from WC to Port Elizabeth).

grossum Aiton

Prostrate to scrambling shrublet, up to 0.15 m high, stems becoming woody at base, roots tuberous. **Leaves** almost cylindrical, narrowly ovate to linear, decussate becoming alternate towards inflorescence, covered with dull, glassy bladder cells. **Flowers** solitary, pale yellow to shades of pink. **Flowering time** Sept., Oct. **Capsules** pale golden-brown, 5-locular, valve wings inflexed over valves, covering membranes absent. Slopes or plains of karoo sediments, often scrambling in other plants; Upper Karoo, Drakensberg Grassland, Rainshadow Valley Karoo, Albany Thicket (Middelburg and Adelaide districts S, from Steytlerville to Ecca Pass Nature Reserve at Grahamstown).

nitidum Haw.

Decumbent to upright shrublet, up to 0.5 m high, stems stout, weakly woody, roots not tuberous. **Leaves** subcylindrical, narrowly ovate, covered with glassy bladder cells. **Flowers** solitary or in dichasia, pale yellow to bright pink. **Flowering time** Sept., Oct. **Capsules** pale golden-brown, 4- or 5-locular, valve wings inflexed over valves, expanding keels to centre of fruit, covering membranes absent. Plains of mainly winter rainfall areas; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (from WC to Willowmore).

Phyllobolus splendens group

Erect, perennial shrub, up to 1 m high, stems woody, root not thickened. **Leaves** almost cylindrical, narrowly ovate, persistent, epidermal bladder cells small. **Flowers** 30–40 mm in diam. **Fruit** 5-locular, valve wings inflexed over valves. **Seeds** with a rough testa, testa cells convex and arranged in concentric rows.

splendens (L.) Gerbaulet subsp. **pentagonum** (L.Bolus) Klak (= *Aridaria pentagona* L.Bolus)

Brack-veld mesemb; *brakveldvygie* (A)

Perennial, dwarf shrublet, up to 0.3 m high, forming loose mats, roots not tuberous. **Leaves** almost cylindrical, narrowly ovate, decussate, becoming alternate towards inflorescence. **Flowers** solitary or in dichasia, cream-coloured, pale yellow, pale pink or pale salmon. **Flowering time** Oct.–Dec. **Capsules** pale golden-brown, 5-locular, valve wings inflexed over valves, expanding keels to centre of fruit, covering membranes absent. Plains or on lower slopes, often along roadsides; Lower Karoo, Upper Karoo, Dry Highveld Grassland, Albany Thicket, Rainshadow Valley Karoo (Graaff-Reinet to Cradock and Somerset East S, from Klaarstroom to Willowmore, Steytlerville, Alexandria and Committees Flats of Fish River Valley).

splendens (L.) Gerbaulet subsp. **splendens**

Differs from subsp. *pentagonum* in the following: upright shrublet, up to 1 m high. **Flowering time** Sept.–Dec. Plains or hills of karoo sediments; Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (below 33° S, Willowmore District E

to Steytlerville, Jansenville, Wolwefontein, Greater Addo Elephant National Park, Grahamstown and Alexandria).

Prenia group

Prostrate to rarely ascending (*M. tetragonum*) perennial, stems weakly lignified, roots fibrous. **Leaves** alternate on flowering branches, flat (erect in central tuft), flatly triquetrous (margins flat), obtusely trigonous or almost cylindrical, persistent, epidermal bladder cells much flattened. **Flowers** 20–40 mm in diam. **Fruit** 4- or 5-locular, locules deep, valve wings inflexed over valves. **Seeds** rough, testa cells centrally papillose.

radicans (L.Bolus) Klak
(= *Aridaria radicans* L.Bolus)

Prostrate, perennial, dwarf shrublet, up to 0.05 m high, rooting at nodes. **Leaves** subcylindrical, linear, smooth, glaucous with waxy layer. **Flowers** solitary, white to pale yellow. **Flowering time** Oct.–Mar. **Capsules** pale brown, 4-locular, locules deep, covering membranes absent, valve wings inflexed over valves. Karroid flats and hills often in disturbed areas; Upper Karoo, Dry Highveld Grassland, Albany Thicket, Lower Karoo, Rainshadow Valley Karoo (Cradock and Tarkastad districts S, from Steytlerville E to Greater Addo Elephant National Park).

tetragonum Thunb.

Erect, perennial shrublet, up to 0.7 m high, branches weakly lignified. **Leaves** subcylindrical, decussate to alternate in inflorescences, with a thick wax layer. **Flowers** in bracteose dichasia, white to pale yellow or pale pink. **Flowering time** Sept.–Mar. **Capsules** 4-locular, covering membranes absent, valve wings inflexed over valves, expanding keels extending to centre of fruit. Flats and hills of arid areas often in disturbed areas; Upper Karoo, Albany Thicket, Lower Karoo, Rainshadow Valley Karoo (between Middelburg and Steynsburg S, from Fish River at Cradock to Willowmore and Steytlerville).

Psilocaulon group

Ash bush, soap bush; *asbos*, *seepbos* (A)

Small to large, prostrate to erect, shrubby perennial or rarely annual or geophyte, at least youngest stems succulent and green, usually articulate, epidermis of stems and leaves similar, with much flattened bladder cells. **Leaves** cylindrical to slightly trigonous, rarely flat and broad, sheaths nude at base, inconspicuous; deciduous. **Flowers** 5–25 mm in diam., filamentous staminodes and stamens conically collected, rarely petals or filamentous staminodes absent. **Fruit** 4- or 5-locular, valve wings inflexed over valves, rarely reflexed and fused in pairs, usually with deep locules. **Seeds** small (0.5–1.2 mm long).

articulatum Thunb.

Decumbent to erect, annual or perennial shrublet, 0.1–0.3 m high, stems with conspicuous nodes with fine horizontal furrow, covered by hair-like bladder cells. **Leaves** often reduced, dried up or deciduous, stems taking over photosynthetic role. **Flowers** solitary to many per cyme, white or dark to pale pink. **Flowering time** all year. **Capsules** pale brown, 5-locular, valve wings inflexed over valves. Pioneer mostly on disturbed areas; Upper Karoo, Dry Highveld Grassland, Albany Thicket, Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Middelburg S, from Graaff-Reinet to Cradock, Steytlerville to Wolwefontein District and to Greater Addo Elephant National Park).

bicorne Sond.

Perennial, prostrate, dwarf shrublet, with a cluster of short stems in the centre, up to 0.05 m high, stems articulate. **Leaves** free with short mucro, bladder cells flattened, often reduced, dried up or deciduous, stems taking over photosynthetic role. **Flowers** in few- to many-flowered cymes, white. **Flowering time** Oct., Nov. **Capsules** 5-locular, valve wings inflexed over valves. Pioneer mostly on disturbed areas; Albany Thicket, Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Willowmore District, Kariega Riverbed and Gwarriepoort area E to Greater Addo Elephant National Park at Uitenhage).

coriarium Burch. ex N.E.Br.

Perennial, scrambling shrublet, up to 3 m high, stems decumbent to erect, articulate, nodes conspicuous with a fine horizontal furrow, bladder cells flattened. **Leaves** free, often reduced, dried up or deciduous, stems taking over photosynthetic role. **Flowers** solitary to many per cyme, white or pale pink. **Flowering time** Oct.–Jan. **Capsules** 4- or 5-locular, valve wings inflexed over valves. Pioneer mostly at disturbed areas; Upper Karoo, Lower Karoo, Albany Thicket, Dry Highveld Grassland, Rainshadow Valley Karoo (Middelburg and Hofmeyr districts S, from Graaff-Reinet to Cradock and from Steytlerville to Wolwefontein).

granulicaule Haw.

Perennial, annual or biennial shrublet, up to 0.25 m high, stems articulate, bladder cells dome-shaped. **Leaves** free, without mucro, often reduced, dried up or deciduous, stems taking over photosynthetic role. **Flowers** solitary to few per terminal or lateral cyme, pale yellow to cream-coloured. **Flowering time** Oct., Nov. **Capsules** 5-locular, valve wings inflexed over valves. Pioneer in disturbed areas; Upper Karoo, Dry Highveld Grassland, Albany Thicket, Sub-Escarpment Savanna, Rainshadow Valley Karoo (Kimberley to Venterstad S, from Graaff-Reinet to University of Fort Hare and from Steytlerville to Uitenhage, Port Elizabeth, Grahamstown and Alexandria).

junceum Haw.

Perennial, annual or biennial shrublet, up to 0.6 m high, stems articulate, prostrate, decumbent or erect, nodes conspicuous with fine horizontal furrow, bladder cells flattened. **Leaves** free, without mucro, often reduced, dried up or deciduous, stems taking over photosynthetic role. **Flowers** solitary to few per terminal or lateral cyme, white or pale to darker pink. **Flowering time** Oct., Nov. **Capsules** 4- or 5-locular, valve wings inflexed over valves. Pioneer in disturbed areas; Lower Karoo, Upper Karoo, Rainshadow Valley Karoo, Albany Thicket (Pearston E to Riet River near Cradock S, from Willowmore E to Baviaanskloof, Steytlerville, Jansenville, Uitenhage and Port Elizabeth).

Sceletium group

Salty mesemb; *kougoed*, *kanna*, *soutvygie* (A)

Prostrate to erect, small perennial, often scrambling in other bushes, roots fibrous. **Leaves** flat, ovate, dry leaves persistent and 'skeletonised' through lignified veins. **Flowers** 20–40 mm in diam. **Fruit** 4–6-locular, with or without valve wings, valve wings inflexed over valves, breaking off easily and dispersed by wind. **Seeds** rough, testa cells convex and arranged on concentric rows.

crassicaule Haw.

Perennial, dwarf shrublet, up to 0.25 m high, stems prostrate to decumbent. **Leaves** not imbricate, linear-lanceolate, with 3–5 straight veins, bright green, bladder cells flat, apex

recurved. **Flowers** solitary, white to pale yellow. **Flowering time** Oct., Nov. **Capsules** pale golden-brown, 5- or 6-locular, valves not opening completely, valve wings present. Karroid plains and slopes; Lower Karoo, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket (Western Cape E to Pearston, Willowmore, Redhouse and Grahamstown).

emarcidum Thunb.

Perennial, dwarf shrublet, up to 0.2 m high, decumbent or scrambling subshrub. **Leaves** linear-lanceolate, not imbricate, with 1 main vein, the others branching off, not reaching the margins, bladder cells domed, apex recurved. **Flowers** solitary, shades of white or pale yellow. **Flowering time** Nov.–July. **Capsules** 4- or 5-locular, valve wings present. Karroid areas; Upper Karoo, Dry Highveld Grassland (NC E to Cradock).

tortuosum L.

Perennial, dwarf shrublet, up to 0.3 m high. **Leaves** linear-lanceolate, with 3–5 straight veins, imbricate, bladder cells flat, apex incurved. **Flowers** solitary, sessile, white to pale yellow. **Flowering time** Aug.–June. **Capsules** 4- or 5-locular, valve wings present. Plains and hills on rocky areas of quartzitic origin; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Western Cape E to Willowmore and Steytlerville).

MESTOKLEMA N.E.Br. ex Glen

Subfamily Ruschioideae, tribe Ruschieae

Donkey mesemb; *donkievygie*, *donkiebos* (A)

Species ± 6, sthn Afr., arid regions, N, B, NW, FS, WC, EC.

[E]**albanicum** N.E.Br. ex Glen

Perennial, dwarf shrublet, 0.25–0.40 m high, stems erect, smooth. **Leaves** trigonous to subterete, recurved at apex, bladder cells fine, glassy. **Flowers** in lax cymes, magenta. **Flowering time** June–Jan. **Capsules** 5-locular, covering membranes complete, closing bodies absent, expanding keels parallel at base diverging at apex, valve wings narrow, acutely pointed. Rocky flats and hills in karroid vegetation; Eastern Fynbos-Renosterveld, Albany Thicket (Uitenhage E to N of Grahamstown and Alexandria).

[E]**elatum** N.E.Br. ex Glen

Perennial, dwarf shrublet, up to 1.2 m high, main branches ascending, minutely papulose when young, rootstock tuberous. **Leaves** compressed-trigonous, apex recurved, bladder cells fine, glassy. **Flowers** in compact cymes, purple. **Flowering time** Oct., Nov. **Capsules** 5-locular, covering membranes complete, closing bodies absent, expanding keels diverging widely at apex, valve wings as broad as expanding keels. Karroid scrub; Rainshadow Valley Karoo, Albany Thicket (Steytlerville, Jansenville and Fish River Valley).

[E]**illepidum** N.E.Br. ex Glen

Perennial, dwarf shrublet, up to 0.3 m high, stems smooth, much-branched. **Leaves** compressed-subterete, obtuse, recurved at apex, bladder cells fine, glassy. **Flowers** in rich cymes, pale magenta. **Flowering time** Nov.? **Capsules** 5-locular, covering membranes complete, closing bodies absent, expanding keels diverging at apex, valve wings broad. Loamy soils in karroid scrub; Sub-Escarpment Grassland, Albany Thicket (between Cradock and Tarkastad and to Bedford).

tuberosum (L.) N.E.Br. ex Glen

Perennial, dwarf, erect shrublet, 0.7–0.9 m high, subglobose, tuberous rootstock, stems smooth. **Leaves** slender, trigonous, recurved at apex, bladder cells fine, glassy. **Flowers** in rich cymes, orange. **Flowering time** Feb.–June. **Capsules** not known. Scrub in alluvial soils; Upper Karoo, Dry Highveld Grassland, Lower Karoo, Drakensberg Grassland, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Albany Thicket (Bethulie to Aliwal North S, from Middelburg to Graaff-Reinet and Alice, and from Baviaanskloof to Uitenhage).

MOSSIA N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Bead mesemb; *kralevygie* (A)

Species ± 1, sthn Afr., G, M, FS, L, EC.

intervallaris (L.Bolus) N.E.Br.

Perennial, creeping, dwarf succulent, forming loose mats, up to 0.02 m high, rooting at nodes. **Leaves** trigonous to club-shaped, glaucous, punctate, apex blunt. **Flowers** solitary, cream-coloured or pale yellow, opening in evening. **Flowering time** Sept.–Feb. **Capsules** 5-locular, valve wings absent, closing body absent, expanding keels divergent forming sheets, covering membranes as a ledge. Rock plates in shallow soil, at high altitudes; Drakensberg Grassland, Sub-Escarpment Grassland (Wodehouse, Molteno and Sterkstroom).

NANANTHUS N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Brack mesemb, yeast mesemb; *brakvygie* (A); *mosedi* (S)

Species ± 10, drier parts of sthn Afr., N, B, G, M, FS, NC, EC.

[E]gerstneri (L.Bolus) L.Bolus

Perennial, caespitose, dwarf succulent, with thickened rootstock, sometimes branched, up to 0.02 m high. **Leaves** sublinear, punctate, apex acuminate, borne flat on ground. **Flowers** solitary, yellow with red central stripe. **Flowering time** Aug., Sept. **Capsules** pale brown, 6–10-locular, pale brown, valve wings broad, closing bodies absent, covering membranes incomplete. Fine alluvial soils; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland (Aliwal North and Lady Grey S to Burgersdorp).

[E]pole-evansii N.E.Br.

Perennial, caespitose, dwarf succulent, with thickened rootstock, up to 0.03 m high. **Leaves** boat-shaped, depressed-trigonous in cross section, punctate, with awn facing inward, borne flat on ground. **Flowers** solitary, yellow with red central stripe. **Flowering time** July–Sept. **Capsules** pale brown, 6–10-locular, valve wings broad, closing bodies absent, covering membranes incomplete. Open areas in grassland, limestone pans or in sandy brackish pans; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland (Middelburg and Cradock E to Steynsburg and Cala).

NEOHENRICIA L.Bolus

Subfamily Ruschioideae, tribe Ruschieae

Coral plant, wart mesemb; *vratvygie* (A)

Species ± 2, sthn Afr., FS, NC, EC.

sibbettii (L.Bolus) L.Bolus

Minute, perennial, dwarf mat-forming succulent, up to 0.02 m high, rooting at nodes. **Leaves** succulent, club-shaped, apex covered with white, warty outgrowths. **Flowers** solitary, pale yellow to cream-coloured, sometimes tipped with pink, scented, opening at night. **Flowering time** Sept.–Jan. **Capsules** 4- or 5-locular, valve wings absent, covering membranes absent, expanding keels parallel, closing bodies absent. Grit pans of weathered sandstone of karoo sediments; Upper Karoo, Dry Highveld Grassland (Free State S to Middelburg, Venterstad, Burgersdorp and Steynsburg).

[E]**spiculata** S.A.Hammer

Perennial, dwarf, mat-forming shrublet, up to 0.02 m high, 0.1 m in diam., rooting at nodes. **Leaves** triquetrous, strongly keeled, pointed, punctate. **Flowers** solitary, pale yellow or pale green, sometimes tinged pink at apex, open at night. **Flowering time** Sept.–Feb. **Capsules** 4- or 5-locular, covering membranes a ledge or complete, expanding keels parallel, valve wings absent, closing bodies absent. Fissures of dolomite outcrops; Sub-Escarpment Grassland (Sterkstroom).

[E]**ORTHOPTERUM** L.Bolus

Subfamily Ruschioideae, tribe Ruschieae

Species ± 2, sthn Afr., subtropical thickets, EC.

[E]**coeganum** L.Bolus

Koega mesemb; *Koegavygie* (A)

Perennial, caespitose, dwarf shrublet, up to 0.03 m high, forming clumps. **Leaves** unequal, elongate-trigonous, few or no teeth on margins, pale green, punctate, apex blunt. **Flowers** solitary, ebracteolate, golden-yellow, lower surface reddish. **Flowering time** June, July. **Capsules** 5- or 6-locular, septa dividing into 2, causing open capsule to appear empty, valve wings broad, expanding keels far apart, diverging. Quartzitic outcrops; Albany Thicket (Port Elizabeth).

[E]**waltoniae** L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.03 m high. **Leaves** oblong-lanceolate, punctate, acuminate, margins with 2 or 3 teeth. **Flowers** solitary, golden-yellow, lower surface reddish. **Flowering time** May–July. **Capsules** 5- or 6-locular, septa dividing into 2, upper parts arching over tops of capsules, causing open capsule to appear empty, valve wings basally connate with valves, in erect position when valves are open. Open rocky areas on flats and hills of karoo sediments; Albany Thicket (Fort Brown to N of Grahamstown).

PEERSIA L.Bolus

Subfamily Ruschioideae, tribe Ruschieae

Species ± 3, sthn Afr., Karoo regions of NC, WC, EC.

frithii (L.Bolus) L.Bolus

Perennial, dwarf shrublet, up to 0.1 m high, forming dense clumps. **Leaves** triquetrous, spreading, glaucous, apex acute, sometimes recurved. **Flowers** solitary, gold-coloured. **Flowering time** May–July. **Capsules** rusty-brown, 5-locular, valve wings broad. Slopes or flats of finely weathered Ecca shales; Lower Karoo, Rainshadow Valley Karoo (WC to Aberdeen).

PLEIOSPILOS N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Zebra mesemb, - food, liver plant; *kwaggavygie*, *-kos*, *lewerplant* (A)

Species ± 4, sthn Afr., N, NC, WC, EC.

bolusii (Hook.f.) N.E.Br.

Perennial, caespitose, dwarf shrublet, up to 0.08 m high. **Leaves** highly succulent, broader than long, upper surface flat when young, lower surface gibbose, grey-green or brownish, dotted. **Flowers** solitary, yellow. **Flowering time** May–July. **Capsules** dark brown, woody, 10–12-locular, closing bodies large, covering membranes complete, valve wings broad tapering to apex. Weathered bands of Beaufort shales; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Beaufort West to Aberdeen and S to Willowmore).

[E]**compactus** (Aiton) Schwantes subsp. **minor** L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.03 m high. **Leaves** highly succulent, short, broad, laterally gibbose with speckled surface. **Flowers** solitary, yellow to orange with age. **Flowering time** May, June. **Capsules** sessile, woody, 10-locular, closing bodies large, covering membranes complete, valve wings broad, tapering to apex. Flats and hills of karoo sediments; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (Steytlerville).

nelii Schwantes

Perennial, caespitose, dwarf shrublet, up to 0.05 m high. **Leaves** highly succulent, semiglobose, appressed, flat above, rounded below, surface speckled. **Flowers** solitary, yellow to orange with paler centre. **Flowering time** May–July. **Capsules** dark brown, woody, 10-locular, closing bodies large, brown, covering membranes complete, valve wings broad, tapering to apex. Flats, hills of white quartz pebbles; Upper Karoo, Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Beaufort West to Graaff-Reinet and S to Willowmore).

[E]**simulans** (Marloth) N.E.Br.

Perennial, caespitose, dwarf shrublet, up to 0.05 m high. **Leaves** highly succulent, broader than thick, spreading widely, surface speckled. **Flowers** solitary, sessile to shortly pedicellate, yellow to orange with age. **Flowering time** May, June. **Capsules** dark brown, woody, 12-locular, closing bodies large, covering membranes complete, valve wings broad, tapering to apex. Flats and hills of Beaufort shales; Albany Thicket (Jansenville).

RABIEA N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

S'keng-keng mesemb; *vygie* (A); *s'keng-keng* (SS)

Species ± 6, sthn Afr., Karoo regions and high altitude grassland of FS, L, NC, EC.

[E]albinota (Haw.) N.E.Br.

Perennial, caespitose, dwarf shrublet, up to 0.08 m high, forming dense clumps, roots thickened, tapering. **Leaves** trigonous to triquetrous, flat on upper surface, lower surface distinctly keeled, epidermis with sparse white dots, apex recurved, mucronate. **Flowers** solitary, yellow. **Flowering time** May–Aug. **Capsules** reddish brown, woody, 7–10-locular, valve wings present, covering membranes present, closing bodies absent. Rocky outcrops of karoo sediments; Dry Highveld Grassland, Upper Karoo (Aliwal North S to Middelburg and Graaff-Reinet and E to Cradock).

albipuncta (Haw.) N.E.Br.

Perennial, caespitose, dwarf shrublet, up to 0.03 m high, forming dense clumps, roots thickened, tapering. **Leaves** semi-terete, trigonous in upper parts, not keeled, epidermis with dark green tannin cells. **Flowers** solitary, yellow. **Flowering time** May–Aug. **Capsules** reddish brown, woody, 7–10-locular, valve wings present, covering membranes present closing bodies absent. Rocky outcrops of karoo sediments; Dry Highveld Grassland, Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland (Free State S, from Steynsburg to Sterkstroom and to Cradock District).

[E]difformis (L.Bolus) L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.03 m high, roots thickened, tapering. **Leaves** tapering gradually from a broad base towards pointed apex, not keeled, epidermis with dark green tannin cells. **Flowers** solitary, yellow. **Flowering time** May–Aug. **Capsules** reddish brown, woody, 7–10-locular, valve wings present, covering membranes present, closing bodies absent. Rocky outcrops of karoo sediments; Upper Karoo, Dry Highveld Grassland (Middelburg and Cradock districts).

[E]jamesii (L.Bolus) L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.03 m high, roots thickened, tapering. **Leaves** tapering gradually from a broad base towards pointed apex, not keeled, epidermis with dark green tannin cells. **Flowers** solitary, yellow. **Flowering time** May–Aug. **Capsules** reddish brown, woody, 7–10-locular, valve wings present, covering membranes present, closing bodies absent. Rocky outcrops of karoo sediments; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland (Cradock District).

RHINEPHYLLUM N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Tortoise mesemb; *skilpadvygie* (A)

Species ± 14, sthn Afr., N, WC, EC.

[E]inaequale L.Bolus

Perennial, dwarf shrublet, up to 0.03 m high, forming compact mats, roots thickened. **Leaves** spathulate to oblique-spathulate, rough with white elevations. **Flowers** solitary, pale lemon-yellow. **Capsules** 5-locular, expanding keels parallel, valve wings broadest

in centre, tapering to awns, closing bodies absent, covering membranes reduced to a ledge. Crevices of pale sandstone; Lower Karoo, Albany Thicket (Kendrew).

graniforme (Haw.) L.Bolus

Perennial, dwarf shrublet, up to 0.15 m high, forming compact, rounded clumps. **Leaves** subglobose, ovate to oblong-ovate, older leaves persistent, glaucous, finely tuberculate with rough white dots. **Flowers** solitary, bright yellow. **Flowering time** Aug.–Oct. **Capsules** 5-locular, expanding keels parallel, valve wings broad covering membranes not complete. Fine-grained, weathered karoo shales; Rainshadow Valley Karoo (WC to W of Willowmore).

[E]**parvifolium** L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.03 m high, rootstock thickened, succulent. **Leaves** semi-globose, epidermis rough from white elevations. **Flowers** solitary, deep yellow. **Flowering time** Nov., Dec. **Capsules** 5-locular, covering membranes reduced, expanding keels parallel, valve wings very broad. Flats of karoo shales; Lower Karoo, Albany Thicket (Aberdeen Road to Jansenville).

[E]RHOMBOPHYLLUM (Schwantes) Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Species ± 5, sthn Afr., Karoo regions of EC.

[E]**albanense** (L.Bolus) H.E.K.Hartmann

Perennial, dwarf shrublet, up to 0.1 m high; roots fibrous, stems woody, single at base becoming much branched at apex, grey with age, leaf scars prominent. **Leaves** trigonous, glaucous, epidermis covered by raised dots. **Flowers** solitary, yellow. **Flowering time** Feb.–May. **Capsules** 5-locular, closing bodies bifid, covering membranes complete, expanding keels widely diverging, valve wings distally narrow, broader at base. Flats and hills of weathered Ecca shale; Albany Thicket (Grahamstown).

[E]**dolabriforme** (L.) Schwantes

Perennial, dwarf shrublet, up to 0.3 m high, roots fibrous. **Leaves** sickle-shaped with 2 lobes near apex, epidermis covered by raised white dots. **Flowers** solitary to ternate, yellow. **Flowering time** June–Aug. **Capsules** reddish brown, 5-locular, closing bodies broad, flat. Flats and hills of weathered Karoo shale; Upper Karoo, Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Graaff-Reinet S to Aberdeen and from Studtis, in Willowmore District, E to Grahamstown).

[E]**dyeri** (L.Bolus) Schwantes

Perennial, dwarf shrublet, up to 0.15 m high, forming compact, rounded clumps. **Leaves** subglobose, ovate to oblong-ovate, older leaves deciduous, finely tuberculate with rough white dots. **Flowers** solitary, bright yellow. **Flowering time** Aug.–Oct. **Capsules** 5-locular. Fine-grained, weathered karoo shales; Albany Thicket (Committees Flats to Alicedale).

[E]**nelii** Schwantes

Perennial, dwarf shrublet, up to 0.2 m high; roots fibrous, stems woody dark brown, almost black with age, much branched at apex. **Leaves** flattened, apex divided into 2 lobes, epidermis covered by raised white dots. **Flowers** solitary to ternate, yellow, suffused with red at apex and outer surfaces. **Flowering time** June–Aug. **Capsules** 5-locular, closing bodies inconspicuously bifid, covering membranes complete, valve wings very narrow

at their bases. Flats and hills of weathered karoo shale; Upper Karoo, Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (Graaff-Reinet S to Jansenville and Steytlerville).

[E]rhomboideum (Salm-Dyck) Schwantes

Perennial or annual, dwarf, caespitose shrublet, up to 0.03 m high, roots fibrous, stems reduced. **Leaves** hatchet-shaped, flat on upper surface, keeled below with a prominent chin, margins whitish, epidermis covered by white dots. **Flowers** in cymes, yellow, tinged pink on outer surface. **Flowering time** June–Sept. **Capsules** 5-locular, closing bodies bifid, covering membranes complete, valve wings narrow. Open gravel patches in thicket; Albany Thicket (Swartkops River, Coega, Sundays River and Port Elizabeth).

RUSCHIA Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Thorny mesemb; *doringvygie* (A) (for the spiny members of the genus)

Species ± 220, sthn Afr., central plateau regions of N, NW, G, M, FS, KZN, L, NC, WC, EC.

[E]britteniae L.Bolus

Perennial, dwarf shrublet, up to 0.3 m high, stems woody, densely branched. **Leaves** forming a connate sheath below node, triquetrous, glaucous, keel with 2 teeth, epidermis with low papillae, apex recurved. **Flowers** solitary, deep purplish pink. **Flowering time** Sept.–Jan. **Capsules** woody, 5-locular closing bodies present, valve wings absent. Open areas in bush clumps; Albany Thicket (Grahamstown, Ecca Pass).

[E]complanata L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, stems erect, woody, much branched towards apex. **Leaves** trigonous to semi-terete, epidermis covered with pellucid dots, apex recurved. **Flowers** solitary, white to pink. **Flowering time** Sept.–Jan. **Capsules** woody, rust-red, 5-locular, valve wings absent, closing bodies small, hook-shaped, covering membranes with closing rodlets, expanding keels almost touching. Karoo sediments on mountain slopes at higher altitudes; Lower Karoo, Dry Highveld Grassland, Albany Thicket, Drakensberg Grassland, Sub-Escarpment Savanna (Graaff-Reinet, Cradock, Somerset East, Amatole Mts to N of Grahamstown on Bedford Road).

[E]congesta (Salm-Dyck) L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, stems erect. **Leaves** triquetrous, almost falcate, shortly united into a sheath, glaucous, apex recurved. **Flowers** solitary, deep pink. **Capsules** not known. Flats and hills of karoo shales or siltstones; Eastern Fynbos-Renosterveld, Albany Thicket (Groot River Poort entrance in Steytlerville District E to Uitenhage and Grahamstown).

cradockensis (Kuntze) H.E.K.Hartmann & Stüber subsp. **cradockensis**

Perennial, dwarf shrublet, up to 0.3 m high, stems single at base, branching richly at apex. **Leaves** semi-terete, covered with pellucid dots. **Flowers** in cymes, pink (rarely white). **Flowering time** July–Sept. **Capsules** woody, 5-locular, valve wings absent, closing bodies small, hook-shaped, covering membranes with closing rodlets, expanding keels almost parallel at base, diverging distally. Flats and hills in karroid regions; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (Middelburg District S, from Aberdeen, Graaff-Reinet and Cradock to Willowmore, Steytlerville and Baviaanskloof).

cymbifolia (Haw.) L.Bolus
Perennial, dwarf, caespitose shrublet, up to 0.3 m high, stems slender, erect, single at base, branching copiously at apex. **Leaves** boat-shaped, blunt, glaucous, punctate, apex recurved. **Flowers** solitary or in few-flowered cymes, deep to paler pink. **Flowering time** May–July. **Capsules** 5-locular, closing bodies present, valve wings absent. Sandy or rocky areas in fynbos communities; Eastern Fynbos-Renosterveld, Albany Thicket (WC to Port Elizabeth).

[E]depressa L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.2 m high, stems decumbent. **Leaves** trigonous, shortly united into a sheath, keel with 1 or 2 teeth, glaucous, finely papillate. **Flowers** solitary, pink. **Capsules** 5-locular, valve wings absent, covering membranes complete, closing body triangular from above, expanding keels basally almost touching. Habitat not recorded; Albany Thicket (Uitenhage E to Addo).

fourcadei L.Bolus
Perennial, dwarf shrublet, up to 0.15 m high, stems upright, woody. **Leaves** triquetrous, margins and keel smooth, apex with recurved mucro, punctate. **Flowers** solitary or in ternate cymes, pink. **Flowering time** May–July. **Capsules** 5-locular, closing body small, valve wings absent. Loamy flats and hills in karroid scrub; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket (Swartberg Mts to Steytlerville Karoo, Baviaanskloof, Great Winterhoek Mts, Uitenhage).

[E]framesii L.Bolus
Perennial, dwarf shrublet, up to 0.07 m high. **Leaves** persistent with age, subglobose to trigonous, sheath merging into stem, apex blunt, glaucous, punctate. **Flowers** solitary, pale pink. **Flowering time** Sept.–Dec. **Capsules** 5-locular, valve wings absent, closing bodies present. Flats and hills of karoo shales or siltstones; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Perdepoort, Jansenville).

hamata (L.Bolus) Schwantes
Perennial, dwarf shrublet, up to 0.7 m high, stems woody, upright, branched at apex, woody taproot thickened. **Leaves** slender, shortly united into a sheath, rough from subhypodermal tannin idioblasts, apex recurved. **Flowers** solitary, pink or white. **Flowering time** Jan.–Oct. **Capsules** reddish brown, woody, 5-locular, covering membranes complete with big closing rodlets, valve wings absent, closing bodies small, expanding keels distant. Rocky situations in grassland; Mesic Highveld Grassland, Drakensberg Grassland, Upper Karoo, Dry Highveld Grassland, Albany Thicket (between Zastron and Lady Grey E to Rhodes S, from Middelburg to Nardousberg at Graaff-Reinet and Suurkloof on Sneeuberg Summit).

indurata (L.Bolus) Schwantes
Perennial, caespitose, dwarf shrublet, up to 0.1 m high, forming compact clumps, roots fibrous, thickened. **Leaves** triquetrous, shortly united into sheaths around stems, glaucous, keel and margins cartilaginous, apex toothed, punctate. **Flowers** solitary, bright pink. **Flowering time** Sept.–Apr. **Capsules** woody, deciduous, leaving the pedicel as a star-shaped stalk, 5-locular, valve wings absent, closing bodies present, covering membranes complete. Rocky areas on dolerite outcrops and weathered karoo sediments; Upper Karoo, Dry Highveld Grassland, Lower Karoo, Albany Thicket (Albert District S, from Aberdeen to Pearston and to Grahamstown).

intricata (N.E.Br.) H.E.K.Hartmann & Stüber
Perennial shrublet, up to 0.7 m high, stems erect, woody. **Leaves** obtuse, smooth, glaucous, punctate. **Flowers** in rich, spiny cymes, pink. **Flowering time** June–Apr. **Capsules** 5-locular, valve wings absent. Rocky areas on flats and hills of dolerite and weathered karoo sediments; Dry Highveld Grassland, Upper Karoo, Lower Karoo, Rainshadow Valley Karoo (between Middelburg and Steynsburg and halfway between Burgersdorp and Molteno S, from Pearston to Cradock and to the W of Willowmore).

knysnana (L.Bolus) L.Bolus
Perennial, dwarf shrublet, up to 0.4 m high, stems woody, erect. **Leaves** triquetrous, bright green, apex apiculate. **Flowers** in cymes, pink. **Flowering time** Jan.–Nov. **Capsules** woody, dark brown, 5- or 6-locular, covering membranes complete with distinct closing ledges, closing bodies absent, valve wings absent. Open rocky areas on slopes and flats between karroid or renosterveld scrub; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket (Knysna to Kouga Mts at Studtis E to Guerna, from Willowmore to Groot River Poort in Steytlerville District, and from Suurberg Pass to Albany District and Alexandria).

[E]**mariae** L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.03 m high. **Leaves** trigonous, shortly united into sheaths, glaucous, margins with 1 or 2 teeth, apex with apical tooth. **Flowers** solitary, pink. **Flowering time** Nov., Dec. **Capsules** 5-locular. Flats and hills of karoo sediments; Dry Highveld Grassland, Rainshadow Valley Karoo (Graaff-Reinet District, Nardousberg S to Steytlerville).

[E]**nonimpressa** L.Bolus
Perennial, dwarf shrublet, up to 0.25 m high, stems decumbent, forming loose clumps. **Leaves** triquetrous, shortly united into a sheath around stem, glaucous, keel with 1 or 2 teeth, apex recurved, toothed, teeth prominent on younger leaves but becoming less so with age. **Flowers** solitary, deep pink. **Flowering time** May–Sept. **Capsules** 5-locular, covering membranes complete, closing ledges at distal ends, closing bodies small, hooked, expanding keels basally distant. Plains and hills comprising karoo sediments; Dry Highveld Grassland, Upper Karoo (Halesowen to Cradock).

[E]**orientalis** L.Bolus
Perennial, dwarf shrublet, up to 0.35 m high, stems woody, spreading. **Leaves** triquetrous, smooth. **Flowers** solitary, deep pink. **Flowering time** May–Dec. **Capsules** woody, 5-locular, covering membranes with closing devices at distal ends, valve wings absent, expanding keels basally close, closing bodies present. Flats and hills of karoo shales or siltstones; Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Baviaanskloof E to Wolwefontein, Greater Addo Elephant National Park, Uitenhage and Port Elizabeth).

perfoliata (Mill.) Schwantes
Perennial, dwarf shrublet, up to 0.6 m high, stems decumbent, forming large low clumps. **Leaves** triquetrous, shortly united into a sheath around stem, glaucous, apex recurved with 1–few teeth on margins and keel. **Flowers** solitary, deep to pale pink. **Flowering time** Apr.–Aug. **Capsules** woody, 5-locular, covering membranes complete, closing bodies small, valve wings absent. Rocky areas on plains and hills of karoo sediments; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (between Prince Albert and Rietbron to Graaff-Reinet S, Willowmore and Jansenville Districts).

pulvinaris L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.1 m high, forming compact cushions, roots fibrous, thickened. **Leaves** triquetrous, shortly united into sheaths around stems, acuminate, glaucous, keel and margins cartilaginous, sometimes toothed, apex toothed, punctate. **Flowers** solitary, bright pink. **Flowering time** Sept.–Apr. **Capsules** woody, 5-locular, valve wings absent, closing bodies present, covering membranes complete. Rocky areas on dolerite outcrops and weathered karoo sediments; Upper Karoo, Dry Highveld Grassland (Steynsburg).

pungens (A.Berger) H.Jacobsen
Perennial, dwarf shrublet, up to 0.8 m high, stems upright, branching at apex. **Leaves** trigonous, obtuse, base of leaves swollen, forming a sheath, glaucous, apex recurved. **Flowers** in compound cymes, bright pink. **Flowering time** Sept.–Dec. **Capsules** woody, 5-locular. Rocky slopes; Albany Thicket (Western Cape E to Bushman's River at Kenton on Sea).

putterillii (L.Bolus) L.Bolus
Perennial, dwarf shrublet, up to 0.6 m high, stems woody, decumbent to erect, forming low loose clumps. **Leaves** triquetrous, almost lunate, glaucous, punctate, apex recurved, white. **Flowers** solitary, pink. **Flowering time** all year. **Capsules** woody, 5-locular, valve wings absent, covering membranes complete, closing body small, hook-shaped, expanding keels distant at their bases. Rock sheets at higher altitudes; Drakensberg Grassland, Sub-Escarpment Grassland, Upper Karoo, Albany Thicket (Drakensberg Mts, Barkly East to Naude's Neck S, from Andriesberg at Bailey to Elliot and Cala, and from Mountain Zebra National Park to Somerset East and Tarka District).

[E]recurva (Moench) H.E.K.Hartmann
Perennial, dwarf shrublet, up to 0.35 m high, stems erect, woody, spreading at apex. **Leaves** subtriquetrous, slender, shortly united into a sheath, rough from subhypodermal tannin idioblasts, apex recurved. **Flowers** solitary, white. **Capsules** woody, 5-locular. Open gravelly, calcareous, areas in scrub; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage).

rigens L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.15 m high, forming dense cushions, roots succulent. **Leaves** triquetrous, keel unidentate, glaucous, apex apically recurved. **Flowers** solitary, pink. **Flowering time** Mar.–July. **Capsules** woody, dropping off leaving the pedicel as a star-shaped stalk, 5-locular, covering membranes complete with distal closing rodlets, closing bodies small, expanding keels basally close. Hills and plains of finely weathered karoo sediments or dolerites; Upper Karoo, Dry Highveld Grassland (Middelburg to Hofmeyr).

spinosa (L.) Dehn
Perennial, dwarf shrublet, up to 0.7 m high, stems erect, highly branched at apex. **Leaves** glaucous, punctate. **Flowers** in rich spiny cymes, bright pink. **Flowering time** Aug.–Apr. **Capsules** 5-locular, with or without narrow valve wings. Hills and plains of karroid scrub; Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket, Rainshadow Valley Karoo (Western Cape E to Witteberg near Miller and Willowmore).

staminodiosa L.Bolus
Perennial, dwarf shrublet, up to 0.15 m high, stems spreading, forming rounded bushes. **Leaves** sharply triquetrous, smooth, punctate, apex recurved. **Flowers** solitary, deep pink. **Flowering time** Apr.–Sept. **Capsules** 5-locular, covering membranes complete with distinct closing ledges, closing bodies absent but placenta protruding, valve wings absent. Flats, hills of karoo shales and siltstones; Eastern Fynbos-Renosterveld, Albany Thicket (Western Cape E to Uitenhage, Port Elizabeth, Albany District and to SW of Humansdorp).

tenella (Haw.) Schwantes
Perennial, dwarf shrublet, up to 0.3 m high, stems woody at base. **Leaves** perfoliate, fused basally to form a sheath, sharply trigonous, apex recurved, keel cartilaginous, serrulate. **Flowers** solitary or 2, white. **Flowering time** Nov.–May. **Capsules** 5-locular. Flats and hills between fynbos scrub; Eastern Fynbos-Renosterveld, Albany Thicket (Western Cape E to Uitenhage, Port Elizabeth and Belmont Valley near Grahamstown).

[E]**truteri** L.Bolus
Perennial, dwarf shrublet, height not recorded, stems erect with long shoots when growing in other plants, caespitose in open areas. **Leaves** trigonous, older stems with leaf scars, epidermis smooth, apex recurved. **Flowers** solitary, pink. **Capsules** not known. Habitat not recorded; Dry Highveld Grassland (Somerset East).

[E]**uitenhagensis** (L.Bolus) Schwantes
Perennial, dwarf shrublet, up to 0.3 m high, forming dense rounded shrub with erect stems. **Leaves** trigonous, slender, shortly united into a sheath, punctate, glaucous, apex recurved, white. **Flowers** solitary, pink. **Flowering time** July–Sept. **Capsules** 5-locular, covering membranes complete, expanding keels diverging from bases. Gravelly plains and hills of karoo sediments; Eastern Fynbos-Renosterveld, Albany Thicket (Uitenhage to N of Grahamstown).

uncinata (L.) Schwantes
Perennial, dwarf shrublet, up to 0.25 m high, stems decumbent forming loose clumps. **Leaves** triquetrous, perfoliate, shortly united into a sheath around stem, glaucous, keel with 1 or 2 teeth, apex recurved, toothed, teeth prominent on younger leaves but becoming less so with age. **Flowers** solitary, purple. **Flowering time** Nov.–Mar. **Capsules** not known. Habitat not recorded; Upper Karoo, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket (Graaff-Reinet S, from Willowmore E to Steytlerville, Uitenhage and Port Elizabeth).

unidens (Haw.) Schwantes
Red mountain mesemb, swallow tail mesemb; *rooibergvygie*, *swaelstertvygie* (A)
Perennial, caespitose, dwarf shrublet, up to 0.16 m high. **Leaves** subacinaciform, glaucous, apex rigid with 1 tooth on keel below apex. **Flowers** solitary, pink. **Flowering time** Oct., Nov. **Capsules** 5-locular. Shale, granite, norite, rocky ridges, gentle to steep slopes; Dry Highveld Grassland, Upper Karoo (Aliwal North, Steynsburg and Molteno districts S to Mountain Zebra National Park).

vaginata (Haw.) Schwantes
Perennial shrublet, up to 0.9 m high, forming dense round shrub, stems upright, woody. **Leaves** united into a sheath around stem, trigonous, glaucous, apex recurved. **Flowers** solitary, white. **Flowering time** Oct., Jan.? **Capsules** 5-locular. Shale, renosterveld,

mesic mountain fynbos; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Uniondale E to Willowmore, Baviaanskloof and Steytlerville).

vanbredai L.Bolus

Perennial, dwarf shrublet, up to 0.15 m high, stems reddish brown. **Leaves** falcate to subfalcate, apex rounded. **Flowers** in cymes, magenta. **Flowering time** June, July. **Capsules** 5-locular, closing body present. Quartzite, cracks in bare rock, partial shade to full sun; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket (Uniondale E to Willowmore and Kouga).

vanderbergiae L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high, stems upright branching at apex. **Leaves** trigonous, glaucous, margins with 1 or 2 fine teeth, apex recurved with 1 tooth on keel below apex. **Flowers** solitary, pink. **Flowering time** Mar.–May. **Capsules** 5-locular, covering membranes with closing ledges at their distal ends, closing body small, hook-shaped, expanding keels gaping, not complete. Gravelly plains and hills of karoo sediments; Upper Karoo, Lower Karoo, Albany Thicket (Free State S to road between Middelburg and Steynsburg and from Aberdeen to Graaff-Reinet).

virgata (Haw.) L.Bolus

Perennial, dwarf shrublet, up to 0.5 m high, stems ascending to prostrate. **Leaves** trigonous, margins cartilaginous, punctate, apex recurved. **Flowers** solitary, pink. **Flowering time** Oct. **Capsules** 5-locular, covering membranes complete with closing ledges, closing body hook-shaped, expanding keels distant at their bases. Gravelly plains and hills between fynbos scrub; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Uniondale E to Willowmore).

SMICROSTIGMA N.E.Br.

Subfamily Ruschioideae, tribe Ruschieae

Turning mesemb; *draaivygie* (A)

Species ± 1, sthn Afr., Karoo regions of WC, EC.

viride (Haw.) N.E.Br.

Perennial, dwarf shrublet, up to 0.6 m high, stems upright. **Leaves** dark green, triquetrous, forming a sheath around stem, apex acuminate, recurved. **Flowers** solitary, bright pink, rarely deeper pink or white. **Flowering time** Aug.–Nov. **Capsules** mostly 7–10-locular, reddish brown, woody, covering membranes complete, expanding keels parallel, diverging at apex, ending in short awns, closing bodies absent. Rocky outcrops in karroid and Renosterveld scrub; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Willowmore and Baviaanskloof).

STOMATIUM Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Small toothed-, night-, cushion mesemb; *kleintand-*, *nag-*, *kussingvygie* (A)

Species ± 39, sthn Afr., grassland and Karoo regions of FS, NC, WC, EC.

agninum (Haw.) Schwantes

Perennial, caespitose, dwarf shrublet, up to 0.04 m high. **Leaves** triangular from above, margins with low teeth, epidermis dotted with elevations. **Flowers** solitary, yellow. **Capsules** not known. A poorly known species.

angustifolium L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.02 m high, roots thickened. **Leaves** glaucous, trigonous, margins with sharp large teeth, epidermis dotted with white elevations, apex rounded, incurved forming a keel. **Flowers** solitary, pale yellow. **Capsules** 5-locular, valve wings present, closing bodies absent, covering membranes a ledge. Weathered outcrops of karoo shales; Upper Karoo, Albany Thicket, Dry Highveld Grassland, Lower Karoo (Murraysburg E to Somerset East).

bolusiae Schwantes
Perennial, caespitose, dwarf shrublet, up to 0.02 m high, roots thickened. **Leaves** glaucous, trigonous, margins with low blunt teeth, epidermis dotted with white elevations, apex with prominent chin when older. **Flowers** solitary, yellow. **Flowering time** May, June. **Capsules** 5-locular, not known. Rocky outcrops on dolerite or karoo sediments; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland (Free State S to Sterkstroom).

[E]**deficiens** L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.02 m high, roots thickened. **Leaves** glaucous, trigonous, with convex sides, margins and keel with few raised white elevations, epidermis dotted with white elevations, apex rounded. **Flowers** solitary, pale yellow with few anthers. **Capsules** 5-locular, otherwise unknown. Habitat not recorded; Upper Karoo, Dry Highveld Grassland (Cradock).

[E]**duthiae** L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.03 m high, roots thickened. **Leaves** glaucous, trigonous, keel without teeth, margins with 3 or 4 teeth, epidermis dotted with dark elevations, apex forming a chin when older. **Flowers** solitary, yellow. **Flowering time** Mar.–July. **Capsules** 5-locular, valve wings with angular apex, closing bodies absent, covering membranes a ledge. Weathered outcrops of karoo sediments; Upper Karoo, Dry Highveld Grassland (Middelburg S to Graaff-Reinet).

[E]**geoffreyi** L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.02 m high. **Leaves** trigonous, upper surface flat to shallowly concave on younger leaves, margins with 3–6 prominent teeth with white apex, epidermis dotted with elevations, leaf apex a blunt point. **Flowers** solitary, yellow with reddish apex. **Flowering time** May–July. **Capsules** 5-locular, covering membranes a ledge, closing bodies absent, valve wings narrow. Mountain slopes; Upper Karoo, Dry Highveld Grassland (Cradock).

gerstneri L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.03 m high. **Leaves** glaucous, trigonous, acute, upper surface triangular from above, margins with 1–3 low teeth, epidermis dotted with white elevations, apex a blunt point, older leaves with a prominent chin. **Flowers** solitary, yellow. **Capsules** 5-locular, covering membranes a ledge, closing bodies absent, valve wings narrow. Rocky shale outcrops covered with sand; Mesic Highveld Grassland (Zastron S to Lady Grey).

[E]**integrum** L.Bolus
Perennial, caespitose, dwarf shrublet, up to 0.1 m high. **Leaves** persistent, becoming grey with age, margins with no teeth or obscurely dentate, epidermis with white elevations, apex rounded. **Flowers** solitary, bright yellow. **Capsules** not known. Habitat not

recorded; Sub-Escarpment Grassland, Dry Highveld Grassland, Drakensberg Grassland, Albany Thicket, Sub-Escarpment Grassland (Tarkastad S to Adelaide and Fort Beaufort).

[E]**jamesii** L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.04 m high, roots fibrous, old stems rooting. **Leaves** trigonous, margins and keel with teeth, epidermis dotted, rough with sharp elevations, apex keeled. **Flowers** solitary, yellow. **Capsules** 5-locular, covering membranes a ledge, closing bodies absent, valve wings broad. Flat rocks; Upper Karoo, Dry Highveld Grassland, Albany Thicket (Cradock).

[E]**leve** L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.04 m high. **Leaves** trigonous, margins and keel with fine, white teeth, epidermis smooth, apex obliquely blunt. **Flowers** solitary, golden-yellow. **Capsules** not known. Habitat not recorded; Upper Karoo, Dry Highveld Grassland, Albany Thicket (Cradock).

middelburgense L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.03 m high. **Leaves** glaucous, trigonous, margins with 3 or 4 prominent teeth, epidermis dotted with white elevations, keel without teeth, keels of older leaves forming a chin. **Flowers** solitary, pale lemon-yellow. **Capsules** not known. Habitat not recorded; Upper Karoo (S Free State to Middelburg).

[E]**ronaldii** L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.02 m high. **Leaves** trigonous, margins toothed unevenly towards apex, apex reflexed into a hook, keeled, keel with 1 tooth just below apex, epidermis dotted with white elevations. **Flowers** solitary, yellow with reddish apex. **Capsules** not known. Flat rocks on mountain summit; Upper Karoo, Dry Highveld Grassland, Albany Thicket (Cradock).

[E]**ryderae** L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.03 m high. **Leaves** with fine teeth on margins, epidermis dotted with elevations. **Flowers** solitary, yellow. **Capsules** 5-locular, closing bodies absent, valve wings broad. Habitat not recorded; Upper Karoo, Dry Highveld Grassland, Albany Thicket (Graaff-Reinet and Cradock).

TRICHODIADEMA Schwantes

Subfamily Ruschioideae, tribe Ruschieae

Karee potato-, walkingstick-, horse-, donkey mesemb, sweet potato, diadem-; *kareemoer-*, *kierie-*, *perde-*, *donkievygie*, *soetaartappel* (A)

Species ± 34, sthn Afr., arid regions of N, FS, NC, WC, EC.

[E]**aureum** L.Bolus

Perennial, dwarf shrublet, up to 0.2 m high; roots single or a cluster of thickened tubers, stems erect. **Leaves** semi-cylindrical, bladder cells as elongated papillae, apex with radiating diadem (crown), cup-cells of diadem brown, bristles paler than cup-cells. **Flowers** solitary, golden-yellow. **Flowering time** Sept.–Nov. **Capsules** not known. Sandstone, gravelly sand, on gentle slope; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore to Wolwefontein District and SE of Steytlerville).

[E?]**barbatum** (L.) Schwantes

Perennial, dwarf shrublet, up to 0.2 m high; roots tuberous, stems erect becoming procumbent. **Leaves** subcylindrical, bladder cells domed, apex with diadem radiating,

cup-cells black, bristles. **Flowers** solitary, bright purple. **Capsules** not known. Quartz and shale, succulent karoo, well drained rocky soil, bedrock; Rainshadow Valley Karoo (Groot River Pass Road near Steytlerville).

[E]**bulbosum** (Haw.) Schwantes

Perennial, dwarf shrublet, up to 0.2 m high, roots fusiform, tuberous. **Leaves** glaucous, cylindrical, covered with domed, elongate bladder cells with apical and basal parts ending in points, diadem radiating, cup-cells orange-brown, bristles pale. **Flowers** solitary, dark pink. **Flowering time** Nov.–Feb. **Capsules** 5-locular. Flats and hills of karoo shales or siltstones; Eastern Fynbos-Renosterveld, Albany Thicket (Port Elizabeth).

burgeri L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.06 m high, taproot thickened at top thinning to bottom. **Leaves** glaucous-grey, cylindrical, crowded, imbricate, bladder cells elongate, upper end terminating in a point, lower end obtuse, diadem radiating, cup-cells yellow-orange, bristles white. **Flowers** solitary, reddish. **Capsules** 5-locular. Habitat not recorded; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Uniondale to Willowmore).

[E]**concinnum** L.Bolus

Perennial, dwarf shrublet, up to 0.15 m high, single to few tuberous taproots. **Leaves** glaucous, cylindrical, covered with domed, elongate bladder cells, apex obtuse, diadem radiating, cup-cells brown-black. **Flowers** solitary, purplish pink with white centre. **Flowering time** Sept.–Jan. **Capsules** 5-locular. Habitat not recorded; Albany Thicket (Port Elizabeth to Bushman's River).

[E?]**decorum** (N.E.Br.) Stearn ex H.Jacobsen

Perennial, dwarf shrublet, up to 0.2 m high, roots tuberous. **Leaves** glaucous, terete, recurved, bladder cells domed with a central papilla, diadem radiating, cup-cells orange brown, bristles white. **Flowers** solitary to ternate, rosy mauve to orange with a pink centre. **Capsules** not known. Flats and hills of karoo shales or siltstones; bioregions not recorded (probably Albany District, corrected on type sheet by N.E. Brown by hand).

densum (Haw.) Schwantes

Perennial, dwarf shrublet, up to 0.15 m high, compact, roots thickened, fleshy. **Leaves** crowded, glaucous, subcylindrical bladder cells apically and basally elongated, diadems radiating, cup-cells orange, bristles white. **Flowers** solitary, magenta. **Flowering time** June–Oct. **Capsules** 6-locular. Plains and hills of karoo sediments; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Uniondale to Willowmore).

[E]**fourcadei** L.Bolus

Perennial, dwarf shrublet, up to 0.15 m high, stems decumbent to erect, with a tapering thick taproot. **Leaves** acute, pubescent, diadem comprising apical hairs with no cup-cells. **Flowers** solitary, white. **Flowering time** Oct. **Capsules** 5-locular, expanding keels pale gold-coloured, covering membranes not complete. Hillsides; Albany Thicket, Eastern Fynbos-Renosterveld (Hankey S to Humansdorp).

[E]**intonsum** (Haw.) Schwantes

Perennial, dwarf shrublet, up to 0.35 m high, stems erect to spreading. **Leaves** semi-cylindrical, slightly recurved, glaucous, bladder cells elongate terminating in a sharp point at upper end, lower end obtuse, dark brown radiating bristles arising from black cup-cells. **Flowers** solitary, pink to white. **Capsules** 5-locular. River flats; Albany Thicket (Uitenhage, E to Swartkops and Sundays rivers).

[E]introrsum (Haw. ex Hook.f.) Niesler

Perennial, dwarf shrublet, up to 0.35 m high, taproot thickened, stems erect with 2 prickles at nodes, succulent **Leaves** semi-terete, recurved, bladder cells elongate-oval, domed without papillae, diadems orange-brown, cup-cells gold-coloured. **Flowers** solitary; petals golden-yellow at base, orange in the centre, tinged magenta outside. **Capsules** 5-locular. Open savanna or karroid scrubs; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Bedford S to Kirkwood and Grahamstown).

mirabile (N.E.Br.) Schwantes

Perennial, dwarf shrublet, up to 0.1 m high, with a tapering thick taproot, stems erect. **Leaves** subcylindrical, flat on upper surface, glaucous, crowded, bladder cells rhomboid with a basal and apical papilla, diadem comprising inclining dark stiff bristles without cup-cells. **Flowers** solitary, white to cream-coloured. **Flowering time** Nov.–Jan. **Capsules** 5-locular, covering membranes not complete, valve wings broad, apex sharp, closing bodies absent. Rocky outcrops on plains and hills of karoo sediments; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (WC to Uitenhage).

[E]olivaceum L.Bolus

Perennial, dwarf shrublet, up to 0.08 m high, with thick tuberous rootstock, stems decumbent or erect. **Leaves** subcylindrical, crowded, bladder cells elongate terminating in a sharp point at upper end, lower end obtuse, diadem radiating, cup-cells brown, bristles paler. **Flowers** solitary, white. **Flowering time** June–Sept. **Capsules** 5-locular, pale gold-coloured, covering membranes narrow, incomplete, valve wings obtuse at apex. Slopes and flats of weathered karoo sediments; Dry Highveld Grassland, Albany Thicket (Somerset East).

[E]orientale L.Bolus

Perennial, dwarf shrublet, up to 0.1 m high, with tuberous rootstock, stems prostrate to erect. **Leaves** subcylindrical, narrowed toward apex; bladder cells domed, basally obtuse with an apical papilla, diadem comprising of inclined dark brown bristles without cup-cells. **Flowers** solitary, white to pale pink with darker apex. **Flowering time** May. **Capsules** 5-locular, covering membranes incomplete. Open rocky areas with karroid scrub; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (King William's Town S, from Uitenhage E to Grahamstown).

[E]peersii L.Bolus

Perennial, dwarf shrublet, up to 0.1 m high, taproot thickened. **Leaves** subcylindrical, glabrous, bladder cells rhomboid, basally and apically papillate, diadems radiating, cup-cells dark brown, bristles paler. **Flowers** solitary, white. **Flowering time** Nov., Dec. **Capsules** 5-locular, covering membranes incomplete. Flats hills of karoo shales or siltstones; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket (Willowmore to Jansenville).

pomeridianum L.Bolus

Perennial, dwarf shrublet, up to 0.4 m high, stems erect, roots fusiform with small round tubers at a depth of ± 150 mm. **Leaves** subcylindrical, glaucous, bladder cells domed, without papillae, diadems radiating, cup-cells yellowish, bristles yellowish. **Flowers** solitary, pale mauve to pink. **Flowering time** all year. **Capsules** pale gold-coloured, 5-locular, covering membranes narrow. Plains and hills of karoo sediments, often on clay pans of drainage areas; Upper Karoo, Dry Highveld Grassland, Rainshadow

Valley Karoo, Albany Thicket (eastwards from Bethulie to Aliwal North S, Middelburg to Tarkastad, Graaff-Reinet to Somerset East and from Steytlerville to Greater Addo Elephant National Park).

rogersiae L.Bolus

Perennial, dwarf shrublet, up to 0.4 m high, stems upright, many, leaf scars prominent on nodes, pedicels also persistent on stems, roots fibrous. **Leaves** subcylindrical, glaucous, upper surface flat to grooved, acute towards apex, bladder cells domed without papillae, diadems radiating, indistinct, cup-cells orange-yellow, bristles orange-yellow. **Flowers** solitary, deep purplish pink. **Flowering time** Aug.–Nov. **Capsules** 5-locular. Flats and hills of karoo sediments or dolerites; Upper Karoo, Dry Highveld Grassland, Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Western Cape E to Graaff-Reinet, Somerset East and Cradock, and S to Willowmore).

[E]**rupicola** L.Bolus

Perennial, caespitose, dwarf shrublet, up to 0.3 m high, roots fibrous, fusiform. **Leaves** imbricate, narrow towards apex, glaucous, becoming grey with age, bladder cells as elongated papillae, diadem radiating, cup-cells orange-brown, bristles paler. **Flowers** solitary, white to pale pink. **Capsules** not known. Open rocky areas in thicket; Albany Thicket (Uitenhage).

[E]**ryderae** L.Bolus

Perennial, dwarf shrublet, up to 0.3 m high, roots fibrous. **Leaves** subcylindrical, narrowing towards apex, bladder cells domed without papillae, diadems radiating, indistinct, pale gold-coloured, cup-cells and bristles pale gold-coloured. **Flowers** solitary, purplish pink. **Capsules** not known. Rocky areas; Albany Thicket, Sub-Escarpment Grassland (Bedford).

setuliferum (N.E.Br.) Schwantes

Perennial, dwarf shrublet, up to 0.4 m high, roots fibrous, stems erect to decumbent. **Leaves** subcylindrical, bladder cells domed with a central papilla pointing towards apex, diadems radiating, indistinct, cup-cells orange, bristles white to light yellow. **Flowers** solitary, bright magenta, sometimes white. **Flowering time** Sept.–May. **Capsules** 5-locular. Plains and hills in arid scrubland; Mesic Highveld Grassland, Dry Highveld Grassland, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Free State S to Lady Grey, Somerset East and Perdepoort near Willowmore).

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AMARANTHACEAE
(= CHENOPODIACEAE, APG 2003)
(Order Caryophyllales)

Compiled by C.L. Bredenkamp, Amaranthaceae *s.s.* by C.J. Cilliers

1a Sepals dry and ± papery or membranous:
2a Leaves alternate or fasciculate or sometimes opposite:
3a Ovaries with more than one ovule:
4a Inflorescences white-woolly; tepals dorsally densely lanate ..... **Aerva**
4b Inflorescences not white-woolly; tepals glabrous or pilose at base only..... **Celosia**
3b Ovaries uni-ovulate:
5a Flowers unisexual, male flowers situated towards apex of inflorescences or scattered among females, or plants dioecious; tepals glabrous; pseudostaminodes absent..... **Amaranthus**
5b Flowers bisexual, or if unisexual, tepals ± hairy and pseudostaminodes present..... **Sericocoma**
2b Leaves opposite:
6a Bracteoles with a projecting dorsal keel along at least upper part of midrib ..... ***Gomphrena**
6b Bracteoles without dorsal keel along midrib:
7a Modified sterile flowers present, consisting of hairs, spines, bristles or scales, frequently on one side of sterile flower, sometimes concealed within bracteoles in flowering stage:
8a Stamens without intermediate pseudostaminodes..... **Pupalia**
8b Stamens with intermediate pseudostaminodes..... **Cyathula**
7b Modified sterile flowers absent, all flowers fertile:
9a Anthers 1-thecous; plants mainly prostrate or decumbent and diffusely branched:
10a Stamens perigynous; tepals densely woolly-lanuginose, 1-nerved, fused to ± halfway..... ***Guilleminea**
10b Stamens hypogynous; tepals glabrous and 1-nerved or barbellate-pilose and 3-nerved, free:
11a Stigma capitate; flower clusters sessile in axils of leaves..... ***Alternanthera**
11b Stigmas 2 or 3; flowers in dense spikes or terminal, sessile heads ..... ***Gomphrena**
9b Anthers 2-thecous; plants mainly erect:
12a Fruiting perianth strongly deflexed, closely appressed to inflorescence axis; bracteoles spinous aristate, arista longer than basal wings, or inflorescences fasciculate and formed of several spikes of diverse lengths ..... ***Achyranthes**
12b Fruiting perianth not or less deflexed, not closely appressed to inflorescence axis; bracteoles frequently with midrib excurrent, but not long and spinose; inflorescence a solitary spike..... **Achyropsis**
1b Sepals herbaceous and soft:
13a Plants with well-developed, ± flat leaves; branches not articulate; plants mostly hairy, mealy or glandular, sometimes glabrous:
14a Plants glabrous; fruiting perianth hard, united in clusters; ovary semi-inferior ..... ***Beta**
14b Plants glabrous, mealy, pilose, or glandular; fruiting perianth membranous or fleshy; ovary superior:
15a Plants mealy when young; flowers unisexual; male flowers with 5-lobed perianth and 5 stamens; female flowers without perianth but surrounded by a pair of bracteoles that may be free or fused:
16a Bracts connate into a somewhat inflated, spongy, winged casing, with a small, apical opening... **Atriplex**
16b Bracts not connate, becoming subsucculent:
17a Flowers in axillary clusters, bisexual and male together ..... **Exomis**
17b Flowers in naked, terminal inflorescences ..... **Manochlamys**
15b Plants variously hairy to glabrous; flowers bisexual or female, all with perianth, not surrounded by bracteoles:

18a Fruit with a succulent pericarp, not enveloped by perianth ..... ***Einadia**
18b Fruit with a membranous pericarp, enveloped by perianth ..... **Chenopodium**
13b Plants apparently leafless or leaves narrow, usually subterete, or scale-like and imbricate:
19a Leaves distinct, though sometimes scale-like; stems entire, not jointed at nodes or not made up of apparently leafless succulent internodes (articles); plants glabrous or hairy:
20a Fruiting perianth without obvious appendages ..... **Suaeda**
20b Fruiting perianth with 1 or more wings, spines or tubercles:
21a Annual or perennial herbs or subshrubs; flowers usually 1–3, in axils of bracts, bibracteolate; perianth horizontally winged at or above middle ..... **Salsola**
21b Annual herbs; flowers in axillary clusters, bracts and bracteoles absent; fruiting perianth accrescent with spine-like or tubercle-like appendages, or membranous with scarious wings at back:
22a Fruiting perianth segments with spines or spine-like tubercles ..... **Bassia**
22b Fruiting perianth segments with membranous, scarious wings ..... ***Kochia**
19b Leaves apparently absent (much reduced or obsolete); stems jointed at nodes, apparently made up of leafless, succulent internodes (articles); plants glabrous:
23a Annual herbs; flowers 3 per bract, arranged in a triangle, central flower much larger than 2 lateral ones, lateral flowers seldom lacking; testa papillose ..... **Salicornia**
23b Shrubs or subshrubs, seldom perennial herbs; flowers 3–12 per bract, arranged in a row; testa papillose or covered with hairs ..... **Sarcocornia**

*ACHYRANTHES L.

Species 6–8, warm temperate and tropical regions of the Old World; 1 naturalised in sthn Afr. with 3 varieties, widespread and very variable in robustness.

aspera L.

Chaff flower, burweed; *grootklits*, *langklitskafblom* (A)

Erect, perennial herb, 0.2–2.0 high, sometimes bushy or scandent, sometimes flowering in first year. **Leaves** opposite, entire, petiolate. **Inflorescence** a ± slender, simple or branched, elongated, solitary or fasciculate spike up to 0.3 m long, terminal on stem and branches; flowers at first congested and ± patent, finally usually laxer and deflexed. **Flowers** bisexual, solitary in axils of bracts; tepals 4 or 5, 1–3(–5)-nerved, narrowly lanceolate. **Flowering time** July–May. **Seed** cylindrical. Disturbed sites, special effect weed (competitive, irritant), declared weed (Category 1); Upper Karoo, Dry Highveld Grassland, Indigenous Forests, Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Orange-Fish River junction, E to Port Edward, S to Port Alfred).

ACHYROPSIS (Moq.) Hook.f.

Species 6, tropical and sthn Afr.; 2 in sthn Afr., B, LIM, NW, G, M, S, KZN, EC.

Perianth 3–4 mm long, tapering from below middle; style ± 1.5–2.0 mm long

avicularis (E.Mey. ex Moq.) T.Cooke & C.H.Wright

Annual or perennial herb, 0.15–1.00 m high, trichotomously branched. **Leaves** green, opposite, obovate, entire; petioles ± 4 mm long. **Inflorescences** at first short becoming longer, terminal on stem and branches, tipped. **Flowers** bisexual, small, solitary in axils of bracts; tepals glabrous or pubescent. **Flowering time** Apr.? Habitat not recorded; Albany Thicket (Suurberg in Greater Addo Elephant National Park).

Perianth small, ± 2 mm long, eventually rounded from base to apex; style ± 0.5 mm long

leptostachya (E.Mey. ex Meisn.) Baker & C.B.Clarke

Perennial or annual herb. 0.15–1.00 m, trichotomously branched. **Leaves** opposite, entire, sessile or shortly petiolate; leaves of main stem linear to linear-oblanceolate; green

with thinly arranged white hair above, white velutinous below. **Inflorescences** at first short, becoming longer, terminal on stem and branches, white-woolly or pink-tipped. **Flowers** bisexual, small, solitary in axils of bracts; tepals glabrous or pubescent. **Flowering time** Feb.? Roadsides, in hedges, grassland or closed shrubland; Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket (Port St Johns S, from King William's Town to Port Alfred).

AERVA Forssk.

Species ± 10, warmer parts of Africa and Asia; 2 in sthn Afr., N, B, LIM, NW, G, M, S, FS, NC, EC.

leucura Moq.

Perennial herb, woody below, erect or low-spreading, 0.5–1.2(–1.5) m high. **Stems** arising from base, simple or branched; ± densely tomentose with whitish hairs. **Leaves** alternate, broadly elliptic to linear-oblanceolate, 16–100 × 5–30(36) mm, shortly cuneate at base, apex obtuse to very acute, moderately pilose on both surfaces; petioles up to 15 mm long. **Inflorescence** a terminal panicle of simple or branched, spikes. **Flowers** hermaphrodite, female or functionally male; tepals ± densely lanate dorsally; outer 2 tepals hyaline, inner 3 tepals slightly shorter and narrower. **Female flowers** with linear stigmas, somewhat shorter than style; anthers absent, filaments reduced. **Male flowers** with stigmas very reduced or absent; anthers longer. **Fruit** a circular capsule, 1 mm in diam. **Seeds** black, shining. Stony, rocky soil; Sub-Escarpment Savanna (Alice, Tyumie River, near Tristicha Pool).

***ALTERNANTHERA** Forssk.

Species ± 100, best represented in the New World tropics and subtropics; 4 naturalised in sthn Afr., widespread.

pungens Kunth

Perennial or annual herb, ± 0.3 m high, sometimes woody at base, prostrate or erect to floating or scrambling. **Leaves** opposite, entire. **Inflorescences** in heads or short spikes, axillary, sessile or pedunculate; bracts persistent. **Flowers** bisexual, solitary in axils of bracts; bracteoles 2; tepals 4 or 5, glabrous or furnished with smooth or denticulate hairs. **Fruit** suborbicular or obovate in outline, usually compressed; capsule thin-walled or sometimes corky, indehiscent. **Seeds** ± lenticular. Habitat not recorded; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Dry Highveld Grassland, Albany Thicket (Middelburg E to Mthatha S, from Uitenhage to East London).

sessilis (L.) DC.

Annual or perennial herb, up to 0.3 m high, prostrate or erect to floating or scrambling. **Leaves** opposite, entire, sessile or nearly so, apex rounded to pointed. **Inflorescences** in heads or short spikes, axillary, sessile. **Tepals** 4 or 5, free or concrescent at base. **Fruit** flattened, heart-shaped, indehiscent capsule. **Seeds** disc-like, 0.75–1.00 mm in diam. Habitat not recorded; Indigenous Forests (Mngazi River between Mthatha and Port St Johns).

Could be confused with the alien *A. philoxeroides* (Matrius) Grisbach, a noxious weed, currently not recorded in sthn Afr.

AMARANTHUS L.

Pigweed; *misbredie* (A)

Species ± 60, tropical and warm temperate regions of both Old and New World, sporadic as weeds in cooler temperate areas; 15 native and introduced in sthn Afr., mostly widespread weeds of cultivation.

1a Axils of stem-leaves mostly bearing paired spines

*spinosus L.

Thorny pigweed; *doringmisbredie* (A)

Annual herb, 0.3–1.5 m high, main stem erect with many branches, some glabrous or with short pubescence near inflorescence. **Leaves** ovate to lanceolate, glabrous or subglabrous, green without darker blotches, base attenuate, apex minutely mucronate; leaf axils with divaricate spines; petioles 30–70(–90) mm long. **Inflorescences** green, ± branched, terminal panicle. **Flowers** many axillary clusters, male and female separate. **Flowering time** Jan.? **Seed** very glossy, deep chestnut-brown. Grassland, littoral dunes; Indian Ocean Coastal Belt (Tembuland, Port St Johns).

1b Axils of leaves without spines
2a Inflorescence composed of axillary cymose clusters, stems thus appearing leafy to apices

capensis Thell.

Annual, prostrate herb, stems radiating from rootstock, 50–250 mm long, slightly hairy, axils without spines. **Leaves** nearly smooth, obovate, apex rounded, green without blotches; petioles 10–13 mm long. **Inflorescence** small, dense, axillary clusters to near base of stem, leafy throughout, male and female flowers. **Flowering time** Nov.–Mar. **Fruit** obovoid. **Seed** glossy, brownish black, 0.75–1.50 mm in diam. Grassland; Upper Karoo, Sub-Escarpment Savanna, Albany Thicket (Venterstad E to Mzimvubu and S to Middelburg).

dinteri Schinz

Annual herb, stems erect or decumbent, 100–400 mm long, usually much branched below. **Leaves** ovate to obovate-elliptic, glabrous, base attenuate, apex obtuse to rounded, green, sometimes with a purplish central blotch; axils without spines; petioles 3–15 (–200) mm long. **Inflorescences** in dense, axillary clusters, with male and female flowers. **Flowering time** Aug.–Apr. **Fruit** ovoid to nearly round. **Seed** glossy, black or brownish black, 1.0–1.5 mm in diam. Grassland; Upper Karoo, Sub-Escarpment Savanna (Norvalspont S to Venterstad, SW to Middelburg and Alice).

thunbergii Moq.

Red pigweed; *rooi misbredie* (A)

Annual herb, stems decumbent or erect, ± pubescent with crisped, elongate hairs when young. **Leaves** green or sometimes with a purplish central blotch; lamina obovate-elliptic to almost elliptic, glabrous, base attenuate or cuneate, apex emarginate; axils without spines; petioles 3–40 mm long. **Inflorescences** dense, axillary clusters extending to near base of stem; leafy throughout, male and female flowers. **Flowering time** Dec., Jan. **Fruit** ellipsoid-ovoid. **Seed** ellipsoid-rounded, glossy blackish. Grassland; Upper Karoo, Mesic Highveld Grassland, Albany Thicket (Oviston E to Lady Grey, S to Port Elizabeth and Grahamstown).

2b Inflorescence forming a terminal branched or spike-like panicle

*deflexus L.

Perennial pigweed; *meerjarige misbredie* (A)

Perennial herb, stems annual, prostrate or ascending, glabrous. **Leaves** green beneath, lamina ovate to lanceolate or almost elliptic, glabrous or nearly so above, pubescent on margins, midrib and lateral nerves; axils without spines; petioles 5–30 mm long. **Inflorescences** in terminal spikes, shorter spikes or clusters often present, with male or female flowers. **Flowering time** Oct.–Feb. **Seeds** very glossy, ellipsoid compressed, blackish brown, 1.0–1.2 mm long, smooth. Grassland; Upper Karoo, Sub-Escarpment Savanna, Albany Thicket (Albert District to Middelburg S, from Alice to King William's Town, and Uitenhage to Grahamstown).

*hybridus L.

Common pigweed; *Kaapse misbredie*, *hanekam* (A)

Annual herb, 0.15–2.00 m high, erect or decumbent, glabrous. **Leaves** alternate, elliptic, green to red, ovate or lanceolate, base attenuate to cuneate, apex subacute; petioles 10–80(–150) mm long. **Inflorescences** terminal, usually green also red, purple or yellowish. **Flowering time** Dec.–Apr. **Fruit** ellipsoid, compressed. **Seed** very glossy, blackish brown, sometimes white. Cultivated land, roadsides, along railway lines; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld (Oviston Nature Reserve to Port St Johns S, from Fort Beaufort to Humansdorp).

*viridis L.

Slender amaranth; *skraal misbredie* (A)

Perennial herb, short-lived, main stems decumbent, up to 1 m long, with many branches, pubescent when young. **Leaves** green without blotches; lamina mostly ovate, glabrous or inconspicuous pubescence on midrib, base attenuate, apex rounded; axils without spines; petioles 20–60(–80) mm long. **Inflorescences** green, branched, terminal panicles; male flowers few, mixed with female flowers. **Flowering time** Dec.–Apr. **Seed** only slightly shining, blackish. Habitat not recorded; Sub-Escarpment Savanna (Alice, University of Fort Hare).

ATRIPLEX L.

Species ± 250, cosmopolitan, particularly in Australia, mainly in deserts, saline habitats and on waste ground in temperate and tropical regions; 19 in sthn Afr., some introduced and naturalised, N, LIM, NW, G, FS, KZN, L, NC, WC, EC.

Plants annual, herbaceous or becoming woody

erosa G.Brückn. & I.Verd.

Breekbossie (A)

Annual, dwarf shrub, 0.6–0.8 m high, profusely, whitish branched. **Leaves** 40 × 20 mm, triangular-deltoid or oblong-ovate, sinuately lobed, base petiole-like, underside prominently nerved, whitish squamose (covered with coarse scales). **Male and female flowers** in mixed clusters at end of branches. **Fruiting bracts** up to 50 mm long and equally broad, roundish deltoid, central basal part hardened, upper free part herbaceous, serrate or 3–5-lobed, mostly with 1 or 2 tubercular appendages. **Seed** up to 2 mm in diam. Cultivated land; Upper Karoo (Middelburg, Grootfontein).

*lindleyi Moq.

Sponge-fruit saltbush; *blasiesoutbos* (A)

Rounded annual, up to 0.13–0.50 m, with mealy grey to white indumentum of vesicular scales. **Leaves** rhomboid, toothed. **Flowers** in axillary clusters. **Flowering time** Sept.–May. **Fruiting bracts** triangular, fused into an inflated bladder, up to 12 mm long. Dry stony flats and disturbed sites; origin Australia, declared invader (Category 3); Upper Karoo, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Oviston S to Willowmore, E to Grahamstown).

*littoralis L.

Annual, dwarf shrub, 0.10–0.75 m high; branches greenish yellow-striped, ± angled. **Leaves** up to 100 ×150 mm, lanceolate to linear, entire sinuate or irregularly toothed, base petiole-like, both surfaces glabrescent. **Male and female flowers** in mixed separate clusters, up to 10 mm in diam. at end of terminal, long-stemmed panicles. **Flowering time** Mar., June. **Fruiting bracts** up to 5 × 4 mm, triangular-deltoid, squamose, thickish herbaceous. **Seed** ± 1 mm in diam., brown. Rare, riverbanks; Albany Thicket (Great Fish River, Kenton on Sea, Kowie West).

suberecta I.Verd.

Annual herb, 0.07–0.70 m high, decumbent or suberect. **Leaves** up to 60 × 30 mm, ovate, elliptic or oblong, base cuneate, apex obtuse, with 1–5 coarse teeth on each margin, upper surface glabrous with reticulate venation, lower surface with mealy grey to white vesicular scales and main vein prominent. **Flowers** clustered in leaf axils, upper clusters male, lower female. **Flowering time** Oct.–Feb. **Fruiting bracts** with basal connate part ± 2 mm long, hardened and pale, free apical part semicircular to triangular in outline 2–3 mm long, apex subacute with 1–4 small teeth on each margin. Weeds of gardens, cultivated lands, pavements; Upper Karoo, Lower Karoo, Albany Thicket [Middelburg (Grootfontein) to Alexandria District, E to Grahamstown].

Plants perennial, small to large

cinerea Poir.

Perennial, monoecious or dioecious shrub, 1–5 m high, grey- to white-squamous (scaly). **Leaves** 10–80 × 5–30 mm, alternate, elliptic-ovate to linear-lanceolate, mostly entire, leathery. **Male and female flowers** mixed in terminal, pyramidal panicles. **Fruiting bracts** 4–15 × 4–11 mm, deltoid-elliptic to spathulate, fused up to broadest part, entire or slightly toothed, glabrous or hump-tubercled on back (under side), ± completely spongy, at length hardening. Road-/railway sides; Upper Karoo, Albany Thicket, Lower Karoo (Middelburg, Graaff-Reinet, Kamferspoort).

*semibaccata R.Br.

Creeping saltbush; *soutbos* (A)

Monoecious, sprawling perennial, 0.07–0.60 m, with mealy grey to white vesicular scales. **Leaves** elliptic-obovate, often coarsely toothed, glabrescent above. **Flowers** minute in axillary clusters. **Flowering time** mainly Sept.–Dec. **Fruiting bracts** rhomboid, red and fleshy, 2–5 mm long. Occurring on coastal and saline sands, origin Australia; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Aliwal North District, S to Seekoei River Estuary, E to Grahamstown).

*muelleri Benth.

Mueller saltbush, vaalbrak saltbush

Mostly perennial, monoecious, dwarf shrub, 0.3–1.0 m high, grey- to white-squamous. **Leaves** 20–70 × 10–40 mm, deltoid-oval or elliptic, base concave, apex blunt, sinuately lobed. **Male flowers** in ± terminal clusters. **Female flowers** in 2–8-flowered clusters lower down. **Fruiting bracts** 2–4 × 2.5–3.5 mm, roundish oval or roundish deltoid in outline, lower half inflated becoming woody or spongy, upper half with 1–4 shallow or sharp teeth on both margins. Habitat not recorded; weed, origin Australia; Lower Karoo (Pearston District).

*nummularia Lindl.

Old man saltbush; *oumansoutbos* (A)

Dense shrub, 1–3 m high, branches whitish, brittle, woody. **Leaves** bluish grey, 40 × 40 mm, flat, margins toothed, covered by mealy grey to white, vesicular scales. **Inflorescences** greyish, yellow-brown; male flowers in terminal clusters, female flowers in compact, long, terminal clusters. **Flowering time** Sept.–Jan. (all year). **Fruiting bracts** ± 5 mm long, ± oval. Cultivated for fodder, invades riverbeds, coastal dunes, roadsides in semi-arid regions; origin Australia, declared invader (Category 2); Upper Karoo, Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Middelburg S to Willowmore, E to Kowie).

vestita (Thunb.) Aellen

Dioecious, perennial shrub, 1–2 m high, stems light-coloured. **Leaves** 40 × 15 mm, oblanceolate, both surfaces covered by whitish scales. **Male inflorescences**: flower clusters in terminal, loose pseudo-spikes, regularly spaced along branches. **Female inflorescences** similarly constructed but contracted, with a shorter axis or arranged in a simple spike. **Flowering time** Aug.–Apr. **Fruiting bracts** subrotund, softly papery, glabrescent and warty, 10–15 mm long. Saline flats, river mouths; Upper Karoo, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Middelburg S to Willowmore, E to Port Alfred).

BASSIA All.

Species ± 10, Eurasia, Africa and introduced to Northern America; 4 in sthn Afr., N, KZN, NC, WC, EC.

diffusa (Thunb.) Kuntze

Prostrate, mat-forming, perennial herb, stems 0.06–0.30 m long, with indumentum of spreading, usually barbellate hairs (microscopic). **Leaves** alternate, sessile, spreading to imbricate, elliptic to lanceolate, entire, silvery silky. **Flowers** axillary, solitary, inconspicuous, greenish. **Perianth** villous, developing short, wart-like tubercles. **Flowering time** Dec.–May. Sandy soil, salt marshes, river mouths; Upper Karoo, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Middelburg, Mbashe River S to Port Alfred and Tsitsikamma).

salsoloides (Fenzl) A.J.Scott

Annual, dwarf shrub, 0.40–1.05 m high. **Leaves** alternate, subsessile, linear or often short and semi-terete, succulent, entire, pubescent. **Flowers** bisexual, axillary, solitary or clustered, small. **Tepals** woolly, urceolate, connate above middle. **Stamens** 5, exserted; anthers oblong; thecae broadly oblong, without appendages. **Ovary** broadly ovoid; style short; stigmas 2, exserted. **Flowering time** Apr., May. Sandy soil, roadsides; Albany Thicket, Lower Karoo (Graaff-Reinet).

*BETA L.

Species ± 12, mainly in the Euro-Siberian and Mediterranean regions; cultivars derived from *Beta vulgaris* L. are food plants including beetroot, sugar beet, spinach beet etc.; some of these have escaped from cultivation, especially in WC, EC.

vulgaris L.

Erect annual, occasionally perennial herb, 0.2–2.0 m high, with furrowed, glabrous stems; roots woody, fleshy or much swollen. **Leaves** alternate, dark green to reddish, up to 120 × 60 mm, flat, entire or nearly so, long-petiolate. **Inflorescences** spike-like branches, composed of small, (1)2–4-flowered clusters, falling off at maturity. **Flowers** bisexual, sessile. **Tepals** 5, green or whitish, often connate with other flowers in the glomerule, perigynous. **Fruit** becomes detached at maturity, opening by a lid (operculum). Road-/railway sides; Upper Karoo (Middelburg District).

CELOSIA L.

Species ± 45, warmer regions of both Old and New World; 2 in sthn Afr., N, B, LIM, M, S, KZN, EC.

trigyna L.

Perennial herb, scrambler, 0.4–0.5 m high. **Leaves** alternate, simple, entire. **Inflorescences** dense, terminal, slender spikes. **Flowers** bisexual, small, white, sessile or shortly pedicellate; bracteolate. **Flowering time** Feb. **Fruit** a membranous capsule, circumscissile, sometimes thickened at apex. **Seeds** black, usually strongly compressed and shining. Subtropical forests; Indigenous Forests, Indian Ocean Coastal Belt (Port St Johns S to Kentani District).

CHENOPODIUM L.

Species ± 150, cosmopolitan, ranging from temperate to tropical regions, often weedy; 23 in sthn Afr., probably mostly introduced, widespread.

Plants pubescent, with yellow- or amber-coloured glands or glandular hairs, aromatic; stamens 1–5; seeds black to red-brown when ripe

*ambrosioides L.

Sandworm plant; *galsiektebos* (A); *khola-bosiu* (SS); *puniyi* (X)

Annual herb, 0.25–1.00 m high, upright, much branched. **Leaves** mostly lanceolate; inferior leaves with coarse, irregular ascending teeth on each margin, up to 140 × 45 mm; superior leaves becoming smaller. **Inflorescences** of ample, much-branched panicles of small, sessile clusters of flowers arranged spicately, mostly bracteate. **Perianth** segments 3–5. **Flowering time** Sept.–Apr. **Pericarp** membranous, easily removed. **Seeds** red-brown. Weeds of cultivated land; Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Queenstown to Port St Johns, Port Alfred to Humansdorp).

*carinatum R.Br.

Green goosefoot; *groen hondebossie* (A)

Annual herb, 0.2–0.8 m high, branched near base. **Leaves** ovate to elliptic, small, up to 30 × 20 mm, with 2–4 coarse, denticulate teeth on each margin. **Flowers** greenish, minute, in small, dense, rounded, axillary clusters at most of nodes. **Perianth**: segments normally 5, with wing-like keel broadening upward. **Flowering time** Sept.–Apr.

Seeds deep, red-brown. Weeds of cultivated land; Sub-Escarpment Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Fort Beaufort S to Suurberg in Greater Addo Elephant National Park, E to Grahamstown).

*multifidum L.

Stinking goosefoot; *stinkbossie* (A)

Perennial herb, 0.2–1.0 m high, procumbent to erect, much branched. **Leaves** pinnatifid, with narrow lobes. **Flowers** sessile in axillary clusters; sepals connate to near apex, net-veined outside. **Flowering time** Oct.–Jan. **Fruiting calyx** enlarged and saccate. Weeds of disturbed places; Upper Karoo, Sub-Escarpment Savanna (Albert District, Middelburg, Grahamstown).

*pumilio R.Br.

Annual herb, 0.06–0.35 m high, with several stems arising from base, aromatic. **Leaves** elliptic to ovate, 10–20 mm long, obtusely lobed. **Flowers** in compound, axillary clusters, ovoid, 0.5 mm high. **Flowering time** July–Feb. **Fruiting perianth** usually crustaceous and white. **Pericarp** dull grey or translucent. Weeds of disturbed places; Sub-Escarpment Savanna, Albany Thicket (Mthatha, King William's Town, Albany).

*schraderianum Roem. & Schult.

Schrader goosefoot; *Schrader-se-hondebossie* (A)

Annual herb, 0.1–1.3 m high, upright, few lateral branches, strongly aromatic. **Leaves**: inferior and median leaves elliptic to oblong in outline, mostly 10–50 × 5–30 mm, apex obtuse, pinnately divided on each side into 3–5 narrow, blunt lobes; superior leaves smaller. **Inflorescences** of dichotomously branched, axillary cymes. **Flowers** greenish or red-tinged, minute. **Pericarp** easily rubbed off. **Seeds** black. Weeds of disturbed places; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna (Oviston, Middelburg, Queenstown, Cradock, Komga).

Plants glabrous, young parts farinose (covered by white vesicular hairs, also referred to as grey-mealy hairs), not aromatic (often with bad odour); stamens always 5; seeds black when ripe

*album L.

Pigweed; *withondebossie* (A); *serue* (SS); *umbicicane* (S)

Annual herb, 0.1–1.0 m high, much branched, green, stem often red or pinkish striped, young parts covered by grey-mealy hairs. **Leaves** variable, rhombic-ovate to lanceolate, 12–82 × 3–55 mm, margins with up to 10 shallow, irregular teeth on both sides, apex acute. **Inflorescences** of ample panicles of many, rounded clusters, with minute, grey to green flowers. **Pericarp** somewhat persistent. **Seeds** black, shiny. Weeds of disturbed places; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Drakensberg Grassland, Sub-Escarpment Savanna, Indigenous Forests, Eastern Fynbos-Renosterveld (Albert District E to Kokstad S, to East London, and to Tsitsikamma).

*foliosum Asch.

Annual herb, 0.07–0.35 m high, ± glabrous. **Leaves**: inferior leaves deltate, coarsely dentate-serrate; superior leaves hastiform. **Inflorescences** of axillary, sessile clusters along main stems. **Calyx** red and fleshy in fruit. **Flowering time** Dec., Mar. **Seeds** reddish brown. Weeds of disturbed places; Upper Karoo, Dry Highveld Grassland (Richmond District, Molteno).

*glaucum L.

Bloubossie, *bloubrakbossie*, *brakmisbredie* (A)

Annual herb, 0.1–0.4 m high, procumbent or erect, much branched, ± glabrous. **Leaves** elliptical or lanceolate, usually coarsely sinuate-serrate to sinuate, green above, densely glaucous-farinose beneath. **Inflorescences** of clusters arranged in spikes or panicles. **Sepals** of lateral flowers 2–4, free to middle, not or scarcely keeled. **Flowering time** Nov., Jan. **Seed** reddish brown. Weeds of disturbed places; Upper Karoo (Middelburg District, Grootfontein).

hederiforme (Murr) Aellen

Annual herb, 0.15–0.30 m high, erect, much branched, grey to glaucous-green, ± densely clothed with grey-mealy hairs. **Leaves** variable, mostly triangular-ovate, 15–45 × 15–45 mm, concave at base, margins with 4–11 coarse teeth on each side, apex rounded to acute. **Inflorescences** ample, profusely branched panicles of many, small, laxly arranged, dense, rounded clusters of minute, grey flowers. **Perianth**: segments 5 with grey-mealy hairs on margins and outside, prominently keeled in upper part. **Flowering time** Nov., May. **Pericarp** readily rubbed off. **Seeds** black, shiny. Weeds of disturbed places; Upper Karoo, Albany Thicket (Richmond, Bedford).

*mucronatum Thunb.

Annual herb, 0.1–2.0 m, straight or procumbent, branched from base, grey-farinose, smelling of decaying fish. **Leaves** up to 2.5 × 2.3 mm, rhombic to ovate, entire with 2 flaring, basal lobes, densely grey-farinose beneath. **Inflorescences** terminal and axillary, leafy with small clusters. **Sepals** 5, not keeled. **Seeds** brownish black. Weeds of disturbed places; Upper Karoo, Drakensberg Grassland, Dry Highveld Grassland, Albany Thicket (Oviston to Barkly East District S, from Port Elizabeth to Port Alfred).

*murale L.

Chuana soap; *ganse voet* (A); *serua* (NS); *undongabatwa* (Z)

Annual herb, 0.15–0.75 m high, upright or spreading, much branched, green, red-tinged, with grey-mealy hairs on young parts. **Leaves** variable, rhombic-ovate, 15–90 × 8–50 mm, margins with several coarse, ascending, irregular, usually sharp teeth. **Inflorescences** leafy, of divaricately branching cymes up to 50 mm long, mostly terminal but also from upper and median axils. **Flowers** greenish, minute. **Perianth**: segments 5, papillose on margins and outside, with blunt, raised keel towards apex. **Flowering time** July–Mar. **Pericarp** difficult to detach from seeds. **Seeds** black, shining. Weeds of disturbed places; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Hofmeyr District S to Port Elizabeth, E to East London).

*opulifolium Schrad. ex W.D.J.Koch & Ziz

Broad-leaved goosefoot; *hondebossie* (A)

Annual herb (short-lived perennial, with stems becoming woody below, closely related to *C. album*), 0.3–1.5 m high, erect, much branched, green, ± clothed with grey-mealy hairs. **Leaves** variable, 7–54 × 4–54 mm, margins with up to 10 shallow teeth or lobes on each side, lowermost lobes more prominent, divergent, base concave, apex rounded to acute. **Inflorescences** ample panicles of many small, dense, rounded clusters, with minute grey to greenish flowers. **Perianth**: segments 5, papillose with grey-mealy hairs on margins and outside. **Pericarp** persistent, readily scraped from seeds. **Seeds** black, shining. Weeds of disturbed places; Upper Karoo (Steynsburg).

*phillipsianum Aellen

Annual herb, 0.25–1.80 m, upright or spreading, much branched, green-striped, with grey-mealy hairs on young parts. **Leaves** variable, ovate-elliptic, 10–33 × 8–20 mm, margins entire or with 1 pair of lobes on either side of base. **Inflorescences** long, tapering, with many, axillary, divaricately branched cymes, containing many clusters. **Flowers** minute. **Perianth** segments 5, margins broadly chartaceous, not keeled. **Flowering time** July–Mar. **Seeds** black, shining. Weeds of disturbed places; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket (Bethulie S to Queenstown and to Baviaanskloof).

CYATHULA Blume

Species ± 25, tropics of both Old and New World; mostly Africa; 6 in sthn Afr., widespread, but less so in the Cape region.

uncinulata (Schrad.) Schinz

Globe cyathula; *rondeklits* (A)

Perennial herb or climber, 0.3–3.0 m high. **Leaves** opposite, broadly elliptic to obovate, up to 100 × 60 mm, yellowish green, pubescence dense and short on both sides, apices acute, margins entire. **Inflorescences** peduncled, dense, globose. **Flowers** in small subinflorescences; perianth segments 5. **Flowering time** Jan.–June. **Seeds** solitary, golden-brown, ellipsoid, shiny. Disturbed sites; Sub-Escarpment Grassland, Albany Thicket, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Queenstown to Matatiele S, from Graaff-Reinet to Komga and Baviaanskloof to Grahamstown).

*EINADIA Raf.

Species 6, 4 endemic to Australia and 2 to New Zealand; 1 introduced in sthn Afr., NW, EC.

nutans (R.Br.) A.J.Scott

Perennial herb or weak shrub, up to 0.8 m high. **Leaves** opposite, linear to broadly hastiform, with grey-mealy hairs when young. **Inflorescences** spicate. **Flowers** single or in clusters, small; terminal flower of cluster bisexual; lateral flowers female, without staminodes. **Tepals** (4)5. **Stamens** 1–3, glabrous; disc absent. **Ovary** glabrous; stigmas 2, slender. **Fruit** not enveloped by perianth; pericarp membranous or succulent. **Seed** horizontal, lenticular with rounded margin; endosperm central, copious; embryo annular. Undergrowth; Sub-Escarpment Savanna (Grahamstown).

EXOMIS Fenzl ex Moq.

Species 1 with 2 varieties, confined to dryish areas of sthn Afr., NC, WC, EC.

microphylla (Thunb.) Aellen

Brakbossie (A)

Subshrub with dichotomous branching, ashy grey, with simple hairs, monoecious with few bisexual flowers. **Leaves** alternate, ovate to lanceolate, larger ones hastiform, entire. **Inflorescences** terminal spikes or axillary clusters. **Male flowers** without bracts; tepals 4 or 5, herbaceous, broadly linear, ± recurved and hood-like towards apex; stamens 5, filaments strap-like, slightly tapering towards apex, longer than tepals, and connate at base; staminodes absent; ovary rudimentary. **Bisexual flowers** bibracteate; bracteoles cylindrical, accrescent in fruit; tepals 3–5, sometimes absent, slightly united below; stami-

nodes absent; ovary fully developed; styles 2, free or united below. **Flowering time** all year. **Fruit** beaked at top; pericarp fleshy, adherent. **Seed** vertical, elongate to roundish or laterally compressed, blackish brownish. Dongas, river mouths, dunes, grazed; Mesic Highveld Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Lady Grey S, from Suurberg in Greater Addo Elephant National Park to East London).

*GOMPHRENA L.

Species ± 120, tropics and subtropics of the New World and in Australia, some introduced and naturalised in the Old World; 2 in sthn Afr., widespread weeds.

celosioides Mart.

Perennial herb, 0.3–1.5 m high, erect, prostrate, ascending 70–300 mm, much branched from base, usually thickened at nodes, pubescent. **Leaves** opposite, sessile or subsessile, entire, narrowly oblong to oblong-elliptic. **Inflorescences** terminal or axillary, capitate, finally elongate and cylindrical, 40–70 mm long. **Flowers** bisexual, solitary in axils of bracts; bracts deltoid-ovate, 2.5–4.0 mm long. **Flowering time** Jan.? **Seed** compressed-ovoid, brown, smooth or faintly reticulate, shining. Disturbed sites; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (Lady Frere S to Bedford and Fort Hare).

*GUILLEMINEA Kunth

Species 5, all natives of the Americas from southern USA to Argentina; 1 naturalised in sthn Afr., an increasingly widespread, tropical weed, N, LIM, G, M, FS, KZN, L, NC, WC, EC.

densa (Willd. ex Roem. & Schult.) Moq.

Perennial herb, 0.3–2.0 m high, prostrate or decumbent, mat-forming. **Inflorescences** sessile, axillary, dense bracts persistent, subequal, silvery, ± ovate. **Flowers** bisexual, minute, solitary in axils of bracts; bracteoles 2; perianth and bracteoles falling with fruit. **Flowering time** Nov.–Apr. **Seed** compressed, firm. Open woody grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Lady Frere S to Grahamstown).

*KOCHIA Roth

Species ± 5, Africa and Eurasia; 1 in sthn Afr., FS, NC, EC.

tricophylla Stapf

Flame bush; *vuurbossie* (A)

Perennial subshrub, up to 0.75 m high; stems ascending or erect, rather slender, almost glabrous. **Leaves** alternate, flat, linear to lanceolate, sessile. **Flowers** bisexual or unisexual, urceolate, solitary, or in pairs in leaf axils. **Tepals** 5, membranous, connate to ± middle; in fruit developing variously-shaped, spreading wings. **Stamens** (4)5, exserted; thecae broadly oblong-ovoid, without appendages. **Ovary** broadly ovoid; style elongate with 2 prominently papillose, apical arms. **Fruit** enclosed within persistent segments, horizontally compressed. Gravel; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Fort Beaufort, Lovedale).

MANOCHLAMYS Aellen

Monotypic, sthn Afr., N, NC, WC, EC.

albicans (Aiton) Aellen

Spanspekbos, *bobbejaanseep*, *spekbos* (A)

Perennial, grey, aromatic shrub, 0.25–0.80 m high. **Leaves** alternate, widely ovate, with concave leaf base elongated into petiole, entire. **Inflorescences** terminal spikes. **Flowers** unisexual. **Male flowers** with 5 tepals, ovate; stamens 5, longer than perianth. **Female flowers** with 3 or 4 very small tepals and 2 broad-based bracts; bracts becoming fleshy, encircling, but not covering fruit. **Fruit** white or greenish. **Seed** compressed with rounded margin, smooth, shiny, black. Grassland, scarce; Lower Karoo, Albany Thicket. (Kommadagga, Port Elizabeth District).

PUPALIA Juss.

Species 4, tropics of Old World from Africa to Malaysia and the Philippines; 2 in sthn Afr., N, B, NW, G, M, S, FS, KZN, L, NC, EC.

lappacea (L.) A.Juss.

Annual herb, 0.3–0.9 m high, erect. **Leaves** opposite, broad, entire, petiolate. **Inflorescence** a spiciform, bracteate thyrse, terminal on stems and branches. **Flowering time** Feb.? **Seed** oblong-ovoid or ovoid, black, slightly compressed. Grassland, forest and closed shrubland; Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Mkambati Nature Reserve to Port St Johns S, from Graaff-Reinet to Nahoon, and Suurberg in Greater Addo Elephant National Park to Port Alfred).

SALICORNIA L.

Species ± 13, cosmopolitan, excluding Australia, 7 in Europe, mostly maritime; 4 in sthn Afr., sheltered saline situations near coast, N, KZN, NC, WC, EC.

meyeriana Moss

Saltmarsh plant

Annual, dwarf shrub, 0.25–0.40 m high, erect or decumbent, sometimes thinly woody below, glabrous, appearing leafless, consisting of many superimposed, ± tubular segments that are green to reddish and succulent, and ultimately shrivel, each segment forming a little cup at apex, with 2 short teeth, embracing base of next higher segment; branches opposite, articulated. **Leaves** much reduced, opposite, consisting of small, connate scales. **Inflorescences** short or long, terminal and lateral, fleshy, cylindrical, persistent spikes breaking up irregularly. **Flowers** minute, bisexual or occasionally a few unisexual, usually in clusters of 3, ± connate, a pair of clusters to each fertile segment, clusters on opposite sides and immersed in hollows at articulations of branches. **Perianth** angular, minutely 3- or 4-lobed, fleshy, opening in middle of a truncate, flattened, lateral shield, lobes hard and spongy in fruit, persistent. **Stamens** 1 or 2 per flower; thecae exserted. **Ovary** ovoid, ovule subsessile; style lacerated at apex. **Flowering time** Dec.–June. **Fruit** an utricle, ovoid or oblong in outline, enclosed in spongy perianth; pericarp membranous. **Seed** erect, small, compressed, ± oblong; testa thin membranous, minutely hairy. Salt or brack estuaries along coastal areas, sand; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp E to Port Alfred).

SALSOLA L.

Saltwort

Species ± 150, in Europe, Asia, and Africa, introduced into America and Australia, in arid or semi-arid regions; 89 in sthn Afr., conspicuous under karroid conditions, N, B, LIM, NW, G, M, FS, NC, WC, EC.

Leaves and bracteoles without an aculeolate (prickly) apex; leaves with a swelling at base; shrubs and shrublets (sect. Caroxylon*)*

aphylla L.f.

Lye bush; *asbossie* (A)

Shortly hairy, grey shrublet, 1–3 m high. **Leaves** scale-like, fleshy, soon becoming glabrous and wrinkled. **Flowers** solitary in upper axils, minute. **Flowering time** Dec.–Feb. **Fruit** broadly winged. Dry, often saline slopes and flats; Upper Karoo, Lower Karoo (Cradock S to Willowmore District).

calluna Fenzl ex C.H.Wright

Rooiloodganna, *swartganna* (A)

Perennial, dwarf shrub, 0.2–0.6 m high, stems very woody, much branched. **Leaves** alternate, scabrous, fleshy, small, up to 2 mm long, furnished with a spur-like, tapered swelling at base and an attenuate, terete, fleshy apex, drying dark brown to black. **Bracts** ± ovate, fleshy, spurred. **Bracteoles** ovate-orbicular, fleshy, concave, carinate on outer surface, drying dark brown to black. **Flowers** pale yellowish green, in dense spikes. **Sepals** 5, with keeled, green centre, forming wings in fruit, margins hyaline. **Stamens** 5. **Ovary** ovoid-globose; style bifid. **Flowering time** Dec.–June. Salt/brack soils; Upper Karoo (Middelburg and Maraisburg districts, Hofmeyr).

geminiflora Fenzl ex C.H.Wright

Panganna, *soutganna* (A)

Perennial, dwarf shrub, ± 0.6 m high, stems woody, light brown, with corky bark; branches and branchlets yellow-brown. **Leaves** alternate, fleshy, tuberculate (wart-like), with rounded, white epidermal cells containing salt (a salt tasting species). **Bracts** and bracteoles with a dorsal keel and membranous margins. **Flowers** evenly spaced in axillary clusters on branches and densely arranged on branchlets; yellowish green. **Sepals** 5, with keeled, green centre, forming wings in fruit, margins hyaline. **Stamens** 5. **Ovary** ovoid-globose; style bifid. Salt/brack soils; Lower Karoo (Beaufort West and Willowmore districts).

gemmifera Botsch.

Low, sturdy shrublet, 0.25–0.45 m high, with intricate, stiff, woody branches; bark dark grey, corky, interspersed with white scales. **Leaves** alternate, cauline and floral leaves scale-like, not provided with attenuate apex. **Flowers** densely spirally arranged on branchlets, axillary, sessile; with 2 bracteoles only; small, gemma-like, flowering parts spongy, thickened, ± closed, yellowish. Sandy/rocky soil; Upper Karoo (Albert District).

glabrescens Burtt Davy

Brakbos, *rooibeen-kool-Janna* (A)

Perennial, indurated, dwarf shrub, 0.2–1.5 m high. **Leaves** alternate, scarious, fleshy, small, up to 2 mm long. **Bracts** ± ovate, keeled. **Bracteoles** ± ovate, fleshy, concave, carinate on outer surface. **Flowers** yellowish, solitary in axils of leaves, ± 2.5 × 1 mm.

Sepals 5, with keeled, green centre, forming wings in fruit, margins hyaline. **Stamens** 5. **Ovary** ovoid-globose; style bifid. **Flowering time** Jan., June. Salt/brack soils, disturbed areas; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket (Oviston S to Graaff-Reinet, E to Cradock).

rabieana I.Verd.

Blouganna, *hardeganna* (A)

Low, spreading shrub, 0.5–1.2 m high, with profuse, intricate, stiff, woody branches; pubescent when young. **Leaves** alternate, scale-like, often imbricate, fleshy, very small, 1.25–2.00 × 1.0–1.5 mm, green and thickened in centre, hyaline margined, apex obtuse. **Flowers** yellow-green, solitary in upper axis, ± 3 mm long. **Fruiting time** Jan., June. **Fruits** encircled by persistent wings of perianth lobes. Sandy soils, river- and stream-banks, seasonally waterlogged; Upper Karoo (between Middelburg and Steynsburg).

Leaves and bracteoles furnished with an aculeolate apex; leaves not swollen at base; annuals (sect. Salsola*)*

***kali** L.

Russian tumbleweed; *Russiese rolbossie* (A)

Robust, much-branched, annual herb, 0.4–0.6 m high, glabrous, rounded, with strong tap roots; aerial portion tumbling in wind when dry. **Leaves** sessile, linear to deltoid, acuminate, spine-tipped. **Flowers** aggregated in a spiciform way towards ends of branchlets, subtended by 2 relatively large bracteoles, hermaphrodite. **Sepals** 5, developing a horizontally spreading wing in fruit. **Stamens** 5. **Stigmas** 2, spreading. **Flowering time** Sept.–Apr. **Fruit** a small, brownish capsule surrounded by 5 papery wings. Eurasian weed in dry, disturbed areas, ruderal and potential transformer; Upper Karoo, Sub-Escarpment Grassland, Indigenous Forests, Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Albert District S, from Middelburg to Cintsa River Mouth, Cradock to Elliotdale and Suurberg in Greater Addo Elephant National Park to Grahamstown).

SARCOCORNIA A.J.Scott

Species 20–24, in Europe, Africa, Asia, North and South America, 3 native to Australia; 9 in sthn Afr., N, KZN, NC, WC, EC.

1a Plants with a decumbent or procumbent growth form, up to 0.3 m high

capensis (Moss) A.J.Scott

Perennial, dwarf shrub, 0.05–0.25 m high, forming dense mats or irregular rosettes; rooting at nodes, dead leaves adhere to stems; branches thin, tough. **Leaves**: apices distinctly keeled; segments narrowly cylindrical, 10–16 × 2–3 mm. **Flowers** not hidden by bracts. **Flowering time** Oct.–Apr. Sandy and fresh marshes, sometimes seasonally submerged; Eastern Fynbos-Renosterveld, Albany Thicket (Port Elizabeth E to Kenton on Sea).

decumbens (Toelken) A.J.Scott

Perennial, decumbent, woody, jointed, dwarf shrub, 0.15–0.50 m high. **Sterile segments** 3–6 mm in diam., glaucous, fading bluish red. **Leaves** reduced to a membranous collar. **Spikes** 10–30(50) mm long, usually cylindrical. **Flowers** 5–7 per cluster. **Perianth** truncate, with a lateral shield in whose centre the perianth opens. **Flowering time** Mar.–June. Midmarsh in estuarine and coastal lagoons; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Cintsa River Mouth SW to East London, and to Humansdorp).

natalensis (Bunge ex Ung.-Sternb.) A.J.Scott

Seekoraal (A)

Short-lived perennial, 0.05–0.30 m high, erect or sprawling, forming mats, stems jointed. **Sterile segments** 2–6 mm in diam., shining to dull grey-green. **Leaves** reduced to a membranous collar. **Spikes** 20–30(80) mm long. **Flowers** 3 in a cluster, hidden by bracts. **Perianth** not truncate laterally, opening at true apex. **Flowering time** Feb.–Aug. Coastal and inland saline habitats; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Cintsa River Mouth SW to East London and Humansdorp).

perennis (Mill.) A.J.Scott

Perennial, prostrate or decumbent, dwarf shrub, 0.1–0.3 m high, forming mats. **Sterile segments** 3–5 mm in diam., dull green to shiny green. **Spikes** 15–35(50) mm long, tapering in flower, cylindrical in fruit. **Flowers** 3–5 in clusters, not hidden by bract below. **Perianth** truncate, with a lateral shield in whose centre the perianth opens. **Flowering time** all year. Lowest zone on estuarine marshes; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Mthatha River, Pondoland S, from Port Elizabeth to East London, and to Nature's Valley).

pillansii (Moss) A.J.Scott

Perennial, sprawling, jointed shrublet, 0.15–0.70 m high; main stem up to 30 mm in diam. **Sterile segments** variable, long and narrow. **Leaves** with apices spreading, distal end of segment concave and 'gondola-shaped'. **Flowers** in threes in narrowly ovoid, terminal spikes. **Flowering time** Jan.–Sept. Highest zone on estuarine marshes, sometimes inland; Eastern Fynbos-Renosterveld, Indigenous Forests, Albany Thicket (Bietou River at Knysna, E to Keiskamma River near Hamburg).

1b Plants with an upright, shrubby growth form, up to 1 m high

littorea (Moss) A.J.Scott

Perennial shrub, 0.5–1.0 m high; dead leaves not adhering to stems that are 30–80 mm at base; secondary branches fastigiate, giving truncate appearance to plant. **Segments** in upper 200 mm of plant, light green or light yellow. **Spikes** solitary, rarely more than 1 per branch. **Flowers** becoming corky with age. **Flowering time** Sept.–May. Rocky beaches; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (Port Elizabeth to Tsitsikamma).

pillansii (Moss) A.J.Scott (see 1a above)

SERICOCOMA Fenzl

Species 3, confined to sthn Afr., N, NW, NC, WC, EC.

avolans Fenzl

Perennial, glabrous or hairy herb or subshrub, 0.25–0.70 m high. **Leaves** opposite, linear, oblong, entire. **Inflorescences** of terminal heads, 1 or 2 flowers together with 1 or more flowers reduced to spines. **Flowers** all bisexual, solitary in axils of bracts; bracteoles 2, falling with fruit. **Flowering time** Jan.? **Seed** compressed. Stony slopes and flats in dry habitats; Lower Karoo (Jansenville District).

SUAEDA Forssk. ex J.F.Gmel.

Sea-blite

Species ± 110, cosmopolitan, mainly in the northern hemisphere; 6 in sthn Afr., N, B, FS, NC, WC, EC.

caespitosa Wolley-Dod

Annual or occasionally perennial herb or subshrub, 0.05–0.25 m, prostrate, mat-forming, often rooting at nodes, aerial branches ± secund, fleshy, usually glabrous, straw-coloured when dry. **Leaves** alternate, ± fleshy, entire, linear, somewhat flattened. **Flowers**, sessile, clustered in upper axils of bracts, upper flowers male. **Perianth** succulent, 5-lobed; lobes rounded on back. **Stamens** 5, shortly exserted. **Ovary** depressed globose; stigmas 2. **Flowering time** Dec.–June. **Seed** horizontal. Sandy slopes, coastal marshes and estuaries; Eastern Fynbos-Renosterveld, Albany Thicket (Port Elizabeth E to Port Alfred).

fruticosa (L.) Forssk.

Inkbush

Softly woody, sprawling to prostrate, glabrous shrublet, up to 1 m high, initially grey-blue, drying brown. **Leaves** alternate, fleshy, ovoid to ellipsoid, with conspicuous, rounded, white, epidermal cells containing salt. **Flowers** red, axillary, in groups of 3, middle flower perfect. **Perianth** succulent, 5-lobed; lobes rounded on back. **Stamens** 5; anthers larger and longer exserted than *S. caespitosa*. **Ovary** ovoid; stigmas 3. **Flowering time** Sept.–Apr. **Seed** erect, slightly beaked. Floodplains, salt/brack, clayey-loam soils; Upper Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Cradock and Somerset East, S to Uitenhage and E to Albany).

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ANACAMPSEROTACEAE

(Order Caryophyllales)

Compiled by C.L. Bredenkamp

ANACAMPSEROS L.

[= *AVONIA* (E.Mey. ex Fenzl) G.D.Rowley]

Species ± 30, very scattered, SW U.S.A, N Mexico, S South America, S Australia and Somalia to Zimbabwe; 27 in sthn Afr., widespread.

albidiflora Poelln.

Boesmansuring, *haasballetjies* (A)

Succulent, perennial herb, 0.03–0.06 m high; branching, shoots columnar, taller than wide. **Leaves** dense, small, obovoid, rounded or truncate, reddish green; axils woolly, bristle hairs many, glossy, white. **Inflorescences** ± 65 mm high, branched; peduncles ± 25 mm long; bracts membranous, sheathing. **Flowers** white. **Stamens** ± 25. **Flowering time** Oct.–Jan. **Fruit** a capsule, 10 mm long. **Seeds** with long, white papillose protrusions. Stony slopes; Rainshadow Valley Karoo, Albany Thicket (Graaff-Reinet, Jansenville, Willowmore and Steytlerville districts).

arachnoides (Haw.) Sims

Succulent, perennial herb, 0.03–0.24 m high; forming dense clumps. **Leaves** ovoid, 20 × 15 mm, apex acuminate, recurved, sparsely cottony; axils woolly. **Inflorescences**

± 70 mm high, branched, dark brown; peduncles ± 30 mm long; bracts white, membranous, sheathing. **Flowers** pink to purplish, nearly 30 mm in diam. **Stamens** ± 25. **Flowering time** Nov.–Jan. **Fruit** a capsule, 8.9 mm long. In dry scrub and semi-karroid areas, lower hill slopes, Ecca shale, grassy vlei areas; Upper Karoo, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Graaff-Reinet to Mountain Zebra National Park S, from Willowmore to Suurberg and Grahamstown).

lanceolata (Haw.) Sweet

Dwarf, succulent, perennial herb, 0.01–0.16 m high. **Leaves** many, lanceolate, 25 × 6–8 mm, apex spinose, upper lamina flat, rounded below, papillate; axils white-hairy, bristle hairs many, 15 mm long. **Inflorescences** ± 100 mm high, branches dark purple-brown; peduncles ± 70 mm long, 1–4-flowered; bracts white, membranous, sheathing. **Flowers** ± 30 mm in diam., red. **Petals** widely ovate. **Stamens** 30–45. **Flowering time** Oct.–Dec. **Fruit** a capsule, up to 14 mm long. **Seeds** 3-angled. Forestry tracks in dry loamy soil on rocky W-facing slope; Indigenous Forests, Eastern Fynbos-Renosterveld (Joubertina, Baviaanskloof Forest Reserve).

papyracea E.Mey. ex Fenzl (Manning & Goldblatt 2012) [= *Avonia papyracea* (E.Mey. ex Fenzl) G.D.Rowley]

Dwarf, succulent, perennial herb, up to 0.08 m high; compressed stem producing many decumbent, relatively thick branches, 8–10 mm in diam.; tuberous root, stout. **Leaves** closely packed, alternate; quite large, blunt, green, hidden beneath imbricate, firmly appressed, widely ovate, pure white, entire, papery scales (stipules); shoots white. **Flowers** 1 or few, short-pedicelled, at stem apex, sometimes cleistogamous, white; bracts scaly. **Seeds** echinate. Rocky outcrops; Rainshadow Valley Karoo (Little Karoo, Willowmore District).

rufescens (Haw.) Sweet

Boesmansuring (A)

Dwarf, succulent, perennial herb, 0.02–0.08 m high; mat-forming, taproot strong, root system extensive. **Leaves** densely spiraled around short stem; widely depressed ovate, 6 × 8 mm, apex acuminate; deep green, lower surface reddish, papillate; bristle hairs many, ± 20 mm long, wavy. **Inflorescences** ± 100 mm long, often wavy, branched, dark brown; peduncles ± 30 mm long, 2–4-flowered; bracts white, membranous, apices long-pointed. **Flowers** white, pink or mauve. **Petals** widely ovate. **Stamens** 30–45. **Flowering time** Nov.–Jan. **Fruit** a capsule, 30 mm long. Rocky soil on bare rock, granite, hill slopes, full sun; Dry Highveld Grassland, Mesic Highveld Grassland, Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Aliwal North to Joubertspas S, from Steynsburg to Cala and Cradock to Komga).

telephiastrum DC.

Gemsboksuring, groothaaskos (A)

Succulent, perennial herb, 0.05–0.15 m high; older plants tufted, short stemmed. **Leaves** 10–30 mm long, ovate to roundish, acute-tipped, brownish green to purplish, lower surface not reddish, smooth or rough, papillate; bristle hairs few, ± 10 mm long. **Inflorescences** ± 150 mm high; peduncles stout, ± 25 mm long, 1–4-flowered; bracts regularly spaced, white, tinted brownish, long-pointed. **Flowers** 30–35 mm in diam., pink. **Petals** widely ovate. **Stamens** 30–45. **Flowering time** Nov., Dec. **Seeds** not angled. Rocky flats and slopes, transition from fynbos to succulent veld; Upper Karoo, Sub-Escarpment

Grassland, Eastern Fynbos-Renosterveld (Schoombee, Maclear, Joubertina and Suurberg in Greater Addo Elephant National Park).

ustulata E.Mey. ex Fenzl (Manning & Goldblatt 2012)
[= *Avonia ustulata* (E.Mey. ex Fenzl) G.D.Rowley]

Moer-plantjie, *kirriemoer* (A)

Dwarf, succulent, perennial herb, up to 0.03 m high; roots thick, woody; forming a mass of thin, prostrate, branching stems. **Leaves** closely packed, alternate, green, kidney-shaped, not or only slightly exposed, hidden beneath imbricate, papery scales (stipules), making shoots appear white; stipules blunt, silvery, apex dark brown. **Inflorescences** terminal. **Flowers** 1 or few, short-pedicelled, at stem apex, white, rarely pink, sometimes cleistogamous; bracts scaly. **Seeds** many. Rocky ridges, plains or gentle slopes, quartzite, granite, sandstone; Dry Highveld Grassland, Upper Karoo, Sub-Escarpment Grassland, Rainshadow Valley Karoo (Aliwal North S, Steynsburg, Sterkstroom and Queenstown districts to Willowmore District).

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ANACARDIACEAE

(Order Sapindales)

Compiled by M. Struwig

1a Leaves compound, trifoliolate, or variably imparipinnate:
2a Leaves variably imparipinnate:
3a Fruit fleshy:
4a Stamens 7–10; leaflets falcate, narrowly ovate, subsessile..... **Harpephyllum**
4b Stamens 4 or 5; leaflets narrowly elliptic, sessile ..... **Loxostylis**
3b Fruit dry..... ***Schinus**
2b Leaves nearly always trifoliolate:
5a Fruit a small, fleshy or dryish drupe..... **Searsia**
5b Fruit with membranous, winged pericarp ..... **Smodingium**
1b Leaves simple:
6a Leaves opposite or nearly so, margins entire; stamens 5, arising below disc; styles 3, connate at base .. .. **Protorhus**
6b Leaves alternate:
7a Leaves with serrate margins; ovary 1-locular; style lateral with minutely 2-lobed stigma; fruit compressed, narrowly winged ..... **Laurophyllus**
7b Leaves with entire margins:

8a Style and stigma 1; male flowers with 1(2) fertile stamens ..... ***Mangifera**
8b Styles and stigmas 3; male flowers with all stamens normal ..... **Ozoroa**

HARPEPHYLLUM Bernh.

Wild plum; *wilde-pruim* (A); *mothêkêlê* (NS); *umgwenye* (X); *umgwenya* (Z)

Monotypic, sthn Afr., LIM, M, S, KZN, EC.

caffrum Bernh.

Tree, 2–15 m high; evergreen, bark dark brown, thick and rough, branchlets nodose due to leaf scars, glabrous. **Leaves** 9–17-foliate, petiole and rachis glabrous, pale green, coriaceous, opposite; terminal lanceolate to ovate; lateral lanceolate-falcate. **Flowers** in panicles, shorter than leaves. **Male flowers**: petals whitish or yellowish, oblong-ovate, margins revolute, disc glabrous; stamens 7–10. **Female flowers**: perianth similar to male; staminodes conspicuous; ovary rhomboid; 4 or 5 sessile stigmas. **Fruit** a red drupe, fleshy, oblong-ovate. **Seeds** compressed. Stony soil or rocky; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Indigenous Forests, Albany Thicket (Mpofu Game Reserve, Stutterheim District and Komga S, from Port Elizabeth to East London District).

LAUROPHYLLUS Thunb.

Iron martin; *ystermartiens* (A)

Monotypic, sthn Afr., WC, EC.

capensis Thunb.

Tree, 1–6 m high; evergreen, dioecious, bark charcoal-grey to brown, smooth. **Leaves** simple, petiolate, spirally arranged, glossy green above, light green below, elliptic-oblong, margins toothed. **Flowers** white; calyx and corolla divided into 5 parts. **Male flowers** in terminal panicles; stamens 4 or 5. **Female flowers** formed from bracts, antler-like, woody, branched, resembles a parasitised deformity; ovary almost spherical, 1-locular; style lateral with minutely 2-lobed stigmas. **Flowering time** Aug.–Feb. **Fruit** hard, compressed, slightly winged, ovoid. Stony soil or rocky, gravel, quartzite, well drained, full sun; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (Port Elizabeth District S, from Tsitsikamma National Park E to Humansdorp).

LOXOSTYLIS A.Spreng. ex Rchb.

Tarwood; *teerhout* (A); *isibara* (X); *isibata* (Z)

Monotypic, sthn Afr., KZN, WC, EC.

alata A.Spreng. ex Rchb.

Tree or shrub, 2–10 m high; evergreen, dioecious, bark pale grey. **Leaves** sessile, petiolate, spirally arranged, pinnately compound, rachis winged; leaflets dark glossy green, narrowly elliptic, margins entire. **Flowers** in terminal panicles; parts in fours or fives; sepals large, petal-like, pink or brick-red, elliptic; petals small, star-like, creamy white, falling very early. **Male flowers**: 4 or 5 stamens. **Female flowers**: ovary obliquely ovoid. **Flowering time** Sept.–May. **Fruit** fleshy, small, embedded in persistent, pink sepals, skin contains a black, sticky substance that is difficult to wash off hands. Stony soil or rocky, bare rock, sand or loam, well drained; Indian Ocean Coastal Belt, Indigenous Forests, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket, Lower Karoo, Sub-Escarpment Savanna (Mkambati Nature Reserve S to Willowmore and Humansdorp Districts, and to Grahamstown).

*MANGIFERA L.

Mango

Species ± 62 in SE Asia; many cultivars and sometimes escapes in sthn Afr., KZN, EC.

indica L.

Tree or shrub, 5–20 m high; branchlets fulvous-puberulous, glabrescent when old. **Leaves** petiolate, striate, glabrous, coriaceous, concolorous, green, oblong or oblong-lanceolate; midrib prominent on both sides, lateral nerves and reticulation raised. **Flowers**: male and female flowers on same panicle. **Sepals** 5, green with whitish margins, sericeous-pilose outside. **Petals** 5, whitish. **Stamens** 1(2) fertile, filaments long; staminodes 3(4), short. **Disc** thick. **Ovary** depressed-globose; styles lateral, opposite to fertile stamen. **Fruit** a drupe. Widely cultivated and sometimes escapes in subtropical forests; Albany Thicket, Eastern Fynbos-Renosterveld (Port Elizabeth District).

OZOROA Delile

Kei resin tree; *kei-harpuisboom* (A); *umphemba* (X)

Species ± 40, Africa and Arabian Peninsula, possibly Madagascar; ± 20 in sthn Afr., widespread.

mucronata (Bernh.) R.Fern. & A.Fern.

Tree or shrub, 1.2–5.0 m high; bark grey. **Leaves** petiolate, in whorls of 3 or spirally arranged; glabrous and dark green above, silvery with silky hairs below, margins entire, midrib indented above, apex ending in hair-like apex. **Flowers** in terminal heads, small, greenish white. **Male flowers**: calyx 5-segmented; petals 5, elliptic; stamens 5. **Female flowers**: calyx and corolla as in male; staminodes 5, rudimentary; ovary 1-locular, symmetrical, with single basal ovule; styles 3; stigmas somewhat capitate. **Fruit** shiny, kidney-shaped, becoming black and wrinkled. Stony soil or rocky, sand, gravel, sandstone, quartzite, well drained, full sun; Albany Thicket, Eastern Fynbos-Renosterveld, Lower Karoo, Sub-Escarpment Savanna (Greater Addo Elephant National Park E to Bathurst District).

PROTORHUS Engl.

Red beech; *rooiboekenhout* (A); *umhluthi* (X); *umhlangothi* (Z)

Species ± 20, Madagascar; 1 in sthn Afr., N, LIM, M, S, KZN, NC, EC.

longifolia (Bernh.) Engl.

Tree, 1.5–18.0 m high; evergreen, dioecious, bark dark brown, milky latex present. **Leaves** simple, petiolate, opposite to subopposite or spirally arranged, dark green and glossy above, paler green below, linear-oblong to narrowly-elliptic, margins entire and frilled; lateral veins fork just before reaching margins. **Flowers** in panicles, greenish white or yellow. **Calyx** 5-lobed, saucer-shaped. **Petals** longer than calyx, erect, oblong. **Stamens** 5. **Ovary** ovoid; styles 3. **Flowering time** July–Dec. **Fruit** a drupe, fleshy, asymmetric, becoming purple-mauve, 1-seeded. Stony soil or rocky, bare rock, loam; Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Lusikisiki District S, from Keiskammahoek District to Kentani, and from Kei Road to East London).

*SCHINUS L.

Pepper tree; *peperboom* (A)

Species ± 25, South and Central America; 2 introduced in sthn Afr., B, LIM, G, M, KZN, NC, WC, EC.

molle L.

Pepper tree; *peperboom* (A)

Perennial tree, 4–11 m high; branches and foliage drooping, fruit and leaves emit peppery scent when crushed, dioecious. **Leaves** imparipinnate; up to 37 leaflets, greyish or light green, narrowly lanceolate, margins entire or serrated, rachis slightly winged, pubescent when young, milky latex. **Flowers** terminal or in axillary clusters, creamy white. **Fruit** a drupe, globose and slightly fleshy, pink to reddish, 1-seeded. Sandy soil, origin South America (Andes or Peru), invasive status: special effect weed (competitive, poisonous, irritant), proposed declared invader; poisonous fruit in quantity, irritant to skin and respiratory tract; Dry Highveld Grassland, Drakensberg Grassland, Lower Karoo, Albany Thicket (Aliwal North S to Graaff-Reinet and Buffelshoek).

terebinthifolius Raddi

Brazilian pepper tree; *Brasiliaanse peperboom* (A)

Perennial tree or shrub, 2.5–4.0 m high, evergreen, wide-spreading horizontal branches, dioecious. **Leaves** imparipinnate; 5–13 leaflets; dark green above, paler below; oblong, rounded, bluntly pointed, sometimes serrated, prominent pale veins above, glabrous, rachis winged. **Flowers** terminal and axillary clusters, small, creamy white. **Fruit** a drupe, globose and slightly fleshy, bright red, 1-seeded. Origin South America (Brazil), invasive status: potential transformer, declared weed in KZN and declared invader (Category 3) elsewhere in SA; poisonous fruit in quantity, irritant to skin and respiratory tract; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Grahamstown District).

SEARSIA F.A.Barkley

[= *RHUS* L. subgen. *Thezera* (DC.) K.Koch, *RHUS* L. subgen. *Gerontogeae* Engl.]

Species currently 111, infraspecific taxa 28, Mediterranean, Africa and Asia; ± 75 in sthn Afr., widespread.

Searsia F.A.Barkley comprises the Old World species of the *Rhus* complex formerly regarded under the above-mentioned two subgenera.

1a Drupes villous, tomentose or puberulous

incisa (L.f.) F.A.Barkley

Rub-rub berry; *baardbessie* (A); *unongqutu* (X)

Tree or shrub, 0.5–5.0 m high; multi-stemmed, deciduous, branches divaricate, greyish brown, glabrous, lenticels brown; branchlets squarrose, often reddish, spur-like. **Leaves** petiolate, trifoliolate; leaflets sessile, coriaceous, dark green and minutely hairy above, canescent to white below, ovate to obovate, dissection varies, from deeply dissected to less deeply dissected. **Inflorescence** a panicle, pubescent, terminal on short spurs, exposed. **Flowers** small, sessile, greenish yellow; calyx and corolla tomentose. **Flowering time** all year. **Fruit** a drupe, cream-coloured to pinkish brown, villous. Stony soil or rocky,

gravel, loam, sand, shale, well drained, full sun; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Lower Karoo, Albany Thicket, Indigenous Forests, Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Steynsburg District S to Humansdorp).

rosmarinifolia (Vahl) F.A.Barkley

Shrub, 0.2–1.0 m high; ericoid, virgate, branched; branches glabrous, rarely puberulous, sometimes arched. **Leaves** petiolate, trifoliolate; leaflets straight or curved, subcoriaceous to rigidly coriaceous, greyish green, glabrous to pubescent above, white below, acicular or widely linear to narrowly oblanceolate, margins entire, revolute, sometimes pauciserrate in upper half. **Inflorescence** axillary and terminal panicles, glabrous to pubescent; males ± 60 mm long, females reduced with few flowers, exposed. **Flowering time** May–Oct. **Fruit** a drupe, oblate, obloid to ellipsoid, fulvous, villous-tomentose to ferruginous glabrous. Stony or rocky soil, sand, sandstone, quartzite, well drained, full sun; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests, Sub-Escarpment Savanna (Seymour District S to Albany District).

tomentosa (L.) F.A.Barkley

Real wild currant; *korentebos* (A); *inhlokoshiyane* (Z)

Tree or shrub, 0.5–5.0 m high, much branched; bark grey-brown, smooth; branches reddish brown, glabrous to tomentose, ridged, lenticels tiny. **Leaves** petiolate, trifoliolate; leaflets petiolulate, coriaceous, dark grey-green and glabrous to pubescent above, creamy canescent and lanate below, widely lanceolate, elliptic or obovate, margins slightly thickened, entire or grossly pauciserrate in upper $^{2}/_{3}$. **Inflorescence** in lax, much-branched panicles, glabrous or pubescent, axillary or terminal; males up to 90 mm long, scented, exposed; females up to 50 mm long, within foliage. **Flowers**: calyx pubescent. **Flowering time** Jan.–Oct. **Fruit** a drupe, oblate, ellipsoid, creamy canescent. Bare rock, sand; Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Indigenous Forests, Sub-Escarpment Savanna, Lower Karoo (Somerset East to King William's Town S, from Uitenhage District to Grahamstown and to Humansdorp).

1b Drupes glabrous
2a Leaf margins entire
3a Leaflets subcoriaceous to coriaceous

acocksii (Moffett) Moffett

Pondo climbing currant; *pondoranktaaibos* (A)

Shrub or climber, 1–? m high; semi-evergreen, prostrate to scandent shrub or woody climber, short recurved spines; bark smooth, peeling. **Leaves** petiolate, trifoliolate; leaflets petiolulate, dark green, drying olive-brown, ovate to elliptical. **Inflorescence** a much-branched panicle, axillary or terminal, axillary peduncles persisting as recurved spines. **Flowering time** Dec.–Mar. **Fruit** a drupe, globoid, green becoming shining dark red. Stony soil or rocky, bare rock, sand, sandstone, well drained, partial shade; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests (Lusikisiki District).

[E]albomarginata (Sond.) Moffett

Shrub, 0.2–0.5 m high; woody, unarmed, divaricate; bark and branches light brown, smooth, lenticels tiny, branchlets slightly compressed, angulate. **Leaves** erect, petiolate, trifoliolate; leaflets sessile, coriaceous, glabrous, dark green, oblanceolate, obtrullate

or obovate, margins thickened, revolute, dull whitish, entire. **Inflorescence** sparingly branched panicles, mostly axillary, within foliage, occasionally terminal. **Flowers** glabrous; calyx lobes ovate, 1 mm long; corolla lobes ovate, 2 mm long, cream-coloured; styles separate, semi-persistent. **Flowering time** Jan.–Apr. **Fruit** a drupe, circular, globoid to obloid, glabrous, shiny, yellow to red. Stony soil or rocky; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Indigenous Forests (Port Elizabeth E to East London).

burchellii (Sond. ex Engl.) Moffett

Karoo kuni bush; *karookoeniebos* (A)

Tree or shrub, 0.25–5.00 m high; much branched, evergreen, sometimes thorny, divaricate; bark grey-brown, granular; branches and branchlets squarrose, lenticels prominent. **Leaves** petiolate, trifoliolate; leaflets sessile, subcoriaceous, olive-green, glabrous, obcordate, emarginate, sometimes covered with a shiny resinous exudate. **Fruit** a drupe, ovoid, slightly flattened, glabrous, shiny, chestnut-brown. Stony soil or rocky, sand, basalt, shale, well drained, partial shade to full sun; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Albany Thicket, Lower Karoo, Sub-Escarpment Savanna (Oviston Nature Reserve S to Fort Beaufort District).

ciliata (Licht. ex Schult.) A.J.Mill.

Sour karee; *suurkaree* (A)

Shrub, 0.4–2.0 m high; multi-stemmed, aromatic, forming dense colonies; branches grey-brown, end in spines, glabrous. **Leaves** petiolate, trifoliolate, sometimes fascicled; leaflets sessile, subcoriaceous, glabrous to pubescent, dark olive above, slightly paler below, oblanceolate to narrowly elliptic, margins entire, ciliolate. **Inflorescence** lax panicles, glabrous and pubescent, axillary or terminal. **Flowering time** Sept.–Mar. **Fruit** a drupe, oblate, glabrous, shiny, reddish, drying brown. Stony soil or rocky, loam, gravel, well drained, full sun; Upper Karoo, Dry Highveld Grassland, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Gariep Dam District S to Uitenhage District).

discolor (E.Mey. ex Sond.) Moffett

Shrub or dwarf shrub, 0.2–1.0 m high; virgate to branched suffrutex; branches pubescent, shallowly ribbed. **Leaves** petiolate, trifoliolate; leaflets sessile, subcoriaceous, greyish green, sericeous to strigose above, greyish white to cream-coloured below, broadly linear, oblanceolate, narrowly elliptic or obovate, margins entire, revolute. **Inflorescence** much-branched panicles, pubescent, axillary and terminal, crowded towards branch ends; males up to 140 mm long, exposed. **Flowers**: pedicle and calyx pubescent; styles persistent. **Flowering time** Nov.–Mar. **Fruit** a drupe, circular to oblate, glabrous, shiny, dull yellowish brown. Stony soil or rocky, sand, loam, moist or damp, well drained; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket (Ramatseliso's Gate to Insizwa S, from Queenstown to Lusikisiki, Katberg Pass to Komga, and to Baviaanskloof).

dregeana (Sond.) Moffett

Shrub, 0.6–2.0 m high; multibranched, wiry, unarmed; branches grey, branchlets glabrous. **Leaves** petiolate, trifoliolate; leaflets sessile, coriaceous, rigid, glabrous, olive-green, linear-acicular, occasionally slightly falcate, concave, margins entire, midrib dull yellow. **Inflorescence** lax, much-branched panicles, axillary and terminal, up to 35 mm

long. **Flowers** pendulous, separate; styles persistent. **Fruit** a drupe, oblate, obloid to ellipsoid, glabrous, shiny, light brown, minutely tricuspidate. Stony soil or rocky, bare rock, sand, loam, sandstone, basalt, dappled shade, running water; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (Oviston to Barkly East S, from Richmond District to Dordrecht, Mountain Zebra National Park to Bedford and to Uitenhage District).

fastigiata (Eckl. & Zeyh.) Moffett

Broom currant; *besemtaaibos* (A); *intlokolotshane yedobo* (X); *inhlokoshiyane* (Z)

Shrub, 0.5–2.0 m high; fastigiate, bark brown; branchlets grey-brown, glabrous to pubescent. **Leaves** petiolate, trifoliolate; leaflets sessile, lateral leaflets smaller than terminal, subcoriaceous, dark green above, slightly paler below, glabrous or thinly pubescent, oblanceolate to narrowly elliptic or rarely obtrullate, margins entire, revolute. **Inflorescence** glabrous to tomentose panicles, axillary and terminal; terminal slightly exposed, up to 30 mm long. **Flowers** small, cream-coloured to yellowish, rarely bisexual. **Flowering time** Nov.–Apr. **Fruit** a drupe, oblate, obloid, glabrous, shiny, brown. Stony soil or rocky, bare rock; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket, Lower Karoo (Tsolo District S, from Cathcart to Kentani, and from Suuranysberge to Grahamstown District).

glauca (Thunb.) Moffett

Blue kuni bush; *bloukoeniebos* (A)

Tree or shrub, 0.5–4.0 m high; much branched, evergreen, divaricate; bark granular, grey-brown to greyish white; branchlets squarrose, shallowly ribbed, furfuraceous. **Leaves** petiolate, trifoliolate; leaflets sessile, subcoriaceous, olive-green, glutinous, drying furfuraceous to farinaceous glaucescent, obcordate to obovate, margins entire, slightly revolute. **Inflorescence** much-branched panicles, axillary and terminal, exposed, up to 50 mm long. **Flowers** whitish or greenish white to yellowish, very small. **Flowering time** May–Sept. **Fruit** a drupe, oblate, ellipsoid, glabrous, shiny, chestnut-brown. Stony soil or rocky, sand, gravel, well drained, full sun; Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna, Indigenous Forests, Eastern Fynbos-Renosterveld, Lower Karoo (Dordrecht District to Lady Frere S, from Fort Beaufort to Gonubie River, Steytlerville District to East London and to Humansdorp).

gracillima (Engl.) Moffett

Dwarf shrub, 0.2–0.7 m high; virgate, branches thin, ascending, hirsute. **Leaves** acutely ascending, widely spaced, not confined to upper parts only; petiolate, trifoliolate; leaflets sessile, rigidly coriaceous, dull grey-green, scabrid-hirtellous, acicular, narrowly transverse rhombic to reduplicate, margins entire, ciliolate. **Inflorescence** thinly hirsute, much-branched, terminal panicles, 80 mm long, few flowered, prominently exposed. **Flowers** glabrous; styles persistent. **Fruit** a drupe, circular, obloid to ellipsoid, glabrous, shiny. Mountainous areas and river valleys; Dry Highveld Grassland, Upper Karoo, Sub-Escarpment Grassland (Cradock District).

harveyi (Moffett) Moffett

Dwarf shrub, 0.2–1.0 m high; virgate or branched suffrutex, branches glabrous or villous, fulvous. **Leaves** petiolate, trifoliolate, glabrous or hairy; leaflets sessile, coriaceous; dark green above, drying shiny brown, glabrous or hairy above, paler green, strigose and

villous below, widely lanceolate to obovate, margins entire or ciliate, slightly revolute and thickened, whitish. **Inflorescence** much-branched panicles, pubescent or glabrous, axillary and terminal. **Flowers**: pedicle and calyx pubescent; styles persistent. **Fruit** a drupe, circular to oblate, glabrous, shiny, dull yellowish brown. High mountainous areas; Drakensberg Grassland, Sub-Escarpment Grassland (Ongeluksnek, Matatiele District).

horrida (Eckl. & Zeyh.) Moffett

Shrub, 1.0–1.7 m high; much branched, armed, often forming spiny thickets; bark grey-brown, granular, branching squarrose; branchlets straight, rigid, spinous; young growth russet. **Leaves** fasciculate, petioles hairy, trifoliolate; leaflets sessile, coriaceous, dull grey-green, stellate-hairy, linear-oblanceolate to spathulate, margins entire. **Inflorescence** a raceme, 10 mm long, often single-flowered, fasciculate, crowded on dwarf outgrowths of often leafless spines. **Flowers**: calyx hairy; styles persistent. **Fruit** a drupe, fleshy, asymmetrically oblate, obloid, dark reddish brown, drying black. Closed shrubland; Albany Thicket (Port Alfred to East London).

keetii (Schönland) Moffett

Slender karee-rhus; *slankkaree* (A)

Shrub, 0.5–1.7 m high; single-stemmed, slender, erect; branches glabrous, branchlets chestnut-brown, surface often peeling. **Leaves** relatively few, internodes 20–40 mm long, petiolate, trifoliolate; leaflets sessile, coriaceous, dull green, glabrous, stellate-glandular, linear, very narrow, lateral leaflets geniculate-falcate, margins entire, dull yellowish white, slightly thickened. **Inflorescence** terminal, much-branched panicles, prominently exposed, up to 140 mm long, sparsely flowered. **Flowers**: styles persistent. **Fruit** a drupe, oblate, obloid to ellipsoid, glabrous, shiny. Habitat not recorded; Upper Karoo (Gariep Dam District).

krebsiana (C.Presl ex Engl.) Moffett

Mock sour currant; *valssuurtaaibos* (A); *inhlokoshiyane* (Z)

Gnarled shrub or small crooked tree, 1.5–3.0 m high; bark rough, dark, branchlets chestnut-brown, blackish, striate. **Leaves** with petioles dull yellowish, trifoliolate; leaflets sessile, coriaceous, glutinous, dark green above, paler below, elliptic to obovate, margins entire, slightly revolute. **Inflorescence** panicles, ± 60 mm long, axillary within dense foliage, terminal panicle partially exserted. **Flowers** small, yellowish; calyx lobes 1 mm long; corolla lobes 2 mm long. **Fruit** a drupe, oblate, obloid, glabrous, shiny, light to dark brown. Stony soil or rocky, sand, shale, well drained, full sun; Drakensberg Grassland, Sub-Escarpment Grassland, Dry Highveld Grassland, Albany Thicket (Ongeluksnek Pass to Mount Fletcher and Maclear districts S, and from Graaff-Reinet District to Hogsback).

laevigata (L.) F.A.Barkley

Dune currant; *duinetaaibos* (A); *umhlakothi* (X); *inhlokoshiyane* (Z)

Shrub, 0.5–2.5 m high; much branched, multi-stemmed, unarmed, sometimes spinous; bark grey-brown, smooth; young branches chestnut-brown, glabrous. **Leaves** petiolate, trifoliolate; leaflets sessile, subcoriaceous, dark green above, paler below, widely obovate to occasionally lanceolate, margins entire, slightly revolute. **Inflorescence** axillary and terminal panicles, ± 60 mm long, lax, glabrous. **Flowers** small, greenish yellow, rarely bisexual or 6-merous; corolla lobes large, ± 2 mm long; styles free. **Flowering time** Nov.–Apr. **Fruit** a drupe, circular, globoid, glabrous, shiny, dull yellow to reddish,

drying brown. Stony soil or rocky, sand; Mesic Highveld Grassland, Dry Highveld Grassland, Drakensberg Grassland, Albany Thicket, Indigenous Forests, Eastern Fynbos-Renosterveld (Lady Grey District S, from Somerset East to Katberg, Port Elizabeth District to Port Alfred and from Humansdorp to Cape Recife).

lancea (L.f.) F.A.Barkley

Karee; *karee* (A); *motšhakhutšhakhu* (S); *umhlakotshane* (X)

Tree or shrub, 1–12 m high; semi-evergreen; bark dark brown to blackish, rough, irregularly fissured; branches and branchlets reddish, pendulous. **Leaves** petiolate, trifoliolate; leaflets sessile, subcoriaceous, glabrous, often glutinous, dark olive-green above, pale yellowish green below, narrowly lanceolate, margins entire, slightly thickened. **Inflorescence** axillary and terminal panicles, lax, much branched; flowers crowded. **Flowers** small, pale greenish yellow, sweetly scented; corolla lobes oblong; styles widely separated, recurved, persistent. **Flowering time** Apr.–Sept. **Fruit** a drupe, oblate, ellipsoid, glabrous, shiny, dull yellow to brown, sometimes sticky. Stony soil or rocky; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket, Lower Karoo, Drakensberg Grassland, Indigenous Forests, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Oviston Nature Reserve to Aliwal North and Middelburg S, from Cradock to Dohne, and from Uitenhage to Grahamstown).

longispina (Eckl. & Zeyh.) Moffett

Thorny currant; *doringtaaibos* (A)

Tree or shrub, 1–4 m high; evergreen, multi-stemmed, much branched, armed; bark granular to rough, slightly fissured; branches striate, pale grey-brown to dull yellowish. **Leaves** fasciculate to crowded on spurs; petioles slightly channelled or winged, trifoliolate; leaflets sessile, subcoriaceous, olive-green above, slightly paler below, oblanceolate to narrowly obovate, margins entire, slightly revolute. **Inflorescence** axillary and terminal panicles, ± 50 mm long; males much branched; females less; branches furfuraceous. **Flowering time** Mar.–Sept. **Fruit** oblate, ellipsoid, glabrous, shiny, chestnut-brown. Stony soil or rocky, sand, loam, shale, sandstone, dolerite, well drained, full sun; Upper Karoo, Dry Highveld Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Lower Karoo, Sub-Escarpment Savanna (Steynsburg District S to Somerset East, and from to Steytlerville District to Port Alfred).

magalismontana (Sond.) Moffett

Rock currant; *kliptaaibos* (A)

Xerophytic shrub or dwarf shrub; branches dark grey, glabrous to puberulous, sometimes furfuraceous. **Leaves**: petiole margins slightly thickened, trifoliolate; leaflets sessile, coriaceous, grey to greyish green to yellowish, young growth gold-coloured or reddish pink above, grey below, glabrous to furfuraceous, narrowly linear to oblanceolate, margins entire, slightly thickened. **Inflorescence** axillary and terminal panicles, terminal exposed, lax, ± 70 mm long. **Flowers**: corolla lobes 2 mm long; calyx $^{1}/_{2}$–$^{3}/_{4}$ length of corolla lobes. **Fruit** a drupe, oblate, ellipsoid, glabrous, shiny, light to dark brown. Mountainous areas and river valleys; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Lower Karoo (Alice District S to Albany District).

nebulosa (Schönland) Moffett

Coastal currant; *kuskaree* (A)

Tree or shrub, 0.5–4.0 m high; bark smooth, branches glabrous, armed or unarmed. **Leaves** petiolate, trifoliolate; leaflets sessile, membranous to subcoriaceous, shiny dark

green above, paler below, obovate to broadly elliptic, margins entire. **Inflorescence** axillary panicles, forming exposed sprays among foliage, ± 70 mm long; females ± 400 flowers, terminal, ± 20 mm long; males ± 1 600 flowers. **Flowers** minute, yellowish; calyx lobes < 0.25 mm long; corolla lobes ± 1 mm long; rarely 6-merous. **Flowering time** Feb.–May. **Fruit** a drupe, circular, glabrous, shiny, dull yellow to reddish, drying brown. Stony soil or rocky, humus-rich soil, sand, sandstone, well drained, partial shade; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (Elliotdale to Mkambati Nature Reserve S, from Kentani to Bulugha River Mouth, and from Alexandria State Forest to Boknes).

pterota (C.Presl) Moffett

Winged currant; *vlerksteeltaaibos* (A)

Tree or shrub, 1.5–3.0 m high; much branched, armed; bark grey, granular, often covered with lichen, young growth covered with russet glands. **Leaves** fasciculate, crowded on dwarf outgrowths of older branches and spines; petioles winged, trifoliolate; leaflets sessile, coriaceous, glabrous, dull grey-green above, slightly paler below, elliptic to obovate, margins entire, revolute. **Inflorescence** furfuraceous panicles, fasciculate, males crowded. **Flowers** small, pale yellowish. **Fruit** a drupe, elliptic, ellipsoid, slightly asymmetric, glabrous, shiny, fleshy, dark reddish brown, drying black, pungent resinous juice makes it unpalatable. Habitat not recorded; Albany Thicket, Eastern Fynbos-Renosterveld (Port Elizabeth E to Port Alfred).

rigida (Mill.) F.A.Barkley

Tree or shrub, 0.2–2.0 m high; much branched, branches dull grey-brown to chestnut when young, glabrous, lateral branches spinous. **Leaves**: petioles dull yellow, trifoliolate; leaflets sessile, subcoriaceous, conduplicate, dark green to blue-green, lanceolate, narrowly elliptic to narrowly ovate, margins entire, whitish, slightly thickened. **Inflorescence** mostly axillary, but also terminal racemes and panicles, ± 60 mm long. **Flowers**: styles basally connate, persistent. **Flowering time** Nov.–Apr. **Fruit** a drupe, circular to oblate, obloid, glabrous, shiny, pale to dark brown. Stony soil or rocky, well drained, full sun; Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Lower Karoo, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Mount Fletcher District S to Bathurst District).

3b Leaflets submembranous to membranous

pallens (Eckl. & Zeyh.) Moffett

Eastern kuni bush; *oostelike koeniebos* (A)

Tree or shrub, 0.5–3.0 m high; evergreen, multi-stemmed, much branched, unarmed; bark grey-brown, ridged; branches ascending, branchlets dark brown, ribbed. **Leaves** petiolate, trifoliolate; leaflets sessile, submembranous, glabrous, olive-green, oblanceolate or spathulate to narrowly obovate, margins entire, revolute, sometimes undulate towards apex, midrib ridged on both surfaces. **Inflorescence** much-branched panicles, ± 80 mm long, axillary within foliage, terminal exposed. **Flowers**: corolla lobes widely ovate. **Flowering time** Mar.–Sept. **Fruit** a drupe, oblate, ellipsoid, glabrous, shiny, light to chestnut-brown. Stony soil or rocky, sand, gravel, well drained; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Maclear District S, Victoria East District to Gonubie Nature Reserve, and from Baviaanskloof to Bathurst District).

pyroides (Burch.) Moffett

Common wild currant; *taaibos* (A); *motšhakhutšhakhu* (S); *intlokotshane* (X); *inhlokoshiyane* (Z)

Tree or shrub, 0.5–6.0 m high; multi-stemmed, unarmed or armed; bark grey, granular; branchlets pendulous, puberulous, occasionally parasitised with spherical galls. **Leaves** petiolate, trifoliolate; leaflets submembranous to subcoriaceous, dull olive-green above, paler below, puberulous to sericeous above, villous below, elliptic to obovate, margins entire, rarely with 1 or 2 indentations, slightly revolute. **Inflorescence** axillary panicles, up to 70 mm long, terminal up to 100 mm long, puberulous to villous. **Flowers** pedicellate to subsessile; pedicels and calyx hairy. **Flowering time** Oct.–June. **Fruit** a drupe, circular, globoid, glabrous, dull yellow to reddish, drying dark brown. Stony soil or rocky, loam, sand, gravel, dolerite, moist or damp, well drained, full sun; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld, Lower Karoo (Bethulie to Mount Currie S, from Middelburg to Coffee Bay, Graaff-Reinet to Kentani, and Uitenhage to East London).

refracta (Eckl. & Zeyh.) Moffett

Thorny crow-berry; *doringdraaibessie* (A), *intlolokotshane* (X)

Much-branched shrub or crooked stem tree, 0.7–8.0 m high; bark rough, irregularly fissured; branchlets striate, glabrous or pubescent. **Leaves**: petioles slightly grooved on top, trifoliolate; leaflets sessile, membranous to submembranous, dark green above, paler below, glabrous to velutinous, obovate, somewhat rugose, margins entire, revolute. **Inflorescence** axillary and terminal panicles, puberulous to shortly pubescent. Flowers: corolla lobes narrow, oblong. **Flowering time** Mar.–July. **Fruit** a drupe, circular to oblate, obloid, pruinose, bluish brown. Stony soil or rocky, sand, gravel, well drained; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (Ntsubane District S, from Graaff-Reinet to Keiskammahoek, and Baviaanskloof to Bathurst).

2b Leaf margins entire in lower third, toothed in upper two-thirds or completely toothed
4a Leaflets subcoriaceous to coriaceous

bolusii (Sond. ex Engl.) Moffett

Very similar to *S. erosa* (Thunb.) Moffett, differing in the following ways: 1–2(–5) m high; much-branched, woody, less bushy habit. **Leaves** with petioles (13–)19(–29) mm long; leaflets widely lanceolate, rarely a 4th leaflet, margins toothed in upper $^{2}/_{3}$ of lamina, latter neither parted nor divided, base cuneate, apex mucronate, teeth mucronulate. **Male flowers** often with a smaller 6th petal. **Fruit** drupe, circular. Stony soil or rocky; Mesic Highveld Grassland, Drakensberg Grassland (Lady Grey District).

carnosula (Schönland) Moffett

Dwarf shrub or shrub, 0.25–1.50 m high; suffrutex, exposed rootstock, up to 100 mm wide with prostrate or erect branches; branches glabrous, brownish when young. **Leaves** petiolate, trifoliolate; leaflets sessile, coriaceous, slightly fleshy, concolorous; elliptic to obovate, margins slightly thickened, often white, paucidentate in upper half, (1–)3(–7) mucronate teeth. **Inflorescence** terminal panicles, exserted from foliage; axillary within foliage. **Flowers**: styles slightly connate at base. **Flowering time** Dec.–Apr. **Fruit** a drupe, globoid, glabrous, shiny, dark brown. Stony soil or rocky, sand; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests,

Albany Thicket (Queenstown to Port St Johns S, from Mbashe and Kei River Mouths to East London).

divaricata (Eckl. & Zeyh.) Moffett

Mountain kuni bush; *bergkoeniebos* (A)

Tree or shrub, 1–3 m high; multi-stemmed, stoloniferous, deciduous; branchlets grey to chestnut-brown, glabrous to puberulous. **Leaves** petiolate, trifoliolate; leaflets sessile, subcoriaceous, dark olive-green above, greyish green to rufescent below, glabrous to puberulent above, glandular below, obovate to obtrullate, margins entire, occasionally paucidentate towards apex, slightly revolute. **Inflorescence** axillary or terminal panicles, terminal slightly exposed, sparsely flowered. **Flowers**: calyx lobes pubescent. **Flowering time** Oct.–Mar. **Fruit** a drupe, globoid, glabrous, shiny, red, drying dark brown. Stony soil or rocky, clay, loam, gravel, sand, dolerite, basalt, dappled shade to full sun, well drained; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Lower Karoo, Sub-Escarpment Savanna, Indigenous Forests (Burgersdorp to Barkly East S, from Graaff-Reinet to Cathcart District).

erosa (Thunb.) Moffett

Broom karee; *besembos* (A)

Perennial shrub, 1–3 m high; much branched, multi-stemmed, rounded, often forming thickets, evergreen, young branchlets wiry. **Leaves**: petioles (8–)19(–30) mm long, trifoliolate; leaflets sessile, coriaceous, olive-green above, slightly paler below, linear, apex acute, often mucronulate, margins erose to grossly dentate, parted or divided, midrib prominent above and below; covered with shiny, resinous exudate. **Inflorescence** axillary and terminal panicles, multiflorous, occasionally glomerate. **Flowering time** Oct.–Mar. **Fruit** a drupe, circular, globoid, glabrous, shiny, light brown. Stony soil or rocky, bare rock, sand, loam, gravel, shale, dolomite, dolerite, well drained, moist, full sun; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Mesic Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket, Lower Karoo, Sub-Escarpment Savanna (Oviston to Barkly East S, from Middelburg to Indwe, and Graaff-Reinet to Cradock).

gerrardii (Harv. ex Engl.) Moffett

River currant; *riviertaaibos* (A)

Shrub, 2.0–2.5 m high; multi-stemmed, deciduous, bark reddish, lenticels prominent, branchlets velvety or smooth. **Leaves** petiolate, trifoliolate; leaflets sessile, subcoriaceous, olive-green above, slightly paler below, glabrous or slightly hirsute, oblanceolate to narrowly elliptic, lateral leaflets progressively smaller towards base; irregular, grossly pauciserrate toward apex to entire; all veins yellowish. **Inflorescence** terminal or axillary panicles, within foliage, drying blackish. **Flowers** subglomerulate; calyx lobes hairy. **Fruit** drupe, oblate, glabrous, shiny, light to dark brown. Habitat not recorded; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Lusikisiki District).

grandidens (Harv. ex Engl.) Moffett

Scrub nana-berry; *bosnanabessie* (A)

Shrub, 1.5–2.0 m high; slender to fairly dense; bark and young branchlets smooth and glabrous. **Leaves** petiolate, trifoliolate; leaflets subsessile, subcoriaceous, glabrous, dark green above, pale olive below, narrowly elliptic to oblanceolate and prominently paucidentate to pauciserrate with each tooth mucronate, margins of one lateral leaflet entire,

the other coarsely toothed. **Inflorescence** many panicles, short, mostly axillary but also terminal. **Fruit** a drupe, globoid, glabrous, shiny, yellowish becoming light brown when mature. Forest, closed woodland; Sub-Escarpment Savanna, Indigenous Forests (Lusikisiki District S, Alexandria).

lucida (L.) F.A.Barkley

Glossy currant; *blinktaaibos* (A); *intlokolotshane ebomvu* (X); *inhlokoshiyane* (Z)

Tree or shrub, 0.5–3.0 m high; evergreen, much branched, unarmed; bark greyish brown, granular, branchlets ascending, striate. **Leaves** crowded, petioles slightly winged, trifoliolate; leaflets sessile, subcoriaceous, dark olive-green above, somewhat glutinous becoming glaucescent, widely obovate to oblong, margins entire, sometimes paucicrenate near apex. **Inflorescence** mostly axillary panicles, within foliage, occasionally terminal; females sparingly branched. **Flowers** small, creamy white; calyx lobes deeply segmented. **Fruit** a drupe, circular, globoid to obloid, glabrous, shiny, dark brown. Stony soil or rocky, gravel, sand, loam, sandstone, well drained, full sun; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Lower Karoo, Dry Highveld Grassland, Drakensberg Grassland, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Lusikisiki District S, from Graaff-Reinet to Kwelera, Joubertina to Grahamstown, Port Alfred, Bathurst and East London, and to Humansdorp).

natalensis (Bernh. ex Krauss) F.A.Barkley

Natal karee; *Natal-karee* (A); *umgwele* (X); *inhlokoshiyane* (Z)

Tree or shrub, 1–5 m high; evergreen, unarmed, semi-scandent; bark grey-brown, granular, lenticellate, branchlets glabrous. **Leaves**: petioles somewhat margined, trifoliolate; leaflets sessile, subcoriaceous, glabrous, dark green above, light green below, elliptical, weakly undulate, margins crenulate in upper $^{2}/_{3}$, slightly thickened. **Flowers** small, greenish yellow. **Inflorescence** axillary and terminal panicles, ± 70 mm long, lax, sparsely branched, exposed. **Fruit** a drupe, circular to oblate, globoid, glabrous, shiny, chestnut- to cinnamon-brown. Stony soil or rocky, gravel, sand; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (Lusikisiki District S along coast to East London).

rehmanniana (Engl.) Moffett var. **glabrata** (Sond.) Moffett

Blunt-leaved currant; *stompblaartaaibos* (A); *motšhakhutšhakhu* (S); *intlolokotshane* (X); *inhlokoshiyane* (Z)

Tree or rarely shrub, 0.5–5.0 m high; single stemmed, much branched; bark rough and blocky; branchlets tomentose. **Leaves** petiolate, trifoliolate; leaflets sessile, subcoriaceous, glabrous to hirsute above, villous below, olive-green above, paler below, widely obovate, margins entire to crenate towards apex, all veins dull yellow. **Inflorescence** axillary and terminal, much-branched panicles, exposed flowers often subglomerulate. **Flowers**: calyx lobes hairy. **Flowering time** Dec.–Apr. **Fruit** a drupe, circular, globoid, shiny, yellowish, fleshy, mature epicarps seldom seen. Stony soil or rocky, humus-rich soil, loam; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Dry Highveld Grassland, Albany Thicket, Sub-Escarpment Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Lower Karoo (Ntsubane Forest Station to Port St Johns S, from Somerset East to Kentani District, Baviaanskloof to Bushman's River, and to Humansdorp).

S. rehmanniana (Engl.) Moffett var. **rehmanniana** occurs in Drakensberg Grassland (Maclear District).

ANACARDIACEAE

rogersii (Schönland) Moffett

Shrub, 0.3–2.0 m high; slender, fastigiate; bark smooth, prominently lenticellate, dull grey-brown; young branchlets glabrous to puberulous, chestnut-brown to grey. **Leaves** petiolate, trifoliolate; leaflets sessile, subcoriaceous, dark green throughout, narrowly elliptic to elliptic, obovate to widely obovate, margins thickened, slightly revolute, whitish, pauciserrate, teeth mucronulate towards apex. **Inflorescence** terminal, up to 150 mm long, exserted from foliage, much branched; axillary shorter, within foliage; males longer than females. **Flowers**: styles slightly connate at base. **Fruit** a drupe, globoid, shiny, yellowish maturing dark brown. Forest areas; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Lusikisiki District, Ntsubane).

undulata (Jacq.) T.S.Yi, A.J.Mill. & J.Wen

Namaqua kuni bush; *namakwakoeniebos* (A)

Shrub, 0.5–3.0 m high; evergreen, much branched, multi-stemmed; bark grey-brown, smooth to granular; branches dark brown, spreading; branchlets ribbed, sometimes ending in spines. **Leaves** aromatic when crushed, petiolate, trifoliolate; leaflets sessile, membranous, olive-green, young leaves often glutinous, oblanceolate to obovate, margins entire to irregularly crenate in upper half and apex. **Inflorescence** axillary and terminal panicles; terminal exposed, much branched, minutely flowered. **Flowering time** all year. **Fruit** a drupe, oblate, ellipsoid, glabrous, shiny, dull yellow to cream-coloured. Stony soil or rocky, gravel, sand; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Upper Karoo, Dry Highveld Grassland, Lower Karoo, Albany Thicket, Drakensberg Grassland, Indian Ocean Coastal Belt, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Tabankulu District S from Middelburg to Mthatha, Graaff-Reinet to Kentani, Uitenhage to Port Elizabeth, Grahamstown, Bathurst and East London).

4b Leaflets submembranous to membranous

chirindensis (Baker f.) Moffett

Red currant; *bostaaibos* (A); *motha-thaa* (S); *umhlakothi* (X); *inhlokoshiyane enkulu* (Z)

Tree or shrub, 1–23 m high; single stemmed, evergreen, bark smooth, brown, older branches often spinous. **Leaves** petiolate, trifoliolate; leaflets petiolulate, membranous, glabrous, dark green turning red when falling, ovate to ovate-lanceolate, margins entire, undulate, often minutely serrulate. **Inflorescence** much-branched panicles; males mainly terminal, 200 mm long; females mainly axillary, shorter. **Flowers** minute, yellowish green. **Flowering time** all year. **Fruit** a drupe, globoid, shiny, dark reddish brown. Stony soil or rocky, clay, loam, sand, well drained, partial shade; Sub-Escarpment Grassland, Indigenous Forests, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Lower Karoo, Albany Thicket (Mount Frere S, from Elliot to Lusikisiki, Somerset East to Kentani and from Suurberg Pass to East London).

crenata (Thunb.) Moffett

Dune crow-berry; *duinekraaibessie* (A); *umhlokotshane* (X)

Tree or shrub, 0.5–4.0 m high; much branched, evergreen, unarmed, forming dense colonies; branches grey-brown; branchlets ascending, greyish red, villous. **Leaves** subsessile to petiolate, trifoliolate; leaflets sessile, membranous, dark green above, slightly paler below, obtrullate, obtriangular to obovate, margins slightly revolute, apex pauci-

crenate. **Inflorescence** terminal panicles, up to 40 mm long, or axillary, exposed, sparingly branched, villous. **Flowers** small, white to cream-coloured, rarely 4- or 6-merous; corolla lobes narrow, oblong. **Flowering time** Apr.–Sept. **Fruit** a drupe, oblate, pruinose to shiny, bluish dark brown. Stony soil or rocky, sand; Dry Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Indigenous Forests (Mountain Zebra National Park to Kentani S, from Baviaans-kloof to Port Elizabeth, Grahamstown and East London, and from Storms River Mouth to Humansdorp).

dentata (Thunb.) F.A.Barkley

Nana-berry; *nanabessie* (A); *incakotshi* (X); *umhlalamvubu* (Z)

Tree or shrub, 0.5–6.0 m high; much branched, deciduous, bark dull grey-brown, smooth; young branchlets brown to greyish. **Leaves** petiolate, trifoliolate; leaflets sessile, membranous, pale to dark green above, paler below, turning dull yellow to orange-red in autumn, obovate to widely obovate, margins dentate with (1–)3(–5) mucronulate teeth in upper half. **Inflorescence** terminal or axillary panicles, glabrous or pubescent, much branched. **Flowers**: styles slightly connate at base. **Flowering time** Oct.–Mar. **Fruit** a drupe, globoid, glabrous, pale to dark brown. Stony soil or rocky, bare rock, clay, sand, loam, gravel, moist or damp, well drained, partial shade; Dry Highveld Grassland, Mesic Highveld Grassland, Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (Herschel District to Fort Donald S, from Queenstown to Mkambati Nature Reserve, Aberdeen to Kwelera, Great Winterhoek Mts to East London, and to Humansdorp).

gueinzii (Sond.) F.A.Barkley

Thorny karee; *doringkaree* (A); *inhlokoshiyane* (Z)

Tree or shrub, 1–7 m high; spreading; bark rough, granular, grey-brown; branchlets whitish grey, lenticels prominent, often terete, stout spines. **Leaves** petiolate, trifoliolate; leaflets sessile, membranous to submembranous, glaucescent to shiny dark green above, slightly paler below, glabrous, lanceolate to narrowly elliptic, margins entire or crenulate to crispate in upper half, often undulate. **Inflorescence** much-branched panicle, lax, axillary and terminal, exposed, up to 80 mm long, furfuraceous. **Flowers** small, greenish yellow. **Fruit** a drupe, circular-oblate, ellipsoid, glabrous, shiny, light to cinnamon-brown. Coastal habitats, forests, woodland, mountainous areas, river valleys; Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket (Port St Johns S, from Toise River to Nahoon in East London District).

montana (Diels) Moffett

Drakensberg karee; *drakensbergkaree* (A); *inhlokoshiyane* (Z)

Tree or shrub, 1.0–2.3 m high; single to multi-stemmed, deciduous, spreading; bark grey-brown, smooth; young branchlets pale brown, glabrous. **Leaves** petiolate, (3–)5(–7)-foliolate, with or without 2 much-reduced leaflets; leaflets sessile, membranous, glabrous, dark green above, pale olive below, turning orange-red in autumn, elliptic to narrowly elliptic or obovate, margins entire or pauciserrate in upper half, teeth mucronulate. **Inflorescence** axillary and terminal, much-branched panicles. **Flowers** small, yellowish. **Flowering time** Oct.–Mar. **Fruit** a drupe, circular, obloid, glabrous, shiny, pale brown. Stony soil or rocky, sand, well drained; Drakensberg Grassland, Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna (Maclear District S to Mthatha District).

ANACARDIACEAE

pentheri (Zahlbr.) Moffett

Common crow-berry; *gewone kraaibessie* (A); *motšhakhutšhakhu* (S); *inhlokoshiyane* (Z)

Tree or shrub, 0.5–5.0 m high; multi-stemmed, spreading, unarmed; bark dark, segmented, rough, branches grey, striate, branchlets greyish white, villous. **Leaves** petiolate, trifoliolate; leaflets sessile, membranous, glabrous when mature, dark green above, olive-green below, obovate to obtrullate, margins entire or irregular blunt teeth near apex, slightly revolute. **Inflorescence** axillary and terminal, much-branched panicles, within foliage, pubescent. **Flowers**: calyx lobes sparsely pubescent. **Fruit** a drupe, circular to oblate, ellipsoid to lenticular, orange-brown to dark brown, with lenticels. Stony soil or rocky, gravel, loam, shale, moist or damp, well drained, full sun; Indian Ocean Coastal Belt, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Mtamvuna River S, from Lady Frere District to Tsitsa River, Graaff-Reinet to Alice and Steytlerville to Port Alfred).

tumulicola (S.Moore) Moffett

Hard-leaved currant; *hardeblaartaaibos* (A); *inhlokoshiyane* (Z)

Tree or shrub, 0.3–2.5 m high; spreading habit; bark rough, somewhat fissured, older branches gnarled, younger branches sometimes striate, glabrous to densely puberulous. **Leaves** petiolate, trifoliolate; leaflets sessile to petiolulate, membranous to coriaceous, dark olive-green, densely tomentose to villous below, pubescent above, elliptic to obovate, margins entire, often irregularly serrate towards apex. **Inflorescence** pyramidal, much-branched panicles; branches pubescent; males terminal and exserted beyond foliage; females shorter and axillary. **Flowers** with styles sometimes partially fused. Fruit a drupe, obloid, glabrous, shiny, brown. Forests; Sub-Escarpment Savanna, Indigenous Forests (Nqudunu Forest, Mthatha District).

SMODINGIUM E.Mey. ex Sond.

Agony bush; *pynbos* (A); *umthomvane* (X); *intovane* (Z)

Monotypic, endemic to SA, G, M, S, KZN, L, EC.

argutum E.Mey. ex Sond.

Tree or scrambler, 1.5–7.5 m high; drooping habit, dioecious, bark grey to brown. **Leaves** sessile, petiolate, spirally arranged, trifoliolate, terminal leaflet larger than lateral leaflets, coriaceous, narrowly ovate, coarsely toothed, dark green above, paler below, turns red before falling. **Flowers** in terminal or axillary panicles, small, creamy green; calyx 5-lobed; petals reflexed. **Male flowers** with 5 stamens. **Female flowers**: staminodes present; ovary spherical; styles 3, persistent. **Flowering time** Aug.–Mar. **Fruit** a flattened achene, encircled by red papery wing. Stony soil or rocky; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt (Tabankulu District S to Kentani).

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ANNONACEAE

(Order Magnoliales)

Compiled by C.L. Bredenkamp & G. Nkoane

Hairs simple or absent ..... **Monanthotaxis**
Hairs stellate or simple ..... **Uvaria**

MONANTHOTAXIS Baill.

Dwaba-berry; *dwababessie* (A); *isidwaba* (X); *umazwenda* (Z)

Species ± 60, tropical Africa and Madagascar; 1 in sthn Afr., M, S, KZN, EC.

caffra (Sond.) Verdc.

Small tree, shrub or woody climber, 1–10 m high; branches with prominent red or blackish lenticels; bracteoles small, ovate-oblong. **Leaves** soft to papery, greyish green. **Inflorescences** few-flowered fascicles or solitary; supra-axillary, rarely axillary. **Flowers** small. **Sepals** (2)3, valvate, free or ± connate at base, much shorter than petals. **Petals** (4–)6-valvate, in 1 or 2 whorls, free or slightly connate at base, inner shorter than outer. **Flowering time** Nov.–Jan. Forest, shade, black loamy soil; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (Kokstad, along the coast to East London).

UVARIA L.

Cluster pears; *trospere* (A)

Species ± 110, mostly tropical Asia, Australia and Africa; 3 in sthn Afr., LIM, S, KZN, EC.

caffra E.Mey. ex Sond.

Small cluster pear; *kleinvrugtrospeer* (A); *idwaba* (X); *umazwenda omnyam*a (Z)

Climbing, straggling, erect shrub or small tree, 0.5–4.0 m high. **Leaves** ± leathery, mostly elliptic-oblong. **Inflorescences** short, terminal cymes, opposite leaves, only rarely axillary or flowers solitary. **Flowers** dull to yellowish green. **Sepals** 3, valvate, often connate at base, or calyx cupular in bud and later splitting into often irregular lobes. **Petals** 6, imbricate, in 2 whorls, subequal, sometimes connate at base, inner somewhat smaller than outer. **Flowering time** Oct.–Mar. Sand forest, thornveld and palmveld; Indigenous Forests (Mzimvubu River S to Cwebe Forest and Lusikisiki District).

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APIACEAE

(Order Apiales)

Compiled by P.J.D. Winter

Genera ± 460; species > 3 750, cosmopolitan, mainly temperate regions; sthn Afr.: genera 52 (11 naturalised), species ± 220 (13 naturalised). Alien species included in key and descriptions: *Caucalis platycarpos* L., *Petroselinum crispum* (Mill.) A.W.Hill (parsley) and *Turgenia latifolia* (L.) Hoffm.

Current treatment based on the system of Plunkett et al. (2004), following evidence from mainly DNA sequence data. Subfamily Hydrocotyloideae is no longer recognised (Nicolas & Plunkett 2009), and some genera (incl. *Hydrocotyle*) have been transferred to the Araliaceae. The genus *Lichtensteinia* has historically been associated either with subfamily Apioideae or subfamily Saniculoideae. Its strong affinity with Saniculoideae has prompted a merger of those two subfamilies (Magee et al. 2010), where the Saniculoideae genera listed below are treated in a tribe Saniculeae and *Lichtensteinia* as a tribe Lichtensteinieae, both under the Apioideae. The four subfamilies recognised by Plunkett et al.

(2004), – with their Eastern Cape representative genera, are as follows:

I. **Mackinlayoideae**: *Centella*

II. **Azorelloideae**: *Hermas*

III. **Saniculoideae**: *Alepidea*, *Arctopus*, *Sanicula*

IV. **Apioideae**: all remaining genera

[After Burtt (1991) and Leistner (2000)]

1a Plants woody, not dying down to ground level after the growing season:

2a Leaves on mature stems with lamina absent, or much reduced and < 30 × 2 mm; fruit hairy or tuberculate ..... **Deverra**

2b Leaves on mature stems with lamina > 30 × 2 mm; fruit glabrous:

3a Fruit strongly flattened dorsally, with marginal wings ..... **Notobubon**

3b Fruit not flattened, or only slightly so; wings, if present, not marginal:

4a Mature leaf lamina absent (reduced to petiole and/or rachis) or reduced to linear lobes, apices pungent ..... **Anginon**

4b Mature leaf lamina > 5 mm wide, apices mucronulate to apiculate, but not pungent:

5a Leaves palmately lobed, with distinct intramarginal nerve; mericarps homomorphic, not winged ..... **Polemannia**

5b Leaves simple or trisect to pinnately and/or pedately compound, without intramarginal nerve; mericarps heteromorphic, ± winged ..... **Heteromorpha**

1b Plants herbaceous (i.e. stems dying down to ground level after the growing season, occasionally radical leaves persistent, or stems creeping and only the inflorescences dying):

6a Fruit conspicuously laterally compressed (widest plane perpendicular to commissure). Note that *Hydrocotyle* (with lobed leaf margin) conforms to this state, but has previously been transferred to the family Araliaceae ..... **Centella**

6b Fruit only slightly laterally compressed, or not compressed, or dorsally compressed (widest plane aligned with commissure):

7a Leaves tomentose below ..... **Hermas**

7b Leaves never tomentose below:

8a Leaves appressed to soil surface, prickly, in dense rosette; flowers borne at ground level, unisexual; fruit 1-seeded ..... **Arctopus**

8b Leaves not tight against ground, or if so, not prickly (at most with strong marginal cilia); flowers borne above ground level, bisexual or andromonoecious; fruit 2-seeded:

9a Lower leaves broad and toothed, upper leaves finely divided with linear lobes; outer flowers with outer petals conspicuously enlarged; fruit glabrous ..... ***Coriandrum**

9b Lower and upper leaves either similar or different; outer flowers with all petals equal, or if outer ones larger; fruit bristly:

10a Fruit at least 3× as long as wide ..... ***Anthriscus**

10b Fruit distinctly < 3× as long as wide:

11a Involucral bracts pinnate or pinnatisect:

12a Fruit glabrous ..... ***Ammi**

12b Fruit bristly ..... ***Daucus**

11b Involucral bracts undivided or absent:

13a Leaves on mature stems simple, or palmately lobed, or palmately compound:

14a Leaf blade many times longer than wide:

15a Inflorescence unit a capitulum (head) of sessile florets with conspicuous involucre of bracts united at base, pale green, greenish yellow or silvery white, sometimes becoming pinkish inside ..... **Alepidea**
15b Inflorescence umbellate; flowers usually pedicellate; involucral bracts free:
16a Leaves grass-like, tapered to an acute tip; flowers yellow ..... **Bupleurum**
16b Leaves linear or spathulate, blunt; flowers white..... **Itasina**
14b Leaf blade not more than 3× as long as wide:
17a Leaves palmately compound; calyx teeth absent ..... **Pimpinella**
17b Leaves simple or palmately lobed to palmatipartite (*Sanicula*); calyx teeth present:
18a Umbels manifestly compound, umbellules with conspicuous peduncles (rays)..... **Lichtensteinia**
18b Umbels simple, or seemingly so by forming compact heads, umbellules sessile or with inconspicuous peduncles:
19a Leaf segment lobes < 2 mm wide; involucral bracts united at base, much larger than fruit; fruit glabrous or warty; rocky grassland or short fynbos habitat..... **Alepidea**
19b Leaf segment lobes > 4 mm wide; involucral bracts free, much smaller than fruit; fruit with hooked bristles; forest habitat..... **Sanicula**
13b Leaves on mature stems pinnate, pinnately lobed or decompound, or basal leaves simple and cauline leaves pinnately dissected:
20a Leaves oblong, 1-pinnate ..... **Berula**
20b Leaves, if 1-pinnate, not oblong:
21a Fruit hairy or bristly:
22a Perennial herbs:
23a Umbels appear simple due to very short rays; sepals narrowly ovate; fruit > 5 mm long, with coarse bristles ..... **Agrocharis**
23b Umbels obviously compound; sepals obsolete; fruit < 4 mm long, glabrous or with soft hairs ..... **Pimpinella**
22b Monocarpic herbs (mostly annuals or biennials):
24a Outer petals distinctly radiate; fruit > 6 mm long:
25a Pinnae undivided, or basally lobed at most, > 3 mm wide; fruits with barbed processes (spines) ..... ***Turgenia**
25b Pinnae finely divided, the ultimate lobes/segments < 2 mm wide; fruits with uncinate-aculeate processes (hook-tipped spines) ..... ***Caucalis**
24b Outer petals equal to others or only slightly radiate; fruit < 6 mm long:
26a Fruit processes large, multicellular, cells multiseriate, sometimes flattened at base and usually with recurved barbs (glochids) at apex..... **Torilis**
26b Fruit processes unicellular, or at least of uniseriate cells, neither flattened nor barbed:
27a Rays ≤ 5; fruit oblong ..... **Ezosciadium**
27b Rays > 5; fruit ovoid ..... **Dasispermum** (= *Sonderina*)
21b Fruit glabrous:
28a Fruit dorsally compressed:
29a Flowering stem with prominent longitudinal ridges:
30a Leaves 1- or 2-pinnate, pinnae obtuse or rounded, > 20 mm wide; involucre absent; mature fruit ± orbicular in outline..... ***Pastinaca**
30b Leaves at least 3-pinnate, pinnae and pinnulae acute, lobes 10–20 mm wide; involucre of several conspicuous linear bracts; mature fruit ellipsoid ..... **Afroligusticum**
29b Flowering stem without prominent ridges:
31a Leaves persistent, rigid, sclerophyllous ..... **Nanobubon**
31b Leaves deciduous, soft, not sclerophyllous:
32a Leaves absent (or at least senescent) at fruiting stage; terminal umbel ± twice the size of lateral umbels; umbel rays > 15..... **Cynorhiza**
32b Leaves present (actively growing) at fruiting stage; terminal umbel about the same size as lateral umbels; umbel rays < 15..... **Afrosciadium**
28b Fruit ± round in cross section:
33a Foliage leaves all radical, those on stem reduced to a sheath with or without a vestigial lamina:
34a Leaves with mucronate lobes or teeth; fruit with vittae below veins in ribs..... **Lichtensteinia**
34b Leaves, if lobed or toothed, then these not mucronate; fruit with vittae in furrows between ribs:

35a Fruit oblong with strong, yellow, almost contiguous ridges, ≥ 5 mm long; mericarps heteromorphic or homomorphic; leaves may or may not be present at time of flowering..... **Annesorhiza**
35b Fruit ovoid or flask-shaped with ribs well spaced, < 4 mm long; mericarps invariably homomorphic; leaves withered at time of flowering..... **Chamarea**
33b Foliage leaves both radical and cauline:
36a At least some of umbels shortly pedunculate, apparently leaf-opposed:
37a Leaf segments > 2 mm wide; strongly aromatic..... **Apium**
37b Leaf segments filiform; not, or only slightly aromatic..... ***Cyclospermum**
36b Umbels usually on well-developed peduncles:
38a Flowers yellow or yellowish:
39a Leaf segments filiform, glaucous; involucre absent..... ***Foeniculum**
39b Leaf segments cuneate, glossy green; involucre present..... ***Petroselinum**
38b Flowers white, cream-coloured or pinkish:
40a Herbaceous perennials, perennating from buds at or below ground level:
41a Basal leaves often simple, cordate; inflorescence erect; involucre absent (or 1); calyx teeth obsolete; fruit ovoid, < 2 mm in diam. ..... **Pimpinella**
41b Basal leaves 3-compound, segments filiform or linear; inflorescence erect or procumbent; involucre of several very narrowly ovate to linear bracts; calyx teeth narrowly triangular; fruit ellipsoid, > 3 mm in diam..... **Stenosemis**
40b Annuals or short-lived perennials with no particular dormancy mechanism, or biennials:
42a Erect, biennial herbs, (0.3–)0.5–3.0 m high, monopodially branched only in upper part; vittae not usually visible in mature fruit; endosperm sulcate on commissural face..... **Conium**
42b Low-growing (0.1–0.5 m high), annual or short-lived perennial herbs, sympodially branched; vittae persistent; endosperm not sulcate..... **Dasispermum**

AFROLIGUSTICUM C.Norman

(= *PEUCEDANUM* in part)

Species 13, Africa; 2 in sthn Afr., M, KZN, L, NC, EC.

thodei (T.H.Arnold) P.J.D.Winter

(= *Peucedanum thodei* T.H.Arnold)

Umphondovu (Z)

Robust, perennial, rhizomatous herb, up to 2 m high. **Stems** sulcate, ribbed, hollow, green to purplish red. **Leaves** scabrid-hairy, 3-pinnate, ± 0.6 m long (basal/radical leaves), leaflets lobed, lobes 20–60 × 10–20 mm; petioles sheathing stem. **Flowers** tiny, yellowish green; calyx with 5 small or rudimentary teeth. **Flowering time** Dec.–Feb. **Fruit** 5–6 mm long, dorsally flattened, biconvex (before splitting), only slightly winged on margins. Streamsides, gullies, seepages, alt. 1 900–2 400 m; Drakensberg Grassland (Ntsikeni Nature Reserve to Elliot).

AFROSCIADIUM P.J.D.Winter

(= *PEUCEDANUM* in part)

Species ± 19, Africa; ± 5 in sthn Afr., widespread.

caffrum (Meisn.) P.J.D.Winter

[= *Peucedanum caffrum* (Meisn.) E.Phillips]

Tamboekietwak (A); *tloro-ngoale* (SS); *isingcina*, *nhlashane* (Z)

Perennial herb, 0.5–2.0 m high, glabrous. **Stems** terete. **Leaves** in basal cluster, 75–150 mm long, pinnate, pinnae 1- or 2-pinnatisect, lobes/segments 15–25 mm long, toothed; petioles 150 mm long. **Inflorescences**: umbels with long rays and short raylets. **Bracteoles** ovate or, more often, fused into a cupule that encircles base of raylets. **Flowers** yellow. **Flowering time** Oct.–Jan. **Fruit** large, up to 15 × 8 mm, dorsally flattened,

broadly winged on margins. Grassland, on rocky slopes, alt. 10–2 400 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Ngele Mtn to Elliot, Engcobo and Port Edward).

natalense (Sond.) P.J.D.Winter
[= *Peucedanum natalense* (Sond.) Engl.]

Perennial herb, 0.4–1.0 m high, glabrous. Stems terete. **Leaves** trifoliolate or once pinnate, segments 25–80(–100) mm long, linear to very narrowly ovate, 3-nerved, entire. **Inflorescences**: umbels with rays 25–45 mm long. **Involucre** of 4 or 5 unequal bracts. **Stylopodium** depressed. **Flowering time** Oct.–Dec. **Fruit** large, up to 15 × 8 mm, dorsally flattened, outline elliptic to obovate, broadly winged on margins. Grassland or seasonal wetland communities, alt. 80–670 m; Indian Ocean Coastal Belt (Pondoland).

platycarpum (E.Mey. ex Sond.) P.J.D.Winter
(= *Peucedanum platycarpum* E.Mey. ex Sond.)

Perennial herb, up to 1 m high, glabrous. **Stems** terete. **Leaves** pinnate, pinnae pinnatisect, segments toothed. **Inflorescences**: umbels with rays (40–)80–107 mm long and short raylets. Bracteoles linear, free. **Flowering time** Oct., Nov. **Fruit** large, up to 15 × 8 mm, dorsally flattened, broadly winged on margins. Open grassland communities, alt. 300–1 200 m; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Kokstad S, from Queenstown to Port Edward, S to Stutterheim).

AGROCHARIS Hochst.

Species 2 or 3, Africa; 1 in sthn Afr., restricted to the high Drakensberg, KZN, L, EC.

melanantha Hochst.

Perennial herb, 0.10–0.85 m high; aerial parts set with bristly, tubercle-based hairs. **Leaves** pinnately decompound, narrowly ovate to ovate, ultimate segments narrowly linear and often appear subverticillate. **Inflorescences**: umbels on long peduncles covered with deflexed hairs. **Involucre** of several linear bracts. **Calyx teeth** lanceolate. **Petals** greenish to yellowish or dark purple. **Flowering time** Nov.–Jan. **Fruit** ± ovoid, primary ribs pilose, secondary ribs armed with rows of coarse, spreading, glochidiate bristles. Moist montane grassland subject to frequent burning, alt. 1 900–2 685 m; Drakensberg Grassland (Barkly East to Ntsikeni Nature Reserve).

ALEPIDEA F.Delaroche

Katazo; *kalmoes* (A); *iKhatazo* (X, Z)

Species ± 25, Africa, mainly sthn Afr., LIM, G, M, S, FS, KZN, L, WC, EC.

The Drakensberg is the centre of diversity and endemism.

1a Leaves digitately compound

[E]multisecta B.L.Burtt

Perennial herb, up to 0.15 m high, when in flower up to 0.3 m high; whole plant shortly papillose-pubescent. **Leaves** long-petiolate, lamina ± 23 × 18 mm, digitately divided to base into 5 segments, themselves multisect in upper part, ultimate segments ± 1.0–1.5 mm wide, acute or somewhat rounded at tip and setose-mucronate. **Inflorescence unit** a capitulum (head) of sessile florets with conspicuous involucre of bracts, 15 mm in diam., usually arranged in panicles. **Involucral bracts** petaloid, in 2 series. **Calyx** with teeth 1.0 × 0.8–1.0 mm, membranous, midvein well developed. **Petals** erect with long, inflexed apices, keeled on face. **Flowering time** late summer. **Fruit** ovoid, scarcely lat-

erally compressed, smooth. Fynbos outlier, alt. 1 900 m; Drakensberg Grassland (known from one collection only, near summit of Gaika's Kop, near Hogsback in Winterberg Mts).

1b Leaves simple
2a Petioles below ground level, with setose margin

natalensis J.M.Wood & M.S.Evans

Perennial herb, up to 0.2 m high, when in flower up to 0.6 m high; rosulate at base. **Leaves** appressed to ground, marginal teeth minute; petioles setose, not visible above ground level. **Involucral bracts**: second series inconspicuously small relative to other 5. **Flowering time** Dec.–Apr. Often in rock outcrops, alt. (300–)1 300–2 300 m; Drakensberg, Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Witteberg Mts, Drakensberg to Pondoland, W to Cala).

2b Petioles above or below ground level, with entire margin
3a Secondary leaf venation raised below; inflorescence branches usually in 2 or more whorls; involucral bracts ± parallel-sided, unequal or subequal; mericarps smooth, rarely with a few outgrowths near apex
4a Leaves with uniformly dentate margins; involucral bracts in 2 unequal series

amatymbica Eckl. & Zeyh.

Giant tinsel flower; *kalmoes*, *slangwortel* (A); *iQwili* (X); *iKhatazo* (Z)

Perennial herb, ± 0.1 m high, when in flower up to 2.1 m high; from a strong rootstock, rosulate at base. **Stems** strongly grooved. **Leaves** up to 600 mm long, undersurface prominently veined and upper surface quilted, base attenuate, margins regularly dentate, sometimes undulate. **Inflorescence** branches often whorled, glabrous. **Involucral bracts** in 2 unequal series (5 long and 5 short), narrowly oblong, white, becoming greenish. **Flowering time** mainly Dec.–Feb. High mountains, cliffs, mountain slopes, alt. 243–2 020 m; Drakensberg Grassland, Sub-Escarpment Grassland (Ramatseliso's Gate to Ntsikeni Nature Reserve, Cala to Maclear, Boschberg to Stutterheim).

4b Leaves with lobulate margins, each lobule 2- or 3-dentate (thistle-like); involucral bracts in 2 subequal series

[E]macowani Dummer

Perennial herb, up to 0.5 m high, when in flower up to 1 m high; rosulate at base. **Leaves** up to 500 mm long, undersurface prominently veined and upper surface quilted, base attenuate, margins lobed with > 1 tooth per lobe (irregularly dentate). **Inflorescence**: branches often whorled. **Involucral bracts** 10, in 2 subequal series, narrowly oblong, white. **Flowering time** midsummer. Grassland on mountain slopes, alt. 1 000–1 770 m; Drakensberg Grassland (Boschberg near Somerset East, to Winterberg and Cathcart).

3b Secondary leaf venation not raised below; inflorescence branches spirally arranged, though the upper branches may radiate from a single point; involucral bracts with curved or angled sides (not ± parallel-sided), subequal; mericarps with distinct sculpturing over most of dorsal surface
5a Basal leaf margin with setae of single type and position (exceptions are known from other areas)
6a Basal leaves oblong–narrowly obovate/elliptic; setae of basal leaves not prominently decurrent into the lamina

peduncularis A.Rich.
(= *A. longifolia* E.Mey. ex Dummer var. *longifolia*, *A. gracilis* Dummer var. *major* Weim.)

Perennial herb, 0.1–0.3 m high, when in flower up to 0.5–1.2 m high. **Leaves** rosulate at base, erect, concolorous, margins barely to conspicuously setose, inflexed setae absent.

Flowers in a large panicle of capitula. **Involucral bracts** prominent, white, in 2 subequal series of 5 each, usually > 10 mm long. **Flowering time** late summer. Open grassland habitats, alt. 20–1 000(–1 400) m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Mount Frere to Port Edward, Mthatha to Port St Johns, Komga to Kentani and East London).

pusilla Weim.

Perennial herb, up to 0.1(–0.2) m high, when in flower usually < 0.3 m high. **Leaves** small, 8–15 × 4–7 mm, teeth very low without setae, sinuses with inflexed setae. **Flowering time** Jan., Feb. Obligate wetland endemic on basalt, alt. ± 2 000–3 000 m; Drakensberg Grassland (Witteberg Mts, E along the Drakensberg Escarpment).

thodei Dummer

Lesokoana (SS)

Perennial herb, up to 0.2 m high, when in flower up to 1.5 m high. **Leaves** rosulate at base, similar to *A. peduncularis*, but leaves paler green, particularly on undersurface, and of thinner texture. **Involucral bracts** large, > 10, fused in lower $^1/_3$. **Flowers** very dark blue/purple, contrasting with surrounding white involucre. **Flowering time** Jan.–Apr. On basalt, alt. 2 200–3 000 m; Drakensberg Grassland (Witteberg Mts and along the Drakensberg Summit Plateau).

woodii Oliv.

Perennial herb, up to 0.2 m high, when in flower up to 1.2 m high. **Leaves** rosulate at base, similar to *A. peduncularis*, but leaves paler green, particularly on undersurface, and of thinner texture. **Flowers** in smaller panicles. **Involucral bracts** smaller and shorter, greenish white. **Flowering time** Jan., Feb. Terrace banks in valleys, alt. 1 300–2 200 m; Drakensberg Grassland, Sub-Escarpment Grassland (Witteberg Mts to uMzimkhulu, S to Baziya Mtn).

6b Basal leaves ovate–obovate (if oblong, base cordate); setae of basal leaves prominently decurrent into the lamina

acutidens Weim.

Perennial herb, up to 0.1 m high, when in flower up to 0.7 m high. **Leaves** cordate, ovate to orbicular, margins dentate, teeth setose, teeth or setae not inflexed in mature leaves, vein prominent (raised) leading up to seta. Grassland, river valleys, mountain slopes and summits, alt. 765–1 830 m; Sub-Escarpment Grassland (Ntsikeni Nature Reserve to Keiskammahoek).

Delimitation from *A. capensis* is unclear. What appears to be an outlying variant with oblong, sometimes cuneate leaves and larger teeth occurs on the Sneeuberg and Winterberg Mts.

capensis (P.J.Bergius) R.A.Dyer

Slender, tufted, perennial herb, 0.4(–0.6) m high. **Leaves** crowded at base, long-petiolate, lamina thick, oblong, dentate, with small teeth which are usually incurved, so directing long bristles inward, vein prominent (raised) leading up to seta. **Involucral bracts** in 2 series, acute to obtuse, white or pink. **Flowers** sessile in simple umbel. **Flowering time** mainly Nov.–Feb. Damp flats or lower slopes, alt. 45–700 m; Eastern Fynbos-Renosterveld (Kareedouw Mts, Suurberg and Grahamstown Mts).

Occurrence in foothills of Amatolas needs confirmation (compare with *A. acutidens*).

galpinii Dummer

Perennial herb, up to 0.1 m high, when in flower up to 0.3 m high. **Leaves** few, lax, lamina thin, ovate, cordate to rounded, 20–25 mm long, serrate, teeth small, setae projecting or antrorse. **Involucral bracts** white, narrowly acuminate. **Flowering time** midsummer. Rocky outcrops, alt. ± 2 000–2 990 m; Drakensberg Grassland (Witteberg and Drakensberg Mts).

5b Basal leaf margin with a seta on each tooth, as well as in some or all of the interdentine sinuses
7a Rosulate leaves narrowly oblong to linear

[E]cirsiifolia Schltr. & H.Wolff

Perennial herb, up to 0.2 m high, when in flower up to 1 m high; rosulate at base. **Leaves** similar to those of *A. serrata*, but margins lobed, secondary teeth superimposed on at least some primary teeth, apparently glaucous. **Flowering time** midsummer. Grassland along edge of Drakensberg Escarpment, alt. 915–1 585 m; Sub-Escarpment Grassland (Matatiele to Engcobo).

serrata Eckl. & Zeyh.

Perennial herb, 0.1–0.2 m high, when in flower up to 0.5 m high; rosulate at base. **Leaves** linear, shallowly serrate to deeply toothed, intertooth setae inflexed toward midvein, dentine setae spreading in the same plane, or perpendicular to lamina. **Flowering time** midsummer. Grassland on moist, rocky outcrops or mountain slopes, alt. 765–2 000 m; Drakensberg Grassland (Witteberg, Stormberg and Drakensberg Mts; Winterberg Mts).

7b Rosulate leaves cordate–ovate to oblong or elliptic

delicatula Weim.
(= *A. ciliaris* auctt.)

Perennial herb, up to 0.1 m high, when in flower 0.07–0.23 m high. **Leaves** rosulate, lamina ovate to elliptic, 20–50 mm long, base cordate to cuneate, toothed, tooth bristles spreading, intertooth bristles inflexed; petioles typically not much longer than lamina. **Flowering time** Dec., Jan. High, rocky slopes, alt. 1 380–2 700 m; Drakensberg Grassland, Eastern Fynbos-Renosterveld (Stormberg Plateau, Coetzeesberge, Winterberg Mts, Kareedouw Mts).

duplidens Weim.

Perennial herb, up to 0.2 m high, when in flower up to 0.4 m high. **Leaves** with long petioles relative to lamina, secondary teeth superimposed on primary teeth. **Involucral bracts** ovate. **Flowering time** midsummer. Habitat?, alt. up to 1 370 m; Sub-Escarpment Grassland (Maclear and Mount Currie).

*AMMI L.

Species 3 or 4, Europe, Asia and Africa; 1 in sthn Afr., cultivated for decorative purposes and has become naturalised in several places from G to EC.

majus L.

Queen Anne's lace

Robust, annual herb, 0.3–1.7 m high, glabrous; taproot slender. **Leaves** pinnate or bipinnate, with ultimate segments elliptic to broadly obovate, toothed along margins. **Flowers** in large, compound, showy, many-rayed, terminal umbels; involucre conspicuous, of several trisect to pinnate bracts. **Calyx teeth** obsolete. **Petals** white. **Flowering time** (June–)Nov.–Feb. **Fruit** narrowly oblong, glabrous, with pale, narrow ribs. **Seeds** dor-

sally compressed. Roadsides, disturbed places, spekboomveld, alt. 120–3 050 m; Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Aliwal North, Cookhouse, Suurberg, Tsitsikamma).

ANGINON Raf.

(= *RHYTICARPUS* Sond.)

Wildeseldery, *wildevinkel* (A)

Species 12, sthn Afr., N, NC, WC, EC.

difforme (L.) B.L.Burtt

[= *Rhyticarpus difformis* (L.) Briq.]

Rigid, stiff-leaved, few-branched shrub, 1–3 m high, never glaucous. **Leaves** in axillary tufts, reduced, terete, pungent, invariably undivided, junciform (rush-like). **Flowers** in compound umbels on stout peduncles, yellowish. **Flowering time** Dec.–Apr. **Fruit** obovoid, ridged and warty, with a basal collar. Rocky sandstone slopes, alt. 200–1 500 m; Eastern Fynbos-Renosterveld (Willowmore to Grahamstown).

[E]**rugosum** (Thunb.) Raf.

Glaucous, stiff-leaved, few-branched shrub, up to 1.5 m high. **Leaves** in axillary clusters, grooved above, mature leaves invariably 3-pinnate, reduced, lobes linear, pungent; lower leaves triternate with flat, toothed segments. **Flowers** in small, compound umbels on slender peduncles, yellowish. **Flowering time** Dec.–Apr. **Fruit** obovoid, ridged and wrinkled, with a basal collar. Limestone slopes, alt. 200–600 m; Eastern Fynbos-Renosterveld (Kouga Mts to Grahamstown).

[E]**sp. A**

Few-branched shrub, never glaucous. **Leaves** decompound. **Flowers** reported as white by Fourcade, but presumably in error, as it appears to have been collected together with *Pimpinella caffra*, the latter having white flowers. **Flowering time** May. **Fruit**? Habitat?, alt. 870 m; Eastern Fynbos-Renosterveld (Tsitsikamma/Langkloof Mts: known only from Prince Alfred Pass and Joubertina).

ANNESORHIZA Cham. & Schltdl.

Anyswortel (A)

Species 13, sthn Afr., widespread.

macrocarpa Eckl. & Zeyh.

Wilde-anyswortel (A)

Perennial herb, up to ± 0.4–1.8 m high. **Rootstock** of many (15 or more), fascicled tubers, slightly or distinctly fleshy, often fluted. **Leaves** usually dry at flowering, finely dissected, trailing on long thin petioles and rachises, segments minute. **Scapes** almost leafless. **Main umbel** of 5–35 rays. **Flowers** pale yellow. **Flowering time** Aug.–Jan. **Fruit** with mericarps large, heteromorphic, distinctly winged, obovate. Azonal plant communities of coastal dunes and sandy slopes, alt. 15–300 m; Eastern Fynbos-Renosterveld, Albany Thicket (Kei River Mouth to Patensie).

schlechteri H.Wolff

Perennial herb, up to ± 0.2 m high, when in flower up to 0.7 m high. **Rootstock** of few (up to 5?), fascicled tubers. **Leaves** present at flowering, in needle-like segments, mostly trifid. **Main umbel** of 2–4(–6) rays. **Flowering time** Jan., Feb. **Fruit** with meri-

carps homomorphic, ribs not expanded into wings, narrowly oblong. Seepages, wetlands, alt. 1 500–1 800 m; Drakensberg Grassland, Sub-Escarpment Grassland (Drakensberg to Winterberg Mts).

[E]**thunbergii** B.L.Burtt

Perennial herb, up to 0.6(–1.3) m high when in flower. **Roots**? **Leaves** may be present at flowering, finely dissected, segments minute. **Main umbel** of ± 4 rays. **Flowers** yellow. **Flowering time** Nov.–Feb. **Fruit** with mericarps dissimilar, at least somewhat heteromorphic. Sandstone slopes, alt. ± 500 m; Eastern Fynbos-Renosterveld (Elandsberg Mts near Loerie).

*ANTHRISCUS Pers.

Species 10–12, Europe, Asia and Africa; 1 naturalised in sthn Afr., KZN, L, EC.

sylvestris (L.) Hoffm.

Perennial herb, 0.6–1.8 m high. **Leaves** bipinnate, tripinnate or sometimes 4-pinnate, fern-like; segments lanceolate to acuminate, toothed, glabrous or somewhat hairy. **Flowers** in sparse, terminal, compound umbels; involucre small or usually absent. **Rays** ± 8. **Calyx** absent. **Petals** notched, white. **Flowering time** Nov.–Feb. **Fruit** narrowly oblong, slightly 3-angled dorsally, glabrous and shiny at maturity. **Seeds** semi-terete and grooved on face. Mountain slopes and banks of river gorges, alt. 915–2 438 m; Drakensberg Grassland (Barkly West and Maclear districts).

APIUM L.

Celery

Species 20–25, cosmopolitan; 2 (1 presumed indigenous) in sthn Afr., WC, EC.

One aquatic species has been transferred back to the reinstated genus *Helosciadium* W.D.J.Koch.

*graveolens L.

Celery; *seldery* (A)

Erect, robust, biennial or perennial herb, up to 1 m high; strongly aromatic. **Stems** hollow, coarsely grooved. **Basal leaves** 100–170 mm long, fleshy, simply pinnate; segments ± deltoid, lobed, margins crenate-serrate, 10–60 mm long; petioles sheathing. **Umbel rays** 6–16, 7–25 mm long. **Involucre and involucel** absent. **Flowers** white or greenish white. **Calyx teeth** absent. **Flowering time** Aug.–Mar. **Fruit** broadly ovoid, 1.5 mm long, with broad furrows between slender ribs. Moist places, river- or streambanks, estuaries, floodplains, often in somewhat saline conditions, alt. 2–2 160 m; Upper Karoo, Sub-Escarpment Savanna, Albany Thicket, Indian Ocean Coastal Belt (Aliwal North, Middelburg, Victoria East, Stutterheim, Grahamstown, and along the coast mainly E of Humansdorp).

The identity of populations across this range is uncertain. Some may rather belong with the next species.

*[?]**prostratum** Vent.

Sea celery

Sprawling (prostrate or decumbent, rarely erect), weak, short-lived, perennial herb, up to 0.3 m high. **Leaves**: basal 2-pinnatisect, segments very narrowly ovate to obovate, deeply lobed or incised, margins crenate-derivate; cauline digitate with leaflets oblance-

olate. **Involucel** absent. **Flowers** few in sessile, leaf-opposed umbels. **Flowering time** mainly Jan.–Mar. **Fruit** subglobose, ridged, with furrows almost obscured by prominent corky ribs. Vlei edges and coastal areas, alt. 5–914 m; Indian Ocean Coastal Belt, Albany Thicket (Mtentu to Tsitsikamma).
Considered by some to be an Australian weed, but may be a distinct species.

ARCTOPUS L.

Species 3, sthn Afr., NC, WC, EC.

echinatus L.

Platdoring (A)

Dioecious, acaulescent, perennial herb, up to 0.1 m high. **Leaves** large, prostrate, ovate to orbicular and lobed to lacerate, with bristly margins and erect spines among bristles. **Flowers** at ground level in simple umbels, cream-coloured to pink, female involucral bracts pungent with 1 or 2 inflexed, lateral spines, united below, not enlarging much in fruit. **Flowering time** May–July. **Fruit** prickly due to coalesced bracteoles. Sand and granite flats and slopes, alt. 50–1 700 m; Eastern Fynbos-Renosterveld (Tsitsikamma Mts to Grahamstown and Alexandria).

BERULA W.D.J.Koch.

Species 7 (1 Holarctic and 6 African); 2 in sthn Afr., widespread.

There is no good evidence whether the Holarctic *B. erecta* (Huds.) Coville has been introduced here.

repanda (Welw. ex Hiern) Spalik & S.R.Downie
(= *Sium repandum* Welw. ex Hiern)

Water parsnip; *tandpynwortel* (A)

Robust, rhizomatous, perennial herb (hydrophyte), up to 1.5 m high, glabrous. **Leaves** elongate, once-pinnate, with pinnae appearing finely and regularly serrate on margins; lowest pinnae smaller than others. **Teeth** directed toward leaflet apex, mostly slightly overlapping. **Flowers** in compound, bracteate umbels; involucre and involucel conspicuous, incised. **Calyx** with 5 small teeth. **Petals** yellowish (or white?). **Flowering time** Jan.–Apr. **Fruit** laterally flattened or contracted, subdidymous; mericarps with 5 ridges; vittae 6, 4 in furrows, 2 on face. Streams, alt. 550–2 150 m; Drakensberg Grassland, Indian Ocean Coastal Belt (Kokstad and Tsolo to Port St Johns).

thunbergii (DC.) H.Wolff
[= *Berula erecta* (Huds.) Coville subsp. *thunbergii* (DC.) B.L.Burtt]

Giant water parsnip; *tandpynwortel* (A); *ibophwani* (Z)

Annual or perennial herb, 0.2–1.8 m high, hydrophyte, glabrous. **Roots** fascicled. **Leaves** mostly basal, pinnate, pinnae sessile, elliptic to ovate, finely toothed, lowest pinnae smaller than others. **Teeth** directed outward or toward leaflet apex, not overlapping. **Flowers** in compound umbels, white; involucral bracts incised. **Flowering time** Jan.–Mar. **Fruit** subglobose, slightly ridged and rough. Streamsides, alt. 1–2 105 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Indian Ocean Coastal Belt (widespread where streamflow is dependable).

BUPLEURUM L.

Species ± 150, mainly Europe, Asia and Africa; 1 in sthn Afr., LIM, G, M, S, FS, KZN, L, NC, WC, EC.

mundii Cham. & Schltdl.

Tufted, perennial herb, 0.3–0.6(–1.0) m high, from woody base. **Leaves** ± crowded at base of stem, lax above, linear (grass-like), attenuate to somewhat stem-clasping base, apex acute to apiculate (leaves narrowly obovate with rounded apex in a coastal grassland form in Kei Mouth area), margins entire. **Rays** 5–8, 25–33 mm long. **Involucre** of 3(–5) very narrowly ovate bracts, as long as umbellules. **Flowers** yellow. **Calyx teeth** obsolete. **Stylopodium** depressed, styles recurved. **Flowering time** (Aug.–)Dec.–Feb. **Fruit** oblong, 4 × 2 mm; mericarps with 5 acute ridges or prominent veins; vittae several per vallecula. Moist slopes, grassy communities, alt. 15–3 475 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt (Witteberg, Middelburg Escarpment to Stormberg Plateau, Insizwa, Pondoland; Winterberg Mts to Kentani; Jeffreys Bay to Grahamstown and Alexandria).

*CAUCALIS L.

Monotypic genus, Eurasia, recorded as a rare escape from wheat fields, EC.

platycarpos L.

Annual herb, 0.3–0.6 m high. **Leaves** 2- or 3-pinnate; pinnae finely divided, the ultimate lobes/segments < 2 mm wide. **Inflorescences**: umbels are pseudanthia, with outer petals much larger than others; bracteoles caducous, < 2 mm wide. **Petals** white or pink. **Flowering time** Nov., Dec. **Fruit** 9–11 mm long, with uncinate-aculeate processes (hook-tipped spines); slightly laterally compressed, outline elliptic in lateral view. Cultivated and disturbed ground, alt. 1 500–1 800 m; Drakensberg Grassland, Sub-Escarpment Grassland (Stormberg Plateau and White Kei catchments in the Wodehouse and Queenstown districts).

CENTELLA L.

Pennywort; *varkoortjies* (A)

Species 45 (Van Wyk & Tilney 2004), mostly sthn Afr., but 2 extending to Zimbabwe and Malawi and 1 pantropical; widespread in sthn Afr.

1a Leaves widely ovate to rotund, reniform or cordate
2a Umbels with all flowers bisexual

asiatica (L.) Urb.

Urban marsh pepperwort; *waternael* (A)

Prostrate perennial, spreading with stolons and rooting at nodes. **Leaves** petiolate, reniform to rounded, sparsely hairy to glabrous, margins regularly crenate all round. **Inflorescences**: umbels simple, axillary. **Flowers** bisexual, 3 per umbel. **Petals** greenish to purplish red. **Flowering time** Nov.–Mar. **Fruit** strongly laterally compressed, obovate, longer than bracts, wrinkled. Marshy or damp places, alt. 5–2 000 m; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt (widespread, except in drier parts).

2b Umbels with at least some functionally male flowers

eriantha (A.Rich.) Drude

Sprawling perennial, up to 0.2–0.5 m high. **Leaves** reniform to widely cordate, glabrous to sparsely hairy, crenate or dentate with mucronate teeth. **Flowers** greenish. **Flowering time** Oct.–Dec. **Fruit** oblong to rounded, mostly longer than bracts. Damp middle to upper slopes, alt. 30–1 200 m; Eastern Fynbos-Renosterveld (Kouga and Tsitsikamma Mts to Grahamstown).

lanata Compton

Sprawling, perennial herb, up to 0.2(–0.5) m high. **Leaves** reniform to widely cuneate, sparsely or densely white- or brown-woolly, crenate or dentate with shallow teeth. **Flowers** greenish. **Flowering time** Jan.–May. **Fruit** oblong, longer than bracts. Rocky slopes at high altitude, alt. 150–1 200 m; Eastern Fynbos-Renosterveld (Tsitsikamma Mts to Grahamstown).

1b Leaves ovate or rhombic to linear, base cuneate to attenuate
3a Umbels with a single, sessile, central, bisexual flower and 4 lateral, male, pedicellate flowers

tridentata (L.f.) Drude ex Domin

Laxly branched, decumbent annual or short-lived perennial, 0.08–0.20 m high. **Leaves** petiolate, cuneate, densely to sparsely hairy, margins mostly 3–5-toothed above. **Inflorescence** sessile, with 4 lateral, shortly pedicellate, male flowers and a central, sessile, bisexual flower, whitish. **Flowering time** Aug.–Dec. **Fruit** obovate, shorter than bracts, ribbed, wrinkled, thinly hairy. Mainly coastal flats and lower slopes, alt. 20–200 m; Eastern Fynbos-Renosterveld (Gamtoos Valley to Port Elizabeth and Uitenhage).

3b Umbels with either a single subsessile bisexual flower, or with 1–5 subsessile, male flowers
4a Tufted with congested internodes, or with long shoots radiating from a central tuft; leaves often reddish, or villous; fruit wider than long; commissure constricted

longifolia (Adamson) M.T.R.Schubert & B.-E.van Wyk

Tufted perennial, up to 0.15 m high, andromonoecious. **Leaves** petiolate, crowded, narrowly elliptic, coriaceous, sparsely long-hairy to glabrous, reddish brown, base narrowly cuneate, margins entire or rarely toothed, teeth obtuse. **Inflorescences**: umbels hidden among crowded leaves of tuft. **Flowers** yellowish. **Flowering time** Jan.–Mar. **Fruit** widely depressed-ovate, 1–2 × 2–3 mm, longer and wider than bracts, smooth to ribbed, slightly wrinkled. Sandy and gravelly lower slopes, alt. 200–1 200 m; Eastern Fynbos-Renosterveld (Tsitsikamma Mts to Van Stadens Mts).

montana (Cham. & Schltdl.) Domin

Tufted, sprawling, perennial herb, up to 0.1(–0.2) m high. **Leaves** petiolate, slightly dimorphic, elliptic to lanceolate, hairy to densely long-hairy, reddish brown, mostly entire. **Inflorescences**: umbels borne in axils of flowering shoots. **Flowers** yellowish. **Flowering time** Aug.–Jan. **Fruit** oblate to widely depressed-ovate, smooth to ribbed, sometimes wrinkled, 2–3 × 3–4 mm, shorter and wider than bracts. Upper slopes, alt. 300–1 200 m; Eastern Fynbos-Renosterveld (Willowmore District: Helpmekaar Mtn).

sessilis Adamson

Tufted, mat-forming, perennial herb, up to 0.4 m high. **Leaves** petiolate or almost sessile, crowded, narrowly oblanceolate to narrowly lanceolate, slightly succulent, mostly entire, sometimes 2- or 3-toothed. **Flowers** whitish or greenish. **Flowering time** Sept.–Jan. **Fruit** round to widely depressed-ovate, longer than bracts. Moist sandstone slopes at high altitude, alt. 300–1 700 m; Eastern Fynbos-Renosterveld (Kouga and Tsitsikamma Mts to Groot Winterhoek Mts).

4b Sprawling or tufted; leaves not reddish or villous; fruit longer than wide (rarely wider than long); commissure ± flush with fruit surface or bulging
5a Leaves rhombic, 3–7-dentate

fourcadei Adamson

Sprawling perennial, up to 0.6 m high, sparsely or densely hairy on young parts. **Leaves** rhombic, dentate with 3–7 large teeth above. **Flowers** greenish. **Flowering time** Nov.–Jan. **Fruit** oblong to round, bract length variable. Middle to upper slopes; Eastern Fynbos-Renosterveld (Tsitsikamma).

5b Leaves ovate to filiform, entire

comptonii Adamson

Trailing, perennial herb, up to 0.15 m high, like *C. glabrata*, but smaller, tufted, much-branched and with smaller leaves. **Stems** usually hairy, with equal branches. **Leaves** clustered, petiolate; blades narrowly ovate or narrowly elliptic, 3-veined, 15–20 × 3–7 mm, apex acute, thinly ciliate, not coriaceous, base cuneate; petioles 10–20 mm long, thinly hairy. **Flowering time** Sept.–Jan. **Fruit** 4–6 × 3.5–4.0 mm, 1.5–2.0 × as long as bracts, ray 5.0–12.5 mm long; bracts acute, ciliate. Flats and lower slopes; Eastern Fynbos-Renosterveld (Tsitsikamma to Port Elizabeth).

debilis (Eckl. & Zeyh.) Drude

Slender, prostrate, trailing perennial, up to 0.15 m high. **Leaves** (at least the lower) petiolate, linear to narrowly lanceolate, apex acute and often curved. **Flowers** small, reddish, male umbellules with 1 flower (not 3–5). **Flowering time** Aug.–Mar. **Fruit** round, 1.5–2.0 mm long, longer than bracts, slightly ribbed, not wrinkled. Rocky slopes, alt. 10–900 m; Eastern Fynbos-Renosterveld (Van Stadens Mts).

glabrata L.

Persiegras, *sweetkruie* (A)

Tufted, trailing, perennial herb, up to 0.05 m high. **Leaves** petiolate, ovate to linear, sparsely hairy to glabrous. **Flowers** yellowish. **Flowering time** Sept.–Jan. **Fruit** oblong, slightly ribbed, smooth; 2–3× as long as acute bracts. Slopes and mountains, alt. 5–1 900 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt (Drakensberg foothills from Maclear to Engcobo; Port St Johns; Somerset East and the Winterberg Mts to Kentani; Van Stadens Mts to Uitenhage and Alexandria).
Some forms may deserve species status.

stenophylla Adamson

Sprawling, patch-forming, perennial herb, up to 0.4(–0.6) m high, similar to *C. virgata*. **Leaves** acicular, thread-like, glabrous or very sparsely hairy. **Flowering time** Aug.–Oct. **Fruit** borne among vegetative parts, 3.0–3.5 × 2–4 mm in commissural view, round to obovate, longer than bracts, smooth or slightly wrinkled. Rocky slopes, alt. 300–2 000 m; Eastern Fynbos-Renosterveld (Tsitsikamma Mts, Humansdorp).

The Graaff-Reinet and Zimbabwe records may yet prove to be erroneous.

virgata (L.f.) Drude

Erect, virgate or somewhat sprawling, sparse perennial herb or suffrutex, up to 0.6–1.5 m high. **Leaves** narrowly linear to acicular, glabrous or (rarely) densely woolly. **Flowers** yellowish. **Flowering time** (Apr.–)Aug.–Dec. **Fruit** borne above vegetative parts, variable in size, mostly relatively small, 2.0–3.5 × 2–3 mm in commissural view, ovate, longer than bracts, slightly ribbed. Coastal, river mouths, rock outcrops, mountain ridges,

Groendal catchment basin, alt. 10–1 700 m; Eastern Fynbos-Renosterveld (Baviaanskloof to Tsitsikamma Mts and E to Suurberge and Bushman's River).
Species excluded – C. coriacea Nannf., perhaps conspecific with **C. asiatica**; **C. didymocarpa** Adamson., perhaps conspecific with **C. sessilis**.
C. graminifolia Adamson: Erect, glabrous herb. **Leaves** linear, flat, 3-nerved; upper leaves sessile, lower leaf bases narrowed to a petiole. **Umbels** often clustered, 3-rayed. **Petals** glabrous. **Fruit** oblong, rugose, much longer than bracts, on a short, erect ray. (Until the type specimen is identified beyond doubt as being different from other species, e.g. **C. affinis**, **C. debilis** or **C. virgata**, known from the Southern Cape Coast, this name is best applied only to matched plants from the type locality at Knysna).

CHAMAREA Eckl. & Zeyh.

Cape caraway; *vinkelwortel* (A)

Species 5 or more, sthn Afr., FS, L, NC, WC, EC.

capensis (Thunb.) Eckl. & Zeyh.

Perennial herb, up to 0.6 m high. **Roots** 1 or 2, evenly fleshy. **Leaves** dry at flowering, the first-formed and later ones all much-dissected (pinnately compound); leaf bases persist as fibres; leaf segments narrowly lobed, ultimate segments acute, lobes 5- or more-toothed. **Scapes** slender and leafless. **Sepals** obtuse, with a rounded apex, > 0.3 mm long. **Petals** yellow. **Flowering time** Jan.–Apr. (mainly Mar.). **Fruit** orbicular, (2.0–)2.5–3.0(–4.5) mm long; mericarps homomorphic. Mixed grassland and Fynbos communities, alt. 10–700 m; Albany Thicket, Eastern Fynbos-Renosterveld (Port Elizabeth to Bathurst).

gracillima (H.Wolff) B.L.Burtt

Perennial herb, like *C. capensis*, but leaves less dissected, the first-formed pinnate with ultimate segments broad and rounded. Sepals acute, with a pointed apex, ± 0.2 mm long. **Petals** yellow. **Flowering time** Feb.–Apr. (mainly Mar.). **Fruit** orbicular, 2.0–3.5 mm long. Stony slopes, alt. 10–1 000? m; Eastern Fynbos-Renosterveld (Langkloof from Joubertina westward).

longipedicellata B.L.Burtt

Perennial herb, up to 0.4 m high. **Leaf segments** narrowly lobed, without a prominent midrib, lobes trisect, ultimate lobes 3- or 4-toothed. **Pedicels** at least 7 mm long. **Sepals** semi-lunar, up to 0.2 mm long, blunt, with rounded apex. **Petals** white to orange. **Flowering time** Nov.–Mar. (mainly Dec.). **Fruit** flask-shaped, 1.5–4.3 mm long. Rocky outcrops, particularly dolerite rocks, alt. ± 1 000–2 000 m; Dry Highveld Grassland (Stormberg Plateau, Sneeuberg Mts).

sp. A

(= *sp. aff. gracillima* of B.L.Burtt, 1991)

Perennial herb, like *C. capensis*, but leaves less dissected, the first-formed tripartite, with ultimate segments broad and rounded. **Sepals** acute, with a pointed apex, up to 0.25 mm long. **Petals** cream-coloured to yellow. **Flowering time** Jan.–Apr. (mainly Mar.). **Fruit** orbicular, 1.5–3.8 mm long. Habitat?, alt. ± 300–1 000 m; Albany Thicket, Eastern Fynbos-Renosterveld (Langkloof to Grahamstown and Alexandria).

CONIUM L.

Species 6, Europe, sthn and NE tropical Afr., Asia; 6 (1 cosmopolitan weed) in sthn Afr., widespread.

1a Flowers yellowish green; bracteoles united at base

chaerophylloides (Thunb.) Sond.

Robust, biennial herb, up to 2 m high; hairy form in the Winterberg Mts. **Leaves** finely divided, sometimes becoming dry at flowering. **Leaflets** soft, cut nearly to midrib, lobes narrowly oblong, 1–2 mm wide, subacute and rarely or sparingly toothed. **Inflorescences**: umbels compound, flat-topped. **Bracteoles** below umbellules broadly lanceolate, shallowly or deeply united at base. **Flowers** yellowish green. **Flowering time** Nov.–Jan. **Fruit** broadly ovoid, slightly laterally flattened, ribbed, glabrous; mericarps square in section, channelled on inner face; vittae many, hardly visible. Rough, open grassland near rivers and streams, damp hollows and gullies, alt. 15–1 800(–2 200) m; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Stormberg, Witteberg and Drakensberg foothills, to Sneeuberg and Winterberg Mts; Tsitsikamma E to Suurberge and Grahamstown).

1b Flowers white or whitish; bracteoles either free or united
2a Bracteoles subtending the umbellules linear or narrowly linear-lanceolate (up to 1 mm wide), free at base

fontanum Hilliard & B.L.Burtt

Biennial herb, up to 0.5(1.0) m high. **Leaflets** lobed at least halfway to midrib, lobes oblong to broadly elliptic or narrowly elliptic to linear, 1.5–3.0 mm wide, often overlapping, apex obtuse or sharply acute, margins toothed or sparsely sharply serrate. **Inflorescences**: umbels obconic when dry, 20–50 mm in diam. at anthesis. **Bracteoles** linear or narrowly linear-lanceolate (up to 1 mm wide), free at base. **Flowers** white. **Flowering time** Nov.–Jan. Seepage lines, marshy streambanks and damp sites at foot of basalt/dolerite cliffs, alt. 1 400–3 000 m; Drakensberg Grassland (Naude's Neck to Witteberg Mts; Mount Thomas).

2b Bracteoles subtending the umbellules mostly broadly lanceolate (up to 1.5 mm wide), shortly to deeply united at base
3a Ultimate leaf lobes narrowly oblong, acute or subacute, ovaries glabrous; Drakensberg, Sneeuberg and Winterberg Mts

sp. A

(= *sp. 3* in Hilliard & BL.Burtt, 1985)

Similar to *C. fontanum*, but with bracteoles broadly lanceolate and at least shortly united at base. **Leaf**: ultimate lobe margins well toothed. **Inflorescences**: umbels often hemispheric (not obconic) when dry, 20–30 mm in diam. at anthesis. **Flowers** white. **Flowering time** Dec., Jan. **Fruit** with mericarps ± suborbicular in transverse section (not ± square). Streamsides, alt. 1 500–2 200 m; Drakensberg Grassland (Joubertspas, Sneeuberg, Hogsback).

3b Ultimate leaf lobes shortly oblong, obtuse, ovaries with white, unicellular hairs; Sneeuberg Mts

[E]sp. B

(= *sp. 4* in Hilliard & Burtt, 1985)

Similar to *C. fontanum*, but with bracteoles broadly lanceolate and deeply united at base. **Leaves** similar to those of *C. sphaerocarpum* Hilliard & B.L.Burtt (ultimate lobes shortly oblong, obtuse). **Flowers** white. **Flowering time** Nov., Dec. **Fruit** similar to that of *C. fontanum*, ribbed. Rocky slopes below dolerite cliffs, alt. ± 1 800 m; Dry Highveld Grassland (Sneeuberg Mts).

*CORIANDRUM L.

Species 2, Europe and Asia; 1 in sthn Afr., occurs sporadically as an escape in most parts, G, FS, KZN, EC.

sativum L.

Coriander; *koljander* (A)

Annual herb, up to 1 m high, strongly aromatic. **Stem** erect, with slender taproot. **Leaves** pinnate or bipinnate, dimorphic; lower ones with broad, cuneate segments, upper ones with slender, linear segments. **Flowers** in terminal and lateral umbels; involucre inconspicuous or absent. **Calyx** with conspicuous, triangular teeth, outer ones larger. **Petals** white to pink, outer ones of outer flowers much enlarged. **Flowering time** Sept.–Feb. **Fruit** globose, glabrous, with inconspicuous blunt ribs; vittae absent; carpophore bipartite. **Seeds** concave on inner face. Probably SW Asian in origin, alt. 10–1 400 m; Indian Ocean Coastal Belt (Port St Johns).

*CYCLOSPERMUM Lag.

Species 1, Caribbean and central America, a weed in tropical and warm temperate areas across the world and sthn. Afr., widespread.

leptophyllum (Pers.) Sprague ex Britton & P.Wilson

Glabrous, annual herb, 0.2–1.2 m high. **Leaves** 3- or 4-pinnate, with many filiform segments. **Flowers** in compound umbels, sessile to pedunculate; involucels absent. **Calyx teeth** obsolete. **Petals** white or pale pink. **Styles** very short. **Flowering time** Oct.–June. **Fruit** broadly ellipsoid to almost round, slightly laterally compressed, 1.25–1.75 mm long; mericarps each with 5 strongly protuberant, broad, pale longitudinal ribs; vittae minute, in furrows and 2 on face. Disturbed, damp places, even in very shallow water, alt. 5–2 100 m; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt (widespread, except in drier parts).

CYNORHIZA Eckl. & Zeyh.

(= *PEUCEDANUM* in part)

Species ± 3, South Africa, NC, WC, EC.

typica Eckl. & Zeyh.

[= *C. olifantiana* Koso-Pol., *Peucedanum olifantianum* (Koso-Pol.) M.Hiroe, *Peucedanum typicum* (Eckl. & Zeyh.) B.L.Burtt]

Hondewortel (A)

Herbaceous perennial, 0.2–1.5 m high, with taproot. **Leaves** 160–480 × 100–250 mm, 3-pinnate, with ultimate segments linear to ovate, soft. **Flowers** in compound umbels on elongate peduncles, yellowish. **Involucre** of few to many bracts. **Calyx** with 5 minute teeth. **Flowering time** Oct.–Jan. **Fruit** 8–21 × 7–13 mm, dorsally flattened, outline obovate, apex often notched due to broad marginal wings that extend beyond apex of stylopodium, vittae conspicuous, usually 6, 2 on inner face, and 4 on dorsal face. Coastal scrub in sand, Noorsveld, alt. 0–100 m; Albany Thicket (Graaff-Reinet to Victoria East S, from Greater Addo Elephant National Park to Port Elizabeth, Grahamstown District and Port Alfred).

EC plants differ in some respects from those in the west of the country.

DASISPERMUM Raf.

(= *SONDERINA* H.Wolff)

Species 7, South Africa, widespread along the coastal plain, KZN, NC, WC, EC.

Leaves not fleshy, green; fruit with slender ribs; in various habitats, rarely on littoral dunes

hispidum (Thunb.) Magee & B.-E.van Wyk
[= *Sonderina hispida* (Thunb.) H.Wolff]

Annual, up to 0.45 m high, branching from below. **Leaves** finely dissected, leaflets linear-filiform. **Flowers** in compound umbels on leaf-opposed peduncles, white; involucre of a few, narrow bracts. **Flowering time** Sept.–Jan. **Fruit** ovate and ridged, fruit and pedicels often hispid. Sandy or limestone flats, usually coastal, alt. 5–200(–700) m; Eastern Fynbos-Renosterveld [E of Kabeljousrivier (Steytlerville) to St George's Strand (Port Elizabeth)].

humile (Meisn.) Magee & B.-E.van Wyk
[= *Sonderina humilis* (Meisn.) H.Wolff]

Annual, up to 0.3 m high. **Leaves** dissected, leaflets narrowly ovate. **Flowers** on scabrid pedicels, white; involucre of a few, narrow bracts. **Flowering time** Nov., Dec. **Fruit** ovate and ridged, glabrous; mericarps with 5 ribs, flat on face, or channelled, convex on back; vittae 6, 1 in each furrow and 2 on face. Forest, rough herbage next to roadsides, riverbanks, alt. (50–)200–1 100 m; Albany Thicket, Indian Ocean Coastal Belt (KZN to Somerset East and Komga S, from Enon to Fort Gray Forest at East London).

Leaves fleshy, glaucous; fruit with thickish ribs or wings; associated with littoral dunes

suffruticosum (P.J.Bergius) B.L.Burtt
Duineseldery (A)

Sprawling to prostrate perennial (flowering from the first year), 0.1–0.3(–0.5) m high, decumbent or suberect with a woody base. **Leaves** bipinnatisect, leathery-fleshy, leaflets narrow, toothed, often curling inward. **Flowers** in compound umbels on pseudoaxillary peduncles; involucre absent or of few bracts. **Petals** cream-coloured. **Flowering time** mainly Aug.–Nov. **Fruit** broadly ovate or elliptic, variously winged or broadly ridged. Coastal sands, azonal littoral vegetation, alt. 1–100 m; Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Port St Johns S along coast, from near King William's Town to Kentani, Van Stadens River Mouth to Swartkopsrivier, Port Alfred, Fish River Mouth and East London, and to Humansdorp and Skoenmakerskop).

*DAUCUS L.

Species 22, Europe, Asia, N Africa, Australia; 1 in sthn Afr., NW, G, KZN, WC, EC.

The toxic *Daucus carota* L. var. *carota*, a close relative of the cultivated carrot, *D. carota* subsp. *sativus* (Hoffm.) Arc., occurs sporadically as an escape and roadside weed. It is cosmopolitan, with a likely SW Asian origin.

carota L.
Wild carrot

Toxic, biennial herb, 0.3–1.8 m high; stem erect, with stiff, bristle-like hairs; taproot ± fleshy. **Leaves** bipinnate, lower ones with acute, lanceolate segments, upper ones much smaller and less divided. **Flowers** in terminal umbels; involucre conspicuous, with many, narrow, 3-forked bracts. **Calyx** minute. **Petals** broadly obovate, notched, white. **Flower-**

ing time Sept.–Apr. **Fruit** ellipsoid, with sharp bristles. Grassland, alt. 150–1 700 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (known from the Stormberg Plateau; well represented in the Winterberg Mts; also in the Suurberg Mts and Tsitsikamma area).

DEVERRA DC.

Species 7–10, North Africa to Arabian Peninsula and sthn Afr.; 2 in sthn Afr., widespread, except S, KZN.

aphylla (Cham. & Schltdl.) DC.
[= *D. aphylla* (Cham. & Schltdl.) DC. var. *denudata* Sond., *D. denudata* (Viv.) Pfisterer & Podlech subsp. *aphylla* (Cham. & Schltdl.) Pfisterer & Podlech]

Twiggy shrub, 0.6–0.9(–1.5) m high, leafless at flowering. **Radical leaves** simple or trifoliolate (young plants). **Cauline leaves** simple; lamina absent (or caducous) or linear to filiform, up to 30 mm long; petioles sheathing, persistent. **Flowers**: umbels in diffuse panicles; umbel rays 4–11, 5–35 mm long. **Involucre** of 4–6 caducous, narrowly ovate, whitish margined bracts. **Flowers** yellow. **Calyx** obsolete. **Flowering time** Oct.–May. **Fruit** ovoid, sparingly villous or muricate. Dry karroid scrub, alt. 60–600 m; Albany Thicket (lower Sundays River and Fish River basins).

burchellii (DC.) Eckl. & Zeyh.

Rigid, perennial herb or broom-like undershrub, similar to *D. aphylla*, 0.4–1.0 m high. **Flowers**: umbel rays 6–11, 5–25 mm long. **Involucre** of 4–6 caducous bracts. **Calyx** obsolete. **Flowering time** Feb.–Apr. **Fruit** ellipsoid, slightly laterally compressed, tuberculate or with almost globular, bladder hairs; mericarps subterete, with primary veins distinct, flat on face; vittae 6, 4 in furrows, 2 on face. **Seeds** flat on face, convex on back. Eastern Mixed Nama Karoo, mountain slopes, alt. 1 000–1 700 m; Dry Highveld Grassland, Sub-Escarpment Grassland (Aliwal North to Steynsburg, Queenstown and Cradock).

[E]**EZOSCIADIUM** B.L.Burtt

Monotypic, endemic to the Cape Floristic Region, WC, EC.

capense (Eckl. & Zeyh.) B.L.Burtt

Small, erect, annual herb, 0.10–0.35 m high, sparsely to densely hairy. **Leaves** slender, long-petiolate, ternately dissected, lobes 2- or 3-fid, linear-oblong, acute, margins entire. **Inflorescences**: umbels sessile, axillary. **Rays** 2–4, unequal. **Involucral bracts** 2, 2–4 mm long, narrowly ovate. **Umbellules** 2–4-flowered. **Petals** very small, white, apices not inflexed. **Stamens** remain highly inflexed, appearing almost sessile. **Flowering time** Sept., Oct. **Fruit** narrowly oblong, with prominent ridges, sparsely to densely pilose; mericarps with blunt ridges; vittae 6, 1 in each furrow and 2 on face; carpophore bifid for the upper $^{2}/_{3}$ of its length. Shady places, pans, alt. up to 150 m; Eastern Fynbos-Renosterveld (Herold in WC, via Langkloof to Port Elizabeth).

*__FOENICULUM__ Mill.

Species 5, Europe, Asia, N Africa; 1 in sthn Afr., cultivated and a widespread roadside weed, NW, G, M, KZN, WC, EC.

vulgare Mill.

Fennel; *vinkel* (A)

Robust, glabrous, slightly glaucous, perennial herb, 1–3 m high; stem erect, ribbed. **Leaves** 3- or 4-pinnate, with narrowly linear to narrowly acicular segments, base sheathing. **Flowers** in many-rayed, terminal or lateral umbels; involucre absent. **Calyx** obsolete. **Petals** inflexed at apex, bright yellow. **Stylopodium** short, broadly conical. **Flowering time** Nov.–Mar. **Fruit** narrowly ovoid, with prominent ridges at maturity; glabrous; vittae 6, large. Common along roadsides, probably of Mediterranean origin, alt. 50–1 800 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt (Middelburg, Port Edward, Port Elizabeth, Grahamstown).

HERMAS L.

Tontelblaar (A)

Species 8, endemic to Cape Floristic Region, WC, EC.

capitata L.f.

Tufted perennial, up to 0.3 m high. **Leaves** radical, long-petiolate, ovate to elliptic, white- or brown-felted beneath, margins sometimes revolute, crenate. **Inflorescences**: umbels each with a single, female or bisexual flower surrounded by a number of male flowers, rarely all flowers bisexual. **Flowers** in small, congested compound umbels on slender peduncles. **Petals** somewhat filiform, white. **Stylopodium** flattened. **Flowering time** Dec.–Mar. **Fruit** dorsally flattened, outline broadly ovate. Damp sites on rocky sandstone slopes, alt. 300–1 800 m; Eastern Fynbos-Renosterveld (Van Stadens Mts).

ciliata L.f.

Tufted perennial, up to 0.6(–0.9) m high. **Leaves** radical, elliptic, tapering below, white-felted beneath, glabrous above, margins finely serrulate-ciliate. **Inflorescences**: umbels each with a single, female or bisexual flower surrounded by a number of male flowers, rarely all flowers bisexual. **Flowers** crowded in compound umbels on branched peduncles. **Petals** somewhat filiform, white. **Stylopodium** flattened. **Flowering time** Dec.–Mar. **Fruit** outline broadly ovate. Sandstone slopes, alt. 300–1 500 m; Eastern Fynbos-Renosterveld (Elandsberg Mts).

HETEROMORPHA Cham. & Schltdl.

Species 7–11, sub-Saharan Africa and Yemen; 5 in sthn Afr., widespread, though absent from arid areas.

arborescens (Spreng) Cham. & Schltdl.

Parsley tree; *wildepietersieliebos* (A)

Shrub, 0.8–1.9 m high, or small tree, 2–5 m high, or woody liana. **Leaves** simple or trifoliolate to pinnately and/or pedately compound with up to 7 leaflets; leaflets elliptic-lanceolate to ovate or obovate, entire to crenate. **Flowers** in bracteate compound umbels, greenish white. **Flowering time** Dec.–Mar. ('Valley Thicket/Scarp Forest form' flowers sporadically all year with a peak in Oct.). **Fruit** outline elliptic to somewhat obpyriform, slightly winged; mericarps of 2 forms, one 2-winged, the other 3-winged, mostly flattened, with prominent ribs; vittae 6, with 2 on face and 4 around each seed; carpophore bipartite. Grassland, forest margins, thicket and rocky woodland, sometimes only in riparian vegetation, alt. 10–2 000 m; in all bioregions, except Lower Karoo and Rain-

shadow Valley Karoo (Aliwal North to Ntsikeni and Mzimkhulu; Middelburg to Port Edward; Graaff-Reinet to Kei Mouth; Willowmore to Humansdorp, Port Elizabeth, Grahamstown and East London).

ITASINA Raf.

Monotypic, endemic to the Cape Floristic Region, WC, EC.

filifolia (Thunb.) Raf.

Delicate, perennial herb, up to 0.5 m high, sometimes appearing annual, glabrous; root fleshy, cylindric. **Leaves**: basal filiform or grass-like; cauline absent or few, narrowly linear. **Flowers** in compound umbels; involucre of few bracts. **Calyx** with ovate-acuminate teeth. **Petals** white. **Stamens** longer than petals; filaments linear; anthers elliptic, subdidynamous. **Stylopodium** conical. **Styles** spreading, subterete. **Flowering time** Dec.–Feb. **Fruit** oblong, ribbed, crowned with persistent styles; mericarps oblong, semi-terete, flat on face, with 5 prominent ribs; vittae 6, 2 on inner face; carpophore absent. Grassy areas, alt. 20–300 m; Eastern Fynbos-Renosterveld (Tsitsikamma: Oesterbaai).

LICHTENSTEINIA Cham. & Schltdl.

Kalmoes (A)

Species ± 7, subendemic to the Cape Floristic Region, M, S, KZN, WC, EC.

interrupta (Thunb.) Sond.

(= *L. kolbeana* Bolus)

Kalmoes (A); *umBungashe* (X)

Tufted, rhizomatous, perennial herb, up to 0.5(–1.2) m. **Leaves** radical, lacerate-pinnatisect or bipinnatisect; leaflets unevenly serrate, usually dry at flowering in western part of distribution. **Flowers** in compound umbels on slender, branched peduncles, white. **Calyx** with 5 thick, ovate, acute lobes. **Stamens** ± as long as petals. **Flowering time** Nov.–Feb. **Fruit** broadly ovoid, crowned with persistent calyx, with prominent stylopodium; 5 primary veins with oil ducts under each; vittae absent from furrows and face of mericarps. Coastal grassland and strandveld, alt. 10–500(–980) m; Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt (Pondoland to Tsitsikamma).

latifolia Eckl. & Zeyh.

Tufted perennial, up to 1.2 m high, aromatic, with large rootstock. **Leaves** radical, sometimes withered at flowering, rotund to ovate, shallowly lobed to trifid with obovate lobes, margins toothed but not aristate. **Flowers** yellow, in compound umbels on long, branched, hollow peduncles. **Calyx** with 5 thick, ovate, acute lobes. **Stamens** ± as long as petals. **Flowering time** mainly Nov.–Feb. **Fruit** crowned with persistent calyx, with prominent stylopodium, narrowly oblong; 5 primary veins with oil ducts under each; vittae absent from furrows and face of mericarps. Sandstone slopes, alt. 500–1 500 m; Eastern Fynbos-Renosterveld (Baviaanskloof and Kouga Mts to Uitenhage).

NANOBUBON A.R.Magee

(= *PEUCEDANUM* in part)

Species 2, endemic to the Cape Floristic Region, WC, EC.

capillaceum (Thunb.) A.R.Magee

(= *Peucedanum capillaceum* Thunb. var. *rigidum* Sond.)

Tufted suffrutex, up to 0.6 m high, with woody, subterranean stems. **Leaves** in a basal tuft, persistent and sclerophyllous, long-petiolate, divaricately dissected, 3-pinnate

or multifid, with ultimate lobes filiform, stiffly erect, lemon-scented. **Flowers** in compound umbels on simple, elongate peduncles; whitish or yellowish. **Flowering time** Sept.–Feb. **Fruit** large, 10–15 mm long, dorsally flattened with thick, very broad, marginal wings. Lower sandstone and limestone slopes, alt. 240–1 200 m; Eastern Fynbos-Renosterveld (Van Stadens Mts).

NOTOBUBON B.-E.van Wyk

(= *PEUCEDANUM* in part)

Species 12, mostly endemic to the Cape Floristic Region, M, S, FS, KZN, NC, WC, EC.

1a Shrubs small, 0.2–0.4 m high (excluding the inflorescence), or if > 0.5 m high, then with ultimate leaf segments entire or only slightly crenulate; vittae 6 in each mericarp
2a Leaves > 20 mm long; raylets glabrous; sepals minute, < 0.2 mm long

laevigatum (Aiton) A.R.Magee

[= *Peucedanum camdebooense* B.L.Burtt, *Peucedanum capense* (Thunb.) Sond.]

Lidbossie (A); *tloro-ngoale* (SS)

Shrub or shrublet, 0.2–1.5(–2.3) m high. **Leaves** (20–)40–170 mm long, distichous, pinnate to 2-pinnate, leaflets very narrowly to broadly elliptic or very narrowly ovate to ovate, usually entire. **Flowers** in compound, flat-topped umbels, yellow; rays 5–67, 21–85 mm long. **Flowering time** Nov.–Mar. **Fruit** dorsally flattened, small, outline elliptic to broadly elliptic, 4–7 mm long. Rocky or sandy slopes, alt. 3–1 980 m; Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt (Aliwal North and Steynsburg, S to Sneeuberg and Winterberg Mts, E to East London, then NE along coast to the Mtamvuna River; Tsitsikamma to Humansdorp, Port Elizabeth and Grahamstown).

2b Leaves up to 20 mm long; raylets scabrous; sepals minute, < 0.2 mm long

[E]**montanum** (Eckl. & Zeyh.) A.R.Magee

(= *Peucedanum dregeanum* D.Dietr.)

Shrublet, 0.4–0.5 m high. **Leaves** 10–18 mm long, pinnate to 2-pinnatisect, lobes very narrowly elliptic, concolorous, margins revolute; petioles sheathing. **Primary umbel** with 7 or 8 rays, flat-topped; rays 5–8 mm long. **Flowers** yellow. **Flowering time** Dec.–Mar. **Fruit** outline broadly elliptic to rotund, 5 mm long, marginal wings thick and narrow, glabrous. Rocky slopes, alt. up to 765 m; Eastern Fynbos-Renosterveld (near Elands River in the Groot Winterhoek Mts).

1b Shrubs relatively large, 0.5–5.0 m high (excluding the inflorescence); ultimate leaf segments 3-lobed to pinnatisect; vittae 11
3a Multi-stemmed shrubs, up to 1 m high (excluding the inflorescence); peduncle long, > 2× as long as diam. of the primary umbel; primary umbel with < 20 (rarely 27) rays

ferulaceum (Thunb.) A.R.Magee

[= *Peucedanum ferulaceum* (Thunb.) Eckl. & Zeyh.]

Slender shrub, up to 1 m high. **Leaves** finely dissected, concolorous green, rarely glaucous, up to 120(–160) mm long, imbricately arranged all along upper parts of branches, ultimate segments weakly pinnatisect or 2- or 3-sect, lobes linear, subequal. **Flowers** pale yellow. **Flowering time** Dec.–Mar. **Fruit** outline elliptic to rotund, (4.5–)6.0–7.0 mm long; marginal wings relatively broad. Moist slopes, alt. 10–900(–1 050) m;

Eastern Fynbos-Renosterveld (Baviaanskloof and Tsitsikamma Mts to Humansdorp and Van Stadens Mts).

sonderi (M.Hiroe) A.R.Magee
[= *Peucedanum sonderi* (M.Hiroe) B.L.Burtt]

Slender shrub, up to 1 m high, stems eventually decumbent. **Leaves** discolorous, upper surface dark green, lower surface silvery-glaucous, > (90–)110 mm long, often congested near base of peduncle, ultimate segments prominently pinnatisect or 2- or 3-sect, lobes linear. **Flowers** yellow. **Flowering time** mainly Jan. **Fruit** 5.0–6.5 mm long, outline elliptic, marginal wings relatively narrow; commissural vittae broad. Steep, moist, rocky slopes, alt. (900–)1 000–1 530 m; Eastern Fynbos-Renosterveld (Tsitsikamma Mts; Groot Winterhoek Mts).

3b Sparsely branched shrubs or trees, 1.5–5.0 m high (excluding the inflorescence); peduncle short, < 1.5 (or at most 2)× as long as the diam. of the primary umbel; primary umbel with > 20 rays

gummiferum (L.) A.R.Magee
[= *Peucedanum gummiferum* (L.) Wijnands, *Peucedanum hypoleucum* (Meisn.) Drude]

Small tree, 1.5–5.0 m high. **Leaves** distichous, discolorous, upper surface dark green, lower surface silvery glaucous. **Primary umbel** often multiradiate, shortly pedunculate. **Flowering time** Sept.–Nov. **Fruit** 5.5–8.5 mm long, outline elliptic, marginal wings thick and narrow, glabrous; vittae 11 in each mericarp (2 in commissure usually very broad). Streambeds along forest margins, alt. 350–1 220 m; Eastern Fynbos-Renosterveld (Tsitsikamma Mts to Kareedouw).

tenuifolium (Thunb.) A.R.Magee
(= *Peucedanum tenuifolium* Thunb.)

Shrub 1.2–2.0(–3.0) m high. **Leaves** 3-pinnate, leaflets linear, concolorous, usually bright green, less often slightly glaucous, terminal lobes 2–3× longer than adjacent lateral lobes. **Flowers** in large compound umbels, yellow. **Flowering time** Sept.–Jan. **Fruit** small, 3.0–4.5(–5.0) mm long, outline rotund (rarely elliptic), marginal wings relatively narrow; vittae 11 in each mericarp (2 in commissure usually very broad). Rocky slopes or along streams, alt. 600–1 400 m; Eastern Fynbos-Renosterveld (Willowmore, Aasvogelberg, Baviaanskloof and Kouga Mts to Groot Winterhoek and Van Stadens Mts).

***PASTINACA** L.

Species 14, Europe and SW Asia; 1 in sthn. Afr., as an occasional escape in moist situations, NW, G, M, FS, KZN, WC, EC.

sativa L.

Parsnip; *witwortel* (A)

Biennial herb, up to 2 m high. **Stems** hollow, furrowed. **Leaves** large, pinnate; leaflets ovate, acute, sometimes lobed, margins irregularly toothed. **Flowers** yellow. **Flowering time** Nov.–Jan. **Fruit** dorsally compressed, virtually orbicular, with marginal wings; vittae not as long as fertile section of mericarp. Vegetable garden escape, alt. 1 000–1 500 m; Sub-Escarpment Grassland (Maclear, Queenstown, Grahamstown).

*PETROSELINUM Hill

Species 2, S Europe and SW Asia; 1 in sthn. Afr., a rare escape from cultivation, WC, EC.

crispum (Mill.) A.W.Hill

Parsley; *pietersielie* (A)

Biennial herb, 0.20–0.75 m high. **Stems** striate. **Leaves** 3-pinnate, triangular, glossy; segments 10–22 mm long, cuneate, lobed. **Inflorescence** much branched, rays 8–20; involucral bracts 1–3, entire or 3-lobed, sheath-like at base; bracteoles 5–8, linear-oblong to ovate. **Flowers** pale yellow. **Flowering time** summer. **Fruit** 2.5–3.0 mm long, broadly ovoid. Coastal grassland; Albany Thicket (East London).

PIMPINELLA L.

Species ± 150, Africa and Eurasia (mainly Mediterranean); 2–7 in sthn Afr., G, M, S, FS, KZN, L, EC.

caffra (Eckl. & Zeyh.) D.Dietr.

Wild aniseed; *wilde anys* (A); *mohopu* (SS); *sehoetjana* (SS)

Slender, erect, sometimes aromatic, perennial herb, 0.3–0.8 m high. **Leaves** slender-petiolate, radical ones often simple, ovate, cordate, entire or toothed and in succession upwards becoming divided and pinnate, leaflets linear to lanceolate. **Involucral bracts** absent or 1. **Rays** 6–8, **Calyx teeth** absent. **Petals** white, glabrous, hirsute or villous. **Flowering time** Jan.–Mar. **Fruit** ovoid to broadly ovoid, slightly laterally flattened, 2–3 mm long, glabrous or hairy; vittae ± 9, 2 or more in each furrow, 2 on inner face. Grassy fynbos slopes, alt. 10–2 400(–2 800) m; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Stormberg, Witteberg and Drakensberg Mts; Sneeuberg to Pondoland and to Kei River Mouth; Prince Alfred's Pass to Van Stadens Mts; Suurberg to Grahamstown).

Species excluded – Poorly known and probably conspecific with the above: **P. schlechteri** H.Wolff, **P. stadensis** (Eckl. & Zeyh.) D.Dietr. A revision is needed to provide the correct application of names.

POLEMANNIA Eckl. & Zeyh.

Species 3, sthn Afr., M, FS, KZN, L, EC.

[E]grossulariifolia Eckl. & Zeyh.

Shrub, up to 3 m high, glabrous. **Leaves** 3-foliolate; leaflets obovate, cuneate, 3-lobed, apices usually truncate, with distinct intramarginal nerve. **Flowers** in compound umbels or umbels in panicles on leafless branches; involucre of few bracts. **Calyx** with persistent, ovate lobes. **Flowering time** Dec.–Mar. **Fruit** oblong or ovoid; mericarps dorsally flattened, flat on face, convex on 3-nerved back, winged on margins; vittae 6, 2 on inner face. Mountain slopes, ridges, summits, alt. up to 2 010 m; Dry Highveld Grassland, Drakensberg Grassland (Sneeuberg and Winterberg Mts).

montana Schltr. & H.Wolff

Shrub or small tree, 1–2(–4) m high, similar to *P. grossulariifolia*. **Leaflets** 3-lobed and sometimes serrate, apices acute. **Flowering time** Feb.–Apr. Rocky streambanks and slopes, alt. 1 700–2 020 m; Sub-Escarpment Grassland (Ntsikeni Nature Reserve S to Hangklip Mtn N of Queenstown and Mount Frere).

simplicior Hilliard & B.L.Burtt

Shrub, 0.5–3.0 m high, similar to the other 2 species and to *Heteromorpha*. **Leaflets** rarely lobed, apices rounded or obtuse. **Inflorescences**: umbels ± 40 mm in diam. **Flowers** yellow. **Flowering time** Jan.–Mar. Steep, open, rocky slopes, alt. up to 2 440 m; Drakensberg Grassland (common in the Witteberg Mts; outliers in the Bamboesberg, Stormberg Mts, Hangklip Mtn and Winterberg Mts).

SANICULA L.

Sanicle

Species ± 39, ± cosmopolitan excluding Australia, with a center of diversity in China; 1 in sthn Afr., LIM, M, S, FS, KZN, L, WC, EC.

elata Buch.-Ham. ex D.Don

Perennial herb, up to 0.8 m high. **Leaves** ± pentagonal, 3–5(–7)-digitate, leaflets lobed and toothed, teeth aristate. **Flowers** few, sessile in simple umbels, pinkish. **Calyx** with lanceolate lobes. **Flowering time** Oct.–Jan. **Fruit** burr-like with hooked bristles; carpophore absent; mericarps broad or narrow on inner face, smooth or sometimes setose or granulate, oil ducts 5, below veins or with 2 oil ducts on inner face. **Seeds** flat or swollen and half-moon-shaped, often deeply concave or grooved on face. Indigenous forests, shady streamsides, alt. 67–1 950 m; Sub-Escarpment Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Insizwa S, from Seymour to Katberg, Somerset East to Isidenge State Forest and S to Humansdorp).

STENOSEMIS E.Mey. ex Sond.

Species 1–3, sthn Afr., KZN, EC.

angustifolia E.Mey. ex Sond.

Perennial herb, up to 0.5 m high. **Stems** procumbent, glabrous, distinctly ribbed. **Leaves** slender, much dissected, 3-pinnate to multifid, ultimate lobules short (6–8 × 1 mm), linear, sulcate beneath with nerves prominent, upper ones smaller; petioles 50–75 mm long. **Inflorescences**: umbels terminal, multirayed on short or long peduncles (procumbent in at least the interior form). **Involucre and involucel** of many narrowly ovate bracts. **Calyx teeth** minute, narrowly triangular. **Petals** white (buds and/or umbel axes often pink). **Anthers** reddish. **Flowering time** Dec.–Mar. **Fruit** roundish ovoid, subterete; mericarps with 5 wing-like ridges, wings thick, corky, undulate. Rock outcrops, alt. 100–2 010 m; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt (KZN S, from Hangklip Mtn to Mthatha and along the Winterberg Mts to Stutterheim).

[E]caffra (Eckl. & Zeyh.) Sond.

Perennial herb, similar to *S. angustifolia* and perhaps conspecific. **Stems** stout, erect, up to 1 m high. **Leaves** triternate, ultimate lobules elongate, terete, acute, sulcate, undivided or trifid; petioles 100–150 mm long, terete, sulcate. **Rays** 10–14, unequal, 13–19 mm long (twice the bract length), sulcate. **Fruit** 6 × 5 mm, ellipsoid to ovoid, terete in transverse section. Rock outcrops, cliff edges and ledges, alt. up to 600 m; Albany Thicket, Indian Ocean Coastal Belt (Pondoland Coast to Grahamstown and Bathurst).

TORILIS Adans.

Hedge parsley

Species ± 15, Eurasia and Africa; 2 (1 doubtfully indigenous, 1 weed) in sthn Afr., FS, NC, WC, EC.

arvensis (Huds.) Link
[= *T. africana* (Thunb.) Spreng.]
Sprawling, soft, annual herb, 0.03–0.50(–1.00) m high. **Leaves** finely divided, hairy, often tinged purple, leaflets toothed. **Flowers** few, in leaf-opposed umbels; peduncles ± as long as, or longer than leaves; involucre absent. **Rays** 2–4. **Umbellules** 3–6-flowered. **Involucel** of 4–6 bracteoles. **Petals** white, setose-hairy. **Flowering time** Aug.–Nov. **Fruit** burr-like with barbed prickles; both secondary and primary dorsal ribs of fruit pilose. Waste places, dune forests along coast, alt. 6–1 340 m; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt (Fort Beaufort to King William's Town S, from Port Elizabeth to Fish River Mouth).

***nodosa** (L.) Gaertn.
Annual herb, usually procumbent, or else up to 0.6 m high; hispid. **Leaves** pinnately compound, resembling carrot leaves. **Inflorescences**: umbels mostly lateral, leaf-opposed, compound with 2 or 3? rays; peduncles < 25(–50) mm long (significantly shorter than petioles); involucre absent. **Rays** very short, concealed by flowers or fruit. **Calyx** of 5 small, acute teeth, persistent. **Petals** obovate, emarginate, with inflexed point, white, larger on outside flowers than on inner ones. **Flowering time** Sept.–Dec. **Fruit** grooved at sides, covered with stiff, straight bristles; mericarps circular in section, without ridges. Grassland, origin W and S Europe, alt. up to 520 m; Sub-Escarpment Grassland, Albany Thicket (Alice to King William's Town and S to Port Alfred).

***TURGENIA** Hoffm.

Species 2, Eurasia and N Africa; 1 (escape) in sthn Afr., FS, EC.

latifolia (L.) Hoffm.
Annual herb, up to 0.6 m high. **Leaves** pinnate; segments narrowly ovate to oblong, serrate or pinnatifid, pubescent to hispid beneath, margins often ciliate. **Inflorescences**: umbels long-pedunculate, rays 2–5, hispid. **Involucral bracts** (2)3–5. **Umbellules** are pseudanthia; raylets short; bracteoles 5–7, ovate-lanceolate to oblong, > 2 mm wide, with wide scarious margins. **Petals** ± 5 mm, white, pink or purplish, 1 or 2 distinctly larger, directed toward umbellule margin, radiating. **Flowering time** Sept. **Fruit** 6–10 × 7 mm, with barbed processes (spines); laterally compressed, outline elliptic to broadly elliptic in lateral view, oblong in dorsal view. Cultivated and disturbed ground, alt. > 1 400 m; Drakensberg Grassland, Sub-Escarpment Grassland (Stormberg Plateau and White Kei Catchment to Dordrecht and Queenstown).

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APOCYNACEAE

(sensu APG, includes ASCLEPIADACEAE and PERIPLOCACEAE)

(Order Gentianales)

Compiled by A. Nicholas (167 sp.), M. Glen (44 sp.), A. Shuttleworth (43 sp.) & S.P. Bester (35 sp.)

Key to subfamilies

1a Anthers free from style-stigma-head; corolla lobe aestivation in bud typically sinistrorse (overlapping to left), rarely dextrorse (overlapping to right); fruit dehiscent or indehiscent, syncarpous or apocarpous, a berry, drupe, follicle or capsule; seeds with wings or arils, but almost never with a tuft or coma of hairs..... subfamily **Rauvolfioideae**

1b Anthers adnate or ± adherent to style-stigma-head; corolla lobe aestivation in bud typically dextrorse or valvate, rarely sinistrorse; fruit dehiscent, almost always apocarpous, forming pairs of follicles, sometimes reduced to one by abortion or postgenitally fused; seeds small, compressed, almost always with a coma (tuft of hairs) at one end:

2a Anthers 4-locular, adherent to style-stigma-head by hairs or secretions, lower part often sterile; filaments free; pollen shed as monads; nectaries, if present, in a ring around base of ovary..... subfamily **Apocynoideae**

2b Anthers 2- or 4-locular, adnate to style-stigma-head, fertile throughout; filaments free or fused; pollen shed in tetrads onto translators or gathered into 2(4) pollinia attached to a corpusculum; nectaries located in alternistaminal troughs at base of filaments or staminal column:

3a Pollen shed in tetrads onto spoon-shaped translators with a sticky end which can adhere to a pollinator for removal; anthers 4-locular..... subfamily **Periplocoideae**

3b Pollen gathered in pollinia attached in pairs (or fours) to a spherical or fusifoid (spindle-shaped) corpusculum which can become attached to a pollinator for removal; anthers 2- or 4-locular:

4a Anthers 4-locular; pollen in 4 small pollinia attached to a soft, pale corpuscle, anthers adherent to style-stigma-head by hairs or secretions..... subfamily **Secamonoideae**

4b Anthers 2-locular; pollen in 2 pollinia attached to a dark, hard corpusculum..... subfamily **Asclepiadoideae**

Subfamily Apocynoideae

1a Leaves alternate or fascicled; stems succulent; stipules transformed into rigid spines..... **Pachypodium**

1b Leaves opposite or ternate; stems woody or subherbaceous; without stipular spines:

2a Corolla ± salver-shaped ..... **Oncinotis**

2b Corolla tube campanulate to broadly funnel-shaped:

3a Coralline (coral red) corona reduced to paired appendages alternating with corolla lobes.... **Strophanthus**

3b Coralline corona of 5 truncate epipetalous parts, each 3–8-lobed ..... ***Nerium**

Subfamily Asclepiadoideae

Key to tribes of Asclepiadoideae

1a Pollinia attached directly to corpuscle (without caudicles); anther appendages erect and inflated filling up inside of tubular corona..... tribe **Fockeeae**

1b Pollinia attached to corpusculum via caudicles/translator; anther appendages of various orientation but membranous and not inflated or filling inside of corona:

2a Pollinia developing in part of anther sac positioned below corpuscle:

3a Inflorescences umbelliform or very contracted cymes, flowers often large..... tribe **Asclepiadeae**

3b Inflorescences of lax cymes, flowers often small..... tribe **Marsdenieae**

2b Pollinia developing in part of anther sac positioned above corpuscle:

4a Pollinia with insertion crest (ridge along edge of pollinium that becomes lodged in the gynostegial groove and through which pollen tubes arise)..... tribe **Ceropegieae**

4b Pollinia without insertion crest:

5a Carpels narrowing gradually into slender neck below style-stigma-head; anther appendages with basal horizontal slit..... tribe **Asclepiadeae**

5b Style-stigma-head sessile on carpels that lack slender neck; anther appendages without basal horizontal slit..... tribe **Marsdenieae**

In this key and in descriptions below, parts of pollinium (e.g. inner side, outer side) are labelled relative to anther in which pollinium has arisen.

Tribe Asclepiadeae

1a Staminal corona absent; plant with clear sap:

2a Corolla lobes closing tube at bases or remaining closed over mouth of tube; anther appendages covering whole of style-stigma-head, mostly with apical tuft of hairs..... **Microloma**

2b Corolla lobes not closing corolla tube; anther appendages only covering base of style-stigma-head, without apical tuft of hairs ..... **Astephanus**

1b Staminal corona present; plant with clear or milky sap:
3a Style-stigma-head produced beyond anthers into an elongated, apical, bifid cone; staminal corona lobes behind anthers with margins folded backwards:
4a Corolla < 10 mm in diam., tube not swollen towards base; plant with clear sap ..... **Oncinema**
4b Corolla > 15 mm in diam., tube swollen towards base; plant with milky sap ..... ***Araujia**
3b Style-stigma-head truncate, obtuse or conical, if produced above, then into a club-shaped knob (= *Cordylogyne*) and staminal corona lobes not as above:
5a Corona consisting of ± uniformly tall outer series of fused (staminal) lobes encircling gynostegium, often with inner series of 5 staminal corona lobes appressed to backs of anthers:
6a Outer interstaminal coronal series ± cupular near base of gynostegium, much shorter than and separated from the inflated vesicular inner staminal lobes appressed to backs of anthers ..... **Sarcostemma**
6b Outer interstaminal coronal series cupular to tubular, sometimes divided to base but equalling or exceeding gynostegium, fused to inner staminal corona lobes, if these are present ..... **Cynanchum**
5b Corona consisting of very small interstaminal corona lobes beneath gynostegial groove (sometimes these obsolete or absent) and much larger, heavily vascularised staminal corona lobes behind anthers, these often highly ornate:
7a Stems twining:
8a Flowers rotate, ± entirely without tube; corolla with microscopic hairs inside, interstaminal corona lobes ± absent beneath gynostegial groove, staminal lobes behind anthers with incurved margins; pollinia attached by slender caudicles and without insertion crest..... **Pentarrhinum**
8b Flower salver-shaped, with cupular tube below insertion of staminal corona; corolla with conspicuous hairs towards the edges of the lobes; corona with 5 discrete interstaminal lobes beneath gynostegial groove, staminal corona lobes behind anthers without incurved margins; pollinia attached by caudicles much shorter than wide and with insertion crest along inner edge..... **Pergularia**
7b Stems erect, decumbent or prostrate, mainly herbaceous; rootstock often tuberous:
9a Style-stigma-head conical, with anther appendages ascending and covering it..... **Stenostelma**
9b Style-stigma-head truncate with central depression, anther appendages appressed to its sides rarely covering it:
10a Staminal corona fused to corolla tube for considerable distance towards sinuses of corolla lobes ..... **Parapodium**
10b Staminal corona not fused to corolla tube:
11a Staminal corona lobes fleshy and solid, without appendages or sinuses..... **Xysmalobium**
11b Staminal corona lobes dorsiventrally flattened or with lateral margins not folded inwards to form cavity, sometimes keeled adaxially:
12a Staminal corona lobes spreading outwards and upwards (not erect from base), with or without keels and appendages; plants fairly robust; fruit large, leathery and inflated but not echinate..... **Pachycarpus**
12b Staminal corona lobes erect from base; fruit narrowly fusiform, if inflated, then with long echina:
13a Flowers nodding; petals with very long white hairs scattered on outer surface; staminal corona lobes linear-oblong, purple..... **Fanninia**
13b Flowers erect; petals, if hairy (as in *Asclepias cultriformis*), then hairs not very long; corona lobes not as above:
14a Petals strongly revolute and erect forming a cage over gynostegial column; staminal corona lobes trifid ..... **Woodia**
14b Petals, if revolute and erect, then not forming a cage over gynostegial column; corona lobes ± spathulate or lanceolate, sometimes produced into a point, keeled or with appendages on inner surface:
15a Plants with one unbranched stem:
16a Style apex extended into a club-like appendage;
17a Corona white or greeny cream-coloured, lobes columnar; marsh-loving..... **Cordylogyne**
17b Corona white and purple-tipped, lobes sagittate-ovate; slender grassland herbs..... **Periglossum**
16b Style apex truncated and not extended into a club-shaped appendage:
18a Staminal corona lobes ventrally flattened, scale-like and often produced into a subulate or filiform apex, with 2 keels and frequently with 1 or 2 appendages on inner face:
19a Inflorescence pedunculate (except in *S. bidens* subsp. *pachyglossum*); pollinia medially attached to caudicle with pellucid zone on outer side..... **Schizoglossum**
19b Inflorescence sessile; pollinia subapically attached, with or without pellucid germination zone (if this present, then located at point of attachment of pollinia to caudicle):

20a Staminal corona lobes fleshy; pollinia without pellucid zone..... **Miraglossum**
20b Staminal corona lobes thin and usually complicated; pollinia often with pellucid zone..... **Aspidoglossum**
18b Staminal corona lobes cup or slipper-shaped, laterally flattened, with inner cavity or sinus, with or without appendages within this sinus:
21a Flowers, especially corolla, maroon-brown or chocolate brown; staminal corona deeply cleft along the back..... **Aspidonepsis**
21b Flowers, especially corolla, yellow, green, mauve, pink, purple, white, cream-coloured or these in complex combinations (never chocolate brown); staminal corona entire (not cleft) along the back:
22a Staminal corona lobe sinus with ligulate appendage, usually a single erect stem produced from a small round or napiform tuber, rarely up to 3, but then always slender and gramineus (grass-like)..... **Aspidonepsis**
22b Staminal corona lobe sinus without central appendage, usually more than one stem, if only one stem, then thick and not graminose..... **Asclepias**
15b Plant with many stems, i.e. foliose:
23a Shrub-like plants with many, erect, perennial branches; rootstock fibrous; fruits inflated and echinate..... **Gomphocarpus**
23b Geophytic herbs with few (rarely many in *Asclepias multicaulis*) branches dying back to ground level in dry season; rootstock thickened below surface (often well below) and often forming a tuber or deep-seated caudex; fruits not inflated, surface smooth or denticulate:
24a Plants not graminaceous, with several stems, erect or decumbent and then erect; leaves narrowly elliptic or triangular..... **Asclepias**
24b Plants graminaceous, with up to 3, slender, erect stems; leaves linear:
25a Flowers (corolla and corona) yellow..... **Aspidonepsis**
25b Flowers, especially corolla, green, mauve, pink purple, white, cream-coloured or these in complex combinations, not yellow..... **Asclepias**

Tribe Ceropegieae

1a Stems herbaceous to fleshy, erect, prostrate or twining, with well-developed leaves to ± leafless and tuberculate, but tubercles not arranged into angles; flowers not fleshy:
2a Roots somewhat woody or fleshy, fusiform and fascicled; follicles single by abortion:
3a Corolla shortly campanulate to globose-campanulate, white or creamy yellow, often densely shaggy-pubescent on inside of lobes; inner corona lobes appressed to anthers and rarely slightly exceeding them; plants erect and slender with filiform leaves..... **Sisyranthus**
3b Corolla deeply lobed and ± rotate (with short bowl-shaped tube), brownish with yellowish green markings, glabrous on inner surface of lobes; inner corona lobes rising up in centre and connate above style head; plants ± creeping with ovate- or orbicular-cordate leaves..... **Anisotoma**
2b Roots soft and fleshy (never woody) fusiform and fascicled or a swollen tuber; follicles paired:
4a Anthers ascending to erect, pressed into sides of style-stigma-head:
5a Corolla tube often with inflated base, 1–3× as long as lobes..... **Riocreuxia**
5b Corolla shallowly bowl-shaped, deeply lobed (tube < 0.5× length of lobes)..... **Emplectanthus**
4b Anthers horizontal and pressed into top of style-stigma-head:
6a Corolla rotate to campanulate, tube broader than long, if longer, then inner corona lobes not exceeding anthers..... **Brachystelma**
6b Corolla with tube longer than maximum width and inner corona lobes exceeding anthers, connivent into column above style-stigma-head (rarely shorter than anthers)..... **Ceropegia**
1b Stems fleshy, with leaves reduced to minute rudiments or absent, leaf rudiments borne on tubercles arranged into 4 or more angles along stems; flowers fleshy:
7a Outer and inner series of staminal corona lobes vertically well separated on staminal tube and not partly or wholly fused to one another (outer corona often disc-like):
8a Leaf rudiments with small, stipular denticles; staminal corona stipitate, outer series resting on rim or sides of cup formed by annulus on corolla..... **Duvalia**
8b Leaf rudiments without stipular denticles; staminal corona not stipitate, outer series spreading on base of corolla tube and often partly fused to it..... **Huernia**
7b Outer and inner series of corona lobes not vertically separated on staminal tube and partly or wholly fused to one another (outer corona never disc-like):

9a Tubercles on stems arranged into 6 or more angles, armed tubercles on stem (at least when young) each with 1 or more spines (1.5–)3.0–15.0 mm long:
10a Spines 3 per tubercle; flowers deeply tubular; outer corona with long, slender lobules, each tipped with a tear-like knob ..... **Tavaresia**
10b Spines 1 per tubercle; flowers rotate to shallowly bowl-shaped; lobes of outer corona short, without apical knob ..... **Hoodia**
9b Tubercles on stems arranged into 4 or 5 angles:
11a Stems, pedicels, sepals and outside of corolla pubescent (stems sometimes ± glabrous) ..... **Stapelia**
11b Stems, pedicels, sepals and outside of corolla glabrous:
12a Pollinia relatively large with broad, ± cupular caudicle attached to base of pollinium; insertion crest twisted onto dorsal surface of pollinium:
13a Outer staminal corona much reduced or absent (as spreading lobe beneath gynostegial grooves), with a deep nectarial cavity behind; flowers borne near apices of stems; pollinia ± ellipsoidal.... **Piaranthus**
13b Outer corona not much reduced, with a shallow nectarial cavity; flowers borne at any height on stem; pollinia ± D-shaped:
14a Surface of stem micropapillate (dull and not shiny), tubercles obtuse and not tapering into leaf rudiments, stem ± leafless ..... **Tromotriche**
14b Surface of stem smooth (± shiny), tubercles tapering into leaf rudiments, not obtuse or leafless:
15a Leaf rudiments deltoid to subulate, with clearly demarcated base, caducous, with small, multicellular hairs in stipular position and along margins, but lacking stipular denticles; corolla covered with multicellular papillae ..... **Tridentea**
15b Tubercles on stem tapering to fine point and leaf rudiment without obvious base, without small hairs in stipular position but with stipular denticles; corolla deeply rugulose to smooth but rarely with multicellular papillae ..... **Orbea**
12b Pollinia small, with small ± circular attachment on ventral surface of pollinium; insertion crest exactly along outer edge of pollinium:
16a Flowers produced towards apex of stem in many, small inflorescences ..... **Quaqua**
16b Flowers produced towards base of stem, only 1 inflorescence per stem:
17a Inner staminal corona laterally flattened, rising above anthers and connate in centre; pollinia longer than wide..... **Stapeliopsis**
17b Inner staminal corona dorsiventrally flattened, appressed to backs of anthers and not exceeding them; pollinia broader than long..... **Ophionella**

Tribe Fockeeae

Only one genus in EC..... **Fockea**

Tribe Marsdenieae

1a Staminal corona absent..... **Marsdenia**
1b Staminal corona present:
2a Corolla almost flat, with obsolete tube ..... **Tylophora**
2b Corolla with a distinct tube ..... **Marsdenia**

Subfamily Periplocoideae

1a Gynostegium enclosed in corolla tube ..... **Cryptolepis**
1b Gynostegium exserted from corolla mouth:
2a Erect, prostrate or climbing herbaceous geophytes with suffrutescent stems..... **Raphionacme**
2b Woody lianas with perennial stems:
3a Nodes of stem with interpetiolar stipular ridge..... **Ischnolepis**
3b Nodes of stems with large, fringed interpetiolar stipule..... **Chlorocyathus**

Subfamily Rauvolfioideae

1a Ovary syncarpous (with carpels fused):
2a Unarmed shrubs or trees; inflorescence axillary ..... **Acokanthera**
2b Armed shrubs, sometimes scandent; inflorescence terminal or pseudo-axillary ..... **Carissa**

1b Ovary of 2 separate (apocarpous) or almost separate carpels:
3a Stems subherbaceous, not higher than 1.5 m:
4a Anthers level with swollen stigma head ..... ***Catharanthus**
4b Anthers stand above swollen stigma head ..... ***Vinca**
3b Stems woody; shrubs, trees or climbers:
5a Leaves in whorls of 3, 4 or 5:
6a Fruit follicular; ovules many in each carpel..... **Gonioma**
6b Fruit a drupe; ovules 2 in each carpel ..... **Rauvolfia**
5b Leaves opposite:
7a Calyx divided almost to base, not circumscissile at base..... **Tabernaemontana**
7b Calyx with distinct tube which is circumscissile at base ..... **Voacanga**

Subfamily Secamonoideae

Only one genus in sthn Afr. ..... **Secamone**

ACOKANTHERA G.Don

Species 5, from Yemen through E Africa to Cape region; 3 in sthn Afr., LIM, NW, G, M, S, KZN, WC, EC.

oblongifolia (Hochst.) Codd

Dune poison bush; *duine-gifboom* (A); *intlungunyembe* (X); *inhlungunyembe* (Z)

Small, perennial tree or shrub, 1.8–6.0 m high. **Leaves** broadly elliptic, oblong or oblanceolate, 60–120 × 25–60 mm, apex obtuse to round, sometimes emarginate, with slim, mucronate tip. **Inflorescences** lax and few-flowered. **Flowers** salver-shaped, white. **Corolla**: tube 12–20 mm long; lobes 5–7 mm long. **Anther**: apices with minute hairs. **Gynoecium** syncarpous. **Styles** 12–16 mm long. **Flowering time** (Aug.) Sept., Oct. **Fruit** a subglobose berry, 25 mm long, 15–22 mm in diam., red to purple when mature. Coastal bush or woodland, on sand dunes, alt. 0–950 m; Indian Ocean Coastal Belt (Umtamvuna Nature Reserve to East London).

oppositifolia (Lam.) Codd

Bushman's poison; *boesmansgif* (A); *intlungunyembe* (X); *inhlungunyembe* (Z)

Small, perennial tree or shrub, (0.6–)2.0–4.0(–6.0) m high; sometimes multi-stemmed. **Leaves** ovate-elliptic, oblong to oblanceolate, 50–100 × 20–50 mm, lateral veins distinct, apex acute, ending in a sharp, callose, mucronate point; new leaves red. **Inflorescences** clustered and many-flowered. **Flowers** salver-shaped, white. **Corolla**: tube 8–11 mm long; lobes 2–3 mm long. **Anther**: apices glabrous. **Gynoecium** syncarpous. **Style** 6–8 mm long. **Flowering time** (Apr.–)June–Oct. (Dec). **Fruit** an ovoid to ellipsoid, fleshy berry, (8–)10–12(–20) mm long, 10–15 mm in diam., red to purple when mature. Wide variety of wooded habitats along entire coastal zone and inland, alt. 0–1 950 m; Indian Ocean Coastal Belt, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Umtamvuna Nature Reserve southwards from Queenstown to Port St Johns, Alice to Kentani and Baviaanskloof to Port Alfred).

ANISOTOMA Fenzl

Species 2, sthn Afr., KZN, EC.

[E]**cordifolia** Fenzl

Perennial, creeping herb, 100–200 mm long. **Stems** many, slender, forking basally. **Leaves** pressed against ground, ovate to almost round, 6–32 × 6–25 mm, base cordate;

petioles 6–13 mm long. **Inflorescences** subglobose; 3–9-flowered; sessile or peduncle up to 30 mm long. **Flowers**: corolla white or light yellow at base, upper half dark to orange-brown; pedicels 4–21 mm long. **Corolla**: tube 1.0–1.5 mm long; lobes narrowly oblong, 2–4 × 1 mm. **Corona** in 2 cycles; outer lobe rhomboid, 0.7–1.0 mm long, deeply bifid; inner lobe extended, subulate, ± 1.5 mm long, erect and then curved and connivent over style-stigma-head. **Anther** tipped with 2 or 3 minute hairs. **Flowering time** Nov.–Jan. Short, often stony grassland, rarely open shrubland, alt. up to 1 370 m; Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Seymour E to Fort Cunynghame, S to Grahamstown).

pedunculata N.E.Br.

Perennial, creeping herb. **Stems** many, slender, forking basally, radiating from fascicled fleshy roots; 100–600 mm long. **Leaves** pressed against ground, widely ovate 8.5–40.0 × 6–35 mm, base cordate; petioles 4–19 mm long. **Inflorescences** 2–10-flowered; peduncle 12–50 mm long. **Flowers**: corolla cream-coloured basally, upper half brown; pedicels 19–32 mm long. **Corolla** deeply lobed; tube campanulate, 1.5–2.0 mm long; lobes narrowly oblong, 3.5–4.5 × 1.5 mm, margins rolled over. **Corona** in 2 series: outer lobes oblong to lanceolate, apex obtuse or dentate, 1.0–1.5 mm long; inner lobes extended into a linear-spathulate appendage, 1.5–2.0 mm long, apex acute or bifid, connivent above style apex. **Anther** tipped with 3 or 4 hairs. **Flowering time** Oct.–Jan. Short, annually burnt grassland, alt. 1 600–2 100 m; Sub-Escarpment Grassland (Mount Fletcher S from Elliot to Mhlahlane Forestry Reserve).

*ARAUJIA Brot.

Species 5, native to South America; 1 weed in sthn Afr., widespread.

sericifera Brot.

Moth catcher; *melktou*, *-bol*, *-toubos* (A)

Perennial, herbaceous, twining climber, (1–)5–10 m long; basal stems woody; latex caustic. **Leaves** oblong, 30–100 × (8–)10–34 mm, base truncate, apex acute, tip mucronate, concolorous; petioles 8–16 mm long. **Inflorescences**: axillary racemes, 2–4(–8)-flowered, clustered; peduncle 9.5–15.0 mm long. **Flowers** 18–30 × 10–20 mm, white or cream-coloured, tinted pink; fragrant. **Sepals** large, leaf-like. **Corolla**: tube campanulate, 8–14 mm long, mouth slightly constricted; lobes 10–20 × 5–8 mm. **Corona** solid, triangular-ovate, ± 3 mm high, ± 1.5 mm wide, apex obtuse. **Style-stigma-head** with apex bilobed. **Flowering time** Sept.–Jan. **Fruit** solitary, pendent, ovoid, 80–120 × 40–50 mm, surface leathery. **Seeds** up to 400. Noxious weed, introduced from South America, disturbed areas, alt. 10–1 800 m; Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket (Queenstown S to Stutterheim and Grahamstown).

ASCLEPIAS L.

Species ± 150, Africa, Arabian Peninsula, America; ± 50 in sthn Afr., widespread.

*la Fibrous roots producing erect leafy stems; leaves with noticeable, but not protruding venation; inflorescences axillary and terminal; flowers red, erect in 4-flowered groups, bright red or orange; corona saccate with a long, erect, horn-like appendage in sinus; follicles smooth with lightish green longitudinal stripes (*Asclepias s.s. *– American species)*

***curassavica** L.

Perennial herb, 0.4–1.0(–1.5) m high. **Leaves** opposite or 3-whorled; lamina lanceolate to elliptic-lanceolate, 60–100 × 8–20 mm, base cuneate, apex acute, brilliant green;

petioles up to 15 mm long. **Inflorescences**: corymbose umbellate, 6–12(–20)-flowered; peduncle 35–75 mm long. **Flowers**: corolla lobes red, sharply reflexed, 7–9 × 4 mm; staminal column 6.8–8.0 mm high, noticeably stipitate by ± 2.7 mm long. **Corona**: lobes orange to yellow, cucullate, not laterally compressed, 3.5–4.0 mm high, 1.5 mm wide; upper proximal edge blunt (level with style-stigma-head), curving up into an acutely blunt distal end, overtopping style-stigma-head. **Anther** orbicular, incumbent on style-stigma-head. **Follicles** fusiform, 60–80 × 10–15 mm, apex acuminate, beaked, glabrous. Garden escape, disturbed, sandy areas, alt. 5–100 m; Albany Thicket (Southernwood, a suburb of East London).

*1b Long cylindrical or napiform tuber producing erect, solitary or sparsely branched stem; plants seldom taller than 400 mm and not graminaceous; leaves linear to elliptic sometimes broadly so; inflorescences axillary and terminal, nodding; flowers green or white; corona saccate or solid, with or without a sinus appendage; follicles glabrous (*Sigridia *sensu Nicholas 1999)*
2a Plants glabrous or with rust-coloured hairs; leaves with secondary venation noticeable; flowers green and without long shaggy hairs

[E]**dregeana** Schltr. var. **dregeana**

Perennial, geophytic herb, 75–150 mm high. **Stems** simple. **Leaves** in 4–8 pairs, spreading-erect, narrowly oblong, ovate, 20–65 × 10–25 mm, base round or slightly cordate, apex acute or obtuse, tip mucronate. **Inflorescences** lax, nodding, 5–10-flowered. **Flowers** green or butter-yellow; corolla lobes elliptical-oblong, 5.5–10.0 × 4.0–5.5 mm; staminal column stipitate. **Corona**: lobes cucullate, ± as high (± 2 mm) as broad (2–3 mm), solid; upper proximal ends extended into deltoid teeth. **Anther**: appendages small, suborbicular, incumbent on style-stigma-head. **Flowering time** Sept.–Dec. **Follicles** fusiform, 75–85 × 12–20 mm. Open, annually-burned coastal, midland and highland grassveld; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Komga, Grahamstown, Humansdorp).

dregeana Schltr. var. **calceolus** (S.Moore) N.E.Br.

Differs from the typical variety as follows: **Stems** mostly solitary. **Leaves** ovate to broadly elliptic. **Corona**: lobes as above but with a shallow or deep grooved sinus. **Follicle** 100–115 mm long. Sub-Escarpment Savanna (Transkei S to Kentani).

2b All parts of plants scabrid; leaves with secondary venation not noticeable but midrib large and prominent; flowers white with shaggy white hairs

concinna (Schltr.) Schltr.

Perennial, geophytic herb. **Stems** solitary, erect, 300–330 mm high. **Leaves** linear, 23–110 × 1.5–4.0 mm, base cuneate, apex acuminate, margins revolute. **Inflorescences** (4–)8-flowered; peduncle 13–30 mm long. **Flowers** cream-coloured to creamy green; corolla lobes rotate, 5.2–5.8 × 2.8–3.1 mm, margins with villous white hairs; staminal column 2.8–3.0 mm high, not stipitate. **Corona**: lobes taller than wide, 1.8–2.0 mm high, (0.8–)1.7–2.0 mm wide, upper proximal edge dentate, 0.7–0.8 mm long and projecting onto style-stigma-head, and upper distal ends blunt, upper ± straight and level with style-stigma-head. **Anther** transversely elliptic with cleft apex, ± 0.5 × 1.0 mm. Hilly midland grassland, alt. 900–1 500 m; Sub-Escarpment Grassland (known from Tina River only).

[E]**cultriformis** (Harv. ex Schltr.) Schltr.

Ishonwe elimpofu (Z)

Perennial, geophytic herb, 150–300(–380) mm; stem solitary, erect, white shaggy-hairy. **Leaves** ascending, linear-oblong to ovate-lanceolate, 25–50 × 6.5–16.0 mm, base round

to subcordate, apex acute. **Inflorescences** corymbose-umbellate, 4–10-flowered; peduncle 12–25 mm long. **Flowers** large; corolla creamy green; corona white, purple-tinted basally. **Corolla**: lobes saucer-shaped, ovate, 12–15 × 9.5–14.0 mm; staminal column 4–5 mm high. **Corona**: lobes ± as high as broad (2–4 mm), upper proximal edge elongated into subulate appendages, straight or curved, projecting over style apex, becoming connivent, upper margin curving down to blunt distal end ± level with style apex. **Anther** ovate, incumbent on style-stigma-head. **Flowering time** Dec.? Hilly coastal or mountainous inland areas, annually-burnt grassland, amongst boulders; Sub-Escarpment Grassland (known from Tina River only).

[E]rara N.E.Br.

Perennial, geophytic herb, 150–205 mm high; stem solitary, erect, white shaggy-hairy. **Leaves** linear to oblong lanceolate, broader at base, 20–56 × 6–25 mm, base ± cordate, apex acuminate; petioles 5–6 mm long. **Inflorescences** 7-flowered; peduncle 12–45 mm long. **Corolla** brownish; lobes spreading and slightly reflexed, 5 × 3–4 mm; staminal column ± 2.5 mm, stipitate by ± 0.7 mm long. **Corona** white; lobes cucullate, compressed, D-shaped in side view, 1.5–2.0 mm high, 1–2 mm wide, upper proximal edge extended into long dentate appendages that project onto style-stigma-head, upper margin truncate curving into a rounded keel proximally; sinus a shallow groove. **Flowering time** Jan.? Hilly midland grassland, alt. ± 360 m; Sub-Escarpment Savanna/Albany Thicket (restricted to small area around Grahamstown).

1c Long, cylindrical tuber producing solitary, erect stem; plants graminaceous up to 850 mm high; stems and leaves glabrous; leaves linear to linear-lanceolate, patent and widely spaced; secondary venation not prominent; inflorescences axial and terminal, nodding; flowers white, pinky purple or green; corona saccate without sinus appendage but with or without upper proximal and/or distal appendages; follicles glabrous
*(*Paulforstera *sensu Nicholas 1999)*

3a Upper distal corona lobe appendage absent (blunt) or extended into a long, dentate appendage

[E]expansa (E.Mey.) Schltr.

Perennial, geophytic herb, 220–720 mm high. **Leaves** linear, 42–120 × 0.8–3.5 mm; minutely hastate. **Inflorescences** 4–8(–10)-flowered; peduncle 9–27 mm long. Flowers cream-coloured to creamy brown; corolla lobes 7.5–11.5 × 4.0–5.5 mm, margins scabrous; staminal column 2–3 mm high, stipitate by 1 mm long. **Corona**: lobes 6.7–9.5 mm high, 4.0–5.5 mm wide, upper proximal 2.1–3.5 mm long and upper distal 3.0–5.5 mm long, ends extended into 2 very long dentate appendages that protrude well over style-stigma-head, upper margin cleft. **Anther**: appendage spathulate, erect, 2.4–4.1 mm long. **Flowering time** Oct.–Mar. Hilly inland grassland, alt. 150–360 m; Drakensberg Grassland, Sub-Escarpment Grassland (Stutterheim to Butterworth).

[E]patens N.E.Br.

Perennial, geophytic herb, 200–840 mm high. Leaves linear-lanceolate, 70–145 × 10–90 mm, base auriculate. **Inflorescences** 2–7(–11)-flowered; peduncle 15–26 mm long. **Flowers** white, tinted pink or lilac; corolla lobes 6–7 × 3.0–4.5 mm, margins scabrous; staminal column 3–4 mm high, stipitate by 0.5 mm long. **Corona**: lobes 2.4–3.5 mm high, 3.0–4.4 mm wide; upper proximal end extended into 2 dentate appendages 1.2–1.9 mm long, protruding over style-stigma-head, upper margin oblique, distal upper end blunt, margins proximally level with style-stigma-head, distally below. **Anther**: appendage triangular to widely ovate, 0.5–1.0 mm long. **Flowering time** Sept.–Jan. Hilly coastal grassland, alt. 150–360 m; Sub-Escarpment Grassland to Indian Ocean Coastal Belt (predominantly Pondoland, Transkei from Kentani to Port St Johns).

praemorsa Schltr.

Perennial, geophytic herb, 240–560 mm high. **Leaves** linear, 30–115 × 1–3 mm, base minutely auriculate. **Inflorescences** 4–10(–14)-flowered; peduncles 3–18 mm long. **Flowers** white, cream-coloured to pale green with mauve base. **Corolla**: lobes 5.5–7.5 × 3.5–4.8 mm, margins scabrous; staminal column 2–4 mm high, stipitate by 0.8 mm long. **Corona**: lobes 2.2–3.8 mm high, 1.8–2.8 mm wide; upper proximal ends blunt, upper margin truncate, overtopping style-stigma-head by 0.5–0.8 mm. **Anther**: appendage oblong or tongue-like, 1.7–2.5 mm long, connivent on style-stigma-head. **Flowering time** Dec.–Apr. Hilly coastal and inland grassland, between sandstone rocks and boulders, alt. 150–360 m; Sub-Escarpment Grassland (Mtamvuna River to Mthatha).

schlechteri (K.Schum.) N.E.Br.

Perennial, geophytic herb, 535–550 mm high. **Leaves** linear, sometimes slightly curved, 45–95 × 1–3 mm, base cuneate. **Inflorescences** 4–8-flowered; peduncle 4–20 mm long. **Flowers** white to green, sometimes tinted with purple; corolla lobes spreading-erect, ± 10 × 4.0–6.5 mm, lower surface and margins with long setose to villous hairs; staminal column ± 1.8 mm high, stipitate by 1.0–1.5 mm long. **Corona**: lobes 7.7–9.4 mm high, ± 3.5 mm wide, with upper distal end extended into long, dentate-filiform appendage 4.8–6.0 mm high, upper proximal end extended into a shorter fin-like appendage, 0.9–1.2 mm protruding over style-stigma-head, upper margin cleft. **Anther**: appendage ligulate, 0.8–0.9 mm long. Hilly inland grassland on sandy soil, alt. ± 800 m; Sub-Escarpment Grassland (Bizana area).

3b Distal corona lobe appendage shorter than upper margin and dolphin tail-like

[E]peltigera (E.Mey.) Schltr.

Perennial, geophytic herb, 310–820 mm high. **Leaves** linear, 50–114 × 1–4 mm, base minutely auriculate. **Inflorescences** (3)4-flowered; peduncle 12–20 mm long. **Flowers** white, pink or lilac. **Corolla**: lobes reflexed, 7.5–11.5 × 4–6 mm, margins scabrous or smooth; staminal column 5–6 mm high, not stipitate. **Corona**: lobes turriform (tower-shaped), divided into distal and proximal sublobes partly joined at base, distal appendage basally narrow, expanded into dolphin tail-like structure, (1.6–)2.5–4.0 mm long; proximal sublobes laterally flattened with small wing-like appendages, taller than distal lobe, 4.4–5.8 mm high, 2.0–3.3 mm wide, reaching middle of anther wings. **Anther**: appendage transversely oblong, apical margin shallowly concave, 0.48–1.2 mm long. **Flowering time** Nov.–Jan. Grassy valleys from coast to midlands on hills, alt. 30–1 000 m; Sub-Escarpment Savanna, Albany Thicket (Pirie to Butterworth).

1d Long, cylindrical tuber producing many, often branched, decumbent or procumbent stems, these radiating from ground level; leaves with secondary venation prominent; inflorescences terminal, hemispherical or globose, many-flowered; flowers pink, yellow, white or purple; corona lobes saccate without sinus appendage; follicles glabrous or echinate
*(*Pachyacris *sensu Nicholas 1999)*
4a Stems procumbent or decumbent

albens (E.Mey.) Schltr.

Idoyi, *ishongwe*, *umadoye* (Z)

Perennial, geophytic herb, 200–500 mm long. **Leaves** ± ovate-lanceolate, 20–75 × 12–35 mm, base rounded, apex broadly acute; petioles 1.0–6.5 mm long. **Inflorescences** pendulous, 15–40 tightly flowered; peduncle 25–117 mm long. **Corolla** mauve, reflexed; lobes 6.7–8.0 × 4.0–4.5 mm. **Corona** yellow or white, laterally compressed,

± square in side view, 2.0–3.5 mm long, 2–4 mm high; upper proximal edge shortly dentate, extended over margin of style-stigma-head; keel at right angles to upper margin, ending in ridge running along lobe base. **Anther** orbicular, incumbent on style-stigma-head. **Flowering time** Oct.–Feb. **Follicle** fusiform, surface warty. Widespread, inland coastal grassland, alt. 30–500 m; Indian Ocean Coastal Belt, Albany Thicket (Mkambati Nature Reserve S to Qora and Kei River Mouths, from Greater Addo Elephant National Park to East London).

crispa P.J.Bergius var. **crispa**

Bitter root; *bitterwortel* (A)

Perennial, geophytic herb, procumbent, 150–388 mm long. **Leaves** triangular, 36–90 × 4–16 mm, base trullate to truncate, apex acute, margins crisped, harshly hairy; petioles 2.7–5.5 mm long. **Inflorescences** solitary, rarely paired, globose, erect, 25–50 mm in diam.; 7–40-flowered; peduncle 20–85 mm long. **Corolla** mauve, reflexed; lobes 5.3–7.5 × 2.5–4.5 mm; staminal column 2–3 mm, stipitate by 0.7–1.0 mm long. **Corona** yellow or white tinted purple, slipper-shaped, 2 mm high, 3–7 mm wide, upper proximal edge shortly dentate, extended over margin of style-stigma-head, upper margin forming acuminate point, overtopping style-stigma-head; keel bow-like. **Anther** bilobed or emarginate, incumbent over style-stigma-head. **Flowering time** Sept.–Apr. **Follicle** fusiform, pedicel twisted, 72–111 mm long, apex long beaked. Coastal grassland, alt. 15–900 m; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (King William's Town to Knysna).

[E]**crispa** P.J.Bergius var. **plana** N.E.Br.

Leaves oblong to ovate, base rounded, apex obtuse or rounded, margins flat, midrib and secondary veins pronounced. **Inflorescence** globose, solitary; peduncle 25–50 mm long. Indian Ocean Coastal Belt, Albany Thicket (Coffee Bay to East London).

[E]**crispa** P.J.Bergius var. **pseudocrispa** (Schltr.) N.E.Br.

Leaves linear, base rounded, apex acute, margins flat. **Inflorescences** hemispherical; peduncle 28–64 mm long. Albany Thicket (Port Elizabeth to East London).

flexuosa (E.Mey.) Schltr.

Umampofu (Z)

Perennial, geophytic, procumbent herb, 210–420 mm long. **Stems** 4–12 per plant. **Leaves** spreading, linear-triangular to narrow-lanceolate, 7–55 × 1–5 mm, base trullate, apex acuminate. **Inflorescences** corymbose umbellate, 6–12-flowered; peduncle 7–13(–19) mm long. **Flowers** mauve-pink or green-purple; strongly scented. **Corolla** reflexed; lobes 4.2–6.6 × 2.2–3.4 mm; staminal column 2.0–4.6 mm, stipitate. **Corona** slipper-shaped, 2.0–4.6 mm long, 1.0–1.8 mm high, upper proximal edge dentate, ± level with style-stigma-head; keel sharply curved upwards overtopping style-stigma-head. **Anther**: appendage transversely oblong, apically truncate, incumbent on style-stigma-head. **Flowering time** Dec.? **Fruit** a smooth follicle with light green stripes. Midland grassland in sandy soil, alt. ± 1 000 m; Sub-Escarpment Grassland (near Clydesdale).

macropus (Schltr.) Schltr.

Perennial, geophytic, decumbent herb, 150–400 mm long. **Stems** 4 or 5 radiating from tuber. **Leaves** spreading, ovate to elliptic, 25–65 × 22–37 mm, base round, apex acute, margins flat and slightly thickened; petioles 4.5–8.0 mm long. **Inflorescences** solitary and terminal, globose, erect, 12–30-flowered; peduncle 75–110 mm long. **Flowers** mauve, almost chocolate or burgundy. **Corolla** reflexed; lobes oblong-ovate,

7.8–8.0 × ± 4.5 mm; staminal column ± 2.5 mm, stipitate. **Corona** yellow- or dark red, cupulate, upper proximal edge extended into long dentate/subulate appendages projecting over edge of style-stigma-head, upper margin forming a long acuminate point that greatly overtops style-stigma-head. **Anther** suborbicular incumbent on style-stigma-head. **Flowering time** Jan.? **Fruit** obliquely fusiform. Midland and upland grassland, often annually burnt, alt. 900–2 000 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Maclear/Elliot to Mthatha).

[E]**monticola** N.E.Br.

Delicate, perennial, geophytic herb, procumbent, 50–130 mm long. **Stems** 3–5 radiating from tuber. **Leaves** spreading, ovate to lanceolate, 16.0–32.3 × 6.0–11.4 mm, base subcordate, apex acute; petioles 2.7–5.4 mm long. **Inflorescences** terminal, subglobose, 6–12-flowered; peduncle 31–34 mm long. **Flowers** green, tinted purple or mauve. **Corolla** reflexed; lobes elliptic-oblong, 4.0–4.7 × 1.9–2.1 mm; staminal column stipitate. **Corona** whitish or yellow, subquadrate, upper proximal edge extended into short falcate, subulate appendages projecting onto edge of style-stigma-head, upper margin obliquely ending in a rounded upper distal end. **Anther** transversely oblong, 0.35–0.50 × 0.8–1.0 mm, upper edge emarginate, incumbent on style-stigma-head. **Flowering time** Jan.? Mountain grassland, alt. ± 2 000 m; Sub-Escarpment Grassland (Andriesberg).

multicaulis (E.Mey.) Schltr.

Melkbossie (A); *isikhonde*, *isiphofu* (Z)

Perennial, geophytic, procumbent herb, 85–150 mm long. **Stems** 4–12 per plant. **Leaves** spreading, flat on ground, triangular, 5.5–22.5 × 3.5–8.0 mm, base truncate, apex acute; petioles sessile. **Inflorescences** corymbose umbellate, 6–16-flowered; peduncles 12.5–60.0 mm long. **Flowers** mauve or pinky red; strong honey fragrance. **Corolla** reflexed; lobes ovate, 4.5–5.0 × 2.8–3.4 mm. **Staminal column** 1.5–2.0 mm, very shortly stipitate. **Corona** white tinted, mauve, slipper-shaped, taller than wide, upper proximal edge dentate, projected onto edge of style-stigma-head, upper margin forming blunt upper distal end overtopping style-stigma-head. **Anther**: appendage subreniform, incumbent on margin of style-stigma-head. **Flowering time** Nov., Dec. **Fruit** a fusiform follicle. Dry sandy, rocky soils, grass cover sparse, alt. 1 200–2 200 m; Drakensberg Grassland, Dry Highveld Grassland (Thaba Chitja District to Dordrecht and Stutterheim).

vicaria N.E.Br.

Perennial, geophytic, decumbent herb, 235–345 mm high. **Stems** 4–9 per plant. **Leaves** spreading, ovate-lanceolate to ovate, 25–35 × 12–24 mm, base truncate or subcordate, apex acute. **Inflorescences** solitary, globose, erect, 25–40-flowered; peduncle 44–82 mm long. **Flowers** creamy green. **Corolla** spreading reflexed; lobes ovate 4–3 × 2.7–3.2 mm. **Staminal column** ± 2.5 mm long, slightly stipitate. Corona: lobes small, slipper-shaped, 1–2 mm long, ± 1.5 mm high, upper proximal edge shortly dentate and extended over margin of style-stigma-head, upper margin ± truncate, curving downwards into blunt-tipped acuminate point. **Anther** transversely oblong to reniform with emarginate apex, incumbent on style-stigma-head margin. **Flowering time** Jan.? Drakensberg Escarpment and mountain island grassland, alt. 1 300–2 000 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Kokstad and Ngeli Districts).

xysmalobioides Hilliard & B.L.Burtt

Delicate, perennial, geophytic, procumbent herb, 165–180 mm long. **Stems** 4–7. **Leaves** spreading, ovate to lanceolate, 10–26 × 7–10 mm. **Inflorescences** terminal, globose,

20–25-flowered; peduncle 38–70 mm long. **Flowers** green, sweetly scented. **Corolla** reflexed; lobes ovate, ± 4 × 2.5 mm. **Staminal column** shortly stipitate. **Corona** dull yellow or creamy brown, solid and fleshy, ± 1 mm square, upper proximal edges extended into 2 short, blunt, inwardly touching, shoulder-like appendages just below style-stigma-head, upper margin truncate, upper distal end rounded. **Anther** transversely oblong (twice as wide as long), upper edge emarginate, incumbent on style-stigma-head. Sparse, high altitude, damp mountain grassland, alt. 1 800–2 500 m; Sub-Escarpment Grassland (Drakensberg around Maclear).

This species may eventually prove to be conspecific with *Asclepias monticola* and deserving subspecific rank.

4b Stems erect for most of length

[E]cooperi N.E.Br.

Perennial, geophytic herb, 150–300 mm long. **Stems** 1 or 2, soon erect. **Leaves** ± ascending, triangular, 38–76 × 6.4–13.0 mm, base truncate or trullate, apex attenuate, margins wavy/crisped; petioles 4.2–12.5 mm long. **Inflorescences** solitary and terminal, hemispherical, rarely subglobose, ± corymbose umbellate, erect, 30–50-flowered; peduncle 50–126 mm long. **Flowers** greenish yellow. **Corolla** reflexed with apex turned up; lobes elliptic-oblong, 5.3–6.3 × 3.2–4.0 mm. **Staminal column** 2.0–2.7 mm high, stipitate. **Corona** bright golden-yellow, fleshy, claw-shaped in side view, wider than high, upper proximal edge extended into dentate appendages, upper margin curving to blunt, rounded upper distal end overtopping style-stigma-head. **Anther** prominently winged, angled at midpoint, appendages large, ± reniform and apically obtuse, incumbent and concealing style-stigma-head. Midland mountain island grassland, alt. 650–1 400 m; Drakensberg Grassland (Hogsback/Amatole Mts).

[E]hastata (E.Mey.) Schltr.

Perennial, geophytic herb, 200–340 mm high. **Stems** 2–5 erect. **Leaves** ascending, lanceolate, 35–75 × 4–14 mm, base hastate, apex acute; petioles 2–5 mm long. **Inflorescences** 1 or 2, terminal or apically clustered, hemispherical, erect, 8–20-flowered; peduncle 10–19(–30) mm long. **Flowers** purple-mauve, tipped greenish white. **Corolla** reflexed; lobes oblong, 4.7–6.3 × 2.7–3.7 mm. **Staminal column** 2.0–2.6 mm high, not stipitate. **Corona** cucullate, taller than wide; upper proximal edge extended into dentate appendages ± level with lobe, upper margin curving up sharply into a blunt, slightly reflexed distal end, greatly overtopping style-stigma-head. **Anther** with appendages transversely oblong, either apically emarginate or round, incumbent on side of style-stigma-head. **Flowering time** Nov.–Jan. Mountain and midland grassland, alt. 400–600 m; Drakensberg Grassland, Sub-Escarpment Savanna (Hogsback, King William's Town and Kei River).

*1e Long, cylindrical tuber producing decumbent to erect, sparsely branching stems; leaves with margins not revolute; inflorescences terminal, erect, 4–many-flowered; flowers green, greeny purple or light purple; corona lobes turriform, sinus open or closed, with or without sinus appendage; anther wings with a notch along its length; follicles narrowly fusiform, held erect on straight jointed stalks, glabrous (*Bruynsia *sensu Nicholas 1999)*

5a Corona lobe sinus an open longitudinal channel without sinus appendage

brevicuspis (E.Mey.) Schltr.

Perennial, geophytic herb, 150–340 mm long. **Stems** 1–8. **Leaves** spreading, ascending, linear to lanceolate, 15–100 × 0.3–5.5 mm, base cuneate to hastate, apex acuminate; shortly petiolate. **Inflorescences** corymbose umbellate, 6–8-flowered; peduncle 17–67 mm long. **Flowers** 6–15 × 9–17 mm, green to cream-coloured, mauve-tinged.

Corolla spreading and semi-reflexed; lobes ovate, 6.5–10.4 × 2.5–4.6 mm. **Staminal column** 3.8–6.5 mm high, not stipitate. **Corona** with claw-like lobes, 4.5–8.4 mm high, 1.2–2.8 mm wide, upper proximal end blunt and shoulder-like, upper distal end narrowed into a short, erect, dentate tip, upper margin level with style-stigma-head. **Anther**: appendage ovate, incumbent on style-stigma-head. **Flowering time** Dec.? Midland and coastal mesic grassland, alt. 50–1 500 m; Sub-Escarpment Grassland (Clydesdale District).

gibba (E.Mey.) Schltr. var. **gibba**

Perennial, geophytic, decumbent to erect herb, 14–310 mm long. **Stems** 2–10. **Leaves** broadly to narrowly lanceolate, 20–105 × 1–6 mm; petioles 0.3–5.0 mm long. **Inflorescences** corymbose umbellate, 4–10-flowered. **Flowers** green, tinged white and mauve. **Corolla** reflexed; lobes ovate to lanceolate, 11 × 2.5–4.8 mm. **Staminal column** 3.8–6.5 mm high. **Corona**: lobes columnar, 4–6 mm high, 1–2 mm wide, upper proximal end shoulder-like, level with style-stigma-apex, distal end a subulate point curving over and overtopping style-stigma-head. **Anther**: appendage ovate, on conical style-stigma-head. **Flowering time** Nov.–Mar. Highlands, midlands and coastal mesic grassland, alt. 20–2 500 m; Upper Karoo, Drakensberg Grassland, Mesic Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket (Aliwal North to Maclear S, from Molteno to Wodehouse, Nico Malan Pass to Kei River Mouth and from Grahamstown to East London).

5b Corona lobe sinus closed off at top, if open, with a central tongue-like appendage

[E]**compressidens** (N.E.Br.) Nicholas

Perennial, geophytic herb, decumbent to erect, 100–200 mm long. **Stems** 1–6. **Leaves** spreading ascending, linear, sometimes falcate, 15–85 × 2.0–4.5 mm, base cuneate, apex acuminate; secondary veins inconspicuous; petioles 1.5–3.0 mm long. **Inflorescences** corymbose umbellate, 4–9-flowered; peduncle 27–35 mm long. **Flowers** white, tinted purple. **Corolla** spreading ascending; lobes lanceolate to ovate, 10.5–11.8 × 5 mm; margins slightly sinuate. **Staminal column** 3–4 mm high. **Corona**: lobes cucullate columnar, 3.8–4.2 mm high, 1.7–2.0 mm wide, upper proximal ends shoulder-like, well below style-stigma-head, curving up to an erect, distal end at corpuscular level; sinus with a rounded, tongue-like appendage; style-stigma-head truncate or conical. Coastal and midland open grassland, alt. 30–140 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Queenstown to Kei River and East London).

disparilis N.E.Br.

Perennial, geophytic, decumbent herb, 80–200 mm long. **Stems** 1–4. **Leaves** broadly ovate to linear lanceolate, 12–48 × 3–10 mm, base auriculate, apex acute, hastate; petioles 2–3 mm long. **Inflorescences** corymbose umbellate, 5–8-flowered; peduncle 25–50 mm long. **Flowers** greeny mauve or light purple, tinged white. **Corolla** saucer-shaped; lobes ovate to lanceolate, 3–5(8–9) × 2.5–4.0 mm. **Staminal column** ± 4 mm high, not stipitate. **Corona**: lobes saccate-columnar, ± 4 mm high, 3–4 mm wide, upper proximal ends blunt, level with style-stigma-apex, upper margin slightly obliquely truncate, distal end blunt; keel gently curved; sinus covered with a sheet of tissue at distal end. Midlands, mesic open grassland, alt. 750–1 000 m; Sub-Escarpment Grassland (restricted around Clydesdale).

[E]**navicularis** (E.Mey.) Schltr.

Perennial, geophytic, decumbent to erect herb, 105–290 mm long. **Stems** 2–6. **Leaves** spreading-ascending, linear, lanceolate, sometimes falcate, 8–85 × 1–5 mm, base

cuneate, sometimes slightly oblique, apex acuminate, secondary veins inconspicuous; petioles ± 5 mm long. **Inflorescences** corymbose umbellate, 4–8-flowered; peduncle 9–30 mm long. **Flowers** purple, white-tinted or mottled purple. **Corolla** spreading-ascending; lobes lanceolate, 8.2–11.0 × 3.2–4.8 mm. **Staminal column** 3–4 mm high. **Corona**: lobes columnar 3.8–5.2 mm high, 1.0–1.6 mm wide, upper proximal ends blunt, level with style-stigma-head, upper margin ± truncate, distal end blunt; keel straight; sinus sealed with a sheet of tissue. **Flowering time** Nov.–Feb. Coastal region and midland grassland abutting coastal regions, alt. 20–900 m; Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Amatole Mts to King William's Town and Kei River S, from Alexandria to East London).

1f Long, cylindrical tuber producing a solitary unbranched erect stem; plants graminaceous, up to 800 mm high; inflorescences axial and terminal, 4-flowered; flowers stelliferous, erect, yellow; corona lobes slipper-shaped with channel-like central sinus, without a sinus appendage; follicles glabrous, often in pairs
*(*Adomene *sensu Nicholas proposed here)*

aurea (Schltr.) Schltr.

Perennial, geophytic herb, 145–520 mm high. **Stems** 1(–6). **Leaves** often ascending, linear, 6–85 × 0.8–1.5 mm, base cuneate, apex acuminate, almost pungent, margins strongly revolute; apetiolate. **Inflorescences** 4(–8)-flowered; peduncles 44–140 mm long. **Flowers** 4–11 mm wide, yellow or white, tinted purple. **Corolla** spreading reflexed; lobes ovate to lanceolate, 3.0–5.4 × 1.7–2.0 mm, lower surface scabrid. **Staminal column** 2.0–2.5 mm high, not stipitate. **Corona**: lobes cymbiform, 1.6–2.2 mm long, upper proximal appendages dentate, folded towards each other, distal end blunt, proximal end of upper margin level with style-stigma-head, distal end just above it. **Pollinia** hemispherical. **Anther**: appendage ovate, 0.3–0.8 × 0.6–0.9 mm, incumbent on style-stigma-head. Midland, highveld and high altitude mesic grassland: alt. 1 000–2 000 m; Drakensberg Grassland, Sub-Escarpment Grassland (KZN Border to Stutterheim).

1g Long cylindrical or napiform tuber producing an erect or decumbent to erect stem, few or much branched just above base; flowers stelliferous, erect, pinky purple, maroon, in 4–many-flowered umbelliform inflorescences; corona lobes slipper-shaped with channel or sac-like central sinus, with or without sinus appendage; follicles glabrous and often paired
*(*Astrocalymma *sensu Nicholas proposed here)*

cucullata (Schltr.) Schltr.

Perennial, geophytic herb, 170–350 mm high. **Stems** 1–3, ascending. **Leaves** linear to narrowly lanceolate, 7.0–10.5 × 0.3—4.0 mm, base cuneate, apex acuminate; petioles up to 3 mm long. **Inflorescences** 4(–10)-flowered. **Flowers** 7–13 mm wide, mauve or white tinted purple. **Corolla** spreading, apex erect; lobes 6.2–7.6 × 3.0–5.2 mm, lower surface sparsely pilose. **Staminal column** 2.5–5.5 mm high, stipitate. **Corona**: lobes cucullate, 2.5–5.0 mm high, (2.0–)2.5–3.8 mm long, upper proximal appendages short, erect and fin-like, upper distal hooded, blunt or rarely apex bifid; sinus cavity with papillae; upper margin with proximal end below style-stigma-head and distal end level or above it. **Anther**: appendage ovate, 0.6–1.0 × 1.0–1.6 mm, incumbent on style-stigma-head. **Flowering time** Nov.–Apr. Midland grassland, alt. 1 000–2 400 m; Sub-Escarpment Grassland (Mthatha District).

humilis (E.Mey.) Schltr.

Perennial, geophytic herb, 50–250 mm high. **Stems** solitary, erect. **Leaves** erect, 2–5 pairs, broadly oblong, 19–75 × 10–18 mm, base rounded, apex obtuse, midrib

and secondary veins prominent; petioles 2.0–13.5 mm long. **Inflorescences** solitary and terminal, subcorymbose, 4(5)-flowered; peduncle 12–25 mm long. **Flowers** mauve or redish mauve. **Corolla** spreading; lobes oblong-ovate, 7.5–10.5 × 4.5–5.5 mm; one margin ciliate. **Staminal column** ± 3 mm high, stipitate. **Corona** white, tinted purple; lobes slipper-shaped, 6.5–8.5 mm long, proximal end ± 5 mm high, upper proximal appendages shoulder-like, level with style-stigma-head, distal end attenuate, pointed; sinus 2 mm deep. **Anther**: appendage reniform, on style-stigma-head. **Flowering time** Oct.–Jan. Midland and mountain grassland, alt. 1 800–2 900 m; Drakensberg Grassland, Sub-Escarpment Grassland (Rhodes District, Ramatseliso's Gate and Naude's Neck S to Barkly East).

meyeriana (Schltr.) Schltr.

Perennial, geophytic herb, 100–260 mm high; multi-stemmed, ascending-erect. **Leaves** linear, 6.0–7.1 × 0.3–1.5 mm, base cuneate, apex acuminate, margins revolute; petioles up to 2 mm long. **Inflorescences** 4(–7)-flowered. **Flowers** 4.5–8.0 mm wide; mauve or white tinted purple. **Corolla** reflexed; lobes 3.3–5.0 × 2.0–2.8 mm. **Staminal column** 1.5–2.0 mm high, not stipitate. **Corona**: lobes cymbiform, 3.6–4.2 mm long, upper proximal appendages absent, distal end blunt, proximal end of upper margin level with style-stigma-head, distal end above it. **Anther**: appendage ovate, 0.5–1.0 × 0.5–1.0 mm, incumbent on style-stigma-head. **Flowering time** Oct.–Dec. Midland and highveld in arid, sandy, sparsely grassed areas, alt. 800–1 500 m; Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket (Aliwal North, Queenstown, Grahamstown).

oreophila Nicholas

Perennial, geophytic herb, 70–230 mm high. **Stem** 1, erect. **Leaves** linear to lanceolate, 8–82 × 1.2–7.0 mm, base cuneate, apex acuminate; petioles up to 4 mm long. **Inflorescences** 4-flowered. **Flowers** 13–16(–18) mm wide, cream-coloured to lilac, veins purple, pink or burgundy-spotted. **Corolla** spreading, apex erect; lobes 9.2–11.5 × 5–7 mm, lower surface pubescent. **Staminal column** 4–5 mm high, stipitate. **Corona**: lobes brownish purple, 2.0–3.5 mm high, 3.2–4.5 mm long, upper proximal appendages forming 2 dentate appendages, reflexed back into coronal sinus and with 2 erect, laciniate, basal ridges, upper distal end blunt; upper margin level with style-stigma-head. **Anther**: appendage ovate, 1.0–1.3 × 0.6–0.8 mm, incumbent on style-stigma-head. **Flowering time** Nov., Dec. High altitude mountain grassland, alt. 1 700–3 000 m; Drakensberg Grassland (Ramatseliso's Gate, Matatiele).

stellifera Schltr.

Perennial, geophytic herb, 120–290 mm high. **Stems** 1(9–13)-branched, erect. **Leaves** linear, 12–105 × 0.5–2.0 mm, base cuneate, apex acute, margins revolute; petioles up to 3 mm long. **Inflorescences** 4(–8)-flowered. **Flowers** 5–16 mm wide, yellow to mauve or white tinted purple. **Corolla** reflexed; lobes 4.5–7.0 × 3.0–4.2 mm, lower surface pubescent. **Staminal column** 2.5–3.5 mm high, not stipitate. **Corona**: lobes cymbiform, 4.0–7.5 mm long, upper proximal appendages dentate or absent, distal end blunt, proximal end of upper margin level with style-stigma-head and distal end above it. **Anther**: appendage ovate, 0.4–1.0 × 0.6–1.1 mm, incumbent on style-stigma-head. **Flowering time** Oct.–Jan. Midland and highveld mesic grassland, alt. 1 000–2 100 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Mount Fletcher to Ramatseliso's Gate S, Molteno to Port St Johns).

ASPIDOGLOSSUM E.Mey.

Species ± 35, distributed throughout sthn and tropical Afr.; 24 in sthn Afr., mainly along eastern side of subcontinent.

1a Leaves whorled, at least in the inflorescence

dissimile (N.E.Br.) Kupicha

Perennial, geophytic herb, 60–200 mm high. **Stems** simple or sparsely and seldom branched. **Leaves** irregularly and fairly densely arranged below, verticillate in inflorescence; blade 1.8–3.0 × 2–8 mm, linear or linear-lanceolate; both surfaces pilose. **Flowers** 3–5 per node; pedicels 6–12 mm long; corolla lobes 4–5 × 2–3 mm, reflexed and flat or replicate at anthesis, lower surface pilose with stiff, patent, hyaline or fine brown, appressed hairs, upper surface glabrous or densely pubescent; corona 3–4 mm high. **Pollinia** 0.4–0.9 mm long with germination zone conspicuous or not; corpusculum 0.2–0.4 mm long. **Flowering time** Nov., Dec. **Fruit**? Grassland, alt. 2 000–2 225 m; Sub-Escarpment Grassland (Fort Cunynghame and Cathcart area).

grandiflorum (Schltr.) Kupicha

Perennial, geophytic herb, 60–150 mm high. **Stems** unbranched, occasionally 2. **Leaves** opposite, longer than nodes, also in whorls of 3–5 towards apex of stem; blade elliptic to obovate, 18–45 × 4–14 mm, upper surface scabrid-pubescent, lower surface pilose, midrib and veins pubescent. **Inflorescence** 4–7-flowered. **Flowers**: pedicels 8–15 mm long; corolla spreading and replicate; lobes 7.5–9.0 mm long, glabrous inside, appressed-hairy on outside of upper half, jade-green; corona inner surface white, outer surface flushed or maroon-spotted, both processes white, basal lobe with peaked shoulders and erect or slightly inflexed apical process, ventral process erect. **Pollinia** without distinct germination zone, reniform; translator arms flat and robust. **Flowering time** Sept.–Nov. Scattered in grassland, alt. 1 750 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Maclear to Grahamstown and Port Alfred).

heterophyllum E.Mey.

Perennial, geophytic herb, 50–120(–230) mm. **Stems** several-branched and ascending. **Leaves** verticillate, irregularly spaced to opposite, basal half linear, apical half becoming elliptic; blade 10–30 × 0.5–9.0 mm, upper surface pilose or glabrous, lower surface glabrous, midrib pilose. **Inflorescence** 3–7-flowered, pedunculate. **Flowers**: pedicels 4–9 mm long; corolla lobes 2–4 × 1–2 mm, spreading at anthesis, dorsal surface glabrous to moderately pilose, ventral surface glabrous or pubescent, green; corona white, apical process short and broadly triangular to long and slender, ventral appendage erect to slightly inflexed. **Pollinia** pyriform, germination zone inconspicuous; corpusculum 0.1–0.3 mm long. **Flowering time** Aug.–Apr., June. **Fruit** 45–60 mm long, with scattered bristles 0.5–2.5 mm long. Stony or dense grassland, alt. 60–690 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (single collection near Barkly East, Keiskamma W to Cape Peninsula).

ovalifolium (Schltr.) Kupicha

Perennial, geophytic herb, 60–330 mm high. **Stems** unbranched and erect. **Leaves** opposite or whorled; blade 14–35 × 0.5–12.0 mm, variable from acicular to broadly elliptic. **Inflorescences** with 2 or 3 flowers per node. **Flowers** large; pedicels 5–10 mm long; corolla lobes 4–7 mm long, dorsal surface appressed-pilose, hairs hyaline or brownish, ventral surface glabrous or pubescent, hairy or at margins only, green-striped

or plain green or maroon; corona 3–7 mm high, white, marked with pink or maroon, apical process erect, ventral process entire or bifid, much shorter than apical process, inflexed. **Pollinia** 0.4–1.0 mm long, germination zone absent; corpuscle 0.2–0.5 mm long. **Flowering time** Sept.–Feb. **Fruit** 30–40 mm long, bristles appressed, up to 4 mm long, rest of surface crisply pubescent. Grassland, close to water, alt. 30–1 740 m; Dry Highveld Grassland, Sub-Escarpment Savanna (Stormberg Mts S to Komga).

1b Leaves opposite throughout
2a Corona an erect, dorsiventrally compressed basal lobe that is ± quadrate in dorsal view, the shoulders sloping, square or peaked, continuing at apex into a tapering process, ventral face of basal lobe with 2 faint ventral ridges continuing into a ventral process similar to the apical one that is erect, inflexed or reflexed

biflorum E.Mey.

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. **Inflorescence** 1–7-flowered. **Flowers**: pedicels up to 3 mm long; corolla lobes 3.5–5.0 × 1.5–2.0 mm, united for a quarter of their length, cup-shaped to spreading at anthesis, ventrally and dorsally pilose, green or purplish; corona white, yellowish or purplish, apical and ventral processes long and thin and extending beyond corolla. **Pollinia** with inconspicuous germination zone, reniform; corpusculum linear, not flanged. **Flowering time** Sept.–Feb. **Fruit** 60–70 mm long, densely pubescent, without bristles. Grassland or open woodland, alt. 725–1 835 m; Sub-Escarpment Grassland, Albany Thicket (Queenstown, Bathurst and Tsomo).

carinatum (Schltr.) Kupicha

Perennial, geophytic herb, (150–)300–600 mm high. **Stems** simple or rarely branched. **Leaves** opposite, longer or shorter than internodes, blade 10–60 × 0.5–4.0 mm, margins revolute. **Inflorescence** 1–7-flowered. **Flowers**: pedicels up to 3 mm long; corolla lobes 2.0–3.5 × 1.0–1.5 mm, cup-shaped to spreading at anthesis, densely pubescent ventrally and thinly pilose dorsally, dull green; corona brownish, apical process broadly triangular or sometimes absent, ventral process long, thin and overtopping style head, sometimes meeting. **Pollinia** with inconspicuous germination zone, reniform; corpusculum 0.2–0.4 mm long. **Flowering time** Sept.–Mar. **Fruit** 40–60 mm long, pubescent, without bristles. In grassland on coastal sandflats, alt. 6–1 020 m; Drakensberg Grassland, Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Kokstad S to Stutterheim and Kei River Mouth).

fasciculare E.Mey.

Perennial, geophytic herb, 100–340 mm high. **Stems** rarely branched. **Leaves** opposite, lower ones much shorter than internodes, lengthening higher up the stem, longer or shorter than internodes; blade very variable, ovate to lanceolate, 25–54 × 4–6 mm. **Inflorescence** 1–7(usually 3–5)-flowered, pedunculate. **Flowers**: pedicels 10–13 mm long; corolla lobes 2.0–6.5 × 1–2 mm, flat and slightly reflexed, dorsal surface appressed-pilose, ventral surface pubescent throughout, green with mauve venation; corona white flushed mauve, apical process erect or slightly reflexed, ventral process erect or slightly inflexed, processes tooth-like; anther appendages with marginal tufts of cilia or membranous. **Pollinia** with conspicuous germination zone, pyriform; corpusculum 0.2–0.3 mm long, slender. **Flowering time** Sept.–Dec. **Fruit**? Grassland, alt. 765–1 500 m; Drakensberg Grassland, Sub-Escarpment Savanna (Maclear S to Willowvale and Pirie).

[E]uncinatum (N.E.Br.) Kupicha

Perennial, geophytic herb, 90–200 mm high. **Stems** simple or sparsely branched. **Leaves** mostly shorter than internodes, blade 11–34 × 4–18 mm, broadly lanceolate or hastate. **Inflorescence** 1–7-flowered. **Flowers**: pedicels 2–8 mm long; corolla lobes ± 3–4 × 1.5 mm, spreading and replicate at anthesis, dorsal surface with stiff patent hairs in centre, otherwise glabrous, ventral surface glabrous, margins revolute, green; corona 2 mm high, each lobe erect, triangular at apex with ventral appendage slightly longer than subtending lobe, inflexed, once coiled or uncinate at tip. **Pollinia** 0.4–0.6 mm long, inconspicuous germination zone; corpusculum 0.3–0.4 mm long. **Fruit**? In grassland, alt. 1 400–1 560 m; Drakensberg Grassland (Amatole Mts SE to Stutterheim).

virgatum (E.Mey.) Kupicha

Perennial, geophytic herb, 350–800 mm high. **Stems** simple or branched. **Leaves** opposite, longer than internodes and often clustered, blade 25–38 × 0.5–3.0 mm, revolute. **Inflorescence** 4–9-flowered. **Flowers**: pedicels 1–3 mm long; corolla lobes 2.0–2.5 × 1 mm, scarcely expanding at anthesis, dorsal surface pilose, ventral surface minutely pubescent, dark brown; corona red-brown to maroon, ± 1 mm long, apical process of lobe triangular, inner process somewhat larger, apically sometimes bifid, inclined. **Pollinia** 0.4 mm long with distinct germination zone; corpuscle 0.20–0.25 mm long, slender. **Flowering time** Feb. **Fruit**? In grassland, often near water, alt. 300–1 650 m; Drakensberg Grassland, Sub-Escarpment Savanna (Loteni S to Port St Johns, Lusikisiki, Komga and King William's Town).

2b Corona with basic form NOT as in 2a
3a Plants very slender, 0.75 mm or taller, glandular hairs absent (except in A. gracile*); corolla usually hairy on ventral surface, sometimes very long, those at apex usually more stout; corona with dorsiventrally compressed basal lobe that is ± quadrate in dorsal view, the shoulders sloping, square or peaked with a truncate apex; ventral surface with 2 well-developed ridges or wings continuing into an inflexed, dorsal process separated from basal lobe by a distinct transverse ridge or are joined by a longitudinal ridge to lobe apex; pollinia sausage-shaped with distinct germination zone and slender translator arms*

[E]flanaganii (Schltr.) Kupicha

Perennial, geophytic herb, 180–300 mm high. **Stems** branched. **Leaves** opposite, longer than internodes, blade 2–8 × 0.5–6.0 mm, both faces glabrous but midvein pubescent. **Inflorescence** 3–8-flowered. **Flowers**: pedicels 2–3 mm long; corolla lobes ± 5 × 2 mm, strongly replicate, completely glabrous; corona ± 3 mm long, shoulders of basal lobe acute, ventral process erect-inflexed. **Pollinia** 0.6–0.7 mm long with distinct germination zone; corpusculum 0.2–0.3 mm long. **Flowering time** Dec., Jan. **Fruit** 65 mm long, pubescent to glabrous, without bristles. In coastal grassland, alt. 5–30 m; Indian Ocean Coastal Belt, Albany Thicket (known from 2 collections only: Kei River Mouth and Chalumna River near East London).

gracile (E.Mey.) Kupicha

Perennial, geophytic herb, 100–1 000 mm high. **Stems** simple or branched. **Leaves** opposite, longer or shorter than internodes, blade 10–80 × 0.5–3.0 mm, upper surface glabrous or pubescent, lower surface glabrous, midrib pilose. **Inflorescence** 2–13-flowered. **Flowers**: pedicels 2–6 mm long; corolla lobes 2–4 × 1–2 mm, cup-shaped to spreading at anthesis, dorsal surface pilose with brown glandular hairs intermixed with indumentum, ventral surface glabrous, brownish green; corona brownish or flushed purple, lobes with basal section 0.5–1.5 mm long and shoulders square or rounded, inner process erect or inclined, lobes sometimes 3-dentate then middle tooth longest. **Pollinia**

0.3–0.6 mm long with distinct germination zone; corpusculum 0.1–0.5 mm long. **Flowering time** Nov.–Mar., May–July. **Fruit** 40–50 mm long, densely appressed-pubescent without echinate bristles. Grassland or fynbos, habitats variable, alt. 8–1 710 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Queenstown SE to Kentani, from Baviaanskloof to East London).

interruptum (E.Mey.) Bullock

Perennial, geophytic herb, 500–1 500 mm high. **Stems** branched in the inflorescence. **Leaves** opposite, longer or shorter than internodes, blade 20–75 × 0.5–2.0 mm, upper leaf surface appressed-pubescent or glabrous, lower surface glabrous, midrib pilose. **Inflorescence** 6–12-flowered. **Flowers**: pedicels 2–10 mm long; corolla spreading at anthesis, dull purplish red outside, cream-coloured or yellowish inside, lobes 2–3 mm long, dorsal surface pilose, ventral surface pubescent, long-pilose around periphery and at tip; corona whitish with purple streaks, basal lobe 0.7–1.0 mm high with scale-like, 3-toothed apex (central tooth longest) and faint dorsal horizontal ridge, ventral process erect, short to long. **Pollinia** 0.3–0.5 mm long, germination zone distinct; corpuscle 0.1–0.3 mm long. **Flowering time** Oct.–Feb. **Fruit** 50–60 mm long, densely pubescent. Grassland and open woodland, alt. 5–2 560 m; Sub-Escarpment Grassland (Witteberg Mts SE to Engcobo).

woodii (Schltr.) Kupicha

Perennial, geophytic herb, 550–1 400 mm high. **Stems** sparsely branched. **Leaves** opposite, longer or shorter than internodes, blade 40–100 × 1–2 mm, glabrous. **Inflorescence** 1–7-flowered. **Flowers**: pedicels 1–5 mm long; corolla lobes 3–4 × 1–2 mm, replicate with apex curved inwards, brownish red to green, dorsal surface pilose with long hyaline hairs; ventral surface glabrous in centre, margins pilose with distinctly longer hairs at tip; corona yellowish, ventral process variable in shape, inflexed and folded laterally with lobed marginal wings. **Pollinia** 0.50–0.63 mm long, germination zone inconspicuous; corpusculum 0.2–0.3 mm long. **Flowering time** Oct.–Feb., May. **Fruit** 40–45 mm long, narrowly fusiform, apically elongated into a long beak, pubescent, without bristles. In grassland, alt. 60–1 800 m; Sub-Escarpment Savanna (Clydesdale and Transkei enclave).

3b Plants usually < 750 mm long, glandular hairs present; corolla usually glabrous on ventral surface; corona of various forms (not as 2a or 3a); pollinia with various forms, often without a distinct germination zone and translator arms slender and flattened

glabrescens (Schltr.) Kupicha

Perennial, geophytic herb, 350–600 m high. **Stems** erect, rarely branched. **Leaves** opposite, longer or shorter than internodes, blade 15–35 × 0.5–1.0 mm, both sides glabrous, sometimes lower midrib puberulous. **Inflorescence** with 2–7 flowers. **Flowers**: pedicels up to 4–8 mm long; corolla lobes 2.0–4.5 × 1–2 mm, cup-shaped to spreading at anthesis, dorsal surface sparsely pilose with brown glandular hairs, ventral surface densely and uniformly pubescent or long-pilose; corona white or dull yellow, erect basal lobe bifid, ventral process erect or inflexed. **Pollinia** very variable with or without conspicuous germination zone; corpusculum 0.1–0.5 mm long; translator arms flattened, ribbon-like. **Flowering time** Oct.–Mar. **Fruit** 60–75 mm long, pubescent without bristles. In rocky grassland, alt. 1 200–2 100 m; Drakensberg Grassland (Elliot and Maclear Districts).

lamellatum (Schltr.) Kupicha
Perennial, geophytic herb, 150–550 mm high. **Stems** unbranched. **Leaves** opposite, shorter than internodes, blade 15–45 × 0.5–8.0 mm, upper surface glabrescent or pilose with brown glandular hairs, lower surface glabrous, midrib pilose. **Inflorescence** 3–6-flowered, terminal or axillary. **Flowers**: pedicels 2–4 mm long; corolla erect, slightly replicate at anthesis, dorsal surface sparsely pilose with hyaline or brownish hairs, ventral greenish to pale yellow, purple-marked inside, buff-coloured outside, surface glabrous or pubescence at base; corona white, 2–3 mm high, lobes simple, scales flat, ± diamond-shaped in dorsal view, ventral surface with 2 inconspicuously longitudinal flaps folded towards centre or appendage ovate-acuminate inflexed triangular. **Pollinia** 0.3–0.5 mm long, germination zone inconspicuous, translators not flattened; corpusculum 0.3–0.4 mm long. **Flowering time** Sept.–Jan. **Fruit** 45–70 mm long, puberulent without bristles. Open grassland, alt. to 1 700 m; Drakensberg Grassland (Indwe).

ASPIDONEPSIS Nicholas & Goyder

Species 5, confined to high altitude mountain grassland of sthn Afr., M, KZN, EC.

Flowers yellow; corona saccate, sinus with a ligulate (tongue-like) appendage; anther appendages reniform (subgenus Aspidonepsis*)*

cognata (N.E.Br.) Nicholas & Goyder
Perennial, geophytic herb, 180–550 mm high. **Stems** solitary, erect. **Leaves** spreading, linear, 11–68 × 0.7–4.0 mm, base cuneate, apex acuminate. **Inflorescences** corymbose umbellate, 1 or 2 per plant, 1–7-flowered; peduncle 3–75 mm long. **Flowers** dull greenish or mustard-yellow. **Corolla** spreading, rotate, 7.6–10.5 × 2.6–5.8 mm. **Staminal column** 1.5–2.6 mm high, stipitate. **Corona**: lobes bonnet-shaped, 3.0–4.8 mm high, 1.3–2.5 mm wide, upper proximal edges extended, subulate appendages projecting over style-stigma-head, upper margin ascending to a flat, spade-like upper distal end greatly overtopping style-stigma-head, keel curving down, lobes supported on thickened basal rim; sinus with tongue-like appendage projecting out by 0.8–1.3 mm. **Anther**: appendage transversely elliptic with cleft apex. High altitude grassland, near damp situations, alt. 1 200–2 100 m; Sub-Escarpment Grassland (three mountain islands: Nsikeni, Insizwa and Ngeli).

diploglossa (Turcz.) Nicholas & Goyder
Perennial, geophytic herb, 170–400 mm high. **Stems** solitary, erect. **Leaves** spreading, narrowly lanceolate, 5–84 × 0.5–7.0 mm, base cuneate, apex acuminate. **Inflorescences** corymbose umbellate, 1–3 per plant, 4–26-flowered; peduncles up to 9.5 mm long. **Flowers** bright yellow, 4–9 mm high, 6–13 mm wide. **Corolla** spreading, rotate, 4–6 × 2.4–4.0 mm. **Staminal column** 2.0–2.8 mm high, stipitate. **Corona**: lobes cup-shaped, 4–6 × 2.4–4.0 mm, upper proximal edges shoulder-like level with style-stigma-head, upper margin ± truncate, upper distal end round; sinus with tongue-like appendage projecting out by 0.2–0.7 mm. **Anther**: appendages apically deeply cleft. **Flowering time** Dec.? High altitude or midland mountain island grassland, alt. 600–2 400 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Ramatseliso's Gate S, Hogsback to Grahamstown).

flava (N.E.Br.) Nicholas & Goyder
Perennial, geophytic herb, 180–475 mm high. **Stems** solitary. **Leaves** spreading-erect, lanceolate to linear, 7–83 × 0.5–6.0 mm. **Inflorescences** corymbose umbellate, 1–3;

4–18-flowered; peduncles 10–175 mm long. **Flowers** pale or butter-yellow, 3–5 mm high, 5–8 mm wide. **Corolla** spreading rotate, 3.5–5.0 × 2.0–3.2 mm. **Staminal column** 1.0–1.5 mm high, stipitate. Corona: lobes boxing-glove-shaped, upper proximal edges extended into 2 arm-like appendages folding over and reflexed, ± level with style-stigma-head, upper margin curving up into a bowl-like distal end, overtopping style-stigma-head; sinus with curved tongue-like appendage projecting out by 0.4–0.7 mm. **Anther**: appendages reniform. **Flowering time** Oct.–Jan. High altitude or midland mountain grassland, alt. 600–2 000 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (Mount Currie to Baziya S, outliers near Grahamstown).

Flowers chocolate-coloured; corona claw-like, sinus without an appendage (subgenus Unguilobium*)*

reenensis (N.E.Br.) Nicholas & Goyder

Perennial, geophytic herb, 240–520 mm high. **Stems** solitary, erect. **Leaves** ascending, linear, 10–56 × 0.7–2.5 mm, base cuneate, apex acuminate. **Inflorescences** corymbose umbellate, 1–3 per plant, 4–8-flowered; peduncles 12–65 mm long. **Flowers** with white or light yellow markings, 5–7 mm high, 7–11 mm wide. **Corolla** reflexed, 5.5–6.5 × 2.5–3.8 mm. **Staminal column** ± 3 mm high, stipitate. **Corona**: lobes cucullate, upper proximal edges extended into 2 blunt or frilly appendages, projecting onto rim of style-stigma-head, upper margin curving down to proximal end produced into a small, curved or inflexed appendage situated well below style-stigma-head. **Anther** ovate to rectangular, sometimes cleft apically, 0.8–1.0 × 1.0–1.3 mm. **Flowering time** Oct.–Jan. High altitude mountain grassland, alt. 1 500–2 100 m; Drakensberg Grassland (restricted to Drakensberg around Ramatseliso's Gate).

ASTEPHANUS R.Br.

Species ± 30, Africa and America; 2 in sthn Afr., WC, EC.

This genus has a chequered taxonomic history. Generally now considered to be an African endemic. N.E. Brown (1907) details 3 species. This was reduced to 2 by Bullock (1963) and Bruyns (2003).

triflorus (L.f.) Schult.

(= *Astephanus marginata* Decne., *Astephanus neglectus* Schltr., *Astephanus pauciflorus* E.Mey.)

Perennial, much-branched, herbaceous, scrambling or twining climber; with clear sap. **Stems** 0.5–3.0 m long. **Leaves** spreading, subcoriaceous, lanceolate to linear-oblong 8.5–31.0 × 2–10 mm, base rounded or truncate to subcordate/subhastate, apex acute or acuminate and notably terminally apiculate, margins thickened or slightly revolute; petioles 1.5–5.2 mm long. **Inflorescences** in pseudo-umbels, 2–5(–9)-flowered; peduncle 2–12 mm long, often ± pendulous; pedicels 2.0–4.2 mm long. **Sepals** lanceolate, apex acuminate, 2–3 mm long. **Corolla** tubular-campanulate; tube 1.0–2.5 × 2 mm; lobes 2.0–2.5 × 1.0–1.5 mm, spreading to spreading-erect, oblong, twisted near apex; corolla purplish red with lobe margins cream-coloured. **Staminal column** 2.0–2.5 mm tall. **Staminal corona** absent (reduced to a small thickening). **Anthers** erect and apically appressed against conical style-stigma-head which extends beyond anthers by 2.5–3.0 mm, apically obtuse or minutely bifid. **Pseudostipe** absent or minute. Coastal thicket, alt. 5–150 m; Eastern Fynbos-Renosterveld (common in WC, on EC border).

The key compiled by N.E. Brown (1907) uses tenuous diagnostics to separate the 3 species of *Astephanus*. Following Bruyns (2003), it is evident that this species is made up of a number of metapopulations, some of which may be moving towards genetic isolation and which have some unique genetic traits.

zeyheri Turcz.

Perennial, much-branched, herbaceous scrambling or twining climber, sap clear; 0.15–3.00 m long. **Leaves** spreading, subcoriaceous, linear-lanceolate to elliptic, 5–20× 2.0–16.8 mm, base cuneate to subcordate, apex acute to obtuse, margins thickened or slightly revolute; petioles 1.5–2.5 mm long or subsessile. **Inflorescences** in pseudo-umbels, 2–5-flowered; peduncle subsessile or 2–12 mm long, often somewhat pendulous; pedicels 2–12 mm long. **Sepals** lanceolate, apex acute to almost obtuse, 2–3 mm long. **Corolla** tubular-campanulate; tube ± 4.5–5.0 × 3 mm, 5 hairy patches inside at base pointing downwards (and sometimes alternating with sepals); lobes 2.0–2.5 × 1.0–1.5 mm, spreading-erect, oblong, apex obtuse, twisted near apex, red to purple-red to white, edges of lobes cream-coloured. **Staminal column** 1.6–2.0 mm high. **Staminal corona** absent (reduced to a small thickening on anther backs). **Anthers** erect and apically appressed against conical style-stigma-head, extended beyond anthers by 2.5–3.0 mm, apically obtuse. **Pseudostipe** long. Coastal thicket on stabilized dune systems, alt. 5–150 m; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp District to East London).

BRACHYSTELMA R.Br.

Species over 100, Africa, India to Australia; ± 80 in sthn Afr., widespread, but rarely common.

Inclusion of *Tenaris* and *Macropetalum* in *Brachystelma* inferred from noncoding nuclear and chloroplast DNA sequences (Meve & Liede 2001). The separation of *Brachystelma* from *Ceropegia* has always been controversial (the two seeming to grade at times). Unpublished DNA evidence suggest that these genera may eventually have to be lumped together with *Ceropegia* taking priority. Please note the groups below are artificial and are used as an identification aid only.

Group 1. Root stock a horizontally depressed tuber; stems ± erect (but not graminaceous), spreading well above the ground or decumbent (never trailing along the ground or procumbent – possibly except for B. caffrum*); tips of corolla-lobes free; inflorescences not of raceme-like panicles*

[E]**caffrum** (Schltr.) N.E.Br.

Small, perennial geophyte. **Stems** several to many, spreading and rarely shortly procumbent, (20–)50–100 mm long (sometimes more in cultivation). **Leaves** vary but often ovate-lanceolate, up to 15 mm long, margins sometimes wavy and ciliolate. **Flowers** 1(2); pedicel slender, 15–30 mm long. **Corolla** rotate, 7.5–12.5 mm in diam.; lobes canary yellow, 3–5 mm long, ovate basally, apex cuspidate. **Corona** small; interstaminal corona lobes fleshy, contiguous, forming circular truncated ring that does not exceed the gynostegial head; staminal corona lobes linear, inflexed on backs of anthers and fused basally to the interstaminal coronas. **Flowering time** Sept.–Jan. **Follicles** erect, divergent, narrowly fusiform (almost cylindrical), smooth, ± 40 mm long. Among flat rocks in grasslands, alt. 300–1 600 m; Drakensberg Grassland, Sub-Escarpment Savanna (near Nqadu in Transkei, Stutterheim to King William's Town).

[E]**campanulatum** N.E.Br.

Dwarf, perennial geophyte. **Stems** 1 or 2 usually unbranched stems, 20–50 mm high, ± erect, produced from apically depressed tuber. **Leaves** elliptic, ovate or obovate,

15–35 × 10–15 mm, puberulous; petioles 10 mm long. **Flowers** solitary, nodding; pedicel ± 5 mm long. Corolla campanulate, 10 mm in diam., outside greenish, inside horizontally purple to purple-brown-striped at base around gynostegium, stripes becoming vertical thereafter with papilla-like hairs; tube ± 10 mm long; lobes 4–5 mm long, ovate but apically acute and spreading slightly. **Corona** small; interstaminal corona lobes fleshy, fused at base into 5 short pockets produced into an erect, dentate-like tooth on each outer margin; staminal corona lobes fleshy linear, ligulate, incumbent on anther backs, fused laterally at base to interstaminal corona. **Flowering time** Jan.? **Follicles** erect, subfusiform and slightly curved, smooth, ± 80 mm long. Sparse grassland, alt. 400–700 m; Albany Thicket (probably restricted to Bathurst area).

[E]**cathcartense** R.A.Dyer

Dwarf, perennial geophyte. **Stems** 1–several, sparsely branched from near base, 50–70 mm high (more in cultivation), ± erect, produced from apically depressed tuber. **Leaves**: lower ones lanceolate, shorter (± 10 mm long), almost sessile; upper ones linear-lanceolate, longer (± 25 mm long), scabrid, margins slightly folded upwards. **Flowers** 1 or 2; pedicel ± 8 mm long. **Corolla** rotate, fused halfway, tube ± 10 mm deep, widening at mouth; lobes spreading, triangular (11–)13 mm long, margins and tip slightly curved downward; 10-ribbed. **Gynostegial column** shortly stipitate. **Corona**: interstaminal lobes fleshy, quadrate (± 0.5 mm tall) and broadly bifid with apex prominent (1.0–1.5 mm tall); staminal corona lobes narrowly ligulate, 2.5–3.0 mm long, incumbent on stamen, connivent over style head and dilated at apex, base with 2 small, lateral, lobular bumps. **Flowering time** Nov.–Jan. **Follicles** erect, subfusiform and slightly curved, smooth, ± 80 mm long. Grassland, alt. 1 200–1 400 m; Sub-Escarpment Savanna (restricted to Cathcart area).

[E]**decipiens** N.E.Br.

Small, perennial geophyte. **Stems** 1–several, erect, 50–100 mm high; densely covered in spreading or deflexed hairs. **Leaves** linear to linear-lanceolate, 25 × 2.0–4.2 mm, attenuating into short petioles, margins folded upward; lower surface harshly puberulous, glabrous above, margins ciliate. **Flowers** 1–4, extra axillary; pedicel 4–5 mm long. **Corolla**: petals fused into small campanulate tube ± 3 mm long; lobes rotate, spreading, linear-lanceolate, attenuate towards apex. **Gynostegial column** compressed and discoid. **Corona**: interstaminal corona lobes fused into 5 deeply cleft pockets that are contiguous to staminal corona lobes; inner circumgynostegial trough filled with hairs. **Flowering time** Nov., Dec., May. Humus-covered Witteberge quartzite, alt. 20–700 m; Eastern Fynbos-Renosterveld, Albany Thicket (Uitenhage and Port Elizabeth to Grahamstown). Possibly conspecific with *B. tuberosum*.

[E]**delicatum** R.A.Dyer

Dwarf, dainty, perennial geophyte. **Stems** 1 or 2(3), unbranched, 20–60 mm high, nodes slightly zig-zag, produced from a subglobose tuber. **Leaves** linear-elliptic to linear-lanceolate, 25 × 2–7 mm, fleshy, almost sessile. **Flowers** 1–7, in extra axillary fascicles nodding; pedicel up to 5 mm long. **Corolla** small, campanulate; tube 1.00–1.25 mm long, mouth small (± 1.25 mm in diam.), but with prominent sinuses; lobes spreading, oblong-ovate, 2–3 × 1.0–1.5 mm, white at base, apex thickened, green or brown. **Corona** small, lime-green; interstaminal corona lobes fused at base into a shallow, ± 1 mm deep, circumgynostegial saucer shallowly v-shaped, cleft at pockets; staminal corona lobes erect, ligulate-triangular, fused at base to interstaminal corona, incumbent on stamen

but not connivent. **Anther appendages** large, ligulate and dilated apically to meet in top of style apex. Rocky outcrops in grasslands, alt. 300–700 m; Albany Thicket (restricted to Trappes and Coombes valleys near Grahamstown).

[E]**huttonii** (Harv.) N.E.Br.

Dwarf, perennial geophyte, with shaggy appearance. **Stem** 1, erect, slightly zig-zag, sparingly branched, 80–120 mm high, red-tinged, minutely pubescent; produced from depressed tubers. **Leaves** linear to linear-filiform, 15–25 × 1–3 mm, narrowing into sessile base, margins ± revolute, apex sometimes reflexed. **Flowers** 1–10, opposite or terminally arranged; pedicel ± 10 mm long. **Corolla** rotate, united at base into a shallow tube 1 mm deep (enclosing gynostegial column), yellow to maroon; lobes lanceolate, ± 3 mm long, margins reflexed. **Corona** yellow; interstaminal corona lobes fused into a tube overtopping the inner column, upper outer edges produced into erect tubular teeth, with 10 of these appendages arranged along rim; staminal corona lobes fused to base of corona tube, narrowly ligulate to subulate, apex pointed, incumbent on backs of anthers, marked green and white. Karroid scrub, alt. 300–1 200 m; Albany Thicket (N of Grahamstown in Fish River Catchment).

[E]**luteum** Peckover

Small, perennial geophyte. **Stems** solitary, soon branching several times, 50–70 mm high, erect, produced from discoid tuber. **Leaves** spreading, linear, 12–16 × 2–6 mm, sessile. **Flowers** 2 or 3; pedicels 4–5 mm long. **Corolla** fused at very base, crateriform (bowl-shaped), ± 0.5 mm deep; lobes spreading-erect, narrowly ovate, with margins revolute, ± 5 × 0.7 mm, greenish yellow. **Corona** coronate, yellow; interstaminal corona lobes fused at base but apically produced into 2 widely separated, erect, fleshy, recurved, dentate appendages; staminal corona lobes linear, incumbent on backs of anthers. **Flowering time** Nov.? Sandy loam soils, on ridge, alt. 400–700 m; Sub-Escarpment Savanna (Salem Area).

[E]**meyerianum** Schltr.

Dwarf, perennial geophyte. **Stems** 1 or 2, spreading-erect, 30–150 mm high; produced from depressed tuber. **Leaves** linear-lanceolate to elliptic, 30 × 2–6 mm, narrowing into short 1.5–2.5 mm petioles. **Flowers** 1–4 in umbelliform groups, produced at upper nodes; pedicels up to 5 mm long. **Corolla** campanulate; fused halfway into a tube 6–7 mm long, outside hairless, tube throat long-hairy inside; lobes spreading, lanceolate, margins revolute, ± 6 mm long, ciliate (long white hairs), pinkish to greyish green or nearly white. **Corona**: interstaminal corona lobes fused at base into a ± 1.5 mm deep cupulate tube, margins with 5 narrow, v-shaped slits opposite the gynostegial groove and with long hairs on outside below these slits (hairs also in circumgynostegial trough); staminal corona lobes fused to interstaminal at base, extended over and connivent over style head. **Flowering time** Oct., Dec. Rare, grassy areas or sand-filled crevices on flat-topped sandstone, alt. 1 100–1 600 m; Drakensberg Grassland, Sub-Escarpment Savanna (Katberg to Komga Mtn Chain).

[E]**micranthum** E.Mey.

Dwarf, perennial geophyte. **Stems** in tufts from depressed tuber, 50–70 mm high. **Leaves** linear-lanceolate to elliptic, 10–12 × 10 mm, tapering into short 4–6 mm petioles. **Flowers** 1(2) at nodes; pedicels 4–6 mm long. **Corolla** very small; lobes spreading, ovate-lanceolate, ± 2 mm long (slightly longer than sepals). **Corona** projecting above corolla. **Follicle** (immature) linear-fusiform, ± 30–70 × 3.5 mm, glabrous; stalk 8 mm

long. Habitat?, alt. ± 1 200 m; Sub-Escarpment Grassland (Queenstown District).
Type apparently with one flower only, most of which had been destroyed by insects (Brown 1908). Species poorly known and understood, possibly extinct?

[E]**minimum** R.A.Dyer

Dwarf, perennial geophyte. **Stems** 2 or 3, erect, 30–60 mm high; produced from depressed tuber. **Leaves** linear, 10–12 × 1.25 mm, narrowing into short 1.5–2.5 mm petioles. **Flowers** solitary, produced at upper nodes; pedicels very slender, ± 12 mm long. **Corolla** divided for $^{1}/_{2}$–$^{2}/_{3;}$ tube ± 1.25 mm deep, white at base, lobes broadly triangular, ± 1.5 × 1.5 mm, recurved to meet pedicel (exposing gynostegial column), purple-maroon with many white hairs along margins. **Corona**: interstaminal corona lobes fused to form a thin wall around staminal column, slightly taller than staminal column, upper margin emarginate or obtusely bilobed, pale yellow, mottled maroon; staminal corona lobes fused distally to interstaminal coronal curtain, pressed to anther bases proximally so partitioning the circumgynostegial trough into 5 hair-filled pockets; maroon to black. **Flowering time** May? Rare, SE-facing ridge amongst sandstone rocks, alt. 300–600 m; Albany Thicket (S of Salem, lip of the Bushman's River Valley).

[E]**montanum** R.A.Dyer

Dwarf, perennial geophyte. **Stems** 1–4, erect, branched, 30–50 mm high; produced from a subglobose-depressed tuber with 1 or 2 underground stems up to 50 mm long. **Leaves** oblong to linear-oblong, 15–25 × 2–4 mm, tapering to base, lower leaves larger than upper ones. **Flowers** (1)2, produced at upper nodes, subcorymbosely arranged; pedicels 10–35 mm long, very slender. **Corolla** 15 × 4.5 mm, tube campanulate-cylindrical; lobes ovate-lanceolate at base tapering into a ± 10 mm long, linear apex, margins revolute, ciliate with long hairs below middle. **Corona**: interstaminal corona lobes fused to form a ± 2 mm tall wall around staminal column, upper margin with a v-shaped cleft; staminal corona lobes linear, fused to interstaminal lobe curtain, incumbent on anther, these lobes partitioning the circumgynostegial trough into 5 pockets. **Flowering time** Dec.? Rare, habitat?, alt. ± 2 000 m; Sub-Escarpment Grassland (Wodehouse District, Andriesberg).

pygmaeum (Schltr.) N.E.Br. subsp. **pygmaeum**

Small, perennial geophyte. **Stems** (1–)3–many, erect, 40–80 mm high; tuber subglobose, depressed, up to 100 mm in diam. **Leaves** ovate to oblong-elliptic, 10–50 × 1.5–15 mm, tapering to subsessile base. **Flowers** in 1–3 clusters at middle nodes; pedicels 3–8 mm long. **Corolla** cage-like, fused in lower $^{1}/_{3}$ into a shallow cup 0.75–1.50 mm deep; lobes linear-lanceolate, 5–6 × 2 mm, margins strongly revolute, sharp apex connivent above gynostegial column, apex sometimes separate; yellow-green to purple-brown. **Gynostegial column** stipitate, ± 0.75 mm long. **Corona**: interstaminal corona lobes fused to form a continuous wall with 5 pockets around staminal column, upper margin entire, emarginate, minutely bilobed; staminal corona lobes fused to inner interstaminal wall, dorso-ventrally flattened, linear-oblong (ligulate), incumbent on backs of anthers but not exceeding them, apex obtuse or notched. **Flowering time** early spring. **Follicles** erect, subfusiform, 50–60 × 4–5 mm. Rocky habitats or burned grassland, alt. 800–1 600 m; Drakensberg Grassland (Cathcart, Windvoëlberg).

[E]**schoenlandianum** Schltr.

Dwarf, perennial geophyte. **Stems** solitary, branched, erect, ± 50 mm high, pilose, produced from small tuber. **Leaves** ± lanceolate, up to 50 mm long, tapered basally into

short petioles. **Flowers** 2–4 clustered at nodes; pedicels 3 mm long. **Corolla** fused, campanulate, 3 × 2 mm at mouth, hairs absent; lobes lanceolate, ± 2 mm long. **Corona**: interstaminal corona lobes fused basally into a cup-like tube, bifid apically; staminal corona lobes linear, incumbent on backs of anthers. Habitat?, alt. ± 150 m; Albany Thicket (Uitenhage).
Type specimen destroyed at Berlin Herbarium during World War II ; not been collected since, may be extinct; only known from Schlechter's description.

[E]**tabularium** R.A.Dyer

Small, perennial geophyte. **Stems** 2- or 3-branched from base, erect, ± 200 mm long, slender with internodes 25–70 mm long, produced from a tuber. Leaves oblong, 10 × 5 mm, margins slightly undulate; petioles short. **Flowers** 1 or 2 (sometimes more) clustered at nodes, almost sessile. **Corolla** rotate, incised to base, lobes narrowly linear, base ± 1.25 mm wide, middle ± 12.5 mm wide, apex inflexed. **Gynostegium** marginally stipitate. **Corona**: interstaminal corona lobes scale-like, ± 1 mm high, deeply bilobulate, just exceeding the style-stigma-head; staminal corona lobes linear-ligulate, incumbent on backs of anthers, almost connivent. Habitat?, alt. ± 100 m; Eastern Fynbos-Renosterveld, Albany Thicket (near Redhouse, Port Elizabeth area).
Known only from the type specimen.

tuberosum (Meerb.) R.Br. ex Sims

Small, perennial geophyte. **Stems** 1(–3), erect, 75–100 mm high, produced from a discoid tuber. **Leaves** linear, linear-lanceolate, ovate to oblong, 3–20 × 12–54 mm, folded upwards, hairy below. **Flowers** 2–4, clustered at nodes; pedicels 4–6 mm long. **Corolla** campanulate; tube 4–5 mm long, yellow with transverse purple-brown markings inside, green-speckled with purple-brown outside; lobes spreading, triangular-ovate, 6–7 mm long, margins revolute, dark purple-brown with long vibratile hairs on margins near base. **Corona**: interstaminal corona lobes fused at base to each other and staminal lobes, deeply cleft in middle; staminal corona lobes triangular, 6 mm tall, apical points connivent over style-stigma-head, forming nectar pockets in between each other. Habitat?, alt. 20–300 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket [Transkei, Transkei Wild Coast, East London (probably once at Knysna)].

Group 2. Differs from group 1 by producing stems that are trailing or procumbent/decumbent; otherwise the same as group 1 in having a horizontally depressed tuber; apex of corolla lobes free; inflorescences not of raceme-like panicles

australe R.A.Dyer

Small, perennial geophyte, top of tuber often exposed. **Stems** few to several, usually spreading, 34–96 mm long. **Leaves** somewhat humifuse, elliptic to lanceolate, 10–20 × 3–8 mm. **Flowers** solitary at nodes; pedicel slender, 7–10 mm long. **Corolla** cupulate, 20 mm in diam., zebra-striped (yellow marked purple), blotched or markings sometimes almost absent; fused in basal $^1/_3$ into a shallow 2–3 mm deep tube; lobes spreading, attenuate apically. **Corona** hidden inside corolla tube, small; interstaminal corona lobes adnate to staminal corona lobes, alternating with pockets, fleshy triangular with narrow elongated apical appendages decumbent on back of anther; staminal corona lobes fused into thin wall around gynostegial column, forming 5 pocketed clefts. In clusters of humus amongst sandstone, alt. 50–600 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Pondoland Coast and a bit further inland).
B. australe quite variable, forming a species complex with *B. modestum* and *B. coddii*, a metaspecies needing further investigation.

[E]**kerzneri** Peckover

Small, perennial geophyte. **Stems** solitary, decumbent, 50–150 mm high; tuber discoid. **Leaves** somewhat humifuse, obovate to elliptic, 20–60 × 10–30 mm; petioles 5–7 mm long. **Flowers** solitary at nodes (after abortion of second one); pedicel 5–8 mm long. **Corolla** campanulate; tube ± 4–6 mm, enclosing gynostegial column, greenish yellow with subcircular or spotted maroon marks; lobes ± 7 mm long, ovate-triangular, yellowish green with basal spots and 3 maroon-spotted longitudinal lines; upper surface with reddish hairs. **Corona**: interstaminal corona lobes reduced, basal pockets not produced; staminal corona lobes of trapezoid, erect scales with maroon-black, shortly dentate appendages, tipped with white hairs, lying on top of staminal column (not at back of anthers), basally fused to corolla, forming nectar pockets. **Follicles** paired, erect, narrowly fusiform, 120 × 7 mm. Tufted grassland, alt. ± 50 m; Indian Ocean Coastal Belt (known from Mtamvuna River Mouth only).

Close to *B. campanulatum*, differing by internodes ± 15 mm long in *B. kerzneri* and ± 5 mm in *B. campanulatum*.

molaventi Peckover & A.E.van Wyk

Dwarf, perennial geophyte. **Stems** several, decumbent, branched; tuber 30–150 mm long, shortly pilose. **Leaves** somewhat humifuse, lanceolate, base cordate, 3–8 × 2–5 mm; petioles 1–2 mm long. **Flowers** solitary, lateral at nodes; pedicels up to 35 mm long. **Corolla** fused at base into a small campanulate tube ± 4 mm deep; externally brownish green, internally with short purplish hairs; gynostegial column just exposed; lobes linear (wiry), 12 × 1 mm, brownish green with very short purple hairs. **Corona**: interstaminal corona lobes fused at base into a circumstaminal tube, upper edges produced into two ± 0.5 mm long apical lobules; staminal corona lobes linear, fused at base to interstaminal curtain, forming 5 nectar pockets, appendages not reaching top of gynostegial column, yellowish to purple-brown. **Flowering time** Nov.? **Follicles** paired, erect, narrowly fusiform, 20–30 × 3 mm. Grassland on mountain massives experiencing high rain, frequent cold and mist, alt. 1 300–1 350 m; Sub-Escarpment Grassland (uMzimkhulu District, Nsikeni Mountain near summit).

Group 3. Differs from groups 1 and 2 by having the apex of the corolla lobes fused into a cage above the corolla mouth; otherwise the same as group 1 and 2 in having a horizontally depressed tuber; stems ± erect (but not graminaceous), spreading well above the ground or decumbent (never trailing along the ground or procumbent – exception maybe B. caffrum*); inflorescences not of raceme-like panicles*

barberae Harv. ex Hook.f.

Platvoetaasblom (A)

Small, perennial geophyte. **Stems** 1–3, erect, 60–100 mm high; tuber quite large, discoid. **Leaves** spreading-erect, clustered, oblanceolate to oblong, 25–100 × 8–25 mm, margins wavy, covered in course hairs; petioles short. **Inflorescences** 2, opposite, sessile, forming a terminal, globose, 25-flowered cluster. **Flowers** sometimes appearing before leaves, scent powerful, evil-smelling; pedicels 10–20 mm long. **Corolla** cage-like, fused at base into shallow tube, ± 5 mm deep, yellowish, crimson-banded; lobes linear, 20–45 mm long, margins replicate, apex connivent, forming a cage over gynostegial column, outside green, inside maroon-crimson, mouth and sinuses purple-hairy. **Corona**: interstaminal corona lobes fused into cup-like rim, ± 1 mm high, surrounding staminal column, with five ± 0.5 mm deep clefts opposite anthers, leading into the inner pockets; staminal corona lobes linear, ± 1 mm long, basally fused to interstaminal coronal rim,

incumbent on anther back but not exceeding the stigma-style apex. **Follicles** erect, divergent, narrowly fusiform, smooth, ± 40 mm long. Grassland, alt. 400–1 300 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Transkei).

circinatum E.Mey.

Wilde aartappel (A)

Perennial geophyte. **Stems** 1–3, erect, branching in upper part only, 70–300 mm high, internodes long, densely covered by short curved hairs; tuber discoid. **Leaves** spreading-erect, linear to ovate, 5–15 × 1–7 mm. **Flowers** usually 2; pedicel 2–5 mm long. **Corolla** cylindrically beaked in bud; lobes erect, linear to filiform, slightly inflated, 5–25 × 1.0–1.5 mm, apically united into a cage surrounding gynostegial column; glabrous outside, sparsely hairy inside; white to maroon. **Corona**: interstaminal corona lobes erect, fleshy, fused at base into a shallow tube, deeply divided, both outer edges extended into 2 linear or tooth-like, erect appendages ± exceeding style head; staminal corona lobes narrowly ligulate or strap-like, fused at base, free above, 0.4–0.6 mm long, incumbent on anthers. **Flowering time** Sept.–Jan. **Follicles** erect, narrowly fusiform, 60–90 × 3–4 mm, surface smooth, apex pointed. Grassland, small pans and depressions on sloping dolerite slabs, alt. 500–1 600 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Cathcart to Transkei S, Graaff-Reinet to Cradock, and to Willowmore, Kommadagga and Grahamstown).

A widespread and complex polymorphic metaspecies.

[E]**elongatum** (Schltr.) N.E.Br.

Small, perennial geophyte. **Stems** 1–3, erect, branched at base, 50–150 mm high, softly hairy. **Leaves** oblong to oblong-elliptic, 7–30 × 5–8 mm, pubescent, almost sessile. **Flowers** 2–5, erect and hidden amongst suberect leaves; pedicels 2–5 mm long. **Corolla** cage-like; tube short, ± 5 mm deep, 4–5 mm wide at mouth; lobes linear-filiform, margins recurved, 12–20 mm long, connivent over gynostegial column, joined apically; glabrous inside, puberulous outside. **Corona**: interstaminal corona lobes fused basally into a tube, free above, apically bifid or deeply 2-lobuled; staminal corona lobes linear, inflexed on backs of anthers; circumgynostegial trough hairy or glabrous. **Flowering time** Nov.? Grassy hills of EC midlands, alt. 400–1 600 m; Sub-Escarpment Grassland (Queenstown).

Group 4. Differs from all other groups in having inflorescences of raceme-like panicles and purple-blue or pink flowers; otherwise as in group 1 in having rootstock adapted to a horizontally-depressed tuber; stems never trailing along the ground or procumbent; apex of corolla lobes free

rubellum (E.Mey.) Peckover

Small, perennial, herbaceous geophyte. **Stems** solitary, 150–530 mm high; tuber discoid. **Leaves** 3–6 pairs in lower $^1/_3$ of stem, ascending, linear, 25–65 × 1–2 mm, glabrous. **Inflorescence** a pedunculate raceme or raceme-like panicle, 2-flowered or rarely fascicled. **Flowers** sessile or pedicels up to 8.5 mm long. **Corolla** cupulate, fused basally into a small tube, ± 1.5–1.7 mm long; lobes spreading-erect, linear-spathulate, 7.0–12.5 mm long, apex spathulate, 2–3 mm wide; purple to pink, lower half of inner surface densely covered with darker papillae. **Gynostegial column** shortly stipitate. **Corona**: interstaminal corona lobes subquadrate, ± 0.5 mm tall, apically notched, basally pouched; staminal corona lobes narrowly linear, ± 0.5 mm long, incumbent on anthers. **Flowering time** Nov.–Mar. **Follicles** linear-fusiform, glabrous. Coastal grasslands or a bit further inland, alt. 50–1 300 m; Indian Ocean Coastal Belt, Albany Thicket

(Mtamvuna River Mouth S, Kei River Mouth to Haga-Haga, from between Bushman's and Assegai rivers to Howison's Poort, Kariega River, Grahamstown, Hopewell, Kowie District, Port Alfred and East London).

Group 5. Differs from groups 1 to 4 in having a fascicled rootstock; otherwise apex of corolla lobes free; stems ± erect (but not graminaceous), spreading well above the ground or decumbent (never trailing along the ground or procumbent – exception maybe B. caffrum*); inflorescences not of raceme-like panicles*

[E]**comptum** N.E.Br.

Small, perennial geophyte. **Stems** solitary, 70–150 mm high, erect; tubers fusiform, fascicled. **Leaves** spreading, soft-textured, oblong to ovate, 10–16 × 6–10 mm, margins irregularly wavy, glabrous or sparingly pubescent. **Flowers** solitary; pedicel ± 7 mm long. **Corolla** urceolate; lobes free almost to base, keeled on inner surface, 10 × 4 mm, glossy green outside, maroon inside; long clavate-vibratile especially on margins near apex. **Gynostegial column** halfway stipitate, apically inflated. **Corona**: interstaminal corona lobes fused at base, then produced into an erect, fleshy, ligulate appendage, 1.4–1.7 mm tall, reaching above style head, apex canaliculate on inner surface; staminal corona lobes fused at base to interstaminal corona, then produced into a ligulate appendage incumbent on the stamen. **Flowering time** Oct., Nov. Semi-karroid scrub, alt. 100–500 m; Albany Thicket (Uitenhage, Howison's Poort and Botha's Hill near Grahamstown).

sandersonii (Oliv.) N.E.Br.

Perennial, herbaceous geophyte. **Stems** 1 or 2, erect, 200–450 mm high, tubers clustered, fleshy, fusiform. **Leaves** in upper part of stem, spreading-erect, linear to elliptic oblong, 20–40 × 3–12 mm, midrib abaxially pronounced, subcoriaceous, subsessile. **Flowers** 2–4 at upper nodes, sessile, somewhat pendulous; pedicels 2–6 mm long. **Corolla** white, tipped pink, light purple or pale greenish yellow, urceolate-like; lobes free, fused at base into shallow cup, 0.75–1.00 mm deep, ovate or oblong, 2.8–4.5 × 2 mm, apex pointed, margins revolute, inner surfaces keeled, glabrous on both surfaces. **Gynostegial column** shortly stipitate. **Corona**: interstaminal corona lobes dorso-ventrally flattened and fused at base to produce shallow tube, free above, deeply cleft to give 2 lobulate appendages ± 0.75 mm high; staminal corona lobes fused at base to interstaminal corona tube, linear to oblong-linear, 0.50–0.75 mm long, incumbent on anthers. **Flowering time** Jan.? **Follicles** solitary or paired, erect, slender, fusiform, ± 150 mm long, smooth. Rare, coastal grassland, alt. 10–200 m; Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Mtamvuna River Mouth, King William's Town).

[E]**schizoglossoides** (Schltr.) N.E.Br.

Perennial, herbaceous geophyte. **Stems** solitary, slender, erect, unbranched, 100–200 mm high; tubers clustered, fleshy, fusiform, fascicled. **Leaves** in upper half of stem, ascending, linear, ± 45 mm long, glabrous, sessile. **Inflorescence** sessile. **Flowers** 1–3 clustered at upper nodes; pedicels 2–4 mm long. **Corolla** green, spreading; fused in basal $^1/_3$ into a shallow saucer-shaped tube, 0.5–0.8 mm long, shorter than gynostegial column; lobes spreading-erect, broadly ovate, 1.0–1.5 mm long, apex incurved; inner surface with small thick or clavate hairs at apex. **Gynostegial column** shortly stipitate. **Corona**: interstaminal corona lobes dorso-ventrally flattened, oblong, ± 1 mm long, bifid apically, with many hairs; staminal corona lobes linear, 0.7–1.0 mm long, incumbent on anthers, extended beyond and connivent, without hairs. **Flowering time** Nov., Dec. Rare, grassland, S-facing mountain slope, alt. 400–800 m; Sub-Escarpment Savanna, Albany Thicket (Grahamstown District, Coldspring; Bathurst District, Southwell).

CARISSA L.

Num-num bushes; *noemnoembosse* (A)

Species ± 20, tropics and subtropics of Africa, Madagascar, Mascarenes, Asia and Australia, 7 in Africa; 6 in sthn Afr., widespread.

This genus is problematic, especially in a continental context, and a number of alternative hypotheses exist. However, extensive statistical analyses have recently been done on the morphology of this genus in SA by the current author A. Nicholas and students. The results tend to support the assumptions by Codd (1963) at this subcontinental level. A big and small flower form of *C. wyliei* exists in KZN and this phenomenon may extend into Pondoland. Further research is being undertaken on this genus in collaboration with workers at Rhodes University.

Leeuwenberg & Van Dilst (2001) placed *C. bispinosa* var. *acuminata* (E.Mey.) Codd, *C. haematocarpa* (Eckl.) A.DC. and *C. wyliei* N.E.Br. in synonymy under *C. bispinosa* (L.) Desf. ex Brenan, all these taxa were clearly distinguished in the EC by Codd (1963), as documented below:

1a Corolla lobes 15–35 mm long, usually 2–3× longer than tube; fruit 30–50 mm long, many seeded

macrocarpa (Eckl.) A.DC.

Natal plum, big num-num; *groot-noemnoem* (A); *amanthungula* (X); *umthungulu* (Z)

Small to large shrub or tree-like, 1–4(–5) m high. **Stems** with stout spines, once or twice bifurcate, 20–45 mm long. **Leaves** broadly ovate, ovate-elliptic to subrotund, (20–)25–60 × 17–35 mm; petioles up to 5 mm long. **Inflorescences** at axil of spines or terminal. **Flowers** salver-shaped, white, heteromorphic. **Calyx** 4–7 mm long. **Corolla**: tube 9–14 mm long, hairy inside; lobes 15–35 mm long. **Anthers** of two lengths: 15 mm in sterile flowers and 25 mm in others. **Style** heterostylous: 6 mm in flowers with short sterile anthers, and 3–4 mm long in others; stigma entire. **Flowering** all year. **Fruit** an ovoid berry, 30–50 × 30–35 mm. **Seeds** 16 or more. Coastal bush, near sea, often on sand dunes, alt. 0–500 m; Indian Ocean Coastal Belt, Albany Thicket (along coast from KZN border to Port Elizabeth).

1b Corolla lobes 2–12 mm long, usually shorter than tube; fruit up to 16 mm long, 1- or 2-seeded
2a Corolla lobes 2–5 mm long; tube 6–9 mm long; leaves 10–70 mm long

bispinosa (L.) Desf. ex Brenan

Red num-num, num-num; *rooi noem-noem*, *num-numbessie(-bos)* (A); *beta-umtumzi* (X)

Scrambling or tree-like shrub, 0.2–4.0 m high. **Stems** with spines, simple or once to twice bifurcate, 20–45 mm long. **Leaves** ovate, 10–70 × 8–35 mm; petioles up to 3 mm long, small colleters in axils. **Inflorescences** terminal. **Flowers** salver-shaped, homomorphic, white. **Calyx** 2.5–3.0 mm long. **Corolla**: tube 6–9 mm long, glabrous inside; lobes narrowly elliptic, 3.5–5.0 mm long. **Anthers** 1.5 mm long. **Gynoecium** syncarpous. **Style** homostylous, 1.5–4.0 mm long; stigma minutely bifid. **Flowering time** Oct.–Dec. **Fruit** an ovoid to oblong berry, 10–16 × 4–6 mm. **Seeds** 1 or 2. Coastal half of province, alt. 0–2 050 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Weza to Umtamvuna Nature Reserve, S from Somerset East to Kentani and from Tsitsikamma to East London).

Following Codd (1963); Kupicha (1985) recognised *C. bispinosa* subsp. *bispinosa* only, comprising both varieties described by Codd.

bispinosa (L.) Desf. ex Brenan var. **bispinosa**

Spines stout, simple to twice bifurcate, rarely > 50 mm long. **Leaves** coriaceous, rarely > 30 mm long, broadly ovate. **Fruit** ovoid. Dry often exposed habitats; Albany Thicket (Uitenhage, Port Elizabeth, near Grahamstown, Port Alfred, East London).

bispinosa (L.) Desf. ex Brenan var. **acuminata** (E.Mey.) Codd

Spines slender (rarely > 25 mm long), sometimes absent. **Leaves** thinly coriaceous, rarely > 60 mm long, broadly ovate to ovate-lanceolate. **Fruit** ovoid-oblong. Forest, in understory; Albany Thicket, Indigenous Forests, Sub-Escarpment Savanna (Somerset East, King William's Town, Komga, Kentani, East London).

haematocarpa (Eckl.) A.DC.

Karoo num-num; *karoo-noemnoem* (A); *isivusankunzi* (X)

Small to large shrub or tree-like, up to 3 m high. **Stems** densely branched, grey-green; very spiny, spines once or twice bifurcate, 20–45 mm long, paired at shoot apex. **Leaves** coriaceous, ovate-elliptic, 15–28 × 10–15 mm, base truncate to obtuse, apex obtuse to acute, mucronate, grey-green. **Inflorescences** cymose, contracted, few-flowered. **Flowers** small, white, scented. **Corolla** salver-shaped; tube cylindric, 6–7 mm long, slightly wider towards mouth, hairy within, especially at throat; lobes shorter and more rounded. **Anthers** subsessile, 1.5 mm long. **Flowering time** Oct.–Jan. **Fruit** an ovoid to subglobose berry, 6–8 × 4–5 mm, black or bluish purple. **Seeds** 1 or 2. Dry karroid bushveld; Sub-Escarpment Grassland, Albany Thicket (Cofimvaba to Maclear S, from Graaff-Reinet to Pearston and from Suurberg to Grahamstown).

2b Corolla lobes 9–12 mm long; tube 11–14 mm long; leaves 50–100 mm long

wyliei N.E.Br.

Large-flowered forest num-num; *groot-blom bos noem-noem* (A)

Scandent shrub, unarmed or with very small spines. **Stems** dichotomously branched; spines bifurcate, 3 mm long. **Leaves** coriaceous, ovate, 50–100 × 25–45 mm, dull to glaucous-green above, paler below; petioles up to 3 mm long. **Inflorescences** of contracted cymes, 3–6-flowered. **Flowers** fairly large, white tinged red, scented. **Calyx** 3 mm long. **Corolla** salver-shaped, tube cylindric 11–14 mm long, hairy inside, lobes lanceolate-oblong, acute, 9–12 mm long. **Anthers** subsessile, 1.5 mm long. **Flowering time** all year. **Fruit** an ellipsoid-oblong berry, 10–12 × 5 mm. **Seeds** 1 or 2. Forest undershrub; Indian Ocean Coastal Belt (Ntsubane and Ntafufu Forests, Port St Johns).

***CATHARANTHUS** G.Don.

Species 8, 1 in India and Sri Lanka, others confined to Madagascar; 1 naturalised in sthn Afr., widespread, sometimes cultivated, weed of disturbed places in warm, dry areas, especially in eastern sthn Afr.

roseus (L.) G.Don

Madagascar periwinkle; *maagdeblom* (A)

Perennial herb or herbaceous shrub, 0.3–0.7(–1.0) m high; multi-stemmed from near woody base. **Leaves** obovate, oblong or oblanceolate, 40–80 × 10–13 mm; fringe of many colleters in axil. **Inflorescences** axillary, solitary or paired. **Flowers** white

or pink. **Corolla**: tube 23–26 mm long, mouth constricted with dense short hairs, widening at point of insertion of stamens; lobes 16–20 mm, apex broadly obtuse almost truncate. **Anthers** with short blunt lobes at base. **Gynoecium** apocarpous and bicarpellate. **Styles**: apex capitate with a translucent frill at base. **Flowering time** all year, peaking in summer months. **Fruit** a pair of slightly diverging, cylindrical follicles, sometimes 1 by abortion, 25–35 mm long. **Seeds** many and small. Widespread garden escape, especially in and around human habitation, origin Madagascar; Indian Ocean Coastal Belt (Port St Johns).

CEROPEGIA L.

Species over 160, Africa and Madagascar to Australia; > 50 in sthn Afr., widespread, but rarely common, rare in WC.

The separation of *Ceropegia* from *Brachystelma* has always been controversial (the two seeming to grade morphologically at times). Unpublished DNA evidence suggest that the two may eventually have to be combined together with *Ceropegia* taking priority.

Like most (but not all) asclepiads the peduncle is fused to the stem of the internode. Flowers (either sessile or with some of the peduncle partly free) emerge laterally at this higher node. This condition is said to be extra-axillary. In the case of climbers it is sometimes difficult to decide on the minimum height. Smaller stems are usually in the process of elongating when pressed as archival research material.

1a Corolla lobes completely free at maturity leaving corolla tube mouth exposed

bowkeri Harv.

Dwarf geophyte. **Stems** 1–3, produced annually, erect and unbranched, (15–)20–400 (–500) mm long; produced from fascicled rootstock. **Leaves** ascending, linear to linear-lanceolate, ± 40–135 × 3 mm. **Flower** solitary, produced laterally from nodes. **Corolla** cylindric-urceolate, 35–40(–60) mm long; tube straight, 16–18(–38) mm long with a basal inflation 6–8 mm in diam. and slightly fluted at mouth; lobes pendulous and hinged at maturity, ± 20 mm long, narrowly elliptic to almost linear with 2 parallel rows of round dimples; light green with violet-brown markings at mouth with greyish white band down the lobe middles; margins yellowish or purple-hairy. **Corona**: interstaminal corona lobes deeply divided, upper margin of 2 deltoid-lanceolate sharply pointed appendages, ± 1.5 mm long with long, white hairs; staminal corona lobes ± 1.25 mm long. In grassland, alt. 200–1 300 m.

[E]**bowkeri** Harv. subsp. **bowkeri**

Corolla tube with basal inflation subglobose, mouth abrupt. Sub-Escarpment Savanna/ Albany Thicket (collected once only in southern Transkei).

bowkeri Harv. subsp. **sororia** (Harv. ex Hook.f.) R.A.Dyer

Corolla tube with basal inflation elongated ovoid, mouth gentle. Sheltered slopes; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Queenstown, King William's Town, Grahamstown and Bathurst).

Dyer (1983) maintains *sororia* as a subspecies in accordance with the accepted notion that subspecies should have some morphological differences and be allopatric. However, subspecies *sororia* can vary quite considerably.

stapeliiformis Haw. subsp. **stapeliiformis**

Slangkambroo (A)

Twining or scrambling, geophytic succulent. **Stems** produced annually from fibrous root system; 0.5–1.5 m long, fleshy, ± 15 mm thick. **Leaves** absent or rudimentary, ovate to deltoid, basally cordate, up to 3 mm long. **Flowers** 1–several in terminal cymes; peduncles 2–20 mm long. **Corolla** cylindrical, up to 70 mm long, divided to almost halfway; tube with an ovoid inflation, 6–7 mm diam., expanding into a pubescent, funnel-like mouth, basally curly-hairy; lobes free, spreading and recurved, replicate, 20–35 mm long, white, margins and apical part violet-purple, greenish yellow or purple-brown. **Corona**: interstaminal corona lobes connate basally, dorso-ventrally flattened forming bowl-like structure, 2.0–2.5 mm high around gynostegial column; staminal corona lobes fused basally to interstaminal corona; lobes linear, erect and exserted above style-stigma-head to which they are connivent. **Flowering time** Nov.–Mar. Karroid scrub or bush, alt. 200–800 m; Albany Thicket, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Pearston to King William's Town S, from Steytlerville to Humansdorp, Port Elizabeth and Salem).

[E]tomentosa Schltr.

Erect, perennial, herbaceous geophyte. **Stems** 1, rarely more, produced annually, 150–500 mm tall, from clustered, succulent or fusiform rootstock. **Leaves** ascending or spreading-erect, linear, apex acute, up to 100 × ± 3 mm. **Flower** solitary, extra-axillary from upper nodes; pedicel 6–10 mm long. **Corolla** 40–50 mm long, erect, tube cylindrical, 16–18 mm long, basal inflation ovoid, ± 5 mm in diam., expanding gently to ± 6 mm diam. mouth, forming 5 sinus-like pockets; lobes free, erect, deltoid at base, somewhat replicate, soon becoming linear, 25–30 mm long; lobes yellowish green, densely tomentose, basally with a tuft of subclavate red hairs, inner surface with interwoven, shortly curly, yellow hairs. **Corona**: interstaminal corona lobes connate into a fused cup-like structure ± 1 mm tall around rest of gynostegium, forming pockets that are deeply bifid on margin, hairy inside; staminal corona lobes erect, arising from base inside interstaminal coronal pockets, linear, sometimes subspathulate with small tubercles basally on either side. Grassland, alt. ?–500 m; Sub-Escarpment Savanna (only known from Fort Bowker, Gwetyibeni and Butterworth area; possibly extinct).

1b Corolla lobes connivent over mouth of corolla tube, forming a variously shaped cage
2a Plants with discoid or globose tuber

africana R.Br.

Twining geophyte. **Stems** 1 or 2, mainly annual, sparsely branched near base, short and erect, to long and twining, up to 1 m long; produced from discoid tubers. **Leaves** vary from lanceolate to elliptic, 15–25 × 10–20 mm, apex with mucron, margins sometimes wavy, subsucculent and sometimes mottled; petioles 2–5 mm long. **Flowers** 1–3, produced at nodes; pedicels 2–10 mm long. **Corolla** cylindrical, 25–35 mm long; tube straight to curved, 12–16 mm long with small basal inflation 4.0–4.5 mm in diam., inflated at mouth; lobes linear, margins folded back with dark purple hairs on lower inner surface, 6–12 mm long; tube green, striped violet-brown. **Corona**: interstaminal corona lobes adnate, fused to staminal corona to create ± 1.5 deep pockets with hairs; staminal corona lobes basally fused to interstaminal corona, ligulate and falcate, ± 1.5 mm long with margins curved slightly inwards to form a shallow furrow/pollination guide. Scrub veld, often on shale, alt. 200–1 200 m.

Dyer (1983) points out that the corona remains fairly constant over its wide range. He also maintains *C. barklyi* as a separate species (1980). As there is little doubt that *C. africana* and *C. barklyi* come from a common ancestor, the current authors are following Bruyns (1985) and treating *C. barklyi* as a subspecies, partly going against the proviso that subspecies need to be allopatric.

africana R.Br. subsp. **africana**

Corolla lobes lantern-like, shorter than tube, hairless on inside. Albany Thicket (Fish River and Grahamstown to East London).

africana R.Br. subsp. **barklyi** (Hook.f.) Bruyns

Corolla lobes sometimes slightly twisted and meet in middle, as long as tube or longer. Long hairs present just below middle on inside of lobes. Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (Queenstown, Stutterheim and Butterworth).

[E]**cancellata** Rchb.

Climbing-twining, herbaceous geophyte. **Stems** up to 1 m long, few, produced annually from a large subglobose tuber, sparingly branched, slender. **Leaves** fleshy, varying from lanceolate to broadly ovate-cordate, 12–25 × 9–20 mm and sometimes variegate. **Flowers** 1–4, produced on a pedunculate cyme; peduncle 6–19 mm long; pedicels 5–8 mm long. **Corolla** cylindrical, 23–35 mm long, tube curved with a globose basal inflation 1.5–2.0 mm in diam., expanding to trumpet-like mouth; lobes linear with margins folded back, 10–15 mm long, connivent into a cage over mouth, finely hairy, tinted purple. **Corona**: interstaminal corona lobes adnate but also fused to staminal corona to create 5 deep fluted hairy pouches, the entire structure forming a synorganised cup-like corona; staminal corona lobes linear, fused basally to interstaminal corona and bends into center of flower to meet above style-stigma-head, where it becomes falcate and hook-like. Scrub veld; Albany Thicket (Addo, Port Elizabeth, Fish River and Peddie).

Bruyns (1985) points out that some plants identified as this species, might actually belong to *C. linearis*. He also suggests that *C. cancellata* may represent a hybrid between *C. africana* and *C. linearis*; future work should focus on testing this hypotheses.

linearis E.Mey.

Isidakwa, *uvemvane samatshe* (Z)

Climbing or scrambling geophytic, slender herbaceous vine. **Stems** 1 or 2, perennial or annual, up to 2 m long, produced from a discoid tuber. **Leaves** ovate-lanceolate to orbicular, 8.5–50.0 × 1.5–7.0 mm, base ± subcordate; petioles up to 10 mm long. **Inflorescence**: cyme with 2 or 3(–5) flowers; peduncles 6–13 mm long; pedicels 3–6 mm long. **Corolla** tubular and cylindrical, erect, straight, ± 25 mm long, fused for 16–19 mm, small ovoid inflation, 2–3 mm in diam., mouth marginally inflated; lobes erect, ± 4 mm long, linear, slightly spathulate at apex, 6.5–8.0 mm long, connivent and fused apically, forming an oblong cage over tube mouth, margins revolute, ciliate, lobes pilose; colour variable. **Corona**: interstaminal corona lobes adnate, widely U-cleft and channel-like almost to bottom, forming 2 pockets just behind these; staminal corona lobes fused basally to interstaminal corona, free above the connivent upper portions, apex flexed out. On rocky outcrops in coastal thicket, alt. 50–1 600 m.

Alternative taxonomy: several have been proposed to classify this polytypic species. Most current and useful is that of Bruyns (1985) who recognises 3 allopatric subspecies that

have limited gene exchange. All 3 occurring in EC and have been recognised as distinct species by various authors. Probably a good example of a metaspecies.

[E]linearis E.Mey. subsp. **tenuis** (N.E.Br.) Bruyns

Leaf blade ovate to deltoid-ovate; petioles 3–6 mm long. **Cyme**: 3–8 mm long or sub-umbellate with 3–6 flowers; pedunculate; pedicels 3–4 mm long. **Corolla** 20–23 mm long; tube 16–19 mm long, subglobose with basal inflation, cylindric above, broadening only slightly towards mouth. **Corolla**: lobes small, ± 4 mm long and replicated, connivent into smaller cage. **Corona**: interstaminal corona lobe ± 2 mm long. Hanging on/off cliffs and rocky ridges; Indian Ocean Coastal Belt, Sub-Escarpment Savanna (eastern Transkei S to King William's Town and Komga, and to East London).

linearis E.Mey. subsp. **woodii** (N.E.Br.) Bruyns

String of hearts

Stems 0.25–1.00 m long. **Leaf blade** orbicular, 6–18 mm long, leaf base cordate. **Cymes** 1–4-flowered; pedicels 3–10 mm long. **Corolla** straight or slightly curved, 18–25 mm long; tube 11–25 mm long, basal inflation globose, ± 4 mm in diam., contracted to ± 2 mm above, noticeably widening at mouth to 4.5 mm diam., crinkled purplish hairs inside; lobes 6–8 mm long, forming an oblong cage over mouth. **Corona**: interstaminal corona lobes 2.0–2.8 mm long. Rocky ledges, at low altitudes; Indian Ocean Coastal Belt, Albany Thicket (Pondoland to Uitenhage and Port Elizabeth).

meyeri Decne.

Geophytic, herbaceous twiner-climber. **Stems** annually produced from discoid tubers, 0.5–2.0 m long, hairy. **Leaves** ovate-lanceolate to ovate, 19–50 × 8–30 mm, base rounded or cordate, herbaceous, hairy, margins entire, variably dentate, slightly undulate; petioles 8–32 mm long. **Inflorescences** 2–4-flowered, produced at nodes; pedicels 5–20 mm long. **Corolla** 40–60 mm long; tube straight, erect, bottle-shaped, 25–38 mm long, basal inflation elliptic-oblong, 16.5–25.0 × 6–9 mm, narrowing above into a short neck 2–3 mm in diam., then abruptly dilating at mouth 5.5–7.0 mm in diam.; lobes linear, 9–11 × 3 mm, curving and becoming connate to form triangular openings in a 5-sided cage; margins revolute and velvety with crinkled hairs. **Gynostegial column** stipitate. **Corona**: interstaminal corona lobes connate basally to form a shallow sunken platform, 1.0–1.5 mm deep; staminal corona lobes fused basally to interstaminal corona, free above, erect, linear, ± 2 mm long, connivent on anther backs and exceeding style-stigma-head, forming a loose cage. Forest margins; Sub-Escarpment Savanna (Transkei S to Komga).

2b Plants with fascicled rootstock

ampliata E.Mey.

Bushman's pipe; *boesmanspyp* (A)

Twining or scrambling, succulent geophyte. **Stems** perennial, 0.3–2.0 m long, almost leafless, rooting at nodes. **Leaves** subsucculent, rudimentary and fugaceous, lanceolate, 2–3 mm long. **Inflorescences** sessile. **Flowers** 2–4 lateral at nodes; pedicels 6–15 mm long. **Corolla** cylindrical, 50–70 × 12–13 mm, fused for $^{3}/_{4}$ of its length into curved tube, 35–50 mm long with basal subglobose inflation ± 20 mm in diam., ± 22 mm long, often papillate inside at mouth and constriction; lobes lanceolate, 10–20 × 5.5–7.0 mm, connivent into cage around mouth, margins slightly revolute; pale green with narrow purple longitudinal stripes. **Gynostegial column** stipitate. **Corona**: interstaminal corona lobes erect, fused basally to staminal corona forming a continuous, shallow, 10-toothed

cup surrounding staminal column; staminal corona lobes long, erect and filiform, greatly overtopping style-stigma-head, mingled apically. **Anthers** without anther appendages. Karroid scrub and thornveld, dry river valleys; Albany Thicket, Sub-Escarpment Savanna (Graaff-Reinet to Komga S, from Uitenhage to Great Fish River Valley and Grahamstown).

carnosa E.Mey.

Cryptic twining or scrambling, perennial, geophyte. **Stems** 1 or 2, branching irregularly, thin and wiry, 0.5–2.0(–5.0) mm; producing fleshy roots that can form large tubers. **Leaves** lanceolate to ovate, 8.5–30.0 × 4–25 mm, slightly succulent, glabrous; petioles 5–15 mm long. **Inflorescence** cymose; peduncle 4–17 mm long; pedicels 6–13 mm long. **Corolla** cylindrical, 16–25 mm long, tube erect and curved, 12–19 × 3.0–3.5 mm, slightly inflated basally, curved abruptly above inflation and expanding towards mouth, ± 8 mm in diam., mouth hairy inside, lobes erect, oblong-ovate, 4–6 × 3 mm, margins revolute with white whisker-like hairs, connivent and fused into a round cage over tube mouth. **Corona**: interstaminal corona lobes erect, dorso-ventrally flattened, fused at base, free above, deeply divided into 2 lobules curving towards each other, rim appearing 10-toothed; staminal corona lobes fused basally to interstaminal corona forming nectar pockets, rest of lobe free, linear to filiform, and incumbent on anthers, connivent, overtopping style-stigma-head, apex thickened and curved out. **Anthers** without anther appendages. Scrub or bushveld or moister coastal forest; Albany Thicket, Sub-Escarpment Savanna (Fort Beaufort, Komga and Buffalo River S, from Hankey to Uitenhage, Port Elizabeth and East London).

Bruyns (1985) suggests that *Ceropegia racemosa* N.E.Br. subsp. *setifera* (Schltr.) H.Huber be sunk under *C. carnosa* E.Mey. The current author is of the opinion that shared common morphologies must be proved to be due to common ancestry (viz. homologous) before this can be done. If the morphologies of the two are due to convergent evolution (viz. analogous) they cannot be sunk into each other. More research is required.

crassifolia Schltr.

Twining, subsucculent geophyte. **Stem** solitary, produced annually from fascicled rootstock, somewhat succulent, up to 3 m high in northern provinces. Leaves linear or linear-lanceolate and folded, up to 100 × 45 mm, base occasionally asymmetric, apex apiculate, margins irregularly crispate. **Flowers** (2)3–7 in contracted cymes; peduncles 5–30 mm long; pedicels 4.5–6.5 mm long. **Corolla** cylindrically urceolate, 25–50 mm long; tube straight or slightly curved, 16–34 mm long with a globose basal inflation 6–9 mm in diam., inflated at mouth; lobes broadly oblong to narrowly lanceolate, 9.0–13.5 × 3.0–4.5 mm, margins strongly folded back and apically connivent, forming a cap-like or rounded cage over mouth; colour variable, tube pale green with purple markings, striped inside, inner surface of lobes with purple-brown reticulations and long purple hairs at base. **Corona**: interstaminal corona lobes dorso-ventrally flattened and erect, connate to each other and adnate to staminal corona to create 1.5–2.8 mm deep, fluted pockets, level or just overtopping style-stigma-head; staminal corona lobes fused basally to interstaminal corona, incumbent on anther backs and connivent over style-stigma-head. Scrub veld; Sub-Escarpment Savanna, Albany Thicket (King William's Town S, Uitenhage and Fish River Valley).

[E?]dubia R.A.Dyer

Climbing, perennial geophyte. **Stems** slender, herbaceous, up 3 m high; produced from a fascicled rootstock. Leaves ovate, 15–25 × 10–15 mm, base cordate; petioles slender,

± 10 mm long. **Flowers** 2 (in pairs) on a pedunculate cyme; peduncles and pedicels ± 5 mm long. **Corolla** cylindrical, 22–25 mm long; tube slightly curved, with globose basal inflation, ± 5 mm in diam., widening in last $^{1}/_{3}$ into a wide trumpet-shaped mouth ± 15 mm in diam.; lobes linear, somewhat spathulate, 6–7 mm long; margins folded back, long ciliate, connivent into a pyramidal cage over tube mouth. **Corona**: interstaminal corona lobes connate into a saucer-shaped basin surrounding staminal curtain, laterally adnate to staminal corona creating shallowish pockets; staminal corona lobes fused basally to interstaminal corona, free lobes spathulate, erect, connivent and much overtopping the style-stigma-head. Albany Thicket/Eastern Fynbos-Renosterveld [between Uitenhage and Coega (type locality)].
Bruyns (1985) suggests it may be conspecific with the tropical *Ceropegia meyeri-johannis* Engl.

filiformis (Burch.) Schltr.

Rankkambroo, *soetwortel* (A)

Twining, cryptic geophyte. **Stem** solitary, produced annually, up to 1 m long; produced from fascicled rootstock. **Leaves** linear-lanceolate to filiform, 10–20(–70) × 5–10 mm. **Flowers** 1–3 in a cyme, laterally at node; peduncle ± 10 mm long; pedicels ± 10 mm long. **Corolla** cylindrically urceolate, 50–60 mm long; tube curved (up to 90°), 30–40 mm long with ovoid to ellipsoid basal inflation, ± 12 mm in diam., expanded at throat to a diam. of 8–10 mm; lobes narrowly linear, base deltoid; margins folded back, ± 20 mm long, connivent above, forming a box-like cage over tube mouth; tube pale green, white-keeled down inner face, veins inside swollen base tuberculate, longitudinal veins dull purple. **Corona**: interstaminal corona lobes dorso-ventrally compressed, spreading out and upwards, connate to form a cup-like structure around staminal curtain, with a widely U-shaped cleft; outer margins on both sides extended into a purple filiform/linear appendage ± 3 mm long; staminal corona lobes fused basally to form 5 nectar pockets, free portion narrowly linear, erect, ± 2 mm long, forming a loose circle around style-stigma-head, which it greatly overtops. Low scrub bush, sandy or very arid situations; Upper Karoo, Lower Karoo (Steynsburg, Aberdeen, Graaff-Reinet and Cradock District).

[E?]**fimbriata** E.Mey.

Climbing or scrambling, perennial, succulent geophyte. **Stems** succulent and leafless, 30–1 000 mm long; produced from a cluster of slender fleshy roots. **Leaves** vestigial, up to 5 mm long. **Flowers** 1 or 2, produced laterally at nodes; pedicels ± 10 mm long. **Corolla** cylindrically complicate, up to 60 mm long; tube mainly green, ± 37 mm long, basal inflation ovoid-ellipsoid, 12–13 × 10 mm, narrowing abruptly and turning ± 90° into an upright trumpet-shaped tube, mouth ± 15 mm diam.; lobes narrow, ± 4 mm long, expanded and connivent into parachute-like canopy, 16–18 mm diam. covering tube mouth, margins 10-crenulate, fringe long, pendulous, clavate and vibratile. **Corona**: interstaminal corona lobes scale-like and connate at base, forming a bowl surrounding gynostegium, apex extended into 2 filiform tortuous appendages ± 3 mm long; staminal corona lobes fused basally to interstaminal corona, filiform, connivent over style-stigma-head, 3.0–3.5 mm long. Confined to dry scrub bush on banks of Great Fish River Valley, just inland of coast; Albany Thicket (Ecca Pass, Fish River Valley, Queen's Pass).
Alternative taxonomy: this species is presented in its narrow sense but forms part of a metaspecies or genetic complex. Bruyns (1985) has proposed an alternative hypothesis reducing *C. geniculata* R.A.Dyer and *C. connivens* R.A.Dyer to subspecies under this species. In his classification subspecies *geniculata* and *connivens* do not occur in the EC.

haygarthii Schltr.

Twining/climbing, subsucculent geophyte. **Stems** often much branched and tangled in basal vegetation, up to 5 m long; from fibrous or fleshy rootstock. **Leaves** ± fleshy, oblong to ovate-lanceolate, up to 75 × 50 mm, base cuspidate; petioles 10–15 mm long. **Inflorescence**: peduncle up to 35 mm long. **Flowers** 1 or 2 at nodes; pedicels 8–16 mm long. **Corolla** complicated, up to 50 mm long, basal inflation small and globose, curved shortly after through 90º, then expanding trumpet or funnel-like into 15–20 mm mouth, throat hairy; lobes free at base, broadly deltoid, margins replicate, connivent over tube mouth and producing a short stalk, 5–15 mm long, becoming inflated at apex forming an elliptic or subglobose knob, 3–5 × 2–5 mm and which is fluted and cage-like, margins replicate and ciliate (like an umbrella with an antenna). **Corona**: interstaminal corona lobes dorso-ventrally flattened, scale-like, connate basally, upper margin cleft and bidentate; staminal corona lobes fused basally to interstaminal corona, narrowly ligulate, broader at connivent apices and flexed outward. Drakensberg Grassland, Albany Thicket, Sub-Escarpment Savanna (Stockenström District, Fish River Valley, Komga and Kei Road).

Alternative taxonomy: Dyer (1977) placed this species under *Ceropegia distincta* subsp. *haygarthii* (Schltr.) H.Huber. This is generally no longer followed.

[E]radicans Schltr.

Succulent, geophytic creeper. **Stem** solitary, 1–3 m long; produced from clustered, fleshy, prostrate, roots; sparsely branched, often rooting at nodes, internodes 4–8 mm long. **Leaves** ovate-elliptic to orbicular, succulent, 16–40 × 13–25 mm, apex usually apiculate; petioles up to 10 mm long. **Inflorescences** sessile or with stout peduncle up to 10 mm long. **Flowers** 1–3 produced at nodes; pedicels stout, 30 mm long. **Corolla** cylindrical, 55–80 mm long; tube pale greenish white with purple dots and splotches, these becoming more intense towards the mouth, softly hairy inside, usually gently curved, 40–55 mm long with a long, 5-angled, basal inflation 13–17 × 5–7 mm, then narrowing to 3 mm in diam., slowly expanding into a wide mouth of 15 mm diam.; lobes ligulate, margins completely revolute to folded, forming a beak-like or pyramid-shaped cage covering the mouth. **Corona**: interstaminal corona lobes adnate forming a shallow, sometimes fleshy, dish-like structure; staminal corona lobes fused basally to interstaminal corona, erect, ligulate, ± 4, connivent near top flexing out at apex; pale yellow green. Sub-Escarpment Savanna, Albany Thicket (Komga area, Kei Road, Gonubie River).

[E]radicans Schltr. subsp. **smithii** (M.R.Henderson) R.A.Dyer

Leaves with lighter markings along the vein. **Corolla**: lobes expanded, obcordate-oblong, forming an obtuse cage over mouth of corolla tube, 15 mm long. Sub-Escarpment Savanna/Albany Thicket (Kwelera River).

Status may need revision as sympatric and possibly not genetically isolated with the type subspecies.

sandersonii Decne. ex Hook.f.

Parachute flower; *sambreelblom* (A)

Herbaceous, twining or climbing, perennial geophyte. **Stems** 1–3(–4) m long, thick/semi-succulent, slightly verrucose; produced from clustered, fleshy, cylindrical roots. **Leaves** fleshy, ovate-lanceolate, base cordate, 20–50 × 12–25 mm; petioles stout, ± 6 mm long. **Flowers** 2–4 in pedunculate cymes, 4.5–11.0 mm long; peduncles ± 10 mm long. **Corolla** trumpet-like, 40–70 mm long; tube 38–50 mm long, basal

inflation ovoid, off-center, ± 6 mm in diam., curving upwards and expanding into a wide funnel-like mouth 15–25 mm in diam.; lobes basally column-like, then horizontally connivent, connate, and expanded into an umbrella-like canopy 25–50 mm in diam., margins scalloped, tube access via 5 slit-like windows; inflation striped green and white, canopy mottled green and white. **Corona:** interstaminal corona lobes dorso-ventrally flattened, connate into a cup-shaped structure ± 1 mm tall surrounding gynostegial column; staminal corona lobes fused basally to interstaminal corona, free above, erect, linear-filiform, ± 3 mm tall, connivent in upper part but with apex curved. **Follicles** spreading horizontally, 75–130(–140) × 7–8(–11) mm, surface rugose and tuberculate. Habitat?, alt. 600–1 000 m; Sub-Escarpment Grassland/Sub-Escarpment Savanna (KZN border).

zeyheri Schltr.

Climbing (sometimes weakly so) succulent. **Stems** branching, 0.3–1.0 m long; produced from fleshy cluster of fascicled, cylindrical roots. **Leaves** reduced to small ovate scales barely reaching 10 mm. **Flowers** usually solitary, produced at nodes; peduncles up to 10 mm long; pedicels 0–7 mm long. **Corolla** erect, cylindrical, 30–58 mm long; tube ± as long as lobes, with dark longitudinal stripes (Bruyns 1985) or verrucose-spotted (Dyer 1980), glabrous within, basal inflation subglobose 5–8 mm in diam., expanding towards mouth; lobes deltoid at base, soon becoming linear, margins infolded, 12–50 mm long, connate at apex (often inflated) forming a loose cage above mouth. **Corona**: interstaminal corona lobes fused basally but with upper margins produced into erect, lobular appendages ± 2 mm long, these forming 2 adjacent lobes appearing bifid; staminal corona lobes fused to interstaminal corona, free above into narrow ligulate or slightly spathulate appendages ± 2 mm long, producing a swollen nodule ± $^1/_3$ of the way up, then connivent above this. Karroid scrub; Dry Highveld Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Somerset East and Kommadagga S, from Uitenhage to Port Elizabeth and Redhouse).

CHLOROCYATHUS Oliv.

(= *KAPPIA* Venter, A.P.Dold & R.L.Verh.) (Venter 2008)

Species 1, sthn Afr., EC.

[E]lobulata (Venter & R.L.Verh.) Venter
[= *Kappia lobulata* (Venter & R.L.Verh.) Venter, A.P.Dold & R.L.Verh., *Raphionacme lobulata* Venter & R.L.Verh.]

Perennial, woody, twining climber; stems produced from string of fleshy tubers. **Leaves** with fleshy, subspherical, interpetiolar stipules with colleters, lamina ovate to elliptic, 60–70 × 20–35 mm, glabrous and glossy, veins sunken above, raised below. **Inflorescences** cymose, up to 10-flowered; peduncle 5–15 mm long. **Corolla** funnel-shaped and semi-succulent; tube 2–3 mm long; lobes ovate, 4–7 × 3–5 mm, outside glabrous, apple-green with base pale maroon, inside apple-green and with long hairs. **Corona** arising at corolla mouth; lobes broadly obcordate, 0.5–1.0 × 2 mm, yellow-green, tinted pale maroon, minutely hairy on outer surface. **Flowering time** Jan.? **Follicles** a divergent pair, narrowly ellipsoid, 65–80 × 23–25 mm. Vulnerable (VUD2), riverine forest, ecotone with valley thicket, alt. 15–75 m; Indigenous Forests, Albany Thicket (Kap River Reserve).

CORDYLOGYNE E.Mey.

Species 1, widespread in sthn Afr., NW, G, M, FS, KZN, L, NC, EC, mainly eastern parts in damp or marshy places of high grassland.

globosa E.Mey.

Perennial, sedge-like geophyte, 120–465 mm high. **Stems** solitary. **Leaves** erect, linear, 37–67 × 0.7–3.0 mm. **Inflorescences** terminal, compact umbels, 10–25-flowered; peduncle 25–170 mm long. **Flowers** light green, brown-marked. **Corolla** erect, oblong, 4.5–5.5 × 1.5–2.5 mm, apex blunt. **Staminal column** not stipitate. **Staminal corona** white or greeny cream-coloured; lobes columnar, apex inflated, 2.0–2.5 mm high, 1.0–1.5 mm wide; 2 vertical ridges on inner surface terminating in upper $^1/_3$ by horizontal, deltoid tissue flap, level with style-stigma-head; interstaminal corona lobes minute, tooth-like. **Anther**: appendages resting against elongated, large, club-like protrusion of style-stigma-head. **Flowering time** Nov.–Feb. **Follicles** solitary, erect, stalk straight, narrowly fusiform, smooth. Marshy areas, alt. 1 000–2 000 m; Dry Highveld Grassland, Sub-Escarpment Grassland, Upper Karoo, Drakensberg Grassland (Aliwal North and Matatiele S to Sneeuberg, Richmond and Tarkastad).

CRYPTOLEPIS R.Br.

Species ± 25, Africa, Madagascar and Asia, from semi-desert to savanna and tropical rain forest; 6 in sthn Afr., B, LIM, NW, G, M, S, KZN, NC, EC.

capensis Schltr.

Perennial climber, up to 2 m long; internodes very long, wiry. **Leaves**: lamina lanceolate to elliptic, (40–)48–90 × 12–45 mm, thinly textured, glabrous, upper surface embossed, green, glaucous below, base cuneate, apex acuminate, tapering into a drip-tip, midveined to apex, prominently net-veined below; petioles 4.0–12.5 mm long. **Inflorescences** of axillary, few-flowered cymes, 18–75 mm long, lax, dichotomously or trichotomously forked. **Peduncle** 20–57 mm long. **Pedicels** 12–25 mm long. **Buds** twisted. **Flowers** cream-coloured or yellowish green, campanulate; tube (4–)5–6 mm long; lobes spreading to reflexed, twisted, lanceolate, 8.5–10.5 mm long. **Corona**: lobes inserted, coralline, fleshy, ovate, ± 1 mm long, apex pointed; staminal corona absent. **Stamens** connivent over conical style-apex. **Flowering time** Nov.–Feb. **Follicles** paired, divergent, narrowly fusiform, 100–220 × 4.5 mm. Escarpment forest margins, alt. 10–1 400 m; Indigenous Forests (Port Edward).

CYNANCHUM L.

Species ± 100, cosmopolitan; 12 in sthn Afr., widespread.

africanum (L.) Hoffmanns.

Bobbejaantou, *bokhorinkie* (A)

Perennial climber, up to 1 m long; basally woody, bark brown. **Leaves** coriaceous, ovate, 20–30 × 10–15 mm, base cordate to rounded, apex mucronate; glabrous; petioles 2–6 mm long. **Inflorescences** umbelliform, 4–7-flowered, with all flowers open at same time. **Peduncle** 10–20 mm long. **Pedicels** 4–12 mm long, glabrous. **Buds**: aestivation basally imbricate and apically contorted. **Flowers** purple to brown, sweetly scented. **Corolla** rotate, basally fused; lobes reflexed, twisted, 6–12 × 1.8–2.2 mm. **Corona** white, tubular, taller than gynostegium, 6–10 mm tall. **Anthers** deltoid. **Flowering time** (June–)Sept.–Dec. **Follicles** obclavate, 40–60 × 9–11 mm, brown. Dunes, coastal fynbos, dune scrub, alt. 0–200(–700) m; Albany Thicket (Port Elizabeth to Port Alfred).

ellipticum (Harv.) R.A.Dyer

Monkey rope; *bobbejaantou* (A)

Perennial, much-branched climber, up to 3 m long; basally woody with grey bark. **Leaves** elliptic to oblong, 20–40 × 10–20 mm, glabrous, base rounded, apex obtuse to acute, apiculate; petioles 5–15 mm long. **Inflorescences** cymose to umbelliform, 2–15(–30)-flowered, with 4–10 flowers open at same time. **Peduncle** 12–20 mm long. **Pedicels** 5–10 mm long, glabrous. **Buds**: aestivation imbricate. **Flowers** brown to green, sweetly scented. **Corolla** rotate, basally fused; lobes spreading to reflexed, straight or apically twisted, 2.5–4.0 × 0.8–1.2 mm. **Corona** white, cyathiform, taller than gynostegium, 2.5–3.5 mm tall. **Anthers** trapezoid. **Flowering time** all year, peaking in Apr. and Sept. **Follicles** obclavate, 45–60 × 6–8 mm, brown, apically beaked. Indigenous forests and forest margins, rarely thickets, alt. 0–1 300 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld [Queenstown S, from Graaff-Reinet to Komga, Suurberg (Doornnek) to East London, and to Humansdorp].

gerrardii (Harv.) Liede

Perennial, semi-succulent climber or decumbent, much branched, up to 2 m long; basally woody with yellowish bark; cream-coloured latex. **Leaves** reduced to scales. **Inflorescences** cymose to umbelliform, 4–7-flowered, with 2–4 flowers open at same time. **Peduncle** 1.0–2.5 mm long. **Pedicels** 3.0–4.5 mm long, glabrous. **Buds**: aestivation imbricate. **Flowers** green to white, sweetly scented. **Corolla** rotate, basally fused, 2–3 × 1.0–1.5 mm. **Corona** white, cyathiform, as tall as gynostegium, 1.2–1.5 mm tall. **Anthers** hexagonal. **Flowering time** May–Sept. **Follicles** elongate, 85–120 × 6–8 mm, dark brown, shortly beaked apically. Karroid scrub, scrub forest, thornveld, *Brachystegia* woodland, alt. 5–1 000 m; Sub-Escarpment Savanna, Lower Karoo, Albany Thicket (Alice to Komga S and from Baviaanskloof to Uitenhage).

natalitium Schltr.

Klimop (A)

Perennial, much-branched climber, up to 0.5 m long; basally corky in old plants with yellowish bark. **Leaves** fleshy, ovate to orbicular, or obovate, 20–50 × 15–35 mm, glabrous, base rounded to cuneate, apex obtuse and acuminate; petioles 7–25 mm long. **Inflorescences** umbelliform, 6–16-flowered, with 6–12 flowers open at same time. **Peduncle** 5–15 mm long. **Pedicels** 5–10 mm long. **Buds**: aestivation imbricate. **Flowers** green to brown, sweetly scented. **Corolla** rotate, basally fused, spreading, 3.5–5.0 × 1.5–2.0 mm. **Corona** white, urceolate, taller than gynostegium, 3.5–4.0 mm tall. **Anthers** trapezoid. **Flowering time** all year, peaking in Mar.–July. **Follicles** obclavate, 40–45 × 5–8 mm, light brown to brown, strongly beaked apically, keeled to winged. Littoral dunes, dune forest, alt. 0–60 m; Indigenous Forests, Albany Thicket (Port St Johns S, from Kentani to Bulura River Mouth and Port Elizabeth to East London).

obtusifolium L.f.

Melkbobbejaantou (A); *ishongwe-elinabawo* (Z)

Perennial, much-branched climber, up to 3 m long; basally woody with yellowish bark. **Leaves** thinly coriaceous, ovate to elliptic, 20–40 × 15–40 mm, glabrous, base rounded to subtruncate or cordate, apex obtuse and acuminate, or obcordate and acuminate, margins entire or crenulate; petioles 5–15 mm long. **Inflorescences** cymose, 8–15-flowered, with 3–6 flowers open at same time. **Peduncle** 3–5 mm long. **Pedicels** 3.5–6.0 mm

long, dense indumentum. **Buds**: aestivation imbricate. **Flowers** green, sweetly scented. **Corolla** rotate, basally fused, spreading, 3–4 × 1.0–1.5 mm. **Corona** white, cyathiform, taller than gynostegium, 2.0–2.5 mm tall. **Anthers** trapezoid. **Flowering time** all year, peaking in Jan.–July. **Follicles** obclavate, 40–50 ×10–12 mm, keeled, brown to dark brown. Dunes, dune scrub, coastal vegetation, alt. 0–250 m; Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Haga Haga to Coffee Bay S, from Bonza Bay to Kei River Mouth, Port Elizabeth to Port Alfred and from Tsitsikamma Coast to Skoenmakerskop).

orangeanum (Schltr.) N.E.Br.

Perennial, erect herb, up to 0.2 m high; basally woody with greyish bark. **Leaves** linear, 30–50 × 0.7–1.5 mm, glabrous, base decurrent, apex acute or obtuse, sessile. **Inflorescences** umbelliform, 1–5-flowered, with all flowers open at same time. **Peduncle** 0–5 mm long. **Pedicels** 3–7 mm long. **Buds**: aestivation imbricate. **Flowers** brown. **Corolla** rotate, basally fused; lobes incurved, margins revolute, 4–6 × 1.5–2.0 mm. **Corona** white, cyathiform, shorter than gynostegium, 4–5 mm tall. **Anthers** trapezoid. **Flowering time** Nov.–Mar. **Follicles** fusiform, 40–70 × 4–7 mm, light brown, strongly beaked apically. Short grassland, alt. 1 000–1 500 m; Upper Karoo (Hofmeyr District, Teviot Station).

virens (E.Mey.) D.Dietr.

Perennial climber, up to 1 m long; basally woody, yellowish bark. **Leaves** lanceolate, 30–50 × 15–30 mm, glabrous with veins and margins hairy below, base cordate, apex acute; petioles 10–25 mm long. **Inflorescences** cymose to umbelliform, 7–15-flowered, with 3–8 flowers open at same time. **Peduncle** 2–10 mm long. **Pedicels** 5–7 mm long, glabrous. **Buds**: aestivation imbricate. **Flowers** green to white. **Corolla** rotate, basally fused; lobes spreading, twisted, 6–8 × 1.0–1.5 mm. **Corona** white, cyathiform, taller than gynostegium, 5.0–5.5 mm tall. **Anthers** trapezoid. **Flowering time** Nov.–Mar. **Follicles** obclavate, 50–60 × 15–20 mm, brown to dark brown. Riverine vegetation, alt. 1 200–2 000 m; exact locality not recorded.

DUVALIA Haw.

Species 17, Africa and Arabia; 13 in sthn Afr., widespread, except L.

angustiloba N.E.Br.

Perennial, dwarf succulent. **Stems** decumbent, 8–30 × 6–20 mm, glabrous, grey-green to purple, obtusely 4- or 5-angled with rows of 2–4 mm long conical teeth tipped with an acute, 1–2 mm long leaf rudiment. **Flowers** 1–20, prostrate; pedicels 10–40 mm long. **Sepals** 2–3 mm long. **Corolla** 10–22 mm in diam., red to brown; annulus prominent, 3.0–4.5 mm in diam., ± pentagonal, constricted basally; lobes spreading 4–9 × 1.5–2.0 mm, completely replicate, glabrous or with basal papillae. **Corona** 2–3 mm in diam., white sometimes with pink or reddish markings; outer lobes spreading into a pentagonal disc; inner lobes 1.5 mm long, ± incumbent on anthers with apices extending into obtuse, ascending, dorsal lobules. Beneath small bushes and shrubs in semi-arid areas, usually in sand with gravel or small boulders, alt. 700–1 700 m; Lower Karoo (Rietbron to Aberdeen).

caespitosa (Masson) Haw. var. **caespitosa**

Perennial, dwarf succulent. **Stems** sometimes rhizomatous, decumbent, ovoid to cylindrical, 15–100(–150) × 6–22 mm, glabrous, dark green, 4- or 5-angled with rows of conical

teeth tipped with 1.5–2.0 mm long leaf rudiment. **Flowers** 1–3(–9); pedicels 10–25 mm long. **Sepals** 3–6 mm long. **Corolla** 18–35 mm in diam., reddish brown to almost black; annulus prominent, circular to pentagonal, 6–12 mm in diam., sometimes with hair-like papillae; lobes spreading, 9–15 × 3–9 mm, ± completely replicate, clavate vibratile hairs sometimes present. **Corona** 4.5–7.0 mm in diam.; outer lobes reddish brown to purple, spreading into a ± pentagonal disc; inner lobes yellowish, 0.5–2.2 mm long with apices extended into obtuse, ascending, dorsal lobules. Amongst stones, under small bushes in arid areas, alt. 100–1 400 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Mesic Highveld Grassland, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket (Clanville to Maclear SW, from Graaff-Reinet to Cradock and Redhouse).

corderoyi (Hook.f.) N.E.Br

Perennial, dwarf succulent. **Stems** decumbent, spherical to ovoid-cylindrical, 12–30 (–45) × 12–25 mm, glabrous, dark green, 5- or 6-angled with obtuse teeth tipped with 1.0–1.5 mm long leaf rudiment. **Flowers** 1–4; pedicels 15–25 mm long. **Sepals** 4–5 mm long. **Corolla** 30–45 mm in diam.; annulus prominent, circular to ± pentagonal, mottled brownish, 9–15 mm in diam., densely pubescent with whitish to purple hairs; lobes reddish brown to purple or greenish, spreading, 12–16 × 3–5 mm, longitudinally furrowed, replicate but somewhat expanded basally with purple, vibratile, clavate hairs on basal $^{2}/_{3}$ and simple hairs in basal sinuses. **Corona** 6–9 mm in diam.; outer lobes reddish brown to purple, spreading into a ± pentagonal disc; inner lobes 2–3 mm long with apices extended into obtuse, ascending, dorsal lobules. Under bushes in flat areas with small stones, alt. 1 000–1 600 m; Upper Karoo, Dry Highveld Grassland (Middelburg to Hofmeyr and Graaff-Reinet to Cradock).

gracilis Meve

Perennial, dwarf succulent. **Stems** decumbent, ovoid to cylindrical, 10–35 × 7–20 mm, glabrous, dark green to grey-green, 4- or 5-angled with rows of conical teeth tipped with acute, 2.5–4.0 mm long leaf rudiment. **Flowers** 1–4, prostrate; pedicels 10–20 mm long. **Sepals** 3–4 mm long. **Corolla** 16–22 mm in diam.; annulus prominent, pentagonal, green or mottled greenish brown, 6–7 mm in diam., finely papillate; lobes reddish brown tinged greenish, spreading, 7–9 × 4–5 mm, replicate with basal $^{1}/_{3}$ papillate. **Corona** ± 4 mm in diam.; outer lobes greenish yellow to brown, spreading into a circular, pentagonal or ± decagonal disc; inner lobes 0.5–1.5 mm long with apices extended into obtuse ascending dorsal lobules. Disturbed or overgrazed areas on karroid formations, alt. 1 300–1 600 m; Upper Karoo, Lower Karoo (Cradock and Pearston, W to WC border).

Treated as a variant of *D. modesta* N.E.Br. in Bruyns (2005a).

maculata N.E.Br.

Perennial, dwarf succulent. **Stems** decumbent, ovoid to cylindrical, 10–40(–60) × 6–18 mm, glabrous, dark green to grey-green, 4- or 5-angled with rows of conical teeth tipped with 1–3 mm long leaf rudiment. **Flowers** 1–8; pedicels 10–25 mm long. **Sepals** 3–4 mm long. **Corolla** 15–25 mm in diam.; annulus prominent, 5–8 mm in diam., pentagonal, bowl-shaped with margin overtopping coronal disc, whitish with reddish brown maculae; lobes spreading, 5–10 × 3.0–6.5 mm, tightly replicate, linear with simple hairs on basal margins. **Corona** 3.0–3.6 mm in diam., yellow; outer lobes spreading into a circular to ± pentagonal disc; inner lobes ± 1.2 mm long with apices extended into obtuse, ascending, dorsal lobules. On karroid formations, usually amongst stones beneath

small bushes, alt. 700–2 100 m; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo (Aberdeen Road to Cradock).

[E]**modesta** N.E.Br.

Perennial, dwarf succulent. **Stems** decumbent, ovoid to cylindrical, 10–40 × 8–15 (–20) mm, glabrous, dark green to purple, 4- or 5-angled with rows of conical teeth tipped with 1.0–1.5 mm long leaf rudiment. **Flowers** 1–5; pedicels 8–20 mm long. **Sepals** 2.5–4.0 mm long. **Corolla** 15–25 mm in diam., greenish brown to purple; annulus prominent, circular to pentagonal, 5–8 mm in diam., rim densely papillate; lobes spreading, 6–9 × 3–6 mm, folded along midrib with base expanded and apex tightly replicate, glabrous or with fine purple hairs in basal $^{2}/_{3}$. **Corona** 4.0–5.5 mm in diam., cream-coloured to brown or purple; outer lobes spreading into a circular to ± pentagonal disc; inner lobes 1–2 mm long with apices extended into obtuse, ascending, dorsal lobules. Under small bushes, usually in karroid habitats, alt. 150–1 700 m; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Graaff-Reinet to Cradock S, from Willowmore to Port Elizabeth and Grahamstown).

[E]**pillansii** N.E.Br.

Perennial, dwarf succulent. **Stems** decumbent, ovoid to cylindrical, 10–40 × 7–15 mm, glabrous, green, 4- or 5-angled with rows of conical teeth tipped with lanceolate, 0.5–2.0 mm long leaf rudiment. **Flowers** 1–4; pedicels 7–15 mm long. **Sepals** 3–6 mm long. **Corolla** 20–35 mm in diam., shiny, red to purple-brown; annulus 7–10 mm in diam., circular to ± pentagonal and slightly overtopping outer coronal disc, sloping outwards and merging into the corolla lobes, whitish with fine hair-like papillae; lobes ascending, 7–14 × 7–8 mm, lamina folded along midrib, basally expanded and tapering to tightly replicate apices, margins with fine purple hairs. **Corona** 4–5 mm in diam., cream-coloured to pale yellow; outer lobes spreading into a ± circular disc; inner lobes 1.0–1.5 mm long with apices extended into obtuse, ascending, dorsal lobules. Under small bushes in stony areas, alt. 150–750 m; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Aberdeen to Hankey and Kirkwood).

EMPLECTANTHUS N.E.Br.

Species 3, sthn Afr., KZN, EC.

[E]**dalzellii** D.G.A.Styles

Perennial, herbaceous climber. **Stems** slender, up to 4 m long. Leaves spreading, broadly lanceolate 35–75 × 13–50 mm; petioles 10–18 mm long. **Inflorescences** axillary, umbels lax, sessile, up to 8-flowered. **Flowers** small, 8–9 mm in diam. **Corolla**: base reddish maroon; tube dark purple, apex brownish purple tinged white; cupular tube 2.0–2.2 mm deep, 4–5 mm in diam., housing gynostegial column, mouth white-hairy; lobes spreading-erect, deltate-ovate; pedicels slender, 17–21 mm long. **Staminal corona** dark purple; lobes 1.4–1.6 mm high, 0.35–0.45 mm wide, ligulate, connivent over style-stigma-head, dilating apically, bifidly lobed along top margin. **Corona**: interstaminal corona lobes ± 0.75 mm long, pouch-like with 2 distally divergent, knob-like, short protrusions, proximally fused together and to back of interstaminal lobes. Forests and forest margins, alt. 270–500 m; Indigenous Forests (Mtentu and Msikaba areas).

gerrardii N.E.Br.

Perennial, herbaceous climber. **Stems** slender, up to 2 m long. **Leaves** heart-shaped, 54–95 × 30–65 mm, petiolate. **Inflorescences** axillary, umbels lax, 4–8-flowered. **Flowers** 12.0–15.7 mm in diam. **Corolla**: basal saucer yellow-green-striped, rimmed maroon; lobes yellow-green; cupular plate 1.5–2.0 mm deep, 5.5–6.5 mm in diam., housing gynostegial column; lobes lanceolate to ovate, 6.0–7.5 × 4.0–6.5 mm. **Staminal corona** dark purple; lobes ± 0.5 mm long, pouch with 2 distal, falcate, knob-like protrusions, proximally fused to each other and to back of interstaminal lobes. **Corona**: interstaminal corona lobes ± 1 mm high, base somewhat bulbous where attached to anthers, apically linear-ligulate, erect and incumbent on style-stigma-head, bifid. **Follicles** paired, stalks straight, filiform, curved at very base, smooth and glabrous, apical hook minute. Forests and on forest margins, alt. ± 1 400 m; Indigenous Forests (Transkei, Ngeli).

FANNINIA Harv.

Species 1, sthn Afr., KZN, EC.

caloglossa Harv.

Delicate, perennial, geophytic herb, 100–250 mm high. **Stems** solitary, white-hairy. **Leaves** spreading to erect, in 2 or 3 pairs; lamina ovate to narrowly lanceolate, 25–46 × 8–25 mm. **Inflorescences** terminal, solitary, umbels lax, nodding, 4(–6)-flowered; pedicels and peduncle noticeably long. **Flowers** creamy lilac, veins purple. **Corolla lobes** erect, oblong-lanceolate, 7.5–12.5 × 4.5–7.0 mm; lower surface white-villous. **Staminal column** short, 4.2 mm high, stipitate. **Corona** purple-black; lobes erect, oblong, much overtopping style-stigma-apex, 5–6 mm high, ± 2.5 mm wide, apex truncate, 2 white appendages at base curving over style-stigma-head. **Anther** suborbicular, incumbent on style-stigma-head. Highlands (Drakensberg) or midlands on mountain islands, annually burned areas, alt. 750–2 500 m; Sub-Escarpment Savanna, Drakensberg Grassland (Drakensberg and Clydesdale S to Keiskammahoek, Cathcart, Hogsback and Stutterheim).

FOCKEA Endl.

Species 6, tropical and sthn Afr.; 6 in sthn Afr., widespread in arid regions, N, FS, KZN, NC, WC, EC.

Although a basal and ancient genus in the Asclepiadoideae, there is no indication that *Fockea* species were isolated for great lengths of time. On the contrary, a number of species show a great range in morphological diversity. This makes the circumscription of species complex. The account below largely follows the research of Bruyns & Klak (2006), supplemented with some insights from Court (1982) and the current author.

comaru (E.Mey.) N.E.Br.

Perennial, herbaceous geophyte of arid areas. **Stems** 300–500 mm high, erect or twining, climbing or decumbent; produced from a napiform tuber becoming deformed with age; young growth tomentose. **Leaves** linear, 25–65 × 1.5–2.0(–4.0) mm, margins flat to slightly undulate and revolute, glabrous or thinly and shortly hairy; petioles ± 1 mm long. **Inflorescences** sessile. **Flowers** 3 or 4(–6) at nodes; pedicels 1–2(–3) mm long. **Corolla**: tube 1.5–3.5 mm long; lobes linear, 4–12 × 1–2 mm, spreading and often spirally twisted; white, grey-green, to brownish green or greenish yellow when young.

Corona: interstaminal corona lobes exceeding corolla tube, consisting of 5 lobes fused basally into a tube 4–6 mm long; lobes are apically divided into 3 lobules, middle one being cylindric and longer (2.0–2.5 mm), while lobules on each side are flatter and shorter, these lobules flex strongly outwards apically; staminal corona of 5 cylindric lobes appressed against stamens and overtopping them. **Anther appendages** erect, inflated, ovoid and almost as long as corona tube, 5–6 mm long. Stony places on hillsides; Rainshadow Valley Karoo, Albany Thicket (Willowmore to Steytlerville and Grahamstown).
Court (1982) includes *F. angustifolia* K.Schum. as a synonym of *F. comaru*, while Bruyns & Klak (2006) maintain *F. angustifolia* as a separate more northern species.

edulis (Thunb.) K.Schum.

Perennial, geophytic herb or herbaceous climber. **Stems**: non-climbing ones 50–300 mm long, up to 2 m when twining; produced from large underground or partially exposed tuber, up to 1 m wide. **Leaves** in widely separated pairs or clustered on short contracted stems, lanceolate, oblanceolate, oblong, elliptic, 15–45 × 6–21 mm, apex obtuse or acute to apiculate, margins flat or wavy, not revolute, essentially glabrous; petioles 2–8 mm long. **Inflorescence** a cyme; peduncle short, (1–)2–3 mm long. **Flowers** (1)2–8; pedicels ± 2 mm long. **Corolla**: tube 2–3(–5) mm long; lobes linear 6–12 × 1.5–2.0 mm, spreading-recurved, twisting with apex turned, margins replicate; greyish green outside, greenish yellow inside. **Gynostegial column** shortly pseudostipitate. **Corona**: interstaminal corona lobes exceeding corolla tube, consisting of 5 lobes fused basally into a tube 3–4 mm long; lobes apically divided into 3 lobules, middle one being cylindric and longer (3–4 mm), while lobules on each side are flatter and shorter, these lobules flex strongly outwards apically, major complex lobes connected by 5 linear lobules that are truncate to emarginate, spreading outwards; staminal corona of 5 cylindric lobes appressed against the stamens and overtopping them and reflexed out towards apex. **Anther appendages** erect, inflated ± $^{2}/_{3}$ as long as corona tube. Karoo, along coast, dune thicket, valley bushveld, forest; Albany Thicket, Rainshadow Valley Karoo, Indigenous Forests (Graaff-Reinet S, from Steytlerville to Uitenhage, Port Elizabeth and Alexandria).

sinuata (E.Mey.) Druce

Perennial, herbaceous geophyte, deciduous. **Stems** 50–300(–450) mm long, simple or bifurcate, erect or weakly twining, young growth tomentose; produced from napiform tuber. **Leaves** brownish to grey-green, linear to linear-oblong, margins strongly sinuate, also revolute, 35–65 × 2–4 mm, apex obtuse, pubescent on darker-coloured upper surface, sessile. **Inflorescence** a 1–10-flowered cyme; peduncle (1)3–5 mm long; pedicels 1–3 mm long. **Corolla**: tube 1.5–2.5(–3.0) mm long, outside greyish green, inside green to brown; lobes narrowly lanceolate, 3.5–4.5 × 2 mm, margins reflexed, apex twisted. **Gynostegial column** shortly pseudostipitate. **Corona**: interstaminal corona lobes exceeding corolla tube, consisting of 5 lobes fused basally into a tube (3–)4–6 mm long; lobes apically divided into 3 lobules, middle one cylindric, strongly reflexed and longer, 2.0–2.5 or 3–4 mm long, lobules on each side erect and shorter, these major complex lobes connected by 5 linear lobules that are truncate to emarginate and erect; staminal corona of 5 cylindric linear lobes appressed against the stamens and overtopping them, erect. **Anther appendages** ± $^{2}/_{3}$ length of corona tube. Karroid vegetation, open flat pan-like areas with loamy calcareous soil; Rainshadow Valley Karoo (Willowmore area).

GOMPHOCARPUS R.Br.

Species 20 (25 taxa), drier parts of African continent and contiguous parts of Arabia, Sinai, Israel, Jordan; 8 in sthn Afr., widespread.

cancellatus (Burm.f.) Bruyns

Berg(*-tonteldoosbos*, *-melkbos*, *-tontelbos*) (A)

Perennial herb or shrub, 0.7–1.2 m high. **Stems** erect, stout. **Leaves** opposite, coriaceous, ovate or oblong, 37–62 × 10–29 mm, base truncate, midrib stout, secondary veins pronounced beneath. **Inflorescences** extra-axillary, terminally clustered, 15–30-flowered; peduncle 5–17 mm long. **Flowers** cream-coloured to white. **Corolla** reflexed; lobes ovate, 5–7 × 3–4 mm. **Staminal column** inconspicuously stipitate. **Corona** white tinged purple; lobes saccate, somewhat fleshy, central sinus cavity 2–3 × 1–2 mm, upper proximal end level with style-stigma-head, upper margin truncate. **Flowering time** Apr.–July? **Follicles**: stalks twisted, solitary, ± erect, ovoid, slightly inflated, beak short. Sandy soil, common along roadsides, alt. 20–1 400 m; Albany Thicket, Eastern Fynbos-Renosterveld, Lower Karoo, Sub-Escarpment Savanna (Graaff-Reinet S, Willowmore, Albany, Port Elizabeth, Riebeeck East, Grahamstown, Highlands).

fruticosus (L.) Aiton f. subsp. **fruticosus**

Milkweed; *melkbos*, *tonteldoosbos* (A); *uSingalwesalukazi* (Z)

Shrub, 0.8–1.5 m high. **Stems** erect, much-branched. **Leaves** opposite, linear-lanceolate, 54–104 × 3–9 mm, base cuneate/attenuate; midrib pronounced beneath. **Inflorescences** extra-axillary, 4–8-flowered. **Flowers** white or creamy yellow. **Corolla** reflexed; lobes ovate, 5–8 × 3–5 mm. **Staminal column** stipitate. **Corona** white tinged purple; lobes saccate, quadrate; central sinus cavity with upper distal ends extended into 2 falcate appendages, ± level with style-stigma-head, upper margin truncate, distal end blunt. **Flowering time** Sept.–Mar. **Follicles**: stalks twisted, solitary, ovoid, inflated, beak pronounced. EC midlands ubiquist, dry sandy veld, short grassland, roadsides and disturbed areas, alt. 900–1 500 m; in all bioregions, except Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Indigenous Forests and Eastern Fynbos-Renosterveld (Oviston Nature Reserve E to Pitseng Pass S, from Richmond to Wodehouse, Aberdeen to Seymour, Hogsback and from Willowmore to East London).

physocarpus E.Mey.

Balloon cottonbush, hairy balls; *balbossie* (A); *umangwazane*, *umbababa* (Z)

Twiggy shrub, 1–2 m high. **Stem** single, erect, becoming much-branched. **Leaves** opposite, narrowly oblong, 40–90 × 7–12 mm, base cuneate/attenuate, midrib and secondary veins pronounced beneath. **Inflorescences** extra-axillary, 5–8-flowered. **Flowers** white. **Corolla** reflexed; lobes ovate, 5–8 × 3–5 mm. **Staminal column** stipitate. **Corona** white tinged purple; lobes saccate, quadrate; central sinus cavity with upper distal end extended into shoulder-like appendage, upper margin jagged, ± level with style-stigma-head, truncate, distal end blunt. **Flowering time** July–May. **Follicles**: stalks twisted, solitary, globose, strongly inflated, 54–62 × 42–56 mm, apex round. Coastal areas, short grassland, roadsides, disturbed areas, alt. 30–700 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Clydesdale S to Port St Johns, across Amatole Mts to Komga, from Assegaaibos to Cape St Francis, Humansdorp and Peddie).

rivularis Schltr.

Perennial herb or shrub, ± 1.2 m high. **Stems** erect. **Leaves** 3- or 4-whorled, linear-lanceolate, 62–124 × 5–10 mm, base cuneate/attenuate, apex acuminate/attenuate, venation herring bone-like, pronounced beneath; interpetiolar scar with colletors present. **Inflorescences** extra-axillary, contracted cymes, 8–11-flowered. **Flowers** white tinged purple. **Corolla** reflexed; lobes olong to ovate, 4–6 × 2–3 mm. **Staminal column** stipitate. **Corona** white; lobes saccate, quadrate; central sinus cavity with upper distal ends extended into 2 shoulder-like lobules, upper margin truncate, level with style-stigma-head; upper distal end rounded, keel ± straight. **Flowering time** Dec.–Feb. **Follicles**: stalks straight, solitary, subglobose, 32–41 × 17–20 mm, apex round. Riversides, alt. 750–1 500 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (rivers between Kokstad and Stutterheim).

tomentosus Burch.

Milkweed, wild cotton; (*wilde-*)*bergkapok* (A)

Stout herb or twiggy subshrub, 0.5–1.5(–2.0) m high. **Stem** erect, 3–8-branched. **Leaves** opposite, linear, 50–110 × 2.0–5.5 mm, base cuneate/attenuate, apex acute, margins revolute, only midrib pronounced beneath. **Inflorescences** extra-axillary, 4–7-flowered. **Flowers** yellow-cream-coloured. **Corolla** reflexed; lobes ovate, 5–7 × 3.0–4.5 mm; lower surface tomentose. **Staminal column** stipitate. **Corona** white or cream-coloured; lobes saccate, D-shaped in outline; central sinus cavity with upper distal end level, having small folds and teeth, this level with style-stigma-head. **Flowering time** July–May. **Follicles**: stalks twisted, solitary, rarely paired, ovoid-fusiform, inflated, 45–73 × 16–24 mm, apical beak long slightly bent at tip. Dry areas, grass cover sparse, roadsides, alt. 600–1 600 m; Upper Karoo, Albany Thicket, Dry Highveld Grassland (Albert District S, from Middelburg to Hofmeyr and from Graaff-Reinet to Cradock).

GONIOMA E.Mey.

Species 1, sthn Afr., S, KZN, WC, EC.

kamassi E.Mey.

Kamassi; *kamassie* (A); *igala-gala* (X)

Shrub or small tree, 0.3–6.0(–10.0) m high; with watery sap. **Stems** slender with leafy crown. **Leaves** 3(4)-whorled, sometimes opposite, oblong to oblanceolate, 40–100 × 10–28 mm; petioles 2–5 mm long. **Inflorescences** compact and terminal, sparsely flowered. **Flowers** tubular, white to yellowish. **Corolla**: tube 6–7 mm long, hairy inside throat; lobe 2.0–3.5 mm long, auriculate at base. Gynoecium apocarpous and bicarpellate. **Flowering** all year, mostly Oct.(–Apr.). **Follicles** paired, at right angles to each other, oblong, often curved, 25–40 × 10–15 mm, surface longitudinally grooved. **Seeds** many, papery and winged. Coastal and inland forests, alt. 0–1 350 m; Indian Ocean Coastal Belt, Indigenous Forests (Umtamvuna Nature Reserve to Willowmore District).

HOODIA Sweet ex Decne.

Species 13, Africa; 12 in sthn Afr., mostly western half of SA (west of 25°E), N, B, LIM, FS, NC, WC, EC.

pilifera (L.f.) Plowes subsp. **pilifera**
Succulent shrub, 0.3–0.6 m high. **Stems** glaucous-green, cylindrical, 25–30-angled; tubercle cushions with 5–9 mm long spines. **Inflorescences** 1–3-flowered. **Flowers** in stem-grooves, 15–20 mm in diam. **Corolla** dark purple to maroon, campanulate; tube cupulate, housing gynostegial column; annulus projecting inwards forming constriction at tube mouth; lobes spreading-erect, deltoid-ovate, 4–6 × 6–7 mm, apex acute. **Corona** dark or reddish purple; interstaminal (outer) corona lobes large, 2–3 mm long, fused to staminal corona at base; staminal (inner) corona lobes broadly linear or tongue-shaped, 0.5–1.0 × 0.6–1.0 mm, obtuse, incumbent on anther backs. **Anther wings** apically divided (bifid) into 2 large, divergent, falcate lobules. **Flowering time** Sept.? **Follicles** paired, fusiform, smooth. Xerophytic vegetation, EC limit of NE distribution, alt. 800–850 m; Rainshadow Valley Karoo (hilly areas around Willowmore, Spitskop).

pilifera (L.f.) Plowes subsp. **annulata** (N.E.Br.) Bruyns
Differing from subsp. *pilifera* in the following: large, succulent shrub, up to 0.45(–0.50) m high. **Stems** 20–23-angled; tubercle cushions, with 4.2–6.0 mm long spines. **Inflorescences** 1-flowered. **Flowers** 19–25 mm in diam. **Corolla** maroon or reddish purple, rotate; tube cupulate, housing gynostegial column, surrounded by a sometimes very pronounced 3 mm high pentagonal annulus; lobes free to annulus, spreading, deltoid-ovate, 5–7 × 7.0–9.5 mm. **Corona** dark purple; interstaminal (outer) corona lobes large, 3.7–4.6 mm high, fused at base; staminal (inner) corona lobes linear, ± 1 × 0.6–1.0 mm. **Anther wings** apically divided (bifid) into 2 large, divergent, channelled, subtriangular lobules. **Flowering time** July–Apr. Xerophytic vegetation in flat areas, alt. 690–1 000 m; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (Rietbron District, Graaff-Reinet, Willowmore District – Kruidfontein, Jansenville, Steytlerville).

HUERNIA R.Br.

Species 72, Africa and Arabia; 44 in sthn Afr., widespread in drier areas.

barbata (Masson) Haw.
Perennial, dwarf succulent. **Stems** erect, 20–64 × 10–20 mm, acutely 4- or 5-angled, tuberculate, glabrous, green to reddish. **Flowers** 1–5; pedicels 6–10 mm long. **Sepals** ± 8 mm long. **Corolla** 15–60 mm in diam., tubular-campanulate, yellowish with red spots becoming concentric red lines in tube; papillate from mouth of tube to ± base of lobes, papillae tipped with purple hairs; lobes spreading to ascending, 9–18 × 15–17 mm. **Corona** 5–8 mm in diam.; outer lobes purple, spreading, notched to bifid; inner lobes purple to cream-coloured, 3–5 mm long, tapering, connivent over column, apex diverging. Habitat variable, usually amongst rocks and bushes, alt. 10–1 600 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Drakensberg Grassland, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Aliwal North S to Willowmore, E to Grahamstown).
Treated as *H. barbata* subsp. *barbata* in Bruyns (2005a).

bayeri L.C.Leach
Perennial, dwarf succulent. **Stems** erect to decumbent, 30–60 mm long, 4- or 5-angled, tuberculate, glabrous, green. **Flowers** developing successively; pedicels up to 35 mm long. **Sepals** 6–7 mm long. **Corolla** 25–30 mm in diam., campanulate with minute asperities often bearing a short hair, cream-coloured to yellowish green with variable amounts of shiny maroon, rarely with reddish transverse lines; lobes spreading, 6–9 × 5–7 mm with prominent intermediate lobes; papillate in mouth of tube, papillae tipped with

a stiff, straight hair up to 2 mm long. **Corona** purple-black ± 4.5–5.0 mm in diam.; outer lobes spreading, bifid, ± 1 × 1.5 mm; inner lobes awl-shaped, connivent over anthers, apex widely divergent-recurved. Habitat?; Albany Thicket, Eastern Fynbos-Renosterveld (Baviaanskloof to Patensie, Hankey and Uitenhage).
Included in *H. thuretii* F.Cels in Bruyns (2005a).

brevirostris N.E.Br.

Perennial, dwarf succulent. **Stems** ascending to erect, 38–64 × 12–25 mm, 4- or 5-angled, tuberculate, glabrous, grey-green to purplish. **Flowers** 3–6; pedicels 8–25 mm long. **Sepals** 3–5 mm long. **Corolla** 25–40(–45) mm in diam., ± rotate with bowl-shaped tube, sometimes with a slight annulus, cream-coloured to yellowish with red-brown spots merging into broken lines in tube; lobes abruptly spreading; mouth of tube and lobes densely papillate, papillae often dark-tipped, sometimes bearing a short hair. **Corona** variable, outer lobes crimson to whitish, oblong, 1.5 mm long, deeply bifid, spreading; inner lobes 1.50–3.25 mm long, purple-brown, awl-shaped, incumbent on anthers with apex connivent-erect over column. Habitat?, alt. up to 1 600 m; Upper Karoo, Dry Highveld Grassland, Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Middelburg to Baviaanskloof, E to Bell).
Following Leach (1988); Bruyns (2005a) treated all subspecies of *H. brevirostris* as variants of *H. thuretii* F.Cels.

[E]**brevirostris** N.E.Br. subsp. **baviaana** L.C.Leach

Corona outer lobes usually cream-coloured or whitish, inner lobes with apices widely divergent. Albany Thicket, Eastern Fynbos-Renosterveld (Baviaanskloof and Groot Winterhoek Mts).

brevirostris N.E.Br. subsp. **brevirostris**

Corolla densely spotted with red-brown. **Corona** inner lobes subobtuse, apices minutely tuberculate. Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Graaff-Reinet to Willowmore).

brevirostris N.E.Br. subsp. **intermedia** N.E.Br. (L.C.Leach)

Corolla unmarked cream-coloured to yellowish, sometimes with a low annulus. Upper Karoo, Dry Highveld Grassland, Lower Karoo, Albany Thicket (Middelburg to Klipplaat, E to Bell).

[E]**echidnopsioides** (L.C.Leach) L.C.Leach

Perennial, dwarf succulent. **Stems** erect, rhizomatous, 40–60 × 10 mm, (6)7–9(10)-angled with rows of tubercles, each tipped with a small tooth, glabrous, green sometimes infused with red. **Flowers** 1–5; pedicels 4–7 mm long. **Sepals** 5–7 mm long. **Corolla** 20–30(–35) mm in diam., campanulate, yellowish to cream-coloured with small reddish spots; densely papillate except for lower part of tube, papillae with red marks and sometimes tipped with a small hair; lobes spreading to decurved, 7.5–10.0 × 6–8 mm. **Corona** 5.5–7.0 mm in diam.; outer lobes spreading, variably emarginate, deep purple; inner lobes reddish, connivent-erect with swollen apices. Habitat variable, but usually on rocky substrates, alt. 300–900 m; Albany Thicket, Eastern Fynbos-Renosterveld (Groot Winterhoek Mts to E end of Baviaanskloof Mts).
Treated as *H. longii* Pillans subsp. *echidnopsioides* (L.C.Leach) Bruyns in Bruyns (2005a).

guttata (Masson) Haw. subsp. **guttata**
Perennial, dwarf succulent. **Stems** decumbent to erect, up to 50–76 × 13–19 mm, 4- or 5-angled, tuberculate, glabrous, grey-green. **Flowers** 1–5; pedicels 10–30 mm long. **Sepals** 5–7 mm long. **Corolla** (20–)25–70 mm in diam., saucer-shaped with prominently raised annulus containing stiff inwardly pointing hairs at mouth; lobes erect to spreading, variably papillate, whitish yellow with maroon spots, 9–11 × 9–11 mm. **Corona** 6–8 mm in diam., cream-coloured to maroon; outer lobes spreading, variably emarginate to bifid; inner lobes 4.5–5.5 mm long, awl-shaped, appressed to anthers basally and connivent above column, apex diverging-ascending. Rocky areas amongst bushes and other succulents, alt. 400–1 000 m; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Somerset East to Willowmore, Joubertina and the Suurberg).
Expanded to include *H. guttata* (Masson) Haw. subsp. *calitzdorpensis* L.C.Leach in Bruyns (2005a).

humilis (Masson) Haw.
Perennial, dwarf succulent. **Stems** erect, stout, pyramidal, 50–64 × 15–25 mm, 4- or 5-angled, tuberculate, glabrous, grey-green with maroon markings. **Flowers** 1–5; pedicels ± 10 mm long. **Sepals** 2.5–4.0 mm long. **Corolla** 25–30 mm in diam., rotate with a prominent annulus, colour variable, usually pale yellow with maroon spots, base of tube shiny maroon; lobes spreading, covered with minute maroon papillae. **Corona** dark maroon; outer lobes spreading, variably bilobed; inner lobes ± 1 mm long, appressed to and subequalling or shortly exceeding anthers, tapering from transverse dorsal gibbosities into small acute apex. Amongst rocks, either exposed or beneath bushes, alt. 1 200–1 600 m; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Willowmore area).
Expanded to include *H. thudichumii* L.C.Leach in Bruyns (2005a).

hystrix (Hook.f.) N.E.Br. var. **parvula** L.C.Leach
Perennial, dwarf succulent. **Stems** erect to decumbent, 20–50(–100) mm long, 5-angled, tuberculate, glabrous, green to purplish. **Flowers** 1–3; pedicels 14–32 mm long. **Sepals** 5–8 mm long. **Corolla** 30–35 mm in diam., ± rotate with a pan-shaped tube, cream-coloured to yellowish with concentric maroon lines and spots; lobes spreading, covered with awl-shaped papillae ± 2.5(–3.0) mm long. **Corona**: outer lobes maroon, rectangular, spreading; inner lobes ± 3 mm long, erect, apex slightly recurved, truncate-clavate (hoof-like) and pustulate-rugulose. Rocky areas, often on sandstone cliffs near rivers, alt. 200–600 m; Sub-Escarpment Savanna (Mount Frere to Mthatha).
Elevated to *H. hystrix* subsp. *parvula* in Bruyns (2005a).

[E]kennedyana Lavranos
Perennial, dwarf succulent. **Stems** erect to decumbent, caespitose, globose 10–35 × 10–25 mm, 6–8(–10)-angled, obtusely tuberculate to tesselate, glabrous, grey-green to purplish. **Flowers** 1–5; pedicels 4–9(–15) mm long. **Sepals** 3–4 mm long. **Corolla** 20–25 mm in diam., bowl-shaped, cream-coloured to dull yellow with maroon to reddish brown transverse markings becoming spots at base of tube; conspicuously papillate, papillae up to 3 mm long; lobes 6–7 × 6.0–6.5 mm. **Corona**: outer lobes pale pink, oblong sometimes apically notched, spreading; inner lobes yellow, ± 2 mm long, subulate, appressed to anthers in basal half, connivent, erect, apex slightly recurved, obtuse, micro-tuberculate and slightly clavate. Raised, gravelly areas, sometimes on dolerite, alt. 1 100–1 500 m; Upper Karoo, Albany Thicket (Cradock District to Somerset East).

[E]**longii** Pillans

Perennial, dwarf succulent. **Stems** rhizomatous, erect to decumbent, 30–70(–150) × (3–)5–15 mm, 6–8-angled, with spiralled rows of tessellate tubercles, glabrous, grey-green. **Flowers** 1–5; pedicels 2–5 mm long. **Sepals** 4.0–4.5 mm long. **Corolla** 20–30(–35) mm in diam., campanulate, yellowish with small red-brown spots; lobes 5.5–10.5 × 6.0–7.5 mm, spreading; papillate to mouth of tube, papillae cylindrical, up to 0.75 mm long. **Corona**: outer lobes maroon, variable, ± subquadrate to triangular; inner lobes awl-shaped, 2.0–2.5 mm long, appressed to anthers in basal half, connivent erect above with apex recurved, micro-tuberculate and slightly clavate. Among grasses and other succulents beneath bushes on steep conglomerate slopes, alt. 200–400 m; Albany Thicket (below Groendal Dam W of Uitenhage).

Treated as *H. longii* subsp. *longii* in Bruyns (2005a).

[E]**pendula** E.A.Bruce

Perennial succulent. **Stems** pendent, sometimes basally erect but bent over and rooting where they touch the ground, 150–500(–1 500) × 3–8 mm, ± cylindrical to obscurely 4-angled, glabrous, grey-green. **Flowers** 1–5; pedicels 7–10 mm long. **Sepals** 3–4 mm long. **Corolla** 15–26 mm in diam., bowl-shaped, dark maroon, densely papillate; lobes suberect to spreading, sometimes recurved. **Corona** dark maroon; outer lobes spreading to form a 3.0–3.5 mm in diam. crenate disc; inner lobes strap-shaped, ± 1.5 mm long, basally appressed to anthers, converging above and tapering to obtuse tuberculate apex. Pendent from ledges on cliff faces and gorges, alt. 400–800 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Mbashe River near Elliotdale and Kei River from around Bolo to Kentani).

[E]**piersii** N.E.Br.

Perennial, dwarf succulent. **Stems** erect, 10–15 × 45–50 mm, 4(5)-angled, tuberculate, glabrous, green mottled with purple. **Flowers** 2 or 3; pedicels up to 25(–40) mm long. **Sepals** 1.5 × 2.5–5.0 mm. **Corolla** up to 35 mm in diam.; ± rotate with bowl-shaped tube, yellowish to cream-coloured with red-brown spots becoming concentric lines inside tube; lobes suberect to spreading, up to 10 mm long, papillate to mouth of tube, papillae terminating in long, erect, crimson hairs. **Corona**: outer lobes dark crimson, spreading, ± rectangular and variably notched; inner lobes brownish, awl-shaped, ± 3 mm long, basally appressed to anthers then connivent above anthers, apex diverging. Amongst stones and other succulents, usually on dolerite, alt.?; Upper Karoo, Lower Karoo, Sub-Escarpment Grassland, Albany Thicket, Rainshadow Valley Karoo (Sterkstroom area S, from Aberdeen to Naudesberg Pass and Steytlerville area).

Collections from the Steytlerville area treated as a form of *H. thuretii* F.Cels by Bruyns (2005a).

pillansii N.E.Br.

Perennial succulent. **Stems** erect, cylindrical to narrowly ovoid, 15–60(–180) × 7–15 mm, grey-green, (9)10–16(–24)-angled with vertical to spiralled rows of tubercles, each tubercle tipped with a 2–8 mm long bristle making the stems look 'furry'. **Flowers** 1–5; pedicels 2–8 mm long. **Sepals** 8.5–12.5 mm long. **Corolla** 30–50 mm in diam., cream-coloured to yellowish with small red spots; tube campanulate; lobes spreading to recurved, 12–22 mm long; papillate to halfway inside tube, papillae cylindrical, up to 1 mm long, sometimes bearing a small hair. **Corona** maroon; outer lobes spreading, variable, ± rectangular to triangular; inner lobes erect, dorsiventrally flattened,

2.0–2.5 mm long, tapering to clavate, tuberculate apex. Amongst bushes in rocky areas, alt. up to 300 m; Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Campfers Poort NW of Steytlerville SW to Nuwekloof).

thuretii F.Cels

Perennial, dwarf succulent. **Stems** decumbent to erect, ± 50 × 8–10 mm, 4- or 5(6)-angled, tuberculate, glabrous, green. **Flowers** many; pedicels up to 25 mm long. **Sepals** ± 5 mm long. **Corolla** size variable, up to ± 25 mm in diam., rotate, cream-coloured to yellowish, with or without red markings; tube subglobose, mouth slightly constricted; lobes spreading, sometimes convex, up to 9 mm long, lobes and upper half of tube usually papillate. **Corona**: outer lobes variable, crimson to black, spreading, triangular to subquadrate, emarginate; inner lobes brown to black, 1.5–2.0 mm long, connivent-erect, flattened, tapering to finely tuberculate apex. Amongst grasses or other succulents, usually on rocky outcrops, alt. 30–1 500 m; Upper Karoo, Albany Thicket, Drakensberg Grassland, Sub-Escarpment Grassland, Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Queenstown, Cradock, Pearston, Bolo, Steytlerville E to Kayser's Beach).

[E]**thuretii** F.Cels var. **primulina** (N.E.Br.) L.C.Leach

Following Leach (1988); Bruyns (2005) expanded *H. thuretii* to include *H. bayeri* and *H. brevirostris*.

Corolla unmarked, usually prominently papillate, sometimes with a low annulus. Sub-Escarpment Grassland, Upper Karoo, Lower Karoo, Albany Thicket, Drakensberg Grassland, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Queenstown, Cradock, Pearston E to Bolo, Steytlerville E to Peddie).

thuretii F.Cels var. **thuretii**

Corolla with concentric transverse reddish markings, ranging from interrupted lines to rows of small spots. Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna, Lower Karoo, Eastern Fynbos-Renosterveld (Queenstown, Uitenhage, Stutterheim area, E to Kayser's Beach).

ISCHNOLEPIS Jum. & H.Perrier

Species > 300, Mediterranean, Africa, Asia, Malesia, Melanesia, Australia and Central and Southern America.; 3 in sthn Afr., M, KZN, EC.

Based on molecular evidence this species is still placed in the genus *Petopentia* by some authorities.

natalensis (Schlt.) Venter.

Woody, twining climber, 10(–15) m long; stems stout, reddish brown. **Leaves** spreading, with interpetiolar stipular ridge; lamina narrowly oblong, 80–137 × 14–58 mm, apex obtuse, apiculate tip up to 14 mm long; midvein embossed above, prominent below, secondary veins at right angles to it, pronounced. **Inflorescences** axillary, cymose, 1–8-flowered. **Flowers** rotate, partly epigynous. **Corolla** yellow-green; lobes with median purple-brown line, almost free to base, twisted in middle, 12–14 × 4 mm; tube 1–2 mm long. **Corona** green, quadrate-triangular, upper outer edges shoulder-like, filiform appendage 8.0–8.5 mm long. **Stamen** apex connivent over style-stigma-head. **Follicles** paired, almost woody, widely divergent, narrowly fusiform, beak outwardly recurved and hooked. Coastal or inland forest, woodland margins, slopes of steep ravines, alt. 50–700 m; Indigenous Forests (KZN border, Ngqaqini to Umtamvuna).

MARSDENIA R.Br.

Species > 300, in Mediterranean, Africa, Asia, Malesia, Melanesia, Australia and Central and South America.; 3 in sthn Afr., widespread, except in FS, L, WC.

floribunda (E.Mey.) N.E.Br.

Perennial, woody climber reaching up to forest canopy. **Stems** much branched, 1–10 m long, young herbaceous stems rusty-hairy. **Leaves** spreading, ovate-lanceolate to ovate, 17–64 × 12–38 mm, glabrous; petioles 6–12 mm long. **Inflorescences** pedunculate (6–17 mm long), erect, pseudo-umbels. **Flowers** often abundant; pedicels stout, 3.5–9.0 mm long; scent foetid-mousey. **Corolla** campanulate-rotate, fused for half its length; tube campanulate, 1.5–2.8 mm deep; lobes spreading, oblong, 2–3 × 1.6–2.0 mm. **Corona**: coralline corona lobe absent, glabrous, white or occasionally greenish yellow. **Stamens**: anther appendages large, ovate to ovate-lanceolate, connivent into a pyramidal-like structure over the conical style-stigma-head; staminal corona lobes arising at base of gynostegial column, fleshy, teardrop-shaped, small and inconspicuous, ± 0.75 mm high, free but fused to anther base, apex not overtopping style-stigma-head. Forest margins on densely vegetated riverbanks, just inland or in coastal zone; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Kei River S to Suurberg).

sylvestris (Retz.) Schult.

Perennial, often large, woody climber. **Stems** with many branches produced irregularly, up to 10 m long, young growth hairy. **Leaves** spreading, elliptic to ovate, 15–90 × 8.5–55.0 mm, venation prominent below, glabrous to softly hairy; petioles up to 22.5 mm long. **Inflorescences** pedunculate (2–11 mm long), spreading, umbel-like cymes, 2 produced on either side of node. **Flowers** small, ± 4.5 mm in diam.; pedicels 2.0–6.7 mm long; sweetly scented. **Corolla** campanulate-rotate, fused for half its length; tube campanulate, 1.6–2.0 mm deep. **Corona**: coralline coronas produced at both sides of lobe near base, fleshy, linear-cuneate, 1 mm long, shallowly channelled down middle, fused from tube base to mouth but apex free and acute, incurved and just exceeding mouth; densely hairy on either side; lobes spreading to reflexed, fleshy, oblong-ovate, ± 1.6 × 1.6 mm, glabrous; yellow to yellowish white. **Stamens** with anther appendages short and wide, incumbent on style-stigma-head; staminal corona lobes absent. **Style-stigma-head** stout, conical and ovoid, protruding from tube mouth, apex entire or bifid. Savanna, deciduous forest or densely vegetated riverbanks; Indigenous Forests, Indian Ocean Coastal Belt, Drakensberg Grassland, Sub-Escarpment Savanna (Pondoland Coast S, from Kat River to Alice).

MICROLOMA R.Br.

Species 11, sthn Afr., N, FS, NC, WC, EC.

armatum (Thunb.)

Ystervarkbossie (A)

Perennial shrub or dwarf shrub, 0.1–0.6 m high. **Leaves** slightly fleshy, triangular in shape, shortly petiolate. **Inflorescence** sessile, cymose, 2-flowered; pedicels 2–4 mm long. **Sepals** ± half as tall as corolla, slightly spreading, narrowly lanceolate, greenish, pubescent. **Corolla** urceolate to tubular, slightly constricted just below mouth with 10 ridges descending from bases of lobes, greenish yellow; lobes ovate, folded inwards. **Corona** absent. **Gynostegium** ± 2 mm tall, narrowing from base to an acute apex. **Anthers** with divergent spurs. **Pollinia** stout. **Flowering time** Nov.–Feb. **Follicles**

50 mm long. Plains, stony hillsides, grazing plots, alt. 150–1 800 m; Upper Karoo, Albany Thicket, Sub-Escarpment Grassland (Middelburg District S, Graaff-Reinet, Cradock and Wortelkuil).

sagittatum (L.) R.Br.

Bokhoring, (*melk-*), *heuningblommetjie* (A)

Perennial climber or rambler if no support; stems 0.2–1.5 m high, pubescent, green, covered with brown-grey corky bark when aging. **Leaves** linear, base auriculate to sagittate, apex acute to obtuse, margins revolute, pubescent, green-grey; petioles 1–5 mm long. **Inflorescence** cymose, 3–10-flowered; peduncles 1–9 mm long; pedicels 4–10 mm long, red-tinged; floral bracts linear, pubescent. **Sepals** slightly spreading to reflexed, lanceolate, puberulous along margins and lower surface. **Corolla** tubular, inflated in lower half or wider towards mouth, pink to dark pink, tinged green towards base; lobes green tinged pale pink at base and reddish towards margin. **Corona** coralline, tubercles inserted at widest point of corolla tube projecting towards gynostegium, apices upturned. **Gynostegium** 4–5 mm tall. **Follicles** fusiform, 45–90 mm long. Well-drained sand, stony soil, full sun, foothills or gentle slopes, alt. 10–1 300 m; Rainshadow Valley Karoo, Albany Thicket (Willowmore SW to Gwarriepoort Area, farm Keurfontein and Bakens River Valley near Port Elizabeth).

MIRAGLOSSUM Kupicha

Species 7; 5 endemic to eastern half of sthn Afr., LIM, NW, G, M, S, FS, KZN, L, EC.

anomalum (N.E.Br.) N.E.Br.

Perennial, geophytic herb, 200–350 mm high; stems simple, pilose-hairy. **Leaves** verticillate on flowering part of stem, internodes up to 20 mm long; blade subsessile, linear to triangular, 25–47 × 2–9 mm, base truncate. **Inflorescence** with 3–9 flowers at distal nodes. **Flowers**: pedicels up to 12 mm long; corolla lobes 4–5 × 2–3 mm, convex and reflexed at anthesis, dorsal surface very sparsely to densely patent-pilose at apex, green; corona green to maroon with white process, compressed-ovoid with 2 shallow concavities on ventral face, one on either side of connection between corona and stamina column; corpusculum 0.3–0.5 mm long, with slight to well-developed flanges. **Flowering time** Nov.–Mar. **Fruit** up to 50 mm long, with bristles up to 2 mm long. In grassland and on stony slopes, alt. 450–1 560 m; Drakensberg Grassland, Sub-Escarpment Savanna (Komga SE to Kei River Mouth).

pulchellum (Schltr.) Kupicha

Horned miracle-tongue; *mpulutsoane*, *sehoete-mpulutsoane* (SS)

Perennial, geophytic herb, 200–600 mm high. **Leaves** irregularly inserted throughout stem, flowering part not well defined, leaves sometimes present between flower fasicles, subsessile; blade linear to narrowly ovate, 20–50 × 1–5 mm, pubescent to pilose. **Inflorescence** 3–5-flowered in a terminal umbel, also in fasicles at 1–3 nodes below apex. **Flowers**: pedicels up to 17 mm long; corolla convex and reflexed at anthesis, lobes 7–8 × 4.0–4.5 mm, brownish green; corona green or white, appendage green, purple or brown, lobes ± circular, fleshy, appendage stout, arising from ventral surface of lobe, curving back over its apex. **Flowering time** Nov.–Jan. **Fruit** 35–70 mm long, with 2 mm long bristles, surface whitish pubescent. In grassland, alt. 600–2 380 m; Drakenberg Grassland (Ramatseliso's Gate S to Maclear).

verticillare (Schltr.) Kupicha

Perennial, geophytic herb, 100–350 mm high. **Leaves** crowded, rarely scattered and irregularly inserted on lower non-flowering part of stem, verticillate at flowering nodes, leaves at flowering nodes not reduced in size, blade 17–45 × 1–2 mm, narrowly linear, subsessile, apressed-pilose. **Inflorescence** in fasicles of 2–6 at distal 2–5 nodes **Flowers**: pedicels up to 10 mm long; corolla lobes 4.5–6.5 × 2.5–3.5 mm, spreading to reflexed at anthesis, green, dorsal surface pilose, hairs hyaline patent and brownish appressed; corona basal lobes 1.5 mm long, compressed-ovoid with 2 shallow concavities on ventral face, apical processes curving to the right and overlapping forming a loose wreath above gynostegium, white with deep green base and margins. **Flowering time** Nov.–Feb. **Fruit**? In rocky grassland, alt. 900–1 800 m; Drakensberg Grassland (Between Cala and Elliot).

*NERIUM L.

Species 1?, Mediterranean to Cape Verde Islands, naturalised in many areas; declared weed in sthn Afr., M, KZN, WC, EC.

A highly poisonous but popular, evergreen garden shrub, cultivated for ornament and screening, has toxic, clear, sticky sap, often occurs as an escape.

oleander L.

Ceylon(s)rose, oleander; *Ceylon(s)roos* (A)

Shrub or small tree, 1–4 m high. **Leaves** ternate; lamina coriaceous, narrowly elliptic, 50–210 × 10–35 mm, acuminate or acute at apex, cuneate at base; petioles 3–10 mm long. **Inflorescence** terminal or axillary, thyrsoid, lax. **Flowers** actinomorphic, ornamental. **Calyx** free, narrowly triangular to narrowly ovate. **Corolla** showy, white, pink to wine-red, yellow or salmon; tube infundibuliform; lobes in bud overlapping to right, obovate, rounded, entire; corona of 5 truncate epipetalous parts, 3–8-lobed. **Stamens** 5; filaments short; anthers 4-locular, narrowly triangular, fertile at sagittate base, introrse, with filiform apical appendages. **Ovary** broadly ovoid. **Follicles** 2, narrowly oblong. **Seeds** oblong with 9–12 mm long tuft of hairs at truncate apex. Rocky and gravelly, dry watercourses, semi-arid regions; North Africa, Middle East, northern India, southern China, declared weed (Category 1); Eastern Fynbos-Renosterveld, Albany Thicket (Baviaanskloof River, Humansdorp).

ONCINEMA Arn.

Species 1, sthn Afr., S, WC, EC.

lineare (L.f.) Bullock

[= *Glossostephanus linearis* (L.f.) E.Mey.]

Perennial climber. **Leaves** shortly petiolate, linear-lanceolate. **Flowers** in lax cymes or racemes, lateral at nodes, pedunculate. **Corolla** with shallowly campanulate tube and 5 suberect, linear lobes, greenish yellow. **Corona** of 5 lobes ± as long as staminal column; lobes free, erect, laterally compressed, linear, grooved down back, white. **Style** produced into tapering, bifid column as long as corolla. **Flowering time** Nov., Feb.? **Follicles** solitary by abortion, narrowly fusiform. **Seeds** brown, linear-lanceolate, convex on back, concave on face, narrowly winged, smooth or with irregular ridges. Forest, alt. 50–1 200 m; Indigenous Forests [Tsitsikamma (Lottering), Uitenhage District, and to Humansdorp District (Clarkson)].

ONCINOTIS Benth.

Species 7, Africa and Madagascar; 1 in sthn Afr., KZN, EC.

tenuiloba Stapf

Scrambling shrub or woody climber, 4.5(–30.0) m long, sometimes reaching forest canopy. **Bark** noticeably warty. **Leaves** obovate to oblanceolate, 60–110 × 15–45 mm, apex attenuate, forming drip-tip; venation purplish. **Inflorescences** axillary, compound cymes. **Flowers** salver-shaped, green. **Corolla**: tube 3–4 mm, mouth with corona consisting of 5 ligulate scales alternating with lobes; lobes reflexed, linear-oblong, 3–6 mm long. **Anthers** sessile, reaching corolla tube mouth. **Circumgynoecial annulus** copular, deeply 5-lobed, almost as high as ovaries. **Gynoecium** apocarpous, bicarpellate. **Style head** fusiform with a fringe near bifid apex. **Flowering time** Sept., Oct. **Follicles** paired, fusiform, 140–180 × 6–8(–10) mm. **Seeds** many, comose. Moist forests, scrub forest, on cliffs, near coast, alt. 50–850 m; Indian Ocean Coastal Belt, Indigenous Forests (Pondoland, Umtamvuna Nature Reserve, Manubi Forest).

[E]OPHIONELLA Bruyns

Species 2, sthn Afr., endemic to EC.

Outside of corolla cream-coloured, often suffused with pink, smooth, glabrous; inside cream-coloured, base maroon, extending slightly to pale yellow of lobes, smooth

arcuata (N.E.Br.) Bruyns

Perennial, creeping succulent; stems 50–100 mm (or more) long, glabrous, green, procumbent then dividing underground and sometimes arising again, always finishing growth underground to form loops above ground, obtusely 4-angled, with slightly flattened sides, angles with tubercles. **Inflorescences** fascicles along sides or under loops of stems, 1–3 flowers per fascicle. **Sepals** ± ovate, subulate-acuminate with recurved apex, glabrous. **Corolla** ovoid, apex acuminate; tube campanulate; lobes creamy white to pale yellow within with pink tinting or markings extending to acute, connate apex. **Corona** 2-seriate (appearing as one series), bright yellow; outer lobes alternating with anthers, deltoid, ascending; inner lobes, erect, ± as tall as anthers, protruding beyond outer lobes, backs rounded, appearing as stout ribs. Low-lying, flat areas in valleys or low, gravelly slopes under small, karroid bushes; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket [between Willowmore, Port Elizabeth and Dikkop Flats (N of Grahamstown)].

Outside of corolla white, speckled with pale red, sparsely covered by small, obtuse, conical papillae, glabrous; inside white with 3 concentric deep red rings, smooth with indumentum of stiff, erect, cylindric white to red hairs up to 1 mm long

willowmorensis Bruyns

Perennial, creeping succulent, 30–150 mm long, 3–5 mm thick; stems somewhat subterranean, then slender, becoming thicker on emerging. **Inflorescences** arising near base of stem, of four small clusters. **Sepals** ovate-acuminate, transparent white, papillate. **Corolla** bud-like, broadly elliptical; outside white, speckled with pale red; inside white with 3 concentric deep red rings in tube, smooth with indumentum of stiff, erect, cylindric white to red hairs up to 1 mm long. **Corona** raised on short, cylindrical stipe, bright yellow, 1.2 ×1.5–2.5 mm; outer lobes ± 0.5 mm long, lanceolate-obtuse to acuminate, laterally joined to horizontally spreading, flattened projections divided into 4 or 5 obtuse

teeth; inner lobes 0.25 mm long, ± deltoid, appressed to backs of anthers, dorsiventrally flattened. **Flowering time** Jan.? Endemic to mountains NE of Willowmore, steep N-facing sandstone slopes, under small bushes or rock crevices, alt. 1 100–1 200 m; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Witteberg and Boesmanspoortberge).

ORBEA Haw.

Species 55, Africa and Arabia; 30 in sthn Afr., widespread.

cooperi (N.E.Br.) L.C.Leach

Perennial, dwarf succulent; stems erect or ascending, 20–60 × 5–11 mm, 4-angled with rows of spreading, conical, teeth up to 7 mm long, glabrous, green with purple markings. **Flowers** 1–3(–10) developing successively; pedicels 6–13 mm long. **Sepals** 4–5 mm long, ovate-lanceolate, acuminate. **Corolla** 22–38 mm in diam., rotate, light purple-brown, rugose with pale yellow transverse ridges and tubercles; annulus ± pentagonal with shallow depression containing gynostegium; lobes 11–15 × 8–11 mm, ovate, acute, margins slightly recurved, vibratile clavate purple hairs on basal half. **Corona** maroon to pale yellow, outer lobes up to 1 mm long, spreading, ± rectangular with apical notch; inner lobes 2.0–3.5 mm long, basally incumbent on anthers, apices connivent-erect, apex clavate, sometimes recurving. Among rocks and bushes in arid areas, alt. 900–1 500 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland and Albany Thicket (Middelburg to Cradock).

macloughlinii (I.Verd.) L.C.Leach

Perennial, dwarf succulent; stems sometimes rhizomatous, erect or decumbent, 30–100 × 6–8 mm, 4-angled with rows of conical teeth up to 15 mm long, glabrous, green suffused with purple. **Flowers** 1–3; pedicels up to 35 mm long. **Sepals** 5–12 mm long, ovate to lanceolate. **Corolla** 35–55 mm in diam., flat to strongly reflexed from centre, maroon with irregular transverse yellow markings; annulus pentagonal to circular ± 5 mm in diam.; lobes 13–20 × 9–14 mm, glabrous, rugulose, punctate, margins with vibratile, clavate hairs, except at apex. **Corona** outer lobes spreading horizontally, maroon, 1.5–2.0 × 1.5–2.0 mm, apex truncate; inner lobes incumbent on anthers, 1.0–2.5 × 1.0–1.5 mm, elliptic with apex truncate to acute, dark red or red with yellow borders. Shallow dry soils, often on dolerite, alt. 500–700 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Mthatha to lower Tsitsa Falls).

miscella (N.E.Br.) Meve

Perennial, dwarf succulent; stems rhizomatous, erect or decumbent, branching, 10–65 × 5–8 mm, 4-angled with shallow teeth, glabrous, green suffused with purple. **Flowers** 1–3; pedicels 4–18 mm long; faecal odour. **Sepals** 2–3 mm long, ovate-lanceolate. **Corolla** rotate, 12–18 mm in diam., deeply lobed with prominent pentagonal annulus; lobes glabrous, purple-brown, rugulose, 4–7 × 3 mm. **Corona** dark purple to black; outer lobes 0.5 × 1 mm, spreading horizontally, apex rectangular with a slight notch; inner lobes ± 0.5 mm long, erect, apex obtuse and appressed to anthers. Flat rocky areas, alt. 500–1 500 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld and Rainshadow Valley Karoo (Middelburg, Cradock, SW to Willowmore and Steytlerville).

[E]pulchella (Masson) L.C.Leach

Perennial, dwarf succulent; stems erect or decumbent, 25–100 × 5–13 mm, obtusely 4-angled with rows of conical teeth up to 9 mm long; glabrous, green with purple markings. **Flowers** 1–3; pedicels 20–32 mm long. **Sepals** 3–10 mm long, ovate, acute or acuminate. **Corolla** 30–57 mm in diam., rotate to shallowly saucer-shaped, glabrous, transversely rugulose, dull yellow with purple spots, purple-brown around gynostegium; annulus 9–15 mm in diam., pentagonal, obscure to prominent; lobes 11–21 × 11–17 mm, spreading or recurved, ovate, acuminate. **Corona**: outer lobes purple-red, 2–3 × 1 mm, ascending, oblong, apex truncate; inner lobes pale yellow with purple-brown markings, incumbent on anthers, unequally 2-horned; outer horns conical, 0.5–1.0 mm long, obtuse, ascending; inner horns 2–3 mm long, connivent-erect, filiform with apices slightly recurving and sometimes clavate. Habitat?, alt. 20–400 m; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Baviaanskloof, Port Elizabeth, NE to Carlisle Bridge).

variegata (L.) Haw.

Perennial succulent; stems erect from decumbent base, 25–150 × 5–11 mm, obtusely 4-angled with conical teeth 3–9 mm long, glabrous, green with purple markings. **Flowers** 1–5; pedicels 20–60 mm long; foetid odour. **Sepals** 5–8 mm long, ovate-lanceolate, acute to acuminate. **Corolla** 45–80 mm in diam., rotate with strong transverse rugulosity; typically pale greenish yellow with purple-brown spots; annulus prominent, 18–23 mm in diam., pentagonal to circular; lobes sometimes recurved, 16–25 × 12–22 mm, ovate, acute to acuminate. **Corona** cream-coloured, spotted purple; outer lobes spreading or ascending, 4–6 mm long, linear-oblong, apex with 2 or 3 small teeth; inner lobes 3–4 mm long, 2-horned, incumbent on anthers, horns filiform with apices clavate and minutely tuberculate, inner horns connivent-erect and recurving, outer horns erect or ascending. Rocky areas, beneath small bushes, alt. 5–1 000 m; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket, Sub-Escarpment Savanna (Queenstown, Willowmore to East London and Humansdorp).

verrucosa (Masson) L.C.Leach

Perennial, dwarf succulent; stems erect or decumbent, 25–100 × 5–11 mm, 4-angled with rows of conical teeth up to 9 mm long; glabrous, green. **Flowers** 1–3(4); pedicels 10–32 mm long; faecal odour. **Sepals** 4–11 mm long, ovate-lanceolate, acuminate. **Corolla** 45–64 mm in diam., rotate to saucer-shaped, glabrous except beneath gynostegium, transversely rugulose, papillate, pale yellow with reddish spots, uniformly reddish around gynostegium; annulus 10–12 mm in diam., pentagonal, sometimes obscure; lobes spreading or recurved, 13–21 × 12–17 mm, deltoid, acute. **Corona**: outer lobes purple-red, spreading or deflexed, 1–2 mm long, sub-quadrate, apex with triangular notch; inner lobes purple-red with upper surface bright yellow, 1–2 mm long, appressed to anthers, ovate-lanceolate with gibbosity at base and extending sub-horizontally over anthers. Arid areas, alt. 20–1 700 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld and Rainshadow Valley Karoo (Aliwal North to Mount Ayliff SW to WC border).

PACHYCARPUS E.Mey.

Species ± 30, Africa; 27 in sthn Afr., widespread, especially in high grassveld, except N, B.

Deepseated caudex, producing 1–3 (occasionally more) erect stems; leaves coriaceous, ovate, oblong, or elliptic, with midrib and sometimes secondary veins prominent; inflorescences umbellate, axillary and terminal, sessile to shortly pedunculate; flowers with corolla reflexed to globose; corona lobes ligulate often with wings, keels and distal appendages, occasionally globular; follicles ovoid to globose, somewhat inflated, glabrous and winged (section Pachycarpus*)*

appendiculatus E.Mey.

Ukhathimuthi (Z)

Perennial, geophytic herb, 220–500 mm long; stems 1 or 2, erect. **Leaves** spreading, ovate to oblong, 53–104 × 1–52 mm, base attenuate, apex abruptly acute to acuminate; petioles 5.5–11.5 mm long. **Inflorescences** 2- or 3-flowered; peduncles up to 6.5 mm long. **Corolla** reflexed-spreading, greenish or white, with brown-maroon spots; lobes free to base, 17.2–21.2 × 9.6–11.7 mm. **Corona** pale green with brown-maroon markings; lobes 8.5–14.0 mm high, basal proximal lobe with 2 lateral wings and 2 apical wings, 4.4–14.8 mm long; distal appendage spathulate, overtoping style-stigma-head, 9.5–14.8 mm long. **Flowering time** July–Jan. **Follicles** ellipsoid, 6-winged; pedicels twisted. Widespread inland, coastal grassland, open woodland, alt. 140–1 000 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Mthatha to Port St. Johns S, from Grahamstown to East London).

asperifolius Meisn.

iShongwe elibomvu, *iShongwe elincane* (Z)

Perennial, geophytic herb, 390–680 mm long; stems 1 or 2, erect, unbranched. **Leaves** spreading, elliptic to oblong, 59–82 ×16–36 mm, base cuneate to shortly attenuate, apex rounded to acute with slight mucronate point or acuminate, margins almost revolute; petioles 3.6–9.2 mm long. **Inflorescences** 2–6-flowered; peduncles up to 7 mm long. **Corolla** reflexed, greenish to white, tinged purple; lobes lanceolate, free for most of length, margins revolute, 11.0–15.4 × 6.5–8.5 mm. **Corona** pale green or cream-coloured; lobes 2.1–4.5 mm high, 0.9–3.8 mm long, globular with 2 fleshy wings on proximal upper surface. **Flowering time** Nov.–Jan. **Follicles** globose, glabrous, 5-winged; pedicels twisted. Widespread in coastal grassland, alt. 60–1 700 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Bizana S to Port St Johns and Kei River Mouth).

concolor E.Mey. var. **concolor**

iShongwe (Z)

Perennial, geophytic herb, 200–700 mm long; stems 1(2), erect or decumbent, unbranched. **Leaves** spreading-erect, lanceolate to ovate, 42–97 × 15–40 mm, base cuneate to shortly attenuate, apex acute or acuminate, margins undulating; petioles 1–11 mm long. **Inflorescences** 2-flowered, sessile. **Corolla** dish-shaped, yellowish, tinged dark red-maroon; lobes free 9–22 × 6–10 mm. **Corona** brown-maroon tinged yellow; lobes fleshy, 4.1–9.0 mm high; basal proximal lobe with 2 bulbous apical wings; basal distal appendage ligulate, upcurved, not overtopping style-stigma-head, 4–10 mm long. **Flowering time** Oct.–Jan. **Follicles** ovoid, glabrous, winged; pedicels twisted. Open midland and coastal grassland, alt. 10–1 700 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket (KZN border S, from Queenstown to Mthatha, Dohne to Komga and from Grahamstown to East London).

coronarius E.Mey.

Perennial, geophytic herb, 500–700 mm long; stems 1, erect, inclined when flowering. Leaves spreading, lanceolate, 85.5–105.0 × 10–25 mm, base shortly attenuate, apex

acute, margins occasionally undulating; petioles 3.0–8.5 mm long. **Inflorescences** 2-flowered; peduncles up to 29 mm long. **Corolla** spreading campanulate, pale green-yellow, purple-spotted below; lobes free for most of length, 20–32 × 10.3–19.4 mm. **Corona** green or brownish; lobes slipper-shaped, 7–10 mm high, 14–18 mm long, upper proximal wings large forming a ± saccate central groove, apex up-turned. **Flowering time** Dec.? **Follicles**? Rare in coastal grassland on Msikaba sandstone, alt. 100–500 m; Sub-Escarpment Grassland (area around Idutywa).

dealbatus E.Mey.

Ukhatimuthi (Z)

Perennial, geophytic herb, 150–600 mm long; stems 1 or 2, erect, unbranched. **Leaves** spreading-erect, lanceolate to oblong, 40–78 × 9–43 mm, base rounded to shortly attenuate, apex acuminate to rounded, margins occasionally undulating; petioles 3.5–12.5 mm long. **Inflorescences** 4–6-flowered; peduncles up to 5(–15) mm long. **Corolla** urceolate, cream-coloured, brown-purple or pale green; lobes free for most of length, 10.5–17.5 × 4.5–11.0 mm. **Corona** yellow, mauve-purple or brown-marked; lobes ligulate from base, keels, wings or appendages absent, distal end erect, not overtopping style-stigma-head. **Flowering time** Nov.–Mar. **Follicles** narrowly ovoid, apex tapering, glabrous, prominently 6-winged; pedicels twisted. Widespread in midland and coastal grassland, often amongst rocks, alt. 250–1 600 m; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Kei River S, Albany, Suurberg, Grahamstown and Humansdorp).

grandiflorus (L.f.) E.Mey.

Perennial, geophytic herb, 200–500 mm long; stems 1 or 2, decumbent or erect, unbranched. Leaves spreading, lanceolate to oblong, 41–89 × 11–32 mm, base rounded to shortly attenuate, apex acute to acuminate; petioles 2–12 mm long. **Inflorescences** 1–6-flowered. **Corolla** globose-campanulate, 38–52 mm in diam., greenish yellow, purple-brown-spotted; lobes halfway free, 16–36 × 19–25 mm. **Corona** pale greenish mauve-purple-marked; lobes ligulate from base with 2 contiguous ridges/wings, upcurved towards tip, 4–6 mm high, 12–19 mm long. **Flowering time** Nov.–Apr. **Follicles** ellipsoid, glabrous, 6- or 7-winged; pedicels twisted. Midland, highland and coastal grassland, alt. 30–1 800 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Matatiele to Bizana S, from Cathcart to Haga-Haga, Groendal State Forest to East London and to Humansdorp).

mackenii (Harv.) N.E.Br.

Perennial, robust, geophytic herb, 300–610 mm long; stems 1, erect, unbranched. Leaves spreading, elliptic-oblong, 38–55 × 17–38 mm, base cuneate, shortly apiculate, apex acute; petioles 2–5 mm long. **Inflorescences** axillary, 2–4-flowered; peduncles 3.0–4.2 mm long. **Flowers** 22–28 mm in diam.; pedicels 6–8 mm long. **Gynostegial column** stipitate. **Corolla** becoming partially reflexed and rotate, white, purple-marked; lobes ± free, ovate and notched apically, 10–14 × 8.3–9.0 mm. **Corona** pale green to purple; lobes linear-ligulate from base with 2 erect, divergent, wings 9–10 mm long, ± 1.6 mm high, appendage becoming erect and inflexed, overtopping style-stigma-head, almost connivent, 4–6 mm high, 14.0–16.6 mm long. **Follicles**? Rocky coastal grassland, alt. ± 23 m; Indian Ocean Coastal Belt (Haga-Haga, between Grosvenor and Lupatana).

macrochilus (Schltr.) N.E.Br.

Perennial, geophytic herb, 140–330 mm long; stems 1 or 2, erect, unbranched. **Leaves** spreading, lanceolate to ovate-trullate, 30–105 × 17–46 mm, base shortly attenuate

to rounded, apex acute; petioles 5–15 mm long. **Inflorescences** 2–4-flowered; peduncles sessile or up to 33 mm long. **Corolla** saucer-shaped to campanulate, greenish yellow, red-tinged, purple- or brown-marked; lobes free for most of length, 16–25 × 9–17 mm. **Corona** yellow; lobes ligulate-spathulate, spreading from base with 2 ridges/wings along top for $^1/_3$ of its length, then distally up-curved to erect, widening into a leaf-like appendage before tapering off at tip, 9.0–19.5 mm long. **Flowering time** Dec.? **Follicles**? Occasional, high altitude grassland, alt. 1 700–2 600 m; Drakensberg Grassland (Thaba Chitja, Qacha's Neck, Maclear).

natalensis N.E.Br.

Ishongwe elibomvu elikhulu (Z)

Perennial, geophytic herb, 300–520 mm long; stems 1 or 2, erect. **Leaves** spreading-erect, lanceolate to broadly ovate, 42–77 × 23–47 mm, base cuneate/attenuate or rounded, apex obtuse, acute or acuminate, point mucronate; midrib and secondary veins prominent; petioles 4.0–13.2 mm long. **Inflorescences** 2–5-flowered. **Corolla** saucer-shaped, yellow to green, purple or brown-spotted, apex reflexed; lobes free for most of length, 11–17 × 5–12 mm. **Staminal column** stipitate. **Corona** maroon-purple; lobes complicate-spathulate, 5.6–6.5 mm high, basal proximal lobe 3–5 mm long, with 2 erect wings, distal appendage dilated, deltoid in shape, 7.0–8.3 mm long, inflexed to enclose style-stigma-head. **Follicles** ellipsoid, glabrous, 6-winged; pedicels twisted. Widespread in midland grassland, rocky areas, alt. 760–1 150 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (KZN border, Mthatha to Flagstaff).

plicatus N.E.Br.

Perennial, geophytic herb, 200–400 mm long; stems 1–4, erect. **Leaves** spreading, lanceolate to ovate, 40–73 × 15–40 mm, apex acute, mucronulate; petioles 5.5–14.0 mm long. **Inflorescences** 2–4-flowered; peduncles sessile or up to 7 mm long. **Corolla** cupulate to saucer-shaped, yellow to green, brown-spotted, apex reflexed; lobes free for most of length, 9–16 × 8–10 mm. **Corona** yellow-brown; lobes complicate-spathulate, 2.0–6.5 mm high; basal proximal lobe 3–6 mm long, with 2 thickened, erect keels positioned on outer margins, distal appendage dilated, deltoid in shape, upcurved but not enclosing style-stigma-head. **Anther wings** large and oblique, broader than high. **Flowering time** Dec.? **Follicles**? Occasional in midland and highland grassland, rocky areas, alt. 760–1 100 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna (KZN border to Bizana and Weza).

[E]**reflectens** E.Mey.

Perennial, geophytic herb, 270–550 mm long; stems 1 or 2, erect, unbranched. Leaves spreading-erect, lanceolate or ovate, 42–75 × 12–28 mm, base cuneate, apex acute to acuminate, point mucronate; petioles 2.0–12.5 mm long. **Inflorescences** 2–4-flowered; peduncles up to 30 mm long. **Corolla** reflexed hugging pedicel, yellowish green, purple-spotted; lobes free for most of their length, margins revolute, 12–19 × 8–13 mm. **Corona** cream-pink-coloured to brown; lobes 5.5–8.5 mm high, basal proximal lobe with 2 erect wings, distal appendage deltoid, 5.5–10.5 mm long, connivent, curved up enclosing style-stigma-head. **Flowering time** Nov.–Jan. **Follicles**? Occasional in coastal and midland grassland, alt. 200–1 400 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Elliot, Katberg Mtn, Butterworth, Komga, Kentani, Kei River, East London).

rigidus E.Mey.

iShongwe (Z)

Perennial, geophytic herb, 200–500 mm long; stems 1 or 2, erect, unbranched. **Leaves** spreading-erect, narrowly oblong, lanceolate or ovate, 35–92 × 8–45 mm, base cuneate to shortly attenuate, apex acute, margins undulating; petioles 3–12 mm long. **Inflorescences** 3–9-flowered. **Corolla** cup- to saucer-shaped, pale dusty pink inside, darker outside; lobes free for most of length, 8–13 × 4.9–7.8 mm. **Corona** white, pale yellow or brown; lobes ligulate, proximal horizontal base without wings, distal appendage deltoid to cruciform, curved up, erect but not enclosing style-stigma-head, 7–9 mm long, 5.5–7.5 mm high. **Flowering time** Dec.? **Follicles** ellipsoid, tapering towards apex, glabrous, with 6-toothed wings; pedicels twisted. Occasional, highveld grassland, alt. 600–2 000 m; Dry Highveld Grassland, Sub-Escarpment Grassland (Aliwal North to Burgersdorp S, from Dordrecht to Queenstown).

scaber (Harv.) N.E.Br.

iShongwe elincane elimhlope (Z)

Perennial, geophytic herb, 300–750 mm long; stems 1–7, erect, unbranched. **Leaves** spreading-erect, elliptic, broadly ovate, or oblong, 62–102 × 24–52 mm, base shortly attenuate, rounded or truncate, apex obtuse, acute, and mucronulate; petioles 4.2–9.2 mm long. **Inflorescences** 4–7-flowered; peduncles 7.3–51.7 mm long. **Corolla** spreading to saucer-shaped, cream-coloured to pale yellow; lobes free for most of length, apex curved down, margins revolute, 9.3–13.1 × 4.8–8.4 mm. **Corona** cream-coloured to pale yellow; lobes 2.3–5.0 mm high, basal proximal limb with 2 erect wings and 2 lateral wings, distal appendage narrowly ligulate, 5.6–10.5 mm long, curving up, connivent over top of style-stigma-head. **Flowering time** Nov.? **Follicles** globose, glabrous, winged towards apex; pedicels twisted. Midland, alt. 750–1 850 m; Sub-Escarpment Grassland (KZN border, Clydesdale area).

[E]stenoglossus (E.Mey.) N.E.Br.

Perennial, geophytic herb, 152–204 mm long; stems decumbent to erect. **Leaves** erect, elliptic, 54.3–61.3 × 12 mm, base cuneate, apex acute; petioles 4.0–13.2 mm long. **Inflorescences** 3-flowered; peduncles 6.3–25.4 mm long. **Flowers** yellowish with dark mauve markings. **Corolla** cupulate; lobes free for most of length, 10–12 × 5–8 mm. **Corona**: lobes spreading, then erect, basal proximal lobe with 2 erect, truncate wings, distal appendage ligulate, apex obtuse, margins somewhat reflexed. **Follicles** ovoid, thinly puberulous, winged towards apex; pedicel twisted. Mountain island grassland, alt. 1 830–2 100 m; Mesic Highveld Grassland (known from type locality at Witteberg Mts only).

vexillaris E.Mey.

Perennial, geophytic herb, 300–520 mm long; stems 1–5, erect, unbranched. Leaves spreading-erect, lanceolate to ovate, 35–89 × 6–21 mm, base cuneate, apex acute. **Inflorescences** 1–5-flowered. **Corolla** campanulate, white to pale pink inside, dark pink to maroon outside, apex reflexed; lobes free, 11–18 × 5.0–13.5 mm. **Corona** corona maroon-purple, markings pink; lobes complex, 6.5–11.0 mm high, basal proximal lobe 6.5–10.5 mm long with 2 reflexed dentate wings; distal appendage ligulate, 10.0–16.5 mm long, upcurved and cruciform; apex occasionally bifid. **Flowering time** Nov.–Mar. **Follicles** ellipsoid, glabrous, 6-winged; pedicel twisted. Occasional in highland grassland, alt. 1 200–2 600 m; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket (Joubert's Pass to Naude's Neck S, from Andriesberg to Barkly Pass and from Graaff-Reinet to Mountain Zebra National Park).

Napiform tubers, producing 1–3 (rarely more) erect stems; leaves linear to narrowly lanceolate, with only midrib prominent; inflorescences umbellate, terminal; flowers with corolla campanulate to globose; corona lobes ligulate, with proximal wings; follicles ellipsoid, smooth and winged (section Trichocodon*)*

campanulatus (Harv.) N.E.Br. var. **campanulatus**

Toad plant

Perennial, geophytic herb, 215–415 mm long; stems 1(2), erect, unbranched. **Leaves** spreading-erect, linear, 55–165 × 2–10 mm, base attenuate, apex acute, margins revolute. **Inflorescences** terminal, 2–6-flowered. **Corolla** campanulate, 44–77 mm in diam., creamy green; petals 24–50 mm long; lobes free for ± $^{1}/_{3}$ their length, ovate, 18–25 × 23–27 mm. **Corona** greenish cream-coloured to maroon-purple, pale yellow-marked; lobes 9–17 mm long, 4.5–6.5 mm high, basal proximal lobe 4.5–5.0 mm long, with 2 erect, triangular wings, 2.5–4.5 mm high, 5.0–6.5 mm wide; distal appendage ligulate, apex obtuse, 7.5–10.5 mm long, spreading. **Flowering time** Feb., Mar.? **Follicles** narrowly ellipsoid, smooth several-winged. Widespread, highland grassland, alt. 1 000–2 075 m; Sub-Escarpment Grassland (Mount Ayliff District).

campanulatus (Harv.) N.E.Br. var. **sutherlandii** N.E.Br.

Differs from typical variety as follows: **Corolla** campanulate and subglobose, 10–30 mm long, 26–44 mm in diam.; lobes free for most of length, ovate to orbicular, 6.0–18.5 × 5.0–21.5 mm. **Corona**: lobes 2.0–8.5 mm long, 2.5–5.0 mm high, basal proximal lobe 2.5–4.0 mm long, with 2 erect wings (fin- to ear-shaped), 2–4 mm high, 1–4 mm wide; distal appendage not erect, ligulate with obtuse apex, 2.5–5.5 mm long, spreading. Northeastern midlands to highlands, alt. 1 100–2 100 m; Drakensberg Grassland, Sub-Escarpment Grassland (Ramatseliso's Gate to Kokstad).

linearis (E.Mey.) N.E.Br.

Perennial, geophytic herb, 280–650 mm long; stems unbranched. **Leaves** spreading-erect, linear, 80–130 × 2.0–4.5 mm, base attenuate, apex acute, margins revolute; petioles 2–7 mm long. **Inflorescences** 3–5-flowered; peduncles 15–38 mm long. **Corolla** campanulate, creamy green turning brown; lobes free for approximately $^{3}/_{4}$ of their length, 9–17 mm long. **Corona** greenish cream-coloured to maroon-purple with pale yellow markings; lobes 8–15 mm long, basal proximal lobe with 2 erect wings; distal appendage ovate-lanceolate, upcurved (overtopping style-stigma-head), with margins somewhat inflexed. **Anther**: appendages erect. Occasional in mountain island grassland, alt. (100–)750–900 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (Baziya, Fort Cunynghame, Dohne).

PACHYPODIUM Lindl.

Species 18, 13 native to Madagascar; 5 in sthn Afr., arid areas or dry situations, N, B, LIM, G, M, S, FS, KZN, NC, WC, EC.

bispinosum (L.f.) A.DC.

Bobbejaankos, *sterkman* (A)

Perennial, dwarf, succulent shrub, 0.1–0.4 m high; stem tuber sometimes partly exposed above ground. **Leaves** lanceolate to narrow-lanceolate, 20–40 × 2–7 mm; lower surface hirsute; stipules spiny, solitary or more commonly paired, 10–20 mm long, spine cushion glabrous when mature. **Inflorescences** solitary or few-flowered. **Flowers** ± campanulate, purple or pink. **Corolla**: tube 14–20 mm long, widening above insertion of stamens;

lobes broadly ovate to rotund, 5–7 mm long. **Gynoecium** apocarpous and bicarpellate. **Circumgynoecial glandular disc** cupular and sinuate, almost hiding ovary. **Style head** subcylindrical. **Flowering time** Apr.–June. **Follicles** 40–65 mm long. Dry, rocky localities, alt. 0–685 m; Albany Thicket, Rainshadow Valley Karoo (Somerset East and Willowmore districts E to Steytlerville, Port Elizabeth and Ecca River Valley).

succulentum (L.f.) Sweet

Dikvoet, *bergkambroo* (A)

Succulent, shrub, 0.1–0.6(–1.5) m high; tuber exposed above ground. **Leaves** linear to linear-lanceolate, 17–45 × 2–8 mm; lower surface tomentose; stipules spiny, in pairs, 20–25 mm long, spine cushion hairy. **Inflorescence** few-flowered. **Flowers** salver-shaped, crimson, pink, rarely white, with dark, central, longitudinal stripe on lobes. **Corolla**: tube 10–18 mm long, narrowing above insertion of stamens; lobes obovate to oblanceolate, 8–18 mm long. **Gynoecium** apocarpous, bicarpellate. **Circumgynoecial glandular disc** 5-lobed, much shorter than ovary. **Style head** cylindrical. **Flowering time** Apr.–June. **Follicles** 80–100 mm long. Dry, rocky localities, succulent shrub vegetation, alt. 288–1 500 m; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Bethulie, Middelburg and Queenstown, S from Graaff-Reinet to Komga and from Baviaanskloof to Peddie).

PARAPODIUM E.Mey.

Species 3, sthn Afr., excluding N, B, S, NC, WC.

costatum E.Mey.

Perennial, geophytic herb, 0.2–0.3 m high. **Leaves** erect, ± parallel to stem; linear to oblong, 62–142 × 6–22 mm; midrib and secondary veins prominent below; petioles up to 27 mm long, curving 90º. **Inflorescences** umbelliform, axillary, 5–9-flowered. **Corolla** globose-campanulate, fused at base, purple-brown, to greenish yellow; tube ± 3.5 mm long; lobes oblong-lanceolate, 6.5–9.0 × 3.5–4.0 mm. **Corona** white; interstaminal corona fused to corolla tube up to sinuses, forming a pentagonal cup housing rest of conical gynostegial column; staminal corona fused to corolla tube, rudimentary between interstaminal lobes. **Anthers**: wings small; appendages ovate, ± 2.2 mm long. Follicles on twisted pedicels, ellipsoid, 104 × 28 mm, glabrous, with rows of prominent dentate protrusions. Grassland in sandy soils; Drakensberg Grassland (restricted to Barkly East area).

[E]crispum N.E.Br.

Perennial, geophytic herb, 150–200 mm high. **Leaves** clustered towards base, spreading-erect, linear-lanceolate, 56–81 × 5.5–15.0 mm, margins strongly undulate or crisped; midrib prominent below only. **Inflorescences** umbelliform, axillary, 4–9-flowered. **Corolla** globose-campanulate, fused at base, dull olive-green; tube ± 3.4 mm long; lobes ovate to lanceolate, up to 5.6 × 3.6 mm. **Corona** white; interstaminal corona fused to corolla tube, forming a pentagonal disk surrounding rest of conical gynostegial column; staminal corona rudimentary, between interstaminal lobes. **Anthers**: wings large, appendages ovate to oblong, erect, connivent and covering style-stigma-head, which is truncate. **Flowering time** Oct.–Jan. **Follicles** not seen by author. Grassy hills; Upper Karoo, Sub-Escarpment Savanna, Albany Thicket (Middelburg S to Graaff-Reinet and Fort Beaufort, from Kommadagga to Grahamstown).

PENTARRHINUM E.Mey.

Species 3, Africa; 2 in sthn Afr., widespread, except L, WC.

insipidum E.Mey.

African heartvine; *donkie perske* (A)

Perennial, herbaceous climber, 2–3 m long. **Leaves** cordiform, 23–63 × 20–50 mm, apex acute to acuminate; petioles 17–50 mm long. **Inflorescences** axillary cymes, 5–15-flowered. **Flowers** fragrant; pedicels 5–20 mm long. **Corolla** reflexed rotate, green to yellow, tipped purple; lobes ± ovate, 4–6 × 2.5–3.5 mm. **Staminal column** 2.5–3.0 mm high. **Corona** yellow or white; staminal corona lobes solid, columnar, 2.5–3.0 mm long, apex truncate, drawn into a horn-like appendage exceeding style-stigma-head; interstaminal corona of microscopic lobes. **Anther**: appendage ovate, inflexed over truncate style-stigma-head. **Flowering time** Apr.? **Follicle** solitary, ellipsoid, 55–85 × 15–20 mm, nearly glabrous to densely covered in 2–4 mm long, dentate spines. Forest, woodland or scrubland margins, occasionally fences in urban areas; Albany Thicket (Graaff-Reinet District).

PERGULARIA L.

Species 5, Africa to India and Madagascar; 1 in sthn Afr., widespread, except FS, L, WC.

daemia (Forssk.) Chiov. subsp. daemia

Trellis vine; *intungu* (Z)

Perennial, herbaceous climber, 1–6 m long; sparsely hispid. **Leaves** spreading, cordiform, 20–120 × 30–127 mm, apex acute; petioles 18–90 mm long. **Inflorescences** axillary, almost corymbose, pendulous, 20–30-flowered; peduncle 50–160 mm long. **Flowers** creamy green to yellowish white, noctiflorus, scented; pedicels 12–35 mm long. **Corolla**: tube campanulate, 3–5 mm long; lobes spreading, apex raised, oblong-lanceolate, 6–10 × 3–5 mm; white-villous along margins. **Corona**: staminal corona lobes fleshy, inserted on staminal column 1–8 mm above corolla; interstaminal corona inserted on corolla tube base, annular encircling staminal column. **Anther**: appendage ovate, inflexed over truncate style-stigma-head. **Follicles** solitary or paired, erect, lanceoloid, 50–75 × 10–20 mm, with apical beak, pubescent with recurved bristles. Xerophytic vegetation types, well-drained soils along forest or woodland margins; Sub-Escarpment Savanna (Willowvale District).

PERIGLOSSUM Decne.

Species 4, Africa, all in sthn Afr., widespread.

angustifolium Decne.

Round head

Perennial, geophytic herb, 300–750 mm high. **Leaves** with blade almost filiform to linear. **Inflorescence** 3–8-flowered, spherical or globose. **Flowers**: pedicels up to 12–30 mm; corolla erect to suberect, lobes glabrous, margins revolute, dorsal surface green sometimes with maroon venation, ventral surface cream-coloured; corona white and purple-tipped, dorsal lobes sagittate-ovate, 3.6–4.8 × 2.1–3.2 mm (stalk and head of equal length), apex with horizontal protruding ridge fitting into cavity formed by anther appendage, inner lobes filiform, 1.5–4.0 mm long. **Pollinia** ± $^1/_3$ length of translator's arm; translator arms thin and twisted, wishbone-like in shape. **Flowering time**

Oct.–Mar., with a peak in Jan., Feb. **Fruit** a follicle. Marshy grassland, alt. 30–2 000 m; Sub-Escarpment Grassland, Drakensberg Grassland, Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Elliot and Maclear E to Port St Johns, from Stutterheim to Komga).

mackenii Harv.
(= *P. kassnerianum* Schltr.)

Perennial, geophytic herb, 150–750 mm high. **Leaves** with blade linear to almost filiform. **Inflorescence** 1–8-flowered, spherical, globose. **Flowers**: pedicels 8–12 mm; corolla broad, suberect to narrowly oblong, lobes glabrous, margins revolute, pale green tinged purple; outer corona blade tongue-like, ovate-oblong to elliptic-oblong, tapering into a rounded thickened and obtuse apex, dorsally smooth, ventrally transversely ridged ± in middle, 4–5 × 1.7 mm, stalk short and wide, lobe usually 2.0–2.5× longer than stalk, sometimes appearing sessile; inner corona lobes rudimentary up to ± 2 mm long, corona green. **Pollinia** ± $^1/_2$ length of translator's arm; translator arms thin and twisted, sigmoid-curved with straight upper and lower parts. **Flowering time** Nov.–Mar. **Fruit** a follicle. In grassland, grassy vlei areas, alt. 3–1 500 m; Indian Ocean Coastal Belt (a single record recorded from Port St Johns).

PIARANTHUS R.Br.

Boesmantoontjie (A)

Species 6, sthn Afr., N, B, LIM, NW, FS, NC, WC, EC.

geminatus (Masson) N.E.Br. var. **foetida** (N.E.Br.) Meve

Perennial, succulent; stems procumbent or decumbent, 25–45 mm long, cylindrically 4- or 5-angled, with ± 4 teeth along each angle. **Flowers** 1 or 2(–4). **Sepals** ovate-lanceolate, acuminate, glabrous. **Corolla** rotate and deeply lobed with tube absent, spreading; lobes ovate or lanceolate, margins revolute, glabrous on outer surface, velvety-puberous on inner surface. **Corona** yellow, arising from staminal column and incumbent on anthers, shortly excceding anthers, minutely toothed along dorsal margin, dorsally produced or expanded into a truncate-rounded crest. **Staminal column** arising from base of corolla. **Flowering time** Jan.–Mar. (June, Oct.). Flats, level slopes, colluvium, succulent karoo bossieveld, partial shade, well-drained loam soil, alt. 150–1 200 m; Albany Thicket, Lower Karoo, Rainshadow Valley Karoo (Graaff-Reinet S to Klipplaat and Jansenville, from Willowmore to Steytlerville Karoo, Greater Addo Elephant National Park, Albany District and Grahamstown).
Alternative taxonomy: *P. germinatus* subsp. *germinatus* in Bruyns (2005b).

QUAQUA N.E.Br.

Species 19, sthn Afr., N, NW, NC, WC, EC.

pillansii (N.E.Br.) Bruyns

Perennial, succulent shrub; stem 0.15–0.50 m high, branching at base to form clumps; 4-angled, glabrous, grey-green with purplish markings, angular sometimes flattened, with yellow-brown teeth. **Inflorescences** of 4–20-flowered fascicles, mainly in upper part of stem. **Flowers** opening successively. **Corolla** slightly spreading, whitish green with purple-brown markings, papillate, purple-hairy within, outer surface glabrous; tube campanulate, up to ± 5 mm deep; lobes oblong to ovate with sides reflexed. **Corona**: outer lobes rectagular to shallowly bifid and entirely enclosing space between inner lobes to form cup around column; inner lobes exceeding height of anthers, appressed to backs

of anthers for most of anther-length, dark purple-brown. **Flowering time** Dec.? Mountain ridge above kloof, very eroded, cultivated in gardens, alt. 350–1 100 m; Albany Thicket (Steytlerville, Studtis, Baviaanskloof).

RAPHIONACME Harv.

Species 36, mostly Africa, 1 in Arabian Peninsula, with majority occurring south of equator; 15 in sthn Afr., mostly found in arid to subhumid savanna, a few in desert, a few in swampy habitat, widespread, except WC.

flanaganii Schltr.

Geophytic herb, climbing, 2(–4) m long; tuber fusiform; a few weakly, woody, monopodial stems, spreading, internodes very long. **Leaves** spreading, ± obovate 110 × 40 mm, dark above, pale below, velutinous, base cuneate, apex truncate to acute and apiculate; veins parallel. **Inflorescence** axillary, clustered, 3–many-flowered; peduncle 5–10 (–25) mm long. **Flowers** campanulate, calyx and corolla velutinous outside; tube 2–3 mm long; lobes rotate, reflexed, ovate, 6–7 × 3 mm, yellow-green, maroon marking at base, margins revolute. **Corona** white, lobes tripartite, middle segment 4–10 mm long, twisting apically, side lobes corniculate, inwardly falcate, 2–3 mm long. **Flowering time** Oct.–Feb. **Follicles** paired, narrowly fusiform, 50–100 × 10 mm, patent. Coastal zone, penetrating inland, dense riverine or open savanna, alt. 10–1 000(–1 300) m; Albany Thicket (Grahamstown, Naude's Hoek).

galpinii Schltr.

Geophytic herb, 50–250 mm long; tuber conical; stem single, erect. **Leaves** 3–7 pairs per stem, ± erect, narrowly obovate or ovate, 25–75 × 7–20 mm; glabrescent, pubescent or almost velutinous, flat (= *R. elata*) or midrib folded, base cuneate, apex acute. **Inflorescences** mostly terminal, many-flowered, in tight subglose clusters; peduncles 4.5–20.0 mm long. **Flowers** campanulate, greenish brown inside; tube 2.0–4.5 mm long; lobes ovate, 4–6 × 1.5–3.0 mm. **Corona** greenish maroon; lobes tripartite, central lobe filiform 4–5 mm long, lateral segments dentate, 1–2 mm long. **Flowering time** (Sept.)Oct.–Dec. **Follicles** 1 or 2, erect, narrowly fusiform, 50–220 × 4–10 mm. Coastal zone, various substrates, rocky hillsides, short grass, alt. 10–1 800 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Umtamvuna Nature Reserve to Mkambati Nature Reserve).

hirsuta (E.Mey.) R.A.Dyer ex E.Phillips

False gentian; *khadi* (*-wortel*) (A); *intsema* (X); *umathangane* (Z)

Geophytic herb, 10–300 mm high; tuber fusiform; stems sympodial (forking). **Leaves** spreading, variable in shape, lanceolate to subrotund, 12–50 × 6–25 mm, lucid green, margins maroon, glabrous to hirsute, base obtuse to cuneate, apex acuminate to apiculate. **Inflorescence** terminal and axillary, lax, cymose, 5–many-flowered; peduncles 2–25 (–40) mm long. **Flowers** campanulate, purple-pink; tube (2–)3–5 mm long, lobes rotate, apex recurved, ovate to oblong, 4–9 × 1.5–3.5 mm. **Corona** mauve-purple, ligulate, connivent, apex frilly, bifid/trifid, 4.5 × 2 mm. **Flowering time** Aug.–Dec. **Follicles** 1 or 2, erect or divergent, narrowly fusiform 45–75 × 6–8 mm. Scattered in open grassland, hillside scrub and savanna, alt. 5–2 200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Weza State Forest southwards, from Queenstown to Stutterheim, Kei River and Grahamstown).

palustris Venter & R.L.Verh.

Geophytic herb, 0.3–0.5 m high; tuber ovoid, fusiform or almost cylindrical; stems sympodial or forking from near base. **Leaves** spreading-erect, denser near stem apex, oblong-ovate, 50–60 × 20–30 mm, base obtuse to cuneate, apex obtuse and apiculate, veins almost translucent, secondary veins divaricate, looping at maroon-tinted margins. **Inflorescence** terminal or axillary, ± 3-flowered; peduncles 10–20 mm long. **Flowers** campanulate, greenish violet outside, whitish violet inside; tube 3–4 mm long; lobes rotate, obovate to oblong, 8–10 × 5 mm, spreading. **Corona** whitish violet; lobe base fleshy and quadrate, apical lobe 1–2 mm long, ovate and connivent, apex bifurcate. **Flowering time** Sept., Oct. **Follicle** solitary, erect, narrowly cylindrical, 180–270 × 8–10 mm, apex ± pungent. Swamps and moist grassland or heathlands, alt. 5–1 500 m; Sub-Escarpment Grassland (UMnga Flats).

[E]zeyheri Harv.

Geophytic herb; tuber fusiform; stems monopodial, sparsely branching, up to 0.4 m long. **Leaves** spreading-erect, narrowly ovate, 15–65 × 2–10 mm, folded lengthwise, puberulous, upper surface glaucous, lower surface pale green, base cuneate, apex acute to attenuate, margins undulate; veins maroon-tinted. **Inflorescence** terminal and axillary, panicles lax; peduncles 2–10 mm long. **Flowers** campanulate, olive- to yellowy green; tube 2–5 mm long; lobes rotate, ovate, 2–7 × 2 mm. **Corona** with fleshy lobe, basally green, apically trident, middle segment purple, filiform, 5–10 mm long, twisted apically, side segments subulate or denticulate. **Flowering time** Nov.–Jan. **Follicles** solitary, erect to pendulous, narrowly ovoid, puberulous. Stony situations, succulent scrublands, grassland, alt. 100–610(–1 000) m; Rainshadow Valley Karoo, Albany Thicket (Mont Pellier, Steytlerville, Jansenville, Fish River Valley, Grahamstown).

RAUVOLFIA L.

Species ± 60, pantropical, 7 in Africa, 3 in Madagascar; 1 in sthn Afr., LIM, NW, M, S, KZN, EC.

caffra Sond.

Quinine tree; *kinaboom* (A); *umjelo* (X); *umhlambamanzi* (Z)

Medium to large tree, (2–)7–16(–20) m high; trunk stout, crown rounded. **Leaves** in whorls of 3–5, narrowly lanceolate, 120–280 × (25–)30–60 mm, apex acuminate, upper surface glossy, resinous; venation pronounced, colleters in axils. **Inflorescences** much-branched cymes; peduncles 20–60 mm long. **Flowers** salver-shaped, white. **Corolla**: tube 3.0–4.5 mm long, mouth with dense white hairs; lobes ovate, 1 mm long. **Stamens** with filaments short; anthers ovate, bases cordate. **Circumgynoecial glandular disc** cupular, sinuate. **Gynoecium** bicarpellate. **Style head** capitate, annular ring thickened. **Flowering time** July–Oct. **Fruit** a pair of small follicles, one by abortion, black and wrinkled when mature. **Seeds** (1)2 per locule. Moist forests mostly in Pondoland region, alt. 0–1 400 m; Indigenous Forests (Lusikisiki, Port St. Johns, Kentani and Humansdorp districts).

RIOCREUXIA Decne.

Species ± 10, Africa, 1 in India; 7 in sthn Afr., NW, M, S, FS, KZN, L, NC, EC.

alexandrina (H.Huber) R.A.Dyer

Perennial, geophytic climber; stems 1 m long or longer with hairs in 1 or 2 lines arranged lengthwise. **Leaves** spreading, broadly cordate-ovate, 75 × 50 mm, base cordate, apex

acute, margins entire. **Inflorescence** sessile or pedunculate; peduncles 0–35 mm long, with flowers clustered at ends, 5- or more-flowered. **Flowers** tubular, light yellowish brown. **Corolla** 8–10(12) mm long, divided for ± $^{1}/_{2}$–$^{2}/_{3}$ of their length; tube 3–5 mm long and slightly inflated towards base; lobes filiform and erect, united at apex to form a cage around tube mouth, 3–6 mm long. **Corona** in 2 series; outer corona lobes erect and dorso-ventrally flattened, fused basally to form pockets, as tall or taller than style apex; inner corona lobes dorso-ventrally flattened, fused at base and to outer corona, slightly overtopping style apex. **Flowering time** Dec., Feb. Twining in tall grass, alt. 10–300 m; Indian Ocean Coastal Belt (inland of Port Shepstone).

[E]**bolusii** N.E.Br.

Perennial, herbaceous climber, 1–3 m high; stems pubescent. **Leaves** broadly cordate-ovate, 35–85 mm long, upper surface sparsely pubescent, lower surface more densely. **Inflorescence** cymose, branched, with flowers in pairs along branches. **Flowers** yellowish, tubular. **Corolla**: tube 8–13 mm long; lobes erect, 6–8 mm long, connivent at apex, connate. **Corona** in 2 series; outer corona lobes deltoid, channelled down face, with a minute tooth on either side of base; inner corona lobes oblong to linear-oblong, reaching halfway up anthers. **Flowering time** Feb.? Habitat?, alt. ± 600 m; Sub-Escarpment Grassland (known from type collection only: bank of Mthatha River, near Mthatha).

burchellii K.Schum.

Koeiriempies (A)

Perennial herbaceous climber, 1–5 m high; stems with single, lengthwise strip of hairs. **Leaves** cordate-ovate to cordate-lanceolate, 30–120 × 20–80 mm, apex acute to acuminate. **Inflorescence** 1–3-flowered, lateral at nodes. **Flowers** tubular. **Corolla** lobes erect with apex connate forming a cage-like structure; tube 10–15 mm; lobes 8–12 mm long. **Corona** in 2 series; outer corona lobes forming 5 small pockets, margins bifid; inner corona lobes linear, slightly shorter than anthers. **Flowering time** Dec.–Mar. **Follicle** linear-terete, ± 100 mm long. Widespread in bushveld, in grassland and closed woodland; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Kokstad District S, Komani, Mthatha and Mbashe Rivers).

[E]**flanaganii** Schltr.

Perennial, herbaceous climber, 0.5–1.0 m high; stems with 2 lengthwise strips of hair. **Leaves** cordate-ovate, 25–90 × 17–58 mm, apex acuminate, thinly puberulous or glabrous. **Inflorescence**: many-flowered, umbel-like fascicles; peduncles 0–17 mm long, each bearing 1 or 2 fascicles. **Flowers** tubular. **Corolla** 10–12 mm long, lobes erect, apex connate forming a cage-like structure, white to pale yellow; tube ± 5 mm, contracted at mouth, yellow to orange at base, purple-brown above. **Corona** yellow, in 2 series; outer corona lobes deeply divided; inner corona lobes linear, exceeding anthers and connivent over style apex. **Flowering time** Jan.? Twining in tall grassland, over shrubs, or vegetation amongst boulders, alt. 0–1 000 m; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Grahamstown and Komga).

torulosa Decne

Kandelaarblom (A); *ugwapha*, *unquntane*, *ushuqu* (Z)

Perennial, herbaceous climber, 1–5 m high, glabrous to pubescent. **Leaves** cordate-ovate, 30–120 × 17–95 mm, base cordate, apex acuminate. **Inflorescence** 2–15-flowered, in umbel-like clusters. **Flowers** tubular, pale yellow tinged red-purplish. **Corolla**: lobes erect, with apex connate forming cage-like structure, 5–8(10) mm long; tube 6–10(12) mm long, somewhat inflated. **Corona** in 2 series; outer corona lobes subulate

or filiform, bifid; inner corona lobes small, pressed against anthers, not exceeding style-apex. **Flowering time** Nov.–Feb. **Follicle** linear-fusiform, 75–180 × 3 mm. Climber at forest and woodland margins, alt. 500–? m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (uMzimkhulu to Mount Frere S, from Engcobo to Baziya Mtn, Seymour to Idutywa and to Grahamstown).

SARCOSTEMMA R.Br.

Species 10, in arid parts of Old World; 2 in sthn Afr., widespread, except WC.

Molecular evidence (Liede & Kunze 1993 and Liede & Täuber 2002) shows *Sarcostemma* to be nested in *Cynanchum* and this genus has been sunk into *Cynanchum* for the tropical African and Madagascar species. However, the senior author feels that a case can be made to maintain the genus on paraphyletic grounds, as it has a distinct morphology and all its members are monophyletic in their nesting.

viminale (L.) R.Br

Caustic creeper; *melktou*, *spantou* (*-melkbos*) (A); *umbelebele* (X); *ingotshwa* (Z)

Perennial, succulent shrub, a crawler or climber, 0.2–5.0 m high. **Leaves** rudimentary. **Flowers** in lateral or terminal, sessile umbels, cream-coloured to yellowish green. **Sepals** ovate. **Corolla** rotate, deeply lobed, lobes 4–6 × 1.9–3.6 mm. **Corona** in 2 series, whitish, shorter than staminal column; outer corona consisting of free lobes; inner corona connate. **Flowering time** Dec.–Mar. **Follicles** narrowly fusiform, 78–180 × 6–14 mm, light brown. Habitat?, alt. 50–1 500 m; Upper Karoo, Sub-Escarpment Savanna, Drakensberg Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Middelburg S, from Graaff-Reinet to Komga and from Baviaanskloof to Uitenhage, Port Elizabeth, Grahamstown, Bathurst and Port Alfred).

SCHIZOGLOSSUM E.Mey.

Species ± 80, Africa; 27 in sthn Afr., widespread and mainly in grassland, except N, B.

1a Corolla lobes replicate, with reflexed margins

bidens E.Mey.

Perennial, geophytic herb. **Leaves** verticillate or irregularly arranged. **Leaves**: lamina linear to oblong. **Flowers**: corolla lobes replicate; corona ± equalling the gynostegium; lobes oblong to ovate in dorsal view, with a simple or bifid tongue-like ventral appendage, either inflexed towards gynostegium or reflexed at its tip. **Anthers** with appendages reniform, broader than long, concealed beneath overhang of gynostegial head; corpusculum not flanged. **Pollinia**: attachment median; sausage-shaped, slightly compressed with germination zone occupying apex of pollinium. **Gynostegium** conspicuously swollen above anthers. Sub-Escarpment Grassland, Upper Karoo, Drakensberg Grassland, Sub-Escarpment Savanna, Lower Karoo, Indian Ocean Coastal Belt (Ongeluksnek Pass E to Kokstad S, Middelburg District to Queenstown and Lusikisiki, and S to Kamdeboo Mts near Aberdeen and to Kentani).

Of the 7 subspecies, 4 occur in the EC:

bidens E.Mey. subsp. atrorubens (Schltr.) Kupicha

Stems 210–660 mm high, rarely branched. **Leaves** verticillate or irregularly arranged; blade 30–64 × 2–5 mm, linear or narrowly triangular; petioles 1–5 mm long. **Inflorescences** 4–10 per stem, 4–13-flowered; peduncles 14–46 mm long; pedicels 3–14 mm long. **Flowers**: corolla lobes 4.0–4.5 × 2.0–2.5 mm, brown; corona white with pink or purple markings, 1–3 mm long. **Flowering time** Nov.–Feb. **Fruit** 64–78 mm long.

In grassland near streams, alt. 1 350–2 220 m; Sub-Escarpment Grassland (Mount Fletcher S to Baziya Mtn and W to Kamdeboo Mts).

bidens E.Mey. subsp. **bidens**

Stems 90–220 mm high, usually branched. **Leaves** verticillate or irregularly arranged; blade linear, 34–60 × 2.5–7.0 mm. **Inflorescences** 3–7 per stem, 5–8-flowered; peduncles 8–33 mm long. **Flowers**: corolla lobes 3.5–5.0 × 3–8 mm, green or brownish; corona white, each lobe oblong to narrowly ovate in dorsal view, with bifid apex. **Flowering time** Oct.–Jan. **Fruit** a follicle, 45–56 mm long. In grassland on marshy or rocky ground, alt. 1 320–2 600 m; Drakensberg Grassland, Sub-Escarpment Savanna, Upper Karoo and Sub-Escarpment Grassland (Ongeluksnek Pass SE to Lusikisiki, W to Cathcart and Middelburg, S to Queenstown).

[E]**bidens** E.Mey. subsp. **gracile** Kupicha

Stems 300–800 mm high, slender, occasionally sparsely branched. **Leaves** verticillate, at least at upper nodes; blade 20–60 × 1–2 mm, acicular; petioles 0–1 mm long. **Inflorescences** 6–9 per stem, 3–10-flowered; peduncles 7–21 mm long; pedicels 4–7 mm long. **Flowers**: corolla lobes 2.5–3.0 × 1–2 mm, completely glabrous, green to yellow; corona 1.5 mm long. **Flowering time** Dec., Jan. **Fruit**? Grassland, alt. 45–360 m; Indian Ocean Coastal Belt (Kentani).

bidens E.Mey. subsp. **pachyglossum** (Schltr.) Kupicha

Stems 200–900 mm high, occasionally branched. **Leaves** verticillate or irregularly arranged, many and dense; blade linear, 27–45 × 1.5–9.0 mm. **Inflorescences** 9–13 (or more) per stem, sessile, 7–many-flowered. **Flowers**: corolla lobes replicate, 2.5–4.0 × 1.5–2.5 mm, yellowish green; corona white, 1–2 mm long. **Flowering time** Oct.–Apr., mainly Nov.–Feb. **Fruit** a follicle, rarely seen, 45–76 mm long. In grassland, often in rocky areas, alt. 300–2 500 m; Sub-Escarpment Grassland (from SW of Kokstad, SW to Queenstown).

cordifolium E.Mey.

Perennial, geophytic herb, 150–600 mm high; stems 150–600 mm high, very rarely branched. **Leaves** opposite and decussate; blade 20–42 × 2–30 mm, triangular to ovate-triangular. **Inflorescences** 2–6 per stem, 2–8-flowered; peduncles 7–30 mm long; pedicels 5–10 mm long. **Flowers**: corolla lobes 5–7 × 3–5 mm, replicate, green lined with brown or yellow; corona 2.0–2.5 mm long, ± equalling gynostegium, white beige or pale green; each lobe broadly ovate in dorsal view, ventral appendage of 2 finger-like projections ± 1 mm long, parallel or divergent, horizontally inflexed over gynostegium. **Flowering time** Sept.–Apr. (June), mainly Nov.–Feb. **Fruit** 58–70 mm long. In open grassland, alt. 5–1 830 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Queenstown SE to Cathcart, Stutterheim, Komga and Kei River Mouth, and to Grahamstown).

nitidum Schltr.

Split-tongue; *stinkmelkgras* (A)

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. **Inflorescences** 2–5 per stem, 3–7-flowered; peduncles 8–45 mm long; pedicels 3–12 mm long. **Flowers**: corolla lobes 6–10 × 3.0–4.5 mm, strongly replicate, glabrous, yellow to greenish brown, white striped brown or pink; corona yellow or white, lobes with several-toothed appendages; gynostegium white or pink. **Flowering time** Oct.–Dec.,

June. **Fruit** a follicle, 54–65 mm long. Moist grassland, marshes or close to streams, alt. 1 200–1 950 m; Sub-Escarpment Grassland (Elliot and Maclear Districts).

1b Corolla lobes spreading to cucullate
2a Corolla spreading and not cucullate; corona shorter or just exceeding gynostegial column or without appendages

[E]amatolicum Hilliard

Perennial, geophytic herb, 250–600 mm high; stems simple, erect. **Leaves** decussate, blade 18–34 × 8–14 mm, oblong to deltoid, base ± truncate; petioles 2 mm long. **Inflorescence** up to 6-flowered; peduncles up to 36 mm long. **Flowers**: pedicels ± 10 mm long; corolla lobes ± 9 × 5 mm, replicate, mostly glabrous, dark blackish green; corona green, much shorter than gynostegium, subquadrate in outline, truncate, margins somewhat crenate with minute vertical tooth from ventral surface (0.5 mm or less). **Pollinia** attached subterminally; corpusculum conspicuously flanged. **Flowering time** Nov.–Jan. **Fruit**? Grassland, alt. 1 600–1 780 m; Sub-Escarpment Grassland, Drakensberg Grassland (Elandsberg Mts, Amatole Mts, and Gaika's Kop).

flavum Schltr.

Perennial, geophytic herb, 700–300 mm high; stems 70–270 mm high, unbranched. **Leaves** opposite and decussate; blade 30–70 × 10–20 mm, lanceolate to ovate-triangular; petioles 3–5 mm long. **Inflorescences** 3–5 per stem, 5–9-flowered; peduncles 10–50 mm long; pedicels 5 mm long. **Flowers**: corolla lobes 7–9 × 3–4 mm, flat, yellow-green; corona 3–4 mm long, much exceeding gynostegium, yellow-green; each lobe narrowly elliptic to broadly sagittate in dorsal view, acute at apex, erect, ventral side with median longitudinal groove. **Flowering time** Sept.–Nov., Feb. **Fruit**? In stony grassland, alt. (60–)900–2 250 m; Sub-Escarpment Grassland (Matatiele District: Cedarville, Inungi Pass).

hilliardiae Kupicha

Perennial, geophytic herb, 90–340 mm high; stems 90–340 mm high, basally branched. **Leaves** opposite and decussate; blade 4–6 × 6–26 mm, linear to triangular; petioles 2–13 mm long. **Inflorescences** 3–8 per stem, 3–9-flowered; peduncles 12–50 mm; pedicels 6–11 mm long. **Flowers**: corolla lobes 5–8 × 2.0–3.5 mm, flat, dorsally green with brown or purple markings towards tip, ventrally white, veined with brownish purple; corona 2–3 mm long, cream-coloured to bright yellow-green; each lobe subquadrate in dorsal view, bearing a short simple or longer bilobed ventral appendage, lower half of ventral surface united with staminal column. **Pollinia** subapically attached, pyriform. **Flowering time** Nov.–Jan. **Fruit** 50–70 mm long. In subalpine grassland, alt. 1 800–2 700 m; Drakensberg Grassland, Sub-Escarpment Grassland (Ramatseliso's Gate and Ongeluksnek SW to Hogsback).

stenoglossum Schltr.

Of the 3 subspecies, only the typical one, occurs in the EC.

Perennial, geophytic herb, 180–500 mm high; stems unbranched, erect. **Leaves** decussate, blade linear to narrowly ovate, 40–70 × 2–9 mm; petioles 1–3 mm long. **Inflorescences** 2–5 per stem, 3–6-flowered. **Flowers**: corolla lobes flat, 6–9 × 2.5–3.5 mm, deep red, maroon or purplish brown; corona lobes simple, erect, exceeding gynostegium tip, narrowly triangular in dorsal view, ventral side with median longitudinal groove, green or yellow with purple apex. **Pollinia** with germination zone extending across top of pollinium, edge distinctly thickened. **Flowering time** Oct.–Jan. **Fruit** a follicle,

45–55 mm long. In mountainous grassland, alt. 300–2 100 m; Sub-Escarpment Grassland (S of Kokstad, SW to Willowvale area).

2b Corolla lobes concave to cucullate; corona lobes greatly exceeding the gynostegial column
3a Flowers > 4 mm in diam.

atropurpureum E.Mey.

Perennial, geophytic herb. **Leaves**: lamina oblong to triangular, sometimes very variable. **Flowers**: corolla lobes cucullate, 4.5–7.0 mm long; corona lobes 1–2 mm long with appendage greatly exceeding the subtending lobe and the gynostegium; lobes oblong to ovate in dorsal view, with a bifid or trifid ventral appendage. **Anthers** triangularly ovoid and laterally placed against the style head. **Gynostegium** conspicuously swollen above anthers, usually white. **Pollinia**: attachment median towards apex of pollinium; sausage-shaped, slightly compressed with germination zone occupying apex of pollinium. **Fruit** a follicle. Drakensberg Grassland Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket, Indian Ocean Coastal Belt (Lusikisiki to Mkambati Nature Reserve and SE to Port St Johns, W to Witteberg Mts and S to Queenstown, SE, to Stutterheim, Amatole Mts, Komga and East London).

Of the 7 subspecies, 3 occur in the EC:

atropurpureum E.Mey. subsp. **atropurpureum**

Red milkwort; *basoetoraap*, *melkwortel* (A); *sehoete-moro* (SS); *ishongwe* (Z)

Stems 600–1 300 mm high, usually unbranched. **Leaves** decussate; blade oblong or oblong-triangular, 29–50 × 8–21 mm; petioles 1–7 mm long. **Inflorescences** 5–9 per stem, 8–15-flowered, umbel sometimes branched. **Flowers**: lobes, 5.5–6.0 × 3.5–4.0 mm, outside dark brown-maroon, almost black, inside green striped brown; corona green, with appendage greatly exceeding subtending lobe; corpusculum often flanged; gynostegium white, tinged brownish purple. **Pollinia** attached medianly. **Flowering time** Jan.–Mar. **Fruit** 40–70 mm long. In grassland or scrub, at forest margins or beside streams, alt. 1 200–2 040 m; Drakensberg Grassland (Witteberg Mts).

[E]atropurpureum E.Mey. subsp. **tridentatum** (Schltr.) Kupicha

Stems 160–550 mm high, rarely branched. **Leaves** opposite and decussate; lamina 21–36 × 6–22 mm, oblong or triangular; petioles 2–4 mm long. **Inflorescences** 4–11 per stem, 4–7-flowered; peduncles 6–20 mm long; pedicels 5–10 mm long. **Flowers**: lobes 5–6 × 3–4 mm, dorsally dark red, ventrally greenish lined with dark red, completely glabrous; corona to 2 mm long, equalling or slightly taller than gynostegium, white; ventrally with an erect, ± 1 mm long appendage, flanked by two vertical wings; gynostegium white with pale green centre. **Flowering time** Oct.–Apr., peaking in Nov.–Jan. **Fruit** 45–55 mm long. Rocky grassy slopes; 450–1 500 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Lusikisiki and Queenstown S, from Amatole Mts to Stutterheim, Komga and East London).

atropurpureum E.Mey. subsp. **virens** (E.Mey.) Kupicha

Stems 160–700 mm high, rarely branched. **Leaves** opposite and decussate; blade 20–40 × 6–30 mm, variable in shape; petioles 1–5 mm long. **Inflorescences** 5–13 per stem, 5–15-flowered; peduncles 20–60 mm long, pedicels 10–15 mm long. **Flowers**: lobes 4–7 × 2–4 mm, flat to slightly cucullate, dorsally green, ventrally yellowish green, striped with purple, completely glabrous; corona 2–3 mm long, greenish, ventrally with 2 or 3 erect, prolonged appendages, 1–2 mm long; corona lobe ventrally with two vertical wings, flanking the appendage. **Pollinium** attachment medianly; gynostegium white.

Flowering time July–Apr., peaking between Oct.–Jan. **Fruit**? At edge of coastal bush, disturbed ground, grassland on sandy or rocky soil, alt. 30–900 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Lusikisiki to Mkambati Nature Reserve and S to Port St Johns).

hamatum E.Mey.

Perennial, geophytic herb, 250–600 mm high. **Leaves** opposite and decussate; blade 22–44 × 8–25 mm, oblong to triangular; petioles 2–4 mm long. **Inflorescences** 3–10 per stem, 4–10-flowered; peduncles 1–4 mm long; pedicels 8–10 mm long. **Flowers**: corolla lobes 8–11 × 4–7 mm, slightly cucullate, dorsally greenish brown or purplish, ventrally green, striped with reddish brown; dorsal surface glabrous, ventral surface glabrous, margins minutely ciliate; corona 3–4 mm long, green, ventrally with a stout appendage of two finger-like processes 2–3 mm long flanked by two vertical wings. **Pollinia** attachment subterminally; gynostegium reddish brown or purple. **Flowering time** Nov.–Feb. **Fruit** 55–65 mm long. Grassland, often on dry slopes, alt. 365–2 200 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Ramatseliso's Gate to Kokstad District S, from Andriesberg to Maclear District, Cathcart and Kei River).

linifolium Schltr.

Perennial, geophytic herb, 150–750 mm high; stems erect. **Leaves** with blade filiform, 1–20 mm wide, glabrous. **Flowers**: pedicels ≥ 20 mm long; corolla lobes flat, spreading, with recurved margins or replicate, 2–4 mm long, glabrous outside, minutely puberulous inside, greenish; corona with needle-like projection extended over style head, lobes 15 mm long, thick and fleshy. **Flowering time** Oct.–Mar., June, Aug. **Fruit** a follicle, without bristles. Rocky to open grassland, open woodland, closed shrubland, alt. 60–2 045 m; Dry Highveld Grassland, Upper Karoo, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Bethulie District S, from Queenstown to Maclear District, Mountain Zebra National Park to Komga and from Riebeek East to Kidd's Beach).

3b Flowers 3.5–4.0 mm in diam.

aschersonianum Schltr.

Perennial, geophytic herb, 50–300 mm high; stems erect, well branched from base. **Leaves** longer than internodes with blade filiform, 1–4 mm wide. **Inflorescences** with 4–8 flowers, spherical; peduncles 1–4 mm long. **Flowers**: pedicles 1–3 mm long; corolla lobes flat, spreading to suberect, 0.5–2.0 mm long, greenish; corona with thin, needle-like projection extended over style head, lobes 15 mm long, thick and fleshy. **Flowering time** Aug.–Mar., with a peak in Oct.–Dec. **Fruit** a follicle, without bristles, 45–75 mm long, broadest below middle. Rocky to open grassland, open woodland, closed shrubland, fynbos, alt. 60–2 045 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Sneeuberg Mts to Cradock, King William's Town, Alexandria and to Humansdorp).

eustegioides (E.Mey.) Druce

Perennial, geophytic herb, 25–380 mm high; stems erect, well branched. **Leaves** narrowly ovate, 4–48 × 1–3 mm, base sometimes sagittate. **Inflorescences** pedunculate, 3–5-flowered. **Flowers**: corolla campanulate, lobes flat, erect, margins revolute, apex recurved, outside green with brownish streak in middle, inside paler green to cream-coloured. **Flowering time** Oct.–Mar., with peak in Nov.–Feb. **Fruit** a follicle with

echinate, 4 mm long processes. Karroid open shrubland, alt. 183–1 980 m; Upper Karoo, Dry Highveld Grassland (Hanover E to Middelburg, SE to Cradock and Tarkastad).

SECAMONE R.Br.

Species ± 100, in warmer regions of Old World, Africa and Madagascar; 5 in sthn Afr., widespread, except N, FS, L.

alpini Schult.

(*Bobbejaan-*), *bostou* (A)

Perennial climber, woody, 1–10 m long; young growth hirsute, ferrugineous. **Leaves** with lamina ± coriaceous, variable, obovate to elliptic, (10–)25–62 × 6–25(–35) mm; petioles 2–8(–11) mm long. **Inflorescences** terminal or axial, cymose panicles. **Peduncles** 6–20(–35) mm long. **Flowers** pedicelled (1–)2–4 mm long; corolla campanulate, tube 0.5–1.0 mm long, lobes ovate, 1–2 × 0.8–1.0 mm, outside glabrous, inside white-hairy. **Staminal corona** subulate, equalling staminal column, small-lobed. **Style** included or exserted from stamina curtain. **Flowering time** Nov.–Jan. **Follicles** paired, widely divergent, narrowly fusiform, 70–100(–150) × (3–)4–8 mm. Inland and coastal forest and thicket margins, alt. 5–2 400 m; Indigenous Forests (Weza, southwards from Queenstown and Port Edward to Tsitsikamma, Humansdorp, Port Elizabeth and East London).

filiformis (L.f.) J.H.Ross

Perennial climber, 1–5 m long; leaf nodes knot-like. **Leaves** with lamina thinly textured, grey below, narrowly lanceolate, 12–25 × 2–7 mm, midrib prominent, base narrowly cuneate, apex obtuse to acute; petioles up to 3 mm long. **Inflorescences** terminal or axillary, compact cymes, 5–12-flowered; peduncle up to 4 mm long. **Flowers** pedicelled, ± 3 mm long; corolla campanulate, tube ± 0.5 mm long, lobes rotate, ovate-oblong, 1.0–1.5 × 0.5–1.0 mm. **Coralline corona** of 5 small ridges. **Staminal corona** white-lobed, quadrate, small, adnate to staminal curtain. **Flowering time** Oct.–May. **Follicles** divergent, narrowly fusiform, 40–60 × 3 mm. Dry coastal and escarpment woodland, alt. 10–1 500 m; Indigenous Forests, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Komga, S from Swartkops River to Port Elizabeth, Grahamstown and East London).

gerrardii Harv. ex Benth.

Ubuka (X); *iPhophoma*, *umhlonyise* (Z)

Perennial climber, 1–5 m long; bark corky-winged; leaf nodes knot-like. **Leaves** with lamina subcoriaceous, ± oblong-lanceolate, 25–45 × 7–13 mm, secondary veins many, base rounded to cuneate, apex obtuse to acute, glabrous on both surfaces; petioles 2–5 mm long. **Inflorescences** terminal or axillary, 3–7-flowered, lax cymes; peduncle 10–18 mm long. **Flowers** pedicelled, 6–14 mm long; corolla campanulate, tube 2–3 mm long, ring of downwardly pointing hairs below mouth, lobes oblong, 4–5 × 1.5–2.5 mm, green to cream-coloured, tinged maroon. **Coralline corona** of 5 small pockets. **Staminal corona** with fleshy lobes, 2–3 mm long. **Flowering time** Aug.–Feb. **Follicles** paired, widely divergent, narrowly fusiform, 60–80 × 8–11 mm, attenuate. Gallery or coastal forest, alt. 5–1 800 m; Indigenous Forests (Port St Johns S to Seymour and Kei River Mouth).

SISYRANTHUS E.Mey.

Species 13, tropical Africa and sthn Afr., widespread in grassland, except N, B.

barbatus (Turcz.) N.E.Br.

Perennial, geophytic herb, stems usually unbranched, up to 0.6 m high. **Leaves** linear, 50–105 × 1.0–2.5 mm, glabrous, apex acute, margins ciliate. **Inflorescences** 9–12-flowered umbels; peduncles 8.5–32.0 mm long. **Flowers** globose-campanulate; tube 2.0–2.5 × 2.8 mm, constricted at mouth, lower surface glabrous, densely bearded in upper half with deflexed hairs; lobes oblong, 2.0–2.5 × 1.3–1.4 mm, lower surface glabrous, densely covered in hairs above but glabrous along margins. **Corona** shorter than corolla tube; lobes broadly cuneate, 3-toothed, middle one overtopping style apex. **Anthers** oblong, densely long white-ciliate at apex. **Flowering time** Dec., Jan. Montane grassland, alt. 1 200–1 600 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket [Engcobo and Mkambati Nature Reserve S, from Amatole Mts (Menziesberg) to Stutterheim and to Port Alfred].

compactus N.E.Br.

Perennial, geophytic herb, stems usually unbranched, 150–360 mm high. **Leaves** linear, 55–105 × 0.65–2.60 mm, glabrous, apex acute, margins somewhat ciliate. **Inflorescences**: 5–12(or more)-flowered umbels; peduncles 0–25 mm long. **Flowers** globose-campanulate; tube 2.0–2.5 × 2.5–3.1 mm, constricted at mouth, lower surface glabrous, densely bearded in upper half, hairs deflexed; lobes ovate-oblong, 1.5–2.1 × 1.0–1.5 mm, lower surface glabrous, upper densely hairy, darker than tube. **Corona** shorter than anthers; lobes rhomboid, 3-toothed, middle one deltoid. **Anthers** oblong, densely long white-ciliate at apex. **Flowering time** Nov.–Jan. Coastal grasslands, alt. 30 m and higher; Drakensberg Grassland, Albany Thicket (Hogsback S, Hopewell, Port Alfred and East London).

huttoniae (S.Moore) S.Moore

Perennial, geophytic herb, stems usually unbranched, 300–410 mm high. **Leaves** linear-filiform, 50–85 × 0.5–1.1 mm, glabrous, apex acute, margins minutely ciliate-denticulate. **Inflorescences** 6–15-flowered umbels; peduncles 12–32 mm long. **Flowers** subglobose-campanulate; tube 2.0–2.6 × 2.8 mm, constricted at mouth, lower surface glabrous, densely bearded in mouth and throat with upper hairs converging to the center, lowers hairs deflexed; lobes oblong-ovate, 2.0–3.1 × 1.5–2.1 mm, both surfaces glabrous. **Corona**: lobes triangular-ovate with a minute tooth on either side at base, apex subulate or filiform, connivent over style apex with erect apex. Habitat?, alt. 400–1 750 m; exact locality not recorded.

imberbis Harv.

Perennial, geophytic herb, stems usually unbranched, 180–610(–990) mm high. **Leaves** linear, 30–130 × 0.5–2.1 mm, glabrous, apex acute, margins sparsely ciliate, somewhat folded lengthwise. **Inflorescences** 2–7-flowered umbels; peduncles 6–25 mm long. **Flowers** broadly campanulate; tube 1.5–2.1 × 3.0–3.7 mm, slightly constricted at mouth, lower surface glabrous, upper with 5 tufts of deflexed hairs just below mouth; lobes oblong or ovate-oblong, 2.5–3.5 × 1.3–2.1 mm, lower surface glabrous. **Corona**: lobes broadly ovate with slightly reflexed sides, shorter than anthers. **Anthers** oblong, glabrous. **Flowering time** Nov.–Jan. **Follicles** terete-fusiform, 70–90 × 5 mm, glabrous. Recently burned grassland, stony soil, alt. 30–1 830 m; Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Mkambati Nature Reserve and Msikaba Gorge S, near Komga, Grahamstown District).

[E]macer (E.Mey.) Schltr.

Perennial, geophytic herb, stems usually unbranched, 180–610(–990) mm high. **Leaves** linear, 100–130 × 1.3–3.1 mm. **Inflorescences** 2–7-flowered umbels; peduncles 6–25 mm long. **Flowers** broadly campanulate; tube 1.5–2.1 × 3.0–3.7 mm, slightly constricted at mouth, both surfaces entirely glabrous; lobes oblong or ovate-oblong, 2.5–3.5 × 1.3–2.1 mm, glabrous lower surface. **Corona**: lobes erect, broadly ovate, shorter than anthers. **Anthers** narrowly oblong, taller than style apex, minutely apiculate. Grassland; Sub-Escarpment Savanna (Komga District).

trichostomus K.Schum.

Perennial, geophytic herb, stems usually unbranched, 350–610(–800) mm high. **Leaves** linear, 50–165 × 1.0–2.6 mm, glabrous, apex acute, margins minutely ciliate and in-folded. **Inflorescences** 12–30-flowered umbels. **Flowers** globose-campanulate, yellow; tube 1.5–2.6 mm long, slightly constricted at mouth, lower surface glabrous, densely bearded at mouth with upper hairs ascending and lower hairs deflexed; lobes oblong to ovate-oblong, 2–4 × 1.5–2.6 mm, both surfaces glabrous. **Corona**: lobes broadly cuneate, shorter than staminal column, with middle one of 3 teeth bifid. **Anthers** hairy at apex, approximately equal in length to style apex. Grasslands around Clydesdale and KZN midlands, alt. 750–1 700 m; exact locality not recorded.

virgatus E.Mey.

Perennial, geophytic herb, stems usually unbranched, 450–760 mm high. **Leaves** sessile, linear, 60–90 × 1 mm, apex acute, margins slightly ciliate. **Inflorescences** 2–8-flowered umbels; peduncles 6–25 mm long. **Flowers** globose-campanulate; tube 2.7 mm long, lower surface glabrous, densely bearded with a ring of spreading hairs at mouth with 5 triangular patches of deflexed hairs below; lobes oblong, 2.5 × 1.3–1.5 mm, lower surface glabrous, upper densely hairy, forming distinct tufts at apex. **Corona**: lobes broadly cuneate-subquadrate, shorter than corolla tube, middle one 3-toothed, closely inflexed over style apex. **Anthers** transversely elliptic to elliptic-oblong, thinly ciliate at apex. **Flowering time** Oct.–Jan. Habitat?, alt. 30–1 500 m; Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket (Msikaba S, Seymour to Stutterheim, Kentani and Kei River Mouth, Hopewell).

STAPELIA L.

Species 44, Angola and sthn Afr.; 43 in sthn Afr., widespread.

asterias Masson

Aasblom (A)

Perennial succulent; stems erect, ± 150 × 15 mm, densely pubescent to ± glabrous, green to grey-green, 4-angled, obtusely tuberculate. **Flowers** 1–5; pedicels up to 65 mm long. **Sepals** up to 10 mm long. **Corolla** rotate, 40–140 mm in diam., pubescent, red to purplish black, deeply lobed; lobes spreading to reflexed, 25–55 × 15–35 mm, usually shiny with transverse rugulosities and pale yellow transverse markings. **Corona** 6–12 mm in diam., purplish black, variable; outer lobes ascending, oblong, ± 5 mm long, longitudinally channelled; inner lobes 6–7 mm long, basally incumbent on anthers, then laterally flattened to form a broad ascending wing with a recurved inner horn. Amongst small bushes in rocky areas, alt. 450–1 312 m; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (WC border to Willowmore SE to near Storms River).

Treated as *S. hirsuta* var. *hirsuta* in Bruyns (2005b).

[E]**baylissii** L.C.Leach

Perennial succulent; stems erect, ± 150 × 15 mm, ± glabrous, green infused with purple, 4-angled, prominently tuberculate. **Flowers** 1–3. **Sepals** ± 6 mm long. **Corolla** rotate, 30–60 mm in diam., dark red to purple, deeply lobed; lobes spreading or recurved with reflexed apex, margins revolute, 15–22 × 8–10 mm, glabrous but apex and margins sometimes minutely pubescent, usually shiny with strong transverse rugulosities. **Corona** 6–12 mm in diam., purplish black, variable; outer lobes ascending, oblong, 3–4 mm long, longitudinally channelled; inner lobes ± 6 mm long, basally incumbent on anthers, then laterally flattened to form an ascending wing with a recurved inner horn. Dry, rocky areas, alt. 200–700 m; Lower Karoo, Eastern Fynbos-Renosterveld (Suurberg Mts).
Treated as *S. hirsuta* var. *baylissii* in Bruyns (2005b).

[E]**glabricaulis** N.E.Br.

Perennial succulent; stems erect, often from a decumbent base, 200 × 15–20(–25) mm, ± glabrous, green to grey-green, 4-angled, bluntly tuberculate. **Flowers** 1–3; pedicels up to 60 mm long. **Sepals** ± 7 mm long. **Corolla** rotate, 50–70(–100) mm in diam., dark red to purple-brown, deeply lobed; lobes spreading or recurved, 15–30 × 12–20 mm, pubescent, sometimes with transverse yellow lines. **Corona** 6–12 mm in diam., purplish black; outer lobes spreading to ascending, oblong, up to 6 mm long, longitudinally channelled; inner lobes variable, up to 10 mm long, basally incumbent on anthers, then laterally flattened to form an erect wing with a recurved inner horn. Amongst rocks and grasses, alt. up to 700 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Mqanduli S to Cradock, King William's Town and Kentani, from Port Elizabeth to Port Alfred).
Treated as *S. hirsuta* var. *tsomoensis* in Bruyns (2005b).

grandiflora Masson

Makghaap, *slangghaap* (A)

Perennial succulent; stems decumbent to erect, 60–300 × 20–30 mm, pubescent, green to grey-green, 4-angled, not prominently tuberculate. **Flowers** 1–5; pedicels (10–)25–70 mm long. **Sepals** 4–15 mm long. **Corolla** rotate, (50–)80–220 mm in diam., pubescent, transversely rugulose, dark purple to red-brown, yellow-brown or greenish cream-coloured, deeply lobed; lobes convex, usually recurved, 30–80 × 20–40 mm. **Corona** 15–20 mm in diam., reddish purple to yellowish; outer lobes ascending, oblong, 7–9 mm long, longitudinally channelled; inner lobes 6–11 mm long, basally incumbent on anthers, then laterally flattened to form a broad erect wing with a recurved inner horn. **Flowering time** Nov.–May. Rocky areas, sometimes under trees, alt. 500–1 800 m; in all bioregions, except Mesic Highveld Grassland and Indigenous Forests (widespread, from Aliwal North southwards to Steynsburg and Engcobo, Rietbron to Keiskammahoek and from Willowmore to Port Elizabeth, Grahamstown and East London).

[E]**kougabergensis** L.C.Leach

Perennial succulent; stems erect, 200 × 12 mm, pubescent, grey-green, 4-angled, not prominently tuberculate. **Flowers** 1–8; pedicels up to 20 mm long. **Sepals** up to 5 mm long. **Corolla** rotate, 16–30 mm in diam., glabrous to slightly pubescent, transversely rugulose, red to purple usually with irregular transverse yellowish lines; lobes as wide as long, spreading to recurved. **Corona** 4.5–7.0 mm in diam., dark red to blackish, variable; outer lobes ascending, rectangular, ± 1.5 mm long; inner lobes ± 2.5 mm long, keeled, appressed to anthers at base, erect to connivent-erect above with recurved apices.

Sandstone soils, sometimes amongst small bushes, alt. 500–900 m; Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Willowmore to Steytlerville S to the Baviaanskloof with an isolated population in the Suurberg).
Treated as *S. paniculata* subsp. *kougabergensis* in Bruyns (2005b).

[E]**macowanii** N.E.Br.

Perennial succulent; stems erect, 300 × 20 mm, pubescent, grey-green, 4-angled, not prominently tuberculate. **Flowers** 1–5; pedicels up to 30 mm long. **Sepals** 4–30 mm long. **Corolla** rotate, (50–)90–120(–155) mm in diam., ± glabrous to sparsely pubescent, transversely rugulose, greenish white to brownish yellow with pale transverse markings, deeply lobed; lobes recurved with whitish hairs along margins, 16–21(–26) × 12.5–15.0(–19.0) mm. **Corona** 15–20 mm in diam., reddish purple to yellowish; outer lobes ascending, oblong, 4–5 mm long, longitudinally channelled; inner lobes 6–11 mm long, basally incumbent on anthers, then laterally flattened to form an erect wing with or without a recurved inner horn. Habitat?, alt. 500–1 000 m; Lower Karoo, Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Graaff-Reinet to Fort Beaufort S, from Willowmore to Port Elizabeth).

Two varieties are recognised:
Following Leach (1985); Bruyns (2005b) treated both varieties as *S. grandiflora* var. *conformis*.

[E]**macowanii** N.E.Br. var. **conformis** (N.E.Br.) L.C.Leach

Pedicels up to 30 mm long. **Sepals** up to 12.5 mm long. **Corolla** up to 155 mm in diam. **Corona** inner lobes with a dorsal wing and an inner horn. Lower Karoo, Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Graaff-Reinet E to Fort Beaufort, Miller E to Port Elizabeth and Grahamstown).

[E]**macowanii** N.E.Br. var. **macowanii**

Pedicels up to 10 mm long. **Sepals** 4–5 mm long. **Corolla** ± 50–60 mm in diam. **Corona** inner lobes with a dorsal wing and rarely with an inner horn. Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Loot's Kloof and Hell Poort near Grahamstown).

[E]**obducta** Pillans

Perennial succulent; stems decumbent to erect, 50–300 × 10–20 mm, ± glabrous, green infused with red, 4-angled, obtusely tuberculate. **Flowers** 1–3; pedicels 15–60 mm long. **Sepals** 5–13 mm long. **Corolla** 28–35 mm in diam., red to reddish brown, inner surface covered with long red-brown hairs; lobes strongly recurved and folded tightly back under corolla, 16–25 × 15–19 mm. **Corona** ± 12 mm in diam., purple-brown to yellow; outer lobes ascending, oblong, 4–6 × 2 mm, longitudinally channelled; inner lobes ± 6 mm long, basally incumbent on anthers then connivent-erect with laterally flattened, erect dorsal wing. Amongst small bushes and rocks, alt. 800–1 200 m; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Grootrivier Mts, Cockscomb Peak and Long Kloof near Joubertina).

olivacea N.E.Br.

Agurkie (A)

Perennial succulent; stems erect, 20–120 × 6–10 mm, tapering, pubescent, grey-green, 4-angled, obtusely tuberculate. **Flowers** 1–6; pedicels 4–6 mm long. **Sepals** 4–5 mm long. **Corolla** 20–40 mm in diam., ± rotate to slightly campanulate, almost black to red-

dish brown or greenish yellow, transversely rugulose; lobes recurved, 7–15 × 6–8 mm, sometimes with white hairs along margins. **Corona** ± 7 mm in diam., dark purple to red; outer lobes ascending, narrowly triangular, 2.5–3.5 × 1 mm, channelled; inner lobes 4–5 mm long, appressed to anthers, ± filiform, connivent-erect and recurving above with a laterally flattened, spreading, ± triangular dorsal horn. Amongst rocks and small bushes, alt. 900–1 100 m; Upper Karoo, Dry Highveld Grassland (Steynsburg to Graaff-Reinet and Cradock).

[E]**peglerae** N.E.Br.

Perennial succulent; stems erect, 175 × 15 mm, tapering at both ends, ± glabrous, green to grey-green, 4-angled, not prominently tuberculate. **Flowers** 3 or 4; pedicels 20–40 mm long. **Sepals** ± 6 mm long. **Corolla** rotate, up to 75 mm in diam., shiny purple-brown, transversely rugulose, deeply lobed; lobes spreading, 15–30 × 12–20 mm, pubescent with whitish to mauve marginal hairs, sometimes with pale transverse lines. **Corona** 6–12 mm in diam., purplish black; outer lobes ascending, oblong, ± 4 mm long, longitudinally channelled; inner lobes variable, ± 8 mm long, basally incumbent on anthers, connivent-erect and strongly recurved above with a laterally flattened, erect, narrowly triangular dorsal wing. Dry rocky areas, alt. up to 900 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Lower Tsitsa Falls to Idutywa).
Treated as *S. hirsuta* var. *tsomoensis* in Bruyns (2005b).

[E]**praetermissa** L.C.Leach

Perennial succulent; stems erect, 120 × 10 mm, glabrous, green, 4-angled, tuberculate. **Flowers** 1–3; pedicels up to 6 mm long. **Sepals** ± 8 mm long. **Corolla** rotate, 30–50 mm in diam., dark red to maroon or pale yellow, deeply lobed; lobes spreading, up to 20 mm long, convex from revolute margins, ± glabrous but with long whitish to purple marginal hairs, usually shiny with light transverse rugulosities. **Corona** 6–12 mm in diam., purplish black or pale yellow, variable; outer lobes spreading to ascending, narrowly oblong, ± 5.5 mm long, longitudinally channelled; inner lobes ± 6 mm long, basally incumbent on anthers, laterally flattened, suberect or recurving above, keeled dorsally with a small, spreading dorsal wing at base. Rocky areas, alt. up to 600 m; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Grahamstown to Salem and Southwell).
Two varieties are recognised:
Following Leach (1985); Bruyns (2005b) treated both varieties as *S. hirsuta* var. *baylissii*.

[E]**praetermissa** L.C.Leach var. **luteola** L.C.Leach

Corolla pale yellow, apices of lobes pink to brownish. **Corona** pale yellow. Albany Thicket (Vaalvlei, Kariega River).

[E]**praetermissa** L.C.Leach var. **praetermissa**

Corolla dark red to maroon. **Corona** blackish. Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Grahamstown to Salem and Southwell).

[E]**tsomoensis** N.E.Br.

Perennial succulent; stems erect, 150 × 10 mm, ± glabrous to minutely pubescent, green, 4-angled, not prominently tuberculate. **Flowers** 1–3; pedicels up to 30 mm long. **Sepals** 6–7 mm long. **Corolla** rotate, up to 70 mm in diam., yellowish to purple, hirsute with long straight reddish hairs, deeply lobed; lobes spreading or recurved with whitish marginal hairs, transversely rugulose and sometimes with pale transverse lines. **Corona** purplish black; outer lobes spreading to ascending, oblong, 4–5 mm long, longitudinally

channelled; inner lobes ± 8 mm long, basally incumbent on anthers, connivent and recurving above with a laterally flattened, spreading, narrowly triangular dorsal wing. Habitat?, alt.?; Sub-Escarpment Savanna, Drakensberg Grassland (Tsomo to Stutterheim and Komga).
Treated as *S. hirsuta* var. *tsomoensis* in Bruyns (2005b).

vetula Masson

Perennial succulent; stems erect, 200 × 10–15 mm, ± glabrous, green to purplish, 4-angled, tuberculate. **Flowers** 1–3; pedicels 10–20 mm long. **Sepals** 4–8 mm long. **Corolla** rotate, 30–80 mm in diam., red to purplish black, glabrous, deeply lobed; lobes spreading to recurved, 15–20 × 10–12 mm, transversely rugulose, sometimes with transverse yellow lines. **Corona** 6–12 mm in diam., dark purple; outer lobes spreading to ascending, oblong, 3.5–6.0 mm long, longitudinally channelled; inner lobes 6–8 mm long, basally incumbent on anthers, erect with apices recurving above, with an erect or spreading, laterally flattened, dorsal wing. Dry rocky areas, alt. 300–1 000 m; Rainshadow Valley Karoo (Willowmore area).
Treated as *S. hirsuta* var. *vetula* in Bruyns (2005b).

STAPELIOPSIS Pillans

Species 6, sthn Afr., N, NW, NC, WC, EC.

Corolla thick and rigid, folds between lobes almost half as broad as lobes; flowers usually subterranean, produced facing horizontally or downwards

pillansii (N.E.Br.) Bruyns

Perennial, dwarf creeping succulent, mat-forming; stems up to 150 mm long, procumbent or partly underground, 4-angled, with flat or slightly concave sides; glabrous, dull green with purple markings, teeth pale green when young, becoming hardened and brown with age. **Inflorescences** 1(3) per stem, arising near base of stem, developed underground, 3 or more flowers. **Sepals** ± ovate, acuminate, glabrous. **Corolla** broadly depressed pear-shaped, frosted pale purple inside, papillate to glabrous outside; lobes fleshy, triangular, connate at apex forming dome-like top to flower or erect and widely spreading. **Corona** 2-seriate; outer lobes whitish, reduced to minute, ovate, spreading; inner lobes dark purple, erect, with apex connivent above style apex. **Flowering time** Dec.? Closed woodland, rocky outcrops, alt. 500–950 m; Lower Karoo, Dry Highveld Grassland, Rainshadow Valley Karoo, Albany Thicket (Pearston and Jansenville to Somerset East S, from Steytlerville to Port Elizabeth).

Corolla thin, folds between lobes minute to absent; flowers above ground, produced facing upwards

saxatilis (N.E.Br.) Bruyns

Perennial, dwarf creeping succulent; stems 35–130 mm long, prostrate, often partly underground, 4-angled, with flat or slightly concave sides; glabrous, young stems glaucous-green becoming dull green with purple markings and finally greyish, axillary buds developing with age. **Inflorescences** 1(3) per stem, arising near base of stem, 4–7-flowered, developing successively. **Sepals** ± lanceolate, acute, apex recurved, glabrous. **Corolla** broadly ovoid or subglobose, frosted blackish purple inside, glabrous outside; lobes deltoid to ovate-lanceolate, connate at apex forming dome-like top to flower. **Corona** 2-seriate; outer lobes dark purple-brown, reduced to minute, ovate-deltoid, spreading; inner lobes dark purple-brown, erect, with apex connivent above style apex, thick and fleshy. **Flowering time** Dec.? Sandstone mountains in small pockets of soil among rocks

and bushes or on exposed slabs of rock, alt. 200–1 000 m; Eastern Fynbos-Renosterveld (high up on Cockscomb Peak).

STENOSTELMA Schltr.

Species 4, sthn Afr., N, B, LIM, NW, G, M, S, FS, KZN, L, EC.

capense Schltr.

Perennial, geophytic herb, 150–250 mm high; stems basally branched and uniseriately hairy or glabrous. **Leaves** longer than internodes, blade 10–40 × 2–5 mm, midrib hairy. **Inflorescence** 8–12-flowered, ± globose; peduncles up to 10 mm long, erect, pubescent. **Flowers**: pedicels up to 3 mm long; corolla dorsally greenish, cream-greenish inside, lobes apically reddish, 3 × 2 mm, narrowly triangular, margins revolute, apex recurved, papillose; corona lobes white, up to 8 mm long, basally stalk-like, abruptly triangularly broadened, apically long-attenuate, reaching over conical style head. **Pollinia** curved inwards, translators broad. **Flowering time** Sept.–Apr., with peak in Jan., Feb. **Fruit** finely pubescent, 30–50 × 3–7 mm. Grassland, especially in seasonally moist areas and on rocky hillsides, alt. 900–1 500 m; Upper Karoo and Sub-Escarpment Grassland (Middelburg and Queenstown districts S to Cradock District).

corniculatum (E.Mey.) Bullock

Perennial, geophytic herb, 100–410 mm high; stems basally branched, uniseriately hairy or glabrous. **Leaves** longer than internodes, blade 10–140 × 2–7 mm. **Inflorescence** 5–12-flowered, ± globose; peduncles 2–10 mm, erect, pubescent. **Flowers**: pedicels 0.5–2.0 mm long; corolla dorsally green, lobes cream-coloured inside, 3 × 2 mm, narrowly triangular, margins revolute, apex recurved, papillose; corona lobes ventrally white, dorsal surface maroon, up to 10 mm long, sessile, abruptly broadened, triangular, long-attenuate, reaching over conical style head, ventral side of process furrowed, apical ends inflexed. **Pollinia** curved inwards, translators broad. **Flowering time** Nov.–Mar., peaking in Dec., Jan. **Fruit** finely pubescent, 25–45 × 3–7 mm, bristles up to 2 mm long. Stony grassland especially in black clay soils, alt. 400–1 700 m; Upper Karoo, Sub-Escarpment Grassland (Middelburg and Queenstown districts S to Cradock District).

STROPHANTHUS DC.

Species 38, Asia, Africa, Madagascar; 30 in Africa; 6 in sthn Afr., N, B, LIM, M, S, KZN, EC.

speciosus (Ward & Harv.) Reber

Bobbejaantou (A); *isiHlungu* (Z)

Much-branched shrub or woody climber, up to 20 m long; bark warty, with watery sap. **Leaves** 3-whorled, narrowly elliptic to oblanceolate, 30–80 × 8–20 mm; colleters in axils scale-like, overlapping. **Inflorescence** terminal, corymbose, up to 16-flowered. **Flowers** yellowish orange with red mark at base of lobes. **Corolla**: tube 6–7(–10) mm long; coralline corona lobes at mouth, scale-like, alternating with lobes; lobes linear, spreading, twisted, 25–30 × 2.5 mm. **Anthers** hidden in corolla tube, long appendage hairy. **Gynoecium** apocarpous, bicarpellate. **Style-stigma-head** capitate with thin, reflexed annulus at base, enclosed by anthers. **Flowering time** Sept., Oct. **Fruit** a pair of follicles, horizontally diverging, fusiform, 100–180 × 10–15 mm, apex attenuate, abruptly thickened. Evergreen forest margins, alt. 50–1 750 m; Indigenous Forests (Flagstaff District, S across Amatole Mts to Seymour, Fish River and Komga).

TABERNAEMONTANA L.

Species ± 110, pantropical, 18 in Africa, 15 in Madagascar, 1 in Mascarene Islands; 2 in sthn Afr., LIM, M, S, KZN, EC.

ventricosa Hochst. ex A.DC.

Forest toad tree; *bospaddaboom* (A); *umhlambamasi* (X); *umkhahlu* (Z)

Small or medium tree, (2–)4–8(–15) m high. **Leaves** oblong, 90–170 × 35–60 mm; petioles 5–12 mm long; stipules fused into caducous tube 2 mm long. **Inflorescences** of contracted cymes; peduncle stout, 30–70 mm long. **Flowers** salver-shaped, white, somewhat fleshy. **Corolla** tube narrowly urceolate, 8–10 mm long; lobes twisted, 10–12 mm long, basally auriculate, margins crisped. **Stamens** with filaments small, swollen; anthers lanceolate, sagittate, conniving apically at tube mouth. **Gynoecium** apocarpous, bicarpellate. **Style** ± ending at anther base, apex swollen and cylindrical. **Flowering time** Sept., Oct. **Fruit** a pair of fleshy follicles diverging horizontally, fused at base, ellipsoid, 45–55 × 25–30 mm, surface smooth. Riverine woodland, coastal scrub, evergreen forest, alt. 0–850 m; Indian Ocean Coastal Belt (Pondoland, Mtamvuna Bridge).

TAVARESIA Welw.

Species 2, Africa; 1 in sthn Afr., widespread, except KZN, L, S.

barklyi (T.-Dyer) N.E.Br.

Bergghaap (A)

Perennial succulent; stems erect, 0.15–0.30 m high, 10–12-angled, angles with white, tuberculate teeth; each tubercle furnished with 3 apical, purple bristles. **Inflorescence** 1 per stem with 1–4 flowers produced in succession from near base of stem. **Sepals** ± ovate-lanceolate. **Corolla** greenish white with dark red markings on outside, pale yellow with dark red markings within; tube campanulate ± 35 mm long; lobes ± 15 mm long, spreading. **Corona** outer lobes united at base, each produced into 2 filiform segments sometimes with knob-like apex, ± 7 mm long. **Corona**: inner lobes united at base to outer corona lobes, linear-lanceolate, incumbent on back of anthers. **Staminal column** arising from base of corolla. **Flowering time** midsummer, after rain. Koppies, N- and E-facing, sandstone and dolerite slopes, sheltered amongst rocks and in gardens, alt. 500–1 200 m; Upper Karoo (WC border from Norvalspont S to Richmond en route to Middelburg).

TRIDENTEA Haw.

Species 8, sthn Afr., N, B, NW, FS, NC, WC, EC.

Both species in Sect. *Tridentea* (Bruyns 1995)

Flowers reddish brown, brown or black, 45–100 mm in diam.

gemmiflora (Masson) Haw.

Perennial succulent; stems decumbent, 60–110 mm long, obtusely 4-angled, softly fleshy, glabrous, grey-green, teeth ending in spreading leaves. **Inflorescence** 1 per stem, arising near base of stem with 1–4 flowers developing in succession. **Calyx** glabrous, ovate-lanceolate. **Corolla** spreading, with shallow, funnel-shaped depression in centre, glabrous, margins ciliate, inside blackish purple with lighter purple and/or yellow markings, outside pale green with brown-red markings. **Corona** blackish purple, arising from staminal column, glabrous; outer corona of 5 ascending to spreading lobes, deeply trifid lobes; inner lobes 2-horned, with yellow markings. **Flowering time** Oct.–Mar. **Follicles** fusiform, beaked, green mottled with darker green markings, glabrous. Well-drained rocky

flats, quartzite colluvium, partial shade, alt. 150–1 200 m; Dry Highveld Grassland, Upper Karoo, Rainshadow Valley Karoo (Aliwal North S to Middelburg and Willowmore).

Flowers uniformly bright greenish yellow or yellow, 25–30 mm in diam.

virescens (N.E.Br.) L.C.Leach

Perennial succulent; stems in clumps together, erect, 50–100 mm long, obtusely 4-angled, grey-green with purplish brown markings, tuberculate-toothed with teeth ending in spreading, deciduous leaves. **Inflorescence** 1 per stem, arising from lower half of stem, 6–9-flowerered with long pedicels. **Calyx** glabrous; lobes ovate-lanceolate, margins sparsely ciliate. **Corolla** spreading, margins reflexed; outside glabrous, pale green with purplish tint; inner surface rugose with stout papillae, greenish yellow. **Corona** yellow, glabrous; outer corona lobes trifid; inner lobes 2-horned. **Flowering time** Dec., Mar. Sandy soil, brackish veld, garden rockeries, alt. 900–1 200 m; Upper Karoo, Lower Karoo (Aliwal North S, between Aberdeen and Willowmore).

TROMOTRICHE Haw.

Species 11, sthn Afr., winter rainfall area of N, NC, WC, EC.

[E]baylissii (L.C.Leach) Bruyns

Perennial, trailing succulent. **Stems** pendulous, branching at base and sometimes along length, 0.15–2.00(–3.00) m × 6–20 mm, glabrous, sulcate, blue-green, obtusely 4-angled with obscure tubercles. **Flowers** 1–5 per inflorescence; pedicels 12–15 mm long. **Sepals** 2–3 mm long. **Corolla** 20–25 mm in diam., tubular-campanulate, outside purplish pink, inside red-purple, transversely rugulose, glabrous or papillate; lobes suberect to spreading, 8 × 7–10 mm. **Corona** 4–5 mm in diam., dark purple; outer lobes ascending, oblong, dorsal surface channelled, apex tridentate; inner lobes 2-horned, inner horn slender, flattened basally, ± 5.5 mm long, connivent-erect, apices slightly clavate; outer horn erect, laterally flattened, ± 3 mm long. Pendant from ledges on sandstone cliffs, alt. 250–900 m; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Willowmore to Steytlerville, S to Joubertina).

[E]longii (C.A.Lückh.) Bruyns

Perennial, trailing succulent. **Stems** spreading or pendulous, branching along length, 40–300 × 4–8 mm, ± glabrous, blue-green with purplish markings, longitudinally grooved to obtusely 4-angled, tessellately tuberculate, tubercles tipped with a ± 1 mm long acute tooth. **Flowers** 1 or 2 per inflorescence; pedicels 10–40 mm long. **Sepals** ± 3 mm long. **Corolla** 18–25 mm in diam., rotate with thickened annulus, glabrous, ± concentrically rugulose, yellowish to reddish brown, paler in centre; lobes slightly reflexed, margins revolute, lined with purple, vibratile, clavate cilia, 7–9 × 6–8 mm. **Corona** 7–8 mm in diam., dark purple; outer lobes spreading, 2.5–3.5 mm long, oblong and channelled at base, apices bifid, terminating in obtusely tuberculate, spherical knobs; inner lobes 2-horned, united with outer lobes to form a well below the guide rails, inner horn appressed to anthers, ± 2 mm long, erect and terminating in an obtusely tuberculate, spherical knob, outer horn similar but shorter and spreading. Sandstone soils on steep slopes, sometimes pendant from rocky ledges, alt. 500–800 m; Albany Thicket (Klein Winterhoek Mts and western end of Suurberg Mts).

Treated as *Orbea longii* in Bruyns (2005a).

TYLOPHORA R.Br.

Species 50, tropical and subtropical parts of Old World; 10 in sthn Afr., N, LIM, M, S, KZN, WC, EC.

Genus needs revision. In consequence, the account below relies heavily on Brown's 1908 revision and material consulted at NH. The genus has unknown or unnamed entities in SA.

anomala N.E.Br.

Perennial, slender, twining climber, without milky latex. **Stems** much branched, usually > 2 m long when mature. **Leaves** coriaceous, often folded along prominent midrib, ovate to ovate-oblong, 32–68 × 19–46 mm, base cordate sometimes rounded, glabrous, apex acute to obtuse, prominently apiculate; petioles 6–13 mm long. **Inflorescences** pedunculate, 6–20 mm long, producing 1(2) umbel-like cymes of ± 5 flowers. **Flowers** 4 mm diam.; pedicels 6.0–8.5 mm long. **Corolla** cupular-rotate; tube fused, small and shallow, ± 1.5 mm deep; lobes ovate, ± 1.5 × 1.5 mm, glabrous outside, puberulous and dull white inside. **Staminal corona**: lobes lobulate, ovoid at base and oblong above, ± 1.5 × 1.5 mm, apex slightly notched, stout keel running down center of inner face, arising at base of staminal curtain, equalling depressed style apex. Habitat?; Indigenous Forests/Indian Ocean Coastal Belt (Port St Johns in Pondoland).

[E?]**badia** (E.Mey.) Schltr. var. **badia**

Perennial, twining climber. **Stems** much-branched, usually > 2 m long when mature. **Leaves** subcoriaceous, lanceolate, 25–63 × 19–25 mm, base cuneate, glabrous; petioles 6–13 mm long, channelled down upper surface. **Inflorescences** with slender peduncle 18–25 mm long, producing 2 or 3 widely separated, 3–5-flowered fascicles; pedicels 5.0–8.5 mm long. **Corolla** rotate; lobes lanceolate to oblong-lanceolate, ± 3 × 1.5–2.0 mm, apex twisted, glabrous outside, minutely puberulous inside; pinkish purple. **Staminal corona**: lobes tuberculate/ligulate, ± 1.5 mm tall, broadest at rounded to subtruncate base, tapering apically, fused completely to rest of gynostegial column, equalling truncate style apex. Grassland and coastal zone, alt. up to 300 m; Sub-Escarpment Savanna (between Mpethu and Kei River Mouth).

T. badia (E.Mey.) Schltr. var. *latifolia* N.E.Br. from KZN is a doubtful taxon and needs revision.

cordata (Thunb.) Druce

Perennial, slender, herbaceous, twining climber. **Stems** much branched, usually > 2 m long when mature, hairy. **Leaves** subcoriaceous, trullate to ovate, 38–100 × 18–50 mm, midrib prominent, base usually subcordate or subtruncate, round or oblique, apex acute to acuminate, sometimes flexed to one side, thinly pubescent above, glabrous to densely pubescent below; petioles 8–25 mm long. **Inflorescence**: peduncle 19–63 mm long, producing 2(–4), widely spaced, 5–8-flowered cymes; pedicels 6.0–8.5 mm long. **Corolla** rotate, divided to base; lobes ovate, 4–5 × 2.5 mm, glabrous on both surfaces; dull green. **Staminal corona**: lobes tuberculate, ovoid, keeled down inner surface, 0.7–1.4 mm long, equalling truncate style apex with a central boss. Forest, closed shrubland/woodland near beaches; Indian Ocean Coastal Belt, Indigenous Forests, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Port St Johns S, from Somerset East to Stutterheim, Hogsback and Komga, and along the coast from Port Elizabeth to East London).

flanaganii Schltr.

iNhlanhla, *umusa* (Z)

Perennial, slender, herbaceous, twining climber or woody liana. **Stems** much branched, 1–5 m long, often reaching canopy. **Leaves** lanceolate to ovate, rarely elliptic, 30–90 × 20–64 mm, base rounded to subtruncate, apex acute and apiculate with noticeable drip-tip, glabrous; petioles 27–34 mm long. **Inflorescences** lax, often profusely flowering, pedunculate, 50–127 mm long, often curved, forked or branching into 2–4 each, ending in umbel-like cymes of 2–4(–6) flowers; pedicels 8.5–10.0 mm long. **Corolla** rotate, ± 10 mm in diam., divided almost to base; lobes lanceolate, 4.0–4.5 × 1.5–1.7 mm, apex slightly twisted, coralline corona a small round swelling at base, glabrous, dark purple, crimson, magenta-red, brownish red or reddish purple. **Staminal corona**: lobes lobulate, ligulate, fleshy, free, 0.7–1.0 mm tall, slightly gibbous at base on outside, narrowing apically with tip incurved over anthers, purple-brown, equalling style apex with central raised boss. Relic forest, edges of dense woodland; Sub-Escarpment Savanna, Drakensberg Grassland (Pondoland SW, from Hogsback to Komga).

lycioides (E.Mey.) Decne.

Perennial, slender, foliose, herbaceous, twining climber. **Stems** much branched, usually > 2 m long when mature, usually hairy. **Leaves** herbaceous, narrowly lanceolate to ovate or ovate-oblong, 38–103 × 19–53 mm, base rounded to subcordate, apex acute or acuminate, pubescent to seemingly glabrous; petioles 8.5–25.0 mm long. **Inflorescences**: peduncles very slender 19–63 mm long, producing 1 or 2(–4), widely separated, umbel-like, 5–8-flowered cymes. **Flowers** rotate; pedicels slender, 6–30 mm long. **Corolla** rotate, lobed almost to base; lobes linear-lanceolate or oblong, 4.2–6.2 × 1.5–2.5 mm, glabrous on both surfaces; dull green. **Staminal corona**: lobes tuberculate, subquadrate with transverse ridge at base, obtuse or acuminate apically, keeled down inner surface and fused to rest of gynostegial column, 0.5–0.8 mm high, equalling or just exceeding truncate or obtuse style-stigma-head with small raised central boss that may be bifid. Shrubland/woodland, clay or bare rock, mountain slopes, cliff bases and river valleys; Indian Ocean Coastal Belt, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Port St Johns SW, from Fort Beaufort to Komga and from Steytlerville District to Uitenhage, Bathurst and East London).

This species possibly consists of metapopulations that may include *T. simiana* Schltr. (according to N.E. Brown 1908) and needs revision.

[E]simiana Schltr.

Perennial, herbaceous, twining climber. **Stems** branched, usually > 2 m long when mature, velvety-pubescent. **Leaves** herbaceous, usually ovate-lanceolate or ovate, 17–35 × 6.5–17.0 mm, base cuneate to rounded, apex acute to obtuse, glabrous above, velvety underneath; petioles 6–8 mm long. **Inflorescences**: peduncles somewhat stout, 12–26 mm long; producing 1 or 2 umbel-like, subcorymbose or contracted, 3–7-flowered cymes. **Flowers** with pedicels 4.0–5.5 mm long. **Corolla** rotate to spreading-erect, lobes divided to base, ovate or ovate-oblong, 5 × 2.5 mm, apex obtuse, glabrous both sides; dull purple. **Staminal corona**: lobes tuberculate, subquadrate, apex subacute, keeled down inner surface and fused to rest of gynostegial column, 0.5–0.8 mm tall, equalling but not exceeding truncate style-stigma-head with a small raised central boss. Mountainous hills; Sub-Escarpment Savanna (King William's Town).

N.E. Brown (1908) thought this species might be conspecific with *Tylophora syringaefolia* (now sunk under *T. lycioides*) however, although the gynostegial column might be similar, the isotype consulted by current author, had several distinct features setting it apart.

[E]**umbellata** Schltr.

Perennial, twining climber. **Stems** much-branched, usually > 2 m long when mature. **Leaves** subcoriaceous, broadly-lanceolate, ovate to ovate-elliptic, 27–90 × 17–38 mm, base cuneate to rounded, apex acute to rarely obtuse, always apiculate, glabrous; petioles 8–25 mm long. **Inflorescences**: pedunculate, 25–50 mm long; producing 1 or 2(3), umbel-like, 5–11-flowered cymes at nodes. **Flowers** with pedicels 8.4–15.0 mm long. **Corolla** rotate or slightly upward-spreading, lobed to base; lobes oblong to oblong-lanceolate, 4 × 2 mm, lower surface glabrous, upper surface shortly puberulous; dull purple. **Staminal corona**: lobes truncate at base, narrowing apically, sides prominent and rim-like, tuberculate, fused to rest of stamen in upper half, apex equalling truncate style-stigma-head. Riverbanks and coastal; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Alice, Komga and King William's Town S, from Uitenhage to Port Elizabeth).

N.E. Brown (1908) suggested that this species could be a possible variety of *Tylophora badia* (E.Mey.) Schltr.

*VINCA L.

Periwinkle (blue-); *gewone-opklim* (A)

Species 7, North Africa, central Asia, Europe, 1 naturalised in sthn Afr., G, KZN, WC, EC.

major L.

Perennial, many-branched herb; stems 0.8–2.0 m long; flowering branches erect, vegetative branches trailing and rooting at nodes. **Leaves** ovate, ovate-lanceolate to subcordate, (30–)50–90 × 25–50 mm; ciliate. **Inflorescences** axillary and solitary. **Flowers** salver-shaped, blue. **Corolla**: tube 20 mm long, with hairs in throat; lobes 30–50 mm, obovate with very obtuse, almost truncate apex. **Stamens** inserted below throat; filaments short. **Gynoecium** apocarpous and bicarpellate. **Styles**: apex ovoid with annulus, tapering to an almost truncate apex. **Flowering time** Aug.–Apr. **Fruit** a pair of erect, diverging follicles, 30–50 mm long; seed without coma. With a number of varieties/cultivars, garden escape, disturbed areas, alt. 500–1 850 m; Dry Highveld Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Molteno, Kouga Mts near Studtis, Grahamstown).

VOACANGA Thouars

Species 12, Old World, 7 in Africa; 1 in sthn Afr., KZN, EC.

thouarsii Roem. & Schult.

Wild frangipani; *wilde frangipani* (A); *umthomfi* (X); *inomfi* (Z)

Tree, 5–17 m high; crown spreading. **Leaves** weakly coriaceous, crowded towards stem apex, oblong-oblanceolate, 80–160 × 25–55 mm, apex obtuse; stipules forming interpetiolar sheath. **Inflorescences** terminal, contracted cymes. **Flowers** salver-shaped, white turning creamy yellow. **Corolla**: tube slightly longer than calyx, constricted above middle, twisted; lobes broadly obcordate, 15–22 × 20–23 mm, apex splayed, bilobed. **Stamens** with swollen, almost obsolete filaments, exserted from mouth. **Circumgynoecial glandular disc** cupular, ± entire, enclosing ovary halfway. **Gynoecium** apocar-

pous, bicarpellate; style apex cylindrical, vertically grooved, annulus basal. **Flowering time** Aug.–Feb. **Fruit** a pair of globose, fleshy follicles, diverging horizontally, fused at base, 70–90 mm in diam., surface smooth, mottled. Coastal forest, swampy places, streambanks, alt. 0–460 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Pondoland, Lusikisiki District, Msikaba River Mouth, Port Edward).

WOODIA Schltr.

Species 3, sthn Afr., M, KZN, EC.

[E]**mucronata** (Thunb.) N.E.Br.

Perennial, graminaceous, geophytic herb; stems unbranched, solitary, erect, 150–250 (–315) mm high. **Leaves** waxy, erect, lanceolate to elliptic-oblong, 38–76 × 6–32 mm, base cuneate or rounded, apex acute to acuminate; midrib and secondary veins prominent below; petioles up to 8–12(–30) mm long. **Inflorescences** axillary and terminal, up to 9 per stem, lax umbels hidden amongst leaves, 4(–7)-flowered. **Flowers** large; pedicels short, 10.0–13.5 mm long. **Corolla** erect, slightly spreading, curving apically inwards, oblong-ovate, 5.5–7.8 × 2.8–4.5 mm, green inside, margins revolute. **Staminal corona** white, complex; lobes dorso-ventrally flattened, trifid with the inner lobule deltoid, 2.0–3.8 mm high, level with style-stigma-head; lateral lobules shorter (1–2 mm high). Open, annually burned grasslands, alt. 30–1 500 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Queenstown to Mthatha S, from Grahamstown to East London).

verruculosa Schltr.

Perennial, geophytic herb; stems solitary, unbranched, erect, 150–250 mm high. **Leaves** waxy, erect, lanceolate to ovate, 33–56 × 22–30 mm, base rounded, apex acute; midrib and secondary veins prominent below; petioles 6.6–14.0 mm long. **Inflorescences** axillary and terminal, up to 4 per stem, racemose with lax umbels, 4–6-flowered. **Flowers** with pedicels 15–20 mm long. **Corolla** green, rotate, erect and flexed inwards at narrow apex to form a cage over gynostegial column, narrowly lanceolate, 5–6 × 2 mm, margins strongly revolute. **Staminal corona** white, complex, lobes dorso-ventrally flattened, trifid with inner lobule linear fleshy and falcate, ± 2.6 mm high, level with style-stigma-head; lateral lobules erect, short and narrowly dentate. Rocky, midland grassveld, alt. 600–1 000 m; Sub-Escarpment Grassland (KZN border, Clydesdale).

XYSMALOBIUM R.Br.

Species ± 40, Africa; 21 in sthn Afr., widespread.

[E]**baurii** N.E.Br.

Perennial, geophytic herb, 100–160 mm long; stems ± 4, radiating from stem tuber, branched from near base, decumbent. **Leaves** spreading to erect; upper leaves lanceolate to ovate; basal leaves elliptic, 13–25 × 5–11 mm, base rounded, apex acute to acuminate. **Inflorescences** terminal, subglobose, 14–20 mm in diam., 15–20-flowered. **Flowers** small, ± 6 mm in diam. **Corolla** probably white, purple-tipped, spreading-rotate; lobes ovate, 3 × 1.5 mm; lower surface long-pubescent near apex. **Staminal column** ± 1 mm long. **Corona** solid and fleshy, oblong/orbicular and contiguous, very small, ± 1.5 mm high and wide, upper end blunt, almost reaching top of style-stigma-head. **Anthers** orbicular. **Follicle** fusiform, glabrous or shortly downy, stalk recurved. Probably on rolling hills in short midland grassland, alt. 1 000 m; Sub-Escarpment Grassland (Baziya, possibly extinct).

[E]carinatum (Schltr.) N.E.Br.
Perennial, geophytic herb, erect, 228–380 mm high; stems solitary. **Leaves** erect, linear 50–90 × 1–2 mm, base cuneate, apex acicular, margins revolute; midrib prominent below; sessile, ± apetiolate. **Inflorescences** subaxillary, subglobose, up to 7 per stem, 1–7-flowered. **Flowers** with pedicels 4–5 mm long. **Corolla** erect but spreading slightly, appearing campanulate, straw-yellow-green; lobes free to base, oblong-lanceolate, 4 × 2 mm, thickened and slightly recurved at apex, margins slightly revolute. **Staminal column** ± 2 mm high, not stipitate. **Corona** white; lobes fleshy, ovate or teardrop-shaped, 3 × 1 mm, tip attenuate and inflexed over style-stigma-head, outer surface convex. **Anther**: appendage ovate, incumbent on style-stigma-head. Midland grassland, especially near rivers and streams, alt. 1 350–1 550 m; Sub-Escarpment Grassland (Kokstad District).

confusum Scott-Elliot
Perennial, geophytic herb, 0.3–0.9 m high; stems solitary, stout at base. **Leaves** erect, ± congested, elliptic-oblong to broadly elliptic, 70–138 × 25–70 mm, base rounded to cuneate, apex obtuse, tip mucronate, glabrous, leathery; midvein and parallel secondary veins pronounced; callose and scabrid along margins. **Inflorescences** axillary, congested apically, subglobose, ± 12-flowered. **Flowers** yellowish green. **Corolla** spreading-erect; lobes oblong-ovate, 10.0–12.5 × 4.5–8.0 mm, margins revolute, apex notched; lower surface glabrous. **Staminal column** 2.5–3.0 mm, not stipitate. **Corona** solid, fleshy, scale-like, obtriangular/subquadrate, 2 mm high, 3 mm wide, contiguous. **Style-stigma-head** inflated and cushion-like above corona, ± 2.5 mm in diam. **Anthers** subreniform, inflexed on style-stigma-head. **Follicle** slightly inflated, 95 × 44–53 mm, very leathery, glabrous. Coastal grassland, alt. 425–1 435 m; Sub-Escarpment Grassland (near Ndindini).

gerrardii Scott-Elliot
Perennial, geophytic herb, decumbent, 300–415 mm long; stems 5(–10), radiating from stem tuber, branched well above base. **Leaves** spreading-erect, lanceolate 30–62 × 10.0–23.5 mm, base trullate, apex acute, rough, sparsely hairy; midrib and secondary veins prominent, venation reticulate. **Inflorescences** terminal often paired and axillary, somewhat corymbose, hemispherical, 22–20 mm in diam., 8–18-flowered. **Flowers** greenish yellow. **Corolla** erect, lobes ovate, 3.0–4.5 × 1.5–3.0 mm, margins slightly revolute; lower surface long-hairy. **Staminal column** not stipitate. **Corona** solid, fleshy, columnar, linear-oblong, 2–3 mm high, 0.5–1.0 mm wide, not contiguous, upper end blunt slightly inflexed over style-stigma-head, protruding by ± 1 mm. **Anthers** transversely elliptic. **Follicle** erect, fusiform, 58 × 5–6 mm, long-bristly. Rocky coastal and midland grassland, alt. 180–1 500 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna (KZN border, Alfred District and Weza).

gomphocarpoides (E.Mey.) D.Dietr.
Perennial, geophytic herb, 100–340 mm high; stems 1–7, erect. **Leaves** erect, congested, glabrous, linear-lanceolate, 50–160 × 3–23 mm, base cuneate, apex acuminate. **Inflorescences** axillary, globose, 4–12 per plant, 4–8-flowered. **Corolla** reflexed, greenish mauve or -yellow; lobes oblong, margins revolute, apex notched, 6.5–8.0 × 3.5–4.5 mm. **Staminal column** 3–4 mm, not stipitate. **Corona** columnar, cream-coloured, 3–4 mm high, 2–4 mm broad, upper end blunt, ± level with style-stigma-head, inner surface keeled. **Anther wings** on upper $^{1}/_{3}$ of staminal column. **Style-stigma-head** truncate. **Flowering time** Dec.–Mar. **Follicle** solitary, obliquely ovoid, inflated, 35–72 ×

18.0–27.5 mm, shortly spiny. Arid, sandy grassland and riverbeds; Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland, Albany Thicket (Rhodes SW to Middelburg, Andriesberg, Graaff-Reinet and Mountain Zebra National Park).

involucratum (E.Mey.) Decne.

Hongersnoodbossie (*-wortel*) (A); *udambisa omkhulu* (Z)

Perennial, geophytic herb, 120–226 mm high; stems solitary. **Leaves** erect, linear, 35–100 × 1–5 mm, base cuneate, apex acuminate, margins revolute; midrib dominant below. **Inflorescences** terminal and axillary, clustered, globose, 15–30-flowered. **Flowers** scented. **Corolla** reflexed, yellow to creamy green; lobes ovate-elliptic, 2–5 × 1–2 mm. **Staminal column** 2.0–3.5 mm high. **Corona** inserted at base, white; lobes fleshy ovate, 0.6–2.0 mm high, 1 mm wide at base, tip attenuate. **Anther wings** triangular; appendage incumbent on style-stigma-head. **Staminal column** barrel-shaped. **Flowering time** Sept.–Feb. **Follicles** solitary, fusiform, 60–100 × 5–15 mm, with apical beak. Coastal and midland grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Ramatseliso's Gate southwards, from Queenstown to Port St Johns, Hogsback to Kentani and from Cold String to East London).

orbiculare (E.Mey.) D.Dietr.

Perennial, geophytic herb, 0.3–1.3 m high; stems solitary, erect. **Leaves** erect, elliptic oblong, 40–110 × 10–60 mm, base truncate, apex obtuse, tip mucronate; midvein and parallel secondary veins pronounced; scabrid along margins. **Inflorescences** subaxillary, globose, 10–25(–50)-flowered. **Corolla** reflexed, purple-brown; lobes oblong, margins revolute, 6–12 × 3–5 mm, lower surface glabrous. **Staminal column** 2.5–3.0 mm. **Corona** solid, fleshy, scale-like, greenish white, obtriangular, 1.5–4.5 mm high, 2–4 mm broad, contiguous, upper end blunt. **Style-stigma-head** 1.0–1.5 mm above corona, truncate. **Anthers** ovate, inflexed on style-stigma-head. **Flowering time** Nov.–Jan. **Follicle** ovoid, inflated, 30–90 × 10–20 mm, with several lines of short, recurved spines. Coastal and midland grassland, alt. 60–610 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket (Kokstad S to Hogsback and East London).

parviflorum Harv. ex Scott-Elliot

Perennial, geophytic herb, 160–360 mm high; stems 6–22, ± erect from stem tuber. **Leaves** erect, lanceolate to ovate, 20–45 × 5.5–23.5 mm, base rounded, apex acute to acuminate; midvein and parallel secondary venation abaxially pronounced. **Inflorescences** terminal and axillary, hemispherical, 14–27 mm in diam., 9–22-flowered. **Corolla** erect, purple-brown to creamy green or purple; lobes elliptic-oblong, 2–3 × 1–2 mm, apex apically notched. **Staminal column** 0.8–1.3 mm high. **Corona** solid, fleshy, columnar, yellow, 1–2 mm high, 0.4–1.0 mm wide, apex blunt. **Anther**: appendage broadly ovate. **Flowering time** Oct.–Jan. **Follicles** narrowly ovoid, 40–80 × 7–14 mm, brown-hairy. Short mountain grassland, amongst rocks, alt. 900–2 100 m; Drakensberg Grassland, Sub-Escarpment Grassland (Ramatseliso's Gate S to Hogsback, Stutterheim and King William's Town).

[E]prunelloides Turcz.

Perennial, geophytic herb, 150–200 mm long; stems 12–22, from stem tuber, much branched from base, decumbent. **Leaves** lanceolate to ovate, 13–30 × 10–18 mm, base rounded, apex acuminate, leathery with sparse, soft hairs. **Inflorescences** terminal,

solitary, hemispherical, 22–30 mm in diam., 15–30-flowered. **Corolla** spreading-erect, white or greenish yellow tipped purple-brown; lobes elliptic, 4.0–7.5 × 1.5–3.0 mm, apex tipped up. **Staminal column** 1.0–1.5 mm high. **Corona** solid and fleshy, yellow, triangular-oblong to ovoid, 1.5–2.5 × 0.6–1.3 mm, contiguous at base, then narrowing into acute, distal end. **Anthers** wider than long, apex notched. **Flowering time** Dec., Jan. Midland and upland mountain grassland, amongst rocks in turf soil, alt. 600–2 440 m; Drakensberg Grassland (Winterberg Mts S to Katberg and Amatole Mts and to Stutterheim).

stockenstromense Scott-Elliot

Mountain uzura

Perennial, geophytic herb, 100–800 mm high; stems solitary, stout at base. **Leaves** glabrous, glaucous, leathery, lanceolate, 105–200 × 15–45 mm, base rounded to cuneate, apex acuminate, margins crisped; midvein and parallel secondary veins pronounced. **Inflorescences** terminal and axillary, tightly clustered, globose, 10–20-flowered. **Corolla** pale green; lobes erect, apex reflexed, velutinous, oblong, 6–10 × 3–5 mm. **Staminal column** 2–3 mm high, not stipitate. **Corona** solid, fleshy, scale-like, white tinged purple, obtriangular/subquadrate, 2.0–3.5 mm high, 2.0–3.5 mm wide, contiguous, upper end blunt. **Style-stigma-head** obtriangular and truncate. **Anthers** semicircular. **Flowering time** Dec., Jan. **Follicle** obliquely ovoid-fusiform, 70–100 × 20–30 mm, with short, recurved, dentate spines, stalk recurved. Open, annually burned, highland grassland, alt. 1 200–2 600 m; Drakensberg Grassland, Sub-Escarpment Grassland (Ramatseliso's Gate, Maclear District E to Kokstad).

tysonianum (Schltr.) N.E.Br.

Perennial, geophytic herb, 150–230 mm long; stems 8–11, much branched near base, decumbent. **Leaves** spreading to erect, lanceolate to ovate, 35–54 × 11–21 mm, base truncate, apex acute, indumentum softly hairy. **Inflorescences** terminal, subglobose, 23–20 mm in diam., 15–20-flowered. **Flowers** yellowish green. **Corolla** erect, globose-campanulate; lobes ovate-elliptic, 2.5–3.5 × 1.5–2.5 mm, margins slightly reflexed, apex inflexed; lower surface pubescent. **Staminal column** ± 2 mm high, stipitate by ± 0.7 mm. **Corona** solid and fleshy, yellow, oblong, contiguous, slightly longer (± 2.3 mm) than high (± 1.5 mm), upper end blunt. **Anther** reniform, incumbent on style-stigma-head margin. **Flowering time** Oct.–Jan. **Follicle** fusiform, glabrous or shortly downy, stalk recurved. Rocky midland and upland mountain grassland, alt. 1 200–2 685 m; Sub-Escarpment Grassland (KZN border, Mount Currie, Ngeli Forest, Fort Donald).

undulatum (L.) Aiton f.

Waved-leaved xysmalobium; *bitterhout* (*-wortel*) (A); *iyeza elimhlophe* (X); *ishongwane* (Z)

Perennial, geophytic herb, 0.5–1.2 m high; stems solitary, stout at base. **Leaves** hirsute, leathery, oblong to ovate, 80–180 × 10–90 mm, base rounded or cuneate, apex acute. **Inflorescences** terminal and axillary, globose, 115–150 mm in diam., 10–20-flowered. **Corolla** creamy white; lobes erect, papillate-hairy, oblong, 4–9 × 3.0–4.5 mm. **Staminal column** 4.5–6.5 mm high. **Corona** solid, fleshy, scale-like, white tinged purple, obovate/subquadrate, 2.0–3.5 mm high, 3–5 mm wide. **Style-stigma-head** obtriangular and truncate. **Anthers** semicircular. **Flowering time** Nov.–Jan. **Follicle** solitary, stalk recurved, obliquely ovoid, inflated, 83–110 × 35–50 mm, echinate/long hairy. Unburned grassland, roadsides, fallow farmland, alt. 80–2 000 m; Drakensberg Grass-

land, Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Ongeluksnek to Mount Frere SW, from Richmond to Queenstown and from Fort Beaufort to Komga).

[E]winterbergense N.E.Br.

Perennial, geophytic herb, 100–130 mm high; stems branched several times from base. **Leaves** spreading-erect, linear-lanceolate, 30–70 × 6.0–8.5 mm, base cuneate, apex acuminate, glabrous, margins scabrid, crisped; midvein prominent. **Inflorescences** axillary, subglobose, ± 4 per stem, 10–12-flowered. **Corolla** spreading, yellowish green; lobes oblong, margins revolute, apically notched; 4.5–5.0 × 1 mm. **Staminal column** ± 2.5 mm high. **Corona** solid, fleshy, browny purple, orbicular, shoulders angled, ± 1.8–2.0 mm high, ± 2 mm wide, apex produced into small apiculus, keeled; closely appressed to and shorter than staminal column. **Anther**: appendages shallowly orbicular, very small, 0.4 × 0.3 mm. **Style-stigma-head** inflated. Mountain island grassland, alt. ± 1 050 m; Albany Thicket, Drakensberg Grassland (known from one collection in Winterberg Mts only).

zeyheri N.E.Br.

Perennial, geophytic herb, 152–230 mm high; stems solitary, erect. **Leaves** erect, linear, 41–90 × 1.0–2.5 mm, base cuneate, apex acuminate, margins revolute; midrib dominant below. **Inflorescences** terminal and axillary, hemispherical to subglobose, 12–21-flowered. **Corolla** yellow- to creamy green, strongly reflexed, hugging pedicel. **Lobes** oblong-lanceolate to ovate, ± 4 × 2 mm. **Staminal column** ± 3.5 mm high, barrel-shaped, stipitate. **Corona** white, inserted well above base; lobes fleshy, ovate, small, ± 2 mm high, ± 1 mm wide at base, shortly-stalked, separating lobe from staminal column; alternating with anther wings, apex attenuate. **Anther wings** broadest at base, with notch level to ± middle of corona lobes. **Anther**: appendages reaching to base of style-stigma-head. Coastal grassland, alt. 300–600 m; Eastern Fynbos-Renosterveld (Port Elizabeth District and SW thereof).

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AQUIFOLIACEAE

(Order Aquifoliales)

Compiled by C.L. Bredenkamp

ILEX L.

Species ± 400, mostly Asia and America, widespread in subtropical and temperate forests; 1 in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, WC, EC.

mitis (L.) Radlk. var. **mitis**

Cape holly; *without*, *waterboom* (A); *umduma* (X); *iphuphuma* (Z)

Tree or shrub, monoecious, sometimes dioecious, evergreen, 3–30 m high. **Leaves** alternate, petioled, simple, entire or toothed, glabrous; stipules minute, semi-persistent. **Flowers** unisexual, regular, small, in 1–few-flowered, pubescent, axillary cymes. **Calyx** 5- or 6- lobed, imbricate, ciliate. **Corolla** 5- or 6-lobed, imbricate, ciliate, white. **Stamens** 5 or 6; alternating with, but basally adhering to petals; anthers 2-thecous with longitudinal dehiscence. **Ovary** superior, 5- or 6-locular, with 1 or 2 pendulous ovules in each locule; stigma sessile, capitate or discoid, prominent. **Flowering time** Oct.–Dec. **Fruit** a small, globose drupe, ripening pink to crimson, containing 5 or 6 pyrenes. Closed woodland, forest; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (from Maclear S and W to Port St Johns, Katberg, Willowmore District, Baviaanskloof and Grahamstown).

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ARALIACEAE

(Order Apiales)

Compiled by B.J. de Villiers & P.J.D. Winter (*Hydrocotyle*)

1a Creeping herbs with simple leaves ..... **Hydrocotyle**
1b Woody phanerophytes (mostly woody shrubs and trees having their bud-bearing shoots elevated and exposed to the atmosphere) with compound leaves:
2a Fruit flattened, membranous, with distinct, longitudinal veins; leaves digitately lobed..... **Seemannaralia**
2b Fruit somewhat fleshy; leaves digitately divided or twice divided, sometimes palmatifid:
3a Flowers umbellate, in panicles ..... **Schefflera**
3b Flowers in spikes or racemes..... **Cussonia**

CUSSONIA Thunb.

Cabbage tree; *kiepersol* (A); *mosêtshê* (SS); *umsenge* (X, Z)

Species 25, tropical to sthn Afr. and Mascarene Islands; ± 10 in sthn Afr., B, LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

1a Inflorescence an umbel of panicles
2a Tree, single stemmed, thick set; bark grey-brown, fissured; leaves matt green-grey; occurring on dry stony hills

paniculata Eckl. & Zeyh.

(Highveld) cabbage tree; *kiepersol*, *hoëveldse kiepersol* (A); *umngqokhwe* (X)

Perennial, single stemmed, thick set tree, > 5 m high. **Bark** grey-brown, longitudinally fissured, thick and corky; trunk thick and squat. **Leaves**: petiolules of primary leaflets 15–30 mm long; mono-digitate, up to 600 mm in diam., with 7–9 simple leaflets; leaflets 100–300 × 20–60 mm, leathery, pale blue to grey-green, apex and base tapering, margins entire (var. *paniculata*) or margins shallowly or deeply lobed, constricted to form segments, separated by narrow waist-like section (var. *sinuata*); petioles 200–300 mm long. **Flowers** in umbel of panicles, short, densely flowered, small, green, stalked. **Flowering time** Jan.–Apr. **Fruit** fleshy, up to 7 mm in diam., purple (Apr.–Aug.). Dry stony hills, alt. 300–2 000 m; Dry Highveld Grassland, Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Indigenous Forests, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Aliwal North E to Mount Ayliff S, from Middelburg to Tabankulu, Graaff-Reinet to Tarkastad District and Willowmore to Grahamstown).

2b Tree to shrub, multi-stemmed, thin stems; bark smooth, greenish grey; leaves glossy green to dark green; occurring in coastal dunes and sand forest

arenicola Strey

[=*C. zuluensis* var. *arenicola* (Strey) Reyneke]

Sand cabbage tree; *sandkiepersol* (A)

Perennial, multi-stemmed, sparsely branched shrub or small tree, 1–3 m high. **Root** tuber. **Bark** greenish, grey, smooth. **Leaves** bi-digitate, 4–7 leaflets, mostly divided into 2 parts, leaflets 60–200 mm long, pinnules obovate-oblanceolate, up to 90 × 20–50 mm, lower surface dull green, upper dark green, base tapering, apex tapering to round, margins serrated, revolute; petioles up to 300 mm long, ribbed; petiolules of primary leaflets 10–25 mm long, winged. **Flowers** in panicle of umbels, panicles dense cylindrical; only one lateral branch developing each time; small, greenish cream-coloured, short stalks 1–3 mm long. **Flowering time** Oct.–Jan. **Fruit** barrel-shaped, 4 × 4 mm, fleshy, dark purple (Dec., Jan.). Coastal dunes and in sand forest, alt. 5–300 m; Albany Thicket (East London).

1b Inflorescence an umbel of spikes:
3a Shrub to small tree, multi-stemmed; stem < 50 mm in diam.
4a Leaves mono-digitate

thyrsiflora Thunb.

Cape coast cabbage tree, dune cabbage tree; *Kaapse kuskiepersol*, *duin kiepersol* (A)

Perennial, scrambling shrub to small tree, up to 5 m high. **Bark** pale grey, corky, branches marked with prominent leaf scars. **Leaves** mono-digitate, with 6–9 simple leaflets, obovate, 50–80 × 20–40 mm, lower surface pale green, midrib prominent, upper surface dark glossy green, base tapering, apex broadly tapering, margins entire to slightly toothed around apex, revolute; petioles 50–150 mm long, sometimes winged; petiolules absent. **Flowers** in spike of umbels, comprising 6–12 short racemes, 20–100 × 10–20 mm; greenish yellow, on short stalks. **Flowering time** Nov.–Jan. **Fruit** in umbel of spikes; green-yellow, fleshy, up to 4 mm in diam., purple (Apr.–June). Dry coastal scrub along the eastern and southern coasts, alt. 5–490 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket (Mthatha SW to Nature's Valley).

4b Leaves bi-digitate:
5a Leaves dark glossy green; petiolules of primary leaflets distinctly wing-shaped; flowers in umbels of 8–30 dense cylindrical spikes, on stalks up to 220 mm long; occurring in northern EC

nicholsonii Strey
[=*C. zuluensis* var. *nicholsonii* (Strey) Reyneke]

South coast cabbage tree, Natal coast cabbage tree; *Natalse kuskiepersol*, *suid-kus-kiepersol* (A)

Perennial, multi-stemmed tree, up to 5 m high, rarely branched. **Bark** reddish grey to grey, smooth to flaking. **Leaves** bi-digitate, with 7–9 leaflets ± divided into 2 parts, fan-like, up to 300 mm in diam., pinnule up to 100 mm long, oblong, lower surface dull dark green, upper glossy dark green, leathery; tapering to apex and base, margins sparsely to distinctly toothed, rarely entire; rachillae bearing triangular wings; petioles 200–300 mm long; petiolules of primary leaflets 30–50 mm long, winged. **Flowers** in terminal umbel of spikes, 8–30 dense cylindrical spikes, up to 120 × 40 mm, on stalks up to 250 mm long; small, greenish yellow, almost sessile. **Flowering time** Aug.–Dec. **Fruit** mostly round, angular-sided, rather wedge-shaped, up to 20 × 15 mm long, fleshy, pale purplish (Sept.–Feb.). Bushveld, from hillsides to dry shrubs, and riverine thickets in coastal areas, alt. 5–550 m; Indian Ocean Coastal Belt, Indigenous Forests (KZN border, Mtamvuna River Mouth SW to Goss Point and Ntafufu).

5b Leaves greyish olive-green; petiolules of primary leaflets not winged; flowers in double umbels of 4–8 spikes, on stalks 20–30 mm long; occurring only in Gamtoos River Valley

[E]gamtoosensis Strey

Gamtoos cabbage-tree; *Gamtoos kiepersol* (A)

Perennial, multi-stemmed, up to 4 m high. **Bark** pale grey, smooth. **Leaves** bi-digitate, relatively small, up to 300 mm in diam., 1–7 leaflets; leaflets lanceolate, 40–100 × 15–25 mm, thickly leathery, dull greyish to olive-green, tapering to apex and base, margins entire, rarely toothed, revolute; petioles ribbed, up to 300 mm long; petiolules of primary leaflets 20–60 mm long. **Flowers** in double umbel of spikes, 4–8 short, thick spikes per unit, up to 30 × 25 mm, on stalks 20–30 mm long; small, greenish

yellow. **Flowering time** Oct.–Jan. **Fruit** up to 8 mm long, conical, fleshy, purplish, bracts clasping fruit (Nov.–Apr.). Dry euphorbia scrub on stony hillsides, alt. 0–500 m; Eastern Fynbos-Renosterveld, Albany Thicket (Gamtoos River Valley).

3b Small to large tree, single-stemmed (usually); stem > 50 mm in diam.
6a Bark grey, corky, lightly fissured; petiolules absent; petioles not ribbed; leaves bi-digitate, up to 70 mm in diam.; occurring in bushveld, at forest margins, mountain slopes and rock outcrops

spicata Thunb.

Common cabbage tree; *Laeveld kiepersol*, *gewone kiepersol* (A); *umboza* (X)

Perennial tree, thickset, unbranched or with sparingly branched trunk, 3–30 m high. **Bark** grey to dark grey, thick and corky. **Leaves** bi-digitate, up to 700 mm in diam., 5–12 leaflets, ± divided into 2 parts, leaflets lanceolate, deeply lobed, with lateral pinnules adding to pattern given by winged rachillae, 60–160 × 20–50 mm; shiny, lower surface yellow-green to green, upper dark green to bluish green; midrib conspicuous, apex and base tapering, margins entire to sharply toothed; petioles stout, 0.6–1.0 m long; petiolules of primary leaflets absent or up to 50 mm long, usually winged, rarely not. **Flowers** in double umbel of spikes, comprising 8–12 thick, closely packed spikes, 50–150 × 10–40 mm, forming a candelabra-like head; greenish yellow, sessile, subtended by 1–3 bracts. **Flowering time** Nov.–May. **Fruit** subobconical to wedge-shaped almost angular, 4–6 mm in diam., purple, closely clustered along spikes and with floral bracts clasping fruit (June–Sept.). Bushveld, at forest margins, mountain slopes and rocky outcrops, alt. 5–1 800 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Mount Frere to Mount Ayliff S, from Queenstown to Port Edward, Graaff-Reinet to Kentani District, from Willowmore to Port Alfred and Nature's Valley to Humansdorp).

Two forms in EC:

Thicket form short (up to 5 m high) sometimes has more than one thick stem, fewer branches, leaves paler green.

Forest form high (up to 30 m high), mostly single stemmed, multibranched, leaves darker green.

6b Bark dark grey, smooth or slightly fissured, corky; petiolules of primary leaflets slightly winged; petioles ribbed; leaves multidigitate, up to 400 mm in diam.; occurring in coastal dune forest and moist, frost-free mountain ravines

sphaerocephala Strey

Forest cabbage tree; *boskiepersol* (A)

Perennial tree, tall and slender, sparsely branched, up to 25 m high. **Bark** reddish grey when young, dark grey, smooth or slightly fissured to corky in mature stage. **Leaves** multidigitate, up to 400 mm in diam., with 6–12 leaflets, first and second divisions triangular-winged rachillae and lateral pinnules; leaflets rarely single, mostly vertebrate with 1–5 joints, 100–350 mm long, pinnules obovate to lanceolate-oblong, leathery, lower surface dull dark green, upper shiny dark green, base decurrent, apex tapering, margins entire to mostly coarsely toothed; petioles up to 900 mm long, ribbed; petiolules of primary leaflets slightly winged towards leaf. **Flowers** in double umbel of spikes, comprising 4–8 short, thick spikes, 80–150 × 40–60 mm, forming a candelabra-like head; greenish cream-coloured, sessile, subtended by 3 bracts. **Flowering time** Mar.–June. **Fruit** obconical, up to 6 mm in diam., fleshy, purple, bract clasping fruit, densely crowded along spikes (July–Dec.). Coastal dune forest and moist, wooded, mountain ravines, eastern coastal areas, alt. 0–800 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Mtamvuna River SW to Mngazi River).

ARALIACEAE

HYDROCOTYLE L.

Species 75(–120), ± cosmopolitan but mainly in Australia (± 60 spp.), then S. America (M. Henwood pers. comm.); 5 (2 naturalised) in sthn Afr., fairly widespread, LIM, G, M, S, KZN, L, WC, EC.

Leaf blade peltate (without an obvious basal sinus)

bonariensis Lam.

Pennywort; *varkoortjies*, *perdekloutjies* (A); *inYongwane* (X/Z)

Prostate, glabrous annual or perennial herb (hydrophyte), 0.1–0.3 m high; profusely rooting at nodes and matted. **Leaves** simple, blade lobed. **Stipules** on cauline leaves. **Peduncles** longer than subtending petioles. **Flowers** bisexual, in whorls along rays of umbels; pedicels 1–20 mm long. **Petals** white to cream-coloured. **Fruit** laterally compressed, lenticular. Damp places and submaritime habitats, alt. 0–50 m; Indian Ocean Coastal Belt, Albany Thicket (Mkambati and Dwessa Nature Reserves, Kei River Mouth, East London).

Leaf blade not peltate (with an obvious basal sinus)

sibthorpioides Lam.

[=*H. americana* var. *monticola* (J.D. Hooker) Hiern, *H. americana* of authors, not of L.**]**

Water pennywort; *perdekloutjies* (A)

Perennial herb, hydrophyte, 0.1–0.3 m high. **Leaves** simple, blade kidney-shaped to almost circular, palmately cleft halfway down to base into 5–7 lobes, glabrous and shining above, scattered hairs beneath. **Peduncles** shorter than subtending petioles. **Flowers** in simple umbels. **Flowering time** mostly Nov–Jan. Habitat?, alt. 100–2 600 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Mount Fletcher to Ntsikeni; Queenstown to Tsolo; Bedford to Stutterheim and King William's Town).

SCHEFFLERA J.R.Forst. & G.Forst.

Species 200, Africa to Madagascar, Far East and New Zealand; 1 in sthn Afr., LIM, M, S, KZN, EC.

umbellifera (Sond.) Baill.

False cabbage tree; *valskiepersol* (A); *umsengambuti* (Z)

Perennial tree, rounded crown, up to 6–20 m high. **Bark** grey-brown, smooth with lenticels when young, becoming rough and longitudinally fissured. **Leaves** digitate, with 3–5 leaflets spirally arranged, crowded at ends of branches; leaflets oblong to elliptic, 70–150 × 20–50 mm, leathery, lower surface pale green, upper dark green, base tapering, apex broadly tapering to rounded, margins entire, rarely toothed on upper half, wavy; petioles up to 250 mm long; stipules absent; petiolules slender, 10–40 mm long. **Flowers** in umbel of panicles, large, loose, terminal heads, up to 180 mm in diam.; small, greenish cream-coloured to yellow. **Flowering time** Jan.–May. **Fruit** almost round, up to 2–3 mm in diam., greyish green becoming dark red (Apr.–Aug.). Margins and in coastal and montane forests, alt. 60–1 980 m; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Port Edward along coast to Port St Johns and from Port Elizabeth to Humansdorp).

SEEMANNARALIA R.Vig.

Species 1, sthn Afr., LIM, M, KZN, EC.

gerrardii (Seem.) Harms

Wild maple; *wilde-ahorn* (A)

Deciduous tree, up to 20 m high. **Bark** grey, thick, rough, cracked into squares; branches thick and brittle, with vertical striations, resinous. **Leaves** simple, spirally arranged, crowded near ends of branches, almost circular, 150–300 × 120–200 mm, shallowly to rather deeply divided into 5–7 lobes, pale to medium green, soft and thinly textured, sometimes with hair when young, glabrescent to glabrous when mature, veins 5–7 from base, vein running into each lobe, base lobed, apex finely pointed, margins irregularly toothed, teeth ending in glandular hairs; petioles up to 120 mm long. **Flowers** in many-flowered biracemose umbels, 20–30 mm in diam., in dense heads; small, green. **Flowering time** June–Sept. **Fruit** elliptic, flattened, almost winged, up to 10 × 8 mm, ribbed and tipped with 2 points, in dense round head 40–80 mm in diam., in large, branched sprays, purple to red-purple. Coastal and mountain ravine forests and on rocky hills, alt. 610–1 830 m; Indigenous Forests, Indian Ocean Coastal Belt (Mkambati Nature Reserve to Port St Johns).

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ASTERACEAE

(Order Asterales)

Compiled by G.V. Cron (*Cineraria & Bolandia*), P.P.J. Herman, S. Howis (*Gazania*), M. Koekemoer, R.J. McKenzie (*Arctotis* & *Haplocarpha*), N. Ngoepe, F.M. Nonyane (*Acanthospermum*), N. Swelankomo & W.G. Welman

Key to the tribes extracted and emended from Herman et al. (2000) and selected updates from Anderberg et al. (2007). 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.

Key to tribes

1a Plants monocotyledonous in appearance; capitula discoid, 1-flowered; upper involucral bracts sheathing floret ..... tribe **Corymbieae**

1b Plants not exhibiting the above characters in combination:

2a Corollas all strap-shaped, equally 5-toothed at apex (florets ligulate – no. 6); latex present in plant..... ..... tribe **Cichorieae**

2b Corollas not strap-shaped, if radiate, then these with 4 or fewer equal or unequal apical teeth; latex rarely present:

3a Style branches with conspicuous papillose appendages; capitula discoid, with florets all bisexual, not yellow; corollas with (4)5 relatively short, broad apical lobes; mature cypselae black..... ..... tribe **Eupatorieae**

3b Style branches, capitula, corollas and mature cypselae not showing the above combination of character states:

4a Involucral bracts uniseriate, cohering by their overlapping margins, or partly or wholly connate, with or without a calyculus; pappus present:

5a Involucral bracts with evident elongated oil glands; cypselae black when mature (consider cypselae to be black if body of mature cypsela is shiny-black, at least in part; paler striations, ribs or wings may be present)..... tribe **Helenieae**

5b Involucral bracts without elongated oil glands; cypselae not black when mature ..... tribe **Senecioneae**

4b Involucral bracts imbricate, in 2 or more rows, free or connate; OR uniseriate, but then bracts not cohering or pappus absent or capitula unisexual or cypselae densely villous with long hairs from base:

6a Style branches long, gradually attenuate-acute, shortly hairy on outside, style shaft similarly hairy on upper part; capitula homogamous, all florets bisexual ..... tribe **Vernonieae**

6b Styles and capitula not exhibiting above combination of character states, or capitula unisexual:

7a Capitula with all or only outer florets bilabiate; corollas with 3-toothed outer lips and 2-lobed inner lips..... tribe **Mutisieae**

7b Capitula without any such bilabiate florets:

8a Capitula discoid; involucral bracts without scarious unlobed appendages or apices, and without scarious margins; OR capitula radiant (capitula discoid but outer florets ± enlarged and sterile, not true ray florets); OR capitula unisexual and plants dioecious; appendages of involucral bracts, if present, spiniform and/or pinnately divided:

9a Leaves spiny or bristly spiny at least towards base:

10a Anthers tailed (caudate); receptacle densely setose ..... tribe ***Cardueae**

10b Anthers not tailed (ecaudate); receptacle alveolate with fringed alveolae .....tribe **Arctotideae**

9b Leaves neither spiny nor bristly spiny:

11a Corolla lobes of tubular florets much longer than broad; leaves alternate; capitula of more than 1 floret, not aggregated into glomerules:

12a Receptacle densely setose; inner florets bisexual, outer sterile ..... tribe ***Cardueae**

12b Receptacle naked, not setose; all florets unisexual; plants dioecious..... tribe **Tarchonantheae**

11b Corolla lobes ± as long as broad, or if much longer than broad, then leaves opposite; capitula sometimes of only 1 floret, or capitula aggregated into glomerules ..... go to couplet 13

8b Capitula radiate or disciform but not radiant as above; OR capitula 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 capitula unisexual and plants monoecious:

13a 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; capitula always bisexual .....tribe **Arctotideae**

13b Style branches of disc florets long to short or absent but connate lower part of style branches, if present, not as above or capitula unisexual and plants monoecious:

14a Receptacle paleate and leaves opposite, or leaves not opposite and mature cypselae black and/or capitula glomerulate; OR receptacle epaleate and pappus of scales and/or leaves opposite and/or mature cypselae black and/or capitula unisexual and/or capitula glomerulate; pappus not of slender bristles, or if of bristles, then bristles plumose ..... tribes **Heliantheae** and **Helenieae**

14b Receptacle epaleate (although sometimes hairy or fimbrillate); OR receptacle paleate and leaves not opposite (although sometimes opposite on upper stem) and cypselae not black when mature, or capitulum not unisexual; capitulum glomerulate or not; or if lower leaves opposite, then pappus of slender barbellate bristles, at least in disc florets, or pappus absent, receptacle naked and capitula not glomerulate:

15a Style branches of bisexual or functionally male florets each with a subulate to triangular papillose appendage:

16a Receptacle alveolate; pappus a deeply and unequally laciniate corona; capitulum disciform..... ..... tribe **Heliantheae** and **Helenieae**

16b Receptacle, pappus and capitula not showing the above combination of character states .... tribe **Astereae**

15b 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:

17a Involucral bracts with scarious, usually brown, often erose margins, not appendaged; leaves often pinnatipartite; pappus absent, or if present, then a short lacerate crown or lobed auricle, or leaves pinnatipartite and outer pappus of 5 white petaloid scales; style branches apically truncate and fringed, or style undivided and truncate..... tribe **Anthemideae**

17b 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 of hairs or scales present in at least some florets, or if absent, then style branches not truncate and fringed:

18a Pappus absent; fruit large, curved, angular or winged cypselae, or smooth drupes; capitula radiate ... .tribe **Calenduleae**

18b Pappus present or absent; fruit small cypselae and not as above; capitula radiate or disciform:

19a Capitula radiate; ray florets neuter, or if fertile, then style branches shortly conical at apex with subdistal fringe of hairs..... tribe **Mutisieae**

19b Capitula radiate, disciform or discoid; ray florets, if present, female; style branches not as above:

20a 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.....tribe **Gnaphalieae**

20b 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..... tribe **Inuleae**

Tribe Anthemideae

Leaves alternate or rarely opposite or fasciculate or rosulate, generally variously dissected, lobed or serrate-dentate or rarely entire. **Capitula** radiate, disciform or discoid, solitary, corymbose or paniculate; involucral bracts in 3 or more rows, rarely in 1 or 2 rows, almost always with scarious margins and apex. **Receptacle** paleate or epaleate. **Disc florets** basally often swollen and saccate in fruit; (3)4- or 5-lobed. **Style branches** almost always truncate and penicillate. **Pappus** generally of rather few scarious scales, corona or auricle, often absent. **Cypselae** generally terete to weakly angled or ribbed or flattened, sometimes winged, thin- or thick-walled.

Extracted and emended from Bremer & Humphries: 84 (1993).

1a Receptacle distinctly paleate with paleae subtending florets:
2a Capitula radiate:
3a Rays yellow, rarely abaxially reddish:
4a Involucral bracts in 5–7 rows ..... **Ursinia**
4b Involucral bracts in 1 row ..... **Eriocephalus**
3b Rays white or rarely pink to reddish on both sides:
5a Pappus of 5(8–10) large obovate scales and sometimes 5 additional subulate scales ..... **Ursinia**
5b Pappus a shallow corona, an auricle or of small scales or absent:
6a Cypselae copiously villous:
7a Involucral bracts in 2–4 rows ..... **Lasiospermum**
7b Involucral bracts in 1 row ..... **Eriocephalus**
6b Cypselae glabrous, sometimes glandular or papillose:
8a Shrubs with opposite leaves; cypselae with 10 or more ribs ..... **Eumorphia**
8b Herbs or rarely shrubs with alternate leaves (rarely with some leaves opposite basally on stem); cypselae various:
9a Cypselae dorsiventrally flattened and with 2 lateral ribs but no wings ..... ***Achillea**
9b Cypselae various, sometimes dorsiventrally flattened but then rhombic in cross section and without 2 lateral ribs and not or only narrowly winged:
10a Leaves serrate-dentate, rarely pinnatifid or entire; anthers caudate ..... **Osmitopsis**
10b Leaves pinnatisect to variously lobed; anthers not caudate ..... ***Anthemis**
2b Capitula discoid or disciform:
11a Pappus present, of scales, an auricle or a corona:
12a Pappus of 5(8–10) large obovate scales and sometimes 5 additional subulate scales ..... **Ursinia**
12b Pappus a shallow corona, an auricle or of small scales:
13a Capitula narrowly oblong-obconical, slender and few-flowered; glabrous or indumentum of stellate hairs ..... **Hymenolepis**
13b Capitula rather widely urceolate to cyathiform-campanulate; indumentum of simple or bifid hairs ..... **Inulanthera**
11b Pappus absent but cypselae sometimes apically with obtuse rim (rarely with pseudopappus of bristle-like stalked glands in *Athanasia*):
14a Cypselae glabrous, sometimes glandular ..... **Athanasia**
14b Cypselae copiously villous:
15a Involucral bracts in 2–4 rows ..... **Lasiospermum**
15b Involucral bracts in 1 row ..... **Eriocephalus**
1b Receptacle completely epaleate (though sometimes pilose or hirsute) or capitula few-flowered and presence of paleae unclear:
16a Capitula radiate:
17a Rays yellow, rarely partly white or reddish or abaxially reddish:
18a Ray cypselae triquetrous, winged; disc cypselae prismatic with narrow adaxial wing or terete and apparently ribbed ..... ***Chrysanthemum**
18b Cypselae all equal, oblong or obovoid, without wings or dorsiventrally flattened and laterally winged:
19a Disc corolla 4-lobed; rays not true ray florets but outer disc florets with 1 corolla lobe expanded to a limb; cypselae dorsiventrally flattened ..... **Cotula**
19b Disc corolla 5-lobed; rays true ray florets with apically 3-lobed laminas; cypselae oblong or obovoid, ribbed ..... ***Leucanthemum**
17b Rays white, rarely pink to reddish, bluish violet or creamy orange, but not yellow:
20a Pappus present at least in ray cypselae, of scales, an auricle or a corona (sometimes almost absent in *Tanacetum* but cypselae then apically with acute rim):
21a Annual herbs ..... **Foveolina**
21b Woody shrubs or shrublets ..... **Cymbopappus**
20b Pappus absent but cypselae sometimes apically with obtuse rim (mainly abaxial and somewhat toothed in *Oncosiphon*):
22a Disc corolla 4-lobed:
23a Disc corolla tube very much swollen and brittle ..... **Oncosiphon**
23b Disc corolla tube not or only slightly swollen:

24a Shrubs; cypselae subglobose with 2 or 3 adaxial faint ribs.....**Hilliardia**
24b Herbs; cypselae dorsiventrally flattened ..... **Cotula**
22b Disc corolla 5-lobed:
25a Leaves opposite..... **Eumorphia**
25b Leaves alternate..... **Phymaspermum**
16b Capitula discoid or disciform:
26a Pappus present, of scales, an auricle or a corona:
27a Annual herbs .....**Foveolina**
27b Perennial herbs or often subshrubs, shrublets or shrubs:
28a Capitula narrowly oblong-obconical, slender and few-flowered; glabrous or pubescent shrubs; indumentum of stellate hairs.....**Hymenolepis**
28b Capitula generally urceolate to cyathiform or campanulate; habit various; indumentum if present of simple or bifid hairs:
29a Shrubs with corymbose capitula and pinnatisect leaves; cypselae 8–10-ribbed; pappus of small scales projecting from cypsela ribs.....**Inulanthera**
29b Shrubs with ± ericoid leaves; pappus of scales not distinctly projecting from cypsela ribs, a corona or an auricle .....**Pentzia**
26b Pappus absent but cypselae sometimes apically with obtuse rim (mainly abaxial and somewhat toothed in *Oncosiphon*; rarely with pseudopappus of bristle-like stalked glands in *Athanasia*):
30a Leaves opposite; shrubs with sessile or corymbose capitula:
31a Leaves entire; capitula sessile .....**Athanasia**
31b Leaves pinnatifid; capitula corymbose..... **Gymnopentzia**
30b Leaves alternate, rarely opposite but then habit or capitula different:
32a Capitula in elongated and paniculate, rarely racemiform or spiciform synflorescences, often small and many.....**Artemisia**
32b Capitula solitary or in lax to dense corymbs, small to medium-sized:
33a Central floret corolla 4-lobed (rarely 3-lobed in *Cotula*):
34a Cypselae dorsiventrally flattened with 2 lateral ± distinct ribs or wings:
35a Shrublets or subshrubs with corymbose or occasionally solitary capitula .....**Schistostephium**
35b Annual or perennial herbs with solitary capitula, rarely few together:
36a Capitula sessile; outer female florets without corolla and with style persistent and spinescent in fruit.. ..... ***Soliva**
36b Capitula ± pedunculate; outer female florets with corolla; style not persistent..... **Cotula**
34b Cypselae not or only slightly dorsiventrally flattened, with or without 3–5 ribs and no wings:
37a Disc corolla tube very much swollen and brittle ..... **Oncosiphon**
37b 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 cypselae almost terete and thin-walled all around.....**Foveolina**
33b Central floret corolla 5-lobed:
38a Annual herbs .....**Foveolina**
38b Perennial herbs or often subshrubs, shrublets or shrubs:
39a Cypselae dorsiventrally flattened, with or without lateral wings .....**Hippia**
39b Cypselae not dorsiventrally flattened, not winged:
40a Cypsela ribs acute, with secretory cavities; corolla gradually expanded and funnel-shaped.....**Athanasia**
40b Cypselae without ribs or ribs faint or rounded, without secretory cavities; corolla ± distinctly divided into tube and limb:
41a Cypselae 10–18-ribbed..... **Phymaspermum**
41b Cypselae with 0 or < 10 ribs.....**Pentzia**

Tribe Arctotideae

Herbs, subshrubs or shrubs; latex sometimes present. **Leaves** alternate, rosulate, rarely opposite, entire or frequently dentate-pinnatisect to lobed, often spiny or spinulose or unarmed. **Capitula** generally radiate or discoid, rarely disciform; solitary or corymbose, rarely in racemiform synflorescences or aggregated to secondary capitula; involucral bracts imbricate in several rows, often with scarious appendages or spine-tipped; free

or ± connate. **Receptacle** areolate-alveolate, sometimes deeply alveolate with enclosed cypselae, rarely almost smooth, naked or often with denticulate to bristly pit margins. **Ray florets** female, fertile, sterile or neuter, often with staminodes; with long radiate and yellow or variously coloured lamina, apically 3- or 4-lobed. **Disc florets** bisexual or sometimes functionally male, regular and rather shallowly to deeply 5-lobed; yellow or sometimes variously dark-coloured, frequently with stalked glands. **Anthers** calcarate, mostly ecaudate or shortly caudate, apical appendage elongate and obtuse-rounded to broadly ovate-triangular and distinctly demarcated from thecae; endothecial tissue polarised or radial; filaments smooth or rarely papillose. **Style** slender or with much-thickened apical part, bilobed or with short to long style branches, mostly with ring of longer hairs beneath style branches or at base of apical part; hairs acute. **Pappus** of scales or absent. **Cypselae** ellipsoid-oblong to obovoid-obconical, frequently distinctly ribbed, often sericeous-villous with twin hairs or glabrous.

After Dyer: 659 (1975) and Hilliard: 529 (1977).

1a Capitula discoid, massed in a cushion covering crown of root and surrounded by a rosette of leaves ..... **Platycarpha**

1b Capitula radiate, if discoid, then not massed in a cushion surrounded by leaves:

2a Involucral bracts ± free, inner ones at least obtuse, scarious at apex and on margins:

3a Pappus with subplumose bristles ..... **Heterolepis**

3b Pappus absent or of scales:

4a Ray florets sterile, not producing cypselae ..... **Arctotheca**

4b Ray florets female, producing cypselae:

5a Acaulescent herbs:

6a Cypselae flat and deeply grooved on one face, convex and tubercled on the other..... **Arctotis**

6b Cypselae turbinate ..... **Haplocarpha**

5b Stems diffuse or matted..... **Arctotis**

2b Involucral bracts connate at base or higher, acute or acuminate, often spine-tipped:

7a Pappus absent; shrublets; branches slender, densely leafy up to capitula ..... **Cullumia**

7b Pappus present:

8a Annual herbs, sometimes wiry; seeds germinating from within old capitula ..... **Cuspidia**

8b Perennial herbs, subshrubs or shrubs, rarely annuals; seeds not germinating within capitula; pappus biseriate:

9a Involucral bracts slightly fused at base, pungent-toothed or -lobed..... **Berkheya**

9b Involucral bracts fused in lower half, sometimes setose, not spinescent:

10a Pappus scales of outer whorl not overlapping, inner ones equal or somewhat longer; sap milky ... **Gazania**

10b Pappus scales of outer whorl spirally overlapping, inner whorl small or obsolete ..... **Hirpicium**

Tribe Astereae

Leaves mostly alternate or rosulate, rarely opposite, usually entire or serrate-dentate only, less often pinnatifid-pinnatisect. **Capitula** radiate, disciform or discoid, solitary, corymbose or paniculate; involucral bracts generally imbricate in several rows. **Receptacle** mostly epaleate, sometimes paleate. **Disc florets** 5-lobed. **Style** with oblong-linear style branches, above stigmatic portions prolonged into acute triangular-lanceolate to subulate, sterile appendages. **Pappus** of scabrid-barbellate, rarely plumose, fine or coarse bristles, or scales, or both bristles and scales or absent. **Cypselae** rather uniform, mostly oblong-obovoid and ± ribbed, rarely shortly beaked; glabrous or pubescent with twin hairs.

Extracted and emended from Herman et al. (2000) and new views on the position of *Printzia* by Bayer & Cross (2002).

1a Pappus uniseriate:
2a Receptacle paleate, anthers shortly caudate ..... **Poecilolepis**
2b Receptacle epaleate, anthers ecaudate:
3a Capitula distinctly radiate:
4a Scandent or twining shrubs..... **Microglossa**
4b Herbs or shrubs, not scandent or twining ..... **Felicia**
3b Capitula disciform or discoid:
5a Capitula discoid ..... **Felicia**
5b Capitula disciform or shortly radiate:
6a Outer female florets in 1 row..... **Nolletia**
6b Outer female florets in 2–many rows:
7a Pappus absent or of 1 or 2 bristles..... **Dichrocephala**
7b Pappus of many barbellate bristles:
8a Ray florets (short rays) yellow..... **Nidorella**
8b Ray florets (short rays) white, pink or mauve, if yellow, then hidden by the pappus bristles:
9a Cypselae narrowly elliptic or narrowly obovate, compressed, glabrous or pubescent ..... **Conyza**
9b Cypselae subcylindric, somewhat compressed, appressed-hairy .....
..... ***Symphyotrichum** (northern hemisphere)
1b Pappus biseriate:
10a Capitula radiate:
11a Pappus of bristles only:
12a Perennial herbs, cypselae obovate or elliptic, compressed, hairy and glandular hairy ..... **Afroaster**
12b Shrubs, cypselae cylindric, 9–11-ribbed, glandular ..... **Printzia**
11b Pappus an outer row of scales and an inner row of bristles:
13a Receptacle mostly paleate ..... **Amellus**
13b Receptacle epaleate:
14a Leaves small, ericoid; cypselae with 2 resin sacs in ribs ..... **Chrysocoma**
14b Leaves usually broad or long, not ericoid; cypselae without ribs and resin sacs ..... **Afroaster** (= *Aster*)
10b Capitula disciform or discoid:
15a Capitula disciform:
16a Pappus of bristles and scales..... **Amellus**
16b Pappus of bristles only:
17a Outer female florets white or purple, in 1 row, shrub..... **Printzia**
17b Outer female florets in many rows, cream-coloured, yellowish, green, rarely whitish or mauve (*Conyza canadensis*), annual or perennial herbs or 1 shrub (*Conyza scabrida*, but outer female florets cream-coloured or yellow)..... **Conyza**
15b Capitula discoid:
18a Pappus of bristles only:
19a Perennial herbs; leaves alternate, sometimes radical; cypselae oblong-obovoid, slightly compressed, usually 3-ribbed, glandular ..... **Heteromma**
19b Shrublets 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**
18b Pappus of bristles and scales:
20a Cypselae without resin sacs; receptacle mostly paleate..... **Amellus**
20b Cypselae with resin sacs in ribs; receptacle epaleate ... . **Chrysocoma**

Tribe Calenduleae

Herbs, subshrubs, shrubs or small trees; unarmed or sometimes spinescent. **Leaves** alternate or rarely opposite, petiolate or sessile, entire or serrate, dentate to variously lobed or dissected, glabrous, glandular or pubescent. **Capitula** radiate, corymbose or solitary, subsessile or shortly pedunculate to scapose; involucral bracts uniseriate and subequal to imbricate with outer bracts gradually smaller. **Receptacle** epaleate. **Ray florets** female,

rarely neuter; fertile or sterile; lamina short or long, yellow, white, pink, mauve, purple or blue, sometimes differently coloured on upper and lower surface. **Disc florets** bisexual or more often functionally male, regular, funnel-shaped or indistinctly differentiated in tube and subcampanulate limb, 5-lobed, yellow, orange or reddish. **Anthers** ecalcarate, caudate, apical appendage ovate-triangular, obtuse or acute-acuminate, flat or somewhat concave; endothecial tissue polarised. **Style** sterile, shallowly bifid with short apical collar of hairs; or deeply bifurcate with hairs extending down below branches, or fertile, shortly bilobed, or deeply bifurcate; hairs mamillate or sometimes acute; stigmatic areas in 2 apically confluent lines. **Pappus** absent. **Cypselae** homo-, di-, tri- or polymorphic; ray cypselae terete or triquetrous to 3-winged, smooth, tuberculate, aculeate or beaked, straight or curved, with or without cavities; or fruit a drupe; disc cypselae (when developed) laterally flattened with thickened margins, obovate, orbicular or elliptic.
Compiled from genus descriptions after Nordenstam (1994).

1a Fruit a drupe..... **Chrysanthemoides**
1b Fruit a cypsela:
2a Style deeply bifurcate with hairs reaching below point of furcation ..... **Garuleum**
2b Style shallowly bifid or bilobed with short apical collar of hairs:
3a Cypselae homomorphic, rarely hetero- or dimorphic:
4a Ray cypselae kidney-shaped with ventral cavity ..... **Gibbaria**
4b Ray cypselae variously shaped with or without apical cavities:
5a Ray cypselae 3-winged with apical fenestrate airchamber; sometimes some cypselae wingless and rostrate..... **Tripteris**
5b Ray cypselae straight or somewhat curved, triquetrous, 3-winged or terete or ribbed or tuberculate or with various processes; with or without apical cavities..... **Osteospermum**
3b Cypselae hetero- or polymorphic:
6a Disc florets mostly bisexual, fertile; disc cypselae laterally flattened with thickened margins..... **Dimorphotheca**
6b Disc florets functionally male:
7a Ray cypselae slightly curved and wingless or straight and 3-winged or rostrate and wingless, with or without apical cavity; smooth or rugose-aculeate ..... **Oligocarpus**
7b Ray cypselae straight or somewhat curved, triquetrous, 3-winged or terete or ribbed or tuberculate or with various processes; with or without apical cavities..... **Osteospermum**

Tribe *Cardueae

Herbs or sometimes subshrubs or shrublets; latex sometimes present. **Leaves** alternate or sometimes rosulate, entire or dentate-pinnatisect to lobed, very often spiny or spinulose or unarmed. **Capitula** discoid, disciform or 'radiate' (radiant: not true ray florets); solitary or corymbose, sometimes clustered; involucral bracts imbricate in several rows, chartaceous to scarious, often spine-tipped or with fimbriate-ciliate, lacerate or variously shaped appendages; innermost bracts rarely much elongated, spreading and coloured, simulating rays. **Receptacle** mostly densely setose, rarely areolate with fringed or scaly pit margins, paleate or epaleate. **Florets** regular or slightly irregular; mostly with slender tube and deeply or shallowly 5-lobed limb; outer florets sometimes elongated and radiating, sometimes tubular and irregularly few-lobed; all or central florets bisexual; outer florets sometimes female or neuter; functionally male and female florets in separate capitula in some *Cirsium* spp.; florets red, pink, purple, violet or blue, less frequently yellow or orange. **Anthers** calcarate and distinctly caudate; tails entire or fringed, rarely very short, apical appendage elongate, acute to acuminate and often somewhat thickened and rounded at apex, flat; endothecial tissue mostly polarised; filaments often papillose-pilose or glabrous, rarely connate to a tube. **Style** with rather long, linear, dorsally papillose-

pilose, sometimes connate style branches and with ring of hairs on a thickening beneath branches, rarely bilobed or with short branches; hairs acute. **Pappus** of scabrid, barbellate or plumose bristles, sometimes deeply cleft, or of scales, or a short corona; bristles in 1–several rows, subequal or very unequal and gradually longer inwards; simple or double with inner row of bristles, hairs or scales, rarely totally absent. **Cypselae** oblong to obovoid-obconical, often laterally somewhat compressed or angular, generally glabrous or sometimes sparsely pubescent, or more densely sericeous, pale yellowish brown or frequently with dark brown to blackish streaks or spots, or entirely brown-blackish, mostly with distinct apical rim.

After Pope: 49 (1992); Bremer: 134 (1994).

1a Dwarf shrubs; leaves with a spinose-dentate margins ..... ***Carthamus**
1b Herbs; leaves not as above:
2a Pappus with hairs connate at base:
3a Pappus of plumose hairs ..... ***Cirsium**
3b Pappus of scabrid hairs:
4a Filaments free ..... ***Carduus**
4b Filaments connate ..... ***Silybum**
2b Pappus with hairs free to base:
5a Pappus of long, subacuminate scales surrounded by long hairs ..... ***Mantisalca**
5b Pappus of several rows of simple, sometimes scale-like, hairs ..... ***Centaurea**

Tribe Cichorieae

Plants containing latex. **Leaves** alternate or often rosulate, entire or frequently dentate-pinnatisect to lobed, sometimes spinulose. **Capitula** ligulate; solitary or cymose to corymbose-paniculate, rarely in spike-like or racemose synflorescences. **Receptacle** mostly epaleate or rarely paleate. **Florets** all ligulate (i.e. strap-shaped with 5 apical lobes). **Pappus** mostly of scabrid-barbellate bristles, more rarely of plumose bristles, sometimes with outer row of hairs or with intermixed hairs, rarely of minute scales, sometimes absent. **Cypselae** terete to ellipsoid-fusiform to obovoid-obconical, sometimes compressed or flattened, frequently ribbed or angular, sometimes scabrid-muricate or tuberculate, mostly glabrous or sparsely pubescent, often with long beak

Extracted and emended from Herman et al. (2000).

1a Pappus of small scales up to 2 mm long ..... ***Cichorium**
1b Pappus of hairs or bristles at least 4 mm long:
2a Hairs of pappus feathery or at least inner ones so:
3a Receptacular paleae present ..... ***Hypochaeris**
3b Receptacular paleae absent:
4a Plants glabrous at maturity, sometimes floccose when young ..... ***Tragopogon**
4b Plants rough hairy:
5a Pappus in 1 row; fruit with a stout hollow beak ..... ***Urospermum**
5b Pappus in 2 rows; fruit beak slender, not hollow ..... ***Picris**
2b Hairs of pappus not feathery, at most somewhat barbellate:
6a Cypselae 2.0–3.5 mm long, obconic, truncate above, pappus of comparatively few coarse scabrid bristles ..... **Tolpis**
6b Cypselae and pappus not as above:
7a Cypselae tuberculate in upper part with a long slender beak; scapes one-headed, hollow ..... ***Taraxacum**
7b Cypselae and scapes not as combined above, or plants not scapigerous:
8a Pappus dimorphic:
9a Pappus of setae and fine down-like hairs intermixed ..... **Sonchus**
9b Pappus in outer florets a small corona, in inner florets of few coarse, basally flattened and scale-like, scabrid bristles ..... ***Hedypnois**

8b Pappus of setae only, monomorphic, rarely with an outer ring of very short setae:
10a Cypselae truncate, without ascending hairs or ascending rough projections on the ribs or margins ..... **Launaea**
10b Cypselae beaked or at least somewhat attenuate above with ascending hairs or rough projections on the ribs or at least on the margins:
11a Cypselae ± compressed and equal-ribbed, with ascending evident or submicroscopic hairs on the ribs or at least the margins; involucres mostly cylindrical ..... ***Lactuca**
11b Cypselae ± terete and equal-ribbed, rough with ascending projections on the ribs; involucres usually obconic ..... ***Crepis**

Tribe Corymbieae

Perennial herbs, with stout, silky hairy rhizome, monocotyledonous in appearance. **Leaves** alternate, mainly rosulate, sessile, entire, parallel-veined. **Capitula** discoid, single-flowered, in corymbs to panicles, pedunculate or rarely sessile; involucre cylindrical, calyculate, involucral bracts 2, enclosing floret, often purplish tinged. **Receptacle** epaleate. **Florets** bisexual, corolla 5-lobed, pink to purplish or white. **Anthers** 5, apical appendage reduced, caudate. **Style** bifurcate with linear branches, style branches and upper part of style hairy. **Pappus** of basally connate short scales and or fine bristles. **Cypselae** narrowly oblong, somewhat compressed, densely pubescent.
One monotypic genus, *Corymbium* L., endemic to WC and EC.

Tribe Eupatorieae

Herbs, shrubs or vines. **Leaves** generally opposite, frequently entire, sometimes serrate or lobed, usually petiolate, rarely sessile, frequently trinerved. **Capitula** discoid; usually corymbose-paniculate, rarely solitary, few- to many-flowered; involucral bracts mostly unequal and subimbricate to imbricate in several rows or subequal in 1 or 2 rows (eximbricate). **Receptacle** mostly epaleate and glabrous, rarely paleate. **Disc florets** bisexual, regular, 5-lobed, white, pink, purple, violet or blue, never yellow. **Anthers** ecalcarate or rarely shortly calcarate, ecaudate, apical appendage ovate-lanceolate to oblong; endothecial tissue radial; filament collar elongate-oblong, sometimes widened, cells often with annular thickenings. **Style** with very long, filiform-linear to oblanceolate-clavate, smooth-mamillose to papillose-pilose, usually coloured, sterile style branch appendages; hairs obtuse; stigmatic areas in 2 short, widely separated marginal lines at base of each style branch; glands sometimes present between stigmatic bands; style base sometimes pubescent. **Pappus** usually of many scabrid-barbellate bristles, or of few bristles or scales, or both bristles and scales, rarely coroniform or absent. **Cypselae** rather uniform, black, mostly oblong and prismatic with ± 5 ribs, more rarely with 7–10 ribs, rarely flattened; glabrous or pubescent with twin hairs.
After Bremer: 643 (1994).

1a Anthers without an apical appendage or minutely apiculate; pappus of 3 or 5 gland-tipped processes ... **Adenostemma**
1b Anthers with an apical appendage; pappus of eglandular bristles or scales:
2a Pappus of scales ..... ***Ageratum**
2b Pappus of bristles:
3a Involucral bracts 4 or 5; plant a twiner or scrambler ..... **Mikania**
3b Involucral bracts many, if few, plant erect, not twining ..... ***Chromolaena**

Tribe Gnaphalieae

Leaves alternate or opposite, margins flat, involute or revolute, mostly entire. **Capitula** disciform or discoid, rarely radiate, solitary or in groups or forming secondary capitula;

involucral bracts imbricate in several rows, papery, sometimes chartaceous or herbaceous. **Receptacle** generally epaleate, rarely paleate. **Disc florets** 5-lobed. **Style** usually with oblong-linear, truncate and apically penicillate style branches or sometimes obtuse with hairs dorsally or acute or prolonged. **Pappus** of free or connate, plumose or barbellate, capillary bristles in 1–several rows, rarely with scales and bristles or scales only, or absent. **Cypselae** often small, generally oblong or obovoid, sometimes triquetrous, variously hairy, sometimes glabrous.

Extracted and emended from Herman et al. (2000).

1a Leaves denticulate, dentate, serrulate, serrate or lobed; involucral bracts cartilaginous or herbaceous, without papery lamina:
2a Capitula disciform ..... **Denekia**
2b Capitula radiate:
3a Receptacle paleate ..... **Callilepis**
3b Receptacle epaleate:
4a Involucral bracts with shortly stalked glandular hairs; cypselae hairy but without glands; leaves xeromorphic, needle-like ..... **Athrixia**
4b Involucral bracts with long-stalked glandular hairs; cypselae hairy and glandular; leaves herbaceous .. .. **Lepidostephium**
1b Leaves entire or else involucral bracts have a papery lamina:
5a Involucral bracts cartilaginous or herbaceous; capitula radiate:
6a Pappus of triquetrous awns; ray florets creamy white or blue; disc florets purplish black ..... **Callilepis**
6b Pappus of capillary bristles; florets not as above:
7a Pappus bristles in several rows; ray florets not yellow (*Athrixia* and *Lepidostephium*, also see *Macowania pinifolia*) ..... go to couplet 4
7b Pappus of bristles in 1 row or absent; ray florets yellow or white:
8a Leaves flat, very pungent; corolla with long woolly hairs; pappus bristles caducous ..... **Arrowsmithia**
8b Leaves revolute, pungent or not; corolla without woolly hairs; pappus bristles persistent ..... **Macowania**
5b Involucral bracts with papery lamina or else capitula disciform or discoid:
9a Capitula radiate:
10a Ray florets yellow:
11a Pappus bristles distinctly plumose ..... **Leysera**
11b Pappus bristles scabrid-barbellate or absent:
12a Annual or biennial herbs ..... **Rhynchopsidium**
12b Perennial subshrubs, shrublets or shrubs:
13a Disc florets with 1–4 pappus bristles ..... **Rosenia**
13b Disc florets without pappus bristles:
14a Plants glabrous (if hairy, then with capitula congested in secondary capitula); capitula generally cymose-corymbose to clustered in secondary capitula (if solitary, then with glabrous, ± distinctly 1-nerved leaves) ..... **Oedera**
14b Plants ± hairy or glandular-hairy (if glabrous then with distinctly 3–9-nerved leaves); capitula generally solitary (if corymbose then with hairy leaves) ..... **Relhania**
10b Ray florets purple, pink or white:
15a Capitula few-flowered, in dense globose clusters ..... **Disparago**
15b Capitula with more florets; well separated in loose clusters ..... **Amphiglossa**
9b Capitula disciform or discoid:
16a Involucral bracts entirely cartilaginous or herbaceous or sometimes with minute papery apical portion:
17a Capitulum 1-flowered ..... **Stoebe**
17b Capitulum with 2 or more florets:
18a Capitula arranged in spikes or in dense glomerules ..... **Elytropappus**
18b Capitulum solitary, neither arranged in spikes nor in dense glomerules ..... **Amphiglossa**
16b Involucral bracts conspicuously papery:
19a Florets purple, at least apically or basally:
20a Leaves adaxially concave, often tomentose adaxially only:
21a Leaves twisted or straight; capitula discoid; pappus barbellate ..... **Metalasia**

21b Leaves straight; capitula disciform or sometimes discoid but then pappus plumose:
22a Capitula large (> 10 mm)..... **Syncarpha**
22b Capitula small (< 10 mm):
23a Disc florets generally bisexual; pappus bristles basally with patent cilia, apical cells clavate; endothecial tissue radial..... **Ifloga**
23b Disc florets functionally male; pappus bristles basally without patent cilia, apical cells not clavate; endothecial tissue polarised..... **Trichogyne**
20b Leaves flat or revolute, not tomentose adaxially only:
24a Capitula discoid or disciform with female florets not outnumbering disc florets:
25a Capitula discoid (or occasionally with 1 or 2 filiform female florets):
26a Capitula few, on filiform peduncles..... **Troglophyton**
26b Capitula several, ± sessile, in glomerules..... **Vellereophyton**
25b Capitula disciform (female florets frequent):
27a Stereome undivided, receptacle paleate ..... **Tenrhynea**
27b Stereome divided:
28a Capitula few, on filiform peduncles..... **Troglophyton**
28b Capitula several, ± sessile, in glomerules..... **Vellereophyton**
24b Capitula disciform with female florets outnumbering disc florets:
29a Stereome divided:
30a Pappus bristles basally connate in groups, pappus plumose ..... ***Facelis**
30b Pappus bristles basally free or cohering by patent cilia:
31a Stereome conspicuously divided; pappus generally distinctly plumose or else cypselae with 2-celled, globose or unicellular, clavate hairs..... **Lasiopogon**
31b Stereome indistinctly divided; pappus barbellate or possibly subplumose but then cypselae not as above:
32a Capitula few, on filiform peduncles..... **Troglophyton**
32b Capitula several, ± sessile, in glomerules..... **Vellereophyton**
29b Stereome undivided:
33a Cypselae with globose hairs; pappus basally connate ..... ***Gamochaeta**
33b Cypselae with clavate or elongated hairs; pappus free, connate or absent:
34a Perennial herbs with long, straggling branches..... **Plecostachys**
34b Perennial or annual herbs; branches never long and straggling..... **Gnaphalium**
19b Florets yellow:
35a Leaves minute, densely appressed; involucral bracts white; cypselae villose..... **Dolichothrix**
35b Characters not as above:
36a Outer involucral bracts subtending single female floret; pappus apically plumose:
37a Disc florets generally bisexual; pappus bristles basally with patent cilia, apical cells clavate; endothecial tissue radial..... **Ifloga**
37b Disc florets functionally male; pappus bristles basally without patent cilia, apical cells not clavate; endothecial tissue polarised..... **Trichogyne**
36b Outer involucral bracts not subtending single female floret; pappus various:
38a Capitula discoid:
39a Ovaries with relatively large and conspicuous white hairs, pappus bristles fused at base in a smooth ring, shaft usually plumose, rarely barbellate or smooth ..... **Syncarpha**
39b Ovaries either without large white hairs or pappus bristles not fused at base (although they may cohere strongly by patent cilia) ..... **Helichrysum**
38b Capitula disciform:
40a Female florets outnumbering disc florets:
41a Capitula with < 20 florets..... **Helichrysum**
41b Capitula with > 20 florets..... **Pseudognaphalium**
40b Female florets fewer than disc florets:
42a Capitula large, solitary or few together; pappus basally connate, of many distinctly plumose bristles; cypselae with globose hairs..... **Syncarpha**
42b Capitula large or small; pappus barbellate or only somewhat plumose, but then with few, basally free bristles and cypselae not with globose hairs..... **Helichrysum**

Tribe Helenieae

Herbs, subshrubs or shrubs. **Leaves** generally opposite, at least below, sometimes alternate throughout or rosulate, entire or serrate-dentate to pinnatisect or lobed, often trinerved. **Capitula** radiate or discoid, rarely disciform, solitary or corymbose-paniculate; involucral bracts generally in 1 or 2, sometimes 3, rarely 4 rows, generally herbaceous, occasionally scarious, sometimes partly or wholly connate. **Receptacle** generally epaleate. **Ray florets** female, rarely female-sterile or neuter, mostly yellow or white, sometimes violet, pink, reddish, orange, purplish, brownish or greenish. **Disc florets** bisexual, rarely functionally male, generally with narrow tube and expanding limb, sometimes funnel-shaped, generally 5-lobed or sometimes 4-lobed, generally yellow, rarely white, pink, violet, purple, orange or greenish. **Anthers** generally shortly calcarate or sometimes distinctly ecalcarate, usually ecaudate, rarely caudate, apical appendage generally ovate to cordate, rarely narrowly oblong, sometimes glandular; endothecial tissue polarised, rarely radial; filament collar sometimes broadened towards base, dilated. **Style** with oblong-linear style branches generally with sterile appendages of ± fused hairs, or sometimes truncate and apically penicillate; hairs obtuse; stigmatic areas in 2 separate lines. **Pappus** generally of scales with or without extended bristle-like midrib, entire or sometimes dissected, sometimes of barbellate or plumose bristles; sometimes absent. **Cypselae** brown to blackish, with or without striations, usually with short to long twin hairs; ray cypselae generally triquetrous, sometimes partly or wholly enclosed by subtending involucral bracts; disc cypselae generally terete or prismatic.
After Hilliard: 324 (1977).

1a Involucral bracts connate for most of their length, gland-dotted ..... ***Tagetes**
1b Involucral bracts free; not gland-dotted:
2a Involucral bracts many, appressed-hairy, margins with long bristles ..... ***Gaillardia**
2b Involucral bracts few (± 3–6), glabrous ..... ***Schkuhria**

Tribe Heliantheae

Herbs, subshrubs or shrubs, sometimes aquatic herbs. **Leaves** generally opposite, at least below, sometimes alternate throughout or rosulate; entire or serrate-dentate to pinnatisect or lobed, often trinerved, often scabrid with multiseptate hairs or woolly hairs or glabrous. **Capitula** radiate, discoid or rarely disciform, solitary or in variously arranged synflorescences; involucral bracts in 1–3, sometimes many, rows; generally herbaceous, sometimes scarious, chartaceous, membranous or foliaceous, sometimes distinctly dimorphic or with scarious margins. **Receptacle** paleate, paleae flat or often conduplicate, membranous or with herbaceous, or rarely lignified-pungent tip, deciduous or persistent. **Ray florets** generally female and fertile, sometimes sterile or neuter, usually yellow, sometimes white, rarely pink, red or purple. **Disc florets** bisexual or functionally male, generally with narrow tube and expanding limb, shallowly 5-lobed, sometimes shallowly 4-lobed, generally yellow, rarely white, purplish or greenish; lobes frequently papillose adaxially. **Anthers** shortly calcarate, ecaudate, usually blackish, sometimes pale, rarely reddish, greenish or yellowish, apical appendage generally ovate to cordate, concave, acute, sometimes truncate to emarginate or acuminate, often glandular; endothecial tissue usually polarised, rarely radial; filament collar generally broadened towards base, dilated, sometimes continuous around filament. **Style** with oblong-linear style branches, generally with sterile appendages of ± fused hairs or sometimes truncate and apically penicillate; hairs obtuse; stigmatic areas in 2 separate lines or sometimes with continuous stigmatic areas.

Pappus of stout to fragile awns, scales and/or barbellate to plumose bristles, rarely coroniform or sometimes absent. **Cypselae** brown to blackish, usually with short to long twin hairs, sometimes glabrous; ray cypselae generally triquetrous, sometimes dorsiventrally compressed and then generally with multiseptate hairs, or rarely laterally compressed; disc cypselae angular or laterally compressed and ± enclosed by subtending paleae, sometimes dorsiventrally compressed.
After Wild: 1 (1967) and Hilliard: 290 (1977).

1a Capitula unisexual:
2a Involucral bracts of male capitula connate; female capitula 1-flowered; cypsela clasped by female involucre which bears 4–6 spines ..... ***Ambrosia**
2b Involucral bracts of male capitula free; female capitula 2-flowered; cypsela clasped by female involucre bearing hooked spines ..... ***Xanthium**
1b Capitula bisexual:
3a Florets of disc sterile ..... ***Acanthospermum**
3b Florets of disc fertile (or only innermost sterile):
4a Receptacular paleae ± flat not clasping cypselae:
5a Involucral bracts quite free, inner merging gradually into receptacular paleae; leaves simple ..... ***Galinsoga**
5b Involucral bracts of inner row connate at base, outer row fewer and mostly smaller or narrower; leaves variously divided ..... **Bidens**
4b Receptacular paleae ± conduplicate and clasping or enfolding cypselae:
6a Inner involucral bracts embracing the fertile ray cypselae; involucral bracts spathulate and densely glandular ..... ***Sigesbeckia**
6b Inner involucral bracts not embracing the outermost cypselae:
7a Cypselae surmounted by a distinct, often lacerate cupule; additional pappus bristles present or absent. ..... **Aspilia**
7b Cypselae without pappus or with pappus of various kinds, but not a cupule:
8a Ray florets persistent; annual herb up to 0.6 m high; unbranched; leaves narrowly oblong-ovate ..... ***Zinnia**
8b Ray florets not persistent:
9a Receptacular paleae obovate, truncate-emarginate and caudate-spinescent at apex; perennial shrubs up to 6 m high with white rays ..... ***Montanoa**
9b Receptacular paleae not caudate-spinescent:
10a Disc florets deep purple, at least above ..... ***Helianthus**
10b Disc florets not purple:
11a Disc florets white; receptacular paleae very narrow and often setiform ..... ***Eclipta**
11b Disc florets not white, ± yellowish:
12a Cypselae thick or angular, not compressed, pubescent at apex, not winged or margined ..... ***Melanthera**
12b Cypselae ± compressed, winged or with a hyaline cartilaginous margin:
13a Cypselae with broad, irregular margins; lamina of ray florets 10 mm long or more ..... ***Verbesina**
13b Cypselae with hyaline, cartilaginous margins; ray florets ± 1.3 mm long or absent ..... **Spilanthes**

Tribe Inuleae (including Plucheeae)

Plants occasionally with winged stems. **Leaves** generally alternate, sometimes opposite, entire to pinnatifid or pinnatisect, serrate or dentate, often glandular and hairy. **Capitula** radiate, disciform or discoid; involucral bracts imbricate in several rows, chartaceous or herbaceous. **Receptacle** generally epaleate, rarely paleate. **Disc florets** generally with 4- or 5-lobed. **Style** with oblong to linear, rounded style branches and hairs reaching to bifurcation, rarely below bifurcation; hairs acute or rarely obtuse. **Pappus** of scales only or composed of ± free, barbellate, rarely plumose, capillary bristles in 1 row, with or without outer row of small scales, scales sometimes forming small ring-shaped cup,

or rarely absent. **Cypselae** ellipsoid, turbinate or triquetrous, often with ribs, glabrous or hairy.

Extracted and emended from Herman et al. (2000).

1a Pappus absent, capitula congested in dense, globose or ovoid, terminal, secondary capitula .... **Sphaeranthus**
1b Pappus present:
2a Pappus of scales only or of scales and barbellate bristles:
3a Pappus of wide scales, often with protruding bristle-like midportion ..... **Geigeria**
3b Pappus of well-developed capillary, barbellate bristles and scales:
4a Pappus scales forming short connate cup; capitula generally disciform ..... **Pulicaria**
4b Pappus scales ± free; capitula discoid..... **Pegolettia**
2b Pappus of barbellate bristles only, capitula solitary or few–many together in open, terminal synflorescence:
5a Cypselae with conspicuous red resin ducts, stems not winged ..... **Doellia**
5b Cypselae without resin ducts, stems winged ..... **Laggera**

Tribe Mutisieae

Herbs, shrubs or trees, sometimes xerophytic and spiny. **Leaves** alternate or rosulate, entire to variously dentate-lobed or sometimes pinnatisect. **Capitula** discoid, disciform or radiate, solitary or variously arranged; involucral bracts generally chartaceous and in several rows, more rarely herbaceous and in few rows. **Receptacle** epaleate. **Ray florets** (if present) bilabiate with expanded lamina, only occasionally without adaxial lobes, bisexual, female or neuter; few species with disciform capitula with inconspicuous, female ray florets. **Disc florets** regular and deeply 5-lobed or frequently bilabiate, bisexual or functionally male or female. **Anthers** calcarate and caudate, tails often branched (pilose), apical appendage often rather long and coloured, flat; endothecial tissue polarised. **Style** variable; style branches frequently rather short, glabrous to papillose or pilose dorsally and apically; hairs acute or obtuse-rounded; stigmatic areas cover inside of style branches. **Pappus** of many scabrid to barbellate, sometimes plumose bristles, rarely of scales, or with additional scales. **Cypselae** oblong-obovoid, sometimes rather slender, often ribbed.

After Dyer: 660 (1975) and Ortíz: 738 (2001).

1a Acaulescent, perennial herbs; capitula usually radiate on upright, unbranched peduncles ..... **Gerbera**
1b Branched perennials, shrublets, or shrubs:
2a Leaves thick, leathery, becoming shiny above, very woolly beneath ..... **Oldenburgia**
2b Leaves herbaceous, often tomentose:
3a Phyllaries glabrescent to hairy, with longitudinal dark stripes, central vein conspicuous; innermost phyllaries longer than outer, margins scarious..... **Dicoma**
3b Phyllaries often completely glabrous, without longitudinal dark stripes, central vein inconspicuous; innermost phyllaries shorter than contiguous outer series, ± entirely scarious ..... **Macledium**

Tribe Senecioneae

Herbs, shrubs, subshrubs, trees or vines. **Leaves** alternate or sometimes rosulate, entire to variously serrate-dentate or lobed, pinnately or sometimes palmately veined, rarely succulent. **Capitula** radiate, disciform or discoid, solitary or cymose to corymbose-paniculate; involucral bracts mostly in 1 row, oblong-lanceolate, calyculate (outer row of smaller bracts) or ecalyculate; rarely in 2 subequal rows (biseriate), sometimes connate. **Receptacle** always epaleate and mostly naked. **Ray florets** female, fertile, yellow, white or variously coloured. **Disc florets** bisexual or sometimes functionally male, 5-lobed, yellow, whitish or variously coloured; outer florets in disciform capitula female,

tubular or filiform. **Anthers** ecalcarate, ecaudate or sometimes caudate, apical appendage ovate-lanceolate to oblong, flat; endothecial tissue of elongated cells, radial or polarised; filament collar slender or often much dilated with swollen cells. **Style** in bisexual florets with oblong-linear, dorsally glabrous or rarely papillose style branches, apically usually truncate and penicillate, sometimes almost glabrous, sometimes acute to acuminate with sterile appendage and ± fused hairs; hairs obtuse; stigmatic areas in 2 separate lines or partly or wholly continuous ventrally on style branches. **Pappus** of scabrid-barbellate (never plumose), fine or coarse bristles; bristles rarely reduced and short or absent. **Cypselae** rather uniform, mostly ellipsoid-oblong and ribbed, rarely compressed, glabrous or pubescent with twin hairs, rarely myxogenic.

Compiled from descriptions in Bremer (1994) and key by Jeffrey: 874 (1986), genus *Bolandia* by Cron et al. (2006b).

1a Pappus absent in all florets ..... **Euryops**
1b Pappus present, at least in ray florets:
2a Involucre calyculate:
3a Anther bases with sterile tailed auricles (caudate):
4a Petioles auriculate; heads discoid ..... **Delairea**
4b Petioles basally thickened and climbing, exauriculate; heads disciform ..... **Mikaniopsis**
3b Anther bases ecaudate or minutely sagittate:
5a Plants not succulent:
6a Outer (ray) cypselae dorsiventrally compressed ..... **Cineraria**
6b Outer (ray) cypselae not compressed:
7a Style branch apices not appendaged:
8a Style branch apices truncate or rounded ..... **Senecio**
8b Style branch apices truncate, with a tuft of papillae in the centre ..... **Bolandia**
7b Style branch apices with very short to elongated appendage of fused papillae..... **Crassocephalum**
5b Plants succulent:
9a Style branches with conical to somewhat elongated appendages..... **Kleinia**
9b Style branches without appendages, truncate or rounded ..... **Senecio**
2b Involucre ecalyculate:
10a Heads discoid:
11a Style branches linear-obtuse with long, filiform, papillose appendages..... **Lopholaena**
11b Style branches linear, truncate to obtuse with smaller appendages or appendages absent:
12a Style branches with small appendages ..... **Othonna**
12b Style branches without appendages ..... **Euryops**
10b Heads radiate or disciform:
13a Heads disciform:
14a Style of central florets undivided ..... **Othonna**
14b Style of central florets divided, with oblong-linear, obtuse or truncate branches ..... **Hertia**
13b Heads radiate:
15a Annual herbs ..... **Euryops**
15b Perennial herbs, shrublets or shrubs:
16a Disc florets bisexual, rarely functionally male; style bifid, sometimes undivided ..... **Euryops**
16b Disc florets functionally male:
17a Style undivided..... **Othonna**
17b Style divided..... **Hertia**

Tribe Tarchonantheae

Shrubs or trees, dioecious; often aromatic. **Capitula** discoid, in terminal or axillary panicles; involucral bracts in 1–several rows, often imbricate. **Receptacle** epaleate. **Male capitula** with 5-lobed, tubular corollas. **Style** (in male florets) filiform, minutely bifid

at apex or undivided. **Female capitula** with 3–5-lobed, tubular to filiform corolla. **Style** (in female florets) with short often recurved branches, flattened or blunt near tip. **Pappus** absent or 1 or 2 rows of rough bristles. **Cypselae** angled or few-ribbed, pubescent. Extracted from Herman et al. (2000).

Pappus of scabrid bristles.....**Brachylaena**
Pappus absent ..... **Tarchonanthus**

Tribe Vernonieae

Herbs, shrubs, small trees or vines. **Leaves** mostly alternate, sometimes rosulate or opposite or verticillate, mostly entire or serrate-dentate only. **Capitula** mostly discoid; very variously arranged, solitary, corymbose, paniculate, scorpioid cymose, clustered, etc.; involucral bracts generally imbricate in several rows. **Receptacle** generally epaleate. **Disc florets** bisexual, regular, 5-lobed, often glandular and sometimes pilose; white, pink, violet, blue, red or purple, rarely yellow or orange. **Anthers** calcarate but mostly ecaudate, apical appendage elongate, obtuse-rounded; endothecial tissue polarised. **Style** slender with long, filiform branches, pilose dorsally along style branches and on shaft below; hairs mostly acute. **Pappus** of scabrid-barbellate bristles, rarely plumose, or of scales, or a corona, frequently double with outer row of much shorter scales or bristles, sometimes absent. **Cypselae** oblong to obovoid-obconical, often ribbed or angled; frequently sericeous with twin hairs or glabrous, often glandular. After Pope: 57 (1992); Bremer: 227 (1994).

1a Pappus absent, cypselae crowned with apical rim.....***Ethulia**
1b Pappus of bristles or scales:
2a Climbing shrubs or shrubs:
3a Leaves trinervate, corollas usually yellow.....**Distephanus**
3b Leaves pinnately veined, corollas purplish to white.....**Gymnanthemum**
2b Perennial herbs:
4a Heads solitary, cypselae glabrous or sparsely hairy, glandular.....**Vernonia**
4b Heads corymbosely arranged, cypselae densely hairy.....**Hilliardiella**

*ACANTHOSPERMUM Schrank

(Heliantheae)

Species 6, Central and South America; 3 naturalised in sthn Afr., widespread, except NC, WC.

australe (Loefl.) Kuntze

Upright starburr; *donkieklits* (A)

Herb with prostate branches forming mats, as much as 0.6 m in diam., branches leafy. **Leaves** opposite, petiolate, up to 45 × 40 mm, elliptic, broadly ovate or suborbicular, base ± truncate or abruptly cuneate, margins subentire to coarsely dentate, pubescent above and below, gland-dotted. **Capitula** axillary, pedunculate, 3–5 mm in diam. when flowering, ± 15 mm in fruit. **Flowering time** Jan.–July. **Cypselae** usually 6–9 in number, radiating from disc, each enveloped in an enlarged involucral bract; ± 7 mm long, fruit covered by short, hooked spines. Weed, grassland, sandy soil, alt. 945–1 600 m; Drakensberg Grassland (Maclear District).

glabratum (DC.) Wild

Prostate star; *ankerbossie* (A)

Prostate herb, branches spreading widely and often rooting along whole length, leafy. **Leaves** opposite, petiolate, up to 30 × 25 mm, elliptic to broadly ovate, base cuneate, margins coarsely toothed, glabrous or glabrescent above and below, gland-dotted. **Capitula** pendunculate, 5–7 mm in diam. when flowering, up to 20 mm in fruit. **Flowering time** Dec.–Apr.? **Cypselae** 4 or 5 in number, radiating from the disc, each enveloped in an enlarged involucral bract, forming a fusiform-oblong fruit 8–10 mm long, covered in short hooked spines. Weed, gravel soil, alt. up to 1 800 m; Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Mkambati Nature Reserve, Grahamstown).

*ACHILLEA L.

(Anthemideae)

Species 115, Europe, Asia, Africa, North America, Australia and New Zealand; 1 naturalised weed in sthn Afr., B, G, M, KZN, EC.

millefolium L.

Common yarrow, milfoil, yarrow; *duisendblaarachillea* (A)

Perennial herb, up to 500 mm high, strongly aromatic. **Leaves** alternate, 2× or 3× pinnate, ultimate segments very narrow, sparsely hairy. **Capitula** radiate, small, crowded in terminal corymbs. **Receptacle** paleate. **Ray florets** usually white, sometimes rosy. **Disc florets** white or creamy white. **Flowering time** Jan.–Apr. **Pappus** absent. **Cypselae** narrowly obovate, compressed. Naturalised weed growing in grassland, old fields and disturbed places, alt. up to 1 920 m; Sub-Escarpment Grassland (Cathcart District, Glencairn).

ADENOSTEMMA J.R.Forst. & G.Forst.

(Eupatorieae)

Species 24, South and Central America, West Indies, Africa, Asia, Pacific Islands; 2 in sthn Afr., N, B, LIM, NW, G, M, S, KZN, EC.

caffrum DC.

uMahogwe (Z)

Perennial herb, 1.0–1.5 m high; hydrophyte glandular-pilose or glabrous; stems erect or ascending and rooting from lower part. **Leaves** opposite, broadly lanceolate to narrowly ovate-rhomboid, acuminate, gradually narrowed at base into short petiole or subsessile, margins coarsely and sharply callose-dentate. **Capitula** discoid; many-flowered, pedunculate, in lax corymbose panicles; involucre campanulate; bracts in ± 2 rows, ± connate at base. **Receptacle** honeycombed, epaleate. **Corolla** white or mauve; tubular, widening gradually upwards; lobes 5, shorter than tube, glandular-hairy. **Anthers** linear, blunt at base; with or without small, apical appendage. **Style** branches long, dilated above, obtuse, sometimes subpetaloid, papillose on outer surface. **Flowering time** Jan., Feb.? **Pappus** of 3 or 5 short, rigid gland-tipped processes. **Cypselae** 3-angled. Common at streamsides, alt. 20–1 450 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Griqualand East, Kei River Mouth).

AFROASTER J.C.Manning & Goldblatt

(Astereae)

(= *ASTER* L.)

Species 18, sub-Saharan Africa; 15 in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, WC, EC.

ananthocladus (Hilliard & B.L.Burtt) J.C.Manning & Goldblatt
(= *Aster ananthocladus* Hilliard & B.L.Burtt)

Slender, perennial herb, with creeping underground stems, producing several, erect, flowering stems up to 0.3 m high, glabrous. **Leaves** alternate, radical and cauline; radical leaves petiolate, oblanceolate, both surfaces coarsely hairy, entire; cauline leaves decreasing in size, upper leaves linear to filiform, 1-nerved, margins entire, thickened, scabrid, surfaces glabrous. **Capitula** radiate, solitary, terminal, pedunculate, small; involucral bracts glabrous, margins fimbriate. **Ray florets** pale lilac. **Disc florets** yellow. **Flowering time** Nov. **Pappus** of outer short scales and inner scabrid bristles. Sub-alpine grassland on mountain slopes; Drakensberg Grassland (from Underberg District in KZN and Maclear area in EC only).

erucifolius (Thell.) J.C.Manning & Goldblatt
[= *Felicia erucifolia* Thell., *Aster erucifolius* (Thell.) W.Lippert]

Perennial, prostrate or decumbent, harshly hairy herb, 0.04–0.20 m long, plant reddish. **Leaves** alternate, pinnatifid, lobes oblong, sometimes dentate, basal and lower petiolate. **Capitula** radiate, solitary on short leafy peduncles, axillary and terminal; involucral bracts coarsely hairy. **Ray florets** mauve or white. **Disc florets** yellow. **Flowering time** Jan.–Mar. **Pappus** of outer short and inner long, barbellate bristles. **Cypselae** obovate, compressed, black, hairy. Marshy places, moist grassy slopes, alt. 945–3 355 m; Drakensberg Grassland (High mountains of EC).

hispida (Thunb.) J.C.Manning & Goldblatt
(= *Calendula hispida* Thunb., *Aster bakerianus* Burtt Davy ex C.A.Sm.)

Scabrous, perennial herb with several annual stems, up to 450 mm high. **Leaves** alternate, sessile, linear-lanceolate to ovate-oblong, nerves prominent, margins ± remotely denticulate, scabrous and sometimes with soft hairs. **Capitula** radiate, 15–25 mm in diam., pedunculate; involucral bracts hairy. **Ray florets** blue, mauve or less commonly white. **Disc florets** yellow. **Flowering time** all year. **Pappus** of outer short and inner long scabrid bristles. **Cypselae** elliptic, compressed, hairy. Coastal thornveld, Dohne sourveld, grassland, riverine bush, on mountains and mountain slopes, alt. 10–2 285 m; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Rainshadow Valley Karoo, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (widespread from Lady Grey to uMzimkhulu, Molteno to Port St. Johns, Amatole Mts to Komga and Joubertina to East London).

[E]laevigatus (Sond.) J.C.Manning & Goldblatt
[= *Diplopappus laevigatus* Sond., *Aster laevigatus* (Sond.) Kuntze]

Glabrous, perennial herb, 0.25–0.35 m high. **Leaves** on lower part of stem, alternate, obovate to elliptic, nerves prominent, margins cartilaginous, smooth. **Capitula** radiate,

pedunculate, up to 3 at ends of stems; involucral bracts glabrous. **Pappus** of short outer and longer inner bristles. **Cypselae** hairy. Eastern Fynbos-Renosterveld (Van Stadens Mts only).
No specimens in PRE, only known from type.

perfoliatus (Oliv.) J.C.Manning & Goldblatt
(= *Aster perfoliatus* Oliv.)

Glabrous, perennial herb, 0.05–0.60 m high. **Leaves** alternate, sessile, on lower half of stem, broadly ovate to subrotund, cordate-amplexicaul, perfoliate, entire, veins prominent, palmate. **Capitula** radiate, solitary on upper part of stem; involucral bracts glabrous, 3–5-nervate. **Ray florets** blue or mauve, rarely white. **Disc florets** yellow. **Flowering time** Oct.–Feb. **Pappus** of outer short scales or bristles and inner long, scabrid bristles. **Cypselae** elliptic to obovate, long-hairy. Rocky mountain slopes among boulders, alt. 305–2 440 m; Drakensberg Grassland, Sub-Escarpment Grassland (Ramatseliso to Nsikeni Mtn).

serrulatus (Harv.) J.C.Manning
(= *Diplopappus serrulatus* Harv., *non Aster serrulatus* Harv., *Aster harveyanus* Kuntze)

Perennial herb, up to 0.65 m high, glabrous. **Leaves** alternate, sessile, lanceolate or linear-lanceolate, margins denticulate, cartilaginous or entire, sometimes scabrid, nerves prominent. **Capitula** radiate, 13–20 mm in diam., usually corymbosely arranged on long peduncles; involucral bracts glabrous. **Ray florets** mauve or white. **Disc florets** yellow. **Flowering time** July, Aug. **Pappus** of outer short scales or bristles, inner long, scabrid bristles. **Cypselae** elliptic, compressed, thinly hairy, alt. 60–2 075 m; Grassland; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (KZN Border S to Mkambati Nature Reserve).

AGERATUM L.

(Eupatorieae)

Species 44, all natives of Central and South America, the West Indies; 2 naturalised in sthn Afr., B, LIM, NW, M, S, KZN, EC.

conyzoides L.
Blueweed; *bokkruid*, *indringer-ageratum* (A)

Annual herb, up to 1 m high; softly hairy. **Leaves** opposite, ovate, with large glandular spots on lower surface, base cuneate or obtuse, apex acute, margins crenate-dentate. **Capitula** discoid; many-flowered, in dense corymbs or occasionally a lax panicle; involucre campanulate; bracts in 2 or 3 rows, free, ribbed, with membranous margins. **Receptacle** honeycombed, conical. **Corolla** purple; tube cylindric below, campanulate above; lobes 5, much shorter than tube, glandular. **Anthers** obtuse at base, with oblong, apical appendage. **Style** terete, with short glandular branches. **Flowering time** June, Sept., Jan.? **Pappus** of 5 acuminate scales. **Cypselae** 5-ribbed, glabrous or short-setose on ribs; carpopodium usually large and asymmetrical. Roadsides, alt. 20–1 450 m; Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Savanna (Port St Johns, Grahamstown).

houstonianum Mill.

Garden ageratum; *tuin-ageratum* (A)

Annual herb or subshrub, 0.3–1.0 m high. **Leaves** opposite or upper alternate, entire or dentate, with large glandular spots on lower surface. **Capitula** discoid; many-flowered, in dense corymbs or occasionally a lax panicle; involucre campanulate; bracts in 2 or 3 rows, free, ribbed, with membranous margins. **Receptacle** honeycombed, conical. **Corolla** mauve; tube cylindric below, campanulate above; lobes 5, much shorter than tube, glandular. **Anthers** obtuse at base, with oblong, apical appendage. **Style** terete, with short glandular branches. **Flowering time** Sept.–Feb. **Pappus** of coroniform scales. **Cypselae** 5-ribbed, glabrous or short-setose on ribs; carpopodium usually large and asymmetrical. Disturbed soil, alt. 5–1 980 m; Indian Ocean Coastal Belt, Indigenous Forests (Port St Johns).

***AMBROSIA** L.

(Heliantheae)

Species 43, North and South America; 3 naturalised in sthn Afr., NW, G, M, FS, KZN, L, EC.

psilostachya DC.

Perennial ragweed

Perennial herb, up to 1 m high; stems simple. **Leaves** opposite, petiolate, bipinnatisect, narrowly oblong, acute or acuminate, margins entire. **Capitula** unisexual. **Male capitula** in terminal racemes, paniculately arranged; involucre cup-shaped; bracts connate. **Corolla** tubular, campanulate above, 5-lobed. **Anthers** ± free, with incurved, linear apical appendage, base entire. **Style** undivided, truncate, penicillate. **Ovary** abortive. **Female capitula** sessile, solitary or clustered in upper leaf axils below males, 1-flowered; involucre enveloping cypsela and becoming indurated, turbinate, with 4–6 spines on shoulder below neck through which long, linear, papillose style branches exserted. **Flowering time** Apr. **Cypselae** ovoid, smooth. Roadsides, alt. ± 15 m; Sub-Escarpment Grassland (Queenstown).

tenuifolia Spreng.

Annual herb, up to 0.3 m high; sometimes shrubby. **Leaves** usually alternate, petiolate, simple, lobed or pinnately dissected, margins entire. **Capitula** unisexual. **Male capitula** in leafless spikes or racemes, usually drooping, hyaline, many-flowered; involucre cup-shaped; bracts connate. **Receptacle** with filiform paleae or epaleate. **Corolla** tubular, campanulate above, 5-lobed. **Anthers** ± free, with incurved, linear apical appendage, base entire. **Style** undivided, truncate, penicillate. **Ovary** abortive. **Female capitula** sessile, solitary or clustered in upper leaf axils below males, 1-flowered; involucre enveloping cypsela and becoming indurated, turbinate, with 4–6 spines, linear, papillose style branches exserted. **Flowering time** Feb.? **Cypselae** ovoid, smooth. Coastal areas, alt. ± 30 m; Albany Thicket (Alexandria District).

AMELLUS L.

(Astereae)

Astertjie (A)

Species 12, sthn Afr., N, B, FS, NC, WC, EC.

strigosus (Thunb.) Less.

Kalkbloublommetjie (A)

Prostrate, annual herb, 50–100 mm high, with appressed or spreading pubescence. **Leaves** alternate, linear-oblanceolate, entire or 1- or 2-dentate. **Capitula** radiate, solitary, pedunculate. **Receptacle** paleate, paleae similar to involucral bracts but smaller. **Ray florets** obvious, blue or mauve. **Disc florets** yellow. **Flowering time** July–Nov. **Pappus** of scales and bristles. **Cypselae** obovate or cordate, brown, hairy. Thornveld, grassland, valley bushveld, coastal bush, disturbed places, alt. 15–2 380 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (NC, WC to East London in the east).

A. strigosus (Thunb.) Less. subsp. *pseudoscabridus* Rommel is endemic to EC.

tridactylus DC.

Prostrate to erect, annual herb, 20–150 mm high, with spreading pubescence, not appressed-pubescent. **Leaves** alternate, linear-oblanceolate, entire or 1- or 2-dentate. **Capitulum** radiate, solitary, pedunculate; involucre hemispherical or cup-shaped; bracts linear-lanceolate to lanceolate, imbricate, hairy. **Receptacle** paleate, similar to involucral bracts but smaller. **Ray florets** female, obvious, blue to blue-purple or sometimes white. **Disc florets** bisexual, many, 5-lobed, yellow, sometimes flushed reddish purple. **Flowering time** Aug.–Feb. **Pappus** of scales and barbellate bristles. **Cypselae** obovate to cordate, brown, hairy. On slopes, alt. 400–1 920 m; Upper Karoo, Drakensberg Grassland (from NC and FS to Middelburg and Barkly East).

AMPHIGLOSSA DC.

(Gnaphalieae)

Species 11, endemic to sthn Afr., N, NW, G, M, FS, L, NC, WC, EC.

callunoides DC.

Stoloniferous, woody, multi-stemmed, blue-grey shrub, up to 0.5 m high. **Branches** with many brachyblasts. **Leaves** sessile, appressed, narrowly triangular, ericoid, upper surface woolly, apex shortly mucronate, 10 × 2 mm. **Capitula** radiate, heterogamous, 7–8 × 2–3 mm, 8–10-flowered with same number of ray and disk florets; single capitulum terminally borne on brachyblasts. **Bilabiate/pseudobilabiate florets** white, female, 4 or 5; lamina ± 1.5 × 0.5 mm, 3-lobed, tube 4.5–5.0 mm long. **Disc florets** white, bisexual, 5-lobed, 5.0–5.5 mm long. **Flowering time** Jan.–Apr. **Pappus** of 18–23 bristles, ± 5 mm long, plumose in upper part. Confined to bolder-strewn riverbeds; Eastern Fynbos-Renosterveld, Albany Thicket (Swartkops, KwaZunga and Elands riverbeds W of Uitenhage).

triflora DC.

Erect, densely entangled, compact, greyish shrub, up to 0.4 m high. **Stems** rigid, terminal branches frequently spinescent, spines 8–25 mm long. **Leaves** sessile, up to 8 mm long, narrowly triangular. **Capitula** 4- or 5-flowered; discoid, homogamous, linear, 8–9 mm

long, solitary or in groups of up to 8; involucral bracts 20–25, outer broadly ovate, inner linear, hyaline in upper part, apex aristate. **Disc florets** white, bisexual, 5.0–5.5 mm long. **Flowering time** mainly Oct.–Mar. **Pappus** of 25–32 bristles, free, caducous, ± 5 mm long, plumose in upper part. **Cypselae** subterete, ± 1 mm long, papillose. Sandy soils, most often on limestone outcrops or sandstone koppies, frequently in disturbed or overgrazed veld; Lower Karoo, Dry Highveld Grassland, Drakensberg Grassland (widespread in dry areas).

*ANTHEMIS L.

(Anthemideae)

Species 211, Europe, Asia, Africa, North America, Australia and New Zealand; 2 naturalised in sthn Afr., NW, G, M, KZN, NC, WC, EC.

cotula L.

Common dogfennel, dogfennel, foetid chamomile, mayweed, poison daisy, stinking chamomile, stinking mayweed; *stinkkamille* (A)

Annual herb, up to 0.6 m high, foetid. **Leaves** alternate, 1–3× pinnate, ultimate segments narrowly linear. **Capitula** radiate, solitary on long peduncles. **Receptacle** conical, paleate, paleae linear, acute. **Ray florets** usually without styles, white. **Disc florets** yellow. **Flowering time** Dec.–May. **Pappus** absent or of minute scales. **Cypselae** oblong, ribbed and tubercled. Native to Europe and Asia, naturalised as a weed of cultivation in waste and disturbed places, localities around cities, alt. 30–2 100 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket (Kokstad S to Grahamstown).

ARCTOTHECA Wendl.

(Arctotideae)

Species 4, Mozambique and sthn Afr., NW, FS, KZN, NC, WC, EC.

calendula (L.) Levyns

Cape dandelion, marigold; *botterblom*, *soetgousblom*, *tonteldoekblom* (A)

Perennial herb, often with creeping rooting stems and tufts of radical leaves, or erect and branched, or rosulate. **Leaves** very variable, lyrate-pinnatifid or rarely sinuate or entire, margins repand and obscurely toothed, glabrous or pubescent above, thinly white-felted below. **Peduncles** axillary, white-woolly. **Capitula** solitary; involucre: inner involucral bracts equalling the disc, all scarious with traces of white wool on the backs. **Ray florets** yellow above, sometimes washed greenish grey below. **Disc florets** yellow. **Pappus** of minute, delicate, pointed scales. **Flowering time** July–Feb. **Cypselae** enveloped in copious pinkish brown silky wool. Variable in habit, alt. 20–1 300 m; Upper Karoo, Lower Karoo, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Middelburg District, Graaff-Reinet District, Dwessa Forest, Humansdorp, Alexandria District).

populifolia (P.J.Bergius) Norl.

Beach pumpkin; *seepampoen* (A)

Perennial herb, up to 0.2 m high; prostrate, decumbent, or suberect; woody taproot, branched, leafy. **Leaves** thick-textured, usually spathulate, base rounded-truncate to cordate or broadly cuneate, apex rounded to obtuse, margins subentire to shallowly dentate. **Capitula** few–many, solitary and terminal on simple or sometimes 1- or 2-branched

axillary stalks; involucres hemispheric; bracts broadly triangular outside and lanceolate-ovate inside. **Receptacle** deeply, membranous-walled alveolate. **Ray florets** yellow, strap-shaped, 3-denticulate apically; ray-floret achenes, rudimentary. **Disc florets** yellow, funnel-shaped with short tube and long campanulate limb with lobes; disc-floret achenes laterally compressed-turbinate, finely lanate. **Flowering time** Aug.–May. **Pappus** cupuliform consisting of row of broad, partly connate scales, deep, membranous or chartaceous. Early coloniser on shifting sand of foreshore dunes, alt. 117–170 m; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (along entire EC Coast).

prostrata (Salisb.) Britten

Perennial herb, 0.01–0.15 m high; stems creeping, prostrate, sprawling. **Leaves** alternate, petiolate, lyrate-pinnatifid, whitish woolly beneath. **Capitula** radiate, many-flowered, solitary, peduncled, terminal or axillary; involucre campanulate; bracts in many rows, imbricate, scarious. **Receptacle** flat, honeycombed. **Ray florets** neuter; corolla yellow, lamina strap-shaped, ± obovate-oblong, 3-toothed; tube flattened; staminodes sometimes present. **Disc florets** bisexual; corolla yellow; tube funnel-shaped, with 5 lanceolate lobes sometimes with process at back of apex; ovary ± obovoid or cylindric. **Anthers** linear, sagittate at base, with ovate appendage. **Style** terete, thickened above, sometimes intruse or with collar at base of cylindric portion, 2-fid. **Flowering time** Sept.–Jan. **Cypselae** obovoid, thinly ribbed, densely to laxly villous or occasionally glabrous. Closed woodland, alt. 100–200 m; Eastern Fynbos-Renosterveld (Humansdorp).

ARCTOTIS L.

(Arctotideae)

Species 61, sthn Afr., including *A. venusta* from Angola and Zimbabwe; distribution in sthn Afr., N, B, NW, G, M, FS, KZN, L, NC, WC, EC.

1a Plants annual

dregei Turcz.

Tufted herb, 0.05–0.15 m high. **Leaves** petiolate, entire to pinnatisect, sparsely pilose above, white-tomentose below. **Involucre** with base rounded; bracts in few rows, outer bracts pilose, acuminate, apex shortly reflexed. **Ray florets** neuter, sterile, limb pale or bright yellow. **Disc florets** many, hermaphrodite, corolla yellow or black. **Filaments** papillose. **Flowering time** July–Nov. **Pappus** of scales in 2 unequal series, inner series longer than outer series, scale base narrow, apex rounded, 0.5–1.6 × cypsela length. **Cypselae** ovoid, tangentially compressed, minutely pubescent, 2 dentate abaxial wings forming a broad elliptic-undulate cavity, basal ring of hairs usually shorter than cypsela. Grassland, disturbed sites, occasional lawn weed, alt. 150–610 m; Lower Karoo, Albany Thicket, Sub-Escarpment Savanna (widespread in the karoo as far E as Salem).

venusta Norl.

Blue-eyed African daisy; *Karoo gousblom* (A)

Tufted herb, 0.08–0.60 m high. **Leaves** petiolate, lyrate-pinnatifid, grey-tomentose on both sides. **Involucre** with bracts in many rows, outer bracts white-tomentose, acuminate, apex shortly reflexed. **Ray florets** female, fertile, limb white with yellow basal band. **Disc florets** many, outer florets hermaphrodite, inner florets male or sterile, co-

rolla mauve-purple. **Filaments** smooth. **Flowering time** mainly Oct.–Mar. **Pappus** of scales in 2 unequal rows, inner scales much longer than outer scales, apex rounded-obtuse, longer than cypsela. **Cypselae** obconical, white-woolly on adaxial side, 3 abaxial wings forming 2 linear-obovate cavities, basal ring of hairs longer than cypsela. Grassland flats, open shrubland, disturbed sites, alt. 75–2 000 m; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland (Conway and Aliwal North districts).

1b Plants perennial

2a Ray and disc florets uniformly yellow, all disc florets hermaphrodite; pappus absent

arctotoides (L.f.) O.Hoffm.
[= *A. hispidula* (Less.) Beauverd, *A. microcephala* (DC.) Beauverd, *A. suffruticosa* K.Lewin]

Botterblom (A); *putswa-pududu* (SS); *ubushwa* (X)

Perennial, woody herb, stems decumbent or prostrate, rarely semi-scandent, 0.07–0.40 m high. **Leaves** petiolate, cordate or lyrate-pinnatisect to pinnatisect, upper surface ± glabrous, pilose-tomentose or glandular-pilose, lower surface white-tomentose or glandular-pilose. **Involucre**: base truncate or rounded, white-tomentose or glandular-pilose, outer bracts acuminate to pandurate, often keeled, apex erect or reflexed. **Ray florets** female, fertile, limb yellow. **Disc florets** many, corolla yellow. **Filaments** smooth. **Flowering time** all year, mainly Aug.–Apr. **Pappus** absent. **Cypselae** obovoid, ± glabrous, 2 strongly inflexed abaxial wings forming a linear furrow, basal ring of hairs absent. Widespread in grassy flats and slopes, open shrubland, disturbed sites, alt. 0–3 300 m; Dry Highveld Grassland, Mesic Highveld Grassland, Eastern Fynbos-Renosterveld, Albany Thicket, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Lady Grey to Kokstad southwards, from Dordrecht to Mkambati Nature Reserve, Willowmore to Komga and Port Elizabeth to East London).

[E]debensis R.J.McKenzie

Perennial herb, forming patches up to ± 1 m in diam., stems prostrate, 0.1–0.2 m high. **Leaves** petiolate, forming a terminal rosette, obovate to lyrate-pinnatifid, toothed, coriaceous, pilose-hirsute above, 150–600 mm long. **Involucre**: base truncate, outer bracts acuminate, pilose, apex erect or shortly reflexed. **Ray florets** female, fertile, limb yellow. **Disc florets** many, corolla yellow. **Filaments** smooth. **Flowering time** mainly Sept.–Dec. **Pappus** absent. **Cypselae** obovoid, glabrous, transversely rugose, 2 strongly inflexed abaxial wings forming a linear furrow, basal ring of hairs absent. Kommetjie grassland, alt. 550–600 m; Sub-Escarpment Grassland (restricted to King William's Town District).

perfoliata (L.f.) Beauverd
[= *A. discolor* (Less.) Beauverd]

Perennial subshrub, stems sprawling, slender with distinct internodes, 0.1–0.4 m high. **Leaves** petiolate, ovate-cordate, pilose above, white-tomentose below. **Involucre**: base rounded, bracts in few rows, outer bracts tomentose-pilose, apex erect. **Ray florets** female, fertile, limb yellow. **Disc florets** few, corolla yellow. **Filaments** smooth. **Flowering time** Sept.–Jan. **Pappus** absent. **Cypselae** obovoid, glabrous, 3 abaxial wings forming 2 obovate-linear cavities, basal ring of hairs absent. Streambanks, damp rocky slopes, alt. 30–600 m; Eastern Fynbos-Renosterveld (Cape Peninsula as far E as Van Staden's Mts and Uitenhage District).

scapiformis Thell.

Perennial herb, stems prostrate, 50–150 mm high. **Leaves** petiolate, ovate or lyrate-pinnatisect, pilose-hirsute above, white-tomentose below. **Involucre**: base rounded; bracts in few rows, outer bracts pilose, apex erect. **Ray florets** female, fertile, limb yellow. **Disc florets** many, corolla yellow. **Filaments** smooth. **Flowering time** Oct.–Mar. **Pappus** absent. **Cypselae** obovoid, glabrous, 2 strongly inflexed abaxial wings forming a linear furrow, basal ring of hairs absent. Damp montane slopes, streambanks, seepages, alt. 1 800–2 800 m; Drakensberg Grassland, Sub-Escarpment Grassland (Drakensberg and foothills as far S as the Baster Voetpad).

2b Ray and disc florets differentially coloured, central disc florets male or sterile; pappus of scales present

argentea Thunb.

Perennial, woody subshrub, largely branching at base, stems decumbent to ascending, 0.3–1.0 m high. **Leaves** linear-oblanceolate, entire, often with 2–4 short lateral lobes, white-tomentose on both surfaces, 3–12 × 15–90 mm. **Involucre**: base rounded-conical, bracts in many rows, outer bracts acuminate, grey-tomentose, apex erect or shortly reflexed. **Ray florets** female, fertile, limb yellow. **Disc florets** many, outer florets hermaphrodite, inner florets male or sterile, corolla black. **Filaments** smooth. **Flowering time** Sept.–Mar. **Pappus** of scales in 2 unequal series, inner series much longer than outer series, apex rounded-obtuse, longer than cypsela. **Cypselae** obconical, woolly-tomentose, 3 abaxial wings forming 2 narrow obovate-undulate cavities, lateral wings with acute inflexed teeth, median wing shorter than lateral wings, basal ring of hairs often longer than cypsela. Open shrubland, sandstone slopes, alt. 200–1 300 m; Eastern Fynbos-Renosterveld (widespread in karoo as far E as Patensie).

elongata Thunb.

Perennial, woody herb, stems decumbent, 0.2–0.5 m high. **Leaves** oblanceolate or lyrate-pinnatifid with two vestigial lateral lobes, 30–125 × 3–36 mm, grey-tomentose on both surfaces. **Involucre**: base conical, bracts in many rows, outer bracts acuminate, grey-tomentose, apex erect or shortly reflexed. **Ray florets** female, fertile, limb yellow. **Disc florets** many, outer florets hermaphrodite, inner florets male or sterile, corolla black. **Filaments** smooth. **Flowering time** mainly Mar.–Nov. **Pappus** of scales in 2 unequal series, inner series much longer than outer series, apex rounded-obtuse, longer than cypsela. **Cypselae** obconical, adaxial side woolly-tomentose, abaxial side glabrous with 3 wings of equal length forming 2 broad obovate-undulate cavities, lateral wings dentate, basal ring of hairs longer than cypsela. Grassland, open shrubland, alt. 0–100 m; Eastern Fynbos-Renosterveld, Albany Thicket (coastal lowlands from George to Port Elizabeth districts).

pinnatifida Thunb.
(= *A. cuneata* DC.)

Bittergousblom (A)

Perennial woody herb, stems decumbent or rhizomatous, 0.1–0.4 m high. **Leaves** shortly petiolate, pinnatifid or lyrate-pinnatifid, coriaceous, grey-green or ± glabrous above, white-tomentose below. **Involucre**: base rounded, outer bracts acuminate, apex linear, white-tomentose, reflexed. **Ray florets** female, fertile, limb white with basal yellow band and sometimes a black blotch. **Disc florets** many, outer florets hermaphrodite, inner florets male or sterile, corolla black. **Filaments** smooth. **Flowering time** mainly

Aug.–Jan. **Pappus** of scales in 2 unequal series, inner series much longer than outer series, apex rounded-obtuse, longer than cypsela. **Cypselae** obconical, densely woolly-tomentose, 3 dentate abaxial wings forming 2 undulate-obovate cavities, basal ring of hairs longer than cypsela. Rocky grassland and open shrubland, alt. 50–500 m; Eastern Fynbos-Renosterveld, Albany Thicket (coastal lowlands as far E as Grahamstown District).

[E]**ARROWSMITHIA** DC.

(Gnaphalieae)

Monotypic, endemic to sthn Afr., EC.

[E]**styphelioides** DC.

Shrublets, somewhat ericoid, up to 0.6 m high. **Leaves** alternate, sessile, crowded, ovate, with entire, flat to somewhat revolute margins, pungent, glabrous on upper surface, hairy and glandular-hairy on lower surface. **Capitula** radiate, sessile, 1–3-nate at end of branches; involucre subglobose; bracts in ± 7 rows, oblong to oblong-linear, main veins fading well below apex of bracts, with large, membranous, elliptic-obtuse, apical appendage. **Receptacle** slightly convex, epaleate. **Ray florets** female, in 1 row; corolla yellow; tube with minutely 3-toothed, obovate-elliptic, villous lamina, longer than tube. **Cypselae** with 20 ribs. **Disc florets** functionally male; corolla yellow, tube widened above, glandular, villous, with 5 short, ovate lobes. **Flowering time** (May) Sept.–Jan. **Pappus** of barbellate, caducous bristles shorter than corolla tube, in 1 row. **Cypselae** with 12 ribs, glabrous or with scattered, elongated twin hairs, glandular-hairy. In grassland on mountains, slopes, alt. 975–2 135 m; Sub-Escarpment Grassland, Indigenous Forests (Winterberg range: Elandsberg, Katberg, Hogsback).

ARTEMISIA L.

(Anthemideae)

Wormwood

Species 388, mainly northern hemisphere but few species in South America, Africa and Hawaiian Islands; 2 (1 naturalised) in sthn Afr., widespread, but absent in NC.

afra Jacq. ex Willd.

Wild wormwood, wormwood; *als*, *wilde-als*, *wilde-alsem* (A); *lengana* (Pedi, SS, T); *umhlonyane* (S, X, Z)

Shrub, up to 2 m high, aromatic, stems greyish pubescent. **Leaves** alternate, bipinnatipartite, ultimate segments linear, entire or toothed, upper surface glabrous, lower surface canescent. **Capitula** disciform, many in terminal, racemose panicles. **Receptacle** flat, convex or hemispherical, epaleate, sometimes pilose. **Ray florets** female, fertile; corolla narrowly tubular, sometimes swollen below, 2- or 3-toothed, yellow. **Disc florets** bisexual, fertile or functionally male; corolla yellow, cylindric, sometimes narrowed or swollen at base, sometimes dilated above, 5-lobed. **Flowering time** Feb.–May. **Pappus** absent. **Cypselae** subglobose, terete or compressed, somewhat 3-angled, striate. Forest margins, along streams, grassland, hillsides, on mountain tops, disturbed places like roadsides and old lands, alt. 20–2 440 m; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket (Oviston E to Rhodes, southwards from Queenstown to Shawbury, Cathcart to Willowvale and Elandsrivier to Grahamstown).

*vulgaris L.

Felon herb, mugwort; *umhlonyane* (Z)

Annual or occasional perennial, aromatic herb, up to 0.7 m high. **Leaves** pinnatifid, auriculate at base, segments sometimes deeply lobed, glabrous and dark green above, whitish tomentose below, lower leaves shortly petiolate, upper sessile. **Capitula** disciform, many together in terminal panicle. **Ray florets** female, filiform. **Disc florets** cylindric, reddish brown. **Flowering time** Mar. **Pappus** absent. Naturalised weed in cultivated lands, alt. up to 1 000 m; Drakensberg Grassland (Stutterheim District only).

ASPILIA Thouars

(Heliantheae)

Species 60, tropical America, Africa and Madagascar; 4 in sthn Afr., N, B, LIM, G, M, KZN, EC.

natalensis (Sond.) Wild

Wild creeping sunflower; *ikhambi-lenyongo*, *ubuhlungwana*, *umahoqo* (Z)

Perennial herb, up to 0.5 m high; straggling, branching, rhizomatous, erect or decumbent, scabrous-pilose; stems leafy. **Leaves** opposite, sessile or subsessile, elliptic to narrowly ovate, margins subentire to serrate. **Capitula** radiate, terminal and solitary; involucre ovoid, campanulate or hemispherical; bracts in 2 or 3 rows, outer herbaceous. **Receptacle** convex or somewhat conical, paleate; paleae conduplicate, enfolding disc florets. **Ray florets** neuter or female, sterile; corolla strap-shaped, patent, conspicuous, orange, yellow, white. **Disc florets** bisexual, fertile; corolla same colour as ray florets, tubular, dilated above, 5-fid. **Anthers** obtuse or very shortly sagittate at base, apical appendage triangular. **Flowering time** July? **Pappus** a laciniate cupule. **Cypselae** narrowly oblong-obovoid, bilaterally compressed. Alt. 3–610 m; Indian Ocean Coastal Belt (Makweni River Mouth).

ASTER L. see **AFROASTER** J.C.Manning & Goldblatt and **SYMPHYOTRICHUM** Nees

ATHANASIA L.

(Anthemideae)

Klaaslouwbos (A)

Species 39, endemic to sthn Afr., N, KZN, NC, WC, EC.

1a Capitula solitary
2a Leaves alternate

grandiceps Hilliard & B.L.Burtt

Sparsely branched shrub, 0.5–1.5 m high; often with many, tufted, secondary shoots, hairs long, simple. **Leaves** alternate, sessile, deeply pinnatifid or bipinnatifid with long, narrow lobes, upper leaves often entire, with long, simple hairs. **Capitula** discoid, large, solitary on long peduncles; peduncles expanded and hollow at top; involucre broadly campanulate; bracts imbricate, narrowly oblong to ovate, obtuse or acute, straw-coloured, margins ciliate. **Receptacle** epaleate. **Disc florets** tubular below, campanulate above, with scattered, long-stalked glands, yellow. **Flowering time** May. **Pappus** absent.

Cypselae cylindrical, 10–12-ribbed, with minute apical rim. Afro-alpine grassland, on mountain slope; Drakensberg Grassland (known from Drakensberg of KZN and Maclear District only).

2b Leaves opposite

minuta (L.f.) Källersjö

Vuursiektebossie (A)

Erect or prostrate, shrub or dwarf shrub, 0.15–0.45 m high; diffusely branched, upper branches sometimes transformed into leafless spines, glabrous. **Leaves** opposite, basally connate, distant along stems, linear, entire or rarely with a few, short, marginal lobes, acute. **Capitula** discoid, solitary, sessile; involucre urceolate; bracts imbricate, ovate, obtuse. **Receptacle** epaleate. **Disc florets** tubular, with minute, scattered glands, yellow. **Flowering time** Aug.–Nov. **Pappus** absent. **Cypselae** somewhat flattened, with 2 lateral ribs and a ventral rib, with some hairs around edges. In the vicinity of dams, vleis, pans, rivers, hollows and alluvial flats, poisonous to stock, alt. 350–1 500 m; Lower Karoo, Rainshadow Valley Karoo (NC, WC E to Graaff-Reinet and Willowmore).

1b Capitula in compound corymbs
3a Cypselae flattened and 2-winged

quinquedentata Thunb.

Moderately to much-branched shrub, up to 0.6 m high. **Leaves** alternate, variable in shape, rotund to obovate to oblong, margins 3–5-toothed, teeth mostly convex, rarely straight-edged, sometimes entire or occasionally apically 3-lobed, mostly glabrous or with few hairs, spreading to squarrose and recurved. **Capitula** discoid, in simple or slightly compound, dense or somewhat spreading corymbs, pedunculate; involucre oblong to campanulate, tapering at base; bracts imbricate, ovate to oblong, acute or obtuse. **Receptacle** paleate, paleae oblong, acute, glabrous. **Disc florets** tubular below, slightly campanulate above, basally with dense ring of stalked glands, yellow. **Flowering time** Dec. **Pappus** absent. **Cypselae** flattened and 2-winged, 10-ribbed. No info on habitat, alt. 15–1 000 m; Eastern Fynbos-Renosterveld (coastal, WC to Uitenhage).

3b Cypselae cylindrical, 5–18-ribbed
4a Corolla tube without glands

dentata (L.) L.

Glabrous shrub, 0.5–1.5 m high, with many erect stems. **Leaves** alternate, semi-amplexicaul, suborbicular to broadly ovate to oblong, margins with small, sharply pointed teeth, rarely entire, fleshy and rigid, glabrous. **Capitula** discoid, in compound, many-headed corymbs, pedunculate; involucre narrowly campanulate-oblong; bracts imbricate, dull yellowish brown, acute to obtuse. **Receptacle** paleate, paleae oblong to lanceolate. **Disc florets** tubular, glabrous, yellow. **Flowering time** Sept.–Mar. **Pappus** absent. **Cypselae** cylindrical, obviously 5-ribbed, with some more obscure ribs. On mountain slopes in fynbos, grassland, false macchia, alt. 15–1 450 m; Eastern Fynbos-Renosterveld (coastal, WC to Port Elizabeth).

microcephala (DC.) D.Dietr.

Little-branched, shrub, 0.75–1.50 m high; glabrous. **Leaves** alternate, sessile, ensiform to ellipsoid, entire, acute with a small mucronate tip, straight, curved or recurved, glabrous. **Capitula** discoid, many in compound, spreading corymbs, pedunculate; involucre narrowly oblong to ovate, somewhat tapering at base; bracts imbricate, narrowly ovate to oblong, obtuse or acute, glabrous, yellowish brown. **Receptacle** paleate, paleae

lanceolate. **Disc florets** tubular, without glands, yellow. **Flowering time** Oct. **Pappus** absent. **Cypselae** cylindric, 10-ribbed, ribs sometimes apically extended into minute teeth. Habitat not known, alt. 250–1 676 m; Upper Karoo, Albany Thicket (from NC to Graaff-Reinet).

vestita (Thunb.) Druce

Many-branched shrub, up to 1 m high; glabrous. **Leaves** alternate, linear to ensiform, often curved upwards, acute, entire. **Capitula** discoid, many in dense, compound corymbs, pedunculate; involucre narrowly campanulate to oblong; bracts imbricate, ovate to oblong, acute or obtuse, glabrous, becoming reddish brown. **Receptacle** paleate, paleae narrowly oblong, acute, lacerate at apex. **Disc florets** tubular, glabrous, yellow. **Flowering time** Nov. **Pappus** absent. **Cypselae** cylindric, apically with small rim, 5–10-ribbed. Grassy mountain renosterveld, alt. 185–1 405 m; Eastern Fynbos-Renosterveld (from WC to Willowmore).

4b Corolla tube with glands, either scattered or in ring at base of tube
5a Leaves entire

filiformis L.f.

Klaaslouwbos (A)

Erect, moderately to densely branched shrub, 0.2–0.8 m high. **Leaves** alternate, sessile, linear, entire, acute, glabrous or sparsely to densely appressed, stellate-pubescent. **Capitula** discoid, in dense compound corymbs, pedunculate; involucre narrowly urceolate; bracts ovate to oblong, imbricate, obtuse to acute, glabrous or dorsally hairy. **Receptacle** partly paleate, paleae few, linear, slender. **Disc florets** tubular below, campanulate above, with a basal ring of slender, long-stalked glands, and some scattered on tube, yellow. **Flowering time** Nov., Dec. **Pappus** absent. **Cypselae** cylindrical, 5–10-ribbed. Along ditches or riverbeds, alt. 0–1 500 m; Eastern Fynbos-Renosterveld (WC to Grahamstown).

linifolia Burm.

Little-branched, glabrous shrub, 0.9–1.5 m high, often reddish tinged. **Leaves** alternate, sessile, linear, entire, acute. **Capitula** discoid, few together in simple, terminal corymbs, pedunculate; involucre cyathiform to urceolate; bracts imbricate, brown, hard and shiny, margins dark brown and lacerate, outer bracts triangular to ovate, acute in outline but with obtuse apex, inner bracts oblong, rounded. **Receptacle** epaleate. **Disc florets** tubular below, campanulate above, with scattered long-stalked glands, yellow. **Flowering time** Sept.–Dec. **Pappus** absent. **Cypselae** cylindrical, 10–12-ribbed. Rocky mountain slopes, alt. 90–1 370 m; Eastern Fynbos-Renosterveld (WC Mts to Baviaanskloof Mts).

tomentosa Thunb.

Ascending to erect, moderately branched shrub, 1.0–2.5 m high; densely hairy, **Leaves** alternate, linear, oblong or narrowly obovate, entire or rarely 2- or 3-toothed at apex. **Capitula** discoid, many in compound corymbs, pedunculate; involucre narrowly campanulate to oblong, tapering at base; bracts imbricate, ovate to oblong, obtuse, hairy. **Receptacle** paleate, paleae acute or distinctly apiculate, often with apical tuft of hairs. **Disc florets** tubular, with scattered long-stalked glands, sometimes with some aggregated at base of tube, yellow. **Flowering time** Nov.–Feb. **Pappus** absent. **Cypselae** cylindric, 12–18-ribbed, ribs sometimes apically extended into minute teeth. Flats and mountain slopes, alt. 305–1 370 m; Eastern Fynbos-Renosterveld (from Swartberg Mts to Kouga Mts).

5b Leave margins toothed, lobed, serrate or deeply cleft

pinnata L.f.

Densely hairy shrub, 0.7–1.5 m high. **Leaves** alternate, deeply serrate, pinnatifid or bipinnatifid, densely hairy. **Capitula** discoid, many in dense, rounded, compound corymbs, pedunculate; involucre narrowly campanulate to oblong, tapering at base; bracts imbricate, narrowly ovate to oblong, acute or apiculate, densely hairy. **Receptacle** paleate, paleae oblong, acute, glabrous. **Disc florets** tubular below, campanulate above, with scattered glands on tube, yellow. **Flowering time** Aug.–Mar. **Pappus** absent. **Cypselae** cylindric, 14–18-ribbed. Lower mountain slopes in fynbos or sour grassland, alt. 550–1 065 m; Eastern Fynbos-Renosterveld, Albany Thicket (Langkloof E to Grahamstown).

trifurcata (L.) L.

Klaaslouwbos, *kouterbos(sie)* (A)

Ascending to erect, many-branched, glabrous shrub, 1–2 m high. **Leaves** alternate, obovate to broadly obovate, mostly apically 3-toothed or -lobed, sometimes with more teeth or lobes, occasionally entire, ± glabrous (in EC). **Capitula** discoid, in simple or compound corymbs, pedunculate; involucre urceolate to somewhat cyathiform, rounded at base; bracts imbricate, oblong, obtuse, often bent outwards. **Receptacle** paleate, paleae oblong to square, apically irregularly lacerate. **Disc florets** tubular below, campanulate above, with basal ring of long-stalked glands on tube, yellow. **Flowering time** Sept.–Mar. **Pappus** absent. **Cypselae** cylindric, 10-ribbed, ribs apically often extended into minute teeth. Grassland, false macchia, on flats and lower mountain slopes, alt. 30–1 366 m; Eastern Fynbos-Renosterveld (WC E to about Port Elizabeth).

virgata Jacq.

Moderately branched shrub, up to 1 m high. **Leaves** alternate, palmately cleft with (3–) 5(–7) broad lobes, glabrous at maturity. **Capitula** discoid, in dense, simple corymbs, pedunculate; involucre urceolate to rotund; bracts imbricate, ovate to oblong, ± hairy. **Receptacle** paleate, paleae apically, irregularly lacerate, glabrous. **Disc florets** tubular below, campanulate above, with dense ring of long-stalked glands at base of tube, yellow. **Pappus** absent. **Cypselae** cylindric, 10-ribbed. Lower mountain slopes, alt. 900–1 500 m; Eastern Fynbos-Renosterveld (Kamanassie and Kouga mts).
No material in PRE from EC.

ATHRIXIA Ker Gawl.

(Gnaphalieae)

Boesmanstee (A)

Species 14, south and tropical Africa and Madagascar; 9 in sthn Afr., widespread, but absent in N, B.

At least some leaves arranged in basal rosette

angustissima DC.

Perennial, rosulate, unbranched herb, 0.06–0.30 m high. **Leaves**: basal leaves obovate to lanceolate, margins sparsely dentate, trinervate from base, upper surface densely glandular, lower surface white-felty and glandular on nerves; cauline leaves alternate, linear, subulate, margins revolute, middle cauline leaves longest, upper leaves going over into involucral bracts, lower surface white-felted. **Capitula** radiate, solitary or up to 5 at ends of stem; involucre funnel-shaped; bracts imbricate, narrowly ovate to linear,

long-acuminate, hairy. **Ray florets** white. **Disc florets** white or yellow. **Flowering time** Dec.–Mar. **Pappus** of outer row of scales and inner row of 3 or 4 barbellate bristles. **Cypselae** narrowly oblong, 3-ribbed, with few hairs at base. Wet grassland on steep hill slopes, alt. 30–2 990 m; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland (from FS along Drakensberg as far S as Lady Frere).

fontana MacOwan

Perennial, rosulate herb, 200–500 mm high. **Leaves**: basal leaves crowded in a rosette, sessile, ovate to lanceolate, trinerved from base, decreasing in size upwards, entire or remotely denticulate, upper surface glabrous to villous with long gland-tipped hairs, lower surface white-felted. **Capitula** radiate, solitary, terminal; involucre funnel-shaped; bracts imbricate, long-acuminate, apex recurved. **Ray florets** white, purple or white above, purple below. **Disc florets** white or yellow. **Flowering time** Dec.–Mar. **Pappus** of 5–12, long, scabrid bristles, alternating with short lacerate scales. **Cypselae** narrowly oblong, 3-ribbed, glabrous or with some hairs at base. In marshes, along streams, on moist grassy slopes, alt. 730–3 000 m; Drakensberg Grassland, Sub-Escarpment Grassland, Dry Highveld Grassland (from FS along Drakensberg to Stutterheim).

Leaves arranged alternately along stem

capensis Ker Gawl.

Erect, little-branched, dwarf shrub, 0.10–0.35 m high. **Leaves** alternate, narrowly lanceolate to linear, acuminate, leaf base running down stem forming stem wings, margins revolute, upper surface glandular, lower surface white-felted. **Capitula** radiate, solitary or few together at ends of stems; involucre urceolate; bracts imbricate, narrowly ovate-lanceolate to linear, apex recurved. **Ray florets** white or purple. **Disc florets** yellow. **Flowering time** Dec. **Pappus** of barbellate bristles. **Cypselae** oblong, 4- or 6-angular, hairy. Rocky soil, alt. 100–670 m; Eastern Fynbos-Renosterveld (coastal, WC to Humansdorp).

gerrardii Harv.

Dwarf shrub, up to 0.6 m high. **Leaves** alternate, sessile, linear, glandular-hispid above, white-felted below, margins revolute. **Capitula** radiate, sessile, solitary, terminal; involucre semi-globose to bell-shaped; bracts imbricate, with long bristle points. **Ray florets** purplish or reddish. **Disc florets** yellow. **Pappus** biseriate, inner of 17–28 scabrid bristles, outer of short fimbriate scales. **Cypselae** oblong, 5- or 6-angular. Short stony grassland or eroded patches, alt. 150–2 010 m; Sub-Escarpment Grassland (lower Drakensberg to about Kokstad).

No material in PRE, but according to revision collected near Kokstad.

heterophylla (Thunb.) Less.

Dwarf shrub, 0.10–0.45 m high. **Leaves** alternate, sessile, linear-lanceolate, acute, entire, margins glandular hairy, lower surface white-felty, leaf bases running down stem to form weak wings. **Capitula** radiate, solitary or a few together at end of stem; involucre funnel- or cup-shaped; bracts imbricate. **Ray florets** white or pink. **Disc florets** yellow. **Flowering time** July–Dec. **Pappus** of inner barbellate bristles alternating with outer shorter scales. **Cypselae** oblong, 4–6-angular. Grassland, fynbos on mountain tops and slopes, alt. 90–2 250 m; Dry Highveld Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Ramatseliso's Neck S to Tarka District, from Witteberg to Baviaanskloof Mts and from Kareedouw to Grahamstown).

phylicoides DC.

Bushmen's tea, bush tea, *beesbossie*, *boesmanstee* (A)

Many-branched shrub, up to 2 m high. **Leaves** alternate, sessile, ovate, lanceolate or linear-lanceolate, margins entire, smooth and glabrous above, white-tomentose below, often trinerved from base. **Capitula** radiate, in upper drawn-out panicle; involucre narrowly cup-shaped; bracts imbricate. **Ray florets** mauve. **Disc florets** yellow. **Flowering time** almost all year. **Pappus** of barbellate bristles alternating with minute scales. **Cypselae** oblong, 4–6-angular. Grassland or forest margin scrub, slopes, banks of rivers, alt. 15–2 000 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (widespread from the north to East London).

BERKHEYA Ehrh.

(Arctotideae)

Species 75, Africa; 71 in sthn Afr., widespread, except N.

1a Stems winged

bergiana Söderb.

Perennial herb, up to ± 1.5 m high; stout, stem branching above into a compound inflorescence, pubescent, winged, leafy. **Leaves** oblong in outline, slightly narrowed to base, subpetiolate or sessile, pinnatilobate, lobes up to 6 each side, coarsely and deeply toothed, teeth triangular, spine-tipped, margins spinose-ciliate, upper surface harshly glandular-pubescent. **Capitula** several, corymbose, paniculately arranged; involucral bracts lanceolate, tip and margins spiny, very lightly cobwebby-glandular on the back. **Ray florets** yellow. **Disc florets** yellow. **Pappus** of obtuse scales. **Cypselae** turbinate, glabrous. Mostly weedy, alt. 30–1 615 m; Indigenous Forests (Port St Johns).

carduoides (Less.) Hutch.

Perennial herb, 0.3–0.8 m high; sometimes cobwebby on young parts. **Leaves** oblanceolate, decurrent on stem wings, pinnatifid, lobes rounded, toothed and spiny, margins slightly revolute. **Capitula** discoid, few in terminal corymbs. **Florets** yellow. **Flowering time** Dec.–Apr. Grassland, alt. 15–1 463 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Queenstown District, Alice, Albany).

cirsiifolia (DC.) Roessler

Perennial herb, 0.3–1.5 m high; stout, branching into large, spreading, corymbose panicle; stems softly pilose, leafy. **Leaves** decreasing in size upwards, oblong in outline, pinnatifid, uppermost sinuate-pinnatilobate, lobes up to 6 each side, rounded or oblong, margins coarsely and deeply toothed, teeth triangular, spine-tipped, upper surface somewhat harshly glandular-pubescent, lower surface white-felted; lowermost leaves narrowed to petiole-like base, upper broad at base, sessile, clasping, decurrent on the stem in long, broad, spiny wings. **Capitula** solitary or few together at tips of inflorescence branches; involucral bracts foliaceous. **Ray florets** white or yellow. **Disc florets** yellow. **Flowering time** Feb., Mar. **Pappus** of obtuse scales. **Cypselae** turbinate, glabrous. Mountainous areas, alt. 2 000–3 200 m; Drakensberg Grassland (Barkly East).

[E]decurrens (Thunb.) Willd.

Grootdissel, *grootdisseldoring* (A)

Perennial herb, 0.3–0.6 m high; white-woolly. **Leaves** oblanceolate, decurrent on stem as wings, discolorous, pinnatifid, lobes rounded, toothed and spiny, margins slightly

revolute. **Capitula** radiate, 1–few in terminal corymbs. **Florets** yellow. **Flowering time** Sept.–May. Grassy slopes, alt. 15–1 675 m; Sub-Escarpment Grassland, Upper Karoo, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Engcobo, Cradock District, Katberg, Komga, Albany).

discolor (DC.) O.Hoffm. & Muschl.

Perennial herb, 0.3–0.9 m high; stout, stem branching above into the compound inflorescence, sparsely pubescent, leafy, narrowly winged. **Leaves** oblong in outline, lower narrowed to short petiole-like base, upper sessile, all decurrent in narrow spiny stem wings, blade coarsely sinuate-dentate or pinnatisect, lobes rounded, coarsely spinose-toothed, margins spinose-ciliate, upper surface rather harshly glandular-pubescent, lower surface white-felted. **Capitula** few on long bracteate peduncles corymbosely arranged; involucral bracts linear-lanceolate to lanceolate, tip and margins spiny, minutely glandular on the back. **Ray florets** yellow. **Disc florets** yellow. **Flowering time** July–Mar. **Pappus** irregularly toothed. **Cypselae** turbinate, glabrous. In damp mountain grassland, alt. 460–2 045 m; Mesic Highveld Grassland, Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Aliwal North Area, Steynsburg District, Queenstown, Alice).

maritima J.M.Wood & M.S.Evans

Coarse, perennial herb, up to ± 2 m high; stem stout, simple below branching above into the compound inflorescence, beset with slender spines, narrowly winged, leafy. **Leaves** elliptic in outline, lowermost narrowed to spiny, petiole-like base, upper sessile, apex acute, spiny, margins deeply toothed, teeth paired or in threes, triangular, spine-tipped, margins with slender spines. **Capitula** paniculately or subcorymbosely arranged; involucral bracts linear-lanceolate, tip and margins spiny, white-tomentose on the back. **Ray florets** yellow. **Disc florets** yellow. **Flowering time** Jan.–Mar. **Pappus** of obtuse scales. **Cypselae** turbinate, glabrous. Commonly in small colonies on forest margins or in grassland, alt. 45–1 564 m; Sub-Escarpment Grassland (Clydesdale).

onopordifolia (DC.) O.Hoffm. ex Burtt Davy

Perennial herb, 0.3–1.0 m high; stout; branching above into a large corymbose panicle, stems glandular-pubescent, winged, leafy. **Leaves** decreasing in size upwards, oblong in outline, pinnatifid, lobes up to 6 each side, rounded or oblong, margins with coarse, triangular, spine-tipped teeth, interspersed with shorter and more slender spines, undulate, shortly decurrent on stem in broad spiny wings, upper surface puberulous, lower surface white-felted. **Capitula** solitary or few together at the tips of inflorescence branches; involucral bracts foliaceous. **Ray florets** yellow or white. **Disc florets** yellow. **Flowering time** Feb., Mar. **Pappus** of obtuse scales. **Cypselae** turbinate, glabrous. Grassland, alt. 45–2 135 m; Drakensberg Grassland, Sub-Escarpment Grassland (Barkly East District, Bedford District).

purpurea (DC.) Mast.

Bloudisseldoring (A)

Perennial herb, 0.3–0.9 m high; stem stout, simple below, branching above into the compound inflorescence, cobwebby or with long soft spreading hairs, leafy. **Leaves** crowded, oblong to broadly elliptic, narrowed to base, margins sinuate-dentate or shallowly lobed, spiny, harshly pubescent and glandular above; cauline leaves elliptic or lanceolate, coarsely toothed or lobed, spiny, base decurrent, in broad, toothed, spiny, stem wings. **Capitula** several on peduncles racemosely arranged; involucral bracts lanceolate, apex and margins spiny, minutely glandular. **Ray florets** yellow. **Disc florets** pale to deep

mauve, rarely white. **Flowering time** Jan.–Apr. **Pappus** of obovate-oblong, obtuse scales. **Cypselae** turbinate, villous, or glabrous. Steep grassy mountain slopes, alt. 1 900–2 743 m; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland (Joubert Pass, Barkly East and Queenstown Districts).

radula (Harv.) De Wild.

Boesmanrietjie (A); *isihlungu* (Z)

Perennial herb, 0.25–0.90 m high; from woody taproot; stems erect, branched in upper part, leafy, longitudinally striate. **Leaves** alternate, basal ones oblanceolate to elliptic; upper cauline leaves narrowly oblong to linear, apex in all leaves subobtuse to rounded and spine-tipped, margins spinescent between teeth, upper surface with scattered pilose hairs becoming scabrous, lower surface felted-tomentose. **Capitula** radiate; involucral bracts: outer and innermost somewhat shorter, all lorate and spine-tipped, sparsely thinly araneose often also with gland-tipped hairs or glabrescent; outer bracts with 5–8 stout spines on each margin. **Receptacle** alveolae margins with teeth. **Ray florets** yellow, 4-lobed. **Disc florets** many; corollas yellow. **Pappus** of biseriate scales, overlapping, narrowly oblong. **Cypselae** narrowly turbinate, 4- or 5-angular, glabrous. Woodland, wooded grassland on flood-plains, riverbanks, vleis, disturbed ground, alt. 370–1 830 m; Albany Thicket (East London District).

rhapontica (DC.) Hutch. & Burtt Davy

Ikhakhasi, *iphungula* (Z)

Perennial herb, 0.1–1.2 m high; stems stout, erect, usually winged, simple, commonly forking above, pubescent or cobwebby, leafy. **Leaves** crowded in a rosette, obovate-oblong to ovate to subrotund, base narrowed, apex acute to rounded, margins entire or sinuate-lobate to coarsely toothed, spiny; cauline leaves few, distant, oblong or linear, sessile. **Capitula** usually with winged peduncles, racemosely, rarely subcorymbosely, arranged, rarely few or solitary; involucral bracts linear-lanceolate, apex and margins of outer bracts spiny. **Ray florets** bright yellow. **Disc florets** bright yellow. **Flowering time** Dec.–May. **Pappus** of scales, up to 1 mm long, ± oblong, obtuse or subacute. **Cypselae** turbinate, villous. Grassland, alt. 5–2 420 m; Indian Ocean Coastal Belt, Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna (Port Edward, Maclear District, Amatole Mts, Grahamstown).

sphaerocephala (DC.) Roessler

Perennial herb, 0.4–1.2 m high; stems simple below, branching above into compound inflorescence, glandular-pubescent, sometimes cobwebby, winged, leafy. **Leaves** oblong in outline, sinuate or pinnatifid, irregularly toothed, teeth spine-tipped, margins ciliate-spinescent; sessile, clasping, decurrent on the stem in broad, toothed spiny wings, upper surface beset with short stiff spines, lower surface glandular-pubescent, sometimes cobwebby. **Capitula** discoid, many in corymbose panicle; involucral bracts linear, margins and tip spiny, cobwebby on the back or glabrous. **Florets** yellow. **Flowering time** Jan., Feb. **Pappus** of obtuse scales. **Cypselae** turbinate, glabrous. In grassland on forest margins or among rock outcrops on grassy hill slopes, alt. 5–1 900 m; Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket (Maclear District, Transkei, Suurberg National Park).

umbellata DC.

Geelklossiesdissel, *vleidissel* (A); *ikhakhasana elincane* (Z)

Perennial herb, 0.25–0.80 m high; rootstock stout, woody, creeping, stem simple, glandular, sometimes cobwebby, winged. **Leaves** mostly radical, subrosulate, oblong-obovate in outline, apex obtuse to subacute, narrowed to a petiole-like base, coarsely sinuate-pinnatilobate or pinnatifid, margins coarsely toothed, spiny, upper surface thickly beset with coarse bristles, lower surface glandular-pubescent; cauline leaves few. **Capitula** discoid, subglobose, several subumbellately arranged at stem apex; involucral bracts linear-lanceolate, tip and margins spiny, minutely glandular. **Florets** yellow. **Flowering time** Aug.–Dec. **Pappus** of narrow, acuminate scales. **Cypselae** turbinate, villous. In open grassland, alt. 45–855 m; Indigenous Forests, Indian Ocean Coastal Belt (Port Grosvenor, Stutterheim District).

1b Stems not winged
2a Plants rosulate

buphthalmoides (DC.) Schltr.

Perennial herb, 0.3–0.6 m high. **Leaves** obovoid, margins incised, spinose-denticulate, upper surface thinly cobwebby, lower surface white-cobwebby. **Capitula** terminal, many-flowered; involucral bracts lanceolate, coriaceous, spiny. **Florets** yellow. **Flowering time** Nov., Dec. Grassland, grazed, stony/rocky, karoo, alt. 516–2 165 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Middelburg, Molteno, Queenstown District, Alice).

carlinifolia (DC.) Roessler

Perennial shrub or herb, 0.5–1.5 m high; erect; stems glandular, ± glabrous. **Leaves** alternate, sessile, narrowly oblong, pinnately lobed, margins spinose-denticulate. **Capitula** terminal, discoid; involucral bracts patent, narrowly triangular or lanceolate if apex is acuminate, spine tipped, margins spiny. **Pappus** of subbiseriate scales. **Cypselae**2–3 mm long, subglabrous. Grassland, alt. 520–1 525 m; Upper Karoo, Drakensberg Grassland (Burgersdorp, Bedford District).

carlinoides (Vahl) Willd.

Bergdissel, *bergdisseldoring* (A)

Perennial herb, 0.2–0.45 m high; woody caudex, stems glandular-hairy. **Leaves** crowded basally, oblanceolate to obovate, glabrous above, white-felted below, margins slightly revolute, toothed and spiny. **Capitula** radiate, 1–few in terminal corymbs on elongate peduncles. **Florets** yellow. Shale and clay slopes, alt. 170–730 m; Upper Karoo, Sub-Escarpment Grassland (Burgersdorp, Middelburg, Bedford District).

macrocephala J.M.Wood

Perennial herb, 0.2–0.5 m high; rhizomatous, lightly cobwebby, leafy. **Leaves** mostly radical, rosetted, spreading, oblong to elliptic in outline, narrowed to petiole-like base, pinnatifid, spinescent, both surfaces sparsely glandular-pubescent or nearly glabrous, margins irregularly spinose-toothed. **Capitula** terminal, solitary; involucral bracts oblong-lanceolate, apex and margins spiny, minutely and sparsely glandular-pubescent on the backs, sometimes also thinly cobwebby. **Ray florets** bright golden-yellow. **Disc florets** bright golden-yellow. **Flowering time** Nov.–Jan. **Pappus** of lanceolate, acute scales. **Cypselae** turbinate, pilose. On poor stony soils, alt. 1 700–3 200 m; Drakensberg Grassland (Barkly East District).

multijuga (DC.) Roessler
iKhakhasi, *imboziso emhlophe* (Z)
Coarse perennial herb, 0.4–0.6 m high; flowering stems simple, lateral to the rosette, stout, cobwebby or with spreading hairs, remotely leafy. **Leaves** mostly radical, rosetted, spreading, oblong to elliptic in outline narrowed to petiole-like base, pinnatisect, usually cut nearly to midrib, lobes up to 15 each side, oblong or broadly lanceolate, ± imbricate, margins coarsely and irregularly toothed; teeth spine-tipped. **Capitula** up to 8-clustered at stem apex, rarely solitary; involucral bracts linear-lanceolate, apex and margins spiny. **Pappus** of ± oblong scales, obtuse. **Cypselae** turbinate, glabrous or minutely pubescent. Commonly in dense patches on steep damp grass slopes below rocky cliffs, alt. 730–2 895 m; Drakensberg Grassland, Indigenous Forests (Barkly East District, Ongeluksnek Nature Reserve).

pannosa Hilliard
Perennial herb, up to ± 0.2 m high; stout woody rootstock, flowering stem solitary from crown, simple or forking once, white-felted. **Leaves** few, mostly crowded at base of stem, broadly elliptic to subrotund, base abruptly narrowed, petiole-like, apex obtuse or rounded; cauline leaves much smaller, oblong or subspathulate, broad-based, few; margins of all leaves ± entire to sinuate-dentate, setose-spinescent. **Capitula** radiate, terminal, solitary or paired; involucral bracts outer oblong or ungulate; inner linear, spine-tipped, margins setose-spinescent, backs of at least outer series white-felted. **Ray florets** bright yellow. **Disc florets** bright yellow. **Flowering time** Sept.–Nov, or Jan., Feb. if burning is late. **Pappus** linear-lanceolate, acuminate, some with long bristle points. On slopes, in open grassland, after the grass is burnt, alt. 1 525–2 164 m; Sub-Escarpment Grassland (KZN Border).

2b Plants not rosulate

acanthopoda (DC.) Roessler
Perennial herb, 0.3–2.0 m high; branching above into large spreading paniculate inflorescence, stems cobwebby at first, later glabrous, leafy. **Leaves** broadly lanceolate or elliptic or pinnatilobate, upper leaves, particularly on the inflorescence branches, sessile, half-clasping, upper surface harshly puberulous or nearly smooth. **Capitula** many in a very large spreading panicle; involucral bracts linear-lanceolate, spine-tipped. **Ray florets** yellow. **Disc florets** yellow. **Flowering time** Mar., Apr.? **Pappus** of obtuse scales. **Cypselae** turbinate, glabrous. Grassland, grazed, forest, alt. 100–1 310 m; Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna (Queenstown, Transkei, Komga).

angustifolia (Houtt.) Merr.
Perennial dwarf shrub, 0.3–0.6 m high; from woody caudex. **Leaves** opposite, narrowly lanceolate, leathery, white-felted below, glabrous above, margins revolute, slightly toothed and spiny. **Capitula** radiate, solitary at branch tips. **Florets** yellow. **Flowering time** Sept.–Nov.? Rocky sandstone slopes, alt. 305–1 219 m; Eastern Fynbos-Renosterveld, Albany Thicket, Sub-Escarpment Savanna (Port Elizabeth, Albany, Grahamstown).

bipinnatifida (Harv.) Roessler
Perennial herb, 0.5–2.0 m high; stems sparingly branched; branches ascending. **Leaves** sessile, elliptic to oblong in outline, tapering and petiole-like, pinnatilobed to pinnatifid sometimes somewhat bipinnatifid, lobes and teeth extended into spines, margins ± spinose-denticulate, base briefly dilated and semi-amplexicaul with spiny auricles,

or cordate, upper surface thinly araneose (cobwebby). **Capitula** homogenous and discoid, paniculately arranged, ± clustered at ends of branches. **Receptacle** cobwebby, with alveolae, margins paleaceous-setose. **Florets** many; corollas white to pale mauve. **Flowering time** Mar., July? **Pappus** of ± 20 overlapping oblong scales, obtuse or acute at apex, fimbriate. **Cypselae** obconic-turbinate, sparsely hispidulous. Grassland, stony/rocky,roadsides, alt. 10–1 370 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Queenstown, Kentani and Komga districts).

cardopatifolia (DC.) Roessler

Perennial shrub, 0.5–1.2 m high; densely branched. **Leaves** closely set, pinnatisect, linear, upper surface glabrescent, lower surface woolly. **Capitula** terminal, paniculate; involucral bracts concrescent at base, outer ones leaf-like, but smaller, inner ones erect, closely spinose-ciliate. **Receptacle** flat, with small erect ovate paleae with acute laciniate apices. **Ray florets** few (absent in some capitula), yellow, ligulate. **Disc florets** many, yellow, tubular. **Flowering time** Oct.? **Pappus** biseriate, outer scales oblong or obovate, obtuse, inner scales narrower and bifid. **Cypselae** obconical, angled and striate. In patches, alt. 915–1 463 m; Albany Thicket (Graaff-Reinet).

cruciata (Houtt.) Willd.

Perennial shrub, 0.3–1.2 m high; glabrous. **Leaves** spreading, rigid, striate, ovate, toothed and spiny, auriculate. **Capitula** shortly radiate, in loose, terminal corymbs. **Florets** yellow. **Flowering time** Dec.? Sandstone slopes, alt. 350–1 495 m; Eastern Fynbos-Renosterveld (Steytlerville).

debilis MacOwan

Perennial herb, up to 2 m high; graminoid; stems glandular-pubescent, sometimes cobwebby at first, leafy. **Leaves** oblong in outline, lower narrowed to petiole-like base, upper broad-based, half-clasping, all with spiny rounded basal auricles, margins sinuate-pinnatilobate or pinnatifid, triangular or irregular in outline, coarsely sinuate-dentate or less deeply cut, teeth spine-tipped, margins spinose-ciliate, upper surface harshly glandular-pubescent, lower surface commonly grey- or white-felted, sometimes glandular-pubescent. **Capitula** many in an open, paniculate compound inflorescence; involucral bracts linear-lanceolate, margins spinose-ciliate, usually glandular on back, sometimes cobwebby as well. **Ray florets** yellow. **Disc florets** yellow. **Flowering time** Dec.–May. **Pappus** of obtuse scales. **Cypselae** turbinate, glabrous or nearly so. Damp shady forest margins, open woodland, alt. 600–1 830 m; Sub-Escarpment Grassland (Malowe).

erysithales (DC.) Roessler

Perennial herb, up to 2 m high; branching above, stems glandular-pubescent, sometimes cobwebby at first, leafy. **Leaves** obovate-oblong in outline, lower narrowed to petiole-like base, upper broad-based, half-clasping, all with spiny rounded basal auricles, margins sinuate-pinnatilobate or pinnatifid, up to 6 lobes each side, teeth spine-tipped, margins spinose-ciliate, upper surface harshly glandular-pubescent, lower surface commonly grey- or white-felted. **Capitula** many in an open, paniculate compound inflorescence; involucral bracts linear-lanceolate, margins spinose-ciliate, usually glandular on back, sometimes cobwebby as well. **Ray florets** yellow. **Disc florets** yellow. **Flowering time** Dec.–May. **Pappus** of obtuse scales. **Cypselae** turbinate, glabrous or nearly so. Damp shady forest margins, open woodland, alt. 5–1 220 m; Eastern Fynbos-Renosterveld, Albany Thicket (Kei Mouth, East London).

heterophylla (Thunb.) O.Hoffm.

Disseldoring, *graweelwortel* (A); *isihlungu* (Z)

Perennial herb, 0.1–0.6 m high; cobwebby. **Leaves** oblanceolate, discolorous, woolly below, pinnatifid, lobes rhombic, margins revolute, spiny. **Capitula** radiate, or discoid; in terminal corymbs. **Florets** yellow. **Flowering time** Sept.–May. Stony waste places, alt. 15–975 m; Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Burgersdorp, Uitenhage, Port Elizabeth, Grahamstown).

insignis (Harv.) Thell.

Perennial herb, 0.25–0.50 m high; from large woody rootstock; roots many, each with fusiform root tuber; stems 1–several, strictly erect or sometimes decumbent. **Leaves** sessile, linear or lanceolate, margins spinescent-denticulate, upper surface thinly araneose to glabrescent, scabridulous when dry, lower surface whitish tomentose. **Capitula** radiate, solitary and terminal on stem or branches; involucral bracts spreading, ± reflexed with age, outer and innermost shorter, linear. **Receptacle** with alveolae, margins paleaceous-setose. **Ray florets** yellow, lobes glandular outside. **Disc florets**: corolla limbs yellow, lobe apices glandular-tuberculate and somewhat thickened callosoglandular. **Flowering time** Aug.–Dec. **Pappus** 2-seriate with 20 overlapping, oblanceolate, shiny stramineous scales. **Cypselae** turbinate, densely sericeous. Woodland, on rocky outcrops or in shallow stony soils, alt. 155–2 100 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Kokstad District, Transkei).

pinnatifida (Thunb.) Thell.

Isihlungu (Z)

Perennial herb or subshrub, 0.2–0.5 m high, ± erect; stems branched, thinly tomentose, glabrescent, leafy. **Leaves** rigid, sessile, decreasing in size upwards, pinnatilobate or pinnatifid, lobes distant, up to 10 pairs, triangular to linear or linear-lanceolate in outline, base half-clasping, apex acuminate, spinose, margins bristly, upper surface thickly, rarely sparsely, beset with harsh bristles, lower surface tomentose, rarely subglabrous. **Capitula** discoid, many, corymbose-paniculately arranged; involucral bracts lanceolate to linear, apex and margins spiny. **Florets** yellow. **Flowering time** July–Jan. **Pappus** ± lanceolate and acute. **Cypselae** turbinate, glabrous or rarely with few small hairs. Roadsides, stony/rocky, alt. 100–1 600 m; Upper Karoo (Burgersdorp, Middelburg District).

robusta Bohnen ex Roessler

Perennial herb, 1–2 m high; robust; stem single, erect, stout, shortly branched above, leafy, coarsely pilose-araneose. **Leaves** sessile, elliptic-oblong in outline, pinnatilobed, upper surface thinly araneose with scattered pilose hairs, becoming scabridulous when dry, lower surface whitish or greyish felted-tomentose. **Capitula** radiate, many, 2–several clustered at ends of short branches; involucral bracts with outer and inner ones thinly araneose; outer leaf-like, ovate-lanceolate and dentate to somewhat lobed with spine-tipped teeth. **Receptacle**: alveolate, margins extended into bristles. **Ray florets** yellow, shallowly 4-lobed at apex. **Disc floret** yellow, lobes glandular-tuberculate at apex. **Flowering time** Nov.–Jan. **Pappus** of uniseriate scales, connate at base, oblong. **Cypselae** narrowly turbinate, 4- or 5-angular, tapering and grooved to base, glabrous. Wooded grassland often on rocky hillsides, alt. 5–1 936 m; Upper Karoo, Sub-Escarpment Grassland (Albert District, Macubeni District).

setifera DC.

Rasperdisseldoring (A); *indlebe-lenkomo* (X); *ulimi-lwenyathi* (Z)

Perennial herb, 0.6–1.2 m high; from stout woody rootstock; stems single, erect, branched above, glabrous or thinly pilose-araneose. **Leaves** mostly basal with 1–several cauline leaves diminishing in size to stem apex, not decurrent on stem; basal leaves ascending-subrosulate, obovate to oblanceolate, apex rounded or subobtuse, margins subentire to dentate or sinuate-dentate. **Capitula** radiate, solitary and terminal on branches or several clustered; involucral bracts linear-tapering to a spinescent apex, spinescent-ciliate on margins and pilose-araneose on back. **Receptacle:** alveolate, margins with spinescent setae. **Ray florets** yellow. **Disc florets** many; yellow. **Flowering time** Dec.–Mar. **Pappus** 2- or 3-seriate, of narrow, paleaceous, barbellate setae. **Cypselae** turbinate, 8–10-ribbed, hispid-strigose. Grassland, shrub savanna, alt. 460–2 135 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Griqualand East, Port St Johns).

speciosa (DC.) O.Hoffm.

Skraaldisseldoring (A); *umaphola* (Z)

Perennial herb, 0.6–1.0 m high; from woody rhizome with fusiform root tubers; stems single erect; branched above, coarsely pilose. **Leaves** mostly basal with 1–several smaller cauline leaves; basal leaves ascending-subrosulate, petiolate, ovate to lanceolate, apex subobtuse to rounded, margins subentire to repand-sinuate rarely dentate, irregularly spinose. **Capitula** radiate, solitary and terminal on branches or several clustered; involucral bracts linear-tapering, spinescent-ciliate on margins, pilose-araneose on back. **Receptacle** with alveolae, margins fimbriate-setose. **Ray florets** yellow. **Disc florets** many; yellow, darkly glandular at apex outside. **Flowering time** Aug.–Apr. **Pappus** 2- or 3-seriate, of narrow ± spathulate overlapping scales. **Cypselae** turbinate, 8–10-ribbed, glabrous or puberulous. Grassland, recently burned, grazed, alt. 15–2 200 m; Sub-Escarpment Grassland, Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Elliot Region, Ntsubane Forest, Port St Johns, Seymour).

BIDENS L.

(Heliantheae)

Species 200, cosmopolitan; 6 (2 introduced weeds) in sthn Afr., widespread, but absent in WC.

***bipinnata** L.

Beggar tick, black fellows, pitchfork; *basterkakiebos*, *knapsekerwel* (A)

Annual herb, 0.05–1.50 m high; stems branching. **Leaves** opposite, glabrous or hairy; ovate in outline, bipinnatisect, leaflets lanceolate in outline, margins often lobulate or lobulate-dentate, sometimes dissected to midrib. **Capitula** in lax, few-headed corymbs; involucral bracts oblong or subspathulate. **Ray florets** 3–5, small, yellow. **Disc florets** yellow. **Flowering time** Jan.–Apr. **Cypselae** linear, angled, ribbed, somewhat dimorphic. Along roadsides and as a weed of cultivation, alt. 4–2 125 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Savanna (Middelberg, Stutterheim, Grahamstown).

***biternata** (Lour.) Merr. & Sherff

Black jack, bur marigold; *Spaanse knapsekêrel*, *geel-blom-knapsekêrel* (A)

Annual herb, 0.4–1.5 m high; branching, stems sometimes decumbent at base and rooting. **Leaves** glabrous or pilose, pinnate, base cuneate, apex acute to acuminate, margins

crenate-serrate. **Capitula** in lax, few-headed corymbs; involucral bracts oblong or subspathulate. **Ray florets** 2–4, yellow. **Disc florets** yellow. **Cypselae** linear, angled, ribbed, slightly dimorphic. Weed of cultivation, alt. 945–1 300 m; Upper Karoo, Sub-Escarpment Grassland (Middelburg, Clydesdale).

*pilosa L.

Blanket-stabbers, sweethearts; *knapsakkêrel*, *weduvrouens* (A); *ucucuza*, *ugamfe* (Z)

Annual herb, 0.4–1.5 m high; branching, stems sometimes decumbent at base and rooting. **Leaves** opposite, glabrous or pilose, trifoliolate or pinnately 5-foliolate, upper leaves occasionally simple, leaflets narrowly ovate to ovate-oblong, acute to acuminate, base cuneate, margins crenate-serrate. **Capitula** few in lax corymbs; involucral bracts oblong or subspathulate. **Ray florets** creamy white. **Disc florets** yellow. **Flowering time** Jan.–June. **Cypselae** linear, angled, ribbed, crowned with 2 or 3 retrorsely barbed awns. Weed of cultivation, alt. 5–1 770 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Savanna (Middelberg, Stutterheim, Grahamstown).

BOLANDIA Cron

(Senecioneae)

Species 2, sthn Afr., L, WC, EC.

pedunculosa (DC.) Cron

(= *Cineraria albomontana* Hilliard, *C. pedunculosa* DC.)

Tufted, perennial herb, 0.1–0.3 m high. **Leaves** ovate to elliptic to obovate, or lyrate pinnatifid, lobed, usually with 1 or 2 pairs of lateral pinnae, cobwebby, usually glabrescent above, white-tomentose or cobwebby below. **Capitula** solitary on long cobwebby-glabrescent, bracteate peduncles; involucre ecalyculate; bracts 8–14, cobwebby to tomentose, glabrescent. **Ray florets** 8–11. **Disc florets** 35–55. **Flowering time** Sept.–Jan. **Cypselae** fusiform, black with short, white, mucilaginous, duplex hairs; ray cypselae triquetrous, slightly compressed, with prominent median rib on inner surface, inner surface glabrous; disc cypselae tetraquetrous, hairs on all sides. Grassland, mountain slopes, near cliffs, amongst rocks, on basalt, alt. 2 450–2 530 m; Drakensberg Grassland (Witteberg near Lady Grey only).

BRACHYLAENA R.Br.

(Tarchonantheae)

Wild silver oaks; *bitterblaar*, *vaalbosse* (A)

Species ± 15, Africa and Mascarene Islands; 9 in sthn Afr., widespread, except N, NC.

discolor DC.

Coast silver oak; *kusvaalbos*, *kreukelboom* (A)

Tree or shrub, 1.8–6.0(–10.0) m high. **Leaves** alternate, petiolate, oblanceolate to obovate, rarely oblong-elliptic, rounded, sometimes briefly acuminate at apex, ± narrowly cuneate and usually tapering to a long petiole, margins entire or dentate in apical part, upper surface shiny dull-green, glabrous, lower surface greyish tomentellous. **Capitula** large, discoid, unisexual, many together in dense, terminal panicles; involucre infundibuliform; bracts imbricate, extending onto upper part of capitulum stalk. **Florets** male and

female on different plants. **Corolla** dull yellow or creamy white. **Flowering time** July–Oct. **Pappus** of many barbellate bristles. **Cypselae** subcylindric–subfusiform, ribbed, sparsely hairy. Coastal dunes, alt. 4–60 m; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (coastal, from KZN to Port Elizabeth).

elliptica (Thunb.) DC.

Bitter-leaf; *bitterblaar*, *suurbos* (A)

Tree or shrub, 1.8–7.0 m high. **Leaves** alternate, subsessile or shortly petiolate, obovate or narrowly elliptic to oblong, apex usually 3-lobed, margins entire or toothed, base acute, rarely obtuse, upper surface glabrous, lower surface white-tomentose. **Capitula** discoid, unisexual, many together in axillary or terminal racemes or panicles; involucral bracts imbricate. **Florets** male and female on different plants. **Corolla** cream-coloured or pale yellow. **Flowering time** Dec.–Aug. **Pappus** of many barbellate bristles. **Cypselae** narrowly obovate to oblanceolate, ribbed, glandular hairy. In grassland, among shrubs, in Thicket, on rocky ridges and mountain slopes, alt. 1–1 200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Lower Karoo, Albany Ticket, Eastern Fynbos-Renosterveld (KZN south to Uitenhage and East London).

glabra (L.f.) Druce

Malabar tree, chatter-brake tree, forest oak, velvet oak; *malblaar* (A)

Tree or shrub, 3–13 m high. **Leaves** alternate, petiolate, narrowly obovate to oblanceolate, sometimes narrowly elliptic, upper surface glabrous, lower surface rusty brown tomentose or glabrous, margins entire or serrate in upper half. **Capitula** discoid, unisexual, many together in axillary or terminal panicles; involucral bracts imbricate. **Florets** male and female on different plants. **Corolla** yellowish or white. **Flowering time** Aug.–Dec. **Pappus** of many barbellate bristles. **Cypselae** narrowly obovate to oblanceolate, ribbed, hairy. False fynbos, riverbush, riverbank forest, alt. 60–900 m; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Indigenous Forests (Humansdorp, Uitenhage, Port Elizabeth).

ilicifolia (Lam.) E.Phillips & Schweick.

Small bitter-leaf; *bitterblaar*, *fynbitterblaar*, *hulsbitterblaar* (A)

Shrub or small tree, up to 6 m high. **Leaves** alternate, subsessile or shortly petiolate, oblong to oblong-lanceolate or narrowly elliptic, margins entire or dentate, mucronate, glabrous above, grey- or white-felted below. **Capitula** discoid, unisexual, few together in dense axillary racemes, sometimes solitary; involucral bracts imbricate. **Florets** male and female on different plants, white, cream-coloured or pale yellow. **Flowering time** all year. **Pappus** of many barbellate bristles. **Cypselae** oblanceolate or narrowly elliptic, ribbed, hairy. In scrub in dry river valleys and on dry hillsides, coastal bush, alt. 20–1 350 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (isolated records from KZN to Port Elizabeth).

neriifolia (L.) R.Br.

Water white alder; *waterwitels* (A)

Small tree or shrub, 2–8 m high. **Leaves** alternate, petiolate, oblanceolate to narrowly oblanceolate, margins entire or dentate in upper part, upper surface glabrous, lower surface glabrous or rusty brown tomentose. **Capitula** discoid, unisexual, many together in axillary or terminal panicles; involucral bracts imbricate. **Florets** male and female on different plants, whitish. **Flowering time** Mar.–Aug. **Pappus** of many barbellate

bristles. **Cypselae** oblanceolate to narrowly elliptic, 3–5-angled, hairy. Fynbos, stream- and riverbanks, alt. 5–600 m; Eastern Fynbos-Renosterveld, Indigenous Forests (WC to Humansdorp).

uniflora Harv.

Natal silver oak; *Natalvaalbos* (A)

Tree, 4.3–8.0 m high. **Leaves** alternate, petiolate, oblanceolate to obovate, rounded or sometimes briefly acuminate at apex, margins entire or dentate in upper part, upper surface glabrous, lower surface white-tomentose. **Capitula** discoid, unisexual, many together in axillary or terminal panicles; involucre small, narrowly infundibuliform; bracts imbricate, acuminate, stiffly erect. **Florets** male and female on different plants, white or yellowish. **Flowering time** July. **Pappus** of many barbellate bristles. **Cypselae** cylindrical, faintly ribbed, hairy. Coastal dunes, alt. 30–1 035 m; Indian Ocean Coastal Belt, Indigenous Forests (coastal, KZN S to Port St Johns).

CALLILEPIS DC.

(Gnaphalieae)

Species 4, endemic to sthn Afr., LIM, NW, G, M, S, FS, KZN, EC.

laureola DC.

Ox-eye daisy; *wildemagriet* (A); *mila* (Swati); *impila* (Z)

Perennial herb, up to 1 m high, from large woody tuber. **Leaves** alternate, sessile, linear-lanceolate to lanceolate or elliptic, 3-nerved, margins entire or denticulate, glabrous or sometimes with a few long hairs. **Capitula** radiate, terminal, solitary or sometimes 2–4; involucre hemispherical; bracts subequal. **Receptacle** paleate, paleae enveloping disc florets. **Ray florets** creamy white. **Disc florets** purplish black. **Flowering time** July–Jan. **Pappus** of scales. **Cypselae** dimorphic: those of ray florets 3-angled, those of disc florets compressed. Grassland, alt. 0–2 150 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (KZN S to Port Edward).

***CARDUUS** L.

(Cardueae)

Species 91, Eurasia, Mediterranean region, East Africa; 2 introduced weeds in sthn Afr., M, KZN, WC, EC.

macrocephalus Desf.

Annual or perennial herb, 1–2 m high; with spiny-winged stems. **Leaves** rosulate to alternate, serrate, pinnatifid, teeth spinose. **Capitula** discoid, many-flowered, sometimes terminal, on long peduncles, sometimes subsessile or glomerate; involucre ovoid, globose or cylindric; bracts in many rows, patent or recurved, spiny. **Receptacle** densely setose. **Florets** bisexual, fertile; corolla white, tube narrowly cylindric below, dilated above. **Anthers** sagittate at base, adjacent auricles connate and produced into entire or lacerated tail. **Style** abruptly thickened above with ring of hairs below thickening; branches short, obtuse, minutely papillose. **Flowering time** Jan.? **Pappus** of scabrid to barbellate, deciduous bristles. **Cypselae** obovoid-oblong, smooth, glabrous, with apical rim. Introduced weed, alt. 121–650 m; Sub Escarpment Savanna, Albany Thicket (Grahamstown, Alexandria District).

tenuiflorus Curtis

Corsican thistle; *blouklossiedissel*, *disseldoring*, *makdisseldoring* (A)

Annual herb, up to ± 1.5 m high; stems simple or branched, furrowed, white-cottony, narrowly spinose-winged. **Leaves** rosetted at first, cauline at flowering time, decurrent, sinuate-pinnatifid to lyrate-pinnatipartite, lobes broad, deeply and irregularly toothed teeth spinose; glabrous or somewhat cottony above, ± cottony below. **Capitula** oblong or cylindric, 3–10 or more in dense, terminal clusters; involucral bracts erect, spinose, nearly glabrous to densely cottony. **Florets** purple, rarely white. **Flowering time** Oct.–Jan. **Pappus** soon caducous. **Cypselae** finely transversely wrinkled. Roadsides, disturbed soil, alt. 460–915 m; Upper Karoo, Sub-Escarpment Savanna (Middelburg, Grahamstown).

*CARTHAMUS L.

(Cardueae)

Species 14, Mediterranean region, Asia; 1 introduced weed in sthn Afr., WC, EC.

lanatus L.

Distaff thistle, woolly safflower; *disseldoring*, *makdissel*, *woldissel* (A)

Annual herb, up to ± 0.3 m high; branched; with glandular indumentum. **Leaves** alternate, pinnatifid to pinnatisect with spiny margins. **Capitula** discoid, solitary; involucral bracts in many rows, imbricate, spiny, outer leaf-like, inner sometimes with apical appendages. **Florets** all bisexual; corolla yellow. **Anthers** with filaments usually densely bearded. **Pappus** usually double, outer row of subulate, serrulate-ciliate, persistent scales, inner row with scales shorter and basally connate. **Cypselae** obovoid to broadly obconical, 4-angled, smooth, glabrous, with apical rim; cypselae in outer florets generally rugose. Introduced weed, alt. 330–783 m; Lower Karoo (Aberdeen).

*CENTAUREA L.

(Cardueae)

Species ± 450, mainly in the Mediterranean region and Near East; 5 introduced weeds in sthn Afr., NW, G, M, FS, KZN, NC, WC, EC.

calcitrapa L.

Star thistle; *sterdissel* (A)

Annual herb, 0.2–0.4 m high; freely and divaricately branched; stems thin. **Leaves** elliptic in outline, deeply pinnatifid almost to midrib, segments linear-lanceolate, margins toothed-incised. **Involucral bracts** 10–12, oval, coriaceous, glabrous with spreading, stout spines. **Florets** neuter, inner bisexual; purplish. **Flowering time** Nov.–Feb. Roadsides, alt. 365–1 280 m; Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Fort Beaufort, Albany, Grahamstown).

cyanus L.

Bachelor's-button, cornflower; *koringblommetjie*, *bloukoringblommetjie* (A)

Annual herb, up to ± 0.6 m high; ascending branches; stems slender, sericeous. **Leaves** linear or lanceolate, entire, white-woolly below. **Involucral bracts** unarmed, deltoid, ovate to lanceolate, membranous, glabrous, margins chartaceous and regularly lacerate. **Florets** blue, purple or white. **Flowering time** July, Aug. **Cypselae** compressed, slightly sericeous. Roadsides, alt. 300–1 400 m; Drakensberg Grassland, Albany Thicket (Dohne, Salem).

melitensis L.

Cockspur, saucy jack; *koringdissel*, *luserndissel* (A)

Annual herb, 0.3–0.6 m high; with stiff erect or ascending winged stems, cottony. **Leaves** deeply lyrate-pinnatifid, lobes distant, narrow, entire or toothed; cauline leaves oblong-lanceolate, commonly entire, sometimes sinuate or toothed, sessile, greyish white-cottony above and below. **Capitula** solitary, terminating short lateral branches, subsessile; involucral bracts appendaged with terminal, brownish, spreading spines pinnately arranged, short. **Florets** yellow, glandular. **Flowering time** Sept.–Apr. **Pappus** of long and short scales, persistent. **Cypselae** glabrous. Roadsides, alt. 6–1 620 m; Dry Highveld Grassland, Upper Karoo, Sub-Escarpment Grassland, Albany Thicket (NC to Queenstown District, Bathurst District).

repens L.

Russian knapweed; *Russiese centaurea*, *bitterbossie* (A)

Perennial herb, 0.3–0.5 m high; corymbosely branched; stems ascending, canescent, thin and stiff. **Leaves** firm in texture, oblanceolate, irregularly pinnately lobed or almost entire; lower cauline leaves at base of stem narrowly oblong to linear-lanceolate; smaller upper leaves entire. **Capitula** eradiate; involucral bracts with outer bracts ovate, glabrous, chartaceous; inner bracts densely silky pubescent. **Florets** pink or purple. **Flowering time** July–Sept. **Pappus** of many, deciduous, white setae. **Cypselae** compressed. Found in cultivated fields, pastures and waste ground, alt. 0–1 065 m; Drakensberg Grassland, Rainshadow Valley Karoo (Seymour, Stockenström District).

solstitialis L.

Burweed; *geeldissel*, *skaapdissel* (A)

Annual herb, up to ± 0.9 m high; erect, freely branched; stems thin, wiry, winged, woolly. **Leaves**: basal lyrate; cauline leaves narrow, linear, entire, woolly; bases decurrent. **Involucre** globose; outer bracts ovate, subcoriaceous, arachnoid; inner bracts unarmed, apex tapering and usually dilated and chartaceous. **Florets** yellow. **Flowering time** Jan.? **Pappus** of slender white bristles. **Cypselae** stramineous with darker brown striations. Cultivated land, alt. ± 1 645 m; Upper Karoo (Middelburg).

*CHROMOLAENA DC.

(Eupatorieae)

Species ± 165, all natives of North and South America, the W Indies; 1 introduced weed in sthn Afr., LIM, M, S, KZN, EC.

odorata (L.) R.M.King & H.Rob.

Triffid weed, paraffin weed; *paraffienbos* (A), *usandanezwe* (Z)

Perennial shrub, 1.5–4.0 m high; sparingly to densely branched. **Leaves** opposite, triangular to elliptic, margins subentire to lobed. **Capitula** discoid; 10–40-flowered, in lax to dense corymbs; involucral bracts imbricate, ovate to lanceolate. **Receptacle** sometimes paleate. **Corolla** white; cylindrical, glandular, often hairy. **Anthers** with appendage margins sometimes crenulate. **Style**: branch appendages linear, sometimes papillose. **Flowering time** Jan.? **Pappus** of many capillary, scabrid bristles. **Cypselae** prismatic, with 5, rarely 3 ribs, setose, sometimes glandular. Open woodland, obnoxious weed, vigorously spreading and along watercourses, becoming a commercial threat to agriculture, alt. 60–750 m; Indian Ocean Coastal Belt (Mkambati Nature Reserve).

CHRYSANTHEMOIDES Fabr.

(Calenduleae)

Bietou (A)

Species 2, extending into tropical East Africa, widespread, but absent in B, NW, G.

Four subspecies of *C. monilifera* (L.) Norl. occurring in the EC.

monilifera (L.) Norl. subsp. **canescens** (DC.) Norl.

Perennial, succulent shrub, 0.30–3.65 m high. **Leaves** elliptic, coarsely and toothed or crenate. **Flowers** yellow. **Drupes** obovoid or elliptic. Streambank, alt. 765–2 210 m; Drakensberg Grassland (Maclear, Woodcliffs Farm).

monilifera (L.) Norl. subsp. **pisifera** (L.) Norl.

Bushtickberry; *sandbietou*, *weskusbietou*, *bosluisbessie* (A)

Perennial, succulent shrub, 0.3–3.0 m high. **Leaves** dentate, oblanceolate, elliptic or narrowly obovate, acute, margins acutely serrate. **Involucral bracts**: outer lanceolate, inner obovate. **Capitula** pale yellow. **Flowering time** all year. **Drupes** obovoid or elliptic, ripe fruit eaten by birds or livestock, dispersing seed. Sandstone, forest margins, mountain and hill slopes; Dry Highveld Grassland, Sub-Escarpment Grassland, Upper Karoo, Drakensberg Grassland, Indigenous Forests, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket, Lower Karoo (Hershel, inland to Amatole Mts, S to Grahamstown).

monilifera (L.) Norl. subsp. **rotundata** (DC.) Norl.

Bietou (A)

Perennial, succulent shrub, 0.25–3.00 m high, young parts cobwebby, later glabrous. **Leaves** alternate, blade broadly obovate to rotundate, contracted into a winged petiole, apex obtuse, margins subrevolute, entire or callose-denticulate. **Involucral bracts** biseriate, outer linear-lanceolate, inner lanceolate to narrowly ovate, acuminate. **Ray florets** yellow. **Disc florets** yellow. **Flowering time** all year. **Drupes** subglobose, shiny, purplish black when ripe. Sand-dunes, riverbanks; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Port St Johns S to Gonubie Nature Reserve, from Van Stadens Pass to East London).

monilifera (L.) Norl. subsp. **subcanescens** (DC.) Norl.

Bietou (A)

Xerophytic, suffruticose succulent, 1–3 m high. **Leaves** lanceolate, tapering at base, subpetiolate, acute or entire, glabrous. **Involucral bracts** ovate, membrane-edged. **Flowers** yellow. **Flowering time** Sept.–Mar. **Drupes** obovate-oblong, smooth, scarcely angular at base. Stream- and riverbanks; Upper Karoo, Albany Thicket, Dry Highveld Grassland, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Graaff-Reinet, Willowmore, Uitenhage).

***CHRYSANTHEMUM** L.

(Anthemideae)

Species 2, Europe, Asia and North Africa; 2 naturalised in sthn Afr., M, WC, EC.

coronarium L.

Crown daisy, garland chrysanthemum

Annual, branched herb, up to 1 m high. **Leaves** alternate, sessile, auriculate at base, pinnate or bipinnate, glabrous. **Capitula** radiate, pedunculate, solitary at ends of branch-

es; involucre campanulate; bracts imbricate, with brownish, scarious margins. **Ray florets** yellow or yellowish white. **Disc florets** yellow. **Flowering time** Aug.–Dec. **Pappus** absent. **Cypselae** dimorphic, those of ray florets 3-angled, angles winged, those of disc florets compressed and ribbed. Weed of disturbed places, around cities and towns, alt. 30–45 m; Sub-Escarpment Savanna, Albany Thicket (Port Elizabeth, Uitenhage and Grahamstown).

segetum L.

Corn chrysanthemum, corn marigold; *gousblom*, *koringkrisant* (A)

Annual herb, up to 0.6 m high. **Leaves** alternate, sessile, auriculate at base, oblong to spathulate or ovate in outline, pinnatifid or coarsely toothed, somewhat succulent. **Capitula** radiate, solitary, pedunculate; peduncles thickened below capitulum; involucre campanulate, bracts imbricate, with broad membranous margins, straw-coloured. **Ray florets** yellow. **Disc florets** yellow. **Flowering time** Nov.–Apr. **Pappus** absent. **Cypselae** dimorphic: those of ray florets winged and ribbed, those of disc florets cylindrical, ribbed. Escape from cultivation, serious weed in cornfields, alt. 50–500 m; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Mount Currie, Uitenhage and Port Elizabeth).

CHRYSOCOMA L.

(Astereae)

Beesbos (A)

Species 20, sthn Afr., 1 extending to Mozambique, widespread, but absent in LIM, S.

ciliata L.

Bitterbush; *bitterbeesbossie*, *bitterkaroo(bossie)* (A); *sehalahala* (SS)

Small, much-branched shrub, up to 1 m high; glabrous. **Leaves** alternate, linear, needle-shaped, entire, up to 15 mm long, glabrous, gland-dotted and often sticky. **Capitula** discoid, solitary, sessile or shortly pedunculate. **Ray florets** absent. **Disc florets** yellow. **Flowering time** all year. **Pappus** of outer small, acute scales and inner barbellate bristles. **Cypselae** obovate, hairy on margins. Widespread throughout sthn Afr., grassland on mountain slopes, flats and rocky places, alt. 5–3 124 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Albert District to Kokstad southwards, from Middelburg E to Mateku, Graaff-Reinet to Kei River Mouth, and from Willowmore to Humansdorp and Peddie). Poisonous to stock. Often an indication of veld deterioration due to overgrazing.

[E]**rigidula** (DC.) Ehr.Bayer

Dwarf shrub, up to 0.35 m high. **Leaves** alternate, broadly linear, entire, both sides densely hairy. **Capitula** radiate, solitary, terminal, pedunculate. **Ray florets** blue or blue-purplish. **Disc florets** yellow or yellow-brown. **Flowering time** Apr.–Oct. **Pappus** of outer acute scales and inner of barbellate bristles. **Cypselae** obovate, those of ray florets densely hairy all over, those of disc florets only hairy along margins. Coastal bush, alt. 15–600 m; Eastern Fynbos-Renosterveld, Albany Thicket (restricted to area around Port Elizabeth).

*CICHORIUM L.

(Cichorieae)

Species 8, Europe, Mediterranean region, Ethiopia; 1 escape from cultivation in sthn Afr., NW, G, FS, NC, WC, EC.

intybus L.

Blue sailors, chicory, coffee weed, succory; *sigorei*, *tjiekoriebos(sie)*, *witloof* (A)

Perennial erect, divaricately branched herb, with milky latex, up to 1.2 m high. **Leaves** basal ones large, irregularly lobed and toothed, semi-amplexicaul; cauline leaves smaller, dentate to entire, amplexicaul. **Capitula** discoid, ligulate, solitary or in few-headed clusters, sessile in axils of upper leaves. **Corolla** sky-blue, rarely pink or white. **Flowering time** Nov.–May. **Pappus** of small scales. **Cypselae** obconic, obscurely 5 angled. Native to Europe and Asia; escape from cultivation, occurring as a weed in disturbed areas; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Middelburg E to Matatiele and S to Willowmore and Bathurst).

CINERARIA L.

(Senecioneae)

Species ± 45, Africa, Madagascar, Saudi Arabia, Yemen; 41 in sthn Afr., N, B, NW, G, M, S, FS, KZN, L, NC, WC, EC.

1a Plants annual

dryogeton Cron

Slender, annual or short-lived, perennial herb, ± 1 m high. **Leaves** sagittate to reniform in outline, with 3 or 5 very acute lobes; green, densely hairy above and below; with conspicuous, sharply toothed auricles. **Capitula** few, 2–8 per stem branch in a lax corymb; glabrous; involucral bracts 8, glabrous. **Ray florets** usually 5 or 6. **Disc florets** 18–20. **Flowering time** Mar., Apr. **Cypselae** narrowly obovate, brown with paler margins, glabrous. In grassland near forest margin, coastal sandstone gorges, alt. 300–400 m; Indian Ocean Coastal Belt (endemic to Umtamvuma Nature Reserve).

lyratiformis Cron

(= *C. lyrata* DC. *nom. illeg.*)

Wild parsley; *boerelusern*, *geelblom* (A); *khotoliea* (SS)

Annual or short-lived perennial herb, up to 0.6 m high. **Leaves** lyrate-pinnatifid, usually with 2 or 3 pairs of lateral lobes, terminal lobe often largest; cobwebby, glabrescent; upper leaves sometimes sessile and clasping; auricles usually conspicuous. **Capitula** few–many in a corymbose panicle; involucral bracts 12–14(–18), glabrescent, cobwebby at base. **Ray florets** usually 7 or 8(9–14). **Disc florets** 32–40(–62). **Flowering time** mainly Oct.–Apr. **Cypselae** broadly obovate, broadly winged, black or dark brown with pale brown wings, glabrous. Disturbed areas, roadsides, fields, near rivers, dams and pans, in grassland amongst rocks, quartzite and dolerite, alt. 1 250–2 450 m; Drakensberg Grassland, Sub-Escarpment Grassland (Aliwal North, Lady Grey, Maclear, Mount Currie District, Middelburg District, Baziya Mtn).

platycarpa DC.

Annual herb, 0.07–0.30 m high. **Leaves** lyrate-pinnatifid to reniform, commonly with 1 or 2 pairs of lateral leaflets, glabrous above, sparsely hairy below, green above, lower

surface often purple, thinly/softly textured; petioles wide near base. **Capitula** few–many; peduncles glabrous; involucral bracts 7 or 8, glabrous. **Ray florets** 3–5. **Disc florets** 14–24. **Flowering time** July–Sept. **Cypselae** either broadly winged, dark brown with paler wings, fringed with hairs, faces hairy, or margined, black, fringed with white hairs on margins and outer faces. Shaded by larger bushes or boulders, near rivers, often on S-facing slopes, Bokkeveld and Ecca shales, alt. 20–900 m; Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (occasional in EC, near Despatch and Uitenhage).

1b Plants perennial
2a Plants grey cobwebby/tomentose

albicans N.E.Br.

Shrublet, up to 0.7 m high. **Leaves** deltoid, deltoid-reniform or reniform, 5–7-lobed, occasionally with lateral pinnae at base, cobwebby above, tomentose below; auricles varying in size and persistence. **Capitula** few(–many) in lax corymbs; peduncles glabrescent; involucral bracts (8–)12–14, tomentose or glabrescent to varying degrees. **Ray florets** 8–13. **Disc florets** 34–60. **Flowering time** Jan.–June. **Cypselae** margined to narrow-winged, brown, ciliate on margins and faces. Cliff/gorge tops, gorges, edge of valley bushveld, rocky outcrops on slopes, partial shade, Natal Group and Msikaba Formation sandstones, alt. 170–2 600 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Barkly East and Maclear districts, near Nyameni, Lusikisiki and Mtamvuna Gorge).

aspera Thunb.
(= *C. burkei* Burtt Davy & Hutch., *C. hamiltoni* S.Moore)

Geelrankbossie (A); *mohodu-wa-pela*, *moholu-oapela* (SS)

Spreading shrublet, up to 1 m high. **Leaves** pinnatisect with ovate to elliptic outline, lobes dentate, pinnatilobed, 1 or 2 lateral lobes below lamina; glabrescent on upper surface, auricles small to conspicuous. **Capitula** usually many in compact corymbose panicle; peduncles cobwebby, conspicuously bracteate; involucral bracts 8–10(–13), glabrous but cobwebby amongst calyculus bracts. **Ray florets** 5–8. **Disc florets** 14–28. **Cypselae** margined, dark brown, ciliate on margins, hairy on faces. **Flowering time** Feb.–June. Amongst rocks on mountainsides, at foot of cliffs, S- or SE-facing aspects, also in disturbed sites such as roadsides, predominantly on quartzites, alt. 1 400–2 600 m; Drakensberg Grassland, Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Lower Karoo (Ramatseliso's Gate southwards, Middelburg E to Elliot, Graaff-Reinet E to Hogsback).

erodioides DC.
[= *C. britteniae* Hutch. & R.A.Dyer, *C. dieterlenii* E.P.Phillips, *C. polycephala* DC., *C. tussilaginea* Thunb. (1823: 671) *pro parte* excl. *C. tussilaginis* L'Hér. *et typus*]

Perennial shrublet, up to 1 m high. **Leaves** reniform to deltoid-reniform in outline, lobed; thinly cobwebby, sparsely hairy or glabrous above, cobwebby or hairy below, glabrescent, auricles conspicuous, auriform and procurrent (running up petiole). **Capitula** few (4–12) to many (18–96) per stem branch arranged in fairly lax, corymbose panicles; involucral bracts 8–13, glabrous or cobwebby, glabrescent. **Ray florets** 5–8(–13). **Disc florets** (14–)20–40. **Flowering time** Jan.–May. **Cypselae** dark brown with a paler distinct, narrow wing (or broad wing on rays), ciliate with sparsely hairy or glabrous faces, or entirely glabrous. Mountain slopes and plateaus, near rivers and along forest margins, on sand-

stone outcrops and basalt, alt. 100–3 300 m; Drakensberg Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Witteberg, Elliott and Barkly East districts, Mount Currie near Kokstad, Amatole and Great Winterberg mts, Uitenhage and surrounding low alt. regions).

grandibracteata Hilliard

Perennial herb, up to 0.5 m high. **Leaves** deltoid-reniform to reniform in outline, 5–7-lobed, rarely pinnatifid; cobwebby and glabrescent above, tomentose below; usually exauriculate. **Capitula** solitary, occasionally paired; peduncles 35–130 mm long, thinly tomentose, with large bracts subtending peduncle; involucral bracts 12 or 13, tomentose. **Ray florets** (8–)11–13(–28). **Disc florets** 60–90. **Flowering time** Feb.–June. **Cypselae** margined to narrow-winged, brown, glabrous. Rocky outcrops in grassland on mountain tops and slopes, often in mist belt, mainly on dolerite, alt. 450–1 900 m; Sub-Escarpment Grassland (Mount Ngeli near Kokstad, Barkly East and Alfred districts).

mollis DC.

(= *C. arctotidea* DC., *C. polyglossa* DC.)

Tufted, perennial herb, 0.03–0.30 m high when flowering. **Leaves** lyrate-pinnatifid or reniform, 1 or 2 (–4) pairs of lateral leaflets; terminal lobe shallowly 3-lobed, cobwebby grey or glabrous and dark green above, tomentose white or grey below; auricles absent. **Capitula** solitary, rarely in twos or threes; peduncles 65–120(–190) mm long; involucral bracts 12–20, glabrescent. **Ray florets** 8–14. **Disc florets** ± 52. **Flowering time** Oct.–Feb. **Cypselae** narrowly obovate, somewhat compressed, margined, dark brown, with white hairs on faces and margins. Along drip line below cave sandstone overhangs and basalt cliffs, crevices on cliff faces, often forming mats, around dolerite rocks, alt. 1 600–2 550 m; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Dry Highveld Grassland (Witteberg, Barkly East and Elliot districts, Hangklip Mount near Queenstown, mts near Graaff-Reinet).

C. mollis closely resembles *C. albicans* and *C. erodioides.*

2b Plants green, glabrous or hairy but not grey cobwebby/tomentose
3a Cypselae glabrous

deltoidea Sond.

(= *C. abyssinica* forma *longiradiata* sensu Oliv. non *C. abyssinica* Sch.Bip. ex A.Rich., *C. bequeartii* De Wild, *C. bracteosa* O.Hoffm. ex Engl., *C. buchanani* S.Moore, *C. densiflora* R.E.Fr., *C. gracilis* O.Hoffm., *C. grandiflora* Vatke, *C. kilimandscharica* Engl., *C. laxiflora* R.E.Fr., *C. monticola* Hutch., *C. prittwitzii* O.Hoffm ex Engl., *Senecio kirsteineanus* Muschl., *Senecio schubotzianus* Muschl.)

Perennial herb, erect or scrambling, 0.6–1.5 m high/long. **Leaves** deltoid to deltoid-reniform, lobed, upper leaves often with lateral lobes below main lamina, auricles small or large, auriform. **Capitula** few–many in lax corymbs or more compact corymbose panicles; peduncles glabrous or hairy, glabrescent; involucral bracts 8–13, glabrous. **Ray florets** 5–8(–13). **Disc florets** 14–39. **Flowering time** mainly Apr.–July. **Cypselae** margined (to narrow-winged), dark brown (to black), glabrous in EC. Forest margins, riverine bush, on roadsides, clearings in forests, amongst rocks in montane grassland, alt. 500–1 500 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Baziya Mtn, near Port St Johns, possibly at Hogback).

erodioides DC. (see 2a above, species very variable)

geraniifolia DC.

Perennial herb, frequently 0.3–0.4 m high, with slender stems. **Leaves** reniform to reniform-pinnatifid (occasionally uppermost lyrate-pinnatisect), shallowly to deeply lobed, often with 1–3 pairs of pinnae below lamina; glabrous above, sparsely hairy to hairy, glabrescent below, auricles small. **Capitula** solitary or in twos or fours (rarely 7 or 8) per stem branch; peduncles 21–195 mm long, glabrous; involucral bracts (8–)12–13, glabrous. **Ray florets** (5–)8–13. **Disc florets** 22–56. **Flowering time** Sept.–Apr. **Cypselae** narrow-winged, brown to dark brown, glabrous. Moist grassy slopes, riverbanks, at base of cliffs amongst rocks, alt. 1 300–2 400 m (rarely near sea level); Sub-Escarpment Grassland, Albany Thicket (Bruintjieshoogte, Boschberg, Winterberg, Amatole Mts, Katberg, Matatiele and Komga, an unusual form near Gonubie).

[E]vagans Hilliard

Perennial herb, diffuse, straggling, with slender, decumbent stems. **Leaves** reniform, shallowly lobed, rarely with 1 or 2 pinnae below lamina; glabrous; auricles absent or petiole base widens slightly. **Capitula** solitary, rarely paired; peduncles (34–)72–200 mm long, glabrous; involucral bracts 12 or 13, glabrous. **Ray florets** (5–)8. **Disc florets** ± 25; corolla lobes may have distinct median red-brown line. **Flowering time** Dec., Jan. **Cypselae** narrow-winged, blackish brown or brown with paler wing, glabrous. Grassland slopes or rocky outcrops or ridges, damp grass at foot of sandstone cliffs, alt. 1 380–1 750 m; Sub-Escarpment Grassland, Drakensberg Grassland (known only from Elandsberg and passes S of Queenstown, Katberg and Amatole Mts).

3b Cypselae hairy on margins and/or faces

erodioides DC. (see 2a above, species very variable)

lobata L'Hér.

Perennial herb or subshrub, up to ± 0.6 m high. **Leaves** deltoid-reniform to reniform, distinctly 5–7-lobed; glabrous, rarely sparsely hairy below, auricles small or conspicuous, auriform. **Capitula** few (2–12) to many (14–90) per stem branch, usually in a lax panicle; peduncles 2–65 mm long, glabrous; involucral bracts (5–)8–10(–13), glabrous. **Ray florets** (3–)5(–8). **Disc florets** (7–)16–28(–43). **Flowering time** Aug.–Jan. (winter rainfall area), May–July (summer rainfall area). **Cypselae** narrow-winged, brown with paler wing, ciliate and variously hairy on faces. Rocky mountains slopes, hills or ridges, shade of boulders, ledges or bushes, in shady gorges or rock crevices, base of cliffs, next to mountain streams, alt. 10–50 m or 500–1 800 m; Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore to Patensie, Uitenhage, Greater Addo Elephant National Park, Port Elizabeth, Grahamstown, Alexandria District and Humansdorp).

[E]saxifraga DC.

Perennial shrublet, up to ± 0.35 m high. **Leaves** reniform, rarely with 1 or 2 lateral pinnae below lamina, glabrous, slightly succulent, base cuneate to truncate, auricles absent. **Capitula** radiate, few (2–8) to many (± 24) in a lax corymbose panicle; peduncles glabrous; involucre sparsely calyculate, involucral bracts 8–12, glabrous. **Ray florets** 5 or 6. **Disc florets** 16–22. **Flowering time** Aug.–Jan. **Cypselae** margined, dark brown, sometimes with paler margins, ciliate and hairy on faces. Grassland, semi-shade, amongst rocks on hillsides, quartzite, alt. 400–1 000 m; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Albany and Uitenhage districts, also the Suurberg, cultivated elsewhere in SA).

*CIRSIUM Mill.

(Cardueae)

Species ± 250, temperate regions of Europe and America; 2 in sthn Afr., LIM, NW, G, M, FS, KZN, L, NC, WC, EC.

arvense (L.) Scop.

Canada thistle, creeping thistle; *rankdissel* (A)

Annual herb, 0.8–1.0 m high. **Leaves** alternate, often decurrent, pinnately lobed, lobes and teeth spinescent or rarely rigidly ciliate. **Capitula** discoid, many-flowered, solitary; involucral bracts in many rows, spiny. **Florets** bisexual, fully fertile or female; corolla purple, tube narrowly cylindric below, slightly widened above, deeply 5-lobed. **Anthers** linear, sagittate at base, adjacent auricles connate and prolonged into entire or lacerated tail. **Style** abruptly thickened below branches, often with ring of hairs there; branches, often partly connate. **Flowering time** Jan.? **Pappus** of feathery bristles in several rows; connate at base. **Cypselae** obovoid-oblong, glabrous, with nearly central, horizontal, basal attachment scar. Disturbed places and waste places, alt. 200–1 980 m; Drakensberg Grassland (Alice).

vulgare (Savi) Ten.

Scotch thistle, bullthistle; *disseldoring*, *skaapdissel* (A)

Annual herb, 0.3–1.0 m high; robust; stems furrowed, cottony or nearly glabrous. **Leaves** rosetted in the first year of growth, obovate-lanceolate in outline, deeply pinnatifid and undulate, lobes commonly split into 2 narrowly triangular segments, spine-tipped, base decurrent on the stem, upper surface setose, lower surface rough, greyish white-cottony. **Capitula** ovoid-oblong, somewhat urceolate, solitary or 2 to 3 clustered at tips of branches; involucral bracts lanceolate-acuminate, outer with long, recurved, spiny apex. **Florets** reddish purple. **Flowering time** Dec.–Apr. **Pappus** of feathery bristles, soon caducous. **Cypselae** obovate in outline, obscurely 4-angled, obliquely humped towards apex, pale with dark vertical streaks. Disturbed places and waste places, alt. 5–2 134 m; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Sub-Escarpment Savanna (Middelburg, Seymour, Cradock District, Grahamstown).

CONYZA Less.

(Astereae)

Species ± 60, cosmopolitan in warm areas; 15 (4 introduced, naturalised weeds) in sthn Afr., widespread.

1a Shrubs

scabrida DC.

Oven bush; *bakbesembossie*, *bakoondbos*, *koorsbos*, *safooibos* (A); *isavu* (X)

Slender shrub, with willowy branches, up to 2 m high. **Leaves** alternate, petiolate, elliptic to lanceolate, 3-nerved from base, margins sharply serrate, pubescent to almost glabrous. **Capitula** disciform, < 8 mm in diam., in dense, terminal corymbs. **Receptacle** epaleate. **Outer female florets** filiform, multiseriate, cream-coloured to pale yellow. **Disc florets** bisexual, tubular below, widening upwards, cream-coloured to pale yellow. **Flowering time** Dec.–May. **Pappus** of many, whitish, scabrid bristles. **Cypselae** narrowly obovate, compressed, pubescent. Damp situations, commonly found in sandy streambeds

or along streams and forest margins, alt. 5–1 920 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket (widespread, Aliwal North to Port St Johns, S to Sedgefield and East London).

1b Annual or perennial herbs
2a Capitula solitary

podocephala DC.

Conyza; *bakbossie*, *oondbos* (A); *manku-a-maholo* (Sotho); *isitshotshokazane* (Z)

Harshly hairy, perennial herb, up to 0.6 m high, often with leafy runners. **Leaves** basal ones in a rosette, oblong-obovate, margins coarsely crenate in upper half, entire in lower half, tapering to petiole-like base; cauline leaves similar but smaller. **Capitula** disciform, ± 15 mm in diam., solitary on long nude or nearly nude peduncles. **Outer female florets** filiform, multiseriate, yellow. **Disc florets** tubular below, widening upwards, yellow. **Flowering time** Dec.–Apr. **Pappus** of scabrid bristles. **Cypselae** narrowly obovate, compressed, glabrous but with few hairs at base and apex. Along roadsides and in disturbed grassland, alt. 1 200–2 750 m; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (widespread, from Middelburg to Kokstad and S to Katberg).

2b Capitula in compound synflorescences
3a Leaves entire, dentate, serrate or crenate but not deeply divided

***bonariensis** (L.) Cronquist

Flax-leaf fleabane, horseweed; *armoedskruid*, *kleinskraalhans*, *skraalhans*, *vaalskraalhans* (A)

Erect, roughly hairy, annual herb, up to 1.2 m high, lateral branches equal to or overtopping main stem. **Leaves** alternate, sessile, lanceolate to elliptic, up to 100 mm long, but mostly only up to ± 50 mm, twisted near base, margins entire or toothed, often undulate as well. **Capitula** disciform, > 10 mm in diam., pedunculate, arranged in compound, paniculate synflorescence. **Receptacle** epaleate. **Outer female florets** filiform, multiseriate, pale yellow. **Disc florets** bisexual, tubular, pale yellow. **Flowering time** Sept.–Apr. **Pappus** of many dirty white or pinkish scabridulous bristles. **Cypselae** narrowly elliptic, compressed, thinly hairy. Native to S America, disturbed places, alt. 5–1 890 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket (weed of cultivation, widespread throughout EC).

***canadensis** (L.) Cronquist

Canadian fleabane, horseweed fleabane; *armoedskruid*, *Kanadese skraalhans*, *peperbossie*, *vaalbossie*, *volstruisgras* (A)

Glabrous or sparsely hairy, annual herb, up to 1.5 m high; lateral branches never overtopping main axis, the whole forming a pyramidal compound inflorescence. **Leaves** alternate, linear or narrowly lanceolate, margins entire or denticulate, ciliate. **Capitula** minutely radiate, ± 5 mm in diam. **Ray florets** white or mauve-tinged, multiseriate. **Disc florets** tubular. **Flowering time** Dec.–Apr. **Pappus** of scabrous bristles, straw-coloured. **Cypselae** narrowly elliptic, compressed, thinly hairy. Native to North America, weed of wasteland and cultivation; Indigenous Forests, Drakensberg Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (widespread, Port St Johns, Stutterheim, Peddie, Humansdorp).

gouanii (L.) Willd.

Little-branched, perennial herb, up to 0.6 m high. **Leaves** basal ones broadly elliptic, thinly hairy, margins crenate, on a long (up to 40 mm) petiole; cauline leaves narrowly elliptic, diminishing in size upwards and becoming sessile, margins serrate or nearly entire. **Capitula** disciform, ± 5 mm in diam., terminal in compact, corymbose clusters. **Outer female florets** filiform, multiseriate, yellowish. **Disc florets** funnel-shaped, yellowish. **Flowering time** Jan. **Pappus** of whitish, scabrid bristles. **Cypselae** obovate, compressed, thinly hairy. Damp, shady situations, favouring path sides in forest, streambanks and wet roadside ditches, alt. 185–1 645 m; Sub-Escarpment Grassland (tropical Africa to EC, 1 old record from Lady Frere).

***sumatrensis** (Retz.) E.Walker var. **sumatrensis**
(= *C. albida* Spreng.)

Horseweed, high fleabane; *armoedskruid*, *skraalhans*, *vaalskraalhans* (A)

Erect, roughly hairy, annual herb, up to 2 m high; lateral branches never overtopping main axis, the whole forming a pyramidal compound inflorescence. **Leaves** alternate, sessile, lanceolate to elliptic, margins entire or toothed, both surfaces densely appressed-pubescent. **Capitula** disciform, < 10 mm in diam. **Outer female florets** filiform, multiseriate. **Disc florets** bisexual, tubular. **Florets** greenish white, greenish yellow, yellowish or whitish. **Flowering time** Jan.–May. **Pappus** of scabrous bristles, straw-coloured. **Cypselae** narrowly elliptic, compressed, thinly hairy. Native to Europe and Mediterranean region, weed of waste places and cultivated ground, alt. 2–1 912 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (widespread from Kokstad, S to Tsitsikamma and E to Grahamstown).

3b Leaves pinnatifid or lyrate-pinnatifid

obscura DC.

Stout, erect, perennial herb, up to 0.6 m high. **Stems** and leaves with copious white pubescence. **Leaves** alternate, sessile, pinnatifid or lower ones deeply crenate, lobes oblong, entire. **Capitula** disciform, ± 10 mm in diam., in compound, terminal corymbs. **Outer female florets** filiform, multiseriate, white to pale yellow. **Disc florets** funnel-shaped, yellowish. **Flowering time** Dec.–June. **Pappus** of whitish scabrid bristles. **Cypselae** narrowly obovate, compressed, glabrous or thinly hairy. Forest margins in grassland or on grassy hillsides, but tending to spread to disturbed areas, alt. 20–2 400 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket (Clydesdale and Kentani southwards, from Katberg to Gonubie Springs and from Port Elizabeth to Alexandria).

pinnata (L.f.) Kuntze

Sekhatlana se seholo (SS)

Weakly hairy perennial herb, up to 0.6 m high, with long leafy runners. **Leaves** alternate, pinnatifid, lobes oblong, obtuse to broadly acute, commonly 1- or 2-toothed, basal leaves shortly petiolate; upper leaves sessile, clasping. **Capitula** disciform, 10 mm in diam., in compound, terminal corymbs. **Outer female florets** filiform, multiseriate, yellow. **Disc florets** tubular below, widening upwards, yellow. **Flowering time** Aug.–Apr. **Pappus** of whitish scabrid bristles. **Cypselae** obovate, compressed, glabrous or sparsely hairy. Damp situations such as hollows in open grassland, streambanks and forest margins and glades, alt. 5–2 500 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket (Kokstad to Grahamstown).

ulmifolia (Burm.f.) Kuntze

Umachakazi (Z)

Annual or occasionally perennial herb, up to 1.2 m high. **Leaves** alternate, distinctly petiolate, eared at base, lyrate-pinnatifid, upper part elliptic to ovate in outline, lower lobes sometimes lacking, margins coarsely and irregularly crenate-serrate to lobulate, pubescent. **Capitula** disciform, ± 10 mm in diam., in loose, terminal corymbs. **Outer female florets** filiform, multiseriate, yellow. **Disc florets** tubular, widening upwards, yellow. **Flowering time** Nov.–Apr. **Pappus** of whitish scabrid bristles. **Cypselae** narrowly obovate, compressed, glabrous. Damp forest margins and straggling through other vegetation along streams, alt. 3–2 225 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (widespread, Kokstad S to Port Elizabeth and East London).

CORYMBIUM L.

(Corymbieae)

Honey bush; *heuningbos* (A)

Species 9, endemic to sthn Afr., NC, WC, EC.

africanum L.

Plampers (A)

Tufted, perennial herb, 0.11–0.35 m high, grass-like in appearance. **Leaves** basal ones in a rosette, linear to falcate, flat or terete, with silky hairs at base, base clasping or half-clasping, margins entire, sometimes thickened, glabrous; cauline leaves decreasing in size upwards, sessile, lower ones decurrent. **Capitula** discoid, 1-flowered, in corymbose clusters, pedunculate; involucral bracts green with purple apex or tinged purple, scabrid. **Florets** tubular, 5-lobed, mauve, pink or white. **Flowering time** Nov., Dec. **Pappus** of many fimbriate bristles, coroniform at base. **Cypselae** linear to ovoid, hairy. Fynbos on mountain slopes, alt. 0–1 860 m; Eastern Fynbos-Renosterveld, Albany Thicket (widely distributed, WC E to Grahamstown).

glabrum L.

Heuningbossie, *plampers* (A)

Tufted, perennial herb, 0.1–0.6 m high, grass-like in appearance. **Leaves** basal ones in a rosette, narrowly to broadly linear, sometimes falcate, with silky hairs at base, base half-clasping, margins entire, scabrid or slightly muricated, venation prominent, glabrous; cauline leaves decreasing in size upwards, sessile, lower ones decurrent. **Capitula** discoid, 1-flowered, in corymbose clusters, pedunculate; involucral bracts green with purple apex or tinged purple, glabrous. **Florets** tubular, 5-lobed, mauve. **Flowering time** Nov.–Jan. **Pappus** of many fimbriate bristles, coroniform at base. **Cypselae** linear to ovoid, hairy. In fynbos or grassland on mountain slopes, alt. 0–1 900 m; Eastern Fynbos-Renosterveld, Albany Thicket (widely distributed, WC to Grahamstown).

COTULA L.

(Anthemideae)

Buttons; *knoppies* (A)

Species ± 55, Africa, Australia, South America; 43 in sthn Afr., widespread.

Genus needs revision.

1a Capitula shortly or distinctly radiate

mariae K.Bremer & Humphries

Suffrutex, decumbent or ascending, 150–300 mm high. **Leaves** alternate, bipinnatisect, lobes short and broad, fulvo-sericeous. **Capitula** shortly radiate, solitary, long pedunculate. **Peduncles** top-shaped below capitulum, hollow; involucral bracts biseriate, ± 3–5-nerved. **Ray florets** in 1 or 2 rows, short, broad, upper surface yellow, lower surface reddish. **Disc florets** tubular below, widening above, 4-lobed, yellow. **Flowering time** Feb., July, Aug. **Pappus** absent. **Cypselae** of ray florets compressed, winged, of disc florets obovate, thickly margined but not winged. Coastal, in sand; Eastern Fynbos-Renosterveld, Albany Thicket (Knysna to Bushman's River Mouth).

nigellifolia (DC.) K.Bremer & Humphries

Staggers weed; *rivierals*, *stootsiektebossie*, *waterkerwel* (A)

Creeping or decumbent, annual or perennial herb, stems up to 300 mm long. **Leaves** alternate, 2 or 3× pinnate, ultimate segments linear, acute, glabrous or hispidulous. **Capitula** radiate, solitary on long nude peduncles; involucral bracts in 2 rows, elliptic to ovate. **Ray florets** short and broad, white. **Disc florets** cylindric, 4-lobed, yellow. **Flowering time** Nov.–May. **Pappus** absent. **Cypselae** oblong, those of ray florets compressed, those of disc florets angled, all with thickened lateral ribs and large glands on each face. Wet places, riverbanks, edges of dams, coastal shrub, in mud and wet soil, sometimes in water, alt. 0–1 500 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket (widespread, WC E to Queenstown and Port St. Johns, S to Grahamstown and East London). Poisonous to stock.

sericea L.f.

Ascending suffrutex, 50–300 mm high. **Leaves** alternate, pinnatisect or bipinnatisect, lobes linear, appressed silky-tomentose. **Capitula** shortly radiate, solitary, long pedunculate; peduncle swollen below capitulum; involucral bracts ovate, 3-nerved, glabrous. **Ray florets** equalling or scarcely equalling involucral bracts, yellow on upper surface, reddish below. **Disc florets** tubular below, globose or cup-shaped above, yellow. **Flowering time** Aug.–Oct. and Mar., Apr. **Pappus** absent. **Cypselae** of ray florets compressed, winged, of disc florets obovate, thickly margined, glabrous. Grassy slopes near sea, dunes along coast, margins of vleis, alt. 3–200 m; Eastern Fynbos-Renosterveld, Albany Thicket (coastal, WC to Kei River Mouth).

turbinata L.

Ganskos (A)

Much-branched, annual herb, 50–500 mm high. **Leaves** sessile, alternate, pinnatisect or bipinnatisect, lobes linear, mucronate, pubescent or pilose. **Capitula** shortly radiate, solitary, long pedunculate. **Peduncles** swollen below capitulum; involucral bracts ovate or oblong, 3–5-nerved. **Ray florets** slightly longer than involucral bracts, corolla sometimes absent, yellow on upper surface, sometimes reddish below. **Disc florets** tubular below, widening upwards, 4-lobed, yellow. **Flowering time** Apr.–Jan. **Pappus** absent. **Cypselae** of outer florets winged, of disc florets obovate, thickly margined. Grassy slopes, grassland or edges of rivers near coast, alt. 0–1 100 m; Eastern Fynbos-Renosterveld, Albany Thicket, Indigenous Forests (WC E to Kei River).

1b Capitula discoid or disciform, without visible ray florets
2a Peduncle swollen or inflated below capitulum, especially obvious in fruiting stage

hispida (DC.) Harv.

Tufted, perennial, erect or decumbent herb, up to 400 mm high. **Leaves** alternate, lower leaves distinctly petiolate, upper sessile, with spreading hairs, bipinnate, lobes linear. **Capitula** discoid, solitary, pedunculate, upper part of peduncle swollen under capitulum; involucral bracts sub-biseriate, glabrous, with broad scarious margins. **Florets** tubular below, cup-shaped or globose above, 4-lobed, bright yellow, reddening with age. **Flowering time** Dec.–Apr. **Pappus** absent. **Cypselae** ovate, flattened on inner face, narrowly winged. Steep rough grass slopes, along bases of cliffs and around rock outcrops, alt. 300–3 230 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Eastern Escarpment Mts, Lady Grey S to Keiskammahoek).

membranifolia Hilliard

Diffuse, perennial herb, 200–400 mm high, rooting at nodes. **Leaves** alternate, petiolate, pinnately divided ± $^{2}/_{3}$ to midrib, lobes oblong-elliptic, villous with long, spreading hairs, decreasing upwards. **Capitula** discoid, solitary, pedunculate; peduncles swollen below capitulum; involucral bracts biseriate, glabrous, margins scarious. **Florets** tubular below, campanulate above, 4-lobed, yellow, reddening with age. **Flowering time** Jan., Feb. **Pappus** absent. **Cypselae** compressed, narrowly winged. Damp mountain slopes, alt. 1 820–2 450 m; Drakensberg Grassland (Drakensberg endemic, Giant's Castle S to Naude's Neck).

microglossa (DC.) O.Hoffm. & Kuntze ex Kuntze

Knoppies (A)

Diffuse, sprawling, annual herb, branching from below, up to 300 mm high, softly and patently villous. **Leaves** alternate, petiolate, bipinnatisect, lobes linear. **Capitula** discoid, solitary on long, naked peduncles, inflated above in fruit, tawny-haired when young; involucral bracts in 2 rows, 1-nerved, glabrous. **Disc florets** tubular below, widening upwards, 4-lobed, yellow or orange. **Flowering time** Nov., Dec. **Pappus** absent. **Cypselae** oblong-obovate. Riverbanks, edges of vleis or in disturbed grassland, alt. 90–1 985 m; Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket (Burgersdorp, Graaff-Reinet and Queenstown).

socialis Hilliard

Diffuse, mat-forming, perennial herb, flowering stems up to 400 mm high. **Leaves** in basal rosette, alternate upwards, sessile or very shortly petiolate, bipinnate in upper part, pinnate in lower part, lobes linear or linear-lanceolate, decreasing upwards. **Capitula** discoid, solitary, terminal, pedunculate; peduncles swollen below capitulum; involucral bracts in ± 3 rows, 1-nerved, margins scarious, glabrous. **Florets** tubular below, globose above, 4-lobed, yellow, turning red with age. **Flowering time** Dec.–Mar. **Pappus** absent. **Cypselae** compressed, obovate, thickly margined. Along Drakensberg on steep, damp, grassy slopes, alt. 1 900–3 050 m; Drakensberg Grassland (KZN to Barkly East districts).

2b Peduncle not swollen below capitulum
3a Capitula disciform, outer fruits broadly winged

anthemoides L.

Tuingras (A); *hlapi-e-nyenyane* (SS); *umhlonyane* (X)

Annual, erect or spreading herb, up to 200 mm high. **Leaves** alternate, pinnatisect, lobes very acute, margins entire or few-toothed, glabrous or nearly so. **Capitula** disciform,

solitary, terminal or in upper leaf axils, pedunculate; peduncles not or scarcely exceeding leaves, either glabrous or with woolly hairs; involucral bracts ± uniseriate, glabrous with broad scarious margins. **Outer female florets** without corolla, in 5 or 6 rows. **Disc florets** bisexual, corolla short, tubular below, globose above, 4-lobed, yellow. **Flowering time** July–Apr. **Pappus** absent. **Cypselae** of female florets winged, of bisexual florets margined but not winged. Damp situations such as muddy streamsides and edges of pans, alt. 115–2 135 m; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Queenstown, Engcobo, Somerset East and Grahamstown).

*australis (Spreng.) Hook.f.

Annual, erect or decumbent herb, up to 200 mm high. **Leaves** alternate, bipinnatisect, glabrous above, thinly villous below, base half-clasping. **Capitula** disciform, solitary, terminal and axillary, pedunculate; peduncles much exceeding leaves, hairs below capitula appressed-ascending; involucral bracts ± uniseriate, margins scarious, glabrous but with some hairs along midline. **Outer female florets** in ± 3 series, corolla wanting. **Disc florets** bisexual, corolla tubular below, globose-campanulate above, 4-lobed, whitish. **Flowering time** July–Oct. **Pappus** absent. **Cypselae** of female florets compressed, winged, of disc florets margined but not winged. Originally from Australia, weed in damp and shaded places in gardens, cultivated land, disturbed places, alt. 3–1 280 m; Upper Karoo, Sub-Escarpment Savanna, Indigenous Forests, Rainshadow Valley Karoo, Albany Thicket (widespread, Albert District southwards, Graaff-Reinet to Port St Johns and Grahamstown to East London).

coronopifolia L.

Brass buttons, water buttons; *eendekos*, *eendjieskweek*, *gansgras* (A)

Ascending or decumbent annual or perennial herb, 300–500 mm high, rooting at nodes. **Leaves** alternate, broadly linear or sublanceolate, irregularly toothed to bipinnatisect, succulent, sheathing at base. **Capitula** disciform, solitary, on slender, minutely leafy peduncles; involucral bracts in several rows, linear, obtuse, with membranous tip. **Outer female florets** in 1 row, corolla absent. **Disc florets** 4-lobed, bright yellow. **Flowering time** Aug.–May. **Pappus** absent. **Cypselae** of outer female florets winged and emarginate, those of disc florets turbinate. Wet spots, edges of pans, along rivers, etc., often in water, alt. 0–2 000 m; Upper Karoo, Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (widespread from NC to WC and E to Lusikisiki).

heterocarpa DC.

Annual, sprawling or ascending, villous herb, up to 300 mm high. **Leaves** alternate, pinnatipartite to bi-pinnatipartite, lobes linear. **Capitula** disciform, solitary, terminal, pedunculate; involucral bracts in several rows, oblong or ovate-oblong, glabrous or pubescent. **Outer female florets** in ± 2 rows, with minute ray, yellow. **Disc florets** tubular, yellow. **Flowering time** July–Apr. **Pappus** absent. **Cypselae** of ray florets winged, of disc florets oblong, subcompressed. Moist grassland, marshy places, also disturbed places, alt. 0–2 250 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (Matatiele S to Port Alfred).

sororia DC.

Thinly pilose, diffusely branched, annual herb, 30–150 mm high. **Leaves** alternate, scarcely clasping at base, petiolate, bipinnatisect, lobes linear, acute. **Capitula** disciform,

solitary on filiform long or short peduncle; involucral bracts ovate-oblong, membranous edged. **Outer female florets** in 1 row, corolla reduced. **Disc florets** tubular below, almost transparent, globose above, 4-lobed, yellow. **Pappus** absent. **Cypselae** of outer female florets winged, of disc florets obovate. Moist sandy soil, alt. 45–1 570 m; Albany Thicket (NC, WC to Graaff-Reinet).
Originally described from Graaff-Reinet, this taxon may be merely a variant of *C. australis*; no authentic material in PRE for EC.

villosa DC.

Glabrescent, annual herb, 300–500 mm high. **Leaves** alternate, bipinnatisect, lobes linear. **Capitula** disciform, solitary, pedunculate; involucral bracts in 2 rows, oblong, obtuse, membrane edged. **Outer female florets** in 1 or 2 rows, corolla reduced. **Dics florets** tubular below, widening upwards, 4-lobed, yellow. **Flowering time** July. **Pappus** absent. **Cypselae** of outer florets winged, of disc florets compressed, obovate, thickly margined. Habitat?, alt. 15–460 m; Sub-Escarpment Savanna, Albany Thicket (WC to King William's Town).
This taxon is doubtful, maybe one of the other taxa; only few old specimens in PRE.

zeyheri Fenzl

Pilose, annual herb, 40–100 mm high. **Leaves** alternate, petiolate, pinnatipartite, lobes narrowly linear. **Capitula** disciform, solitary, pedunculate; involucral bracts oblong, glabrous, membrane edged. **Outer female florets** in 1 or 2 rows, corolla reduced. **Disc florets** tubular below, widening upwards, 4-lobed, creamy white. **Flowering time** May, Aug. **Pappus** absent. **Cypselae** of outer florets winged, of disc florets compressed, oblong-obovate, hispidulous. In grassland on mountain tops, hillsides and along foot of rocks and boulders in shade, alt. 15–1 310; Upper Karoo, Dry Highveld Grassland, Albany Thicket (Middelburg, Cradock and Uitenhage districts).

3b Capitula discoid, fruits not or very narrowly winged

burchellii DC.

Annual, erect or suberect herb, up to 300 mm high. **Leaves** alternate, sessile, bipinnatisect, lobes linear, acute, hairy. **Capitula** discoid, solitary, large, pedunculate; involucral bracts in several rows, obtuse, with broad scarious margins. **Florets** bisexual, corolla tubular, 4-lobed, yellow. **Flowering time** May–Oct. **Pappus** absent. **Cypselae** turbinate, smooth, of outer florets angled and crenate. Disturbed sites and seasonally wet areas, alt. 1 100–1 310 m; Upper Karoo (Aliwal North, Middelburg, Richmond).

lineariloba (DC.) Hilliard

Tufted, perennial herb, 30–400 mm high. **Leaves** alternate, petiolate, once or twice pinnate, lobes linear-terete, obtuse, appressed silvery sericeous, diminishing upwards. **Capitula** discoid, solitary, long pedunculate; involucral bracts in ± 3 rows, glabrous with broad scarious margins. **Florets** tubular below, cup-shaped to globose above, 4-lobed, bright yellow, reddening with age. **Flowering time** Feb. **Pappus** absent. **Cypselae** slightly compressed, narrowly winged. On bare soil or in short, stony turf or around rock sheets, alt. 1 520–3 250 m; Drakensberg Grassland (KZN S to Rhodes).
Only 1 record in PRE for EC.

paludosa Hilliard

Stoloniferous, mat-forming, perennial herb, flowering stems upright, 30–180 mm high. **Leaves** alternate, petiolate, bipinnate, lobes linear, glabrous, diminishing upwards.

Capitula discoid, pedunculate, terminal; involucral bracts in ± 3 rows, glabrous, margins scarious. **Florets** tubular, widening upwards, 4-lobed, yellow, turning reddish with age. **Flowering time** Feb., Mar. **Pappus** absent. **Cypselae** compressed, narrowly winged. In shallow standing water-filling depressions, alt. 2 600–3 230 m; Drakensberg Grassland (along Drakensberg S to Barkly East).

CRASSOCEPHALUM Moench

(Senecioneae)

Species 24, Africa, Madagascar, Mascarene Islands, Yemen; 5 in sthn Afr., widespread, but absent in NW, FS.

Peduncles with usually 1, occasionally 2 or 3 capitula; flowers bright golden-yellow

× picridifolium (DC.) S.Moore

Straggling, ± hairy, often glandular, perennial herb, stems mostly simple, up to ± 1 m high, leafy. **Leaves** up to 120 × 30 mm, lanceolate, sessile, auriculate-amplexicaul, sometimes narrowed to a petiole-like base, mostly simple, margins coarsely toothed. **Capitula** ± 15 mm long, solitary on long, bracteate peduncles, terminal or in uppermost leaf axils; involucral bracts ± 20, ± hairy. **Flowering time** Nov.–June. **Cypselae** 2 mm long, narrowly cylindric, ribbed; pappus of many long white-silky hairs, deciduous. Marshy places; Indigenous Forests, Sub-Escarpment Savanna (uMzimkhulu S to Stutterheim and Komga).

Peduncles with several–many capitula; flowers whitish or buff-coloured with reddish lobes

crepidioides (Benth.) S.Moore

Erect, ± hairy, branching, annual herb, up to 1.2 m high. **Leaves** up to 250 × 150 mm, elliptic to ovate in outline, tapered petioles up to 40 mm long with or without a pair of stipule-like lobes basally, upper leaves ± entire, lower leaves sometimes lyrate-pinnatifid, margins coarsely, sharply serrate. **Capitula** ± 10 mm long, pedunculate, few–many in a corymb, nodding, then erect; involucral bracts ± 16, ± hairy. **Flowering time** Sept.–May. **Cypselae** 2 mm long, narrowly cylindric, ribbed; pappus of many long white hairs, deciduous. Along streams, forest margins, shady damp roadsides; Indigenous Forests (Port St Johns, Kei River Mouth).

*CREPIS L.

(Cichorieae)

Species ± 200, northern hemisphere, tropical and sthn Afr.; 2 in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, EC.

capillaris (L.) Wallr.

Smooth hawk's beard

Annual herb, with 1 or several stems from base, up to 0.9 m high, with milky sap. **Leaves** mostly in basal rosette, petiolate, dentate or lyrate- or runcinate-pinnatifid, margins of lobes entire or dentate, diminishing in size upwards, glabrous or hairy. **Capitula** ligulate, many in corymbose panicles, pedunculate; involucre shortly downy and often glandular. **Florets** yellow, 5-toothed. **Flowering time** Nov. **Pappus** of many barbellate bristles. **Cypselae** subterete or compressed, many-ribbed, narrowed to top but without beak. Garden weed, native to Europe, along roadsides, alt. 1 200–1 400 m; Sub-Escarpment Grassland (from Garden Castle in KZN S to Kokstad area).

hypochaeridea (DC.) Thell.
Perennial herb, up to 500 mm high, with milky sap. **Leaves** mostly radical in a basal rosette, oblong to lanceolate, narrowed to base, margins remotely denticulate, irregularly and coarsely toothed or runcinate-pinnatifid. **Capitula** ligulate, solitary or few together in an open corymb, long pedunculate; involucre white-woolly and densely glandular, at least 10 mm long at flowering. **Florets** pale yellow, 5-toothed. **Flowering time** Oct.–Dec. **Pappus** of many barbellate bristles. **Cypselae** subterete, rough, with long beak. Grassland, grassy hills, alt. 350–2 200 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (widespread, Kokstad S to Kentani).

CULLUMIA R.Br. ex Aiton

(Arctotideae)

Species 15, sthn Afr., endemic to NC, WC, EC.

cirsioides DC.
Perennial dwarf shrub, 0.6–1.0 m high; prickly, densely leafy. **Leaves** alternate, reflexed, lanceolate, margins slightly revolute, bristly, pungent. **Capitula** radiate, several- to many-flowered, solitary, sessile, terminal on main and side branches; involucre campanulate. **Ray florets** neuter; yellow. **Disc florets** bisexual, fertile; yellow. **Flowering time** May, June? **Cypselae** oblong-ellipsoid, smooth. Sandstone slopes, alt. 60–1 150 m; Eastern Fynbos-Renosterveld (Port Elizabeth).

decurrens Less.
Perennial dwarf shrub, 0.6–0.9 m long; prickly, robust, sprawling, densely leafy, glabrous. **Leaves** recurved, linear-lanceolate, margins strongly revolute, bristly, pungent. **Capitula** radiate, several- to many-flowered, solitary, sessile, terminal on main and side branches; inner involucral bracts unarmed, outer ones armed. **Ray florets** neuter; yellow. **Disc florets** bisexual, fertile; yellow. **Flowering time** Aug.–Oct.? **Cypselae** oblong-ellipsoid, smooth. Sandstone slopes, often on streams, alt. 151–915 m; Eastern Fynbos-Renosterveld (Port Elizabeth, Humansdorp).

patula (Thunb.) Less.
Perennial dwarf shrub, up to ± 0.3 m high; prickly, robust, sprawling, densely leafy, cobwebby on young parts. **Leaves** spreading, acicular, margins strongly revolute, bristly, pungent. **Capitula** radiate; involucral bracts with inner ones armed, outer ones unarmed. **Florets** yellow. **Flowering time** Sept.? **Cypselae** oblong-ellipsoid, smooth. Dry sandstone slopes, alt. 455–915 m; Eastern Fynbos-Renosterveld (Joubertina).

CUSPIDIA Gaertn.

(Arctotideae)

Monotypic, sthn Afr., endemic to NC, WC, EC.

cernua (L.f.) B.L.Burtt
Wortelbossie (A)
Annual herb, up to ± 0.15 m high; sprawling, thinly cobwebby. **Leaves** alternate, oblanceolate, spinose-toothed, pungent. **Capitula** radiate, several-flowered, solitary, terminal; involucre campanulate; bracts connate; outer bracts ovate to elliptic, becoming lignified, usually with 3 large, marginal spines, membranous, veined; inner bracts spiny, membranous, veined. **Receptacle** flat, honeycombed, with rim of pits produced into membra-

nous cup enclosing ovary. **Ray florets** neuter; corolla yellow; lamina oblong, 4-toothed. **Disc florets** bisexual, fertile; corolla yellow; tube narrowly funnel-shaped, somewhat angled, glandular-hairy, with 5 linear lobes. **Anthers** sagittate at base, with lanceolate, apical appendage. **Style** terete, with linear, obtuse branches. **Flowering time** Apr.–Dec. **Pappus** of linear, ciliate-barbellate, subulate scales. **Cypselae** obovoid-obconical, sericeous. **Seeds** germinating within capitulum. Rocky flats and lower slopes, alt. 5–1 383 m; Lower Karoo, Sub-Escarpment Savanna, Albany Thicket (Graaff-Reinet District, Komga Area, Albany).

CYMBOPAPPUS B.Nord.

(Anthemideae)

Species 3, endemic to sthn Afr., each species in a different province, M, WC, EC.

E**hilliardiae** B.Nord.

Erect, rounded shrub, up to 0.5 m high. **Leaves** alternate, filiform, entire or mostly trisect above middle, sometimes some pinnatipartite, laxly woolly, glabrescent. **Capitula** radiate, solitary, terminal, long pedunculate; involucral bracts imbricate, narrowly oblong-lanceolate to oblong-spathulate. **Ray florets** white-pinkish. **Disc florets** tubular below, narrowly campanulate above, 5-lobed, yellow, often tipped reddish. **Flowering time** Mar.–May. **Pappus** cup-shaped, white, shorter in disc florets. **Cypselae** oblong, ribbed, glandular. Growing on rocky slopes, alt. 1 000–1 500 m; Sub-Escarpment Grassland (confined to Mount Ayliff area).

DELAIREA Lem.

(Senecioneae)

Monotypic, endemic to sthn Afr., KZN, L, WC, EC.

odorata Lem.

Slender, herbaceous twiner, ± succulent, all parts ± glabrous. **Leaves** up to 70 × 80 mm, deltoid-ovate in outline, sharply 3–5-lobed on either side, sinuses broad, base cordate to hastate; petioles ± as long as blade, often twisted, usually with 2 small leaf-like basal auricles. **Capitula** discoid, many in congested, compound, corymbose panicles, terminating in short lateral branchlets; involucre narrowly campanulate; bracts 8, ± 3 mm long, resinous, calyculus bracts few, short; flowers bright yellow. **Flowering time** Apr.–June. **Cypselae** oblong, 2 mm long, glabrous, ribbed; pappus of many fine bristles. Forests, forest margins; weed in Europe, St Helena, Argentina, Australia, also cultivated; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests, Sub-Escarpment Savanna (uMzimkhulu S to Graaff-Reinet, Kentani and Port Elizabeth).

DENEKIA Thunb.

(Gnaphalieae)

Monotypic, widespread in *Flora zambesiaca* area and sthn Afr., extremely variable in size and pubescence.

capensis Thunb.

Perennial herb, up to 0.7 m high. **Leaves** alternate, oblong or linear-oblong, sessile, often auriculate at base, or lower leaves petiolate; usually white-felted below, margins entire, denticulate or sometimes coarsely toothed. **Capitula** disciform, small, in terminal,

corymbose clusters. **Outer female florets** filiform. **Disc florets** funnel-shaped, 5-lobed, white or bluish. **Flowering time** Oct.–July. **Pappus** absent in outer female florets, of 1 or 2 delicate bristles in disc florets, plumose at tip. **Cypselae** develop from outer female florets only, subterete, glandular. Damp places, often in shallow water, in marshes or marshy streamsides, alt. 30–2 400 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket (widespread, Kokstad S to Colesberg and Kei River Mouth).

DICHROCEPHALA L'Hér. ex DC.

(Astereae)

Species 4, tropical and subtropical Africa, Madagascar and Asia; 1 in sthn Afr., LIM, NW, M, S, KZN, WC, EC.

integrifolia (L.f.) Kuntze

Erect or ascending, annual herb, up to 1 m high. **Leaves** alternate, petiolate, lyrate-pinnatifid, lobes serrate. **Capitula** disciform, in lax, terminal, divaricate panicles, pedunculate; involucral bracts small, membranous, margins fimbriate. **Outer female florets** in many rows, corolla tubular, reduced, 2- or 3-dentate, whitish yellow. **Disc florets** few, tubular below, campanulate above, 4-lobed, yellowish green. **Flowering time** Oct.–Apr. **Pappus** usually absent in outer female florets, of 2 delicate bristles in disc florets, soon caducous. **Cypselae** narrowly obovate, compressed, margins thickened. Damp, shady places, often on roadsides, kloofs and forest, weed, alt. 15–1 830 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests (scattered records from Kokstad S to Kentani).

DICOMA Cass.

(Mutisieae)

Species 35, tropical and sthn Afr., Madagascar, Sokotra, India; 19 in sthn Afr., widespread.

anomala Sond.

Maagbitterwortel (A); *inyongana* (X); *isihlabamakhondlwane* (Z)

Perennial herb, up to 0.3 m high; prostrate from woody rootstock, uniformly leafy, closely densely araneose. **Leaves** discolorous, sessile, linear-elliptic, sometimes linear and wide, or narrowly elliptic, base broadly cuneate, apex acute, gland-pitted and glabrous on upper surface or evanescent finely araneose, densely greyish araneose-lanate beneath. **Capitula** solitary and terminal on stem and branches; involucres broadly obconic-campanulate, truncate-concave at base; involucral bracts narrow, often squarrose. **Florets** yellowish to purplish or white, linear. **Flowering time** Feb., Mar.? **Pappus** of many barbellate bristles. **Cypselae** compressed-turbinate, obscurely 10-ribbed, densely strigose-hispid, glandular-viscid. Wooded and submontane grassland, on rocky hillsides or grassy plains in doleritic or sandy soils, alt. 152–2 200 m; Sub-Escarpment Grassland (Maclear District).

capensis Less.

Prostrate herb, up to 0.6 m high; root perpendicular, stems many from the crown, decumbent, tomentose. **Leaves** concolorous, narrowly oblong-lanceolate, tomentose on both sides. **Capitula** disciform; involucral bracts with outer ones squarrose, acuminate, cobwebbed or glabrous, inner ones lanceolate, erect. **Disc florets** ± equal to pappus

in length. **Pappus** of disc florets dimorphic; base of inner pappus scale-like for $^1/_3$ the length, upper part plumose. **Cypselae** of disc florets furrowed. Stony hillsides; Upper Karoo, Albany Thicket (Middelburg S to Sundays River and Graaff-Reinet).

macrocephala DC.

Perennial herb, up to 0.2 m high; procumbent; from a woody taproot; stems several. **Leaves** subspathulate-oblanceolate, elliptic in upper half and narrowing, base narrowly semi-amplexicaul, acute at apex, margins obscured subserrate, uniformly silvery-grey thinly appressed-lanate on upper surface, more densely so beneath. **Capitula** few–many, solitary and terminal on branches or short-shoots, subsessile, usually axillary, subtended by several leaves and leaf-like bracts; involucre campanulate; involucral bracts many, stiffly chartaceous to subcoriacous with narrow membranous margins. **Florets** purplish. **Flowering time** Dec., Jan.? **Pappus** several-seriate of many barbellate setae. **Cypselae** turbinate, strongly 10-ribbed. Poor stony soils, alt. 550–2 745 m; Sub-Escarpment Grassland (Queenstown).

picta (Thunb.) Druce

Knoppiesdoringbossie (A)

Perennial, dwarf shrub, 0.3–0.6 m high; often tomentose. **Leaves** alternate, occasionally subrosulate, sessile, usually discolorous. **Capitula** discoid; involucral bracts in many rows, pungent, glabrous. **Receptacle** flat, epaleate. **Florets** rose pink; tube of bisexual floret dilated above, deeply 5-lobed; neuter florets narrowly tubular, subbilabiate or subradiate. **Anthers** linear, sagittate at base, produced into long, retrorse-ciliate tails, apical appendage lanceolate. **Style** terete, slightly swollen at base, bifid at apex, apex obtuse with minute sweeping hairs. **Flowering time** Nov.–Feb. **Pappus** of various bristles in several rows; bristles scabrid to barbellate to plumose, apically pilose. **Cypselae** obovoid to obconical, ribbed, pilose. Stony or rocky soil, alt. 520–1 020 m; Albany Thicket (Uitenhage).

DIMORPHOTHECA Vail. ex Moench

(Calenduleae)

Species 19, sthn Afr., Angola and Zimbabwe, widespread.

1a Disc flowers bisexual, fertile

cuneata (Thunb.) Less.

Bride's bouquet; *karoo bietou*, *witgousblom*, *witbietou* (A)

Semi-woody, perennial, rounded shrub, 0.01–1.00 m high, young parts of plant are densely gland-dotted and sticky. **Leaves** oblong and characteristically toothed along margins, sticky and aromatic when young. **Capitula** with ray florets white above, purple interspersed with copper on reverse; disc florets yellow. **Flowering time** May–Sept. **Cypselae** either large, rounded, flat, winged or much smaller, narrow, wingless with warty surface. In stony and shale ridges, grassland; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Albany Thicket, Rainshadow Valley Karoo (Aliwal North, Lady Grey, inland to Mountain Zebra National Park, S to Port Elizabeth).

zeyheri Sond.

Bietou, *jakkalsblom* (A)

Perennial herb, with stems 0.05–0.30 m high; stems short, tufted, simple, scaberulous, ending in naked peduncles. **Leaves** linear-lanceolate or linear, either entire or coarsely

few-toothed, pinnatifid, and occasionally pinnatipartite. **Capitula** with ray florets white above, and bluish, purplish brown or brownish golden beneath. **Flowering time** all year. **Cypselae** of ray florets triquetrous, angles crenate-toothed, faces rugulose and gland-dotted, cypselae of disc florets flat, with wide thickened rim, occasionally 3-winged. Streambanks, mountain slopes and ridges, alt. 155–2 835 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Indigenous Forests (Aliwal North, inland to Graaff-Reinet E to Alexandria).

1b Disc flowers male
2a Ray flowers white on upper side

caulescens (Harv.) Harv.

Bietou (A); *bohlahlo*, *mohlahlo*, *phela* (SS)

Tufted, glandular-hispid, perennial herb, up to 0.3 m high, stiffly hairy; stems several from a woody stock, often contracted. **Leaves**: cauline ones shorter and narrower than basal ones, linear-lanceolate or lanceolate, narrowed to a petiole-like, clasping base, apex acute or subacute, mucronate; basal leaves up to 150 × 20 mm, margins entire, or with few, hard teeth, wavy, narrowed to stalk-like base, repand or remotely callose-denticulate. **Capitula** terminal, solitary, ± 40 mm in diam. **Ray florets** creamy white above, bluish mauve beneath. **Disc florets** whitish. **Flowering time** Sept.–Mar. **Cypselae** ± 6 mm long, obovoid, 3-angled. Grassland, rocky ridges, dolerite, sandstone, alt. 1 200–2 100 m; Drakensberg Grassland, Mesic Highveld Grassland, Sub-Escarpment Grassland, Upper Karoo, Indian Ocean Coast Belt, Indigenous Forests, Lower Karoo, Albany Thicket (Aliwal North, Mkambathi, inland to Aberdeen E to King William's Town).

ecklonis DC.

Cape marguerite, Van Staden's River daisy, Sunday's River daisy, white daisy bush, blue-and-white daisy bush, marigold; *bergbietou*, *Kaapse magriet*, *jakkalsbos* (A)

Suffruticose or perennial plant, up to 1 m high, erect to decumbent, sometimes woody at base. **Leaves** alternate, linear-lanceolate or lanceolate, sessile, simple, elliptic, slightly succulent and margins entire to conspicuously dentate, crowded at ends of branches; lower branches quite hairless. **Capitula** up to 80 mm in diam.; borne singly or in a few groups at end of branches on short stalks (peduncles). **Ray florets** long, bright white on upper side and light blue or violet on lower side. **Disc florets** dark blue or purple. **Flowering time** Sept.–May. **Cypselae** of ray florets smooth, obovoid and triangular. Quartzite, alt. 200–350 m; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket, Indigenous Forests (Humansdorp to Uitenhage).

fruticosa (L.) Less.

Creeping marguerite; *rankmagriet* (A)

Sprawling, slightly succulent herb, stems 3–4 mm in diam., older parts woody and often leafless, decumbent or ascending, rooting where they touch ground, young shoots herbaceous, leafy. **Leaves** ± 100 × 25 mm, often rosetted, obovate, spathulate or oblanceolate, apex obtuse, mucronate, narrowed to petiole-like clasping base, margins entire or remotely callose-denticulate, slightly fleshy, rough-hairy. **Capitula** ± 40 mm in diam. **Ray florets** white above, bluish mauve beneath. **Disc florets** mauve. **Flowering time** all year. **Cypselae** 6–7 mm long, narrowly obovoid, 3-angled. Coastal sand dunes, grassland, alt. 0–50 m; Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal

Belt, Dry Highland Grassland, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Mkambathi, inland to Amabele S to East London).

2b Ray flowers purple-red on upper side

barberiae Harv.

Bergbietou (A)

Suffruticose, perennial herb, 0.2–0.6 m high, straggling, minutely glandular-pubescent. **Leaves**: lower ones often attenuate at base, oblong-lanceolate, upper sessile; acute or subacute, distantly callose-denticulate or quite entire. **Ray florets** deep bright purple on upper surface, dull purple beneath. **Disc florets** purple. **Flowering time** Aug.–Feb. Grassy slopes at the coast, as well as inland, alt. 0–500 m; Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket, Indigenous Forests (Keiskammahoek, King William's Town, Kentani, East London).

jucunda E.Phillips

Trailing pink daisy; *bergbietou*, *bloutou* (A); *umasigcolo-nkonakazi* (Z)

Spreading, rhizomatous, glandular-hispid, perennial herb, 0.2–0.5 m high, stems long, erect or trailing, leaves ± rosetted or cauline, young parts leafy throughout. **Leaves** 60–150 × 20 mm, linear-lanceolate or lanceolate, decreasing in size upwards, narrowed to petiole-like, clasping base, apex usually acute, margins entire, repand or remotely callose-toothed. **Capitula** terminal, solitary, up to 150 mm long, ± 60 mm in diam.; involucral bracts subbiseriate, lanceolate, ± 10 mm long, glandular, ciliate. **Ray florets** pink, coppery-buff-coloured below. **Disc florets** yellow, tipped black. **Flowering time** Sept.–Apr. **Cypselae** ± 5 mm long, obovoid-ellipsoid, 3-angled. In moist rocky grassland, broken cliffs, gullies, on cave sandstone cliffs, alt. 1 000–3 200 m; Mesic Highveld Grassland, Drakensberg Grassland, Dry Highveld Grassland (Barkly East, inland to Kokstad, Suurberg S to Maclear).

DISPARAGO Gaertn.

(Gnaphalieae)

[= *GONGYLOGLOSSA* Koekemoer *ined.*, *LAEVICARPA* (Koekemoer) Koekemoer *ined.*]

Species 5, endemic to sthn Afr., KZN, WC, EC.

kraussii Sch.Bip.

Small, dwarf shrublet, 0.15–0.50(–0.80) m high. **Leaves** linear, 4.0–8.0 × 0.3–0.5 mm, spirally twisted. **Synflorescence** globular or ovate. **Capitula** heterogamous, radiate, 2-flowered, with one ray and one disc floret. **Ray florets** sterile, lobe 1.8–2.2 × 0.7–1.5 mm, usually white or sometimes pink; cypselae reduced. **Disc florets** bisexual; lobes spreading star-like. **Flowering time** Feb.–Aug. **Pappus** present in disc florets only, (3–)5(–8) plumose setae. **Cypselae** puberulous, hairs falcate. Low alt. Fynbos areas on sandy, open flats, where restioid component is short, alt. 0–300 m; Albany Thicket (WC and a single collection from the Farm Sonop in the Koega region).

kolbei (Bolus) Hutch.

[= *Amphiglossa kolbei* Bolus, *Laevicarpa kolbei* (Bolus) Koekemoer *ined.*]

Shrublets, 0.1–0.3 m high, very old plants up to 0.7 m high and ± 1.5 m in diam. **Leaves** filiform to lanceolate, 2.0–4.0 × 0.3–0.5 mm. **Synflorescence** terminal,

clusters of 1–3(–5) capitula, florets homochromous, pink. **Capitula** heterogamous, radiate, 4–8-flowered. **Ray florets** 2 or 3, pink, female, fertile. **Disc florets** 2 or 3, pink, tubular, bisexual. **Flowering time** Aug.–Dec. **Pappus** present in all florets, 8–12 bristles; densely plumose above. **Cypselae** identical and fertile in both ray and tubular florets, cylindrical. High alt. Fynbos areas in short, open veld, alt. 1 200–1 800 m; Eastern Fynbos-Renosterveld (WC to Antoniesberg).

tortilis (DC.) Sch.Bip.
[= *Gongyloglossa tortilis* (DC.) Koekemoer *ined.*]

Shrub, up to 1 m high. **Leaves** linear, 4–8(–10) mm long, spirally twisted, margins tightly involute, upper surface woolly. **Capitula** in dense, globose arrangements, homogamous, radiate or discoid, 1-flowered, either a disc or a ray floret; involucre 6–8 bracts. **Ray florets** female, shades of pink to white, lobe 2.7–3.3 mm long. **Disc florets** bisexual, matching colour of ray florets. **Nectaries** present. **Flowering time** Oct.–Mar. **Pappus** usually of 5 plumose bristles up to 20 in robust forms in winter rainfall area, sporadically in other areas. **Cypselae** fertile, surface puberulous. Rocky, sandy plains, slopes and ridges throughout Fynbos, pioneer in disturbed areas, alt. 0–1 500 m; Eastern Fynbos-Renosterveld, Albany Thicket, Indian Ocean Coastal Belt (widespread along S and E coast, not more than 150 km inland, to Dweza State Forest in Transkei).

DISTEPHANUS Cass.

(Vernonieae)

Species 24, palaeotropical; 4 in sthn Afr., N, B, LIM, M, S, KZN, EC.

angulifolius (DC.) H.Rob. & B.Kahn
Impoqompoqwane (Z)

Perennial shrub, 1–6 m high; scandent or climber; branches usually opposite or subopposite, striate, puberulous, glandular. **Leaves** mostly opposite, membranous, petiolate; deltate-ovate, base truncate or abruptly cuneate and decurrent on petiole, apex subacute to obtuse, margins coarsely 3–9-toothed to sublobate; sparsely pilose to glabrescent on upper surface, puberulous beneath. **Capitula** many in moderately dense clusters; borne in upper leaf axils and terminal on branches; involucres obconic-campanulate; involucral bracts several-seriate, margins narrowly membranous, lamina puberulent outside. **Florets** sweetly scented; corollas pale mauve to creamy white. **Flowering time** July–Dec. **Pappus** of outer short, linear, seta-like scales, inner of white barbellate setae. **Cypselae** narrowly turbinate, sharply to narrowly 5-ribbed. Dune and coast forest margins, alt. 10–500 m; Indigenous Forests (Port St Johns).

anisochaetoides (Sond.) H.Rob. & B.Kahn
Ikhambi-lesimungumungwane (Z)

Perennial shrub, up to 3 m high; vigorously scandent or climbing; branches alternate, striate, puberulent and glandular to glabrescent. **Leaves** alternate, petiolate, broadly ovate to cuneate-rhomboid, bases broadly cuneate to abruptly narrowed before tapering onto petiole, gland-pitted beneath; upper leaves smaller, ovate-elliptic, base acuminate, apex rounded to acute. **Capitula** many in large, stiffly, divaricately branched panicles; stalks strongly ribbed, bracteate; involucres broadly campanulate; involucral bracts several-seriate, margins narrowly membranous; outer ones short, narrowly triangular; inner ones lanceolate to linear-oblong, subacute. **Florets** sweetly scented; corollas pale

mauve fading to creamy white. **Flowering time** July–Sept. **Pappus** 2-seriate, outer of short linear scales, inner of barbellate setae. **Cypselae** narrowly subcylindric, sparsely hispidulous, glandular. Forest and riverine vegetation of coastal areas, alt. 0–1 518 m; Indigenous Forests, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Port St. Johns, Seymour, Grahamstown, Humansdorp).

DOELLIA Sch.Bip. emended Anderb.

(Inuleae)

Species 2, Africa, Arabia and Madagascar; 1 in sthn Afr., N, B, LIM, G, M, S, KZN, EC.

cafra (DC.) Anderb.

Annual or short-lived perennial herb, 0.6–1.0 m high. **Leaves** alternate, sessile, base rounded and auriculate, oblong to oblong-lanceolate, acute, glabrous to sparsely hairy, margins serrate or serrulate. **Capitula** disciform, in a lax, terminal corymb, pedunculate; peduncles straight, capitula held erect; involucral bracts linear-lanceolate, purplish, silky hairy. **Outer female florets** filiform, in many rows, purplish. **Disc florets** few, tubular, widening upwards, 5-lobed, purplish. **Flowering time** Mar., Nov. **Pappus** of scabrid bristles, soon caducous. **Cypselae** cylindrical, hairy. Marshy or moist sandy places, streambanks, alt. 10–2 000 m; Albany Thicket (widespread, few recorded in Grahamstown District).

Can be confused with *Pulicaria scabra*, but that species has yellow florets and outer female florets are shortly radiate, arranged in only 1 or 2 rows.

DOLICHOTHRIX Hilliard & B.L.Burtt

(Gnaphalieae)

Species 1, endemic to Fynbos of sthn Afr., WC, EC.

ericoides (Lam.) Hilliard & B.L.Burtt

Rock rhenoster

Woody, dwarf shrub, 0.1–0.2 m high. **Leaves** small, scale-like, tightly appressed, < 2 mm long, upper surface woolly-hairy; lower surface arachnoid, very densely glandular. **Capitula** homogamous, discoid, 6–8 × 8 mm, 1–3 terminal, 24–28-flowered, funnel-shaped; involucral bracts 48–52, in several rows, reflexed in upper third, apex opaque, milky-white. **Florets** ± 3.5 mm long, scarcely widening towards lobes, reddish. **Nectaries** absent. **Flowering time** sporadic, mainly Dec.–Mar., rarely in Aug. **Pappus** of 18–24 bristles, fused at base. **Cypselae** very densely hairy with twin-hairs. Mountainous areas, rock crevices in sandstone, alt. 1 100–2 300 m; Lower Karoo, Eastern Fynbos-Renosterveld (WC, and from a single collection near Jansenville).

*__ECLIPTA__ L.

(Heliantheae)

Species 3 or 4 pantropical; weed in warmer regions of the world, preferring damp conditions; 1 introduced weed in sthn Afr., N, B, LIM, M, S, KZN, EC.

prostrata (L.) L.

Erect or decumbent, annual herb, 0.3–1.0 m high; scabrous-pubescent. **Leaves** opposite, up to 120 × 25 mm, lanceolate to elliptic, margins irregularly toothed. **Capitula** hemispherical, up to 15 mm in diam., on 70 mm long peduncles; involucral bracts

elliptic or acute. **Ray florets** white, inconspicuous. **Flowering time** Jan.–Mar. **Cypselae** 3 mm long, oblong-ovate in outline, ± compressed, strongly wrinkled or tuberculate, reddish brown, apex truncate, crowned with a small shallow cupule. Weeds along rivers, water furrows and pans, alt. 2–1 005 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Transkei to Kei River Mouth).

ELYTROPAPPUS Cass.

(Gnaphalieae)

(= *DICEROTHAMNUS* Koekemoer *ined.*)

Species 5, endemic to sthn Afr., NC, WC, EC.

adpressus Harv.

[= *D. adpressus* (Harv.) Koekemoer *ined.*]

Wyfierenosterbos, *lady renoster* (A)

Low, erect shrub, up to 0.45 m high, with rigid, whip-like branches and a yellow-green colour. **Brachyblasts** short. **Leaves** ericoid, closely appressed, 2.0–2.5(–5.0) mm long, at least 5× longer than wide, very densely glandular underneath woolly hairs. **Capitula** 3(4)-flowered, solitary in the upper 1–20 leaf axils, often arranged spike-like; involucral bracts ± 15, innermost bracts ± 5 in a single row, hyaline, up to 5 × 1 mm, apex acute. **Florets** up to 4 mm long. **Flowering time** mainly from Feb.–May, occasionally June–Sept. **Pappus** of 14–18 bristles. **Cypselae** bilaterally symmetric, smooth on outer side, with 4 ribs on inner side. Rocky soils, alt. 500–1 700 m; Eastern Fynbos-Renosterveld (WC to Joubertina).

rhinocerotis (L.f.) Less.

[= *D. rhinocerotis* (L.f.) Koekemoer *ined.*]

Renosterbos (A)

Shrub, up to 1.8 m high, generally grey-green. **Brachyblasts** profusely branched into fine-flowering shoots. **Leaves** generally scale-like and closely appressed, 1.5 × 0.5 mm, very densely glandular under a matted layer of hairs. **Capitula** (2)3-flowered, solitary or in groups of 2–4; involucral bracts ± 20, innermost lanceolate, up to 4 × 1 mm, chaffy, apex of innermost bracts rounded and slightly winged on sides. **Florets** up to 3 mm long. **Flowering time** mainly in Mar.–June, occasionally in Feb., July, Aug. **Pappus** of 10–18 bristles. **Cypselae** up to 2 mm long, bilaterally symmetric, outer side smooth, inner side with 3 or 4 ribs. Mountain fynbos, dry aspects in high rainfall areas, moist slopes in drier situations, alt. 200–1 900 m; Upper Karoo, Dry Highveld Grassland, Eastern Fynbos-Renosterveld, Lower Karoo, Albany Thicket, Sub-Escarpment Grassland, Drakensberg Grassland (Sneeuberg and Stormberg Escarpments S to Cathcart, Willowmore, Humansdorp and Grahamstown Districts).

ERIOCEPHALUS L.

(Anthemideae)

Wild rosemary; *kapokbosse* (A)

Species 32, endemic to sthn Afr., widespread, but absent in G, S, KZN.

1a Capitula radiate
2a Leaves mostly alternate, sometimes opposite

capitellatus DC.

Kapokbos (A)

Slender, erect, conical shrub, 0.25–1.20 m high. **Leaves** mostly alternate, rarely opposite, palmatisect to pinnatisect, sometimes entire, delicately sericeous with underlying felted layer, giving them a blue-green to grey-green appearance. **Capitula** radiate, small, in terminal spike or spicate-racemose, subsessile; involucral bracts 4, oval to ovate, with central green part and broad membranous margins, finely appressed sericeous. **Receptacle** paleate, those of ray florets connate, hairy on outside, those of disc florets free. **Ray florets** 1 or 2(3), white. **Disc florets** 1–4(–13), infundibuliform, creamy white with red-purple tint. **Flowering time** May, June. **Pappus** absent. **Cypselae** oblong, flattish, trigonous, long-lanate. Mountain slopes, alt. 900–2 000 m; Lower Karoo, Eastern Fynbos-Renosterveld (Steytlerville area).

tenuipes C.A.Sm.

Kapokbos (A)

Many-stemmed, much-branched shrub, 0.4–1.0 m high. **Leaves** mostly alternate, sometimes opposite, linear to linear-oblong to clavate, entire, rarely with 1 or 2 lobes, initially silvery sericeous, glabrescent, matt green. **Capitula** radiate, in terminal and lateral, umbellate racemes, pedunculate. **Peduncle**s longer than subtending leaves; involucral bracts 4 or 5, elliptic-oblong to broadly ovate, with broad membranous margins. **Receptacle** paleate, those of ray florets connate, hairy on outside, those of disc florets free. **Ray florets** 2 or 3, white. **Disc florets** 8–12, infundibuliform to trumpet-shaped, yellow with red-purple tinge. **Flowering time** Mar. **Pappus** absent. **Cypselae** oblong to obovoid, slightly trigonous. Hillsides, alt. 900–2 500 m; Eastern Fynbos-Renosterveld (restricted to Langkloof and Kouga mts).

2b Leaves decussate or opposite, rarely alternate

africanus L.

Cape of Good Hope shrub, hardeveld rosemary, rosemary, wild rosemary, clustery leaved scentwort; *bittermaryn*, *blomkapok*, *hardeveldroosmaryn*, *kapokbossie*, *renosterveldkapok*, *roosmaryn*, *wilde roosmaryn* (A)

Much-branched, spreading to erect, conical shrub, 0.3–0.6 m high. **Leaves** mostly opposite, alternate on flowering shoots, linear, mostly entire, sometimes 1- or 2-dentate to pinnatisect with 3 lobes, silver-grey or silver-white sericeous, sometimes glabrescent. **Capitula** radiate, in terminal or lateral umbellate racemes or paniculate, subsessile to distinctly pedunculate; involucral bracts 4–6, oblong, ovate, obovate or lanceolate with light brown to red-purple membranous margins. **Receptacle** paleate, those of ray florets connate forming a cylindrical sheath, hairy on outside, those of disc florets free. **Ray florets** 3 or 4, white to pale red-purple. **Disc florets** 2–27, tubular to trumpet-shaped, red-purple or yellow below, red-purple above. **Flowering time** July–June. **Pappus** absent. **Cypselae** oblong to obovoid, compressed, long-hairy. Common in fynbos, on mountain slopes and peaks, grassland, coastal bush, among rocks, along roadsides, alt. 100–3 000 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (WC E to East London).

aromaticus C.A.Sm.

Kapokbos (A)

Erect, much-branched shrub, up to 0.6 m high. **Leaves** decussate, oblong to linear-oblong, entire, shiny, glabrous except for felty, axillary buds. **Capitula** radiate, racemose or umbellate-racemose, shortly to distinctly pedunculate; involucral bracts 4, ovate to broadly ovate, central part green to purple with broad membranous margins. **Receptacle** paleate, those of ray florets connate, hairy on outside, those of disc florets free. **Ray florets** 2 or 3, white. **Disc florets** 13–18, infundibuliform, lower part yellow, upper part red-purple. **Flowering time** Aug. **Pappus** absent. **Cypselae** oblong-ovoid, slightly flattened. Mountain slopes and summits, alt. 900–1 500 m; Eastern Fynbos-Renosterveld (WC Mts E to Willowmore).

eximius DC.

Grootbergkapok(bossie) (A)

Much-branched, rigid shrub, 0.3–0.6 m high, sometimes spinescent. **Leaves** opposite, densely imbricate, linear, entire, permanently silvery sericeous. **Capitula** radiate, solitary, terminal, rarely 2–4 in terminal racemes, sessile or subsessile; involucral bracts 4, broadly ovate, margins purple. **Receptacle** paleate, those of ray florets partly or totally connate, glabrous but long-pilose on margins, those of disc florets free. **Ray florets** 3 or 4, white or pale to dark red-purple. **Disc florets** 26–35, tubular, widening in upper part. **Flowering time** Feb.–Aug., Dec. **Pappus** absent. **Cypselae** lanceolate to ovoid, flattened, densely hairy. Mountain slopes and summits, alt. 1 000–2 400 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland (Joubert Pass E to Rhodes southwards, from Lootsberg Pass to Wasbankspruit and to Bankberg in the Mountain Zebra National Park).

karooicus M.A.N.Müller

Doringkapok(bossie), *kleinkapokbossie*, *silwerkapokbossie*, *volstruiskapok*, *wilde dagga* (A)

Spinescent, much-branched shrub, 0.15–0.45 m high. **Leaves** decussate, obtuse-triangular to linear-lanceolate, entire, permanently silver- to green-grey sericeous. **Capitula** small, radiate, sessile, terminal, solitary or spicate; involucral bracts 4, with thickened green to purple central part and transparent margins, hairy. **Receptacle** paleate, all paleae free, hairy on outside. **Ray florets** 2 or 3, white. **Disc florets** 4–10, trumpet-shaped, white to pale yellow to yellow with red-purple lobes. **Flowering time** Aug.–Oct., Mar. **Pappus** absent. **Cypselae** oblong, slightly flattened, densely lanate. Rocky slopes and bases of hills, alt. 0–300 m; Upper Karoo, Dry Highveld Grassland (FS, NC to Middelburg area).

tenuifolius DC.

Bergkapok, *boegoekapok*, *klein-bergkapokbossie* (A)

Erect, many-stemmed shrub, 0.3–1.3 m high. **Leaves** opposite but sometimes alternate on flowering shoots, linear, entire, sparsely felty, glabrescent, pale green to yellow-green, greenish shiny white. **Capitula** radiate, in umbellate racemes, terminal, pedunculate. **Peduncle**s as long as or shorter than subtending leaves; involucral bracts (4)5, with broad membranous margins. **Receptacle** paleate, those of ray florets connate, hairy on outside, those of disc florets free. **Ray florets** 2 or 3, white, sometimes with red-purple tinge. **Disc florets** 13–22, trumpet-shaped, red-purple. **Flowering time** June–Oct. **Pappus**

absent. **Cypselae** oblong, slightly flattened, long-lanate. Mountain plateaus, hillsides, among rocks, alt. 1 000–2 500 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland (Lady Grey southwards, from Middelburg to Sterkstroom and from Pearston to Amatole Mts).

1b Capitula disciform

ambiguus (DC.) M.A.N.Müller

Doringkapok, *grootdoringkapokbos*, *steekmaryn* (A)

Many-stemmed, erect, much-branched, spinescent shrub, 0.3–0.6 m high. **Leaves** alternate or rosulate, linear, entire, densely silver-grey pilose. **Capitula** disciform, solitary, rarely in terminal racemes, shortly to distinctly pedunculate; involucral bracts 4 or 5, ovate, green with narrow membranous margins, hairy. **Receptacle** paleate, all free, hairy on outside. **Outer female florets** 2–5, corolla rudimentary, yellow. **Disc florets** 5–21, corolla tubular, widening upwards, yellow, sometimes tinged red-purple. **Flowering time** Mar. **Pappus** absent. **Cypselae** oblong-ovoid, compressed, long-hairy. In low-lying areas in sandy and clayey soils, alt. 0–300 m; Lower Karoo (widespread, WC to Aberdeen area). Can be confused with *E. karooicus*.

ericoides (L.f.) Druce

Rosemary, wild rosemary; *bergroosmaryn*, *bittermaryn*, *gladdekapokbos*, *grootkapokbos*, *kapokbos*, *regtekapok*, *renosterveldkapok*, *roosmaryn*, *sandveldkapokbos* (A)

Erect, many-stemmed, relatively sparsely branched, conical or broom-like shrub, 0.3–1.0 m high. **Leaves** opposite or decussate, rarely alternate on flowering shoots, small, linear, entire, initially densely felty, glabrescent, shiny, bright green (in subsp. *ericoides*). **Capitula** disciform, spicate racemose or racemose or solitary, rarely paniculate, sessile to shortly pedunculate; involucral bracts 4, ovate to lanceolate, central part herbaceous, green with broad, purple, membranous margins. **Receptacle** paleate, all paleae free, hairy on the outside. **Outer female florets** (1)2, corolla tubular-filiform, yellowish. **Disc florets** (1)3–5(7), tubular to trumpet-shaped, red-purple, sometimes yellow towards base. **Flowering time** Feb.–May. **Pappus** absent. **Cypselae** oblong to oblanceolate, slightly flattened, long-lanate. Mountain slopes, rocky ridges, foot of mountains, alt. 350–1 700 m; Upper Karoo, Dry Highveld Grassland, Lower Karoo, Sub-Escarpment Savanna, Albany Thicket (Oviston to Albert District southwards, from Nieu-Bethesda to Hofmeyr, Graaff-Reinet to Gwarriepoort and to Great Winterhoek Mts).

glandulosus M.A.N.Müller

Kapokbos (A)

Many-stemmed, spinescent shrub, 0.2–0.6 m high. **Leaves** decussate, densely imbricate, obtuse triangular to linear, entire, initially sparsely felty, soon glabrous, shiny, bright green, often with red-purple tinge. **Capitula** 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** paleate, all paleae free, hairy on outside. **Outer female florets** 2, white, with short strap-shaped lamina. **Disc florets** 10–18, trumpet-shaped to infundibuliform, red-purple. **Flowering time** Mar. **Pappus** absent. **Cypselae** oblong to ovoid, slightly flattened, long-lanate. Plains, alt. 500–1 500 m; Upper Karoo (WC east to Middelburg area).

racemosus L.

Bossieveldroosmaryn, *kapkappie*, *rivierkapok*, *roosmaryn*, *sandveldkapok*, *sandveldse roosmaryn*, *strandveldkapok* (A)

Slender, erect shrub, 1.2–2.0 m high. **Leaves** alternate, rarely opposite, linear to narrowly lanceolate or obtuse-triangular, entire, succulent, permanently grey-felty. **Capitula** disciform, racemose or paniculate, sessile to very shortly pedunculate (in var. *racemosus*); involucral bracts 4 with red-purple, membranous margins. **Receptacle** paleate, those of ray florets connate, hairy on outside, those of disc florets free. **Marginal female florets** (1)2, white to pink. **Disc florets** (4–)7–9, widening upwards, yellow-green to yellow with purple-red margins. **Flowering time** no flowering specimens in PRE from EC, but June–Sept. (Nov.) according to literature. **Pappus** absent. **Cypselae** ovoid-oblong, slightly flattened, densely lanate. Near the coast, alt. 0–100 m; Eastern Fynbos-Renosterveld, Albany Thicket (Lambert's Bay to Port Elizabeth and Humansdorp).

*ETHULIA L.f.

(Vernonieae)

Species 19, tropical Africa and less commonly in tropical Asia; 1 introduced weed in sthn Afr., N, B, LIM, G, M, S, KZN, EC.

conyzoides L.f.

Blue weed, carter's curse: *umsokosoko* (Z)

Annual, occasionally perennial herb or shrub, 0.45–2.00 m high. **Leaves** alternate, shortly petiolate, ovate-lanceolate to linear. **Capitula** discoid; several- to many-flowered, in much-branched corymbs; involucre campanulate or subhemispherical; bracts herbaceous, in 3–many rows, imbricate. **Receptacle** flat, epaleate. **Florets** mauve or purple; tube cylindric below, shallowly campanulate above; lobes 5, lanceolate. **Anthers** obtuse at base, with short, ovate, membranous apical appendage. **Style** branches filiform, subulate; pollen-sweeping hairs relatively long, exserted. **Flowering time** Jan.–Aug. **Pappus** absent. **Cypselae** oblong-obconical, usually strongly 2–6-ribbed. Forest, bare rock, alt. 2–2 200 m; Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Port St Johns, Kentani District, Kei River Mouth, East London).

EUMORPHIA DC.

(Anthemideae)

Species 6, endemic to sthn Afr., LIM, M, S, FS, KZN, L, WC, EC.

dregeana DC.

Erect shrub, 0.3–1.0 m high, young branches softly hairy. **Leaves** small, linear, decussate, densely imbricate, more distant on flowering branches, entire or sometimes 3-lobed at apex, initially with some longish hairs becoming glabrous. **Capitula** radiate, terminal, corymbose, pedunculate; involucral bracts imbricate, narrowly ovate, with orange oil glands at outer apex of outer involucral bracts. **Receptacle** paleate, paleae enveloping disc florets. **Ray florets** white or pink. **Disc florets** yellow. **Flowering time** Feb.–Apr. **Pappus** absent. **Cypselae** narrowly cylindric, ribbed, glabrous. Grassland, mountain slopes and plateaus, alt. 1 311–1 980 m; Dry Highveld Grassland, Upper Karoo, Albany Thicket (Kompasberg, Sneeuberg, Wapadsberg and Oudeberg).

prostrata Bolus

Low spreading shrub, often prostrate, stems 0.17–0.60 m long. **Leaves** opposite, linear or 2- to 3-forked, silky silvery, with hairs appressed. **Capitula** radiate, solitary, terminal, shortly pedunculate; involucral bracts imbricate, villous, without oil glands on inner surfaces. **Receptacle** epaleate or with a few marginal paleae. **Ray florets** white sometimes tinged pink. **Disc florets** yellow. **Flowering time** Dec.–Feb. **Pappus** absent. **Cypselae** narrowly cylindric, closely ribbed, crowned with a thickened rim. Grassland on escarpment cliffs and mountain slopes, alt. 1 830–2 970 m; Drakensberg Grassland (small area in the high Drakensberg, borders of KZN, L).

sericea J.M.Wood & M.S.Evans

Much-branched dwarf shrub, 0.2–2.0 m high. **Leaves** opposite, linear or digitately 3-lobed, grey silky-woolly, with hairs fluffed up from leaf surface (subsp. *sericea*), or indumentum thinner and bush appearing green (subsp. *robustior*). **Capitula** radiate, solitary, terminal, shortly pedunculate; involucral bracts imbricate, villous, with large orange oil glands on inner surfaces. **Receptacle** paleate. **Ray florets** usually white, sometimes rose-pink. **Disc florets** yellow. **Flowering time** Nov.–May. **Pappus** absent. **Cypselae** narrowly cylindric, closely ribbed, crowned with a thickened rim or corona. Montane grassland, often near streams, alt. 2 073–3 414 m; Drakensberg Grassland (high Drakensberg of KZN, L and EC).

EURYOPS (Cass.) Cass. emend. B.Nord.

(Senecioneae)

Key to sections

Based on Nordenstam (1968).

(section 2. *Euryops* absent from EC)

1a Pappus present, shrubs, undershrubs or perennial herbs:
2a Peduncles lateral, axillary ..... section 1. **Angustifoliae**
2b Peduncles (pseudo-)terminal at branch tips and branching points:
3a Capitula distinctly pedunculate; peduncles 10–350 mm long (peduncles sometimes only 5 mm long) ... . section 3. **Chrysops**
3b Capitula sessile or nearly so; peduncles up to 8 mm long (rarely elongating postflorally up to 20 mm) .. .. section 4. **Brachypus**
1b Pappus absent:
4a Shrubs or shrublets ..... section 5. **Psilosteum**
4b Caudex subterranean, thick and lignified; aerial stems herbaceous or suffrutescent ... **E. laxus** (section 3)

Section 1. ***Angustifoliae*** S.Moore emend. B.Nord.

Shrubs or shrublets, glabrous or sometimes pubescent. **Leaves** dense on young branches or often crowded to ± fascicled on brachyblasts, simple or variously lobed or divided, flat or flattened, rounded, leathery or sometimes fleshy or herbaceous. **Inflorescences** lateral, axillary, often corymbose or racemose; peduncles short to long, with or without two lateral, rudimentary or rarely well-developed leaves at base. **Capitula** radiate, sometimes discoid; involucre cup-shaped, hemispherical, campanulate or rarely turbinate, small to medium-sized; bracts uniseriate to ± biseriate, connate to various lengths or sometimes free from base, 2–24. **Receptacle** flat to convex, sometimes hemispherical or conical, shallowly to deeply alveolate. **Ray florets** yellow or orange-yellow, rarely with a red tinge.

Disc florets fertile or sterile. **Pappus** of few–many bristles, white or ± brown. **Cypselae** ± oblong, rarely clavate or pyriform, glabrous or pubescent, rarely papillate, often ribbed, even tuberculate, verrucose or smooth.

1a At least some leaves fascicled or crowded several together on distinct lateral brachyblasts

subcarnosus DC. subsp. **vulgaris** B.Nord.

Resin bush; *soetharpuis* (A)

Erect shrub, 0.3–1.5 m high, few main stems, many short lateral stems and brachyblasts, young stems leafy, soon nude. **Leaves** erect to spreading, 5–35 mm long, usually tripartite from or above middle with 2- or 3-forked, lateral lobes, segments filiform to linear, leathery or ± succulent. **Peduncles** erect or ascending from young stems and brachyblasts, 7–80 mm long. **Capitula** 12 mm in diam.; involucre hemispherical to cup-shaped, 3–8 mm in diam.; bracts 5–9, connate at base, ± ovate, 2.5–6.0 mm long. **Receptacle** ± convex, alveolate. **Ray florets** 5–9. **Disc florets** 8–35. **Flowering time** mostly May–Aug. **Pappus** of 1–2 mm long bristles. **Cypselae** 2–5 mm long, densely hairy, white to brown, mucilaginous when wet. Weed in Arizona, USA, karoo, grassland; Albany Thicket, Lower Karoo (common, Graaff-Reinet to Albert and Albany districts).

1b Leaves evenly and ± closely set on young branches, often imbricate at branch tips, but not fascicled on lateral brachyblasts
2a Leaves or leaf segments < 2.5 mm wide; erect or decumbent shrubs or shrublets; peduncles mostly glabrous, seldom puberulous; leaf margins glabrous or ± ciliate, sometimes sparsely woolly basally or whole leaf shortly puberulous
3a Leaves small, ericoid to subulate or oblong, 2–5 mm long, abaxially convex or keeled; involucral bracts connate, at least basally; cypselae glabrous
4a Leaf margins shortly and rigidly ciliate; involucral bracts connate to $^1/_4$–$^1/_3$; leaves spreading

petraeus B.Nord.

Erect to ascending shrublet, 0.1–0.8 m high, stems closely leafy, nude below with leaf scars. **Leaves** spreading, narrowly oblong, entire, 4–7 mm long, glabrous, underside convex. **Peduncles** lateral in upper leaf axils, 2–8 mm long. **Capitula** 6 mm in diam.; involucre campanulate, glabrous; bracts uniseriate, 5 or 6, ± lanceolate, 3.0–4.5 mm long, 1–3-veined. **Receptacle** ± flat, alveolate. **Ray florets** 2–5, yellow. **Disc florets** 8–13. **Flowering time** Dec., Jan. **Pappus** of many bristles, 1–2 mm long, erect, white. **Cypselae** oblong-obovate, 2.5–3.0 mm long, brown, glabrous, rugose, 5–7 ribs. Montane, rocky places, cliff faces; Drakensberg Grassland, Dry Highveld Grassland, Upper Karoo (very rare, Graaff-Reinet, Molteno).

4b Leaf margins smooth; involucral bracts connate to ± $^2/_3$; leaves appressed to spreading

candollei Harv.

Dense, rounded, bushy clumps, up to 1 m wide, ± 1.5 m high, stems erect or ascending, basally often prostrate, sometimes rooting at nodes, glabrous. **Leaves** erect and appressed or ± spreading, oblong-lanceolate, base flat, dilated, 2–5 mm long, ± keeled. **Peduncles** lateral in leaf axils, erect or suberect, 2–25 mm long. **Capitula** up to 15 mm in diam.; involucre campanulate 2–4 mm long; bracts 6–10, uniseriate, 3-nerved, lobes ± deltoid, ± 1 mm long. **Receptacle** ± flat, alveolate. **Ray florets** 5–8, yellow. **Disc florets** 13–25. **Flowering time** Nov.–Apr. **Pappus** of many bristles, 1.5–2.5 mm long, erect, white. **Cypselae** ± oblong, 2–3 mm long, brown, glabrous, ribs 5–10. Mountain grassland, slopes and rocky places; Drakensberg Grassland (Middelburg and Graaff-Reinet to Maclear and Queenstown).

3b Leaves > 5 mm long
5a Leaves ± flat, ± cuneate, digitately 3–7-lobed, 5–12 mm long; involucre 3–6 mm in diam.; cypselae glabrous

virgineus (L.f.) DC.

Rivierharpuisbos (A)

Compact shrub, 0.5–3.5 m high, glabrous, mostly erect, straight stems, leafy above, later nude below with leaf scars. **Leaves** imbricate to dense, erect to spreading or reflexed, outline ± obovate, leathery. **Peduncles** lateral in upper leaf axils, many in a ± corymb or raceme, 2–30 mm long. **Capitula** up to 10 mm in diam.; involucre ± campanulate; bracts 7–11, uniseriate, connate to middle, 2–5 mm long, 1–3-veined, lobes ± ovate, 1–2 mm long. **Receptacle** ± convex, alveolate. **Ray florets** 5–11, yellow. **Disc florets** 15–30. **Flowering time** mostly June–Dec. **Pappus** of many bristles, 1.5–2.0 mm long, white, barbellate. **Cypselae** oblong, 1.8–2.5 mm long, smooth, shiny yellow or ± brown. Fynbos, karroid scrub, grassland, forest margins; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (Humansdorp to Uitenhage, Alexandria, also cultivated).

5b Leaves not as above, entire or lobed to partite
6a Leaf margins shortly and rigidly ciliate; leaves terete, narrowly oblong; cypselae glabrous

petraeus B.Nord. (see 4a above)

6b Leaf margins smooth (but sometimes weakly ciliate or puberulous towards base); branches glabrous (or puberulous)
7a Peduncles twice as long as leaves or longer
8a At least some leaves tripartite to pinnatipartite; decumbent slender shrublet; leaves 10–25 mm long, acutely apiculate, segments 0.5–1.5 mm wide; peduncles 35–90 mm long; involucral bracts connate to middle or less; rays 5 or 6; cypselae shortly villous

[E]gracilipes B.Nord.

Glabrous shrublet, up to 250 mm high, stems leafy upwards, nude below with leaf bases. **Leaves** dense, erect to spreading, linear, entire or 2- or 3-forked from or above middle, flat, leathery to ± succulent, base dilated. **Peduncles** several, lateral in upper leaf axils, ± erect. **Capitula** up to 10 mm in diam.; involucre cup-shaped to ± campanulate, 4–6 mm in diam.; bracts 8–12, uniseriate, ± oblong to lanceolate, 2.5–3.5 mm long, connate to $^1/_4$–$^1/_3$, 1–3-veined. **Receptacle** ± convex, alveolate. **Ray florets** yellow. **Disc florets** 20–35. **Flowering time** Mar. **Pappus** of few bristles, 0.5–1.0 mm long, white, barbellate. **Cypselae** oblong-obovate, 2.0–2.5 mm long, ribs ± 8, faint. Open scrub; Albany Thicket (very rare, endemic to Fish River Valley).

8b All leaves entire
9a Involucral bracts connate to $^2/_3$–$^4/_5$

rehmannii Compt.

Erect shrub, up to 1.5 m high, often resinous, stems ± glabrous, apically closely leafy, later nude below. **Leaves** erect to spreading, filiform-linear, 5–50 mm long, mostly entire, flat, young leaves ± hairy. **Peduncles** lateral in upper leaf axils, 10–100 mm long, glabrous, longer than leaves, forming a corymb. **Capitula** 20 mm in diam.; involucre cup-shaped, 4–10 mm wide, glabrous; bracts 7–15, uniseriate, lobes ± lanceolate, 4–7 mm long, 3–6-veined, margins entire, apex hairy. **Receptacle** ± convex, alveolate. **Ray florets** 5–13, yellow. **Disc florets** 25–50. **Flowering time** July–Dec. **Pappus** of many bristles, 1–2 mm long, white. **Cypselae** obovate to oblong, 2–3 mm long, often ± curved, appressed papillate, ribs 5–8. Arid fynbos, karoo, on slopes; Albany Thicket, Eastern Fynbos-Renosterveld (Willowmore, Uitenhage, Humansdorp).

9b Involucral bracts connate basally, ± 5; peduncles 5–30 mm long

oligoglossus DC. subsp. **oligoglossus**

Waterharpuis (A)

Rather lax shrub, 0.4–1.7 m high, mostly glabrous, younger stems leafy, later nude with leaf scars. **Leaves** erect to spreading, lanceolate to linear, 5–15 mm long, flat, ± fleshy. **Peduncles** lateral in leaf axils, mostly in an elongated raceme. **Capitula** ± 10–15 mm in diam.; involucre ± campanulate, 3–7 mm wide; bracts 5 or 6, ± uniseriate, ovate to lanceolate, 3–6-veined, free parts 2–5 mm long. **Ray florets** 2–6, yellow. **Disc florets** 10–20, mostly 13. **Flowering time** Dec.–June. **Pappus** of many bristles, 1–2 mm long, white. **Cypselae** ± obovate-oblong, 2–3 mm long, densely white-hairy, mucilaginous when wet, 5 narrow veins. Karroid flats and slopes, dry riverbeds, overgrazed, eroded grassland; Upper Karoo, Drakensberg Grassland, Dry Highveld Grassland (Graaff-Reinet to Steynsburg and Lady Grey).

7b Peduncles usually not distinctly longer than leaves, sometimes up to twice leaf length
10a Cypselae (ovaries) glabrous
11a Leaves flat, narrowly elliptic-oblong, acute or subacute; involucral bracts connate above middle

tysonii E.Phillips

Erect, often dense shrub, up to 1.5 m high, glabrous, stems closely leafy above, nude below with leaf scars. **Leaves** often imbricate, erect to spreading, 10–30 mm long, elliptic to oblong, flat, leathery, midrib distinct, entire, margins smooth or ± denticulate. **Peduncles** lateral in upper leaf axils, ± erect, many on one branch, 15–40 mm long. **Capitula** ± 15 mm in diam.; involucre ± cup-shaped, base ± rounded, 4–7 mm high; bracts 5–7, uniseriate, connate to $^{4}/_{5}$, 3–7-veined, lobes ± deltoid, 1–2 mm long, apex hairy. **Receptacle** ± flat, deeply alveolate. **Ray florets** 5–8, yellow. **Disc florets** 13–30. **Flowering time** mainly Sept.–Apr. **Cypselae** ± oblong, 2.5–3.5 mm long, glabrous, ± brown, ribs faint, 5–8. Montane, scrub, grassland, among rocks, also riverbeds, rarely roadsides; Drakensberg Grassland (Herschel to Elliot and Mthatha).

11b Leaves ± terete, linear to oblong, obtuse and mucronate; involucral bracts connate below middle

annae E.Phillips

Klein bitterharpuis (A); *sehalahala sa qoqolosi*, *sehlakoana se senyenyane* (S)

Dense, rounded, erect shrub, 0.2–1.5 m high, resiniferous, glabrous, stems closely leafy, later nude with leaf scars. **Leaves** ± spreading, mostly linear, entire, 5–20 mm long, thick, leathery. **Peduncles** lateral in apical leaf axils, in a corymb or ± raceme, 5–25 mm long. **Capitula** 5–8 mm in diam.; involucre campanulate, basally narrow, 3–7 mm wide; bracts uniseriate, 5 or 6, connate to $^{1}/_{4}$–$^{1}/_{3}$, veins absent to many-veined, lanceolate to ovate, 3–7 mm long. **Receptacle** flat or ± convex, alveolate. **Ray florets** 2–5, yellow. **Disc florets** 8–20. **Flowering time** Dec.–May. **Pappus** of many bristles, 1–2 mm long, erect, white. **Cypselae** oblong-obovate, 2.0–2.5 mm long, glabrous, brown, ribs 5–8. Grassland, karoo, dominating disturbed veld; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland (Middelburg, Graaff-Reinet to Barkly East, Queenstown, Somerset East).

10b Cypselae (ovaries) pubescent or papillate; involucral bracts connate at least basally
12a Involucral bracts connate to above middle (at least when young)
13a Involucre completely connate when young, splitting into 2–4 broad, rather thin segments

spathaceus DC.

Resin bush; *harpuisbos* (A)

Erect shrub, dense, rounded, 0.3–1.5 m high, glabrous, young stems closely leafy, later nude with rough leaf scars. **Leaves** erect to spreading, filiform to oblanceolate, flat, 10–100 mm long, leathery or ± fleshy. **Peduncles** lateral in upper leaf axils, many on each branch, 10–70 mm long. **Capitula** 15 mm in diam.; involucre campanulate, 5–10 mm wide, segments 3–7 mm long, many-nerved, obtuse, apex hairy. **Receptacle** flat or ± convex, alveolate. **Ray florets** 5–12, yellow. **Disc florets** 15–60. **Flowering time** all year. **Pappus** of many bristles, 1–2 mm long, white, erect. **Cypselae** obovate or pyriform, 3.5–5.5 mm long, densely lanate, hairs white to yellow-brown, ribs 5–8. Rocky places in karroid scrub and bushland; Albany Thicket, Eastern Fynbos-Renosterveld (rather common, Humansdorp to Sneeuberg and East London).

13b Involucral bracts 7–15, ± leathery

rehmannii Compt. (see 9a above)

12b Involucral bracts connate to middle or less
14a Leaves 5–15 mm long, narrowly lanceolate to linear, convex on abaxial side; involucral bracts 5 or 6

oligoglossus DC. (see 9b above)

14b Leaves 10–150 mm long, linear or linear-filiform
15a Involucre campanulate, brown or yellow-brown; leaves linear, flat; cypselae densely silky, not mucilaginous when soaked; pappus short and often sparse, 0.5–1.5 mm long

brevipapposus M.D.Hend.

Erect shrub, 0.5–3.0 m high, mostly glabrous, stems leafy above, nude below with leaf scars. **Leaves** erect to spreading, later reflexed, 15–90 mm long. **Peduncles** lateral and solitary in upper leaf axils, many in a ± corymb, suberect, 30–60 mm long. **Capitula** 15 mm in diam.; involucre 4–6 mm long; bracts 8–12, uni- to biseriate, connate to middle, 3–8-veined, apex hairy. **Receptacle** ± convex, alveolate. **Ray florets** 5–10, yellow. **Disc florets** 15–30. **Flowering time** all year, mostly Sept.–May. **Pappus** of few–many bristles, white. **Cypselae** oblanceolate to obovate, 3–5 mm long, hairs long, white to yellow-brown, 7–10-nerved. Scrub, bushland, open forest, mainly rocky places, riverbanks; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (disjunct, Port St Johns, Port Elizabeth to East London).

15b Involucre hemispherical to cup-shaped; leaves ± terete to flat, linear to filiform; cypselae 1–3 mm long, densely pubescent, usually mucilaginous when soaked
16a Leaves glabrous; peduncle-base with 2 lateral, subulate, 1–2 mm long leaflets; involucral bracts with 3–9 thick and distinct veins; pappus 1.5–2.0 mm long

E?**floribundus** N.E.Br.

Resin bush; *kamdebooharpuis* (A)

Dense, erect, rounded shrub, 0.3–3.0 m high, glabrous, resinous; young stems closely leafy, nude below with leaf scars. **Leaves** erect to spreading, linear, 15–60 mm long, entire or 2- or 3-lobed from or above middle, green or glaucous, lobes 5–30 mm long. **Peduncles** lateral in upper leaf axils, many on each stem in a ± corymb, 10–60 mm long. **Capitula** 10 mm in diam.; involucre 4–10 mm wide; bracts mostly 8, uniseriate,

connate to middle, ovate, 2.5–5.0 mm long. **Receptacle** convex to hemispherical, alveolate. **Ray florets** 6–10, yellow. **Disc florets** 25–50. **Flowering time** Aug.–Feb. **Pappus** of many bristles, white. Scrub and grassland, also weedy. **Cypselae** oblanceolate to clavate, ribs 5–8. Common, weedy; Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Sneeuberg to Grahamstown and Transkei Border).

16b Leaves glabrescent; peduncle-base without lateral leaves; involucral bracts not thick-veined; pappus 0.8–1.5 mm long

tenuissimus (L.) DC. subsp. **tenuissimus**

Grootharpuisbos (A)

Erect shrub, 0.3–2.5 m high, stems glabrous or glabrescent, apically leafy, nude below with leaf scars. **Leaves** erect to reflexed, straight or curved, filiform to linear, 15–150 mm long, mostly entire. **Peduncles** lateral, solitary in upper leaf axils, many in a ± corymb, 20–150 mm long. **Capitula** up to 25 mm in diam.; involucre ± hemispherical, 5–13 mm wide, glabrous; bracts 7–24, uniseriate, 3–6 mm long, connate to $^{1}/_{3}$–$^{1}/_{2}$, 3–7-nerved, lobes ovate to lanceolate, apex hairy. **Receptacle** convex, alveolate. **Ray florets** 8–24, yellow to orange. **Disc florets** 25–150. **Flowering time** July–Dec. **Pappus** of many bristles, white. **Cypselae** ± obovate, ± curved, 1–3 mm long, densely white- to brown-hairy, ribs 5, mucilaginous when wet. Arid fynbos, rhenosterveld, karoo; Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland (Uitenhage, Queenstown, Cathcart).

2b Leaves > 2.5 mm wide
17a Leaves simple, entire
18a Leaf margins shortly and rigidly ciliate

[E]ciliatus B.Nord.

Erect shrub, with few straight stems, glabrous, closely leafy above, later nude below with leaf scars. **Leaves** imbricate, ± erect, ± elliptic, 11–18 mm long, mostly entire, flat, leathery, margins ciliate, midrib distinct. **Peduncles** lateral in uppermost leaf axils, ± erect, 10–30 mm long. **Capitula** 20 mm in diam.; involucre campanulate to hemispherical, 7–12 mm wide, fully connate when young, later connate to $^{1}/_{2}$–$^{2}/_{3}$, splitting into 4–6 segments, 4–8 mm long. **Receptacle** flat, ± alveolate. **Ray florets** 8–15, yellow. **Disc florets** 30–50. **Flowering time** May. **Pappus** of many bristles, 2–4 mm long, white. **Cypselae** elliptic-oblong, 5–6 mm long, glabrous, brown, ribs 10. Montane, among rocks; Sub-Escarpment Grassland (very rare, Katberg, Tarka).

18b Leaf margins not ciliate, glabrous
19a Involucre at first completely connate, splitting up into 2–4 thin and broad segments

spathaceus DC. (see 13a above)

19b Involucral bracts not as above, involucre 5–12-lobed
20a Cypselae glabrous; involucral bracts connate to ± $^{4}/_{5}$

tysonii E.Phillips (see 11a above)

20b Cypselae pubescent; involucral bracts connate to middle or less
21a Leaves ± linear, 15–90 mm long; involucre campanulate; pappus 0.5–1.5 mm long

brevipapposus M.D.Hend. (see 15a above)

21b Leaves oblong to rotund-obovate, leathery, grey-green or glaucous, 8–30 mm long

lateriflorus (L.f.) DC.

Soetharpuis (A)

Vigorous shrub, up to 2.5 m high, ± glabrous, resiniferous, stems leafy apically, later nude. **Leaves** ± erect, often imbricate, flat, entire, midveined, margins smooth, apex acute to rounded. **Peduncles** lateral in upper leaf-axils, 2–60 mm long. **Capitula** up to 20 mm in diam.; involucre hemispherical, 5–15 mm in diam.; bracts uni- to bi-seriate, 5–11, connate to ± middle, lobes ovate, ± overlapping, 2.5–6.0 mm long, 5–8-veined. **Receptacle** convex, alveolate. **Ray florets** 5–11, yellow. **Disc florets** 30–75. **Flowering time** Apr.–Dec. **Pappus** of many bristles, 1–3 mm long, white, barbellate. **Cypselae** ± obovate, 2.5–5.0 mm long, densely white- or brown-hairy, ribs 5, mucilaginous when wet. Common, variable, mainly karoo; Dry Highveld Grassland, Upper Karoo (Aliwal North and Somerset East to Willowmore).

17b Leaves lobed or simple, with serrate or dentate margins or apex
22a Leaves distinctly many-nerved, with serrate margins, elliptic-ovate, 15–40 mm long, 6–15 mm wide

[E]latifolius B.Nord.

Erect shrub, 1.0–2.5 m high, glabrous, lax, stems closely leafy above, nude below with leaf scars. **Leaves** imbricate, suberect to spreading, obtuse, flat, leathery, glaucous or grey-green, leaf base ± clasping. **Peduncles** lateral in upper leaf-axils, several–many in a corymb, 20–40 mm long. **Capitula** up to 20 mm in diam.; involucre ± campanulate, 6–12 mm in diam.; bracts 13–15, uniseriate, 4–7 mm long, connate to $^{2}/_{3}$–$^{3}/_{4}$, lobes ± deltoid, 1.5–2.5 mm long, apex hairy. **Receptacle** ± flat, alveolate. **Ray florets** 11–15, yellow. **Disc florets** 50–90. **Flowering time** May, June. **Pappus** of many bristles, 1.5–2.5 mm long, barbellate, white. **Cypselae** ± oblong, 3–4 mm long, often ± curved, glabrous, honey to brown, ribs 13–20. Montane, fynbos; Eastern Fynbos-Renosterveld (very rare, Kirkwood).

22b Leaves lobed or dentate, at least apically
23a Leaf margins ciliate; leaves ovate to oblong, laxly serrate towards apex; capitula radiate; involucral bracts connate to $^{1}/_{2}$–$^{2}/_{3}$

ciliatus B.Nord. (see 18a above)

23b Leaf margins not ciliate
24a Leaves apically 3-toothed, flat, margins not involute, 6–30 mm long; involucre 4–12 mm in diam.; bracts connate to well above middle
25a Leaves widest about middle; cypselae glabrous

tysonii E.Phillips (see 11a above)

25b Leaves widest above middle; cypselae villous

[E]algoensis DC.

Kleinharpuisbos (A)

Erect, glabrous shrub, up to 1.2 m high, young stems leafy, older nude with leaf scars. **Leaves** erect to spreading, oblanceolate to oblong, ± cuneate, 6–25 mm long, 3–5-toothed or -lobed above middle or pinnatilobate ± basally with 2 or 3 pairs of lobes, leathery, ± glaucous or grey-green, base ± clasping. **Peduncles** lateral in upper leaf-axils, few–many in a corymb or raceme, ± erect, 5–60 mm long. **Capitula** up to 15 mm in diam.; involucre campanulate, 6–12 mm in diam.; bracts 8–13, uniseriate, connate to $^{2}/_{3}$, lobes ovate to lanceolate, 1.5–3.0 mm long, apex hairy. **Receptacle** convex, alveolate. **Ray**

florets 8–13, yellow. **Disc florets** 40–80. **Flowering time** Feb.–June. **Pappus** of many bristles, 2–3 mm long, white, barbellate. **Cypselae** oblong-obovate, 3–4 mm long, hairs white to ± brown, ribs 8–10, mucilaginous when soaked. Fynbos and other scrub; Albany Thicket, Eastern Fynbos-Renosterveld (endemic to Humansdorp and Grahamstown).

24b Leaves cuneate or flabelliform, obovate to oblanceolate, digitately 5–7-lobed or pinnatilobate from near base, 5–25 mm long, glabrous; inflorescence corymbose to racemose; involucral bracts connate to middle or more; peduncles slender
26a Involucre 3–6 mm wide, 2–4 mm long; cypselae glabrous, smooth; leaves flabelliform, digitately 5–7-lobed

virgineus (L.f.) DC. (see 5a above)

26b Involucre 6–12 mm wide, 4–6 mm long; cypselae densely villous; leaves cuneate, pinnatilobate to apically 3-toothed

algoensis DC. (see 25b above)

[E]exsudans B.Nord. & V.R.Clark

Habit and leaf-shape suggest affinities to *E. algoensis* DC., *E. virgineus* (L.f.) DC. and *E. latifolius* B.Nord. (Nordenstam et al. 2009).

Erect, moderately branched shrub, up to 0.5 m high; young stems leafy, older with leaf scars. **Leaves** erect to spreading, elliptic-obovate or broadly cuneate, 5–8 × 2.5–6.0 mm, 8–10-toothed with ± cucullate teeth covered by honey-coloured resin exudate. **Peduncle** axillary, suberect, simple, 10–25 mm long, with stalked glandular hairs. **Capitula** solitary; involucre campanulate-hemispherical, ± 10 mm in diam.; bracts 8, uniseriate, connate to middle. **Receptacle** convex, alveolate. **Ray florets** 8–11, yellow. **Disc florets** 25–30. **Pappus** of many bristles, 1.5–2.0 mm long, white, barbellate. **Cypselae** narrowly elliptic-obovate, 2.8–3.5 mm long, 8–10-ribbed, densely white-villous, mucilaginous when soaked. Karoo Escarpment Grassland, alt. > 1 600 m; Dry Highveld Grassland [Sneeuberg, Wapadsberg (Graaff-Reinet and Middelburg districts), Bankberg (Cradock District)].

Section 3. *Chrysops* B.Nord.

Shrubs or shrublets, or with thick and woody subterranean caudex, producing short or elongated, sometimes acaulescent, herbaceous to suffrutescent stems. **Leaves** set closely to laxly along branches or crowded at branch tips or rosulate from caudex, flat to rounded, simple to divided, entire to sometimes dentate, glabrous or ± hairy. **Capitula** radiate or seldom discoid, terminal, solitary or few–several together, sometimes many in an umbel; peduncles ± equalling leaves in length or up to many times longer; involucre campanulate to hemispherical or broadly cup-shaped, mostly medium-sized; bracts 8–22, uniseriate to ± biseriate, connate to various lengths. **Receptacle** convex to flat, shallowly to distinctly alveolate. **Ray florets** yellow, sometimes with red or coppery reverse. **Disc florets** fertile or rarely sterile. **Pappus** absent or of many bristles, white or ± brown. **Cypselae** narrowly obovate or pyriform to oblong, glabrous or hirsute to silky, velvety or papillate-hairy, clearly or vaguely ribbed or veined.

1a Caudex subterranean, thick and woody, with aerial, sometimes woody, annual branches, or ± stemless with radical leaves

laxus (Harv.) Burtt Davy

Stems several, annual, erect, 20–350 mm long, mostly simple, glabrous, leafy. **Leaves** ± erect, filiform-linear, 10–110 mm long, 3-lobed or pinnatipartite or sometimes entire, glabrous, lobes up to 35 mm long. **Peduncle** terminal, solitary, erect, 50–260 mm

long. **Capitula** up to 30 mm in diam.; involucre hemispherical to widely campanulate, 8–20 mm in diam., glabrous; bracts uniseriate, 11–17, connate to ± $^{1}/_{2}$, 4–10 mm long, lobes ± deltoid, 3–many-veined, ± acute with ± ciliate apex. **Receptacle** flat or ± convex, alveolate. **Ray florets** 8–17, yellow. **Disc florets** 25–70. **Flowering time** all year. **Pappus** absent or of few bristles, up to 1 mm long, white. **Cypselae** ± obovate, 3.5–5.0 mm long, ribs 8–12, yellow to red-brown, puberulous. Grassland, rocky places, fire-resistant; Sub-Escarpment Savanna (very rare, uMzimkhulu).

1b Shrubs
2a Leaves broad and flat, apically dentate, oblanceolate to narrowly oblong or obovate

[E]dentatus B.Nord.

Vigorous, glabrous shrub, stems and branches erect, closely leafy in upper parts, later nude below. **Leaves** ± erect, 6–20 mm long, ± leathery, 3–10 small teeth along margins towards apex, midrib distinct. **Peduncles** terminal, 1–5 together, erect, stout, up to 90 mm long. **Capitula** up to 40 mm in diam.; involucre campanulate with truncate base, widening above to 17 mm in diam., many-veined; bracts 10–13, ± uniseriate, connate to ± $^{2}/_{3}$, lobes broadly ovate to deltoid, partly overlapping, margins and apex puberulous. **Receptacle** alveolate. **Ray florets** 10–15, yellow. **Disc florets** many. **Flowering time** Dec., Jan. **Pappus** of few bristles, ± 2 mm long, erect, white. **Cypselae** narrowly oblong, 3–4 mm long, glabrous, ribs indistinct. Montane; Dry Highveld Grassland, Upper Karoo (very rare, ± Cradock, Graaff-Reinet).

[E]proteoides B.Nord & V.R.Clark

Vigorous, erect, moderately branched shrub, 1.0–2.2 m high; branches densely leafy towards tips. **Leaves** sessile, erecto-patent to spreading, narrowly oblong-obovate, base cuneate, 30–60 × 10–15 mm, 9–12-toothed, teeth ovate. **Peduncle** axillary, ± as long as leaves. **Capitula** solitary or few, terminal; involucre broadly campanulate or hemispherical, 20–25 mm in diam.; bracts 9–13, subuniseriate, connate to middle. **Receptacle** convex, minutely alveolate. **Ray florets** 4–19, yellow. **Disc florets** many, yellow. **Flowering time** Oct. **Pappus** of copious bristles, 4–5 mm long, white, barbellate. **Cypselae** narrowly elliptic-oblong, 5–6 mm long, 8-ribbed, greyish brown, puberulous, hairs papilliform, white, obtuse. Moist S-facing escarpment slopes, below cliff-lines, alt > 1 900 m; Dry Highveld Grassland (Pearston, Tandjiesberg–Coetzeesberg section of Sneeuberg, Graaff-Reinet District).

2b Leaves linear to filiform, simple or divided but not apically dentate
3a Peduncles 15–50 mm long; pappus copious, 3–4 mm long

[E]trilobus Harv.

Glabrous shrub, forms dense rounded cushions, up to 1.2 m high, leafy above, nude below with leaf scars. **Leaves** dense, erect to spreading, linear, up to 35 mm long, mostly 3-lobed above middle, flat, ± fleshy, lobes 1–12 mm long. **Peduncles** terminal, 1–few together, erect. **Capitula** up to 35 mm in diam.; involucre hemispherical, 10–15 mm in diam.; bracts ± 13, ± uniseriate, 6–9 mm long, connate to ± middle, green or ± brown, 3–7-nerved, lobes ± overlapping, with triangular, apex, margins puberulous. **Receptacle** convex, alveolate. **Ray florets** 10–17, yellow. **Disc florets** 40–60. **Flowering time** Nov.–June. **Pappus** of white bristles, shortly barbellate. **Cypselae** ± oblong-obovate, 3–4 mm long, densely, shortly white- or ± brown-hairy, ribs 8–10. Montane, rocky places; Upper Karoo, Sub-Escarpment Grassland (Queenstown, Sneeuberg Mts, Somerset East).

3b Peduncles 120–250 mm long; pappus bristles few–many, 0.2–2.0 mm long

[E]dyeri Hutch.

Low shrublet, decumbent or lax cushions, glabrous, stems densely leafy above, nude below with old leaf bases. **Leaves** ± spreading, linear-filiform, 10–30 mm long, entire or 2–5-lobed above middle, ± leathery, ± flat, lobes up to 10 mm long. **Peduncles** terminal, erect, 1–few together. **Capitula** 20 mm in diam.; involucre broadly cup-shaped to ± hemispherical, 8–12 mm in diam.; bracts 13–18, uniseriate, 5–6 mm long, connate to $^{1}/_{2}$–$^{2}/_{3}$, lobes ± deltoid with 1–3 resiniferous veins, puberulous-tipped. **Receptacle** ± convex or ± flat, alveolate. **Ray florets** 11–17, yellow. **Disc florets** 40–80. **Flowering time** Nov.–Feb. **Pappus** of white bristles. **Cypselae** oblong-obovate, 3.5–4.0 mm long, ribs 8–11, densely silky-villous with short, white or light brown hairs. Montane, rocky places; Albany Thicket, Indigenous Forests (Katberg, Amatole Mts).

Section 4. *Brachypus* B.Nord.

Much-branched, erect to decumbent or prostrate low shrubs or shrublets, often cushion- or mat-forming, glabrous (some lax woolly hairs in leaf axils). **Leaves** imbricate, erect to spreading, ± linear to ± obovate, simple and entire or 3–5-lobed, leathery to ± fleshy, ± rounded to flat. **Inflorescence** terminal, solitary or seldom 2 together; peduncles short or absent (sometimes elongating post-florally 10–20 mm long). **Capitula** radiate; involucre cup-shaped to campanulate or cylindrical, with rounded or truncate base, small to medium-sized; bracts uniseriate, much connate (up to $^{3}/_{4}$), 5–13. **Receptacle** flat to convex, alveolate. **Ray florets** yellow. **Disc florets** mostly fertile. **Pappus** of few–many bristles, white or light brown. **Cypselae** obovate to oblong, glabrous or densely villous, ribbed.

1a Leaves lanceolate to elliptic-oblong or elliptic-obovate with ciliate margins; capitula sessile

[E]galpinii Bolus

Erect, glabrous, branched shrub, up to 1 m high, stems ± straight, leafy above, nude below or with old leaf bases or scars. **Leaves** dense, erect to spreading, later ± reflexed, 5–10 mm long, flat, entire or 2- or 3-lobed apically, leathery, midveined, lobes erect, 1–3 mm long. **Capitula** terminal, 1 or 2 together, up to 20 mm in diam.; involucre bell- or cup-shaped, 6–12 mm high, many-veined; bracts 8–13, uniseriate, connate to $^{2}/_{3}$–$^{3}/_{4}$, lobes ovate to lanceolate, 2–4 mm long, margins and apex ± puberulous. **Receptacle** ± convex, alveolate. **Ray florets** 8–15, bright yellow. **Disc florets** 13–35. **Flowering time** Sept.–Jan. **Pappus** of few bristles, up to 1 mm long, white, densely barbellate. **Cypselae** ± oblong, 3–5 mm long, glabrous, brown, ribs thick, ± 10. Usually montane, open localities, karroid vegetation; Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Grassland, Upper Karoo (Amatolas, Sneeuberg Mts).

1b Leaves linear-filiform with smooth margins; capitula ± sessile
2a Peduncles distinct though short, after anthesis elongating to 2–15 mm; leaves mostly 3-forked

[E]calvescens DC.

Erect, branched, rounded shrub, up to 500 mm high, glabrous, stems ± straight, leafy above, nude below with leaf bases or scars. **Leaves** dense, erect to spreading, 7–12 mm long, 2- or 3-forked below middle, some entire, flat, lobes 4–8 mm long, white-apiculate. **Peduncle** terminal, solitary, erect, 2–15 mm long. **Capitula** ± 20 mm in diam.; involucre bell- or cup-shaped, veined, 7–10 mm long; bracts 8–11, uniseriate, connate to $^{3}/_{5}$–$^{2}/_{3}$, lobes ± deltoid, 3–4 mm long, apex ciliate. **Receptacle** convex, alveolate. **Ray florets** 6–9, yellow. **Disc florets** 20–25. **Flowering time** Dec., Jan. **Pappus** of few bristles,

up to 0.5 mm long, white, barbellate. **Cypselae** ± oblong, 3–5 mm long, glabrous, brown, ribs 10–12, shiny, thick. Montane, 'karroid *Danthonia* Mount. veld'; Drakensberg Grassland, Dry Highveld Grassland (very rare, Molteno, Steynsburg, Stormberg).

2b Peduncles indistinct, sometimes elongating after anthesis to 5 mm
3a Cypselae densely white silky-villous; leaves grey-green

decumbens B.Nord.

Much-branched, decumbent or prostrate shrublet, up to 250 mm high, glabrous, stems short, leafy apically, soon with old leaf bases, then nude, scarred, blackish. Leaves erect to reflexed, linear, 3–15 mm long, mostly 3–5-lobed above middle, flat, leathery, midvein dark, base dilated, ± clasping, lobes 1–4 mm long. **Capitula** terminal, solitary, ± sessile, ± 12 mm in diam.; involucre campanulate, 3–10 mm wide; bracts 5–10, uniseriate, connate to ± halfway, 3–7-veined, lobes ovate-lanceolate, apex hairy. **Receptacle** convex, alveolate. **Ray florets** 5–10, yellow. **Disc florets** 8–25. **Flowering time** Dec.–Mar. **Pappus** of many bristles, 2–4 mm long, ± erect, white, ± barbellate. **Cypselae** ± oblong, 5–7 mm long, 8 low ribs. Montane, stony flats; Drakensberg Grassland (very rare, Barkly East, Mount Fletcher).

3b Cypselae glabrous; leaves pure green

montanus Schltr.

Much-branched, dense, rounded, ± erect shrublet, up to 600 mm high, glabrous, young stems leafy apically, below with old leaf bases and scars. **Leaves** dense, erect to spreading, linear, 5–20 mm long, entire or 2–4-lobed from ± halfway, leathery, leaf base dilated, ± clasping. **Capitula** terminal, solitary, ± sessile, 15 mm in diam.; involucre a ± campanulate or cylindrical cup, 5–9 mm long, leathery; bracts 8–12, uniseriate, connate to $^{2}/_{3}$–$^{4}/_{5}$, 1–6-veined, lobes ± deltoid, apex hairy. **Receptacle** ± convex, alveolate. **Ray florets** 6–10, yellow. **Disc florets** 8–15. **Flowering time** Oct.–July. **Pappus** of many bristles, 1.5–2.0 mm long, white, ± erect. **Cypselae** narrowly oblong-obovate, 3–4 mm long, often ± compressed or subtrigonous, shiny, yellow-brown, 7–10 low ribs. Montane, streambanks, stony places; Drakensberg Grassland (rare, Barkly East).

Section 5. *Psilosteum* (DC.) B.Nord.

Shrubs or subshrubs, mostly glabrous. **Leaves** simple, lobed or forked, glabrous or sometimes pubescent when young, flat to ± rounded, herbaceous to leathery. **Inflorescences** terminal at branches, solitary to several together; peduncles short or long. **Capitula** radiate; involucre campanulate to cup-shaped or crescent-shaped, small to large, glabrous; bracts uniseriate to ± biseriate, 8–27, connate to various lengths but seldom above middle. **Receptacle** convex, hemispherical or conical, alveolate. **Ray florets** yellow (or orange-yellow), sometimes with red reverse. **Disc florets** mostly fertile. **Pappus** absent. **Cypselae** oblong to pyriform, often with an apical ring, green, brown or black, 1–5 mm long, usually with 5–10 ribs or ridges, smooth to verrucose, never clearly pubescent.

1a Leaves lobed or dissected, glabrous or shortly pubescent
2a Most leaves pinnatipartite or pinnatifid
3a Leaves flat, herbaceous, 30–100 mm long, 10–30 mm wide, shallowly–deeply pinnatilobate

chrysanthemoides (DC.) B.Nord.

Branched, erect shrub, 0.5–2.0 m high, glabrous; young stems leafy, soon denuded. **Leaves** spreading, broadest above middle, pinnately veined, base petiolate, lobes 6–20, ovate to lanceolate, 2–20 mm long. **Peduncles** terminal, often several together, erect,

50–200 mm long. **Capitula** up to 35 mm in diam.; involucre widely campanulate, 10–18 mm in diam.; bracts 8–15, ovate to lanceolate, 5–8 mm long, connate to $^1/_5$–$^1/_3$. **Receptacle** ± convex, alveolate. **Ray florets** 11–20, yellow. **Disc florets** 50–125. **Flowering time** all year. **Cypselae** ± oblong-obovate, 3.5–5.0 mm long, glabrous, longitudinal ribs 8–11. Forest margins, clearings, mixed scrub, grassland; weedy, hybridises, also cultivated; Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket (Stutterheim, Alexandria, Albany).

3b Leaves ± leathery, 5–40 mm long, pinnatipartite with round to flat, filiform to linear segments
4a Slender moss-like plant; leaves 5–10 mm long; leaf segments bristle-shaped, tapering to fine long points; involucre 4–6 mm in diam.

[E]**hypnoides** B.Nord.

Glabrous, ± erect shrublet, up to 400 mm high, dichotomously branched, old stems with leaf remains, later nude. **Leaves** dense, erect to spreading, pinnatisect with 2–4 pairs of lobes, lobes 2–5 mm long, filiform-subulate. **Peduncles** terminal, 1–3 together, erect or ascending, 30–80 mm long, filiform. **Capitula** 8–10 mm in diam.; involucre campanulate; bracts uniseriate, 8, ovate to lanceolate, 3 mm long, connate to ± middle, 3-lined. **Receptacle** narrowly conical, ± alveolate. **Ray florets** 5–8, yellow. **Disc florets** 15–25. **Flowering time** Mar., Apr. **Cypselae** ± oblong, 2–3 mm long, finely papillate. Moist mountain slopes, grassland and fynbos; Sub-Escarpment Savanna (Albany).

4b Plants not as above, with broader leaf segments and larger involucres
5a Peduncles short, up to 60 mm long
6a All leaves pinnatipartite with 3–8 pairs of lobes; cypselae tuberculate

pinnatipartitus (DC.) B.Nord.

Bergkamille (A)

Erect or ascending shrub, up to 1 m high, stems long and straight, leafy above, nude below with old leaf bases, mostly glabrous. **Leaves** 10–30 mm long, ± spreading, lobes ± opposite, erect to spreading, 2–15 mm long, ± flat, middle lobes longest. **Peduncle** terminal, solitary, erect. **Capitula** 20–25 mm in diam.; involucre ± cup-shaped to campanulate, 10–15 mm in diam.; bracts ± 13, uniseriate, connate to $^1/_3$–$^1/_2$, ± lanceolate, 4–7 mm long, often ± blue apically. **Receptacle** convex to conical, alveolate. **Ray florets** 11–19, yellow. **Disc florets** 60–150. **Flowering time** ± all year. **Cypselae** oblong-obovate, 1.7–2.7 mm long, apical annulus, ± 10 coarse ridges. Fynbos, rocky places; Eastern Fynbos-Renosterveld, Indigenous Forests (rare, Humansdorp).

6b Some leaves 3-forked or entire; cypselae glabrous, ribbed
7a Young branches lanate; leaf lobes short-acuminate; peduncles 0–20 mm long

[E]**brachypodus** (DC.) B.Nord.

Erect, branching shrub, 0.3–1.2 m high, young stems leafy, leaf axils cobwebby, old stems nude with leaf scars. **Leaves** erect to spreading, glabrous, up to 30 mm long, pinnatipartite with 4–8 lobes or 3-forked below middle, also entire or bipartite, lobes 1–15 mm long, linear-filiform, often white-tipped. **Peduncle** terminal, solitary, erect. **Capitula** up to 30 mm in diam.; involucre widely campanulate, 15–20 mm in diam.; bracts uniseriate, 11–15, connate to $^1/_3$–$^1/_2$, 8–12 mm long, lanceolate, 3-lined, glabrous. **Receptacle** ± convex, alveolate. **Ray florets** 13–17, yellow, often bronze-red below. **Disc florets** 50–100. **Flowering time** mostly May–Sept. **Cypselae** ± oblong, 2–3 mm long, apical annulus, ribs 8–12. Bushland, scrub, grassland; Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket (± coastal, Port St Johns to Somerset East, Albany and Alexandria).

7b Young branches glabrous; leaf lobes subacute to obtuse; peduncles 10–50 mm long

[E]euryopoides (DC.) B.Nord.

Erect, branching shrub, 0.5–1.5 m high, young stems leafy, old stems nude with leaf scars. **Leaves** erect to spreading, 10–30 mm long, mostly 3-forked ± from middle, lobes linear, 5–15 mm long, ± flat. **Peduncles** terminal, 1–few together, erect. **Capitula** up to 25 mm in diam.; involucre widely campanulate to ± flat, 10–20 mm in diam.; bracts ± 1- or 2-seriate, 8–13, connate to $^1/_5$–$^1/_3$, lanceolate to ovate, 3–6 mm long. **Receptacle** convex to conical, alveolate. **Ray florets** 10–15, yellow. **Disc florets** 25–75. **Flowering time** July–Dec., Mar.–May. **Cypselae** ± oblong-obovate, 3–4 mm long, glabrous, longitudinal ribs ± 10. Rocky places, fynbos, scrub, bushland; Albany Thicket, Eastern Fynbos-Renosterveld (Somerset East and Albany to Alexandria and Humansdorp).

5b Peduncles long and slender, 60–250 mm long
8a Involucral bracts connate to middle or ± more; cypselae large, 3.5–5.0 mm long, papillate or sometimes glabrous; leaves 10–110 mm long
9a Involucral bracts 8–10, ovate; erect to ascending shrublet

leiocarpus (DC.) B.Nord.

Glabrous shrublet, stems little branched, 200–600 mm high, leafy above, nude below. **Leaves** erect to spreading, 10–40 mm long, pinnatipartite with linear segments, lobes 4–8, opposite, flat, up to 20 mm long. **Peduncle** terminal, solitary, ± erect, 60–170 mm long. **Capitula** 15–20 mm in diam.; involucre campanulate, 10–15 mm in diam.; bracts uniseriate, 5–7 mm long, connate to middle, multistriate. **Receptacle** convex, alveolate, pit margins distinct. **Ray florets** 8–11, yellow. **Disc florets** 50–80. **Flowering time** Aug.–Mar. **Cypselae** ± oblong-obovate, 4.5–5.0 mm long, ribs 8–12, densely papillate. Grassland, among rocks; Indian Ocean Coastal Belt, Indigenous Forests (± coastal, Lusikisiki, Flagstaff, Bizana).

9b Involucral bracts 11–17; caudex thick and lignified, subterranean, with annual, aerial, herbaceous to suffruticose stems

laxus (Harv.) Burtt Davy (see section 3)

8b Involucral bracts connate to $^1/_3$–$^1/_2$, 10–13, mostly lanceolate; cypselae 1.5–3.0 mm long, not clearly papillate (but often muricate to tuberculate); leaves 5–30 mm long
10a Leaves clearly curved upwards to inwards, up to 10 mm long; leaf lobes acute to acuminate, ± pungent, in 4 pairs

munitus (L.f.) B.Nord.

UmSola (X)

Much-branched, glabrous, erect shrub, up to 1 m high, leafy. **Leaves** ± erect, 3–10 mm long, pinnatipartite, firm, leathery, bright green, keeled on underside, base decurrent, lobes ± spreading, linear-subulate, 0.5–2.0 mm long. **Peduncle** terminal, erect, solitary, 50–200 mm long. **Capitula** up to 20 mm in diam.; involucre widely campanulate, 7–11 mm in diam.; bracts uniseriate, 10–13, connate to $^1/_3$–$^1/_2$, lanceolate, often ± blue apically, ± midveined or 3-lined. **Receptacle** alveolate, convex to hemispherical. **Ray florets** 8–13, yellow. **Disc florets** 30–70. **Flowering time** all year. **Cypselae** oblong, apically constricted, 1.5–2.6 mm long, light brown, glabrous, smooth or with 8–10 faint ribs. Fynbos, grassland, rhenosterveld, rocky places; Eastern Fynbos-Renosterveld, Albany Thicket, Indigenous Forests (WC to Port Elizabeth).

10b Leaves not as above

11a All leaves pinnatipartite with 3–6 pairs of lobes, 10–30 mm long

[E]ursinoides B.Nord.

Erect, little-branched shrub, up to 2 m high, glabrous. **Leaves** dense, erect to spreading, lobes 6–12, ± alternate, spreading, straight or ± curved, up to 5 mm long, longest towards apex or middle. **Peduncles** terminal, 1–6 together, erect, 60–150 mm long. **Capitula** up to 25 mm in diam.; involucre widely campanulate, 10–15 mm in diam.; bracts uniseriate, 11–13, connate to $^1/_3$–$^1/_2$, 5–7 mm long, 3–7-veined, lobes ovate to lanceolate, rarely tinged red or brown. **Receptacle** convex, ± alveolate. **Ray florets** 11–13, yellow. **Disc florets** 25–70. **Flowering time** July–Dec. **Cypselae** elliptic-obovate, ± 3 mm long, glabrous, ± 10 ribs. Hillsides and rocky places; Albany Thicket, Eastern Fynbos-Renosterveld (rare, Port Elizabeth and Uitenhage).

11b Some leaves 3-forked or entire

anthemoides B.Nord.

Erect, branched shrublet, 200–600 mm high, young stems leafy, older nude or with leaf remains. **Leaves** erect to spreading, flexuous, up to 20 mm long, 3-forked above middle, some 4–7-lobed or pinnatipartite with 2 pairs of lobes, lobes ± curved and white-tipped. **Peduncle** terminal, solitary, erect, 50–250 mm long, glabrous. **Capitula** up to 30 mm in diam.; involucre widely campanulate, ± flat, ± 10 mm in diam.; bracts uniseriate, ± 13, connate to $^1/_3$–$^1/_2$, lanceolate to narrowly ovate, 5–6 mm long, glabrous, grey-green. **Receptacle** convex to hemispherical, alveolate. **Ray florets** 11–15, yellow. **Disc florets** 50–100. **Flowering time** all year. **Cypselae** clavate to oblong-obovate, 2–3 mm long, green to ± black, with ± 10 coarse, irregular, verrucose ridges. Karoo, scrubveld and grassland, also degraded grassland; Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld, Lower Karoo, Sub-Escarpment Savanna (Middelburg to Aberdeen, Cradock, Fort Beaufort, Steytlerville and Port Elizabeth).

anthemoides B.Nord. subsp. **anthemoides**

Young leaves and branches pubescent with short, entangled, multicellular, whitish grey hairs, sometimes glabrate or glabrous.

[E]anthemoides B.Nord. subsp. **astrotrichus** B.Nord.

Young leaves and branches densely pubescent with whitish grey or brown, distinctly stellate hairs. **Flowering time** Sept.–Jan., Mar.–May.

2b Most leaves 3-lobed or 3-sect

12a Peduncles short, 0–50 mm long

13a Young branches lanate; leaf lobes acuminate; peduncles 0–20 mm long

brachypodus (DC.) B.Nord. (see 7a above)

13b Plants glabrous; leaf lobes subacute to obtuse; peduncles 10–50 mm long

euryopoides (DC.) B.Nord. (see 7b above)

12b Peduncles long and slender, 50–250 mm long

14a Leaves distinctly curved upwards to inwards; leaf lobes acuminate with ± pungent apex; cypselae smooth or faintly ribbed, glabrous

munitus (L.f.) B.Nord. (see 10a above)

14b Leaves not as above, although often flexuous or with apically curved lobes

anthemoides B.Nord. (see 11b above)

1b Leaves simple

15a Peduncles ± equalling leaves in length, up to 20 mm long; involucre 15–20 mm in diam.

brachypodus (DC.) B.Nord. (see 7a above)

15b Peduncles many times longer than leaves, 30–230 mm long; involucre ± 10 mm in diam. or smaller

16a Leaves filiform, slender, spreading, tapering to fine bristle-shaped points, 7–13 mm long; involucral bracts and rays ± 8

[E]polytrichoides (Harv.) B.Nord.

Slender, glabrous shrublet, erect or ascending, up to 500 mm high, always branching into 2–several stems, stems closely leafy above, with old leaf remains below, denuded basally. **Leaves** very closely set, entire, subulate-filiform. **Peduncle** terminal, solitary, erect to ascending, 30–90 mm long. **Capitula** 10–15 mm in diam.; involucre campanulate, 5–7 mm in diam., uniseriate, ovate to lanceolate, 3–4 mm long, connate to $^{1}/_{4}$–$^{1}/_{3}$, 3-lined. **Receptacle** convex to conical, ± alveolate. **Ray florets** yellow. **Disc florets** 15–30. **Flowering time** Feb.–June. **Cypselae** oblong-obovate, glabrous. Moist mountain slopes; Sub-Escarpment Savanna (very rare, Albany).

16b Leaves linear to subulate, up to 5 mm long; involucral bracts and rays 9–13

[E]ericifolius (Bélang.) B.Nord.

Erect, much-branched, compact shrublet, glabrous, stems straight, short, slender, closely leafy, older stems becoming nude. **Leaves** imbricate, closely appressed, entire, 1.5–5.0 mm long. **Peduncle** terminal, solitary, erect, 80–170 mm long. **Capitula** 10 mm in diam.; involucre widely campanulate, 5–8 mm in diam.; bracts uniseriate, 9–13, connate to $^{1}/_{3}$–$^{1}/_{2}$, 3–5 mm long, 1–3-lined, lobes ovate to lanceolate. **Receptacle** alveolate, convex to subconical. **Ray florets** 11–13, yellow. **Disc florets** 25–40. **Flowering time** Mar.–Oct. **Cypselae** ± obovate, 1.5–1.7 mm long, longitudinal ridges 8–10, ± brown, dense short hairs. On slopes and flats, Albany Thicket, Eastern Fynbos-Renosterveld (Port Elizabeth, Uitenhage).

*FACELIS Cass.

(Gnaphalieae)

Species 3, South America; 1 naturalised in sthn Afr., KZN, WC, EC.

retusa (Lam.) Sch.Bip.

Tufted, erect or decumbent, annual herb, up to 0.25 m high. **Leaves** alternate, sessile, oblong or spathulate-oblong, apex truncate, entire, green above, grey- or white-woolly below. **Capitula** disciform, terminally racemosely crowded together. **Ray florets** filiform, purple. **Disc florets** narrowly tubular, purple. **Flowering time** Sept. **Pappus** of plumose bristles, bases connate in a ring. **Cypselae** turbinate, hairy. Weed in gardens and disturbed places, alt. 5–1 500 m; Drakensberg Grassland (Dohne Forest Station, Grahamstown).

FELICIA Cass.

(Astereae)

Astertjie (A)

Species 83, sthn Afr. to Nigeria, Ethiopia and Saudi Arabia; 78 in sthn Afr., widespread.

1a Involucral bracts strictly arranged in 2 rows, ± equal in size
2a Leaves always opposite

amelloides (L.) Voss

Much-branched, perennial or biennial herb or shrub, 0.2–1.0 m high. **Leaves** opposite, sessile or subsessile, elliptic to obovate, entire, 1–3-nerved, shortly and roughly hairy. **Capitula** radiate, solitary, distinctly and long pedunculate. **Peduncle** densely hairy; involucral bracts arranged in 2 rows, ± equal in size, hairy and glandular. **Ray florets** bright blue. **Disc florets** yellow. **Flowering time** Mar.–Nov. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, blackish brown, shortly hairy. Hill slopes, sand dunes, coastal scrub, alt. 0–1 000 m; Eastern Fynbos-Renosterveld, Albany Thicket (coastal, Riversdale to Bathurst area).

[E]flanaganii Bolus

Sprawling or pendulous to erect shrub, up to 0.45 m high. **Leaves** opposite, petiolate, ovate, entire, shortly hairy. **Capitula** radiate, solitary, long pedunculate; involucral bracts arranged in 2 rows, ± equal in size, hairy. **Ray florets** pale blue or white. **Disc florets** yellow. **Flowering time** June–Aug. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, dark brown, shortly hairy. Rocky hillsides overhanging rocks and under bushes, alt. 90–795 m; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (rare, King William's Town, Komga, Suurberg and Alexandria districts).

[E]joubertinae Grau

Erect, branched shrub, up to 0.4 m high. **Leaves** opposite, rarely alternate, elliptic, obovate, lanceolate to oblanceolate, entire, appressed-pubescent or glabrescent. **Capitula** radiate, solitary, long pedunculate, appressed-pubescent; involucral bracts arranged in 2 rows, ± equal in size, shortly hairy and with hair tufts at apex. **Ray florets** white or blue. **Disc florets** yellow. **Flowering time** July–Jan. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, black, shortly hairy. Rocky riverbanks, in forest and littoral dunes, alt. 600–900 m; Eastern Fynbos-Renosterveld, Indigenous Forests (endemic to Tsitsikamma area).

[E]tsitsikamae Grau

Erect shrublet, up to 0.3 m high. **Leaves** opposite, rarely alternate, obovate, entire, densely long-hairy. **Capitula** radiate, solitary, long pedunculate. **Peduncles** densely bristly hairy to woolly below the capitulum; involucral bracts arranged in 2 rows, ± equal in size, bristly hairy. **Ray florets** blue. **Disc florets** yellow. **Flowering time** Dec., Jan. **Pappus** of barbellate bristles. **Cypselae** obovate, dark brown, shortly hairy. Rocky ridges, alt. 1 000–1 525 m; Eastern Fynbos-Renosterveld (endemic to Formosa Peak in Tsitsikamma Mts).

2b Leaves alternate, sometimes lower leaves opposite

aethiopica (Burm.f.) Bolus & Wolley-Dod ex Adamson & T.M.Salter
Wilde-astertjie (A)

Shrub, 0.6–1.0 m high, branches often reddish. **Leaves** alternate except the lowest which are opposite, sessile, narrowly to broadly elliptic to obovate, entire, lower leaves often recurved, glabrous to hairy and glandular. **Capitula** radiate, solitary, long pedunculate; peduncle densely glandular below capitulum; involucral bracts arranged in 2 rows, ± equal in size, outer bracts with 3 depressed striae, hairy and glandular. **Ray florets** blue. **Disc florets** yellow. **Flowering time** Sept.–Dec. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** oblong to elliptic, black, with thickened

margins, hairy. Grassland on gravel soil, in flat areas, alt. 10–2 100 m; Indian Ocean Coastal Belt, Indigenous Forests, Rainshadow Valley Karoo, Albany Thicket (Barkly Pass E to Mkambati Nature Reserve S to Hogsback, from Somerset East to Kariega River).

amoena (Sch.Bip.) Levyns

Biennial or perennial herb, 0.06–1.28 m high, side branches sometimes ascending, rooting at nodes. **Leaves** alternate or opposite, subsessile, the lower leaves usually opposite, becoming alternate upwards, lanceolate to obovate, entire, hairy, glabrescent. **Capitula** radiate, solitary, long pedunculate; peduncles densely hairy below capitula; involucral bracts arranged in 2 rows, ± equal in size, hairy on the outside. **Ray florets** dark blue. **Disc florets** yellow. **Flowering time** May–Nov. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, black-brown, thickly margined, with short hairs. Coastal sand dunes, alt. 1–275 m; Eastern Fynbos-Renosterveld, Albany Thicket (coastal, from Cape Peninsula to Bathurst).

linifolia (Harv.) Grau

Much-branched shrub, up to 0.45 m high. **Leaves** at base opposite, alternate upwards, linear-lanceolate, entire, bristly hairy on margins and main vein, often glandular as well. **Capitula** radiate, solitary, long pedunculate; involucral bracts arranged in 2 rows, ± equal in size, outer ones with 3 depressed resin striae, shortly hairy and glandular. **Ray florets** blue. **Disc florets** yellow. **Flowering time** May, June. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** narrowly elliptic, black, glabrous or shortly hairy. Flats on valley floor, alt. 425–1 200 m; Eastern Fynbos-Renosterveld (Ladismith to Uitenhage).

petiolata (Harv.) N.E.Br.

Sprawling or pendulous to erect, perennial herb, stems 0.9–1.0 m long. **Leaves** alternate, petiolate, ovate to elliptic, margins dentate, densely bristly hairy. **Capitula** radiate, solitary, pedunculate; involucral bracts arranged in 2 rows, ± equal in size, bristly hairy. **Ray florets** white or mauve. **Disc florets** yellow. **Flowering time** Sept.–Dec. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, yellow-brown, shortly hairy. Along streams, in grassland, often trailing/cascading over rocks, alt. 1 500–2 400 m; Mesic Highveld Grassland, Dry Highveld Grassland, Drakensberg Grassland (Drakensberg Mts from Bethlehem to Molteno).

1b Involucral bracts arranged in more than 2 rows: either in many rows (3 or 4) and imbricate, or in 2 rows with a few additional outer bracts, or in 3 rows of almost evenly long bracts
3a Mat-forming, prostrate herbs or rosulate herbs

caespitosa Grau

Mat-forming, prostrate herb with upright flowering branches, up to 0.15 m high. **Leaves** alternate, linear, entire, long hairs along margins, some hairs on leaf blade, glabrescent. **Capitula** radiate, solitary; peduncle with many small leaves/bracts, hairy; involucral bracts in many rows, imbricate, lanceolate, hairy to glabrous. **Ray florets** blue-purple. **Disc florets** yellow. **Flowering time** Feb. **Pappus** of many barbellate bristles present in both ray and disc florets. **Cypselae** obovate, brown, shortly hairy. Short grass, alt. 2 000–2 538 m; Drakensberg Grassland (endemic to sthn Drakensberg, L Border).

linearis N.E.Br.

Perennial, single-stemmed, rosulate herb, up to 0.2 m high. **Leaves** alternate, in a basal rosette, linear, entire, glabrous, somewhat succulent. **Capitula** radiate, solitary, terminal on stems; involucral bracts in 3 or 4 rows, imbricate, glabrous or ciliate. **Ray florets**

mauve to pink. **Disc florets** yellow. **Flowering time** Feb. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, brown, shortly hairy. Edge of wet rock sheets, marshy ground or sometimes drier grassland, alt. 1 800–3 355 m; Sub-Escarpment Grassland (endemic to Drakensberg, Mount Ayliff).

quinquenervia (Klatt) Grau

Rhizomatous, perennial herb, up to 0.6 m high. **Leaves** in a basal rosette and alternately scattered along stem, obovate to elliptic, diminishing in size upwards, sessile, 3–5-nerved from base, margins entire or faintly denticulate, hairy to glabrous. **Capitula** radiate, fairly large, 2–4 per stem; involucral bracts in 3 rows, equal in size, outer ones densely glandular and some hairs. **Ray florets** blue. **Disc florets** yellow. **Flowering time** Dec.–Mar. **Pappus** of barbellate bristles. **Cypselae** obovate, shortly hairy. Grassland, on hill and mountain slopes, alt. 600–2 895 m; Drakensberg Grassland, Sub-Escarpment Grassland (endemic to Drakensberg, Van Reenen's Pass to Keiskammahoek).

rosulata Yeo

Rhizomatous, perennial herb, up to 300 mm high. **Leaves** in a basal rosette, alternate upwards, elliptic to obovate, diminishing in size upwards, margins entire to denticulate, 3–5-nerved from base, densely hairy. **Capitula** radiate, solitary, terminal on hairy and glandular stems; involucral bracts arranged in 3 rows, equal in size, outer ones long-hairy and with some glands. **Ray florets** blue. **Disc florets** yellow. **Flowering time** Sept.–Dec. **Pappus** of barbellate bristles. **Cypselae** obovate, shortly hairy. In grassland on mountain slopes and rocky outcrops, alt. 640–3 290 m; Drakensberg Grassland, Sub-Escarpment Grassland, Upper Karoo (Katberg and Graaff-Reinet).

3b Shrubs or dwarf shrubs
4a Leaves ovate, obovate to oblanceolate, sometimes 3-nerved

echinata (Thunb.) Nees

Much-branched, erect shrub, 0.3–1.0 m high. **Leaves** alternate, densely set, upper part recurved, sessile, ovate to narrowly ovate, entire, glabrous or with hairs along margins and with some hairs on blade, succulent. **Capitula** radiate, shortly pedunculate or subsessile, solitary or subcorymbosely arranged; peduncle hairy; involucral bracts in many rows, imbricate, lanceolate, stiffly hairy. **Ray florets** blue-purple. **Disc florets** yellow. **Flowering time** all year. **Pappus** of many barbellate bristles, present in both ray and disc florets. **Cypselae** obovate-elliptic, yellowish brown to reddish, those of ray florets glabrous, those of disc florets shortly hairy. Sand dunes, alt. 0–155 m; Albany Thicket, Eastern Fynbos-Renosterveld (coastal, Cape Town to Keiskamma River Mouth).

erigeroides DC.

Much-branched shrub, 0.3–1.2 m high. **Leaves** alternate, sessile, oblanceolate to obovate, 3-nerved, entire, hairy, margins long ciliate. **Capitula** radiate, solitary, pedunculate; peduncle densely spreading, hairy below capitulum; involucral bracts in many rows, imbricate, narrowly ovate to obovate, glabrous or with some hairs and ciliate. **Ray florets** blue or white. **Disc florets** yellow. **Flowering time** all year. **Pappus** of many barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, yellowish brown, long-hairy. Grassland, sandy slopes, riverbanks, beach dunes, alt. 6–1 370 m; Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket (Eshowe S to Port Elizabeth).

microcephala Grau

Much-branched shrub, up to 0.3 m high. **Leaves** opposite to alternate, obovate, subsessile to petiolate, entire, shortly hairy and glandular. **Capitula** radiate, very small, solitary;

peduncle hairy and glandular below capitulum; involucral bracts in 3 or 4 rows, imbricate, with resin striae, outer ones shortly hairy and glandular. **Ray florets** white or blue. **Disc florets** yellow. **Flowering time** Sept., Oct. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** small, obovate, brownish, densely long-hairy. Rocky slopes, alt. 300–950 m; Eastern Fynbos-Renosterveld (Prince Alfred's Pass to Kouga Mts).

ovata (Thunb.) Compton

Baardbloublom, *bloublommetjie*, *grootbloublommetjie* (A)

White-hairy, diffuse shrublet, up to 0.3 m high. **Leaves** opposite, basally weakly connate around stem, narrowly ovate to lanceolate, with long white hairs, apex acute and recurved, margins entire, revolute. **Capitula** radiate, large, solitary; peduncles with white spreading hairs and glandular-pubescent; involucral bracts in 2 or 3 rows, imbricate, hairy and glandular. **Ray florets** blue. **Disc florets** yellow. **Flowering time** Feb.–Aug. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** elliptic, with short hairs. Karroid mountain slopes, alt. 90–2 000 m; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Dry Highveld Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (WC to Grahamstown).

4b Leaves acicular, linear, lanceolate, oblanceolate or narrowly obovate

burkei (Harv.) L.Bolus

Small shrub, 0.07–0.45 m high. **Leaves** alternate, linear, entire, hairy within axils and with a few short hairs apically, otherwise glabrous, slightly succulent. **Capitula** radiate, solitary; peduncle long, hairy or glabrous; involucral bracts imbricate, in several rows. **Ray florets** blue-purple. **Disc florets** yellow. **Flowering time** Nov.–Feb. **Pappus** of barbellate bristles, of different lengths, present in both ray and disc florets. **Cypselae** obovate to elliptic, covered by long hairs. Grassland, alt. 915–1 370 m; Upper Karoo, Lower Karoo (Middelburg and Pearston Districts).

Very similar to *F. filifolia* and can be confused with it; differences in leaf indumentum and pappus bristles.

fascicularis DC.

Much-branched, dwarf shrub, up to 0.3 m high. **Leaves** alternate, sessile, acicular with strongly broadened bases, entire, often with axillary tufts of leaves, glabrous, rarely hairy. **Capitula** radiate, solitary, pedunculate; peduncles often with stalked glands; involucral bracts imbricate, in 4 rows, glabrous or glandular, rarely with some hairs. **Ray florets** violet. **Disc florets** yellow. **Flowering time** all year. **Pappus** of many barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, brownish, shortly hairy. Grassland, hill slopes, alt. 35–2 200 m; Upper Karoo, Dry Highveld Grassland, Lower Karoo, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Middelburg E to Molteno southwards, from Graaff-Reinet to Fort Beaufort and from Gwarriepoort to Albany District).

filifolia (Vent.) Burtt Davy

Wild aster; *bakbos*, *bergdraaibos*, *blombossie*, *bloudraaibos*, *draaibos(sie)*, *ghombos*, *noembos*, *persbergdraaibos*, *persdraaibos* (A)

Much-branched shrub or dwarf shrub, up to 1.5 m high. **Leaves** alternate, in fascicles on short-shoots or spread out on long-shoots, filiform and needle-like, entire, glabrous or

woolly-pubescent in leaf-axils, somewhat succulent. **Capitula** radiate, solitary (ray florets sometimes absent in subsp. *bodkinii* and subsp. *schaeferi*); peduncles, if present, glabrous; involucral bracts in 3 or 4 rows, imbricate, glabrous. **Ray florets** bright or pale violet, rarely white. **Disc florets** yellow. **Flowering time** all year. **Pappus** of barbellate bristles of different lengths, present in both ray and disc florets. **Cypselae** obovate to elliptic, long-hairy (villous). Grassland on hillsides or mountainsides, rocky slopes, sandy or gravelly flats, alt. 15–3 000 m; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (widespread, Albert E to Kokstad southwards, from Middelburg to Mthatha, Graaff-Reinet to King William's Town and Gwarriepoort to Grahamstown).

hirsuta DC.

Bloublommetjie (A)

Rounded, roughly hairy shrublet, 0.1–0.6 m high; bark often reddish. **Leaves** alternate, linear, lanceolate to oblanceolate, entire, white-hairy; young leaves also glandular-pubescent. **Capitula** radiate, solitary, pedunculate; peduncles glandular-pubescent; involucral bracts in 3 or 4 rows, imbricate; hairy and glandular-pubescent. **Ray florets** blue-violet. **Disc florets** yellow. **Flowering time** July–Oct. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, brownish, shortly hairy. Hill slopes and along drainage lines, alt. 100–2 000 m; Upper Karoo, Lower Karoo (widespread in Middelburg, Graaff-Reinet and Willowmore Districts).

hirta (Thunb.) Grau

Karooastertjie (A)

Rounded shrublet, up to 0.35 m high, branches densely white-appressed-hairy. **Leaves** alternate, lanceolate to oblanceolate, rarely obovate, entire; appressed shortly pubescent. **Capitula** radiate, solitary, pedunculate; peduncles pubescent with spreading hairs; involucral bracts in 3 rows, imbricate, hairy and glandular-pubescent. **Ray florets** blue-violet. **Disc florets** yellow. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** obovate, black, shortly hairy. Hill slopes, loamy flats, sandy or gravelly soil, alt. 60–1 400 m; Upper Karoo (WC to Middelburg).
No flowering specimens for EC in PRE.

hyssopifolia (P.J.Bergius) Nees

Pokkiesblom (A)

Thinly hairy to glabrous, much-branched, erect shrublet, up to 0.6 m high. **Leaves** alternate, linear to lanceolate, entire, white-hairy or glabrous, margins of lower leaves with few hairs, margins of lower part of upper leaves thickly covered with 2 rows of glandular hairs, upper leaves shorter than lower leaves. **Capitula** radiate, solitary, pedunculate; involucral bracts in 4 rows, imbricate, glabrous or outer ones white-hairy, inner ones with hairs along their margins. **Ray florets** pale violet. **Disc florets** yellow. **Flowering time** Dec.–Aug. **Pappus** of barbellate bristles, present in both ray and disc florets. **Cypselae** narrowly elliptic, brown, shortly hairy. Grassland, alt. 30–1 676 m; Dry Highveld Grassland, Lower Karoo, Albany Thicket (WC to Port Elizabeth).

muricata (Thunb.) Nees

Wild aster; *bloublommetjie(karoo)*, *bloubossie*, *blouheuningkaroo*, *kapokbossie*, *karoo-aster*, *karoobossie*, *skaapbossie*, *skaapkaroo*, *sonneblombossie*, *taai-astertjie*, *taaibloublommetjie* (A)

Much-branched shrublet, up to 0.7 m high, young branches hairy. **Leaves** alternate or tufted in axils of older leaves, linear, ascending, entire, hairy or glandular and then shiny. **Capitula** radiate, solitary, pedunculate; peduncles hairy; involucral bracts in 4 rows, imbricate, hairy or glabrous. **Ray florets** lilac, blue, pink or white. **Disc florets** yellow. **Flowering time** all year. **Pappus** of many barbellate bristles, present in both ray and disc florets. **Cypselae** narrowly obovate, reddish brown, with short hairs. Grassland on mountain slopes and also disturbed places, alt. 10–2 600 m; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (widespread, Albert E to Mount Frere southwards, from Middelburg to Maclear, Willowmore to Komga and Humansdorp to Alexandria).

westae (Fourc.) Grau

Sparsely branched shrub, up to 0.4 m high. **Leaves** alternate, densely set, linear-lanceolate, arching, grooved, margins rolled inwards, glabrous except for ciliate-dentate margins. **Capitula** radiate, solitary, shortly pedunculate; peduncles white-hairy; involucral bracts in 3 or 4 rows, imbricate, ciliate. **Ray florets** blue-purple. **Disc florets** yellow. **Flowering time** June–Mar. **Pappus** of barbellate bristles. **Cypselae** obovate, yellowish to reddish, those of the ray florets glabrous, those of the disc florets shortly hairy. On hills and along rivers or near vleis, alt. 50–250 m; Eastern Fynbos-Renosterveld (Keurbooms River to Humansdorp area).

zeyheri (Less.) Nees

Much-branched shrub, up to 0.4 m high. **Leaves** alternate, oblanceolate or linear, sessile, entire, ciliate, glabrous on blade or rarely with some long hairs on the lower surface or hairy all-over. **Capitula** radiate, solitary, pedunculate; peduncle woolly to glabrous; involucral bracts in 4 rows, imbricate, glabrous or rarely outer ones with some hairs. **Ray florets** blue-purple. **Disc florets** yellow. **Flowering time** Jan., Dec. **Pappus** of barbellate bristles. **Cypselae** narrowly obovate, brownish red, shortly hairy. Various habitats like hill and mountainsides, rocky hills, forest edges, along rivers, alt. 10–1 900 m; Mesic Highveld Grassland, Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Lady Grey to Naude's Neck Pass S, from Hofmeyr to Queenstown, Cradock to Kei River and Uitenhage to Bathurst).

FOVEOLINA Källersjö

(Anthemideae)

Wildekamille (A)

Species 5, endemic to sthn Afr., N, NC, WC, EC.

dichotoma (DC.) Källersjö

Bitterstinkkruid, *roggeveldgras*, *skaapstinkkruid*, *stinkkruid* (A)

Pubescent, annual herb, 0.07–0.50 m high. **Leaves** alternate, bipinnatisect. **Capitula** discoid, solitary, long pedunculate; involucre hemispherical or spherical; bracts in 3–5

rows, apically obtuse, with scarious margins, without central resin canal. **Receptacle** flat to convex-conical, epaleate. **Disc florets** bisexual, 4- or 5-lobed, number of lobes varying within same species; corolla tube of thin texture, often dilated at base; limb campanulate, partly enervate, yellow. **Flowering time** Aug. **Pappus** white and spongy, auriculate or pappus sometimes absent. **Cypselae** white, adaxially ± flat with 2 lateral rows of 3–5 small cavities, pericarp spongy and almost transparent abaxially, thus revealing dark brown colour of testa. Roadsides, disturbed places, alt. 10–2 325 m; Upper Karoo (Grootfontein Agricultural College, Middelburg).

*GAILLARDIA Foug.

(Helenieae)

Species 28, North and South America; 1 naturalised in sthn Afr., NW, FS, KZN, EC.

pulchella Foug.

Annual herb, up to 0.5 m high; erect, branched, softly pubescent. **Leaves** alternate, usually sessile, oblong or spathulate, margins entire. **Capitula** radiate; several-flowered, usually solitary on long, nude peduncles, terminating branches; involucral bracts lanceolate, ciliate on margins and midline. **Ray florets** neuter, rarely female and fertile; corolla yellow, often bicoloured, strap-shaped, rarely irregularly enlarged. **Disc florets** bisexual; corolla yellow or purplish, tubular below, campanulate above, 5-toothed. **Anthers** with apical appendage acuminate. **Style** linear, truncate, penicillate. **Pappus** of 5 awned scales. **Cypselae** turbinate, villous. Weed in abandoned field, alt. 5–1 345 m; Albany Thicket (Graaff-Reinet District).

*GALINSOGA Ruiz & Pav.

(Heliantheae)

Species 13, North, Central and South America; 2 introduced weeds in sthn Afr., widespread, except NC.

parviflora Cav.

Gallant soldier, small-flowered quickweed, kew weed; *knopkruid* (A)

Annual herb, 0.07–0.50 m high; glabrous, leafy. **Leaves** opposite, petiolate, ovate, membranous, base broadly cuneate, apex acuminate, margins subentire to serrate-crenate. **Capitula** radiate, pedunculate, in small cymes, terminal; involucre hemispherical; bracts ovate. **Receptacle** conical, paleate; paleae flat, membranous. **Ray florets** female, fertile; corolla white, strap-shaped. **Disc florets** bisexual, fertile; corolla yellow, cylindric, 5-toothed. **Anthers** oblong, faintly sagittate at base, with suborbicular apical appendage. **Style** linear; branches of ray florets linear-lanceolate. **Flowering time** Sept.–Apr. **Pappus** scales fimbriate. **Cypselae** usually dorsiventrally compressed, enclosed by group of connate involucral bracts and paleae. Introduced weed, cultivated land, alt. 10–2 325 m; Upper Karoo, Sub-Escarpment Savanna, Albany Thicket (Middelburg, Grahamstown, East London).

*GAMOCHAETA Wedd.

(Gnaphalieae)

Species 52, mainly South America, but also in other parts of the world; 5 naturalised in sthn Afr., LIM, NW, G, M, S, FS, KZN, WC, EC.

coarctata (Willd.) Kerguélen

Purple cudweed

Annual or biennial herb, up to 500 mm high. **Leaves** in a basal rosette, narrowly spathulate, cauline leaves smaller, entire, markedly discolorous, upper surface glabrescent, lower surface white-tomentose. **Capitula** disciform, in small glomerules or spikes arranged in long racemose inflorescence; involucral bracts in ± 3 rows, apex reddish purple at first turning golden-brown. **Female florets** filiform, outnumbering disc florets, whitish, tipped reddish purple. **Disc florets** bisexual, whitish, tipped reddish purple. **Flowering time** Oct.–Jan. **Pappus** of many barbellate bristles in 1 row, bases fused in a smooth ring. **Cypselae** small, oblong, minutely hairy. Native to South America, now naturalised in several parts of the world, widespread in FSA, damp and disturbed places like roadsides and along dams, and weed of cultivation, alt. 50–2 000 m; Albany Thicket, Indigenous Forests (Hogsback, Bathurst and Tsitsikamma areas).

pennsylvanica (Willd.) Cabrera

White-woolly, annual herb, up to 400 mm high. **Leaves** alternate, spathulate, decreasing in size upwards, entire, not discolorous. **Capitula** disciform, in small axillary glomerules racemosely arranged; involucral bracts in ± 3 rows, pale brown or buff-coloured. **Female florets** filiform, outnumbering disc florets, whitish, tipped reddish purple. **Disc florets** bisexual, whitish, tipped reddish purple. **Flowering time** (May) Sept.–Nov. **Pappus** of many barbellate bristles in 1 row, bases fused in a smooth ring. **Cypselae** small, oblong, minutely hairy. Native to North America, now naturalised in the warmer parts of the world, widespread in FSA, damp places and weed of cultivation, alt. up to 1 200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (Elliot and Mthatha Districts S to Grahamstown area).

spiciformis (Sch.Bip.) Cabrera

Delicate, erect or decumbent, greyish white-woolly, annual herb, 0.05–0.12 m high or long. **Leaves** alternate, oblanceolate or narrowly spathulate, decreasing in size upwards, entire. **Capitula** disciform, in small glomerules terminating the branchlets; involucral bracts in ± 3 rows, pale buff-coloured. **Female florets** filiform, outnumbering disc florets, whitish. **Disc florets** bisexual, whitish. **Flowering time** Dec. **Pappus** of many barbellate bristles in 1 row, bases fused in a smooth ring. **Cypselae** small, oblong, minutely hairy. Native to America, disturbed grassland on hillside, alt. 1 000–1 500 m; Sub-Escarpment Savanna (known from 2 collections in FSA only, in Swaziland and Alice in the EC).

subfalcata (Cabrera) Cabrera

Thinly grey-green, silky-woolly, decumbent to erect, annual herb, up to 350 mm high. **Leaves** alternate, lower leaves spathulate, upper linear-lanceolate, folded, apex recurved, grey-green silky-woolly, not discolorous, entire. **Capitula** disciform, in small woolly glomerules, racemosely arranged at branch tips; involucral bracts in ± 3 rows, apex tinged red-purple at first, pale brown later. **Female florets** filiform, outnumbering disc florets, white tipped red-purple. **Disc florets** bisexual, white tipped red-purple. **Flowering time** Aug.–Dec. and in Apr. **Pappus** of many barbellate bristles in 1 row, bases fused in a smooth ring. **Cypselae** small, oblong, minutely hairy. Native to Argentina, now naturalised in various parts of the world, widespread in FSA, weed of cultivation and disturbed, damp places, alt. 0–2 000 m; Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (Stutterheim to East London and Humansdorp areas).

GARULEUM Cass.

(Calenduleae)

Species 9, sthn Afr., widespread, but absent from B, LIM, NW, S.

album S.Moore

Much-viscid, aromatic, perennial shrub, 0.6–0.9 m high, with soft woolly indumentum especially underneath leaves, on peduncles and involucre. **Leaves** lyrato-pinnatifid, 50–75 mm long, white-woolly underneath, green and glandular above, alternate, sessile, margins serrately toothed. **Capitula** heterogamous, involucre campanulate. **Ray florets** oblong-elliptic, 3-toothed at apex, pale underneath, purplish blue above, glandular, cylindric disc floret sterile; corolla tube widening above, whitish in lower half, yellow in upper part, glandular, 5-lobed. **Flowering time** Jan.–May. On steep hillsides among dolerite rocks, alt. 1 200–1 350 m; Indigenous Forests, Sub-Escarpment Savanna (Pondoland, Lusikisiki District, Mlengana Cutting between Mthatha and Port St Johns).

bipinnatum (Thunb.) Less

Kowerbossie, *slanghoutjie* (A)

Perennial dwarf shrub or herb, 0.3–1.5 m high, scabrous, rigid. **Leaves** alternate, glabrous, pinnate or bipinnatipartite, lobes linear, subulate, acute, few-lobed or simple. **Capitula** solitary, terminal or arranged in loose corymbs, pedunculate. **Ray florets** blue, mauve, purple, violet, disc yellow. **Flowering time** Feb.–May. **Cypselae** of outer disc floret glabrous, outer ones surrounded by a wing with stiff, thickened margins, obovate and slightly emarginate at tip or almost obcordate ± 5 × 3.5 mm. Northern slopes and gravelly soil, alt. 305–1 220 m; Lower Karoo, Albany Thicket, Sub-Escarpment Grassland, Upper Karoo, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Aberdeen, Albany to Grahamstown).

pinnatifidum (Thunb.) DC.

Perennial shrub or herb, 0.3–1.5 m high, minutely velvety. **Leaves** pinnatipartite, lobes oblong, toothed, serratures blunt or subacute, callous-tipped. **Flowering time** Sept.–June. Streambanks, mountain ridges, along rivers, alt. 765–1 705 m; Lower Karoo, Dry Highveld Grassland, Upper Karoo, Albany Thicket, Dry Highveld Grassland, Rainshadow Valley Karoo (Richmond District, in Carlton Hills, Mountain Zebra National Park to Steytlerville).

sonchifolium (DC.) Norl.

Perennial shrub or herb, 0.3–1.2 m high. **Leaves** alternate, sessile, oblanceolate or oblong, coarsely toothed, teeth subulate. **Capitula** showy. **Ray florets** purple-blue, violet-blue. **Disc florets** yellow; bracts in 2 series. **Flowering time** Aug.–Nov. Open places near road, forest margin, rocky outcrops, alt. 450–1 860 m; Sub-Escarpment Savanna, Sub-Escarpment Grassland, Drakensberg Grassland, Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket (Malowe Mts, Willowvale to East London).

tanacetifolium (MacOwan) Norl.

Suffrutex, up to 0.9 m high. **Leaves** sessile, finely bipinnatisect, roughly glandular, viscous, hooked; involucral bracts biseriate, membrane edged. **Ray florets** 10–12. **Cypselae** distinctly, longitudinally 4- or 5-ribbed, ± minutely tuberculate towards apex. Forest edge, alt. 1 200–1 400 m; Dry Highveld Grassland, Albany Thicket (Somerset East).

GAZANIA Gaertn.

(Arctotideae)

Treasure flower; *botterblom* (A)

Species ± 7, Africa; mainly in N and SA, 1 extending to Angola and Tanzania, and 1 in Mozambique; widespread.

1a Stem developed, leaves present along entire length
2a Leaf undivided, obovate or obovate-spathulate, margins dentate or slightly lobed; herb

lichtensteinii Less.

Gazania; *kougoed*, *geelgousblom* (A)

Annual or perennial herb, 0.05–0.40 m high; short basal branches or elongated decumbent/ascending branches. **Leaves** arranged uniformly on branches (or crowded into basal rosettes), obovate, 20–70 × 3–20 mm, apex obtuse, upper and lower surfaces finely grey-tomentose, upper sometimes glabrous. **Capitula** on peduncles 20–120 mm long; involucre cylindrical; all scales terminal, 2-seriate; outer involucral scales linear/triangulate, 1.5 × 1 mm, margins minutely ciliate; inner involucral scales ovate-triangulate, 4–7 × 2.5 mm, margins entire. **Ligules** yellow/orange, basal blotches/bicolour spots. **Flowering time** all year, rainfall dependent. Disturbed grassland; Lower Karoo (extreme far W of EC, N of Willowmore, W of Graaff-Reinet).

2b Leaf undivided (linear-lanceolate or lanceolate), or pinnatifid (with lanceolate laciniae) with margins entire, or linear with margins spinulose-ciliate; dwarf shrub or trailing herb
3a Shrub, densely branched; leaves densely crowded, linear undivided, with margins spinulose-ciliate

caespitosa Bolus

Perennial, dwarf shrub ± 0.10 m high; densely branched, caespitose. **Leaves** densely crowded, rigid, undivided, linear, 20–30 × 1.0–1.5 mm, margins ciliate with spinules 1 mm long, upper surface smooth and glabrous, lower surface glabrous tomentose except for midvein; tomentum often hidden beneath revolute margins. **Capitula** on peduncles 30–50 mm long; involucre subcampanulate; all scales terminal, 2- or 3-seriate; outer involucral scales linear-triangulate, 5 × 1.5 mm wide, acute, margins very slightly denticulate; inner involucral scales: ovate-triangulate, 7–8 × 2–3 mm wide, acuminate, margins entire. **Ligules** yellow. **Flowering time** all year, rainfall dependent. Grassland; Upper Karoo (montane grassland of the Koudeveld of the Sneeuberg Mts).

3b Trailing herb; leaves lanceolate or obovate-lanceolate undivided, rarely some leaves pinnatifid, margins entire

rigens (L.) Gaertn.

Perennial herb, mat-forming, up to 0.4 m long, trailing/creeping. **Stem** uniformly leafy. **Leaves** coriaceous, 30–110 × 4–23 mm, lanceolate or obovate-lanceolate, either all leaves undivided or some pinnatifid, with 1 or 2 laciniae lanceolate, apex acute/obtuse, margins entire, upper surface glabrous/tomentose, lower surface tomentose, except midvein. **Capitula** on penduncles 40–150 mm long, not leafy, sometimes linear bracts on stem; involucre campanulate/cupuliform; scales terminal, few parietal, 2- or 3-seriate; outer involucral scales triangulate-lanceolate, acute, 4–7 mm long, tomentose; inner involucral scales narrowly triangulate, acuminate, 5–10 mm long, ± glabrous. **Ligules** yellow, plain or basal black/bicoloured spots. **Flowering time** all year, rainfall dependent. Disturbed grassland, dunes/beachfronts; Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt (along entire EC Coast).

1b Stem shortened, often multiple, leaves crowded in basal rosette
4a Inner involucral scales setose-acuminate; scape very frequently 150–300 mm high

linearis (Thunb.) Druce

Perennial herb, 0.1–0.3 m high. **Leaves** in basal rosettes, 80–300 × 1–10 mm (rarely 25 mm wide), linear/lanceolate (rarely elliptic); undivided, or some pinnatifid, or all pinnatifid, with 1–6 laciniae, upper surface smooth/rough with setulae, lower surface tomentose, except for midvein. **Capitula** on scapes 100–350 mm long, usually shorter than leaves, few solitary linear bracts; involucre campanulate; scales terminal, few parietal, 2- or 3-seriate; outer involucral scales linear, margins ciliate; inner involucral scales very finely acuminate, 8–18 × 2 mm, margins entire. **Ligules** yellow/orange, sometimes basal spots. **Flowering time** all year, rainfall dependent. Disturbed grassland; Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (widespread in EC).

4b Inner involucral scales obtuse or acute or acuminate; scape usually < 150 mm high
5a Apex of leaves and involucral scales drawn out into a clearly pungent spine ± 0.5 mm long; leaves all pinnatifid (very rarely some undivided), 2–5 pairs laciniae 2–8 mm long, subtriangular

jurineifolia DC.

Perennial herb, 0.03–0.50 m high. **Stem** undivided/plural. **Leaves** in basal rosettes, rigid, ± coriaceous, 10–70 mm long, pinnatifid, with 2–5 pairs laciniae, 2–8 mm long, upper surface covered with cilia, rough/smooth, lower surface tomentose, except for midvein. **Capitula** on scapes 5–80 mm long, not leafy; involucre campanulate; scales terminal, few parietal, ± 3-seriate; outer involucral scales 1–3 mm × 1 mm, linear- or triangulate-lanceolate, margins densely ciliate with spinules; inner involucral scales ovate-triangulate or narrow triangulate, 3–8 × 1.5–3.0 mm, margins ± ciliate/entire. **Ligules** white. **Flowering time** all year, rainfall dependent. Disturbed grassland; Upper Karoo, Albany Thicket, Lower Karoo (N of Fort Beaufort, W of Queenstown).

5b Apex of involucral scales not drawn out into a spine; leaves undivided linear/linear-lanceolate or pinnatifid with 1–4 pairs of laciniae 3–15 mm long, linear/lanceolate

krebsiana Less.

Gazania; *bruingousblom*, *(rooi)botterblom* (A); *mabone* (SS); *umkwinti* (X); *ubendle* (Z)

Perennial herb, 0.03–0.20 m high. **Leaves** in basal rosettes, 30–250 mm long, linear/lanceolate; all undivided 1–8 mm wide, or some pinnatifid with 1–4 linear laciniae, upper surface smooth/± rough with setulae, lower surface tomentose, except for midvein. **Capitula** on scapes 30–150 mm long, not leafed/few solitary linear bracts; involucre campanulate; scales terminal, few parietal, 2- or 3-seriate; outer involucral scales linear, 1 mm wide, acute, margins ciliate; inner involucral scales narrowly triangulate or ovate-triangulate, acuminate/acute/± obtuse, margins entire. **Ligules** yellow/orange, plain/basal blotches or bicoloured spots. **Flowering time** all year, rainfall dependent. Disturbed grassland; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (widespread in EC).

GEIGERIA Griess.

(Inuleae)

Species 27, mostly in the sthn part of Africa; 20 in sthn Afr., widespread.

aspera Harv.

Misbeksiektebos, *vermeerbossie* (A)

Perennial herb, up to ± 0.2 m high; stems hispid to glabrous. **Leaves** alternate, linear to linear-lanceolate, glandular-punctate, margins entire or remotely denticulate. **Capitula** radiate, few- to several-flowered, sessile, solitary at each forking of branches; involucre narrowly ovoid; outer bracts with short, linear, leaf-like appendage; inner acute with ciliate margins. **Receptacle** convex to conical, epaleate but with many bristles. **Ray florets** female, marginal; corolla yellow; lamina longer than tube; ovary oblong; style terete, with linear, obtuse branches. **Disc florets** bisexual, fertile; corolla tube slightly narrowed upwards. **Anthers** sagittate at base, with lanceolate, apical appendage. **Style** terete, slightly swollen at base; branches linear, acute. **Flowering time** Feb.? **Pappus** of 10 elliptic, hyaline scales, alternate ones tipped with slender awn. **Cypselae** turbinate, silky-villous. Grassland, alt. ± 1 495 m; Sub-Escarpment Grassland (Matatiele District).

filifolia Mattf.

Vermeerbos (A)

Perennial herb, 0.05–0.10 m high; stemless. **Leaves** rosetted, erect, narrowly linear, glandular-punctate, glabrous, margins entire, strongly revolute. **Capitula** solitary, subtended by leaves, but several tufts usually crowded together; involucre subglobose; outer bracts with long, linear, leaf-like appendage; inner long-acuminate with ciliate margins. **Receptacle** convex to conical, epaleate but with many bristles. **Ray florets** female, marginal; corolla yellow; ovary oblong; style terete, with linear, obtuse branches. **Disc florets** bisexual, fertile; corolla tube slightly narrowed upwards, with linear-lanceolate lobes. **Anthers** sagittate at base, with lanceolate, apical appendage. **Style** terete, slightly swollen at base; branches linear, acute. **Flowering time** Sept.–Apr. **Pappus** of 10 elliptic, hyaline scales, alternate ones tipped with slender awn. **Cypselae** turbinate, silky-villous. Grassland, stony/rocky, alt. 155–1 600 m; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Aliwal North, Queenstown, Graaff-Reinet, Grahamstown).

ornativa O.Hoffm.

Vomeerbos (A)

Perennial herb, 0.2–0.4 m high; stems ascending; branches irregularly or divaricately branching. **Leaves** 1–few-rosulate or cauline, narrowly oblanceolate or linear, apex obtuse or acute, margins denticulate, if linear, then entire; gland-pitted on both surfaces. **Capitula** ovoid, crowded in leaf axils at base of plant in acaulescent form or solitary in widely separated leaf axils in cauline form; involucre ovoid or globose; bracts in many rows, outer bracts usually with foliaceous appendages. **Receptacle** convex to conical. **Ray florets** yellow; tube 3-toothed, oblong-elliptic. **Disc florets** bisexual, yellow. **Anthers** sagittate at base, with lanceolate, apical appendage. **Style** terete, slightly swollen at base; branches linear, acute. **Flowering time** Sept.–Apr. **Pappus** biseriate, outer series oblong, membranous, inner similar but with elongate aristae. **Cypselae** obconic, silky-pilose. Grassland, roadsides, alt. 305–2 000 m; Upper Karoo, Albany Thicket, Sub-Escarpment Savanna (Middelburg, Graaff-Reinet, Grahamstown).

GERBERA L.

(Mutisieae)

Species ± 30, tropical and sthn Afr., Madagascar, Asia; 13 in sthn Afr., widespread, but absent in N, B.

ambigua (Cass.) Sch.Bip.

Botterblom, *Griekwateebossie* (A); *ucabazane*, *uhlamvuhloshane*, *ulimi-lwenkomo* (Z)

Perennial herb, 0.15–0.50 m high; from thickened woody rootstock; root crowns densely silky-lanate. **Leaves** radical, ascending or spreading, petiolate, elliptic or oblong, apex rounded mucronate, margins sinuate-denticulate, undulate or coarsely crenate-denticulate, upper surface at first pilose-hispid, lower surface thinly crisped, pubescent to glabrescent. **Capitula** solitary, erect; involucres broadly obconic; involucral bracts narrowly lanceolate to narrowly elliptic. **Ray florets** white above, pink below, or yellow and then coppery below. **Disc florets** bisexual, inner functionally male. **Flowering time** Aug.–May. **Pappus** of many scabrid bristles, whitish. **Cypselae** elliptic, shortly beaked, pubescent. Grassland, woodland and dambos, alt. 200–2 000 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Maclear District, Queenstown, Grahamstown, Trappes Valley).

cordata (Thunb.) Less.

Tongblaarbossie (A)

Perennial herb, 0.15–0.45 m high; acaulescent and scapigerous, with woolly crown. **Leaves** radical, oblong-elliptic to oblong ovate, base broadly and distinctly cordate, apex rounded or acute, margins entire or remotely denticulate, densely ciliate, upper surface dull dark green, lower surface persistently whitish tomentose. **Capitula** radiate, solitary on long scapes; scapes 1–4, densely tomentose-villous; involucre turbinate to broadly campanulate; bracts in many rows. **Receptacle** flat, epaleate. **Ray florets** white, yellow, pink or red. **Disc florets** bisexual, of same colour as ray florets. **Flowering time** Sept.–May. **Pappus** of many scabrid bristles, white to snow-white when young, whitish to rufous-tinged with age. **Cypselae** sparsely puberulous. In shaded forests, along rivers and roads, in rocky places, alt. 0–1 000 m; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Uitenhage, Grahamstown, Humansdorp).

natalensis Sch.Bip.

Groenteebossie (A)

Perennial herb, 0.02–0.20 m high; stemless, roots fusiform, crown thick, woody, white silky-villous. **Leaves** radical, elliptic, base tapering into slender petiole, apex subacute, margins entire. **Capitula** radiate, solitary on long scapes; scapes 1–3 from crown, ebracteate; involucre narrowly campanulate; bracts thinly hairy, often margined with purple. **Ray florets** white above, pink or reddish below. **Disc florets** bisexual, of same colour as ray florets. **Flowering time** Aug.? **Pappus** of many scabrid bristles, whitish. **Cypselae** elliptic, shortly beaked, pubescent. Open grassland, alt. 300–2 100 m; Sub-Escarpment Grassland (Griqualand East).

piloselloides (L.) Cass.

Swartteebossie (A); *ubulawu*, *umqwashu* (X); *indlebeyempithi*, *uhlango olimpofu* (Z)

Perennial herb, 0.06–0.45 m high; from thickened woody rootstock. **Leaves** few–many, radical, ascending or spreading, broadly oblanceolate, base attenuate sometimes broadly cuneate, or rounded below and decurrent on petiole, apex rounded or subobtuse mucronulate, margins entire, upper surface sparsely pilose-hispid to glabrescent, lower surface thinly pilose or araneose to glabrescent. **Capitula** solitary, erect; involucres broadly obconic, thinly or thickly woolly outside; bracts linear-triangular tapering to an acute apex, scapes solitary sometimes several, erect slender. **Ray florets** white, pink or yellow. **Flowering time** Aug.–Apr. **Pappus** of many scabrid bristles, pinkish or whitish. **Cypselae** hispid. Grassland, dambos, open woodland, alt. 0–1 891 m; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Albany Thicket (Queenstown, Port Elizabeth, Grahamstown, East London).

tomentosa DC.

Perennial herb, 0.15–1.00 m high; acaulescent and scapigerous. **Leaves** radical, elliptic-oblong, ovate, or broadly lanceolate, base often narrowly cordate, but varying from truncate to cuneate, and cuneate only near petiole, apex rounded to obtuse, margins entire, dentate, regularly or irregularly subsinuate to sinuate, upper surface green to dark green, lower surface golden-brownish to yellow-brownish. **Capitula** radiate, solitary on long scapes; scapes 1–4, many-flowered; involucre turbinate to broadly campanulate; bracts golden-brownish tomentose. **Receptacle** flat, epaleate. **Ray florets** white or red to purplish below, also yellow-reddish, cream-coloured. **Disc florets** bisexual, light in colour. **Flowering time** Oct.–Jan. **Pappus** of many scabrid bristles, whitish to whitish tawny. **Cypselae** narrowly flask-shaped, ribbed, sparsely puberulous. Open woodland, alt. up to 1 500 m; Eastern Fynbos-Renosterveld (Clarkson, Humansdorp).

viridifolia (DC.) Sch.Bip.

Blushing barberton daisy

Perennial herb, up to 0.2 m high; from thickened woody rootstock, root crowns densely silky-lanate. **Leaves** radical, ascending or spreading, petiolate, elliptic or oblong, rounded or cordate below and sometimes shortly decurrent on petiole, apex rounded mucronate, margins sinuate-denticulate, undulate or coarsely crenate-denticulate. **Capitula** solitary erect; involucres broadly obconic; bracts narrowly lanceolate to narrowly elliptic; scapes 1–several, erect slender. **Ray florets** usually white inside and reddish or purplish on the margins and outside. **Disc florets** bilabiate, functionally male, whitish. **Flowering time** Nov.–Feb. Grassland, open woodland and dambos, alt. 350–1 998 m; Drakensberg Grassland (Rhodes District, Maclear District).

GIBBARIA Cass.

(Calenduleae)

Species 2, sthn Afr., WC, EC.

scabra (Tunb.) Norl.

[= *Oxylaena acicularis* (Benth.) Anderb. (Koekemoer 2011)]

Perennial shrub, 0.1–0.2 m high. **Leaves** filiform, spreading. **Capitula** radiate, solitary, yellow or white with orange underneath. **Flowering time** Aug.–Apr. **Cypselae** reniform,

smooth, ± 3 mm long. Riverine bush and forest margins, alt. 80–800 m; Eastern Fynbos-Renosterveld, Indigenous Forests, Mesic Highveld Grassland, Albany Thicket (Uniondale to Uitenhage).

GNAPHALIUM L.

(Gnaphalieae)

Species ± 80, cosmopolitan; 14 in sthn Afr., widespread, but absent in S.

austroafricanum Hilliard

Decumbent or prostrate, perennial herb, 0.15–0.45 m long, often rooting at nodes. **Leaves** alternate, narrowly spathulate, entire, thinly greyish-white appressed-tomentose. **Capitula** disciform, in small corymbose clusters, on cottony peduncles terminally; involucral bracts in ± 4 rows, outer row golden-brown, hairy, inner rows with snow-white, obtuse or subacute apex, longer than broad. **Female florets** filiform, outnumbering disc florets, purple. **Disc florets** bisexual, narrowly tubular, purple. **Flowering time** Dec.–Feb. **Pappus** absent in female florets, of free, scabrid bristles with plumose apex in disc florets. **Cypselae** small, oblong, sparsely hairy. Muddy places along streams and dams, alt. 5–1 578 m; Drakensberg Grassland, Sub-Escarpment Savanna, Indigenous Forests (widespread, Amatole Mts and Grahamstown).

capense Hilliard

Decumbent or prostrate to suberect, perennial herb, 0.10–0.15 m long. **Leaves** alternate, linear to narrowly oblanceolate, entire, greyish white-appressed-woolly. **Capitula** disciform, in small corymbose clusters, terminal, closely surrounded by leaves; involucral bracts in ± 4 rows, outer row pale golden-brown or straw-coloured, hairy, inner rows with snow-white, oblong, obtuse or rarely subacute apex, longer than broad, often recurved. **Female florets** filiform, outnumbering disc florets, yellow. **Disc florets** bisexual, narrowly tubular, yellow. **Flowering time** May–Jan. **Pappus** of scabrid bristles in female florets, of free, scabrid bristles, shortly plumose at apex in disc florets. **Cypselae** small, oblong, sparsely hairy. Damp or seasonally damp places, alt. 15–1 740 m; Dry Highveld Grassland, Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (WC to Amatole Mts and Bathurst).

confine Harv.

Decumbent or erect, annual herb, up to 200 mm high or long. **Leaves** alternate, oblanceolate to linear-oblong, entire, apex obtuse to subacute, mucronate, grey-woolly. **Capitula** disciform, clustered at branch tips, closely surrounded by leaves; involucral bracts in 4 rows, outer ones pale brown, woolly outside, inner rows with acute or subacute apex, dirty white or palest buff-coloured, sometimes tinged purple. **Female florets** filiform, outnumbering disc florets. **Disc florets** bisexual, narrowly tubular. **Flowering time** Sep.–Jan. (Apr.). **Pappus** of scabrid bristles in female florets, of free, scabrid bristles with subplumose apex in disc florets. **Cypselae** small, oblong, sparsely hairy. Damp places such as riverbanks or streambanks etc., sometimes behaving as a weed, alt. 460–2 285 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Lower Karoo (widely distributed, Steynsburg and Graaff-Reinet to Kei River).

[E]**gnaphalodes** (DC.) Hilliard & B.L.Burtt

Prostrate or decumbent, greyish cottony tomentose perennial herb, 0.1–0.3 m long. **Leaves** alternate, oblong-spathulate or rarely narrowly oblong-elliptic, conspicuously

mucronate, often folded lengthwise and somewhat recurved, margins ± undulate, loosely greyish-white appressed-tomentose, glabrescent. **Capitula** disciform, in small, corymbose clusters, terminal, shortly cottony pedunculate; involucral bracts in ± 4 rows, outer golden-brown, glabrous or nearly so, inner with snow-white, oblong, obtuse apex. **Female florets** filiform, outnumbering disc florets. **Disc florets** bisexual, narrowly tubular. **Flowering time** Sept.–May. **Pappus** of scabrid bristles in female florets or absent, of free, scabrid bristles with short plumose apex in disc florets. **Cypselae** small, oblong, sparsely hairy. Marshy places, alt. 20–600 m; Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Mthatha S to Port Elizabeth, Grahamstown and East London).

limicola Hilliard

Prostrate, thinly grey-woolly, perennial herb, up to 0.12 m long, rooting at nodes. **Leaves** alternate, oblong-spathulate, entire, silky grey-tomentose. **Capitula** disciform, in small groups of up to 4, conspicuously pedunculate; involucral bracts in ± 4 rows, outer ones brown, woolly at base, apex of inner ones snow-white, obtuse. **Female florets** filiform, outnumbering disc florets. **Disc florets** bisexual, narrowly tubular. **Flowering time** Dec.–Mar. **Pappus** of bristles with scabrid apex present in both female and disc florets. **Cypselae** small, oblong, sparsely hairy. Muddy streambeds, alt. up to 2 650 m; Drakensberg Grassland, Sub-Escarpment Grassland (Drakensberg of L, Barkly East and Rhodes areas).

[E]**vestitum** Thunb.

Greyish white-woolly annual or occasional perennial, erect, suberect or trailing herb, 0.05–0.40 m long. **Leaves** alternate, appressed, linear or linear-spathulate, obtuse to subacute, entire, greyish-white tomentose. **Capitula** disciform, few–several crowded at branch tips, closely surrounded by leaves; involucral bracts in ± 4 rows, outer ones woolly, apex of inner bracts lanceolate, acute to subacute, sometimes somewhat squarrose, dirty white or pale buff-coloured. **Female florets** filiform, outnumbering disc florets. **Disc florets** bisexual, narrowly tubular. **Flowering time** Sept.–June. **Pappus** of bristles with scabrid apex present in both female and disc florets. **Cypselae** small, oblong, sparsely hairy. Damp places in grass or grass and shrub communities, alt. 30–945 m; Drakensberg Grassland, Sub-Escarpment Savanna, Dry Highveld Grassland, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Komga to Tsitsikamma Mts).

GYMNANTHEMUM Cass.

(Vernonieae)

Species > 43, Africa, southern Asia, Indonesia; 6 in sthn Afr., B, LIM, M, S, FS, KZN, WC, EC.

corymbosum (L.f.) H.Rob.

Erect shrub, up to 1.8 m high. **Leaves** alternate, obovate, cuneate-oblong or deltoid, coarsely toothed in upper half or at apex, sometimes entire, base cuneate, subsessile, glabrescent above, silky canescent below, discolorous. **Capitula** discoid, in corymbose panicles; involucral bracts ovate-elliptic. **Florets** pale to deep violet. **Flowering time** Dec.–Apr. **Pappus** outer of short bristles, inner of persistent barbellate bristles. **Cypselae** narrowly turbinate-cylindric, somewhat angular and ribbed, hairy. Mountains in scrub on forest margins, sometimes open grassland, coastal forest, alt. 45–1 620 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (from Clydesdale to Port St Johns, Hogsback, Kentani and Port Elizabeth).

crataegifolium (Hutch.) H.Rob.
Subshrub, up to 2 m high. **Leaves** alternate, subsessile, elliptic, obovate, oblanceolate or suborbicular, coarsely toothed, especially in upper half, base cuneate, upper surface cobwebby or glabrous, lower surface cobwebby and glandular. **Capitula** discoid, in large corymbose panicles; involucral bracts elliptic-ovate, imbricate. **Florets** whitish or mauve. **Flowering time** Mar., Apr. **Pappus** of scabrid bristles, outer shorter than inner. **Cypselae** subterete, hairy. Dry, open woodland, alt. 60–2 000 m; Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt (Clydesdale, Ngqeleni, Port St Johns and Kei Mouth).

mespilifolium (Less.) H.Rob.
Scrambling shrub, up to 9 m high. **Leaves** alternate, petiolate, broadly obovate or cuneate-oblong, base attenuate, coarsely toothed in upper half or at apex, glabrous above, thinly cobwebby or glabrescent below. **Capitula** discoid, in corymbose panicles; involucral bracts oblong-elliptic, obtuse. **Florets** pinkish violet to white. **Flowering time** Jan.–Apr. **Pappus** of barbellate bristles, outer a little shorter than inner. **Cypselae** subterete, hairy. Forest margins or scrambling into trees along roads and paths through forest, alt. 0–1 830 m; Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket, Indigenous Forests (from Bedford to Kentani and Komga, and from Nature's Valley and Port Elizabeth to Alexandria).

GYMNOPENTZIA Benth.

(Anthemideae)

Monotypic, endemic to sthn Afr., M, FS, KZN, L, EC.

bifurcata Benth.
Erect or decumbent shrub, up to 1.2 m high. **Leaves** opposite, bases connate and sheathing, blades simple or 1–3× dichotomously forked, lobes narrowly linear, glabrous to thinly or densely villous. **Capitula** discoid, small, in dense, terminal corymbs; involucre broadly campanulate; bracts in few rows, ciliate. **Disc florets** bisexual, corolla yellow, tubular below, campanulate above, glandular, with 5 ovate lobes. **Flowering time** (Aug.) Dec.–June. **Pappus** absent. **Cypselae** ± cylindric, 10-ribbed, long-papillose. Open grassland, rocky gullies and on rock outcrops, often on riverbanks and seepage areas, alt. 1 525–3 050 m; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt (mountains from Lady Grey to Kei River Mouth).

HAPLOCARPHA Less.

(Arctotideae)

Species 9, Africa; 6 in sthn Afr., one extending to Angola, Democratic Republic of Congo and Tanzania, B, NW, G, M, S, FS, KZN, L, WC, EC.

1a Peduncle not exceeding 150 mm long; capitulum geocarpic; cypselae obovoid, basal ring of hairs much shorter than cypsela; pappus scales shorter than cypsela, apex rounded

nervosa (Thunb.) Beauverd
Perennial herb, stems rhizomatous or prostrate, forming caespitose mats, 0.05–0.15 m high. **Leaves** petiolate, elliptic to pinnatifid, margins entire or lobed, upper surface glabrous or hirsute, 15–180 mm long; involucral bracts in few rows, apex of outer bracts erect or reflexed, glabrous or hirsute. **Ray florets** female, fertile, limb yellow.

Disc florets many, hermaphrodite, corolla yellow. **Filaments** smooth. **Flowering time** Sept., Oct. **Pappus** of scales in 2 series of subequal length, 0.2–0.5 mm long. **Cypselae** glabrous or minutely pubescent, smooth or transversely rugose, abaxial ribs ± inconspicuous. Damp montane slopes and grassland, vleis, streambanks, seepages; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland (Sneeuberg and from the Drakensberg to WC).

1b Peduncle often exceeding 150 mm long; capitulum erect when cypselae mature; cypselae obconical, basal ring of hairs at least as long as cypsela; pappus scales longer than cypsela, apex acuminate
2a Outer involucral bracts with acute, erect apex; cypselae densely silky-villous all over

lyrata Harv.

Bietou (A)

Perennial herb, rosulate or with short prostrate stems, 0.1–0.3 m high. **Leaves** petiolate, lyrate-pinnatisect, sometimes elliptic, 35–150 mm long; involucral bracts in many rows, outer bracts apex white-tomentose. **Ray florets** female, fertile, limb yellow. **Disc florets** many, hermaphrodite, corolla yellow. **Filaments** papillose. **Flowering time** Aug.–Mar. **Pappus** of scales in 1 series, apex acuminate-serrate, 4–5 mm long. **Cypselae** smooth, silky-villous, 3 abaxial ribs conspicuous, basal ring of hairs ± equal in length to cypsela. Montane slopes, grassland, roadsides; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Uniondale to King William's Town District).

2b Outer involucral bracts with rounded, reflexed apex; cypselae with basal ring of hairs, otherwise glabrous

scaposa Harv.

Tonteldoosbossie (A); *moarubetsu* (SS); *isikhali* (X)

Perennial herb, rhizomatous, forming caespitose clumps, 0.2–0.6 m high. **Leaves** in basal rosette, ± sessile, entire or shortly lobed, 50–250 mm long; involucral bracts in many rows, outer bracts hirsute above, white-tomentose below. **Ray florets** female, fertile, limb yellow. **Disc florets** many, hermaphrodite, corolla yellow. **Filaments** shortly papillose. **Flowering time** Nov.–Feb. **Pappus** of scales in 2 unequal series, inner series longer than outer series, inner scales exceeding cypsela length, 5–6 mm long. **Cypselae** tangentially compressed, smooth, 3 abaxial ribs conspicuous, basal ring of hairs longer than cypsela. Damp montane slopes and grassland, margins of vleis, seepages; Sub-Escarpment Grassland, Drakensberg Grassland, Mesic Highveld Grassland, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (from Sneeuberg and Suurberg E to Drakensberg).

*HEDYPNOIS Mill.

(Cichorieae)

Species 3, Macronesia to the Mediterranean; 1 introduced in sthn Afr., WC, EC.

cretica (L.) Dum.Cours.

Annual herb with milky latex, 0.3–0.6 m high. **Leaves** rosulate, entire to pinnatifid. **Capitula** ligulate, on stout, rather long peduncles; involucre with bracts in 2 distinct, unequal rows. **Florets** bisexual, corolla yellow, dorsally sometimes with reddish or greenish stripes. **Flowering time** Oct. **Pappus** a small corona in outer florets, of few, coarse, basally flattened and scale-like, scabrid bristles in inner florets. **Cypselae** narrowly terete and incurved, enclosed by persistent involucral bracts. Introduced weed, apparently not common, disturbed places near the coast, alt. 0–50 m; Eastern Fynbos-Renosterveld (known from 2 collections only: Cape Peninsula and Port Elizabeth).

*HELIANTHUS L.

(Heliantheae)

Species 50, North America; 3 occasional escapes in sthn Afr., G, FS, KZN, EC.

annuus L.

Common sunflower, mirasol; *sonneblom* (A)

Annual herb, ± 2 m high; branching from base. **Leaves** alternate, sometimes opposite below, ovate to triangular, base cordate to truncate and abruptly descending on petiole, apex acuminate, scabrid-pubescent on both surfaces. **Capitula** terminal, solitary, long-pedunculate; involucral bracts triseriate, ovate-lanceolate, abruptly long-acuminate, scabridulous. **Ray florets** neuter; corolla yellow, occasionally reddish, strap-shaped, conspicuous. **Disc florets** bisexual, fertile; corolla yellow or sometimes partly or wholly purple, narrowly tubular below, expanded above, 5-toothed. **Anthers** entire or minutely sagittate at base, with apical appendage. **Style** with branches narrowly oblong. **Pappus** of 2 deciduous awn-like scales. **Cypselae** narrowly obovate, ± compressed, thinly hispid. Cultivated land, alt. up to 90 m; Albany Thicket (Alexandria District).

HELICHRYSUM Mill.

(Gnaphalieae)

For key to groups, see Hilliard (1983).

Group 1

Small shrubs. **Leaves** small, linear-oblong to obovate, often minutely petiolate. **Capitula** homogamous, ± 4–5 × 2 mm, in small congested or lax corymbose panicles; involucral bracts not radiating, white or sometimes rosy. **Receptacle** with fimbrils. **Flowers** usually 5, corolla cylindric. **Pappus** of scabrid bristles, bases cohering strongly by patent cilia. **Cypselae** glabrous.

zeyheri Less.

Vaalbergkaroo (A)

Dense or open shrublet, ± 0.15–1.00 m high, greyish-white, woolly, branches virgate, leafy. **Leaves** 6–23 × 2–9 mm, apex obtuse to acute, mucronate, base broad and often subcordate-clasping, only midvein visible, margins often undulate or crisped. **Capitula** cylindric, many, terminal; involucral bracts in 4 or 5 series, graded, imbricate, oblong-lanceolate, keeled, blunt or subacute, often truncate and emarginate. **Receptacle** with fimbrils ± equalling ovaries. **Flowering time** Nov.–May. **Pappus** of many bristles, ± equalling corolla. **Cypselae** 0.75 mm long. Sandy and stony soils; palatable to stock; Upper Karoo, Albany Thicket, Sub-Escarpment Grassland, Dry Highveld Grassland, Lower Karoo (widespread, common in drier parts of sthn Afr.; Steynsburg, Glen Grey and Stutterheim).

Group 2

Small shrubs or bushy perennial herbs. **Leaves** small, oblong to spathulate. **Capitula** heterogamous (or rarely homogamous in the same species), 3–4 × 1–2 mm, in congested, terminal, corymbose panicles; involucral bracts imbricate, not radiating, silvery or lemon-yellow. **Receptacle** smooth. **Flowers** 3–8, 0–3 female, corolla of bisexual

flowers narrowly campanulate above. **Pappus** of scabrid bristles, bases with small patent cilia, not cohering. **Cypselae** glabrous.

1a Leaves closely greyish woolly

callicomum Harv.

Tufted, perennial herb, up to 0.4 m high, stems branching and woody at base, closely greyish-white, felted, densely leafy. **Leaves** up to 25 × 6 mm, passing into inflorescence bracts, apex obtuse, base half-clasping. **Capitula** cylindric, ± 4.5 × 1 mm, very many in panicles up to 60–80 mm in diam.; involucral bracts in ± 4 series, graded, apex acuminate, glossy, pellucid, pale straw-coloured. **Flowers** 4–6, 1–3 female, 2 or 3 bisexual, yellow. **Flowering time** Mar.–May. **Pappus** of several bristles, delicate. **Cypselae** 0.75 mm long. Often large stands in overgrazed grassland on poor stony or sandy soils; Drakensberg Grassland, Mesic Highveld Grassland, Sub-Escarpment Grassland (widespread, to Grahamstown).

1b Leaves enveloped in tissue paper-like indumentum, becoming woolly only with age
2a Involucral bracts pale lemon-yellow, not webbed together

rutilans (L.) D.Don

Sandsewejaartjie (A)

Lax or dense, twiggy shrublet, up to 0.6 mm high and in diam., covered with silver-grey indumentum with tissue paper-like surface, woolly when old, ± viscid, branches very leafy. **Leaves** very variable, 6–30 × 1–6 mm, linear to spathulate, often folded lengthwise, apex subacute, mucronate, often recurved. **Capitula** heterogamous, cylindric; involucral bracts in 4 series, graded, ovate-lanceolate, acute, pellucid, glossy. **Flowers** 3–5, bright yellow. **Flowering time** all year. **Pappus** of 2–4 bristles, ± equalling corolla, or absent. **Cypselae** < 1 mm long. Among shrubs and shrublets on poor sandy, shaly or stony soils; Mainly Upper Karoo and Dry Highveld Grassland, also Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (Aliwal North and Cathcart).

2b Involucral bracts silvery, webbed together at base with delicate, tissue paper-like indumentum

dasycephalum O.Hoffm.

Twiggy, dwarf shrub, up to 0.3 m high, covered with silver-grey felt with a tissue paper-like surface, old stems woody, branches prostrate or decumbent, ultimately stiffly erect, densely leafy. **Leaves** rigid, up to 20 × 5 mm, spathulate to oblong, apex obtuse to subacute, mucronate, hooked, base half-clasping. **Capitula** cylindric, ± 4 × 1 mm, webbed together with woolly hairs, tight clusters arranged in panicles up to 20 mm in diam.; involucral bracts in ± 3 series, pellucid, silvery, apex sometimes pale brown or yellow. **Flowers** 4–6, bright yellow. **Flowering time** Feb.–Apr. **Pappus** of few bristles, shorter than corolla. Forms mats and cushions on rock sheets and hard bare soil; Drakensberg Grassland, Sub-Escarpment Grassland (Keiskammahoek).

Group 3

Stoloniferous, perennial herbs. **Leaves** small, lanceolate or linear-lanceolate, becoming smaller upwards, bases decurrent or not. **Capitula** homogamous, ± 3 × 1.0–1.5 mm, many crowded and felted together in dense glomerules, which may be further arranged in corymbose panicles at ends of branches; involucral bracts not radiating, loosely imbricate, creamy or pale to bright yellow. **Receptacle** honeycombed. **Flowers** 3–11, corolla campanulate above. **Pappus** absent or of few bristles, apex subplumose, bases nude. **Cypselae** 0.75 mm long, glabrous.

Leaf bases decurrent on the stems in long narrow wings, involucral bracts creamy or very pale straw-coloured, pappus bristles 2–several

natalitium DC.

Stems erect, up to ± 1 m high, simple below, thinly greyish-white, woolly or -cobwebby, very leafy. **Leaves** up to 200 × 20 mm, passing into few inflorescence bracts, glandular above, thinly greyish-white, woolly below. **Capitula** ± 3 × 1 mm, in dense cymose-corymbose clusters up to 20 mm in diam.; involucral bracts in 2 or 3 series, subequal, pellucid to opaque. **Flowers** ± 8–11, dull yellow. **Flowering time** Jan.–Apr. **Pappus** of bristles, not cohering. Damp and ± shady places, mainly streambanks and forest margins; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests (rare, Matatiele to uMzimkhulu and Bizana).

Leaf bases not decurrent, inner involucral bracts bright canary-yellow, pappus absent

epapposum Bolus

Stems very slender, branching mostly basally, erect, up to ± 0.6 m high, thinly greyish-white, woolly, indumentum stringy, stripping from older parts, closely leafy. **Leaves** rigid, ± appressed, up to 22 × 5 mm, lanceolate, apex acuminate, base broad, ± clasping, margins revolute, upper surface cobwebby, glabrescent, lower surface greyish-white, woolly, stringy. **Capitula** narrowly campanulate, ± 3 × 1.5 mm, many in dense cymose clusters in compact, flattish corymbs up to 20 mm in diam.; involucral bracts in 2 or 3 series, translucent, outer tipped pale brown. **Flowers** 3–5, yellow. **Flowering time** Feb.–Apr. Streambanks, marshes, on tussocks, in tangled clumps or supported by other plants; Sub-Escarpment Grassland, Sub-Escarpment Savanna (rare, Amatole Mts).

Group 4

Shrublets or bushy or straggling perennial herbs. **Leaves** small, mostly linear to spathulate. **Capitula** homogamous or heterogamous (not always a species character), 2.5–3.5 × 1–2 mm, usually in dense clusters further aggregated into compact or lax corymbose panicles; involucral bracts not radiating, bright yellow. **Receptacle** smooth or with short fimbrils. **Flowers** 3–15, corollas campanulate above. **Pappus** absent, if present, of scabrid bristles, bases with patent cilia, cohering or not. **Cypselae** mostly with duplex hairs.

1a Leaves generally broadest above middle, bases decurrent in narrow or broad stem wings (not uppermost reduced leaves)
2a Capitula heterogamous, 2.5–3.0 mm long, flowers usually ± 4–15
3a Leaves obtuse, mucronate; flowers 7–15

odoratissimum (L.) Sweet

Hottentotskooigoed (A); *impepho* (X)

Branched, aromatic herb, base woody, stems often decumbent, rooting, glandular, thinly greyish-white, woolly, leafy below. **Leaves** variable, 5–60 × 1.5–15.0 mm, linear-oblong to spathulate, base clasping, glandular, setose-scabrid above, greyish-white, woolly, both sides. **Capitula** 2.5–3.0 mm long, matted together basally with wool in terminal, cymose clusters; involucral bracts imbricate, pellucid, outer pale brown, inner yellow. **Receptacle** fimbrils ± equalling ovaries. **Flowers** yellow. **Flowering time** mainly Jan.–June. **Pappus** of many bristles, bases cohering by patent cilia. **Cypselae** 0.75 mm long, barrel-shaped. Clumps on well-watered grassy or rocky slopes; also bare areas along roads or paths; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna,

Indigenous Forests (widespread, Aliwal North E to Mkambati Nature Reserve southwards, from Cradock to Kentani, Joubertina to East London and Humansdorp).

3b Leaves very acute to acuminate; flowers 4–6

stenopterum DC.

Kerriebos, *klipteebossie* (A)

Straggling, aromatic, perennial herb, stems up to 2 m long, simple below, branching above, gland-dotted, greyish-white, woolly, leafy. **Leaves** up to 120 × 15 mm, smaller upwards, lanceolate or linear-lanceolate, base narrowed, long narrow stem wings, margins revolute, scabrous above, gland-dotted, lightly cobwebby to white-felted below. **Capitula** 3 × 1 mm, many in terminal, congested, cymose clusters in corymbose panicles; involucral bracts in 2 or 3 series, loosely imbricate, translucent. **Receptacle** with fimbrils. **Flowers** 4–6, yellow. **Flowering time** Apr., May. **Pappus** of many bristles, delicate, bases cohering. **Cypselae** 0.75 mm long, glabrous. Marsh- and streamside scrub; Sub-Escarpment Savanna, Albany Thicket, also Sub-Escarpment Grassland, Indigenous Forests (KZN S to Komga and East London).

2b Capitula homogamous, ± 3–4 mm long, flowers 4–7

gymnocomum DC.

Impepho (X)

Very closely allied to *H. odoratissimum* but distinguished by key characters and: **Involucral bracts** loosely imbricate. **Flowering time** Feb.–July. **Pappus** often absent or of a few bristles free at base, but may be copious and cohering. Same habitats as *H. odoratissimum*; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (Barkly East to Humansdorp).

1b Leaves broadest in lower half, bases not decurrent

griseolanatum Hilliard

Mat-former up to 0.25 m high, 1 m wide, old stems bare, decumbent, rooting, ultimate branchlets greyish-white, woolly, first closely leafy, fewer later. **Leaves** ± imbricate, up to 15 × 6 mm, oblong to lanceolate-elliptic, apex ± obtuse, base broad, ± clasping, margins revolute, both sides greyish-white, woolly. **Capitula** homogamous, cylindric, ± 3.5 × 1 mm, many felted together basally in dense cymose clusters, these in compact, ± flat, terminal corymbs; involucral bracts in ± 4 series, graded, closely imbricate, pellucid, yellow. **Receptacle** smooth. **Flowers** 3–5, yellow. **Flowering time** Dec.–Apr. **Pappus** absent. **Cypselae** 0.75 mm long. Rock sheets, bare stony areas on mountain tops, slopes; Drakensberg Grassland, Eastern Fynbos-Renosterveld, Indigenous Forests, Sub-Escarpment Grassland (Mount Fletcher, Matatiele, Mount Ayliff to Queenstown, King William's Town).

Group 5

Tufted, perennial herbs. **Leaves** linear to elliptic. **Capitula** homogamous, ± 3–4 × 1–3 mm, very many felted together in umbrella-like clusters, flattened branches of the inflorescence visible through the wool; involucral bracts loosely imbricate, not radiating, bright yellow. **Receptacle** smooth, nude or with some paleae. **Flowers** 3–18, corollas narrowly campanulate above. **Pappus** either absent or of few bristles, shorter than corolla, scabrid, bases nude, free. **Cypselae** with duplex hairs.

Stems leafy throughout, becoming bracteate, then nude only near the capitula

umbraculigerum Less.

Kerriebos, *kerriekruie* (A)

Stems decumbent, rooting, then erect to ± 1 m high, young parts thinly grey-woolly. **Leaves** 20–80 × 3–25 mm, variable, mostly oblong-spathulate, narrowed basally, then expanded and ear-clasping, or tapering to a ± petiolar base, upper surface glandular-hairy, cobwebby or greyish white-woolly, lower surface thickly greyish white-woolly, or wool ± absent. **Capitula** cylindric, 3 × 1 mm, crowded into a flattened disc; involucral bracts biseriate, pellucid, outer ± golden-brown. **Receptacle** ± smooth. **Flowers** 3–6, yellow. **Flowering time** Jan.–Apr. **Pappus** of 0–7 bristles. **Cypselae** 0.50–0.75 mm long, barrel-shaped. Grassland or scrub, forest margins, streambanks, damp gullies, grass slopes; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Indigenous Forests, Sub-Escarpment Savanna (Ongeluksnek to Kokstad S, from Steynsburg to Tsitsa Falls, Somerset East to Mazeppa Bay and from Grahamstown to East London).

Stems leafy only in the lower half, leaves frequently rosetted

krookii Moeser

Tuberous-rooted, rhizomatous herb, flowering stem solitary, simple, erect, glandular, thinly cobwebby. **Leaves** mostly radical, up to 100 × 50 mm, elliptic, apex subacute, abruptly narrowed to a broad, clasping, petiole-like base up to 30 × 6 mm, both sides glandular-pubescent; cauline leaves smaller, sessile, passing into distant bracts. **Capitula** ± 3–4 × 2–3 mm, felted together in compact corymbose clusters, these further felted together into a ± flat disc 20–70 mm in diam.; involucral bracts in 2 or 3 series. **Receptacle** paleate. **Flowers** 7–18, yellow. **Flowering time** Jan., Feb. **Pappus** of few bristles, apex barbellate. **Cypselae** 1.25 mm long. Forms small colonies in grassland, mainly near streams or on steep moist slopes; Drakensberg Grassland, Sub-Escarpment Grassland (rare, from Mount Ayliff to Mount Fletcher and Wodehouse District).

Group 6

Subshrubs or perennial herbs, often mat-forming. **Leaves** linear to elliptic or spathulate. **Capitula** homogamous, ± 2.5–6.0 × 1–3 mm, many felted together in dense corymbose clusters; involucral bracts imbricate, either erect or minutely radiating, bright yellow. **Receptacle** shortly honeycombed. **Flowers** 4–26, corolla narrowly funnel-shaped. **Pappus** usually of few bristles, apex shortly plumose, bases nude. **Cypselae** usually glabrous.

1a Ovaries glabrous
2a Cauline leaves ± spreading, or if appressed, then reduced in size
3a Either leaf margins flat or outer involucral bracts obtuse, or both
4a Leaves concolorous; capitula 2.5–5.0 mm long
5a Tufted perennial herbs; capitula 2.5–3.5 mm long; radical leaves lingulate, oblong or elliptic

subglomeratum Less.

Kerriebos, *kerriekruie* (A)

Perennial herb, indumentum close, silvery felted, 1–several leaf rosettes, stems lateral, 80–600 mm long, decumbent or ascending, simple, leafy. **Leaves**: radical leaves up to 120 × 15 mm, apex obtuse or subacute, base broad, clasping; cauline leaves similar, smaller upwards, spreading or imbricate. **Capitula** narrowly cylindric, 2.5–3.5 × 1.5–2.0 mm, in a flat spreading corymb 20–40 mm in diam., matted wool below; invo-

lucral bracts in 3 or 4 series, outer brown or straw-coloured, inner tipped bright yellow, translucent. **Flowers** 4–13, yellow. **Flowering time** Mar.–June. **Pappus** of 5–7 bristles, not cohering. **Cypselae** 0.75 mm long, narrow. Stony grassland or mats over rock sheets; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests, Sub-Escarpment Savanna (common, from N to Uitenhage and Graaff-Reinet).

5b Mat-forming perennial herb or subshrub; capitula 4–5 mm long

spodiophyllum Hilliard & B.L.Burtt

Main stem woody, many prostrate, rooting branches producing leaf tufts, flowering stems decumbent, then erect to ± 100–250 mm, simple, silky-silvery, leafy then bracteate upwards. **Leaves** broad-based, clasping, both sides closely grey-silky-woolly; radical leaves 10–100 × 1–2 mm, linear, flat or channelled, apex subacute; cauline leaves up to 20 mm long, linear-lanceolate to lanceolate, spreading or appressed. **Capitula** cylindric, 4–5 × 2 mm, corymbose clusters 10–20 mm in diam., webbed basally with tissue paper-like indumentum; involucral bracts in 3 or 4 series, translucent, outer tipped brown. **Flowers** 8–12. **Flowering time** Dec.–May. **Pappus** of ± 5 bristles, not cohering. **Cypselae** 0.75 mm long, obscurely ribbed. Large woody mats on rock outcrops and sheets in grassland; Eastern Fynbos-Renosterveld, Indigenous Forests (rare, Dohne, Mount Kemp).

4b Leaves discolorous (thin papery indumentum above, drying dark, silky white below); capitula 5 mm long

ephelos Hilliard

Mat-forming, perennial herb, main stems stoloniferous, many leaf rosettes, flowering stems decumbent then erect, 0.3–0.4 m long, simple, silvery sericeous, appressed-leafy. **Leaves**: radical leaves rosetted, mostly 40–100 × 3–10 mm, linear-lanceolate, apex obtuse or subacute, base broad, clasping; cauline leaves ± 10–30 × 1.5–3.0 mm, turning into bracts upwards, linear or linear-lanceolate, ± acute with indumentum webbed to stem, only leaf apex free. **Capitula** ± 5 × 2 mm, many webbed together in a congested, terminal, cymose cluster ± 15–25 mm in diam.; involucral bracts in ± 3 series, outer apex light brown, inner apex canary-yellow. **Flowers** 7–10. **Flowering time** Feb.–May. **Pappus** of many bristles, not cohering. **Cypselae** 1 mm long. Large mats on damp earth banks, tussocks at marshy sources of streams; Sub-Escarpment Grassland (very rare, Mount Ayliff).

3b Leaf margins strongly revolute and outer (brown) involucral bracts very acute

nanum Klatt

Mat-forming, perennial herb, main branches stoloniferous, nude, many erect dwarf shoots with closely rosetted leaves, stems terminal, solitary, erect, 50–120 mm high, simple, closely leafy. **Leaves** stiff, erect, up to 35 mm long, linear, apex obtuse, base broad, clasping, both sides with silvery, silky, closely felted indumentum. **Capitula** cylindric, 4–5 × 1.5 mm, clusters congested, not felted, in a terminal, cymose-corymbose cluster 15–20 mm in diam.; involucral bracts in 2 or 3 series, outer brownish, inner tipped bright yellow, translucent. **Receptacle** smooth. **Flowers** 4–6, yellow. **Flowering time** Mar., Apr. **Pappus** of ± 5 bristles, slender, not cohering. **Cypselae** ± 1 mm long, obscurely 5-ribbed. Mats in stony grassland or over rock sheets; colonises eroded areas; Drakensberg Grassland, Sub-Escarpment Grassland (Naude's Neck, Maclear and Ugie).

2b Cauline leaves erect, closely imbricate, all ± the same size
6a Leaves elliptic, apex obtuse or subacute, thin skin-like indumentum above, white-silky-tomentose below; flowers 8–12 in each head

[E]albanense Hilliard

Perennial herb, spreading by woody underground runners, flowering stems up to 0.4 m long, erect or decumbent, simple or branched, silky, closely leafy. **Leaves** 8–20 × 2–6 mm, mucronate, ± hooked, base half-clasping. **Capitula** turbinate, 3 × 2 mm, many in round, terminal clusters matted with wool basally, clusters congested in a flat, corymbose cyme 15–20 mm in diam.; involucral bracts in ± 4 series, graded, outer brown, inner bright canary-yellow, subopaque. **Flowering time** July–Oct. **Pappus** of bristles not cohering. Grassland or shrub communities; Albany Thicket, Eastern Fynbos-Renosterveld (Queenstown, Albany, Uitenhage and Humansdorp).

6b Leaves lanceolate, apex acute to very acute, both surfaces with silky often 'stringy' indumentum, rarely woolly felted; flowers 5 or 6 in each head

glomeratum Klatt

Rhizomatous, perennial herb, stems 1–3 together, erect to ± 0.45 m high, simple, loosely grey-cottony, densely leafy. **Leaves**: radical leaves rosetted, spreading, up to 30 × 10 mm, base broad, half-clasping; cauline leaves similar but smaller, up to 20 × 8 mm. **Capitula** 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 20–50 mm in diam.; involucral bracts in ± 4 series, graded, outer brownish, inner tipped bright canary-yellow, ± translucent. **Flowers** yellow. **Flowering time** Feb.–May. **Pappus** of ± 6 bristles, not cohering. Large colonies in open grassland; Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland, Indigenous Forests (from N to Amatole Mts).

1b Ovaries hairy, leaves spathulate, concolorous

albirosulatum Killick

Prostrate shrublet, main branches bare, with many, erect, leafy, dwarf branches, flowering branches up to 120 mm long, decumbent then erect, silvery white-felted, closely leafy. **Leaves** at first rosetted terminally, up to 25 × 6 mm, apex rounded or subacute, ± recurved, base half-clasping, both surfaces with silvery white, ± glossy, closely felted indumentum; cauline leaves similar but smaller. **Capitula** subcylindric, ± 4 × 2–3 mm, rounded clusters 10–20 mm in diam.; involucral bracts in ± 3 series, obtuse, translucent, pale yellow, golden-brown outside. **Flowers** ± 8–26, yellow. **Flowering time** Jan.–Mar. **Pappus** of 6–10 bristles, shaft nude, bases not cohering. **Cypselae** 1 mm long, with myxogenic duplex hairs. Confined to Cave Sandstone, sprawling over rock sheets; Drakensberg Grassland, Sub-Escarpment Grassland (Engcobo, Maclear).

Group 7

Similar to Group 6, differing in **pappus** of many bristles, with subplumose apex and bases cohering by patent cilia.

alticolum Bolus

Mat-forming, perennial herb, older parts nude, younger densely clothed in greyish-white, silky, woolly indumentum, stoloniferous, many dwarf branches with closely rosetted leaves, flowering stems lateral, 20–50 mm long, leafy. **Leaves** spathulate, up to 45 × 15 mm, apex rounded, base broad, half-clasping, both surfaces closely greyish-white, woolly felted. **Capitula** 5–6 mm long, 3 mm in diam., subcylindric, many in a subglobose,

terminal cluster 10–20 mm in diam., bases felted together with grey wool; involucral bracts in ± 4 series, subequal, spreading, glossy, bright canary-yellow. **Flowers** 4–6, yellow. **Flowering time** Feb.–Apr. **Pappus** of ± flattened bristles. **Cypselae** ± 1.5 mm long, ellipsoid, obscurely ribbed. Mats on cliff faces, rock platforms or stony ground; Eastern Fynbos-Renosterveld, Indigenous Forests (old Katberg Pass between Seymour and Cathcart).

Group 8

Bushy shrubs, subshrubs, rarely perennial herbs. **Leaves** ± linear to lanceolate, small. **Capitula** homogamous or heterogamous (sometimes in the same species), 2.5–4.0 × 1–3 mm, usually in cymose clusters arranged in terminal, corymbose panicles; involucral bracts imbricate, either not radiating or minutely radiating, white, yellow or tawny. **Receptacle** with fimbrils. **Flowers** 6–45, 0–18 female, female sometimes outnumbering bisexual, corolla of bisexual flowers funnel-shaped, of female flowers narrowly tubular with a conspicuous limb. **Pappus** of scabrid bristles, bases cohering by patent cilia, or rarely absent. **Cypselae** glabrous.

1a Involucral bracts brownish, tawny, straw-coloured or yellow; leaves (not uppermost reduced ones) linear-lanceolate, linear, oblong or ± elliptic, margins flat or ± revolute
2a Leaves oblong or oblong-spathulate, obtuse or subacute, both surfaces appressed-woolly; capitula campanulate

aureonitens Sch.Bip.

Tufted, perennial herb, whole plant greyish-white, appressed, woolly, stems up to 0.3 m high, slender, simple or sparingly branched from a creeping stock, leafy. **Leaves** up to 30 × 6 mm, ± smaller upwards, base broad, half-clasping, margins flat/subrevolute. **Capitula** heterogamous, ± 4 × 3 mm, up to ± 30 in compact, corymbose clusters; involucral bracts in ± 3 series, graded, mostly obtuse, outer woolly at base, all pellucid, yellow often washed pale brown. **Flowers** 37–57. **Flowering time** Sept.–Feb. **Pappus** of many bristles, equalling corolla. **Cypselae** < 0.5 mm long. Often in extensive colonies in grassland, especially when overgrazed; Drakensberg Grassland, Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland (widespread, from N to ± King William's Town).

2b Leaves either linear-lanceolate or lanceolate, very acute to acuminate, capitula cylindric or campanulate; or leaves linear-oblong to elliptic-oblong, acute or acuminate and then upper surface with thin papery indumentum and capitula cylindric
3a Apex of at least the inner involucral bracts yellow
4a Leaves (not uppermost reduced ones) linear-oblong to elliptic-oblong, acute or rarely acuminate, upper surface clad in paper-like indumentum

cymosum (L.) D.Don subsp. **cymosum**

Spreading subshrub, up to 1 m high, branches long, ± decumbent at base, then erect, thinly greyish white-woolly, densely leafy. **Leaves** very variable, 8–45 × 2–15 mm, smaller, fewer upwards, apex acute, mucronate, half-clasping, base subdecurrent, margins ± flat, lower surface closely white-woolly. **Capitula** mostly heterogamous, cylindric, ± 3 × 1 mm, many in compact cymes; involucral bracts in ± 4 series, graded, translucent, glossy, bright yellow. **Receptacle** fimbrils exceeding ovaries. **Flowers** 6–20, yellow. **Flowering time** Sept.–Apr. **Pappus** of many bristles. **Cypselae** 0.75 mm long, broadly cylindric. Straggling clumps, often in moist places, shrub vegetation, forest margins; Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket, Eastern Fynbos-

Renosterveld (very common, from Bizana southwards to Graaff-Reinet and Cathcart, Willowmore and Humansdorp).

cymosum (L.) D.Don subsp. **calvum** Hilliard

Differs from typical *H. cymosum*: **Leaves** more crowded, often narrower. **Capitula** smaller (4–7 flowers), fimbrils shorter (± as long as ovary). **Flowering time** Dec.–Mar. **Pappus** absent. Low, spreading clumps in stony grassland, on steep turf slopes; Drakensberg Grassland (rare, Wodehouse District and Barkly East to Matatiele).

4b Leaves linear-lanceolate, lanceolate or ovate-lanceolate, very acute to acuminate, upper surface glabrous, cobwebby or woolly
5a Leaves glabrous or cobwebby above; apex of involucral bracts smooth or nearly so

tenuiculum DC.

Tufted, perennial herb or subshrub, stems wiry, branching mostly basally, decumbent and rooting, then ± erect, up to ± 0.5 m high, thinly greyish white-woolly, closely leafy. **Leaves** mostly 8–35 × 1–5 mm, smaller and fewer upwards, lanceolate or linear-lanceolate, apex acuminate, base broad, ear-clasping, margins ± revolute, thinly white-woolly below. **Capitula** mostly heterogamous, cylindric or narrowly campanulate, ± 3 × 2 mm, usually in compact, corymbose panicles; involucral bracts in ± 4 series, graded, apex obtuse, translucent, straw-coloured or the inner yellow. **Receptacle** fimbrils equalling ovaries. **Flowers** 8–14. **Flowering time** Jan., Feb. **Pappus** of many bristles, ± equalling corolla. **Cypselae** ± 0.5 mm long, barrel-shaped, glabrous. On slopes and in moist places near streams; Albany Thicket, Lower Karoo (rare, Mts near Graaff-Reinet).

5b Leaves grey-woolly felted on both surfaces, like stems; apex of involucral bracts well crisped, ± squarrose

simillimum DC.

Perennial herb, creeping, stems slender, tufted, simple or branching mostly basally, erect, up to 0.4 m high, closely leafy. **Leaves** imbricate, up to ± 17 × 5 mm, lanceolate or ovate-lanceolate, base cordate-clasping, shortly decurrent. **Capitula** heterogamous, oblong-campanulate, ± 3–4 × 2–3 mm, many in compact, corymbose panicles up to ± 40 mm in diam.; involucral bracts in ± 6 series, graded, apex opaque, pale yellow or whitish. **Receptacle** fimbrils exceeding ovaries. **Flowers** 15–27. **Flowering time** Jan.–Apr. **Pappus** of many bristles. **Cypselae** < 0.5 mm long. Large tangled clumps, particularly near forest margins; Sub-Escarpment Grassland, Indigenous Forests, also Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (KZN Border to Dordrecht, Stutterheim, Komga).

3b Apex of at least the inner involucral bracts straw-coloured or tawny
6a Leaves glabrous or thinly cobwebby above; apex of involucral bracts smooth or nearly so; flowers 8–14

tenuiculum DC. (see 5a above)

6b Leaves woolly or at least cobwebby above; apex of involucral bracts crisped; flowers 15–45

melanacme DC.

Hottentotskooigoed (A)

Closely allied to *H. tenuiculum*, but differs by: **Leaves** ± always woolly or cobwebby above. **Involucral** bracts tawny, apex always clearly crisped. **Flowers** 15–45. **Flow-**

ering time Dec.–Apr. Large tangled clumps on grassy mountain slopes or near forest margins; Sub-Escarpment Grassland, Albany Thicket (Lady Grey, Herschel, Barkly East and Graaff-Reinet).

1b Involucral bracts white or dirty white; leaves (not uppermost reduced ones) mostly 3–5 mm wide, margins ± reflexed, crisped or not.
7a Leaves acuminate; capitula ± 3–4 mm long; involucral bracts ± squarrose

simillimum DC. (see 5b above)

7b Leaves acute; capitula ± 2.5 mm long; involucral bracts not squarrose

helianthemifolium (L.) D.Don

Perennial herb, up to 1 m high. **Stems** long, thin, woody, thinly greyish-white, woolly, closely leafy. **Leaves** mostly 10–20 mm long, becoming smaller upwards, lanceolate or oblong-lanceolate, spreading or later deflexed, mucronate, base broad, subcordate-clasping, margins ± reflexed, crisped or not, both surfaces thinly greyish-white, woolly. **Capitula** heterogamous, ± 2.5 × 2 mm, cylindric, base ± woolly, many in compact corymbose panicles; involucral bracts in 4 series, graded, imbricate, oblong, silvery pellucid, apex rounded, opaque, crisped. **Receptacle** fimbrils exceeding ovaries. **Flowers** 12–21. **Flowering time** Dec., Jan. **Pappus** of many bristles. **Cypselae** 0.5 mm long, cylindric. Streambanks and other damp places in mountain kloofs or on slopes; Albany Thicket, Eastern Fynbos-Renosterveld (rare, Uitenhage).

Group 9

Shrubs or subshrubs, rarely tufted, perennial herbs. **Leaves** small, mostly linear to lanceolate, margins revolute. **Capitula** homogamous or heterogamous (sometimes in the same species), 3–5 × 2–5 mm, solitary or few–many in compact to corymbose clusters or panicles; involucral bracts imbricate, either not radiating or minutely radiating, tawny, golden-brown or white, often with purple or rose overlays, rarely yellow. **Receptacle** honeycombed or with fimbrils. **Flowers** 16–50, 0–19 female, females sometimes ± equalling bisexuals, corolla of bisexual flowers campanulate above, of female flowers narrowly tubular with a conspicuous limb. **Ovaries** usually with myxogenic duplex hairs, sometimes glabrous. **Pappus** of scabrid bristles, bases cohering strongly by patent cilia, occasionally some basal fusion as well, or rarely pappus reduced.

1a Apex of inner involucral bracts bright canary-yellow

anomalum Less.

Shrublet, up to 0.3 m high and broad, branches closely grey-woolly, densely leafy. **Leaves** 3–14 × 1–3 mm, fewer, smaller upwards, linear to oblong, apex acute or obtuse, mucronate, base broad, ± clasping, margins revolute, closely grey-woolly. **Capitula** heterogamous, cylindric-campanulate, ± 4 × 2.5 mm, few–many in dense, terminal, cymose clusters; involucral bracts in ± 6 series, graded, obtuse, outer pale brown, apex bright yellow. **Receptacle** fimbrils 2–3× as long as ovaries. **Flowers** 17–50. **Flowering time** Sept.–May. **Pappus** of very few bristles, ± equalling ovaries. **Cypselae** ± 0.75 mm long, glabrous. In colonies and singly on bare, often rocky areas, or in rough grassland; Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket (very common, L Border and coastal to ± East London).

1b Apex of involucral bracts white, cream-coloured, rosy, straw-coloured, tawny, golden-brown or purplish brown, but never bright yellow
2a Apex of at least the inner involucral bracts white, cream-coloured or rosy
3a Apex of bracts crisped
4a Capitula 2–4 mm wide, 2–5 clustered at the branch tips

dregeanum Sond. & Harv.

Bergankerkaroo (A)

Mat-forming subshrub, branches stiff, diffuse or erect, up to ± 0.15 m high, thinly white-woolly, closely leafy, often with dwarf axillary shoots. **Leaves** up to 14 × 2 mm, linear or linear-lanceolate, apex subacute, base broad, upper surface thinly and loosely woolly, lower surface white-woolly. **Capitula** heterogamous, campanulate, 3.5–5.0 × 2–4 mm, 2–5 clustered terminally; involucral bracts in ± 4 series, graded, apex obtuse, pellucid, whitish, straw-coloured to ± tawny. **Receptacle** shortly toothed. **Flowers** 18–36. **Flowering time** Sept.–Feb. **Pappus** of many bristles, ± equalling corolla. **Cypselae** ± 1 mm long. In dry sandy or stony grassland, or shrublet communities, weed along roads, in overgrazed places; Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland (from L and KZN Border to Middelburg and Queenstown).

4b Capitula 3–5 mm wide, usually several–many in corymbose panicles, if few, then capitula ± 5 mm wide
5a Stems simple or subsimple from a creeping stock

rugulosum Less.

Perennial herb, stems tufted, erect, up to 0.3 m high, ± white-felted, closely leafy. **Leaves** sessile, up to 25 × 5 mm, smaller upwards, ± spreading or ascending, lanceolate to oblong, acute or acuminate, upper surface thinly cobwebby felted, rugose, lower surface white-felted, hairs ± stringy. **Capitula** heterogamous, campanulate, 5 × 4 mm, few–many in compact, corymbose panicles; involucral bracts in 4 or 5 series, graded, apex opaque, crisped-dentate, purplish to cream-coloured. **Receptacle** fimbrils exceeding ovaries. **Flowers** 17–42. **Flowering time** Dec.–Mar. **Pappus** of many bristles, ± equalling corolla. **Cypselae** 0.75–1.00 mm long, broadly cylindric. Poor stony or sandy grassland, overgrazed areas, roadsides; in all bioregions, except Upper and Lower Karoo and Indian Ocean Coastal Belt (widespread, Herschel District E to uMzimvubu southwards, from Middelburg to Maclear, Mountain Zebra National Park to Komga and Willowmore to Port Alfred).

5b Well-branched shrubs or subshrubs; capitula ± 5 mm wide, campanulate

teretifolium (L.) D.Don

Subshrub, up to ± 0.3 m high, branchlets thinly white-felted, closely leafy. **Leaves** ± 3–15 × 1.0–1.5 mm, linear, rigid, spreading, margins revolute, apex uncinate, upper surface soon glabrous, lower surface white-woolly. **Capitula** usually heterogamous, ± 5 × 5 mm, few–several in compact, terminal corymbs; involucral bracts in 6–8 series, graded, apex very obtuse, opaque, creamy white or outer sometimes rosy. **Receptacle** fimbrils exceeding ovaries. **Flowers** 17–60. **Flowering time** July–Nov. **Pappus** of many bristles, ± equalling corolla, apex barbellate. **Cypselae** ± 1 mm long, glabrous or hairy. Often in dense stands in shrub communities on sand, on dunes near sea or on mountain slopes; Indian Ocean Coastal Belt, Albany Thicket, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Indigenous Forests (Bizana District to Port Edward southwards, from Somerset East to Komga, Joubertina to East London and Humansdorp).

3b Apex of bracts smooth or very nearly so; capitula oblong-campanulate; bracts oblong

rosum (Berg.) Less. var. **arcuatum** Hilliard

Differs from typical variety below: **Stems** decumbent, radiating, often arcuate and producing simple, erect, < 50 mm long, flowering shoots at the nodes, sometimes rooting when in contact with the soil. **Involucral bracts** mostly or all pellucid. **Flowering time** Aug.–Apr.

rosum (Berg.) Less. var. **rosum**

Subshrub, up to ± 1 m high, young stems thinly white-felted, closely leafy, some leaves with dwarf axillary shoots. **Leaves** 8–25 × 1–5 mm, linear to oblong-lanceolate, apex ± acute, margins often undulate-dentate, upper surface glabrous to thinly cobwebby felted, often wrinkled, lower surface white-felted, hairs often stringy. **Capitula** heterogamous, ± 4 × 3 mm, few–many in compact, terminal, corymbose panicles; involucral bracts in 5 or 6 series, graded, pale straw-coloured or tawny, apex blunt, white. **Receptacle** honeycombed. **Flowers** 15–28. **Flowering time** Sept.–Dec. **Pappus** of many bristles, ± equalling corolla. **Cypselae** ± 0.75 mm, broadly cylindric. In shrub communities, on flats or mountain slopes; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Middelburg to Cofimvaba southwards, from Graaff-Reinet to Komga, Willowmore to Kowie and Humansdorp).

2b Apex of at least inner involucral bracts straw-coloured, tawny, golden-brown or purplish brown; leaves linear, linear-lanceolate or lanceolate, margins revolute but not repand, glandular hairs, if present, small

6a Perennial herb with tufts of stems from a creeping stock, stems simple or branching near base; leaves linear; capitula ± 2 mm wide, many in a congested terminal cluster

ammitophilum Hilliard

Stems erect, up to ± 150–200 mm, white-felted, closely leafy. **Leaves** mostly 8–15 × 0.5–1.0 mm, suberect, imbricate, apex acute, mucronate, base broad, upper surface with thin, tissue paper-like indumentum of woolly hairs, lower surface white-felted. **Capitula** heterogamous, oblong-campanulate, ± 3 × 2 mm, clusters 10–30 mm in diam.; involucral bracts in ± 4 series, thinly webbed together with wool, graded, pellucid, straw-coloured, apex tawny, blunt, crisped-denticulate, ± squarrose. **Receptacle** shortly toothed. **Flowers** 18–31, bright yellow. **Flowering time** Feb. **Pappus** of many bristles, ± equalling corolla. Stony or sandy turf on hilltops and slopes; Drakensberg Grassland, Mesic Highveld Grassland (very rare, from FS and L, S to ± Dordrecht, Indwe).

6b Well-branched shrubs or subshrubs, stock creeping or not

7a Leaves ± 4–14 × 0.5–2.0 mm, margins strongly revolute; capitula 2–5 clustered at branchlet tips

dregeanum Sond. & Harv. (see 4a above)

7b Leaves ± 18–60 × 2–6 mm, margins weakly revolute; capitula many in terminal, congested clusters

[E]**montis-cati** Hilliard

Bushy subshrub, sprawling or erect, up to 1–3 m high, branches greyish white-woolly felted, closely leafy, leaves spreading, later reflexed. **Leaves** linear, acute, mucronate, base broad, ± clasping, upper surface cobwebby, glabrescent, rugose, glandular, lower surface greyish white-woolly felted, fewer and smaller upwards. **Capitula** heterogamous, campanulate, ± 4 × 3 mm, clusters 15–25 mm in diam.; involucral bracts in± 5 series, outer shorter, inner subequal, equalling flowers, apex subacute or obtuse,

recurved, translucent, pale golden-brown. **Receptacle** shortly honeycombed. **Flowers** 21–31, bright yellow. **Flowering time** Oct., Nov. **Pappus** of many bristles, equalling corolla. **Cypselae** 1 mm long. In forest and shrubland; Drakensberg Grassland, Indigenous Forests (rare, endemic to ± Amatole Mts, Stockenström and Keiskammahoek).

Group 10

Shrubs or woody perennial herbs. **Leaves** small, mostly oblong, elliptic, ovate or obovate. **Capitula** usually heterogamous, rarely homogamous and then within the same species, 4–6 × 2–5 mm, in congested, rounded, terminal clusters; involucral bracts imbricate, either not radiating or minutely radiating, straw-coloured or tawny, often villous on the backs, stereome undivided. **Receptacle** smooth, honeycombed or with fimbrils. **Flowers** 12–32, 0–10 female, corolla of bisexual flowers broadly campanulate above, of female flowers with a very well-developed limb. **Pappus** of shortly plumose bristles, barbellate or rarely scabrid above, shaft scabrid or barbellate, bases cohering by patent cilia, or lightly fused. **Cypselae** usually hairy, rarely glabrous (dimorphic in one species).

dasyanthum (Willd.) Sweet

Subshrub, hairs patent, up to 1 m high, erect, sprawling, stems thin, greyish white-woolly, leafy. **Leaves** 6–30 × 2.5–10.0 mm, elliptic to oblong-lanceolate, apex ± obtuse, mucronate, margins ± revolute, undulate, ± greyish white-woolly above, thickly woolly below. **Capitula** heterogamous, campanulate, 4 × 3 mm, many in corymbose panicles; involucral bracts in 4 or 5 series, graded, outer lanceolate, often dark-tipped, inner oblong, glabrous, pale straw-yellow. **Receptacle** fimbrils exceeding ovaries. **Flowers** 17–28. **Flowering time** Sept.–Nov. **Pappus** of many bristles, equalling corolla, barbellate, bases cohering by patent cilia. **Cypselae** ± 0.75 mm long, from bisexual flowers often $^{1}/_{3}$ smaller, barrel-shaped, glabrous, ± ribbed, from female flowers with duplex hairs. Mountain slopes; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (very rare, Willowmore).

Group 11

Shrubs or subshrubs. **Leaves** small, oblong, narrowly elliptic, spathulate or obovate. **Capitula** homogamous, 4–5 × 3–5 mm, in congested, corymbose panicles; involucral bracts not radiating. **Receptacle** smooth, honeycombed or with fimbrils. **Flowers** 8–34, corolla broadly campanulate above. **Pappus** of bristles, barbellate above, shaft scabrid, bases either cohering by patent cilia or free. **Cypselae** glabrous or hairy.

pentzioides Less.

Kerriebos (A)

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, mostly 3–10 × 2–4 mm, smaller upwards, spathulate or obovate, narrowed to base, thick, tip mucronate, recurved, both sides grey silky-felted, glandular-punctate. **Capitula** turbinate-cylindric, ± 5 × 3 mm, few in terminal, corymbose clusters; involucral bracts in 4 series, graded, oblong, white-woolly and glandular-punctate, apex rounded, glabrous, straw-coloured or golden-brown. **Receptacle** smooth or shortly toothed. **Flowers** 8–15. **Ovaries** with duplex hairs. **Flowering time** Oct.–May. **Pappus** of many bristles, ± equalling corolla, bases cohering by patent cilia. In karroid and other dry scrub; Upper Karoo, Drakensberg Grassland, Albany Thicket (Colesberg, Aliwal North, Middelburg, Keiskammahoek, Albany District).

Group 12

Shrubs, subshrubs or bushy, perennial herbs, rarely annual. **Leaves** small, linear, oblong, elliptic, spathulate or obovate. **Capitula** homogamous, 3–7 × 2–4 mm, few–many in clusters or small, corymbose panicles; involucral bracts imbricate, not radiating, or rarely squarrose, white, pink, straw-coloured, tawny, golden-brown or yellow, often red above the stereome. **Receptacle** smooth, honeycombed or with fimbrils. **Flowers** 3–30, corolla narrowly funnel-shaped. **Pappus** of scabrid bristles, apex sometimes barbellate, bases cohering by patent cilia, sometimes also lightly fused, or bases free, with or without patent cilia. **Cypselae** usually with myxogenic, duplex hairs, rarely glabrous and then usually in the same species.

1a At least the apex of the inner involucral bracts white or rosy, or white and rose; capitula 11–34-flowered, ± 4–5 × 1–2 mm; leaves either linear with revolute margins or lingulate with weakly revolute margins
2a Plants erect though some stems may straggle

[E]asperum (Thunb.) Hilliard & B.L.Burtt var. **appressifolium** (Moeser) Hilliard

Shrublet, 0.15–0.40 m high, sometimes straggling, outer spreading branches with many, erect shoots, branches thinly grey-woolly, closely leafy. **Leaves** 3–6 × 0.5–1.0 mm, linear, obtuse to apiculate, sessile, margins strongly revolute, both sides loosely woolly. **Capitula** ± 4 × 2 mm, cylindric, several at branch tips, closely surrounded by leaves; involucral bracts in 5 or 6 series, outermost short, webbed with wool to surrounding leaves, semi-pellucid, buff-coloured, sometimes with a ± red tinge. **Receptacle** raised, ± tuberculate. **Flowers** 7–13. **Flowering time** Nov.–Jan. **Pappus** of many bristles, equalling corolla, bases with patent cilia not cohering. Dry gravelly or sandy places; Upper Karoo, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Wapadsbergpas, Mountain Zebra National Park, Amatole Mts, Willowmore to Alexandria).

asperum (Thunb.) Hilliard & B.L.Burtt var. **comosum** (Sch.Bip.) Hilliard

Habit like var. *glabrum* but coarser. **Leaves** 7–20 × 1.0–1.5 mm, always woolly; involucral bracts with conspicuous opaque white apex. **Flowering time** Nov., Dec. Coastal sand dunes; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland (disjunct, Umtamvuna Nature Reserve, Kareedouw, Port Elizabeth and Humansdorp).

asperum (Thunb.) Hilliard & B.L.Burtt var. **glabrum** Hilliard

Rounded, bushy shrublet, up to ± 0.2 m high, main branches laxly corymbosely branched above, branches virgate, thinly white-woolly felted. **Leaves** patent or reflexed, 2–10 × 0.5 mm, linear, glabrous, glandular-punctate. **Capitula** several in terminal clusters; involucral bracts either buff-coloured, sometimes ± red, pellucid or subopaque to opaque, white or dirty white. **Flowering time** mainly Dec. On sandy soils, grassy slopes or in fynbos; Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket, Indian Ocean Coastal Belt (Bathurst, Kei River Mouth, Essenbosch Hills, Port Alfred and Humansdorp).

2b Plants prostrate
3a Capitula ± 4 mm long, containing 8–14 flowers; branches loosely spreading

lineare DC.

Geilsiek(te)opslag (A)

Perennial herb, branches up to 0.2 m long, prostrate or decumbent, thinly white-woolly, closely leafy. **Leaves** 5–13 × 0.75–4.00 mm, ± spreading, ± linear, obtuse, both sides

white-woolly, upper surface ± glabrescent, glandular-punctate, viscid. **Capitula** cylindric, ± 4 × 2 mm, in small, terminal glomerules; involucral bracts in ± 6 series, outer short, webbed to leaves below, persistent, inner subequal, apex ± subacute, ± erose, white, colourless or ± red. **Receptacle** conical, tuberculate. **Flowers** 8–14, yellow, sometimes tipped pink. **Flowering time** Aug.–Dec. **Pappus** of many bristles, equalling corolla, bases with patent cilia not cohering. Sandy, alluvial, limestone soils, bare, seasonally wet places, streamsides, pans, disturbed ground; Upper Karoo, Drakensberg Grassland, Dry Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Oviston Nature Reserve E to Suurberg, southwards from Somerset East to Stutterheim and Komga).

3b Capitula ± 5 mm long, containing 11–24 flowers; branches tufted, forming dense mats

caespititium (DC.) Harv.

Perennial herb, much branched, branchlets ± 10 mm high, closely leafy. **Leaves** ± patent, up to 5–10 × 0.5 mm, linear, ± subacute, base broad, clasping, margins revolute, silvery, tissue paper-like indumentum, later woolly, with orange glands. **Capitula** cylindric-turbinate, 1–several clustered terminally; involucral bracts in ± 6 series, outermost short, pellucid, webbed together and to surrounding leaves with wool; inner series subequal, apex opaque white or pale pink. **Receptacle** with flattened tubercles. **Flowers** 11–24, yellow, often tipped pink. **Flowering time** Aug.–Dec. **Pappus** of many bristles, equalling corolla, bases with minute patent cilia not cohering. **Cypselae** 0.75 mm long, elliptic. Bare or sparsely grassed areas, disturbed sites; Sub-Escarpment Grassland (from N to Lady Grey, Maclear).

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 apex
4a At least the apex of the inner involucral bracts clear bright canary-yellow; leaves spathulate, ± 5–8 × 2–3 mm

excisum (Thunb.) Less.

Twiggy, dwarf shrub, up to 0.45 m high, aromatic, old branches bare, twigs short, thinly grey-felted, closely leafy. **Leaves** suberect to spreading, ± thick, shortly decurrent, apex mucronate, both sides grey-felted. **Capitula** turbinate-cylindric, 4 × 2.5 mm, few in terminal, corymbose clusters; involucral bracts in 6 series, graded, inner lanceolate, acute, apex squarrose, outer golden. **Receptacle** smooth or very shortly toothed. **Flowers** 7–11. **Flowering time** Nov.–Feb. **Pappus** of many bristles, apex barbellate, bases cohering strongly by patent cilia. Hills and mountain slopes; Eastern Fynbos-Renosterveld (Willowmore and Humansdorp).

4b Involucral bracts straw-coloured, buff-coloured or various shades of brown, but not clear bright yellow
5a Leaves linear, linear-oblong, or linear-lanceolate, margins often revolute
6a Capitula 3–6 mm long; leaves mostly concolorous, or if discolorous, capitula ± 4 mm long only; bracts buff-coloured, brownish or golden-brown, often also with red tints
7a Capitula ± 4 × 2 mm containing 7–12 flowers; bracts ± oblong-lanceolate

asperum (Thunb.) Hilliard & B.L.Burtt (see 2a above)

7b Capitula ± 4 × 3 mm containing 15–23 flowers; bracts ± ovate or subrotund and somewhat concave

[E]refractum Hilliard

Shrubby, much-branched perennial, sprawling or a dense, rounded bush or mat, branches up to 0.45 m long, young branches grey-woolly felted, closely leafy. **Leaves** spreading,

later reflexed, 4–10 × 1 mm, linear-lanceolate, apex obtuse, base half-clasping, margins revolute, both sides ± woolly. **Capitula** campanulate, 10–15 in dense, terminal glomerules 10 mm in diam., topped by young growth; involucral bracts in ± 5 series, graded, outer reduced, acute, webbed together and to adjoining capitula, inner glabrous, very obtuse, erose, translucent, pale golden-brown. **Receptacle** ± honeycombed. **Flowers** ± 15–23. **Flowering time** Sept. **Pappus** of many bristles, bases ± cohering by patent cilia. In shrub communities and on inland sand dunes; Eastern Fynbos-Renosterveld, Albany Thicket (rare, endemic to Port Elizabeth, Albany, Alexandria).

6b Capitula 6–7 mm long; leaves discolorous (glabrous to cobwebby above, white-tomentose below)

hamulosum E.Mey. ex DC.

Geelbergsewejaartjie (A)

Well-branched, ericoid shrublet, up to 0.6 m high, young branchlets white-tomentose, closely leafy. **Leaves** suberect, imbricate, 6–25 × 1 mm, linear, apex acute, mucronate, hooked, base broad, sessile, margins strongly revolute. **Capitula** cylindric, many in dense, terminal, corymbose panicles; involucral bracts in 5 or 6 series, graded, ovate-lanceolate, ± acute, straw-coloured, glossy, erect. **Receptacle** with fimbrils ± half as long as ovaries. **Flowers** 5–14. **Flowering time** Dec.–Mar. **Pappus** of many bristles, ± equalling corolla, bases nude, not cohering. **Cypselae** 1 mm long. In shrub communities; Upper Karoo, Dry Highveld Grassland, Albany Thicket (Graaff-Reinet, Cradock, Somerset-East).

5b Leaves spathulate or obovate
8a Involucral bracts squarrose

fourcadei Hilliard

Twiggy (dwarf?) shrub, branchlets rigid, closely appressed silvery grey-woolly, leafy. **Leaves** 3–9 × 1–3 mm, spathulate, apex obtuse to subacute, mucronate, recurved, base narrowed, shortly decurrent, webbed to the stems, both sides silvery grey-felted, surface papery. **Capitula** turbinate-cylindric, ± 6 × 4 mm, terminal, solitary or 2 or 3 loosely arranged; involucral bracts in ± 8 series, graded, backs woolly, ± red above the stereome, apex ± red-brown, obtuse or subacute, squarrose. **Receptacle** ± smooth. **Flowers** ± 20–24. **Flowering time** Dec. **Pappus** of many bristles, apex barbellate. In scrub; Upper Karoo, Lower Karoo (very rare, Aberdeen, Willowmore?).

8b Involucral bracts erect, not squarrose; capitula surrounded by broad leaves free from the involucral bracts, which are soon deciduous; pappus in more than one series

lucilioides Less.

Bergkerriebos (A)

Dwarf, gnarled, branched shrub, 0.5–0.6 m high, or lax with spreading branches, twigs ± tomentose, closely leafy. **Leaves** 3–12 × 2–5 mm, thick, obovate, obtuse, tip recurved-mucronate, base narrowed, margins ± crisped-undulate, both sides ± greyish white-woolly. **Capitula** cylindric, 5–7 × 2–4 mm, 2–several clustered terminally; involucral bracts in 4 series, graded, outer ± webbed to 1 or 2 upper leaves, all subpellucid, pale yellow or straw-coloured, sometimes ± red below, glossy, oblong, obtuse, ± concave. **Receptacle** ± honeycombed. **Flowers** 9–18. **Flowering time** Sept.–May. **Pappus** of many bristles, equalling corolla, bases cohering by patent cilia. Rocky or stony hills and karroid plains; valuable grazing; Upper Karoo, Dry Highveld Grassland (Aliwal North to Cradock and Willowmore).

Group 13

Subshrubs or perennial herbs, erect, prostrate or decumbent and mat-forming. **Leaves** small or medium, linear to obovate. **Capitula** homogamous or heterogamous, 3–6 × 3–6 mm, usually in congested clusters; involucral bracts not radiating, straw-coloured, tawny or golden-brown. **Receptacle** nearly smooth to honeycombed. **Flowers** 11–70. **Pappus** of many bristles, delicate, apex scabrid or barbellate, bases with patent cilia, cohering or not. **Cypselae** glabrous, 0.75 mm long.

1a Capitula homogamous; clusters of capitula closely surrounded and partly obscured by leaves and soon overtopped by new shoots arising below

[E]**praecinctum** Klatt

Dwarf shrublet branching from base, taproot long, woody. **Stems** up to 200 mm long, nude at base, branched above, thinly white-felted, leafy throughout. **Leaves** 5–20 × 1.5–5.0 mm, smaller upwards, spathulate-oblong to oblong, base ± clasping, both sides white-woolly felted. **Capitula** cylindric, 5 × 3 mm, several in glomerules 10–15 mm in diam. at branch tips; involucre surrounded by 2 or 3 reduced leaves webbed together with wool; bracts in 3 or 4 series, pale straw-coloured to light golden-brown. **Receptacle** ± smooth. **Flowers** 11–17. **Flowering time** Dec.–Mar. **Pappus** of scabrid bristles, bases cohering lightly. Coastal, on bare, well-compacted, often stony sand dunes or slopes on foreshore; Albany Thicket, Indigenous Forests, Sub-Escarpment Savanna (Port Alfred to Kei River Mouth).

1b Capitula heterogamous
2a Many-stemmed, mat-forming, perennial herb; leaves up to 4 mm wide

flanaganii Bolus

Main branches prostrate, rooting, soon nude, ultimate branchlets ascending, 40–200 mm long, greyish white-woolly, closely leafy. **Leaves** up to 20 × 4 mm, obovate or oblong-obovate, base ± clasping, both sides glandular-punctate and closely greyish white-woolly, or without wool and with stalked glands. **Capitula** subcylindric, 3 × 3 mm, felted together in dense, rounded, terminal clusters up to 18 mm in diam.; involucral bracts in 4 series, tawny-yellow, tipped golden-brown. **Receptacle** smooth or ± honeycombed. **Flowers** 35–55, yellow. **Flowering time** Oct.–Dec. **Pappus** of bristles with barbellate apex, bases cohering lightly. Montane; thick mats over damp rock sheets, on bare earth or in short damp turf; Drakensberg Grassland (Barkly East, Maclear).

2b Perennial herb with one or several leaf rosettes crowded on the crown and several lateral simple or sparingly branched flowering stems; radical leaves up to 15 mm wide

basalticum Hilliard

Stems prostrate, 40–400 mm long, grey-woolly, leafy. **Leaves**: radical leaves up to 40 mm long, obovate-oblong, base ± clasping, both sides thickly grey-woolly; cauline leaves similar but smaller and narrowly oblong. **Capitula** campanulate, 4 × 4 mm, felted together in dense, rounded, terminal clusters 15–20 mm in diam.; involucral bracts in 3 series, tawny-yellow, tipped golden-brown. **Receptacle** honeycombed. **Flowers** 40–70, yellow. **Flowering time** Feb.–Apr. **Pappus** of bristles with barbellate apex, bases not cohering. Montane; small mats on basalt sheets and bare stony soil; Drakensberg Grassland (rare, Maclear).

Group 14

Annual or perennial herbs, often ± prostrate, forming small mats. **Leaves** small, elliptic-oblong to subrotund. **Capitula** homogamous or heterogamous, often in the same species, 3–6 × 2–4 mm, usually in congested, terminal clusters; involucral bracts not radiating, whitish to orange, red, purple or golden-brown, colours often combined, lamina with a median, opaque patch often drawn out into a squarrose tip, outer 2 series webbed together with wool. **Receptacle** ± smooth. **Flowers** 9–45. **Pappus** of bristles, sometimes in more than one series, scabrid, bases cohering by patent cilia. **Cypselae** glabrous or hairy, often in the same species.

1a Branches erect or decumbent and then erect

spiralepis Hilliard & B.L.Burtt

Tufted, perennial herb, all parts grey-woolly. **Stems** annual, often many, up to 300 mm high, simple or branched from near base, leafy. **Leaves**: radical leaves rosetted, up to 70 × 15 mm, mostly oblong-spathulate; cauline leaves smaller. **Capitula** heterogamous, 5 × 3 mm, campanulate, in small, terminal glomerules surrounded by leafy bracts, glomerules in corymbose panicles; involucral bracts whitish to red-purple, soon caducous, whole capitulum disintegrating. **Flowers** 12–36. **Flowering time** Oct.–Mar. **Pappus** of bristles, in several series. **Cypselae** 0.75 mm long, hairy or glabrous. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Mount Fletcher to Bizana, S to Humansdorp).

1b Branches prostrate or diffuse
2a Involucral bracts either obtuse and then often emarginate, or subacute to acute, not recurved or very weakly so
3a Capitula ± 5 mm long; plants either closely branched and forming dense mats or, if more loosely branched, then plants lacking long simple leafy runners; pappus in more than one series
4a Plants closely branched and forming small dense mats
5a Inner involucral bracts at least 1 mm wide immediately below the opaque apical patch

lineatum Bolus

Much-branched, perennial herb, forming mats up to 200 mm in diam., or tufted. **Stems** ± prostrate, greyish white-felted, closely leafy. **Leaves** with bases webbed to the stem, blades 4–10 × 3–7 mm, elliptic-oblong to oblong-spathulate, both sides closely greyish white-woolly. **Capitula** homogamous, cylindric, 5 × 2 mm, many clustered at branch tips closely surrounded by leaves; involucral bracts soon caducous, outermost webbed to 2 or 3 reduced surrounding leaves, all translucent, light golden-brown. **Flowers** 18–25. **Flowering time** Feb.–Dec. **Pappus** of many bristles, delicate. **Cypselae** spindle-shaped, 1 mm long, glabrous or hairy. Montane; tufted in short grassland, small mats on bare earth; Drakensberg Grassland (rare, Barkly East, Maclear).

5b Inner involucral bracts < 1 mm wide immediately below the opaque apical patch

zwartbergense Bolus

Greyish white-woolly herb, perennial(?). **Stems** many from the crown, 40–150 mm long, prostrate, much branched, forming dense little mats, closely leafy. **Leaves** 3–15 × 1.5–7.0 mm, spathulate to subrotund. **Capitula** homogamous, cylindric, 5 × 3 mm, solitary or several clustered at tips of branchlets, surrounded by leaves; involucral bracts soon caducous, all light golden-brown, sometimes red above the stereome. **Flowers** 15–44. **Flowering time** Dec., Jan. **Pappus** of very many bristles, in more

than 1 series, delicate. **Cypselae** 1 mm long, glabrous or hairy. Montane; Eastern Fynbos-Renosterveld (rare, Humansdorp, Uitenhage).

4b Plants loosely branched

litorale Bolus

Prostrate or diffuse grey- or white-woolly, perennial herb. **Stems** several from the crown, up to 450 mm long, loosely branched, leafy. **Leaves** 8–20 × 2–12 mm, spathulate to obovate, tip or whole leaf folded and recurved. **Capitula** homogamous or heterogamous, cylindric, 5 × 2–3 mm, solitary or in small, terminal glomerules 10 mm in diam., surrounded by reduced leaves webbed together with wool; involucral bracts mostly golden-brown, sometimes crimson. **Receptacle** ± honeycombed. **Flowers** 9–26. **Flowering time** Nov.–Jan. **Pappus** of bristles, in 2 or 3 series, very many, delicate. **Cypselae** 0.75 mm long, glabrous or hairy. Coastal dunes and inland; Drakensberg Grassland, Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket (Fort Cunynghame, Dohne, Albany, Joubertina to East London, Humansdorp).

3b Capitula 4 mm long
6a Plants forming small dense mats

tysonii Hilliard

Small, dense, annual, herbaceous mats, up to 200 mm in diam. **Stems** rooting, grey-tomentose, leafy. **Leaves** 4–10 × 1.5–6.0 mm, spathulate, apex folded and ± recurved, both sides grey-woolly. **Capitula** homogamous or heterogamous, campanulate, 4 × 2 mm, in small, terminal glomerules, innermost leaves webbed to outer involucral bracts; involucral bracts in 3 series, opaque straw-coloured or ± red. **Flowers** 19–32. **Flowering time** Sept.–Nov. **Pappus** of many bristles. **Cypselae** 0.75 mm long, with duplex hairs. Montane; bare stony ground, eroded places, hard gravelly road verges; Upper Karoo, Dry Highveld Grassland (rare, Middelburg, Graaff-Reinet).

6b Plants loosely branched; capitula crowded in glomerules, heterogamous, with 23–29 flowers, ovaries hairy

leontonyx DC.

Grey-woolly, annual herb. **Stems** 15–150 mm long, many from the crown, slender, prostrate, often ± red, distantly leafy, leaves crowded under capitula and at crown. **Leaves**: radical leaves often withered at flowering, 15–30 × 5–10 mm, oblong-elliptic to spathulate; cauline leaves similar but smaller, often folded lengthwise, apex recurved. **Capitula** heterogamous, campanulate, 3–4 × 2.0–2.5 mm, in terminal glomerules 5–15 mm in diam.; involucral bracts in 3 or 4 series, outer webbed to leaves, inner dull yellow, orange or red. **Flowers** 20–37, yellow, sometimes tipped red. **Flowering time** July–Oct., mainly Sept. **Pappus** of bristles, barbellate above, scabrid below. **Cypselae** 0.75 mm long, with duplex hairs or glabrous. Sand, common along roadsides, in old fields; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (very rare, Willowmore).

2b Involucral bracts very acute to acuminate, recurved or hooked
7a Capitula 5–6 mm long; pappus bristles in more than one series

tinctum (Thunb.) Hilliard & B.L.Burtt

Prostrate or diffuse grey- or white-woolly herb, annual(?). **Stems** 40–450 mm long, many from the crown, much branched above, leafy. **Leaves** 7–20 × 4–8 mm, spathulate to obtuse, upper leaves often folded lengthwise and recurved. **Capitula** mostly homogamous, campanulate, 5–6 × 3–4 mm, mostly 3–12 in small, terminal glomerules; involucral bracts in 4 series, outer webbed to surrounding leaves, pale straw-coloured

to golden-brown or crimson, or combinations. **Flowers** 13–27. **Flowering time** Sept.–Nov. **Pappus** of many bristles, in several series, delicate. **Cypselae** with duplex hairs, rarely glabrous. Montane?; Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Aberdeen to Uitenhage and Port Elizabeth, Humansdorp).

7b Capitula 3–4 mm long; pappus uniseriate
8a Plants with a loose open habit; apex of involucral bracts long-acuminate

leontonyx DC. (see 6b above)

8b Plants in small dense mats; apex of involucral bracts very acute

tysonii Hilliard (see 6a above)

Group 15

Perennial or annual herbs or shrublets. **Leaves** small, mostly ± spathulate or obovate, sometimes linear to elliptic. **Capitula** mostly heterogamous, 3–10 × 1.5–10.0 mm, solitary or few subcorymbosely arranged or in dense clusters; involucral bracts radiating or squarrose, white, pink, creamy, yellow, rufous or golden-brown, often partly coloured or flushed red. **Flowers** 7–290. **Pappus** of scabrid bristles, apex scabrid or barbellate, bases free or cohering lightly by patent cilia. **Cypselae** with duplex hairs, sometimes glabrous.

1a Involucral bracts predominantly various shades of brown, buff-coloured, gold-coloured or yellow (apex of inner bracts may be white or pink), or combinations of these colours; capitula campanulate or cylindric
2a Capitula solitary or 2 or 3 together, 3–6 mm long, frequently further arranged in corymbose panicles; annual or perennial, plants woody at least at base
3a Apex of involucral bracts acute to acuminate; leaf bases oblong, very shortly decurrent or not, but not ear-clasping

pumilio (O.Hoffm.) Hilliard & B.L.Burtt subsp. **pumilio**
Wolbossie (A)

Usually closely branched, rounded, dwarf shrublet, 20–200 mm high, taproot thick, woody. **Main stem** gnarled, short, branches erect or spreading, grey-woolly, densely leafy. **Leaves** 4–20 × 1–4 mm, linear-spathulate, base narrow, both sides glandular-pubescent, glandular hairs hidden by grey wool. **Capitula** 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, outer webbed to surrounding leaves, apex golden-brown to pale buff-coloured or whitish. **Receptacle** ± smooth. **Flowers** 30–96, mostly yellow. **Flowering time** mainly Aug.–Mar. **Pappus** of many bristles, bases ± cohering by patent cilia. **Cypselae** 0.75 mm long. Arid areas, gravelly, rocky places; palatable to stock; Lower Karoo, Albany Thicket (rare, Graaff-Reinet, Pearston, Somerset East).

3b Apex of involucral bracts obtuse

obtusum (S.Moore) Moeser

Shrublet, main stem 5–50 mm long, bare, woody. **Branches** forming a dense cushion up to 150 × 300 mm, white-silky or woolly-felted, leafy. **Leaves** 4–10 × 2–5 mm, oblong-lanceolate to suborbicular, narrowed below, ± clasping, apex recurved. **Capitula** campanulate, 4 × 4 mm, solitary or few clustered terminally; involucral bracts in 3 or 4 series, not radiating, obtuse, golden-brown to whitish or red-purple, outer bracts webbed to surrounding leaves. **Receptacle** ± smooth. **Flowers** 12–42. **Flowering time** all year, mainly Sept. **Pappus** of many bristles, bases with patent cilia, not cohering.

Cypselae hairy or glabrous. On sand, gravel, limestone among rocks on dry hills; Upper Karoo (rare, Middelburg).

2b Capitula crowded in terminal glomerules surrounded by leaves
4a Capitula 5–6 mm long; apex of involucral bracts very acute to acuminate and recurved

pumilio (O.Hoffm.) Hilliard & B.L.Burtt subsp. **pumilio** (see 3a above)

4b Capitula 3–5 mm long; apex of involucral bracts not recurved
5a Shrublet; apex of involucral bracts obtuse

obtusum (S.Moore) Moeser (see 3b above)

5b Herbaceous, annual or perennial; stems simple or subsimple; capitula many in terminal glomerules; involucral bracts ± uniformly pale golden-brown

albertense Hilliard

Annual herb, taproot slender. **Stems** 10–70 mm long, several from the crown, prostrate, very slender, ± simple, dark red-brown, cobwebby, distantly leafy. **Leaves** 4–11 × 2–3 mm, spathulate, base narrowed, both sides loosely grey-woolly, glabrescent. **Capitula** campanulate, 3 × 2 mm, many in terminal glomerules surrounded by leaves; involucral bracts in 6 series, outer webbed to surrounding leaves, whitish to red- or golden-brown. **Receptacle** raised, with flat tubercles. **Flowers** 12–22. **Flowering time** Sept.–Dec. **Pappus** of many bristles, bases with patent cilia not cohering. **Cypselae** 0.75 mm long, glabrous. Flat, arid areas; Lower Karoo, Albany Thicket (rare, Jansenville).

1b Involucral bracts predominantly white or white and crimson, rose or pink, sometimes wholly crimson or pink; capitula solitary or clustered
6a Capitula subglobose

argyrosphaerum DC.

Wild everlasting; *poprosie* (A)

Annual(?) herb, taproot woody. **Stems** up to 300 mm long, many, radiating, prostrate or decumbent, subsimple to branched, thinly woolly, leafy throughout. **Leaves** up to 25 × 7 mm, spathulate to oblanceolate, base narrowed, both sides thinly grey-woolly. **Capitula** solitary, terminal, surrounded by leaves; involucral bracts in 9 series, glossy, silvery to pink-tinged inwards, fading with age, apex obtuse, radiating. **Receptacle** ± honeycombed. **Flowers** 166–290, yellow, tipped pink. **Flowering time** June–Dec. **Pappus** of many bristles, bases cohering lightly by patent cilia. **Cypselae** 0.75 mm long. Hot, dry, sandy places, also weedy; good forage, poisonous in large quantities; Upper Karoo, Sub-Escarpment Savanna (rare, Middelburg, Komga).

6b Capitula campanulate

cerastioides DC. var. **cerastioides**

Sewejaartjie, *wolbossie* (A)

Bushy herb, taproot woody. **Stems** up to 200 mm long, erect to prostrate, simple or branched, grey-woolly, closely leafy throughout. **Leaves** 5–20 × 1–4 mm, base broad. **Capitula** solitary or few clustered terminally, webbed to surrounding leaves; involucral bracts in 6 series, acute to acuminate, radiating. **Receptacle** ± honeycombed. **Flowers** 41–172, yellow, tipped pink. **Flowering time** mainly June–Oct. **Pappus** of many bristles, bases with patent cilia, not cohering. **Cypselae** 0.75 mm long. Open flats or slopes on sand, gritty quartzites or calcareous soils, also weedy; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Eastern Fynbos-Renosterveld (Venterstad to Queenstown and Willowmore).

Group 16

Shrubs or subshrubs. **Leaves** large, ovate or subrotund, petiolate. **Capitula** homogamous or heterogamous, 2–3 × 2 mm, in clusters arranged in panicles; involucral bracts minutely radiating, white or silvery. **Flowers** 8–24. **Pappus** of scabrid bristles, apex barbellate, bases cohering by patent cilia. **Cypselae** with duplex hairs.

populifolium DC.

Soft-wooded shrub, up to 2 m high. **Stems** white-felted, leafy. **Leaves** up to 130 × 110 mm, broadly ovate or subrotund, obtuse, base cordate, upper surface cobwebby, glabrescent, lower surface white-felted; petioles white-felted, up to 70 mm long. **Capitula** homogamous, campanulate, 3 × 2 mm, in small clusters arranged in very large, divaricate, terminal panicles; involucral bracts in 4 or 5 series, outer pale brown, woolly, inner with opaque white, obtuse apex. **Receptacle** conical, minutely tuberculate. **Flowers** 16–24. **Flowering time** Feb.–May. **Pappus** of many bristles. **Cypselae** 0.50–0.75 mm long. Table Mountain Sandstone; large outcropping masses of rock or along cliffs above gorges; Indian Ocean Coastal Belt, Indigenous Forests (rare, Port St Johns).

Group 17

Shrubs, subshrubs or perennial herbs. **Leaves** small to medium, linear to elliptic, base sometimes petiole-like in broader leaves. **Capitula** homogamous or heterogamous, 4–15 mm long solitary or many in corymbose clusters or panicles; involucral bracts radiating, usually at least apex of inner white, occasionally rosy. **Receptacle** honeycombed, fimbrillate or ± toothed. **Flowers** 8–145. **Pappus** of bristles with scabrid, barbellate or subplumose apex, bases usually with patent cilia, cohering or not. **Cypselae** usually hairy.

1a Compact cushion-forming shrubs, often dwarf
2a Leaves subrotund, ovate or elliptic, up to twice as long as wide; capitula containing 19–145 flowers

confertum N.E.Br.

Compact, well-branched, dwarf shrub, old branches bare, younger closely leafy. **Leaves** up to 20 × 10 mm, ovate to elliptic, petiole-like base up to 10 mm long, upper surface grey, lower surface white, woolly-felted. **Capitula** homogamous, campanulate, 5–8 mm long, solitary or few terminally, or in several-headed, corymbose clusters; involucral bracts in 9 series, radiating, outer pale golden-brown or ± pink, bases webbed together with wool, inner milk-white. **Receptacle** honeycombed. **Flowers** 19–145, yellow, often tinged red. **Flowering time** July–Sept. **Pappus** of scabrid bristles, apex barbellate, bases not cohering. **Cypselae** 1.25 mm long, elliptic, hairy. Basalt and Cave Sandstone, on cliff faces; Drakensberg Grassland (Maclear).

2b Leaves linear to narrowly oblong or narrowly elliptic, at least twice as long as wide, 5–40 × 1–4 mm, indumentum like tissue paper; capitula containing 20–38 flowers

sessile DC.

Very compact, cushion-forming shrublet, 40–100 mm high. **Leaves** 5–40 × 1–4 mm, narrowly elliptic or oblong, both sides with thick white indumentum, surface silky-smooth, drying like crumpled tissue paper, becoming felty. **Capitula** homogamous, campanulate, 5–7 mm long, solitary or 2–12 on leafy peduncles, terminal; involucral bracts in 4–6 series, apex opaque milk-white, radiating. **Receptacle** ± honeycombed. **Flowers** 20–38, yellow. **Flowering time** Dec., Jan. **Pappus** of scabrid bristles, bases cohering by

patent cilia. **Cypselae** 1.5 mm long, hairy. Montane; among rocks; Dry Highveld Grassland, Drakensberg Grassland, Indigenous Forests (rare, Graaff-Reinet, Somerset East, Amatole Mts, Adelaide).

1b Laxly branched shrubs or subshrubs, or perennial herbs
3a Capitula 8–10 mm long, solitary at branch tips; leaf indumentum like tissue paper

altigenum Schltr. & Moeser

Dwarf subshrub, rootstock creeping. **Stems** prostrate to ascending, 10–150 mm long, ± simple, silky grey-woolly, closely leafy. **Leaves** 5–13 × 2–7 mm, elliptic-ovate, apex apiculate, both sides with silvery grey, tissue paper-like indumentum. **Capitula** homogamous or heterogamous, campanulate, 8–10 mm long, solitary, terminal, surrounded by leaves; involucral bracts in 5 series, radiating, outer membranous, palest brown, inner opaque, dull white. **Receptacle** ± honeycombed. **Flowers** 44–58, yellow, sometimes tipped pink. **Flowering time** Nov.–Jan. **Pappus** of scabrid bristles, bases cohering by patent cilia. **Cypselae** narrowly obovate, hairy. Stony mountain slopes; Eastern Fynbos-Renosterveld (rare, Humansdorp, Uitenhage).

3b Capitula either few–many in clusters or corymbose panicles, or rarely solitary and then leaves woolly-felted
4a Leaves lanceolate to elliptic, acute, upper surface cobwebby at first, soon coarsely and harshly pubescent

felinum Less.

Erect, stout, perennial herb, up to 1 m high. **Stems** woody, branched above, rough with leaf scars below, loosely greyish white-woolly, densely leafy above. **Leaves** spreading or deflexed, 35–50 × 8–12 mm, lanceolate to elliptic, bases clasping, upper surface cobwebby to harshly pubescent or rugose, lower surface grey-woolly felted. **Capitula** homogamous, subglobose, 5–7 mm long, many in dense, rounded, corymbose clusters; involucral bracts in 8–12 series, milk-white, or tinged rose-pink, often crisped, radiating. **Receptacle** ± honeycombed or toothed. **Flowers** 38–103, yellow. **Flowering time** Sept.–Dec. **Pappus** of bristles with barbellate apex, bases cohering by patent cilia. **Cypselae** hairy. Rough scrubby slopes; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket, Drakensberg Grassland, Eastern Fynbos-Renosterveld (common, Bizana, inland to Glen Grey, S to Humansdorp).

4b Leaves differing from above in either shape or indumentum; leaf apex acute or obtuse; flowering stems pedunculoid and nude below the compound inflorescence

[E]outeniquense Hilliard

Perennial herb or subshrub. **Stems** 250 mm high, ± greyish white-woolly, leafy, ± nude near capitula. **Leaves** mostly 10–25 × 5–7 mm, elliptic-oblong to lanceolate, base ± clasping, both sides greyish white-woolly and glandular-setose. **Capitula** homogamous, campanulate, 4 × 3 mm, many in clusters in a dense, corymbose panicle; involucral bracts radiating, in 5 series, opaque white, ± crisped. **Receptacle** with short fimbrils. **Flowers** 20–25. **Flowering time** Jan. **Pappus** of bristles with barbellate apex, scabrid, bases with patent cilia cohering strongly. **Cypselae** hairy. Peaty soil; Eastern Fynbos-Renosterveld (rare endemic, Joubertina).

Group 18

More or less scandent, soft-wooded shrubs. **Leaves** small or medium, broadly elliptic or ovate to rhomboid or orbicular, petiolate or panduriform. **Capitula** homogamous,

4–8 × 3–10 mm, mainly in loose, terminal, corymbose panicles; involucral bracts radiating, opaque white, rarely ± yellow or tinged with rose. **Receptacle** fimbrillate. **Flowers** 12–68, corolla funnel-shaped. **Pappus** of scabrid bristles, bases cohering strongly by patent cilia, sometimes ± fused as well. **Cypselae** glabrous.

1a Involucral bracts very obtuse, concave; leaves subrotund, broadly ovate or rhomboid-elliptic, distinctly petiolate, petioles sometimes winged, leaf margins flat

petiolare Hilliard & B.L.Burtt

Straggling, loosely branched, soft-wooded shrub, forming tangled masses. **Stems** thinly grey-woolly, leafy becoming distantly bracteate below inflorescences. **Leaves** 10–35 × 10–30 mm, both surfaces grey-woolly felted, upper surface sometimes only cobwebby; petioles up to 10 mm long, base auriculate. **Capitula** many, subglobose to broadly campanulate, 5 × 5 mm; involucral bracts in 5 series, opaque milk-white. **Flowers** 18–30, yellow, sweetly scented. **Flowering time** Dec., Jan. **Pappus** of bristles, with bases cohering strongly by patent cilia, also lightly fused. **Cypselae** 1 mm long, barrel-shaped, 5-ribbed. Shrubby places in damp kloofs, forest margins; Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (common, Glen Grey, Bathurst and S to Humansdorp).

1b Involucral bracts subacute to acute

2a Leaves orbicular to broadly ovate, abruptly contracted to a broad petiole-like ear-clasping base

pandurifolium Schrank

Loosely branched, soft-wooded shrub. **Stems** thinly grey-woolly, leafy, becoming distantly bracteate below inflorescence. **Leaves** 8–16 × 8–10 mm, margins crisped-undulate, both sides grey-woolly. **Capitula** broadly campanulate, 5–8 × 6–14 mm, few–many; involucral bracts in 6 series, ± crisped, opaque milk-white, sometimes tinged with rose. **Flowers** 12–39, yellow. **Flowering time** Sept.–Jan. **Pappus** of bristles, with bases cohering strongly by patent cilia. **Cypselae** 0.75 mm long, barrel-shaped. Sandy or rocky slopes; Eastern Fynbos-Renosterveld (rare, Humansdorp).

2b Leaves panduriform, sessile

panduratum O.Hoffm. var. **panduratum**

Loosely branched, soft-wooded subshrub. **Stems** thinly grey-woolly, leafy, becoming distantly bracteate below inflorescence. **Leaves** up to 70 × 35 mm, base broadly auricled, half-clasping, margins ± crisped, thinly grey-woolly above, densely so below. **Capitula** many, subglobose, 5–6 mm long; involucral bracts in 5 series, often erose, opaque white. **Flowers** 27–48, yellow, honey-scented. **Flowering time** Dec., Jan. **Pappus** of bristles, with bases cohering strongly by patent cilia, lightly fused as well. **Cypselae** 1 mm long, barrel-shaped, ± ribbed. Mixed scrub-grassland near forest margins, coastal; Indigenous Forests, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (KZN Border to Kei River).

Group 19

Small shrubs. **Leaves** medium, broadly elliptic to suborbicular, petiolate. **Capitula** homogamous, 4–5 × 4–6 mm, in terminal, corymbose clusters; involucral bracts minutely radiating, white or straw-coloured. **Receptacle** honeycombed or fimbrillate. **Flowers** 10–32, corolla narrowly campanulate above. **Pappus** of scabrid bristles, bases usually cohering by patent cilia, sometimes free. **Cypselae** glabrous or hairy.

lepidissimum S.Moore
Dense, twiggy shrublet, 100–600 mm high, lower stems often decumbent, rooting, all closely leafy, younger parts loosely greyish white-woolly. **Leaves** 7–30 × 3–15 mm, base auriculate in larger leaves, margins ± crisped, ± greyish white-woolly above, with long, coarse, shaggy hairs, greyish white-woolly felted below. **Capitula** campanulate, 4–6 × 3–5 mm, few–many; involucral bracts in 5 series, crisped, glossy, white to pale straw-coloured. **Receptacle** fimbrillate. **Flowers** 10–30, yellow. **Flowering time** mainly Apr.–Aug. **Pappus** of bristles, with bases cohering by patent cilia. **Cypselae** 1 mm long, barrel-shaped, ± ribbed, glabrous. Rocky places, ± montane; Indian Ocean Belt, Indigenous Forests (Lusikisiki District).

Group 20

Perennial herbs with woody tubers. **Leaves** medium or large, elliptic, clasping, sometimes decurrent. **Capitula** homogamous, 5 × 5 mm, webbed together and dense, or in a spreading, corymbose panicle; involucral bracts not radiating, white or yellow. **Receptacle** fimbrillate and paleate. **Flowers** 33–55, corolla narrowly campanulate above. **Pappus** of bristles, with smooth shaft and barbellate apex, bases free or cohering by patent cilia or ± fused in bundles. **Cypselae** hairy.

platypterum DC.
Stems solitary or several, erect, up to 1 m high, simple, thinly white-cottony, leafy below, bracteate above. **Leaves** up to 250 × 80 mm, lower broadly elliptic, narrowed to broadly winged base, upper leaves narrower, becoming bracts, clasping, decurrent in long stem wings, upper surface thinly, harshly pubescent, lower surface more so particularly on nerves, 3- or 5-nerved. **Capitula** campanulate, 5 × 5 mm, many in a large corymbose panicle; involucral bracts in 5 or 6 series, opaque silvery white. **Flowering time** Feb.–Apr. **Pappus** of bristles, with bases cohering lightly by patent cilia, some light fusion as well, or bases nude and free. Damp grassy slopes, forest margins, montane; Indigenous Forests, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Mount Fletcher to Stutterheim and Humansdorp).

Group 21

Stoloniferous, perennial herb. **Leaves** medium or large, radical leaves tufted, elliptic to obovate, base often petiole-like. **Capitula** homogamous, 5–9 × 3–5 mm in small clusters, these often in corymbose panicles; involucral bracts not radiating, yellow. **Receptacle** ± honeycombed. **Flowers** 7–16, corolla narrowly campanulate above. **Pappus** of scabrid bristles, bases cohering by patent cilia, some fusion as well. **Cypselae** hairy.

acutatum DC.
Variable perennial herb, rootstock stout. **Stems** solitary or several, erect, up to 600 mm long, simple, cobwebby to woolly-tomentose. **Leaves**: radical leaves up to 350 × 80 mm, blade elliptic or ovate-elliptic, tapering into a long, winged petiole, base expanded, clasping, both sides glandular-punctate, often glandular-pubescent, often cobwebby to densely grey-woolly also, 3-nerved; cauline leaves similar, soon sessile, oblong-lanceolate, becoming distant, linear-lanceolate bracts. **Capitula** oblong-campanulate, 5–7 × 3 mm, many in corymbose clusters, these in dense corymbose panicles; involucral bracts in 4 series, outer webbed with wool, pellucid, bright yellow. **Flowers** 7–13. **Flowering time** Sept.–Jan. **Pappus** of many bristles. **Cypselae** 1.25 mm long. Grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Mthatha to Bizana).

Group 22

Shrubs or tufted perennial herb or rarely annual. **Leaves** small, linear to ovate-lanceolate. **Capitula** usually heterogamous, bases mostly woolly, 3–7 × 2–7 mm, in lax or dense, terminal, corymbose panicles; involucral bracts minutely radiating, yellow or some golden-brown. **Receptacle** ± honeycombed, rarely fimbrillate or ± tuberculate. **Flowers** 7–156. **Pappus** of scabrid bristles, apex sometimes barbellate, bases usually cohering by patent cilia. **Cypselae** mostly hairy.

1a Shrubs, sometimes mat-forming
2a Capitula hemispherical at maturity; all bracts bright yellow, loosely imbricate
3a Virgate shrub, usually erect, occasionally sprawling; leaves linear to linear-lanceolate, acute or subacute

splendidum (Thunb.) Less.

Geelsewejaartjie (A); *impepho* (X)

Virgate shrub, up to 1.5 m high, rarely sprawling. **Branches** thinly grey-woolly, closely leafy, older parts glabrescent, rough with leaf scars. **Leaves** 10–40 × 1–6 mm, linear to linear-lanceolate, base broad, ± clasping, margins revolute, upper surface greyish white-woolly or ± glabrous, lower surface greyish white-woolly. **Capitula** hemispherical, 4–5 mm long; involucral bracts in 5 series, bright yellow, rarely orange, glossy. **Flowers** 47–105, yellow. **Flowering time** Oct.–Jan. **Pappus** of many bristles. **Cypselae** 0.75 mm long. Montane; rocky places, forest margins, stream gullies; Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Indigenous Forests, Eastern Fynbos-Renosterveld (Herschel and Matatiele S to Graaff-Reinet, Cathcart and Humansdorp).

3b Mat-forming, dwarf shrub with short, closely congested branches; leaves obovate, lingulate or subspathulate, very obtuse

montanum DC.

Mat-forming, dwarf shrub, 100–450 mm high, ± 1 m in diam. **Branches** short, congested, densely leafy, flowering stems terminal, erect, up to 200 mm long, greyish white-woolly. **Leaves** up to 50 × 10 mm, obovate to subspathulate, base ± clasping, both sides thickly greyish white-woolly, clearly striped from 3–5 parallel nerves. **Capitula** hemispherical, 4–5 mm long, many in compact panicles; involucral bracts in 6 or 7 series, glossy, bright yellow. **Flowers** 53–133. **Flowering time** Jan.–Apr. **Pappus** of many bristles, apex barbellate or subplumose. **Cypselae** 0.75 mm long. Montane; cliff faces, rocky gullies, steep rocky slopes; Drakensberg Grassland, Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket (Lady Grey E to Maclear, S to Queenstown and Graaff-Reinet).

2b Capitula campanulate at maturity; outer bracts often brownish or straw-coloured, remaining closely imbricate, inner bright yellow (sometimes with reddish tints), more loosely imbricate
4a Leaves linear or oblong, apex recurved, either woolly on both sides or glabrous above and then minutely gland-dotted

trilineatum DC.

Impepho (X)

Rounded shrub, 150–1 000 mm high. **Old branches** bare, rough with leaf scars, young branchlets greyish-white, woolly, closely leafy. **Leaves** 3–25 × 1–5 mm, linear or oblong, tip recurved, base ± clasping, margins revolute, upper surface minutely gland-dotted, glabrous to greyish-white, woolly, lower surface white-woolly, ribbed by parallel veins. **Capitula** mostly heterogamous, campanulate, 4–6 mm long, many in compact clusters;

involucral bracts in 5 series, outer pale golden-brown, inner bright yellow. **Flowers** 25–60. **Flowering time** mainly Aug.–Feb. **Pappus** of many bristles. **Cypselae** 1 mm long, barrel-shaped. Montane; rocky outcrops and gullies, steep slopes, grassy or shrubby plateaus; Dry Highveld Grassland, Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland (Herschel and Mount Fletcher S to Graaff-Reinet and Cathcart).

4b Leaves ovate-lanceolate, apex not or scarcely recurved

witbergense Bolus

Spindly shrub, up to 900 mm high. **Old stems** bare, rough with leaf bases, branchlets closely leafy. **Leaves** up to 20 × 3.5 mm, or 35 × 10 mm on coppice growth, ovate-lanceolate, base ± clasping, margins revolute, both surfaces sometimes grey-woolly, or commonly upper surface ± cobwebby, hairs soon deciduous or confined to midrib, often minutely gland-dotted and glutinous, lower surface white-felted, striate. **Capitula** campanulate, 5–6 mm long, many in dense, rounded, terminal, corymbose clusters, 15–20 mm in diam.; involucral bracts in 5 or 6 series, glossy, outer light brown, inner bright yellow. **Flowers** 34–56. **Flowering time** Nov.–Feb. **Pappus** of many bristles, apex subplumose. **Cypselae** 1 mm long. Montane; moist grassy slopes and valley bottoms; Drakensberg Grassland (Barkly East, Maclear).

1b Either bushy or tufted perennial herbs, or annuals
5a Both leaf surfaces greyish white-woolly
6a Capitula 5 mm long

psilolepis Harv.

Tufted, perennial herb, stock rhizomatous. **Stems** many, erect or ascending, up to 400 mm long, simple or branched from base, greyish white-woolly, closely leafy. **Leaves** up to 30 × 4 mm, linear or linear-lanceolate, base ± clasping, both sides greyish-white, woolly. **Capitula** campanulate, 5 mm long, many in dense, terminal, corymbose clusters; involucral bracts in 7 series, inner bright yellow, crisped, outer tipped pale golden-brown, bases woolly. **Receptacle** minutely tuberculate. **Flowers** 112–156. **Flowering time** Nov.–Jan. **Pappus** of many bristles. **Cypselae** hairy. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Indigenous Forests, Sub-Escarpment Savanna (Albert and Barkly East to Graaff-Reinet and Uitenhage).

6b Capitula 3–4 mm long; stereome of outermost but one series of involucral bracts 2 mm long (outermost bracts often reduced); bisexual flowers mostly 3–4× as many as female

versicolor O.Hoffm. & Muschl.

Annual herb. **Stems** basal, several, up to 300 mm long, erect or decumbent, simple or ± branched, white-woolly, leafy. **Leaves** 15–40 × 4–12 mm, oblong-lanceolate to lanceolate, base cordate-clasping, margins flat or crisped-undulate, both sides thinly greyish-white, woolly. **Capitula** campanulate, 3 × 2 mm, many in dense, woolly clusters in compact, corymbose panicles; involucral bracts in 6 series, backs white-woolly, crisped, bright yellow. **Flowers** 12–30. **Flowering time** mainly Oct., Nov. **Pappus** of many bristles, bases not cohering. **Cypselae** 0.5 mm long. Coastal, seashore or dune scrub; Eastern Fynbos-Renosterveld, Albany Thicket (St Francis Bay to Fish River Mouth).

5b Upper leaf surface either without wool at maturity or wool confined to margins and midline
7a Capitula 4 mm long; upper leaf surface coarsely hairy, lower white-tomentose

intricatum DC.

Perennial herb. **Stems** in tufts, wiry, decumbent then erect, up to 600 mm long, glabrous below, white-woolly above, leafy. **Leaves** 12–30 × 2.5–8.0 mm, smaller upwards,

oblong to lanceolate, base cordate-clasping, margins ± revolute, upper surface with coarse spreading hairs, cobwebby also at first, lower surface white-woolly felted. **Capitula** homogamous or heterogamous, campanulate, 4 × 2.5 mm, many felted into terminal, flat-topped glomerules; involucral bracts in 4 series, outermost pale brown or yellow, inner lemon-yellow. **Receptacle** fimbrillate. **Flowers** 8–15. **Flowering time** Dec., Jan. **Pappus** of many bristles, bases cohering by patent cilia, some light fusion too. **Cypselae** 1 mm long, broadly cylindric, glabrous or hairy. Marshy places; Drakensberg Grassland, Indigenous Forests (Stockenström, Hogsback, Stutterheim).

7b Capitula 7 mm long; leaves with wool confined to margins and midline

E isolepis Bolus

Straggling, perennial herb. **Stems** branching at ground level, decumbent, rooting, then erect, up to 300 mm long, loosely white-woolly, closely leafy. **Leaves** 10–25 × 3–5 mm, oblong-obovate to oblong, upper leaves tipped with a yellow scarious appendage, base ± clasping, both surfaces coarsely glandular-pubescent, cobwebby at first, margins thickened, margins and midvein below white-woolly. **Capitula** homogamous, campanulate, 7 × 6–7 mm, several in a terminal, spherical cluster; involucral bracts in 5 series, bases webbed with wool, apex ± crisped, ± glossy, bright yellow. **Flowers** 24–35. **Flowering time** Dec., Jan. **Cypselae** 1.5 mm long, glabrous. **Pappus** of many bristles, apex barbellate, yellow. Stony mountain grassland; Eastern Fynbos-Renosterveld, Indigenous Forests (Katberg and Great Winterberg).

Group 23

Perennial herbs, often stoloniferous, often with radical leaves. **Leaves** medium or large, mostly elliptic to suborbicular, sometimes linear-lanceolate, base often petiole-like. **Capitula** homogamous, 4–8 × 3–8 mm, in lax or compact, corymbose panicles; involucral bracts minutely radiating or not, sometimes squarrose, creamy, tawny, yellow or rosy. **Receptacle** fimbrillate. **Flowers** 8–69, corolla campanulate above. **Pappus** of scabrid bristles, bases cohering by patent cilia, sometimes also lightly fused. **Cypselae** glabrous, 0.75–1.00 mm long.

1a Flowering stem leafy mainly in lower half, nude or with a few reduced leaves or bracts in upper half
2a Crown clothed in brown silky wool, wool sometimes hidden in leaf axils
3a Involucral bracts either minutely radiating or not, but not squarrose
4a Upper leaf surface variously pubescent or woolly at least on the main veins and margins
5a Upper leaf surface clad in long coarse hairs

nudifolium (L.) Less. var. **pilosellum** (L.f.) Beentje

Rootstock stout, woody, crown brown-silky woolly; flowering stem simple, up to 450 mm high, woolly felted. **Leaves** often only 3 or 4 basally, spreading or ascending, up to 230 × 60 mm, elliptic to subrotund, base broadly clasping, cauline leaves rare, cordate-clasping, shortly decurrent, upper surface harshly pubescent, lower surface white-felted, strongly 5–9-nerved, reticulate. **Capitula** campanulate, ± 5 × 5 mm, many in compact, corymbose clusters in a cyme; involucral bracts in ± 3 series, base woolly, crisped, pale brown. **Flowers** 23–58, bright yellow. **Flowering time** mainly Aug.–Dec. **Pappus** of many bristles, also lightly fused. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Rhodes E to Kokstad southwards, from Elliot and Ugie to Mkambati Nature Reserve, Somerset East to Kei River Mouth and from Suurberg to Peddie).

5b Upper leaf surface with minute soft pubescence or woolly as well or wool confined to margins and main veins; both leaf surfaces loosely woolly or wool confined to margins and main veins

thapsus (Kuntze) Moeser

Crown brown-silky woolly, stems 1–many, simple, erect, up to ± 600 mm long, thinly white-felted, leafy in lower half, bracteate above. **Leaves** up to ± 120 × 30 mm, elliptic or elliptic-spathulate, apex acute, base narrowed, half-clasping, mostly both surfaces thinly to thickly greyish white-woolly, prominently 3-nerved. **Capitula** campanulate or broadly cylindric, ± 5 × 3 mm, up to ± 12 in tight clusters, these in open, corymbose panicles; involucral bracts in ± 6 series, woolly, straw-coloured or pale brown, not radiating. **Flowers** 15–30. **Flowering time** Dec.–Apr. **Pappus** of many bristles, bases cohering lightly by patent cilia. Grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests (from north to uMzimkhulu).

4b Upper leaf surface glabrous and smooth, though initially it may be covered with papery indumentum or a little wool may cling to the midline
6a Involucral bracts brown

pedunculatum Hilliard & B.L.Burtt

Rootstock woody, silky-brown wool in axils of leaf bases, stem solitary, simple, erect, up to ± 500 mm long, white-woolly, leafy below, bracteate upwards. **Leaves** mostly radical, up to 130 × 40 mm, elliptic, apex acute, petiole-like base broad, flat, clasping, upper surface glabrous, lower surface with a white-silky, woolly, felted indumentum; cauline leaves similar but soon sessile, bracteate. **Capitula** campanulate, ± 7.5 × 7 mm; involucral bracts in ± 5 series, woolly below, apex red-brown, crisped, not radiating. **Flowers** 30–65. **Flowering time** Nov.–Feb. **Pappus** of many bristles, bases lightly fused. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Dordrecht E to Mthatha, S from Katberg to Kentani and from Line Drift to East London).

6b Involucral bracts straw-coloured

nudifolium (L.) Less. var. **nudifolium**

Teebossie (A); *icolocolo* (X)

Stout underground runners, crown often woody, brown-silky woolly, flowering stems 1–many, simple, up to ± 1.5 m high, thinly woolly. **Leaves**: radical leaves up to 600 mm long, linear-lanceolate to ovate, narrowed to a long winged, petiole-like base, apex acute, blade coriaceous, upper surface scabrid or with a skin-like indumentum, glabrescent, lower surface scabrid, cobwebby, white-woolly or silky, 3–7-nerved, nerves strongly raised below, reticulate; cauline leaves similar, sessile, stem-clasping, lower ones often decurrent, smaller upwards and bracteate. **Capitula** campanulate, ± 4–7 × 2.5–6.0 mm, very many in a large, corymbose panicle; involucral bracts in ± 6 series, woolly at base, yellow to palest brown. **Flowers** 16–69. **Flowering time** Nov.–Mar. **Pappus** of many bristles, bases ± fused. Grassland; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Ongeluksnek to Kokstad southwards, from Middelburg to Mthatha, Cradock to Kei River, Lottering State Forest to East London, Humansdorp).

3b Involucral bracts very acute to acuminate, squarrose

griseum Sond.

Rootstock stout, woody, crown brown-silky woolly, flowering stems up to ± 700 mm high, simple, 1–many, woolly felted, leafy in lower part, bracteate upwards. **Leaves** ± 4,

ascending, up to 200 × 80 mm, broadly elliptic or ovate, apex acute, base narrowed in lower leaves, broad, cordate-clasping in upper leaves, upper surface thinly cobwebby to harshly pubescent, lower surface greyish white-felted, faintly 5–9-nerved, reticulate. **Capitula** campanulate, 6 × 5 mm, many in a congested or lax, corymbose cyme; involucral bracts in ± 4 series, base woolly, apex glossy, pink or buff-coloured, squarrose. **Flowers** 25–31. **Flowering time** Aug.–Oct. **Pappus** of many bristles, bases lightly fused. Grassland, after fire; Indigenous Forests, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Mkambati Nature Reserve S to Komga and Kentani).

2b Crown not clothed in brown silky wool; leaves not spreading flat on ground
7a Upper leaf surface glabrous at maturity except for traces of wool sometimes clinging to the veins
8a Involucral bracts reddish brown; leaves 5–7-nerved

pedunculatum Hilliard & B.L.Burtt (see 6a above)

8b Inner involucral bracts pale yellow or whitish, outer often purplish or reddish; leaves 3-nerved

allioides Less.

Stock woody, with thin, wiry leaf bases; flowering stems solitary, up to 650 mm high, thinly woolly. **Leaves** mostly radical, up to 600 × 20 mm, linear-lanceolate, apex acuminate, base gradually narrowed to a long, thin, wiry petiole, margins often undulate, upper surface thinly woolly, glabrescent to smooth and coriaceous, lower surface woolly felted, 3-nerved; cauline leaves similar but soon sessile and distantly bracteate. **Capitula** campanulate, ± 6 × 4–6 mm, many in a compact, flat-topped corymb; involucral bracts in ± 4 series, bases woolly, outer often purplish or reddish, inner pale yellow to white. **Flowers** 20–43. **Flowering time** Aug.–Dec. **Pappus** of many bristles. Colonies in open grassland; Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Thaba Chitja southwards, from Molteno E to Port St Johns, Amatole Mts to Komga and to Grahamstown).

7b Upper leaf surface variously hairy; capitula campanulate or cylindric-campanulate; bracts mostly various shades of cream, yellow or brown, or rarely whitish, outer then purplish or reddish
9a At least the radical leaves 5–7-nerved, or if 3-nerved, capitula 6–7 mm long and inner bracts whitish or creamy
10a Involucral bracts creamy, yellow, straw-coloured, golden-brown or combinations of yellow and brown; leaves 5–7-nerved
11a Leaves rigid, involucral bracts mostly pale or lemon-yellow, only the outermost sometimes pale brown

nudifolium (L.) Less. var. **nudifolium** (see 6b above)

11b Leaves soft; involucral bracts creamy, yellow or yellow and brown; tertiary veins on lower leaf surface ladder-shaped, raised or not, but clearly visible

pallidum DC.

Rootstock stout, woody, flowering stem solitary, up to 650 mm high, thinly woolly. **Leaves**: radical leaves up to 400 × 120 mm, blade elliptic, contracted to a long, flat petiole-like base, expanded and clasping below, margins often undulate, upper surface harshly pubescent, lower surface greyish white-felted, 5–7-nerved, tertiary nerves clearly visible; cauline leaves similar, becoming sessile and cordate-clasping upwards, passing into distant bracts. **Capitula** campanulate, ± 6–7 mm long, many in a compact, flat-topped corymb; involucral bracts in ± 4 series, backs woolly, apex creamy to pale yellow or pale brown, ± opaque. **Flowers** 18–34. **Flowering time** Aug.–Feb. **Pappus** of many bristles, bases lightly fused. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland,

Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Thaba Chitja E to Clydesdale, S from Maclear to Port St Johns and Hogsback to Komga).

10b Outer involucral bracts purplish or reddish, inner white or creamy; leaves generally 3-nerved, rarely 5-nerved

nudifolium (L.) Less. var. **oxyphyllum** (DC.) Beentje

Uzandokwa (X)

Stock woody, flowering stem solitary, simple, up to 600 mm high, thinly woolly. **Leaves**: radical leaves up to 350 × 40 mm including petiole, elliptic to ovate, narrowed to a slender petiole, apex acute, margins ± undulate, upper surface scabridulous, lower surface white-felted, 3–5-nerved; cauline leaves similar, soon sessile, cordate-clasping, bracteate. **Capitula** campanulate, ± 6–7 mm long, many in a compact, flat-topped, corymbose panicle; involucral bracts in ± 4 series, base woolly, ± opaque, outer purplish or reddish, inner tipped white or creamy. **Flowers** 18–29. **Flowering time** Aug.–Jan. **Pappus** of bristles, with lightly fused bases. Grassland; Indian Ocean Coastal Belt, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Mkambati Nature Reserve southwards, from Queenstown to Kei River Mouth and from Joubertina to East London).

9b Radical leaves 3-nerved, capitula 4–5 mm long; bracts light golden-brown or yellow or a combination of the two; flowers 16–32, involucral bracts in ± 6 series

nudifolium (L.) Less. var. **nudifolium** (see 6b above)

1b Flowering stem either leafy throughout or with ± crowded reduced leaves or bracts below the compound inflorescence
12a Cauline leaves not decurrent in long narrow wings
13a Capitula campanulate; bracts not convex
14a Capitula ± 6 × 3 mm; bracts closely imbricate, lemon-yellow

pannosum DC.

Up to 1 m high, creeping woody stock, crown brown silky woolly, stem ± branched low down, often zigzag, greyish white-woolly. **Leaves** up to 100 × 30 mm, smaller upwards, oblanceolate to lanceolate, apex acute, base broad, cordate-clasping, both surfaces greyish white-woolly, sometimes glabrescent. **Capitula** narrowly campanulate, ± 6 × 3 mm, many in tight clusters corymbosely arranged; involucral bracts in ± 6 series, outer woolly, inner glossy, lemon-yellow. **Flowers** 8–15. **Flowering time** Apr.–June. **Pappus** of many bristles. Grassland, often on hill slopes near forest patches; Sub-Escarpment Savanna, Indian Ocean Belt (Kasteelpoort, Mkambati Nature Reserve, Port St Johns).

14b Capitula ± 4–5 × 3–5 mm; bracts loosely imbricate, either tawny, yellow or yellow and brown; involucral bracts yellow often washed light golden-brown, mostly acute to acuminate

miconiifolium DC.

Teebossie (A); *isicwe* (X)

Rootstock stout, woody, with fibrous leaf bases, flowering stem solitary, up to 600 mm high, thinly woolly. **Leaves**: radical leaves up to 300 × 45 mm, elliptic, 3-nerved, apex acute, upper surface scabridulous to smooth, lower surface white-felted to glabrescent, margins ± revolute, petioles long, wiry and thin; cauline leaves similar but soon sessile and bracteate, linear-lanceolate, acuminate, margins strongly revolute. **Capitula** campanulate, ± 5 × 5 mm, many in a flat-topped, corymbose panicle; involucral bracts in ± 6 series, base woolly, limb glossy, lemon-yellow to light golden-brown. **Flowers** 12–23. **Flowering time** mainly Nov.–Feb. **Pappus** of many bristles. Grassland; Drakens-

berg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Rhodes E to Kokstad, southwards, from Queenstown to Mkambati Nature Reserve, Aberdeen to Komga and Suurberg to Port Alfred).

13b Capitula subglobose; bracts deeply convex

krebsianum Less.

Up to 600 mm high, stock stout, woody, stem solitary, simple, thinly white-cottony. **Leaves**: radical leaves up to 200 × 50 mm, including thin, wiry petioles, blade elliptic, apex and base tapering, 3-nerved, upper surface harshly pubescent, lower surface thinly woolly or white-cobwebby; cauline leaves crowded, linear-lanceolate, acuminate, soon bracteate, margins strongly revolute. **Capitula** subglobose, ± 5 × 5 mm, many in a spreading, flat-topped, corymbose panicle; involucral bracts in 5 or 6 series, convex, apex rounded, opaque, creamy white to pale yellow. **Flowers** 19–29. **Flowering time** mainly Oct.–Feb. **Pappus** of many bristles, bases lightly fused. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Maclear E to Kokstad southwards, from Baziya Mtn to Mkambati Nature Reserve and from Katberg Pass to King William's Town).

12b Cauline leaves decurrent in long narrow wings

mundtii Harv.

Robust, up to 1.5 m high, stock stout, woody, creeping, also leafy runners, flowering stem simple, upper part white-felted, leafy throughout. **Leaves**: radical leaves up to 600 × 60 mm including petiole, blade elliptic, base tapering into long-winged petiole, apex ± acute, clasping, upper surface glabrous, reticulate, rugose, lower surface white-felted, 3-nerved, reticulate; cauline leaves oblong-lanceolate, becoming linear-lanceolate upwards, acute, base decurrent in long, narrow stem wings. **Capitula** campanulate, ± 4 × 3.5 mm, many in cymose clusters in large, much-branched, corymbose panicles; involucral bracts in 5 or 6 series, graded, not radiating, opaque creamy white. **Flowers** 18–24. **Flowering time** Feb.–Apr. **Pappus** of many bristles, lightly fused. Wet places; Sub-Escarpment Grassland, Drakensberg Grassland (Malekgalonyane Nature Reserve E to Malowe, S to Cala, Mount Hope, Stutterheim and Toise River).

Group 24

Perennial herbs, usually with thick, woody rootstock and basal leaf rosettes. **Leaves** medium, oblong to obovate. **Capitula** homogamous, ± 5–15 mm long, in lax or congested, corymbose panicles; involucral bracts radiating, white, creamy or yellow, often with some tipped light or dark brown, crimson or purple. **Receptacle** fimbrillate. **Flowers** 23–335, corolla narrowly funnel-shaped. **Pappus** of scabrid bristles, apex sometimes barbellate, bases cohering strongly by patent cilia. **Cypselae** glabrous.

1a Involucral bracts white, tipped brown; leaves ± concolorous, grey-woolly

albo-brunneum S.Moore

Slender, woody rhizome with several leaf rosettes, flowering stems simple, ± decumbent then erect, up to ± 150–300 mm long, loosely greyish white-woolly, closely leafy. **Leaves**: radical leaves 30–80 mm long, obovate or oblong-obovate, apex subacute, base ± narrowed, clasping, both surfaces densely grey-woolly; cauline leaves similar, to linear-lanceolate, smaller upwards, ± appressed. **Capitula** rarely heterogamous, broadly campanulate, ± 7–15 mm long, 1–14 crowded at stem tip; involucral bracts in ± 8–12 series,

graded, outer glossy white, tipped brown, pure white inwards. **Flowers** 50–335, mostly yellow. **Flowering time** mainly Dec.–Feb. **Pappus** of many bristles, barbellate above. **Cypselae** ± 1 mm long. Montane, colonies on stony slopes; Mesic Highveld Grassland, Drakensberg Grassland, Albany Thicket (Witteberg, Rhodes, Barkly Pass, Aberdeen).

1b Involucral bracts creamy to pale or bright yellow, often with brown as well, or crimson or purple
2a Flowering stems leafy or bracteate throughout
3a Capitula 6–14 mm long, involucral bracts dull, creamy to pale yellow, often overlaid brown, purplish or crimson, acute to acuminate, often ± squarrose

appendiculatum (L.f.) Less.

Sheep's-ears; *skaapoorbossie* (A); *indlebevu* (X)

Flowering stems 1–several, up to ± 550 mm high, mostly simple, thinly grey-woolly, closely leafy throughout. **Leaves**: radical leaves up to 80 mm long, elliptic-oblong, base broad, apex acute, clasping, both surfaces woolly; cauline leaves smaller, lanceolate-oblong to lanceolate, shortly decurrent, upper surface grey-woolly, often glandular-hispid, glabrescent, lower surface grey-woolly. **Capitula** campanulate, 6–14 mm long, many in corymbose clusters, these in panicles; involucral bracts in ± 6 series, graded, ± acute, often squarrose, dull, creamy white or ± yellow, often washed brown, purple or crimson. **Flowers** 28–58, yellow. **Flowering time** mainly Dec.–Feb. **Pappus** of many bristles. **Cypselae** 1 mm long, barrel-shaped. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Ongeluksnek E to Fort Donald southwards from Cala to Lusikisiki, Somerset East to Kentani and Kareedouw to East London).

3b Involucral bracts generally glossy, if dull or ± dull, capitula either smaller or bract colour and shape not as above
4a Capitula in congested, compound inflorescences, peduncles often webbed together with wool
5a Capitula 4–6 mm long
6a Plants growing in well-drained grassland, flowering mainly from Dec. onwards, radical leaves often woolly above

cephaloideum DC.

Flowering stems several, mostly simple, erect, up to ± 400 mm long, loosely grey-woolly, leafy throughout. **Leaves**: radical leaves ± 20–50 mm long, lanceolate- or oblanceolate-oblong, base broad, both surfaces mostly grey-woolly, upper surface also with coarse patent hairs; cauline leaves erect, smaller upwards, ± lanceolate, shortly decurrent, upper surface sometimes glabrescent. **Capitula** campanulate, 4–6 mm long, several in compact, subglobose clusters up to ± 30 mm in diam., webbed together; involucral bracts in ± 6 series, glossy, bright yellow or deep straw-coloured, outer often tipped ± brown. **Flowers** 30–103. **Flowering time** mainly Dec.–Mar. **Pappus** of many bristles, apex barbellate. **Cypselae** 0.75 mm long, barrel-shaped. Grassland; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Aliwal North E to Mount Insizwa southwards, Gxulu to Mkambati Nature Reserve, Somerset East to King William's Town, Suurberg to Bathurst).

6b Plants growing in marshy grassland, flowering mainly in Oct. and Nov., radical leaves lacking wool above

subluteum Burtt Davy

Flowering stems several, erect, up to 350 mm long, loosely greyish white-woolly, leafy throughout. **Leaves**: radical leaves spreading, 28–55 mm long, elliptic or ovate, apex

± subacute, base broad, clasping, upper surface with long, coarse, patent hairs, lower surface greyish white-felted; cauline leaves erect, smaller upwards, lanceolate-oblong to lanceolate, ± acute, shortly decurrent, both surfaces greyish white-woolly. **Capitula** campanulate, 5–6 mm long, several in a ± globose, compound capitulum up to 25 mm in diam., webbed basally; involucral bracts in ± 6 series, glossy, bright yellow, outer tipped golden-brown. **Flowers** 37–66. **Flowering time** mainly Nov. **Pappus** of many bristles, apex barbellate. **Cypselae** 0.75 mm long, barrel-shaped. Montane, marshy, grassy places; Drakensberg Grassland, Sub-Escarpment Grassland (very rare, Naude's Neck, Baziya Mtn).

5b Capitula 6–8 mm long, very tightly congested, all the bracts acute or the inner subacute or subobtuse

auriceps Hilliard

Flowering stems several, mostly simple, erect, up to 600 mm long, loosely grey-woolly, leafy throughout. **Leaves**: radical leaves 65–150 mm long, oblong-lanceolate, apex acute, base broad, clasping, both surfaces loosely grey-woolly, upper surface also with long coarse hairs; cauline leaves erect, smaller upwards, ± lanceolate, ± acute, shortly decurrent, both surfaces loosely grey-woolly. **Capitula** campanulate, 6–8 mm long, several in a tight, subglobose cluster up to 45 mm in diam., base webbed with wool; involucral bracts in ± 6 series, glossy, bright yellow, mostly acute. **Flowers** 36–59. **Flowering time** mainly Feb.–Apr. **Pappus** of many bristles. **Cypselae** 1 mm long, barrel-shaped. Grassland; Indian Ocean Coastal Belt (Mkweni and Msikaba river mouths, Bizana).

4b Capitula in relatively loose inflorescences with all the individual peduncles visible
7a All the leaves woolly above and below

mixtum (Kuntze) Moeser var. **mixtum**

Flowering stems several, simple, erect, up to ± 450 mm long, thinly grey-felted, leafy throughout. **Leaves**: radical leaves 40–190 mm long, elliptic to oblanceolate, base broad, clasping, apex ± acute, both surfaces thinly grey-woolly; cauline leaves smaller upwards, lanceolate to linear-lanceolate, ± acute, shortly decurrent, both surfaces thinly grey-woolly. **Capitula** campanulate, 6.5–9.0 mm long, several in congested or open, corymbose panicles; involucral bracts in 6–8 series, glossy, bright yellow. **Flowers** 48–132, yellow. **Flowering time** mainly Nov.–Jan. **Pappus** of many bristles, apex barbellate. **Cypselae** 1 mm long, barrel-shaped. Grassland; Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket (Queenstown, Amatole Mts, East London).

7b Radical leaves and usually also the cauline leaves discolorous at maturity, without wool and green above, drying brown, woolly below

longifolium DC.

Flowering stems several, simple, erect, up to ± 450 mm long, thinly greyish white-felted, leafy throughout. **Leaves**: radical leaves ± 70–250 mm long, linear-lanceolate to oblong-lanceolate, base broad, clasping, apex acute to apiculate, upper surface cobwebby, glabrous later, lower surface greyish white-felted to silky; cauline leaves smaller upwards, lanceolate to linear-lanceolate, ± acute, shortly decurrent, both surfaces cobwebby or thinly felted, upper surface glabrescent. **Capitula** campanulate, 7–11 mm long, several in congested or open corymbose panicles; involucral bracts in 6–8 series, graded, glossy, bright yellow. **Flowers** 53–154, yellow. **Flowering time** mainly Nov.–Jan. **Pappus** of many bristles, apex barbellate. **Cypselae** 1 mm long, barrel-shaped. Coastal, sandy grassland; Indian Ocean Coastal Belt, Albany Thicket (rare, Lusikisiki to East London).

2b Flowering stem pedunculoid in upper half

xerochrysum DC.

One to few flowering stems lateral to the 1–few leaf rosettes, erect, simple, leafy below, pedunculoid and distantly bracteate upwards, tawny- or grey-woolly. **Leaves**: radical leaves 60–100 mm long, oblong-elliptic, apex subacute, base clasping, both surfaces grey-woolly; cauline leaves similar, lanceolate upwards, decurrent in long, narrow wings. **Capitula** subglobose, 10–20 mm in diam., few on nude peduncles in a lax, corymbose panicle; involucral bracts in ± 10 series, graded, golden-yellow overlaid red-brown. **Flowers** 122–240. **Flowering time** Dec., Jan. **Pappus** of many bristles, yellow, barbellate in upper half. Moist grassy slopes; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (Boschberg, Amatole Mts, Katberg, Grahamstown).

Group 25

Mat-forming, perennial herbs or subshrubs, rootstock stout, woody. **Leaves** small to medium, linear to lanceolate-elliptic, margins weakly involute. **Capitula** homogamous, ± 7–18 mm long, solitary or few clustered at branch tips; involucral bracts radiating, ± white. **Receptacle** ± honeycombed. **Flowers** 50–200, corolla narrowly campanulate above. **Pappus** of scabrid bristles, bases cohering strongly by patent cilia. **Cypselae** hairy.

1a Involucral bracts glossy; capitula either solitary or few at branch tips on distinct peduncles
2a Capitula 7–15 mm long; leaves linear or linear-lanceolate, 1.5–5.0 mm wide with 3 parallel nerves

chionosphareum DC.

Stems many, well-branched, prostrate, older parts rooting, young parts leafy. **Leaves** initially ± rosetted, 10–100 mm long, linear or linear-lanceolate, upper surface usually glandular-pubescent, lower surface usually with wool confined to margins and 3 parallel veins. **Capitula** campanulate, 7–15 mm long, 1–4 clustered at tips of erect, leafy stems up to 150 mm high; involucral bracts in ± 6 series, graded, glossy white or very pale yellow-brown outside. **Flowers** 71–154, yellow. **Flowering time** July–Dec. **Pappus** of many bristles. **Cypselae** ± 1.25 mm long, barrel-shaped. Mainly montane grassland, over and among rocks; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Rhodes E to Matatiele, S from Molteno to Port St Johns and Wodehouse District).

2b Capitula 13–18 mm long; leaves lanceolate-elliptic, ± 10 mm wide, nerves scarcely visible

swynnertonii S.Moore

Stock creeping, stems many, branching below, ascending, up to 150 mm long, closely leafy, flowering stems solitary, terminal, 1-headed, leafy below, bracteate upwards, grey-felted. **Leaves** up to 80 mm long, ± erect, lanceolate-elliptic, apex acute, base narrowed, half-clasping, webbed to stems by hairs, both surfaces and margins with similar loosely woven, grey, stringy, woolly felt underlain by patent glandular hairs. **Capitula** broadly campanulate, ± 13–18 mm long; involucral bracts in ± 10 series, graded, radiating, glossy white with a faint yellow or brown overcast. **Receptacle** with flattened tubercles. **Flowers** 129–201, yellow. **Flowering time** Oct.–Dec. **Pappus** of many bristles. **Cypselae** ± 1.5 mm long, barrel-shaped. Clumps or mats on stony mountain slopes; Sub-Escarpment Savanna (Stutterheim District, Fort Cunynghame).

1b Involucral bracts dull; capitula several, crowded at stem tip, peduncles very short

grandibracteatum M.D.Hend.

Tufted, perennial herb, leaf rosettes several, flowering stems terminal, solitary, up to 200 mm high, grey-woolly, leafy. **Leaves**: radical leaves up to 120 mm long, linear-lanceolate, base broad, clasping, glabrous above, silvery, silky, woolly felted below, striate from the strongly raised parallel veins; cauline leaves much smaller. **Capitula** campanulate, 8–10 mm long, several clustered at stem apex; involucral bracts; involucral bracts in ± 12 series, loosely imbricate, snow-white. **Flowers** 51–89, yellow. **Flowering time** Sept.–Nov. **Pappus** of many bristles, barbellate. **Cypselae** 1.5 mm long, elliptic. Poor stony grassland; Drakensberg Grassland (Amatole Mts, Boschberg, Katberg).

Group 26

Subshrubs or mat-forming, perennial herbs with straggling and sometimes rooting branches. **Leaves** small or medium, linear-lanceolate to obovate. **Capitula** heterogamous or rarely homogamous in the same species, ± 10–40 mm long, solitary; involucral bracts radiating, white often overlaid brown or crimson. **Receptacle** smooth or shortly honeycombed. **Flowers** 18–282. **Pappus** of bristles, with scabrid shaft, apex barbellate or subplumose, bases either shortly fused into a ring or partly fused and cohering by patent cilia as well. **Cypselae** glabrous or hairy, sometimes in the same species.

1a Capitula ± 15–40 mm long
2a Capitula ± 25–40 mm long, terminating scaly peduncles sharply distinguishable from the leafy sterile branches

lancifolium (Thunb.) Thunb.

Subshrub, branches straggling, up to 600 mm long, closely leafy. **Leaves** linear-lanceolate, 6–18 mm long, smaller appressed bracts upwards, lower ± appressed, webbed to stem, base broad, ± clasping, upper half flat or folded, recurved, apex apiculate, both surfaces with dense silvery, silky indumentum. **Capitula** turbinate, 25–35 mm long, 40–50 mm in diam., branchlets 50–200 mm long; bracts appressed, close, becoming involucral bracts; involucral bracts in ± 7 series, graded, inner linear-lanceolate, white flushed rose to crimson, outer ± ovate, golden-brown. **Receptacle** ± honeycombed. **Flowers** 73–130. **Flowering time** Sept.–Jan. **Pappus** of many bristles, apex subplumose, shaft barbellate to scabrid, bases lightly fused. **Cypselae** 1.25 mm long, cylindric, hairy. Montane, among shrubs, restiads; Eastern Fynbos-Renosterveld (Humansdorp, Willowmore).

2b Capitula ± 15–20 mm long
3a Leaves wholly enveloped in silvery tissue paper-like indumentum

stoloniferum (L.f.) Willd.

Ankerbossie (A)

Subshrub, branched, stems up to 300 mm long, prostrate or diffuse, flowering stems ascending, all closely leafy. **Leaves** on sterile shoots 7–15 mm long, narrowly obovate, lower part appressed, acute, leaves on flowering twigs much narrower, ± oblong, ± acute, all leaves with silvery, silky indumentum. **Capitula** turbinate-campanulate, 15–20 mm long, ± double that in diam., at tips of branchlets in upper axils; involucral bracts in ± 7 series, graded, inner glossy white or rose, or white tipped rose, outer golden-brown sometimes tinged rose. **Receptacle** ± honeycombed. **Flowers** 58–282. **Flowering time** Nov.–Feb. **Pappus** of many bristles, apex subplumose, bases lightly fused. **Cypselae** 1 mm long, cylindric, hairy. Montane, rocky places; Albany Thicket, Drakensberg Grassland (very rare, Graaff-Reinet, Wodehouse District).

3b Upper leaf surface clad in tissue paper-like indumentum, lower closely white-felted

retortoides N.E.Br.

Branched, perennial herb or subshrub, main stems prostrate, rooting, flowering stems erect, up to ± 200 mm long, closely leafy. **Leaves** up to 10 mm long, elliptic-oblong or subspathulate, upper surface with smooth, silky, tissue paper-like indumentum, green drying silvery grey, lower surface closely white-felted. **Capitula** campanulate, 20 mm long, 30 mm in diam., sessile at stem tips; involucral bracts in ± 9 series, closely imbricate, outer short and broad, glossy brown, tinged crimson, inner white or tinged rose-pink to crimson, opaque. **Receptacle** ± honeycombed. **Flowers** 50–68. **Flowering time** Sept.–Dec. **Pappus** of many bristles, apex subplumose, bases cohering by patent cilia, also ± fused. **Cypselae** 1.75 mm long, ellipsoid, glabrous or ± hairy. Montane, summits and slopes, rocky places; Drakensberg Grassland (very rare, Maclear).

1b Capitula ± 8–10 mm long; diffuse undershrub with long, slender, straggling branches

scitulum Hilliard & B.L.Burtt

Undershrub, branches closely leafy. **Leaves** 3–7 mm long, spreading, ± recurved, linear, base broad, ± clasping, upper surface green with very thin, tissue paper-like indumentum, lower surface closely greyish white-silky-felted. **Capitula** turbinate-campanulate, 8–10 mm long, at tips of short, densely leafy, erect stems often closely set along main stems; involucral bracts in 7 series, graded, outer rose, inner white often tipped rose. **Receptacle** honeycombed. **Flowers** 26–45. **Flowering time** Nov., Dec. **Pappus** of many bristles, scabrid above, smooth below, bases cohering by patent cilia, some fusion in bundles too. **Cypselae** 1 mm long, cylindric, hairy. Montane, rocky places; Mesic Highveld Grassland, Dry Highveld Grassland, Sub-Escarpment Grassland (Lady Grey, Molteno, Queenstown).

Group 27

Shrublets or herbaceous perennials. **Leaves** small or medium, linear to suborbicular. **Capitula** homogamous, 5–15 mm long, solitary or few tightly clustered; involucral bracts radiating, white, pink, or pink and white, often with some brown as well. **Receptacle** smooth or honeycombed. **Flowers** 17–277. **Pappus** of scabrid bristles, apex barbellate, bases mostly with patent cilia, cohering or not. **Cypselae** hairy, or rarely glabrous within the same species.

1a Perennial herbs with rosettes of radical leaves; capitula ± 15 mm long

bellidiastrum Moeser

Rhizomatous, perennial herb, with 1–many basal leaf rosettes, flowering stems solitary, up to 250 mm high, loosely greyish white-woolly, leafy. **Leaves**: radical leaves prostrate, up to 70 mm long, elliptic to obovate, white- or grey-woolly above, later shortly pubescent, white-felted below, older leaves discolorous, drying ± grey above, ± white below; cauline leaves up to 15 mm long, smaller upwards, distant, narrowly elliptic, greyish white-woolly. **Capitula** campanulate, 15 mm long, 30 mm in diam., solitary; involucral bracts in ± 15 series, graded, outer pale golden-brown, inner opaque white. **Receptacle** ± smooth. **Flowers** 217–277. **Flowering time** Nov.–Jan. **Pappus** of many bristles, apex subplumose. **Cypselae** 1 mm long, ellipsoid, hairy. Montane, damp places; Drakensberg Grassland (Barkly East, Maclear, Ngeli, Amatole Mts).

1b Dwarf shrubs or mat-forming subshrubs; capitula ± 10–15 mm long
2a Leaf blades suborbicular, obovate or broadly spathulate; erect dwarf shrublet; leaves woolly; capitula 10–13 mm long; bracts loosely imbricate

glaciale Hilliard

Rounded, dwarf shrublet, up to 200 mm high and 300 mm in diam., branches slender, nude below and rooting, closely leafy above. **Leaves** imbricate, visible part suborbicular, 5 × 5 mm, dense, thick, greyish white-woolly. **Capitula** campanulate, 10–13 mm long, 20 mm in diam., solitary on terminal, leafy peduncles; involucral bracts in ± 11 series, graded, outer pale brown, inner opaque, white, all tinged crimson at base. **Receptacle** nearly smooth. **Flowers** 45–81, yellow. **Flowering time** Nov.–Jan. **Pappus** of ± 12–14 bristles, apex shortly plumose, bases not cohering. **Cypselae** 1.25 mm long, hairy. Montane, basalt and dolerite cliffs; Drakensberg Grassland (very rare, Naude's Neck).

2b Leaf blades linear to lanceolate-elliptic

sessilioides Hilliard

Cushion-forming, dwarf shrublet, branches densely tufted, leafy. **Leaves** 4–15 mm long, imbricate, rosulate, linear to lanceolate-elliptic, upper surface with silky, tissue paper-like indumentum, green with silvery sheen, drying silver-grey, lower surface white-felted. **Capitula** campanulate, 10–15 mm long, sessile, solitary at branch tips; involucral bracts in 8–12 series, graded, outer pale brown, rose or crimson, inner white or tinged rose, opaque. **Receptacle** ± honeycombed. **Flowers** 37–118, yellow. **Flowering time** July–Dec. **Pappus** of many bristles, bases cohering lightly by patent cilia. **Cypselae** 2 mm long, elliptic, hairy. Montane, among dolerite or basalt rocks; Drakensberg Grassland (Lady Grey and Maclear to Matatiele).

Group 28

Perennial herbs with rosettes of radical leaves, sometimes forming small mats. **Leaves** linear to obovate. **Capitula** heterogamous or homogamous in the same species, 10–30 mm long, solitary or in few-headed, corymbose panicles; involucral bracts radiating, white, pink or crimson, sometimes multicoloured. **Receptacle** shortly honeycombed. **Flowers** ± 100–550. **Pappus** of scabrid bristles, apex barbellate to shortly subplumose, bases either free or cohering by patent cilia, sometimes fusion as well. **Cypselae** glabrous or hairy.

1a Ovaries hairy
2a Involucral bracts glossy
3a Capitula ± 25–30 mm long; 1–few leaf rosettes tufted together, radical leaves membranous when dry, loosely woolly cobwebby, wool sometimes stripping to leave only woolly margins, then upper surface clearly 3–5-nerved

ecklonis Sond.

Stock stout, woody, flowering stem terminal, solitary, up to 500 mm high, loosely woolly, leafy. **Leaves**: radical leaves up to 200 mm long, oblong-lanceolate to elliptic-obovate, upper surface sometimes glabrescent, lower surface usually persistently woolly, margins always so; cauline leaves similar, narrower and smaller upwards. **Capitula** mostly heterogamous, campanulate, 50–60 mm in diam., solitary; involucral bracts in ± 10 series, graded, white to deep pink. **Flowers** 231–407. **Flowering time** Sept.–Dec. **Pappus** of many bristles, apex barbellate, bases cohering by patent cilia, some fusion as well. **Cypselae** 1.75 mm long, barrel-shaped, hairy. Grassy slopes; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian

Ocean Coastal Belt (Ramatseliso's Plateau to Rhodes, S from Elliot and Ugie to Lusikisiki and from Hogsback to Kologha Mts).

3b Capitula ± 10–20 mm long
4a Leaves variously pubescent or woolly, but indumentum not silky
5a Leaves lingulate

lingulatum Hilliard

Mat-forming, perennial herb, many-crowded leaf rosettes from woody well-branched underground stems, flowering stems terminal, solitary, up to 180 mm high, grey-woolly, leafy. **Leaves**: radical leaves lingulate, up to 35 mm long, apex rounded, both sides closely grey-woolly; cauline leaves narrowly elliptic, tipped with a white membranous bract. **Capitula** homogamous or heterogamous, campanulate, ± 20 mm long, ± 40 mm in diam., solitary; involucral bracts in ± 7 series, graded, glossy, pink fading to white, crimson blotch inside near base. **Flowers** 152–180. **Flowering time** Sept., Oct. **Pappus** of many bristles, apex barbellate, bases cohering by patent cilia, some fusion also. **Cypselae** 1.5 mm long, barrel-shaped, hairy. Montane, on hard bare earth or on stony turf; Drakensberg Grassland, Sub-Escarpment Grassland (very rare, Mount Fletcher, Maclear, Engcobo).

5b Leaves linear, lanceolate, elliptic-oblong or suborbicular
6a Flowering stems lateral to the leaf rosette; involucral bracts white, rose, crimson or multicoloured; capitula 15–20 mm long; radical leaves elliptic to suborbicular

adenocarpum DC. subsp. **adenocarpum**

Rooisewejaartjie (A)

Variable, stock woody, with 1–several leaf rosettes, flowering stems decumbent or erect, up to 450 mm long, simple or forking above into a few- to many-headed, very open corymb, glandular-pubescent or woolly, closely leafy. **Leaves** grey-woolly or cobwebby to glandular-pubescent; radical leaves prostrate, up to 140 mm long; cauline leaves oblong to lanceolate, becoming bracteate. **Capitula** heterogamous, campanulate, ± 25–35 mm in diam.; involucral bracts in 9–11 series, graded, glossy, white to crimson. **Flowers** 165–520, yellow often tipped red. **Flowering time** mainly Jan.–Apr. **Pappus** of several bristles, bases nude, free. **Cypselae** 0.75 mm long, barrel-shaped, hairy. Grassland, often moist places; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (± common, Ramatseliso's Pass to Flagstaff, S from Indwe to Mkambati Nature Reserve and across Amatole Mts to Katberg Pass and Stutterheim).

6b Flowering stem terminal; involucral bracts white

monticola Hilliard

Perennial herb, 1–many leaf rosettes from a thick woody stock, flowering stems solitary, terminal, up to ± 300 mm high, closely leafy. **Leaves**: radical leaves up to 90 mm long, lanceolate, upper surface glandular-pubescent and cobwebby, wool deciduous, lower surface greyish white-woolly; cauline leaves similar, becoming bracteate. **Capitula** heterogamous, campanulate, 15–20 mm long, 20–30 mm in diam., solitary or in a few- to many-headed corymb; involucral bracts in ± 10 series, graded, glossy, white, tinged pink or crimson at base inside. **Flowers** 102–329. **Flowering time** Dec.–Feb. **Pappus** of ± 5 bristles, apex barbellate, bases free. **Cypselae** 1.5 mm long, hairy. Stony grass slopes; Drakensberg Grassland, Sub-Escarpment Grassland (Qacha's Neck E to Mount Ayliff, S from Barkly East to Baziya Forest and King William's Town).

4b Leaves silvery grey silky woolly, linear or linear-lanceolate; involucral bracts white

argentissimum J.M.Wood

Mat-forming, perennial herb, many-crowded leaf rosettes from thick, woody, branched underground stems, flowering stems terminal, solitary, up to 400 mm long, grey-woolly, leafy. **Leaves**: radical leaves up to 120 mm long, ± linear, silvery grey silky-woolly; cauline leaves similar but shorter, uppermost with a white membranous tip. **Capitula** homogamous or heterogamous, campanulate, ± 20 mm long, double that in diam., solitary; involucral bracts in ± 10 series, graded, glossy white, crimson or pink blotch at base inside. **Flowers** 111–201. **Flowering time** Sept.–Mar, mainly spring. **Pappus** of many bristles, apex barbellate, bases cohering by patent cilia, some fusion also. **Cypselae** 1.5 mm long, barrel-shaped, hairy. Stony grass slopes, on sandstone cliffs or platforms; Sub-Escarpment Grassland (very rare, uMzimkhulu and Mount Currie districts to Tabankulu).

2b Involucral bracts dull white, wool on leaves confined to margins, or wanting

marginatum DC.

Mat-forming, dwarf shrub, main stems prostrate, branching, with many-crowded leaf rosettes, flowering stems terminal, often solitary, erect, up to ± 150 mm high, loosely greyish white-woolly, leafy. **Leaves**: radical leaves lingulate, up to ± 40 mm long, leathery, glandular-punctuate, glabrous to glandular-pubescent, margins white-woolly; cauline leaves similar but smaller upwards. **Capitula** heterogamous, campanulate, ± 15–20 mm long, double that in diam., solitary; involucral bracts in ± 10 series, graded, white, crimson blotch near base inside. **Flowers** 195–259. **Flowering time** Dec.–Feb. **Pappus** of many bristles, bases free. **Cypselae** 1.25 mm long, cylindric, hairy. Montane, steep stony slopes, rock sheets; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland (rare, Lady Grey, Barkly East, Maclear, Mount Fletcher and Kraalberg).

1b Ovaries glabrous

7a Capitula ± 15 mm long; leaves glandular-pilose, margins white-woolly or not

bellum Hilliard

Perennial herb, with 1–few leaf rosettes from a woody rhizome, flowering stems 1 or 2, terminal, lateral to new rosettes, decumbent then erect, up to 300 mm long, loosely greyish white-woolly, closely leafy. **Leaves**: radical leaves up to 150 mm long, lanceolate-spathulate or lanceolate-elliptic, membranous, glandular-pilose, margins white-woolly when young; cauline leaves similar but smaller upwards. **Capitula** heterogamous, campanulate, ± 15 mm long, double that in diam., mostly solitary; involucral bracts in ± 10 series, graded, white. **Flowers** 287–544. **Flowering time** Jan.–Mar. **Pappus** of many bristles, bases ± cohering by patent cilia. **Cypselae** 1.5 mm long, ellipsoid, strongly 5-ribbed, glabrous. Montane, in stony turf on steep slopes and on summit plateaus; Mesic Highveld Grassland, Drakensberg Grassland (very rare, Witteberg, Barkly East).

7b Capitula ± 10 mm long; leaves grey silky-woolly

palustre Hilliard

Perennial herb, with tufts of leaf rosettes from a woody rhizome, flowering stems lateral, 1 or 2, erect, up to ± 150 mm long, loosely grey-woolly, closely leafy. **Leaves**: radical leaves up to 50 mm long, lanceolate-lingulate, silvery-silky; cauline leaves lanceolate, smaller upwards. **Capitula** heterogamous, campanulate, ± 10 mm long, double that in diam., mostly solitary; involucral bracts in ± 9 series, graded, white, dull crimson patch near base inside. **Flowers** 145–224. **Flowering time** Dec., Jan. **Pappus** of many

bristles, bases ± fused. **Cypselae** 1.5 mm long, 5-ribbed, glabrous. Montane, wet places; Drakensberg Grassland (very rare, Barkly East).

Group 29

Shrubs, subshrubs or mat-forming perennials. **Leaves** small or medium, linear to obovate. **Capitula** heterogamous or rarely homogamous in the same species, 10–25 mm long, solitary or few in lax corymbs; involucral bracts radiating, generally white with some brown, rose or crimson, sometimes yellow and brown. **Receptacle** shortly honeycombed, paleate in one species. **Flowers** 102–483. **Pappus** of scabrid bristles below, barbellate above, bases nude, not cohering. **Cypselae** glabrous.

1a Involucral bracts yellow or yellow and brown
2a Capitula ± 10 mm long; leaves enveloped in silvery white somewhat glossy indumentum

[E]**argyrophyllum** DC.

Vaalsewejaartjie, *vrouebossie* (A)

Mat-forming, dwarf shrub, often extensive, old stems bare, rooting, flowering stems up to ± 100 mm high, simple, closely leafy, vegetative parts with silvery white, closely felted somewhat glossy indumentum. **Leaves** obovate or obovate-spathulate, up to 30 mm long, hooked, recurved, base half-clasping. **Capitula** homogamous, broadly campanulate, 10–20 mm in diam., 1–few in lax corymbs; involucral bracts in ± 8 series, graded, radiating, lemon-yellow, outer with golden-brown. **Receptacle** paleate. **Flowers** 149–202. **Flowering time** Dec.–Mar. **Pappus** of many bristles, yellow. Dry places in grassland, also weedy; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Maclear, S to Amatole Mts, Victoria East and King William's Town).

2b Capitula ± 18–20 mm long; leaves loosely woolly

herbaceum (Andrews) Sweet

Stoloniferous, perennial herb, flowering stems up to 400 mm high, 1–few, closely leafy. **Leaves**: radical leaves ± rosulate, spreading, elliptic or obovate, up to 50 mm long, loosely cobwebby above, later glabrous, white-felted below; cauline leaves 10–25 mm long, erect, ± imbricate, linear to linear-lanceolate, base broad, clasping, margins revolute, greyish white cobwebby above, ± felted below. **Capitula** campanulate, 18–20 mm long, ± 27 mm in diam., mostly solitary at branch tips; involucral bracts in ± 8 series, glossy, golden-brown, inner lemon-yellow. **Flowers** 102–209. **Flowering time** Oct.–Apr. **Pappus** of many bristles. **Cypselae** 1.25 mm long, narrowly cylindric. Grass- or shrubland, also disturbed parts; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Ramatseliso's Gate E to Insizwa southwards, from Macubeni to Mkambati Nature Reserve, Amatole Mts to Haga Haga and to Joubertina, Humansdorp and Port Alfred).

1b Involucral bracts white, usually with some brown or crimson; leaves up to 9 mm wide, often much narrower
3a Shrubs or subshrubs, erect or forming tangled clumps, loosely branched; leaves mostly 1–3 mm wide, linear or linear-lanceolate

argyrolepis MacOwan

Soft-wooded, much-branched subshrub from a woody stock, stems greyish white-felted, closely leafy. **Leaves** linear or linear-lanceolate, 6–25 mm long, smaller and fewer upwards, appressed or spreading, reflexed, base broad, ± clasping, margins ± revolute, glandular-pubescent and greyish white-cobwebby or -woolly above, lower closely felted. **Capitula** campanulate, 13–15 mm long, 25 mm in diam., solitary at branch tips;

involucral bracts in ± 10 series, graded, glossy white, pale to dark brown above, rarely pink. **Flowers** 111–232. **Flowering time** Nov.–Apr. **Pappus** of many bristles. **Cypselae** 1.0–1.5 mm long, glabrous. Grassland, among rocks; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Malowe Mts, uMzimkhulu, Port St Johns).

3b Mat-forming perennial herbs or subshrubs; radical leaves linear-lanceolate

confertifolium Klatt

Mat-forming, perennial herb with rooting branches from a stout woody stock, many-crowded leaf rosettes, flowering stems terminal, up to 400 mm high, leafy. **Leaves**: radical leaves up to 70 mm long, linear-lanceolate, base broad, clasping, margins ± revolute, both sides silvery white-felted, lower paler than upper, prominently 3–5-nerved; cauline leaves similar, often shorter, closely imbricate. **Capitula** campanulate, 12–15 mm long, ± 25 mm in diam., mostly solitary; involucral bracts in ± 8 series, graded, glossy white, upper half very pale to dark or red-brown outside. **Flowers** 153–443. **Flowering time** Dec.–July, mainly Feb., Mar. **Pappus** of many bristles. **Cypselae** 1.5 mm long. Short, rocky grassland, rock sheets and other bare areas; Sub-Escarpment Grassland (rare, Mount Ayliff, uMzimkhulu).

Group 30

Coarse biennials, herbaceous perennials or shrubs. **Leaves** medium to large. **Capitula** heterogamous, ± 8–20 mm long, depressed-globose to broadly campanulate, few–many in corymbose panicles, sometimes solitary; involucral bracts radiating, mostly yellow, often brown outside, sometimes tawny, light brown, white, or red (pink) and white. **Receptacle** very shortly honeycombed. **Flowers** 300–2 350. **Pappus** of scabrid bristles, apex barbellate to subplumose, bases either smooth or with patent cilia, cohering or not. **Cypselae** glabrous.

1a Involucral bracts white, or red (pink) and white, creamy, straw-coloured or brown
2a Involucral bracts white, or red (pink) and white; high biennial(?) herb; capitula many in a large, corymbose panicle

elegantissimum DC.

Witsewejaartjie (A)

Stout, biennial herb, stem up to ± 1 m high, simple, glandular-pubescent, sometimes cobwebby also, leafy throughout. **Leaves**: radical leaves up to 150 mm long, ovate-oblong, glandular above, ± woolly below; cauline leaves up to 90 mm long, smaller upwards, ± lanceolate, base cordate-clasping, both sides glandular-pubescent. **Capitula** depressed-globose, ± 20–25 mm in diam., many in a large, spreading, leafy, corymbose panicle; involucral bracts in ± 10 series, ± graded, glossy, white sometimes tipped red or flushed pink. **Receptacle** ± smooth. **Flowers** ± 362–745. **Flowering time** Jan.–Apr. **Pappus** of many bristles, apex subplumose, bases with patent cilia, free. **Cypselae** 0.75–1.00 mm long, barrel-shaped. Montane, on slopes, along riverbanks; Drakensberg Grassland, Sub-Escarpment Grassland (rare, Lady Grey District to Elliott and Mount Fletcher).

2b Involucral bracts creamy, straw-coloured or brown
3a Involucral bracts creamy, sometimes with a brownish overcast outside
4a Bushy perennial herb or subshrub; leaves mostly elliptic, generally white-woolly on both surfaces; capitula 30–35 mm in diam. across the radiating bracts, up to ± 7 in a compact, corymbose cluster

tenax M.D.Hend. var. **pallidum** Hilliard & B.L.Burtt

Leaves grey-white at least on lower surface; involucral bracts creamy white, outer overlaid palest buff-coloured. **Flowering time** Oct., Nov. Steep rocky slopes; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Tabankulu and Insizwa mts).

tenax var. **tenax** (see 4b below)

4b Biennial herb, stem simple or sparingly branched from base; leaves lanceolate, acute to acuminate, lower surface thinly white-tomentose; capitula ± 15–25 mm in diam. across the radiating bracts, many in a large, leafy, spreading, corymbose panicle

foetidum (L.) Moench

Vlei-sewejaartjie (A)

Stout, foetid, up to ± 1 m high, glandular-pubescent, young parts thinly white-tomentose, leafy. **Leaves**: radical leaves ± rosulate in first year, withered at flowering, up to ± 120 mm long, elliptic, base auriculate-clasping, upper surface ± pubescent, lower surface ± white-tomentose; cauline leaves up to 90 mm long, smaller upwards, lanceolate, base cordate-clasping, upper surface harshly glandular-pubescent. **Capitula** depressed-globose, ± 8–12 mm long, ± 15–25 mm in diam.; involucral bracts in 8 or 9 series, graded, glossy, deep to pale lemon-yellow or creamy. **Flowers** 396–835. **Floweringtime** Oct.–May. **Pappus** of many bristles, bases ± cohering. **Cypselae** 0.75–1.00 mm long. Shrubby slopes, damp places, also weedy; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Mthatha to Umtentu River, S from Katberg Pass E to Fort Warden, Kouga Mts to Humansdorp and Bathurst).

3b Involucral bracts brown or straw-coloured

fulvum N.E.Br.

Strongly aromatic, flowering stem up to 1 m high, simple, glandular-pubescent, leafy throughout. **Leaves**: radical leaves rosetted, withered at flowering, up to 350 mm long, oblanceolate, petiole-like base clasping; cauline leaves up to ± 120 mm long, smaller upwards, elliptic-lanceolate, base cordate-clasping, shortly decurrent. **Capitula** depressed-globose, ± 7–8 mm long, many in a large, spreading, leafy, corymbose panicle; involucral bracts in 6 series, graded, glossy light brown, very acute. **Flowers** 423–731, orange-yellow. **Flowering time** Oct.–Jan. **Pappus** of many bristles, bases with patent cilia, ± cohering. **Cypselae** 0.75 mm long, barrel-shaped. Montane, along streams, rooted in mud; Sub-Escarpment Grassland (very rare, Ngeli Mtn, uMzimkhulu).

1b Involucral bracts yellow (lemon to golden) at least inside, sometimes brown outside; bases of pappus bristles with patent cilia, lightly cohering or not
5a Perennial herbs or subshrubs with a stout woody stock, crowned with one or more leaf rosettes; cauline leaves oblong or lanceolate

aureum (Houtt.) Merr. var. **aureum**

Variable, perennial herb, stock stout, 1–many leaf rosettes, flowering stems several, lateral, up to 800 mm high, simple or branched apically, glandular-setose to cobwebby or loosely white-woolly, leafy. **Leaves** with both surfaces glandular-setose, lower or both also woolly, or wool only on margins and midline; radical leaves up to 270 mm long, elliptic-spathulate, base broad, clasping; cauline leaves only very lightly woolly, or wool confined to margins and midline, up to 100 mm long, smaller upwards, oblong to lanceolate, base ± cordate-clasping, shortly decurrent. **Capitula** depressed-globose, 15–20 mm long, 35–45 mm in diam., 1–6 at stem tips on leafy peduncles; involucral bracts in ± 7–9 series, graded, glossy, bright yellow. **Receptacle** ± honeycombed. **Flowers** 1 488–1 642, yellow. **Flowering time** July–Nov. **Pappus** of many bristles, apex barbellate, bases with patent cilia, ± free. **Cypselae** 0.75–1.00 mm long, barrel-shaped.

Grassland and short scrub; Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Barkly East E to Mkambati Nature Reserve southwards, Sneeuberg Mts to Gonubie River Mouth, Port Elizabeth to East London and Humansdorp).

aureum (Houtt.) Merr. var. **monocephalum** (DC.) Hilliard

Capitula mostly 8–15 mm long, up to 32 mm in diam. the radiating bracts. **Flowering time** July–Nov. Mainly open grassland; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Lady Grey E to Kokstad southwards, from Stormberg to Lusikisiki, Amatole Mts to King William's Town, Suurberg to Fish River Mouth and to Humansdorp).

aureum (Houtt.) Merr. var. **serotinum** Hilliard

Flowering stems woolly or cobwebby only in uppermost part. **Flowering time** Dec.–May. Montane, grassy slopes; Drakensberg Grassland, Sub-Escarpment Grassland (Matatiele to Barkly East and Winterberg).

5b Biennial herb with radical leaves rosetted in the first year of growth, or perennial herbs, subshrubs or shrubs, sometimes with vegetative buds or small leaf tufts at base of stem, but lacking a stout caudex
6a Subshrub with leaf rosettes terminating the branches, flowering stems lateral to them

tenax M.D.Hend. var. **tenax**

Subshrub, up to ± 1.8 m high, viscid, aromatic, branches spreading, rough, glandular, traces of white wool, each ending in a large leaf rosette subtended by dry withered leaves; flowering stems 1–many from axils of these leaves, up to 450 mm long, appressed white-woolly, closely leafy. **Leaves**: rosette leaves up to 250 mm long, elliptic or obovate, base broad, clasping, margins of young leaves often undulate, both sides very glandular; cauline leaves erect, up to 80 mm long, smaller upwards, ± lanceolate, cordate-clasping, margins crisped-undulate in upper half, both surfaces glandular-pilose with white wool traces on margins and main veins. **Capitula** depressed-globose, ± 25–35 mm in diam., 1–12 clustered at peduncle tip, base loosely white-woolly; involucral bracts in 10 series, ± graded, glossy, bright or pale yellow. **Flowers** yellow. **Flowering time** Oct.–Dec. **Pappus** of many bristles, apex barbellate, bases ± cohering by patent cilia. **Cypselae** 0.75–1.00 mm long, barrel-shaped. Montane, grassy slopes, boulder beds of streams, weed in disturbed areas; Drakensberg Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (Mount Fletscher District, S from Andriesberg to Macubeni, from Katberg Pass to Stutterheim and Suurberg).

6b Biennial or perennial herbs; leaf rosettes, if present, radical
7a Leaf bases not decurrent in stem wings (not always visible in upper leaves); biennial

foetidum (L.) Moench (see 4b above)

7b Leaf bases decurrent on the stem in short or long wings (not always visible in upper leaves); biennials, producing a rosette of leaves in the first season, growing out into a flowering stem in the second season
8a All cauline leaves thinly cobwebby above, thinly greyish white-woolly below

decorum DC.

Biennial or short-lived, perennial herb, up to 1.3 m high, stem stout, usually simple, thinly greyish white-woolly, leafy. **Leaves**: radical leaves absent at flowering, up to 150 mm

long elliptic, clasping base broad, both sides thinly greyish white-woolly; cauline leaves up to 80 mm long, smaller upwards, oblong or elliptic-lanceolate, clasping. **Capitula** depressed-globose, ± 25–32 mm in diam., many in a large, corymbose panicle; involucral bracts in ± 9 series, graded, glossy, bright yellow. **Flowers** 900–1 260, yellow. **Flowering time** Nov.–Apr. **Pappus** of many bristles, apex barbellate. **Cypselae** 1 mm long, barrel-shaped, ± ribbed. Sandy grassland, open woodland; Indian Ocean Coastal Belt (Port St Johns S to Kentani).

8b Cauline leaves at most woolly on the margins and midline, only some of the old radical leaves sometimes woolly on one or both surfaces

cooperi Harv.

Geelsewejaartjie (A)

Herb, up to 1.5 m high, aromatic, stem stout, simple, glandular-setose, inflorescence branches sometimes thinly white-cobwebby, leafy. **Leaves**: radical leaves absent at flowering, up to ± 250 mm long, elliptic, base broad, clasping, glandular or very thinly woolly; cauline leaves up to 130 mm long, smaller upwards, lanceolate, base cordate-clasping, both sides glandular-setose. **Capitula** depressed-globose, 8–12 mm long, 15–25 mm in diam., many in a large leafy, spreading, corymbose panicle; involucral bracts in ± 9 series, glossy, bright yellow. **Flowers** 650–1 200. **Flowering time** Dec.–Apr. **Pappus** of many bristles, apex barbellate, bases with patent cilia. **Cypselae** 1 mm long, barrel-shaped. Among grass or scrub; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Maartenshoek E to Kokstad, S from Maclear to Port St Johns).

HERTIA Less.

(Senecioneae)

Species ± 10, Africa and Southwest Asia; 5 in sthn Afr., N, NW, FS, NC, WC, EC.

1a Capitula radiate

pallens (DC.) Kuntze

Springbokbush; *malkopharpuis*, *springbokbossie* (A)

Erect, succulent shrub, 0.3–1.0 m high, glabrous, twiggy, stems pale, rigid, bark papery. **Leaves** sessile, each with 2 decurrent lines on stems, ± linear, subobtuse, ± concave, 18–25 × 1.5–6.0 mm, coriaceous, glaucous, entire, pale green, axils woolly. **Capitula** terminal, solitary; pedicels 6–12 mm long; involucral bracts 5, oblong, acute, 8–10 mm long, edges membranous; ray florets 5, ± 10 mm long, inconspicuous, yellow. **Flowering time** mainly Aug. **Pappus** of many delicate bristles. **Cypselae** densely silky-villous. Grassland, scrub, also overgrazed areas; poisonous; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Drakensberg Grassland, Albany Thicket (Aliwal North S to Middelburg and Bolotwa, from Cradock to Victoria East and to Grahamstown).

1b Capitula discoid
2a Capitula 5–20 per corymb, corymbs many

alata (Thunb.) Kuntze

Erect or diffuse, succulent shrub or shrublet, 0.3–1.3 m high, glabrous, branches flexuous. **Leaves** 18 × 6–12 mm, obovate, obtuse, decurrent into stem wings, leathery, veins absent, entire, margins thickened. **Capitula** yellow, up to 10 mm in diam., few to 20 in a subsessile, branching corymb; pedicels swollen upwards; involucral bracts

± 5, oblong, subacute, 6 mm long, connate to middle. **Flowering time** Aug.–Nov. **Pappus** of many delicate bristles. **Cypselae** densely hairy. Mostly montane, stony, loamy, sandy soil or shale with fynbos or dry open scrub, also streambanks; Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore, Baviaanskloof, Kouga Mts).

2b Capitula solitary, terminal on branches or in leaf axils
3a Pedicels 2–8× longer than leaves

kraussii (Sch.Bip.) Fourc.

Erect or diffuse shrub or shrublet, 0.30–1.25 m high, glabrous, stems flexuous. **Leaves** obovate, obtuse, up to 20 × 5 mm, decurrent basally, leathery, entire or few-toothed, margins thickened. **Capitula** single, up to 10 mm in diam., yellow; pedicels subterminal, 1–3 together, up to 120 mm long; involucral bracts 6–8, 8 mm long, oblong, subacute, connate basally, edges membranous. **Flowering time** Mar.–Sept. **Pappus** of many delicate bristles. **Cypselae** silky-villous. Bush clumps, fynbos and grassland; Eastern Fynbos-Renosterveld, Albany Thicket (rare, Port Elizabeth, Alexandria, Victoria East).

3b Pedicels shorter, ± $^1/_2$–1$^1/_2$ × longer than leaves
4a Leaves obovate-elliptic, obtuse, entire, drying pale

cluytiifolia (DC.) Kuntze

Ertjiebos (A)

Erect, succulent shrub, 0.45–1.50 m high, pale, glabrous, stems flexuous. **Leaves** sessile, ± clasping, obovate to oblong, obtuse, up to 20 × 10 mm, entire, rigid, glaucous. **Capitula** single, yellow, up to 12 mm in diam.; pedicels terminal, up to 35 mm long; involucral bracts 5–7, broadly oblong or ovate, acute, basally connate. **Flowering time** Aug. **Pappus** of many delicate bristles. **Cypselae** very hairy. Rare, riverbanks, flats, among karoo bush on red soil; Upper Karoo, Albany Thicket, Lower Karoo (Middelburg, Graaff-Reinet).

4b Leaves cuneate-oblong, 3–5-toothed, drying dark

ciliata (Harv.) Kuntze

Skilpadbossie (A)

Succulent shrub, 0.15–0.60 m high, ± glabrous, spreading, stems ± angular. **Leaves** sessile, up to 30 × 10 mm, ± clasping, cuneate-oblong, apex deltoid, mostly 3–5-toothed, leathery, glaucous (often black when dry). **Capitula** single, up to 10 mm in diam.; pedicels short, terminal or opposite leaves; involucral bracts 4 or 5, up to 15 mm long, broadly oblong, acute, connate at base, edges membranous. **Flowering time** Aug., Sept. **Pappus** of many delicate bristles. **Cypselae** densely white-hairy. Stony False Karoo (Acocks); Upper Karoo (rare, Aliwal North to Middelburg).

HETEROLEPIS Cass.

(Arctotideae)

Rotsgousblom (A)

Species 3, endemic to sthn Afr., WC, EC.

E mitis (Burm.) DC.

Viscous, dwarf shrub, ± 0.5 m high. **Leaves** alternate, linear to very narrowly oblanceolate, entire, glandular, otherwise glabrous. **Capitula** radiate, solitary, subsessile or very shortly pedunculate; involucral bracts in 2 or 3 rows, inner ones without conspic-

uous membranous margins, acute. **Ray florets** yellow. **Disc florets** yellow. **Flowering time** Apr. **Pappus** of stout, subulate, bristle-like, marginally barbellate scales in 2 rows, outer row shorter than inner. **Cypselae** oblong-obovoid, densely sericeous. Rock crevices on mountain slopes; Albany Thicket (rare, confined to Winterhoek and Suurberg Mts).

HETEROMMA Benth.

(Astereae)

Species 3, endemic to sthn Afr., FS, KZN, L, EC.

decurrens (DC.) O.Hoffm.

Erect, sparingly branched, rough-hairy, perennial herb, 0.7–2.4 m high. **Leaves** alternate, lyrate-pinnatisect or pinnatisect, lobes oblong-lanceolate, coarsely and irregularly dentate, narrowed to a winged, petiole-like base, decurrent on stem in a broad wing, upper leaves undivided. **Capitula** discoid, broadly campanulate, many corymbosely arranged in large, terminal panicles; involucral bracts in 2 or 3 rows, imbricate, lanceolate to ovate-elliptic, acute, gland-dotted. **Florets** bright yellow. **Flowering time** Dec., Jan. **Pappus** of many scabrid bristles. **Cypselae** elliptic to obovate, slightly compressed, 3-ribbed, pubescent. Forest margins and along mountain streams, alt. up to 2 485 m; Mesic Highveld Grassland, Sub-Escarpment Grassland (Lady Grey and Mount Currie).

simplicifolium J.M.Wood & M.S.Evans

Rosulate, perennial herb, flowering stems 0.9–1.1 m high. **Leaves**: radical leaves oblong, base somewhat cordate or rounded, margins entire or irregularly crenulate-serrulate, long-petioled, base of petiole expanded, semi-amplexicaul; upper leaves smaller, getting sessile, shortly decurrent; all leaves with spreading, white hairs. **Capitula** discoid, broadly campanulate or subrotund, in open, compound inflorescence; involucral bracts in 2 or 3 rows, imbricate, lanceolate to elliptic-lanceolate, acute, gland-dotted. **Florets** bright yellow. **Flowering time** Feb. **Pappus** of many scabrid bristles. **Cypselae** elliptic to obovate, slightly compressed, 3-ribbed, pubescent. Damp grassy mountain slopes and grassy terraces along mountain streams, alt. 1 800–2 500 m; Drakensberg Grassland (Naude's Neck, Maclear).

HILLIARDIA B.Nord.

(Anthemideae)

Monotypic, endemic to sthn Afr., KZN, EC.

zuurbergensis (Oliv.) B.Nord.

Scrambling, much-branched, thinly to densely sericeous-pilose shrub, 0.5–2.0 m high. **Leaves** alternate, deeply pinnatilobate, hairy and glandular. **Capitula** radiate, pedunculate, solitary or laxly corymbose; involucral bracts 8–11, imbricate, rounded-oblong, with subscarious hyaline margins and obtuse-rounded hyaline tip. **Ray florets** white occasionally tinged pink. **Disc florets** 4-lobed, yellow. **Flowering time** Mar., June, Dec. **Pappus** absent. **Cypselae** elliptic-oblong, glabrous, adaxially slightly flattened and 3-ribbed, wall very thin, translucent and showing brownish black testa. Edges of forest, streambanks and sandy riverbeds, alt. 500–2 000 m; Indigenous Forests (Port Edward).

HILLIARDIELLA H.Rob.

(Vernonieae)

Species 8 or more, southern and eastern Afr.; 5 in sthn Afr., widespread.

aristata (DC.) H.Rob.

(= *Vernonia natalensis* Oliv. & Hiern)

Simple or rarely branched, perennial herb, up to 1.2 m high. **Leaves** alternate, linear-lanceolate to elliptic, apex acute or obtuse, mucronate, base cuneate, subsessile, margins entire, silky silvery on both surfaces, nervation prominent on lower surface. **Capitula** discoid, in corymbose panicles; involucral bracts generally lanceolate, attenuate to a long-acuminate bristle tip or acute and bristle-tipped, silky silvery. **Florets** violet. **Flowering time** Nov.–Jan. **Pappus** of inner barbellate bristles, outer of much shorter, linear, acuminate scales. **Cypselae** turbinate to subcylindric, densely hairy. Grassland, alt. 5–2 200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (Elliot, Queenstown, Stutterheim and Komga).

hirsuta (DC.) H.Rob.

[= *Vernonia hirsuta* (DC.) Sch.Bip. ex Walp.]

Erect, simple, perennial herb, up to 1.5 m high. **Leaves** alternate, sessile, broadly lanceolate, oblong or obovate, apex obtuse, acute or acuminate, base cordate to subcordate, margins entire, crenate or serrate, hairy, lower surface often with greyish white-woolly hairs and leaves therefore discolorous. **Capitula** discoid, in terminal, corymbose panicles; involucral bracts oblong-elliptic, mucronate. **Florets** violet, rarely pinkish or white. **Flowering time** Nov.–Jan., July. **Pappus** outer of very short, narrow scales, inner of barbellate setae. **Cypselae** terete, obscurely ± 4-ribbed, densely long-sericeous. On mountains, in grassland and in scrub on forest margins; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Drakensberg Grassland (Matatiele, Elliot, Port St Johns, Katberg and Kentani).

nudicaulis (DC.) H.Rob.

(= *Vernonia dregeana* Sch.Bip.)

Unbranched, perennial herb, up to 0.8 m high. **Leaves** mostly in a basal rosette, elliptic to obovate, tapering to a petiole-like base, margins often denticulate; cauline leaves distant, linear, margins entire, glabrous. **Capitula** discoid, in an open corymb; involucral bracts oblong-elliptic, mucronate, silky silvery. **Florets** violet. **Flowering time** Nov.–Mar. **Pappus** of scabrid bristles, outer ones shorter than inner. **Cypselae** subterete, pilose. Open grassland, particularly in damp places, alt. 0–1 920 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Drakensberg Grassland, Albany Thicket (from Fort Donald near Kokstad to Mthatha, Stutterheim, East London and Grahamstown).

oligocephala (DC.) H.Rob.

[= *Vernonia oligocephala* (DC.) Sch.Bip. ex Walp.]

Simple, rarely branched, erect, perennial herb, up to 1 m high. **Leaves** elliptic, ovate or subrotund, apex obtuse, acute or acuminate, mucronate, base rounded, subsessile, margins entire, thinly hairy to glabrous above, silky silvery below, markedly discolorous. **Capitula** discoid, in corymbose panicles; involucral bracts oblong to lanceolate, mucronate or gradually attenuate, silky silvery. **Florets** violet. **Flowering time**

Nov.–Feb., July. **Pappus** outer of short, linear-lanceolate scales, inner of barbellate bristles. **Cypselae** subcylindric, densely hairy. Grassland on mountainsides, rocky outcrops or on streambanks and in forest, alt. 15–2 338 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Clydesdale, Port St Johns, Cathcart and Kentani).

pinifolia (Lam.) H.Rob.

[= *Vernonia capensis* (Houtt.) Druce]

Blounaaldeteebossie (A); *umnqathe*, *igqubulenja* (X)

Unbranched or sparsely branched, perennial herb, up to 1 m high. **Leaves** alternate, linear, apex acute, mucronate, sessile or shortly petiolate, margins entire, revolute, upper surface glabrous or thinly hairy, lower surface silky silvery. **Capitula** discoid, many in corymbose panicles; involucral bracts in several rows, imbricate, oblong-elliptic, abruptly mucronate, silky silvery. **Florets** violet, rarely white. **Flowering time** Aug.–Feb. **Pappus** of scabrid bristles, outer ones shorter than inner. **Cypselae** subterete, hairy. Open grassland, alt. 15–2 100 m; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (from Aliwal North District, Fort Donald near Kokstad, Middelburg, Mthatha, Steytlerville, Grahamstown, East London, Humansdorp and Port Elizabeth).

HIPPIA L.

(Anthemideae)

Rankals (A)

Species 8+, endemic to sthn Afr., WC, EC.

frutescens (L.) L.

Rankals (A)

Aromatic, sprawling shrub or suffrutex, 0.15–1.50 m high. **Leaves** alternate, petiolate, deeply pinnately lobed, lobes oblanceolate to linear, up to 12 on each side, hairy. **Capitula** disciform, several in terminal corymb, pedunculate; involucral bracts imbricate, in 2 or 3 rows. **Ray florets** female, corolla tube short or conical, minutely 2–4-lobed, without lamina. **Disc florets** functionally male, corolla tube funnel-shaped, yellow. **Flowering time** July–Nov. **Pappus** absent. **Cypselae** dorsiventrally flattened, laterally winged, body glabrous outside, hairy inside. Edges of forest, open patches in forest, along streambanks, alt. 10–1 150 m; Eastern Fynbos-Renosterveld, Indigenous Forests (from WC to Humansdorp and Port Elizabeth).

sp. 2

Aromatic, delicate suffrutex, up to 1 m high. **Leaves** alternate, sessile, deeply pinnately lobed, lobes elliptic to linear, up to 4 on each side, hairy. **Capitula** disciform, several in terminal corymb, pedunculate; involucral bracts imbricate, in 2 or 3 rows. **Ray florets** female, corolla tube short or conical, minutely 2–4-lobed, without lamina. **Disc florets** functionally male, corolla tube funnel-shaped, yellow. **Flowering time** Sept., Oct. **Pappus** absent. **Cypselae** dorsiventrally flattened, laterally winged, body glabrous outside, hairy inside. Marshy places, along streambanks; Eastern Fynbos-Renosterveld (from WC to Humansdorp).

Similar to *H. frutescens* but smaller in stature. Called *sp. 2* as Goldblatt & Manning identified a *sp. 1* in Cape Plants, *Strelitzia* 9 (2000).

HIRPICIUM Cass.

(Arctotideae)

Species 12, sthn and tropical Africa; 8 in sthn Afr., M, FS, KZN, L, EC.

armerioides (DC.) Roessler

Skynloodkruin (A)

Annual or perennial herb, 0.04–0.30 m high; few–many rosettes from stout, woody crown. **Leaves** radical, linear, oblanceolate or pinnatifid, narrowed to petiole-like clasping base; lobes, when present, generally few, linear or lanceolate, apiculate, upper surface setose-hispid, lower surface white-felted, margins revolute. **Capitula** solitary, terminal; involucre with long white hairs; bracts acute to subulate. **Receptacle** conical, honeycombed. **Ray florets** neuter; corolla yellow, strap-shaped. **Disc florets** bisexual, fertile; corolla yellow, tubular, slightly widened above, with 5 linear lobes. **Anthers** minutely sagittate at base. **Style** terete, thickened above, with linear branches. **Flowering time** Jan.–Mar.? **Pappus** generally of 2 distinct rows of scales, inner reduced to small bristles. **Cypselae** obconical, villous with silky hairs. Poor stony soils, rock sheets, bare areas, alt. 245–3 475 m; Drakensberg Grassland (Maclear District).

HYMENOLEPIS Cass.

(Anthemideae)

Basterkaroo (A)

Species 7, endemic to sthn Afr., NC, WC, EC.

[E]indivisa (Harv.) Källersjö

Glabrous or pubescent shrub, up to 1.3 m high. **Leaves** alternate, entire, narrowly linear, glabrous. **Capitula** discoid, small, slender, many in much-branched corymbs; involucre narrowly ellipsoid; bracts glabrous. **Corolla** gradually expanded, funnel-shaped above, 5-lobed, glandular all over with short-stalked, biseriate glands. **Flowering time** Sept.–Nov. **Pappus** of basally united, fimbriate scales. **Cypselae** ellipsoid-obovoid to terete, glabrous, with 5–10 ribs. Grassland next to dams, mountain tops and slopes and disturbed areas, alt. 305–850 m; Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (restricted to Albany area).

*HYPOCHAERIS L.

(Cichorieae)

Species ± 50, Europe, Asia, North Africa, South America; 4 in sthn Afr., LIM, G, M, FS, KZN, L, WC, EC.

brasiliensis (Less.) Griseb.

Cat's ear

Perennial herb, up to 1 m high, with milky latex. **Leaves** mostly radical, subentire to sinuate to pinnatifid, base narrowed, broadly winged, petiole-like, hispid mainly on nerves and margins; cauline leaves similar but broad-based, half-clasping. **Capitula** ligulate, several in sparingly branched, corymbose panicle, long-pedunculate; involucre oblong-cylindrical or campanulate; bracts in several rows. **Receptacle** paleate; paleae linear, acuminate. **Florets** bisexual; corolla yellow, strap-shaped. **Flowering time**

Nov.–Jan. **Pappus** of long plumose bristles in 1 row. **Cypselae** narrowly cylindric with several ribs and transversely wrinkled, tapering into a long beak, reddish brown. Native to South America, weed in old fields and along roadsides, alt. 400–1 750 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Hogsback to Grahamstown).

glabra L.

Smooth cat's ear; *skaapslaai* (A)

Annual herb, 0.2–0.8 m high, with milky latex. **Leaves** in a basal rosette, oblanceolate, narrowed to clasping base, sinuate toothed to sinuate pinnatifid, glabrous, rarely somewhat hairy on midrib and margins. **Capitula** ligulate, solitary, or in lax cymes, long-pedunculate; involucre oblong-cylindrical or campanulate; bracts in several rows, glabrous or minutely ciliate. **Receptacle** paleate; paleae linear, acuminate. **Florets** bisexual; corolla yellow, strap-shaped, ± as long as involucre. **Flowering time** Aug.–Nov. **Pappus** in 2 rows, outer of short scabrid bristles, inner of long plumose bristles. **Cypselae** of 2 types, outer ones obconic, truncate, inner ones fusiform, beaked, both types with several ribs and transversely wrinkled. Cosmopolitan weed in gardens and other disturbed places, alt. 50–1 800 m; Albany Thicket, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Graaff-Reinet, Stutterheim, Grahamstown and East London areas).

microcephala (Sch.Bip.) Cabrera

Decumbent to erect, perennial herb, up to 300 mm high, with milky latex. **Leaves** in a rosette, oblong in outline, narrowed to broad, winged, petiole-like base, runcinate-pinnatifid; cauline leaves similar but sessile and coarsely dentate. **Capitula** ligulate, several in sparingly branched, corymbose panicle, long-pedunculate; involucre oblong-cylindrical or campanulate; bracts in several rows, thinly white-cottony on backs. **Receptacle** paleate; paleae linear, acuminate. **Florets** bisexual; corolla white, strap-shaped. **Flowering time** Dec. **Pappus** of long plumose bristles in 1 row. **Cypselae** reddish brown, cylindric with several ribs and transversely wrinkled, tapering into a long beak. Native to South America, weed in disturbed places, alt. 600–1 700 m; Albany Thicket (Grahamstown area).

radicata L.

Cat's ear, hairy wild lettuce, spotted cat's ear; *harige skaapslaai*, *katoor*, *skaapslaai* (A)

Acaulescent, perennial herb, with flowering shoots up to 0.6 m high, with milky latex. **Leaves** in a basal rosette, oblanceolate to narrowly elliptic, narrowed to clasping base, sinuate-toothed to sinuate-pinnatifid, hispid to glabrous. **Capitula** ligulate, solitary at tips of long peduncles; peduncles usually branched; involucral bracts ciliate above, setose-papillose along midrib, otherwise glabrous. **Receptacle** paleate; paleae linear, acuminate. **Florets** yellow, corollas longer than involucre. **Flowering time** Aug.–Apr. **Pappus** in 2 rows, inner setae long, plumose, outer much shorter, scabrid. **Cypselae** cylindric-fusiform, multiribbed, tapering into long beak, those of outer cypselae shorter than those of inner. Widespread weed, native to Europe and Asia, along roadsides and other disturbed areas, alt. 50–2 200 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Naude's Neck to Engcobo southwards, from Hogsback to Willowvale and Tsitsikamma to Bushmans River).

IFLOGA Cass.

(Gnaphalieae)

Naaldebos (A)

Species 6, mostly Africa, N to the Middle East, spreading to Canary Islands; 4 in sthn Afr., N, NW, FS, L, NC, WC, EC.

glomerata (Harv.) Schltr.

Bekvol (A)

Prostrate, decumbent or erect, annual herb, 30–200 mm long. **Leaves** alternate, linear-filiform or lanceolate, entire, often twisted, margins involute or flat, upper surface thinly white-tomentose, lower surface with thin, tissue paper-like indumentum. **Capitula** very small, disciform, many, crowded in leafy glomerules; involucral bracts golden-brown or straw-coloured, sometimes reddish, glabrous. **Outer female florets** filiform, many more than disc florets, purple. **Disc florets** cylindric, yellow. **Flowering time** July–Apr. **Pappus** absent in female (outer) florets, in disc florets of bristles, naked below, shortly plumose at top. **Cypselae** elliptic, minutely hairy. Disturbed sandy soil or gravelly places, sometimes on bare earth at roadsides and as a weed of cultivation, alt. 200–1 600 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Aliwal North, Middelburg, Dordrecht, Cradock).

INULANTHERA Källersjö

(Anthemideae)

Species 10, sthn Afr., Angola, Zimbabwe and Madagascar; 7 in sthn Afr., LIM, M, S, FS, KZN, WC, EC.

calva (Hutch.) Källersjö

Shrub, up to 1.5 m high. **Leaves** alternate, sessile, oblong or oblanceolate, with a pair of basal, linear, stipule-like lobes, margins entire to sharply serrate in upper half, glabrous, primary leaves with axillary leaf tufts or shoots. **Capitula** discoid, small, in dense, terminal corymbs. **Receptacle** paleate. **Florets** tubular below, dilated above, bright yellow. **Flowering time** Mar. **Pappus** of minute teeth—upward prolongations of ribs. **Cypselae** without superficial glands between ribs, ribs ± scabrid. Grassland on mountain slopes, alt. 600–2 000 m; Drakensberg Grassland (one record from Prentjiesberg near Maclear).

dregeana (DC.) Källersjö

Thinly white-tomentose shrub, 0.3–2.0 m high. **Leaves** alternate, sessile, oblong, margins entire or sharply serrate, always with a basal pair of linear, stipule-like lobes, glabrous or thinly to densely hairy, primary leaves with axillary leaf tufts or shoots. **Capitula** discoid, small, many in compact, terminal corymbs. **Receptacle** paleate. **Florets** tubular below, dilated above, bright yellow. **Flowering time** Mar.–July (Sept.). **Pappus** of small but relatively broad teeth, often fused at base. **Cypselae** narrowly obovate, with large superficial glands between ribs, ribs smooth. Grassland along streams, forest margins or mountain slopes, alt. 90–2 315 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Maclear SW to Humansdorp).

leucoclada (DC.) Källersjö

Sparingly branched, slender shrub, 0.6–1.2 m high, branches white-tomentose, sometimes glabrous. **Leaves** alternate, sessile, narrowly ovate or lower ones oblong, margins sharply serrate, the upper leaves sometimes entire, glabrous, without axillary leaf tufts or shoots. **Capitula** discoid, in simple or compound, terminal corymbs. **Receptacle** paleate. **Florets** tubular below, dilated above, yellow. **Flowering time** Feb.–July. **Pappus** of small scales. **Cypselae** narrowly obovate. Grassland, margin of coastal forest, riverbanks, mountain slopes, alt. 5–1 830 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (KZN south to Port Edward).

thodei (Bolus) Källersjö

Much-branched, aromatic shrub, 0.45–1.50 m high, young stems woolly. **Leaves** alternate, sessile, linear, entire or 2- or 3-lobed at apex, white-woolly below, loosely woolly above, glabrescent, without axillary leaf tufts or shoots. **Capitula** discoid, in dense, terminal corymbs. **Receptacle** paleate. **Florets** tubular below, dilated above, yellow. **Flowering time** Jan., Feb. **Pappus** of small teeth. **Cypselae** narrowly obovate. Grassland on mountain slopes and along streams, alt. 2 350–3 170 m; Drakensberg Grassland (Drakensberg Mts S to Maclear).

tridens (Oliv.) Källersjö

Tufted, perennial herb, flowering shoots up to 0.25 m high. **Leaves** alternate, crowded below, spread out upwards, sessile, narrowly oblong, 3-lobed at apex, decreasing in size upwards, upper leaves lanceolate, entire, both surfaces loosely grey-woolly, the upper surface sometimes glabrescent, without axillary leaf tufts or shoots. **Capitula** discoid, few together in dense, terminal corymb. **Receptacle** paleate. **Florets** tubular below, dilated above, bright yellow. **Flowering time** Feb. **Pappus** of small teeth. **Cypselae** narrowly obovate. Mountain grassland, alt. 1 525–2 435 m; Drakensberg Grassland (Drakensberg Mts S to Naude's Neck).

KLEINIA Mill.

(Senecioneae)

Species ± 40, mainly tropical Africa, also Middle East, India, Sri Lanka; 5 in sthn Afr., widespread, except L.

longiflora DC.

Sjambokbush; *sambokbos* (A)

Many-stemmed, succulent shrub, 0.2–2.0 m high, glabrous, stems multi-angular (furrowed when dry). **Leaves** distant, up to 10 mm long, linear-subulate, sessile, deciduous. **Peduncles** 1–8, lateral or terminal, branched or unbranched, 3–10 mm long, ± bracteate. **Capitula** 10 mm in diam.; involucre cylindrical; bracts ± 5, linear, acute, 15–20 mm long, edges membranous; calyculus bracts 2 or 3, minute; disc florets 5–12. **Flowering time** June–Nov., mostly Oct. **Pappus** of many fine, creamy, silky bristles, up to 30 mm long. **Cypselae** cylindrical, ± 8 mm long, papillose between ribs. Rocky slopes, among scrub and karoo bushes; Upper Karoo, Albany Thicket (Middelburg, Graaff-Reinet, Jansenville, Cradock).

*LACTUCA L.

(Cichorieae)

Species ± 100, cosmopolitan, especially in north temperate regions; 5 in sthn Afr., widespread.

inermis Forssk.

Kholobotia (SS)

Glabrous, perennial herb, up to 1 m high, with milky latex, flowering shoots much-branched upwards. **Leaves**: basal leaves rosulate, sessile, narrowly lanceolate, entire or remotely denticulate to runcinate, bases semi-amplexicaul; cauline leaves lanceolate-acuminate, entire, amplexicaul, auriculate, glabrous or lower surface sparsely hispid. **Capitula** ligulate, many in lax panicle; involucre ± 15 mm long. **Florets** strap-shaped, blue-purplish or white, rarely yellow. **Flowering time** Sept.–Jan. **Pappus** of many barbellate bristles. **Cypselae** dark brown to black, flattened ellipsoid, broadly margined, with median rib on each face and wrinkled, tapering to short beak. Widespread in Sub-Saharan Africa, Madagascar and Yemen, short grassland and as a pioneer in disturbed areas, alt. 100–2 200 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Upper Karoo, Dry Highveld Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Oviston to Clydesdale southwards, from Middelburg to Queenstown, Cradock to Komga and Joubertina to Port Elizabeth).

serriola L.

Compass plant, prickly lettuce, wild lettuce; *melkdissel*, *wildeslaai* (A)

Erect annual or biennial herb, up to 2 m high, with milky latex. **Leaves** alternate, sessile, runcinate-pinnatifid, decreasing in size upwards, upper leaves lanceolate and less deeply cut, base sagittate-amplexicaul, margins spinose-ciliate, prickly on main veins below, otherwise glabrous. **Capitula** ligulate, many in a large, loose, pyramidal panicle with stiff branches; involucre up to 12 mm long. **Florets** pale yellow. **Flowering time** Nov.–Mar. **Pappus** of many barbellate bristles. **Cypselae** greyish, narrowly obovate, strongly compressed, each face closely and equally ribbed, tapering into a beak longer than body of achene. Widespread weed, native to Europe and Asia, along roadsides and in waste places on outskirts of towns, alt. 15–1 800 m; Upper Karoo, Albany Thicket (Oviston S to Middelburg, S from Greater Addo Elephant National Park to Andries Vosloo Kudu Reserve).

tysonii (E.Phillips) C.Jeffrey

Perennial herb, up to 0.5 m high, with milky latex. **Leaves** alternate, sessile, mostly basal, oblong to elliptic, narrowed to base, amplexicaul, margins irregularly denticulate, coarsely toothed or subruncinate-pinnatifid, setose. **Capitula** ligulate, few, subcorymbose; involucre up to 20 mm long; bracts glandular-setose or glabrous. **Florets** pale yellow. **Flowering time** Oct.–Feb. **Pappus** of many barbellate bristles. **Cypselae** reddish brown, elliptic, tapering to both ends, strongly compressed, 3–5-ribbed on each face with broad, thickened margins, tapering into a very short beak. Grassland on mountain slopes, alt. 300–2 500 m; Drakensberg Grassland, Sub-Escarpment Grassland (Ramatseliso S to Elliot and Amatole Mts).

LAGGERA Benth

(Inuleae)

Species 17, tropical Africa, Arabian Peninsula, Asia; 2 in sthn Afr., N, B, LIM, NW, G, M, S, KZN, NC, EC.

crispata (Vahl) Hepper & J.R.I.Wood

Katpisbossie, *muishondbossie* (A)

Annual or perennial, glandular herb, up to 2 m high, stems winged. **Leaves** alternate, sessile, oblong, elliptic-oblong, narrowly obovate or obovate, margins coarsely serrate or serrulate, base decurrent on stem in narrow wings, glandular-puberulous. **Capitula** disciform, pedunculate, solitary or few, terminating, short, lateral shoots, the whole forming large, leafy, pyramidal panicle; involucral bracts in many rows, lanceolate to linear-lanceolate, acute to acuminate. **Outer female florets** filiform, many, pinkish purple. **Disc florets** tubular, widening upwards, pinkish purple. **Flowering time** not recorded for EC. **Pappus** of barbellate bristles. **Cypselae** cylindric, closely ribbed, hairy. Grassland, streamsides, forest margins, also a weed of cultivation, waste places or disturbed places, alt. 230–1 675 m; Sub-Escarpment Savanna (one record from King William's Town).

LASIOPOGON Cass.

(Gnaphalieae)

Species 8, mainly Africa, 1 also Spain to India; 8 in sthn Afr., N, NW, FS, NC, WC, EC.

glomerulatus (Harv.) Hilliard

Groenbossie (A)

Greyish white-woolly, prostrate, annual herb, 0.01–0.08 m long. **Leaves** alternate, small, oblanceolate to spathulate, entire, loosely greyish white-woolly. **Capitula** disciform, surrounded by leaves and webbed together with wool, few or many together in small, woolly glomerules terminating the branchlets; involucral bracts glabrous, in 2 rows, outer row short, ovate, acute, inner row lanceolate, exceeding the florets, obtuse, often minutely notched, straw-coloured, sometimes tinged purple. **Ray florets** female, narrowly tubular or filiform, more than disc florets, purple tipped. **Disc florets** bisexual, corolla tubular below, campanulate above, 5-lobed, all lobes glandular-hairy on backs, purple tipped. **Flowering time** June–Aug. (Nov.). **Pappus** of barbellate bristles with scabrid tip and bases cohering strongly by patent cilia. **Cypselae** oblong, usually minutely hairy. Stony and gravelly flats, hard-packed sand, alt. 60–1 000 m; Upper Karoo, Albany Thicket (Middelburg, Graaff-Reinet and Grahamstown areas).

muscoides (Desf.) DC.

Mat-forming, prostrate or decumbent, grey-woolly, annual herb, 0.01–0.15 m long. **Leaves** alternate, spathulate or oblong-spathulate, obtuse, thin, loosely woolly. **Capitula** disciform, small, closely surrounded by leaves, massed in dense, rounded, woolly clusters at ends of branchlets; involucral bracts in 2 rows, obtuse, pale straw-coloured. **Ray florets** female, much more than disc florets, whitish, apex sometimes reddish. **Disc florets** bisexual, corolla tubular below, campanulate above, 5-lobed, all lobes glandular-hairy on backs, whitish, apex sometimes reddish. **Flowering time** Sept.–Dec. **Pappus** of bristles, delicately plumose from base, tipped with a pair of pointed cells, cohering by a few patent cilia at base. **Cypselae** hairy. Bare sandy or gravelly places,

seasonally wet areas like watercourses, edges of pans, alt. 610–1 585 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket (Aliwal North to Port Elizabeth).

LASIOSPERMUM Lag.

(Anthemideae)

Gifknoppies (A)

Species 4, Egypt and sthn Afr.; 4 in sthn Afr., N, NW, G, FS, L, NC, WC, EC.

bipinnatum (Thunb.) Druce

Gansbossie, *gansieskweek*, *ganskweek* (A); *manku* (SS); *isifikane* (X)

Perennial, much-branched herb, up to 0.6 m high, erect but becoming decumbent with age. **Leaves** alternate, bipinnatisect, lobes linear, mucronate with hard white mucro, margins irregularly serrate, yellow-green, initially sparsely long-pilose, soon glabrous; petioles semi-amplexicaul, sheathing. **Capitula** radiate, terminal, solitary, long pedunculate; involucral bracts in 3 or 4 rows, imbricate, outer narrowly oblong to lanceolate, inner broadly lanceolate to ovate, with narrow membranous margins, glabrous. **Receptacle** flat or convex, paleate, paleae membranous. **Ray florets** female, corolla white or pale red-purple, sometimes absent. **Disc florets** many, corolla tube campanulate above, with 5 ovate lobes, pale yellow. **Flowering time** all year. **Pappus** absent. **Cypselae** dark yellow-brown, smooth, lanceolate, flattened triangular, densely white-woolly. Sandy soil or clay soil in moist conditions like vleis, marshes, riverbanks and roadsides where pools of water have formed, sometimes weedy, alt. 120–2 400 m; Drakensberg Grassland, Albany Thicket, Sub-Escarpment Grassland, Indigenous Forests (Aliwal North to Port Elizabeth). Poisonous to stock.

LAUNAEA Cass.

(Cichorieae)

Species ± 30, Canary Islands, Mediterranean region, East Asia, Africa and Madagascar; 4 in sthn Afr., N, B, LIM, NW, G, M, S, KZN, EC.

rarifolia (Oliv. & Hiern) Boulos

Acaulescent, cushion-like, perennial herb, with flowering stems up to 0.1–0.9 m high, with milky latex. **Leaves** in solitary rosettes, oblong to obovate, margins entire or aculeate-denticulate, glabrous, sometimes absent at flowering time. **Capitula** ligulate, solitary at tips of inflorescence branches, paniculate; involucral bracts imbricate, glabrous. **Florets** bisexual, corolla yellow. **Flowering time** Sept. **Pappus** of barbellate setae. **Cypselae** greyish green, narrowly subfusiform, somewhat compressed, finely ribbed. Open grassland, alt. 700–1 900 m; Sub-Escarpment Grassland (1 record from Maclear).

sarmentosa (Willd.) Sch.Bip. ex Kuntze

Perennial, prostrate herb, creeping stems up to 1 m long, with milky latex. **Leaves** in a rosette at crown, fascicled at nodes, spathulate or oblanceolate, long attenuate into a petiole-like base, margins entire or denticulate, glabrous, upper leaves smaller. **Capitula** ligulate, solitary or few together at tips of short peduncles; involucral bracts imbricate, glabrous. **Florets** bisexual, corolla yellow. **Flowering time** Jan.–Apr. (July).

Pappus of barbellate setae. **Cypselae** greyish brown, subfusiform-cylindric, 7-ribbed. Coastal dunes, alt. 0–10 m; Indian Ocean Coastal Belt, Albany Thicket (KZN Coast as far S as Port Elizabeth).

[E]**LEPIDOSTEPHIUM** Oliv.

(Gnaphalieae)

Species 2, endemic to sthn Afr., KZN, EC.

[E]**asteroides** (Bolus & Schltr.) Kroner

Single-stemmed, perennial herb, 0.45–0.60 m high. **Leaves** alternate, linear, sessile, base amplexicaul, entire, margins revolute, upper surface glandular, lower surface felty hairy, often with axillary leaf tufts and short-shoots. **Capitula** radiate, solitary or up to 6 terminally in a loose corymb on long peduncles; involucral bracts imbricate, glandular. **Ray florets** purplish or pink. **Disc florets** yellow. **Flowering time** Jan., Feb. **Pappus** of barbellate bristles in 2 rows, outer row shorter than inner. **Cypselae** cylindric, ribbed, glandular. Grassland in moist situations like riverbanks, alt. 1 100–1 950 m; Drakensberg Grassland (KZN south to Stutterheim area).

[E]**denticulatum** Oliv.

Single-stemmed, perennial herb, 0.40–0.55 m high. **Leaves** lower ones almost rosulate, alternate, sessile, lanceolate, margins dentate, not revolute, upper leaves narrower and shorter, narrowly lanceolate to filiform, sessile, bases running down stem in narrow wings, entire, margins revolute, all leaves glandular and sparsely hairy above, lower surface cobwebby-felty and sparsely glandular. **Capitula** radiate, pedunculate, many in loose corymbs; involucral bracts imbricate, glandular. **Ray florets** purplish. **Disc florets** yellow. **Flowering time** Nov.–Apr. **Pappus** of lacerated scales. **Cypselae** narrowly elliptic, angular, glandular. Grassland on mountain slopes, alt. 900–1 800 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Maclear to King William's Town).

*__LEUCANTHEMUM__ Mill.

(Anthemideae)

Species ± 33, throughout Europe, 1 in North Africa, Morocco, Algeria and Tunisia; 1 naturalised weed in sthn Afr., M, KZN, EC.

vulgare Lam.

Dog daisy, garden chrysanthemum, marguerite, white weed; *margriet* (A)

Perennial herb, 0.3–1.0 m high. **Leaves** with basal ones in a rosette, roundish to obovate-spathulate, margins crenate to dentate or more deeply lobed, sparsely or nearly glabrous, on long petioles, upper leaves sessile, oblong to narrowly spathulate, decreasing in size upwards, margins toothed to pinnatifid. **Capitula** radiate, solitary on long, nearly nude stalks. **Ray florets** female, fertile, white. **Disc florets** bisexual, fertile, corolla yellow, 5-lobed, tube basally swollen and spongy in fruit, especially abaxially. **Flowering time** Nov. **Pappus** of 2 minute scales in ray florets, absent in disc florets.

Cypselae narrowly obovate, compressed, ± 10-ribbed. Native to Europe, garden escape, naturalised in various parts of the world, open grassland and along grassy roadsides, alt. 1 050–2 500 m; Sub-Escarpment Savanna (KZN south to Stutterheim District).

LEYSERA L.

(Gnaphalieae)

Species 3, mainly in sthn Afr., 1 in North Africa, Arabian Peninsula and the Middle East; N, FS, NC, WC, EC.

gnaphalodes (L.) L.

Perennial shrublet, ± 0.2–0.5 m high. **Leaves** linear, glandular. **Peduncles** (5–) 15–70 mm long; involucre (4–)8–20 mm wide; involucral bracts 20–110, smooth or occasionally laxly tomentose dorsally, inner gradually oblong to somewhat spathulate with a scarious and often marginally brown apical limb, 6–11 × 0.8–2.4 mm. **Ray florets** 8–45, lamina elliptic-oblong, lamina 4–12 × 1–3 mm. **Disc florets** 35–450, perfect, corolla 3.8–6.5 mm long; tube hairy with a collar of hairs just below the limb. **Flowering time** Sept.–Nov. **Pappus** of short, flat scales and in disc florets (3–)5 outer bristles. **Cypselae** 2.8–5.0 mm long, with twin hairs. Common on flats and lower mountain slopes of WC, or EC grassland, alt. 30–1 900 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (widely distributed, extending through the Karoo to the Winterberg and Stormberg mts).

tenella DC.

Annual herb (occasionally perennial), 0.01–0.45 m high, mostly small and delicate. **Leaves** glandular. **Peduncles** 10–60 mm long; involucre 4–12 mm wide; involucral bracts 15–50, smooth, inner gradually longer and oblong with a scarious and often brown apical limb, 5–9 × 0.7–1.6 mm. **Ray florets** 8–35, lamina 2–9 × 0.7–3.0 mm. **Disc florets** 20–175, perfect, corolla 2.6–4.0 mm long; tube with scattered hairs and often with a collar of hairs just below limb. **Flowering time** predominantly Aug.–Oct. **Pappus** of short, flat scales and in disc florets 2–5 outer bristles. **Cypselae** 2.5–3.8 mm long, with twin hairs. Common karoo species, alt. 300–1 500 m; Upper Karoo, Lower Karoo (Middelburg District, Grootfontein, SW to Blouwater, Rietbron and Bosduiwerivier on WC Border).

LOPHOLAENA DC.

(Senecioneae)

Species ± 20, tropical and sthn Afr.; 8 in sthn Afr., widespread, except B, FS.

dregeana DC.

Bloubos (A)

Succulent, perennial herb, 0.4–1.0 m high, glabrous, 1–several, stout, simple stems from a woody stock, stems nude, rough with leaf scars basally, leafy above. **Leaves** up to 60 × 25 mm, oblong-elliptic, entire, narrowed basally, not decurrent, glaucous. **Capitula** 1–3 on short-shoots in upper leaf axils, forming a leafy panicle; involucre 15 × 5 mm, ± enlarged in fruit; bracts ± 5, each with a broad, median, longitudinal wing. **Flowering time** Mar.–July. **Pappus** of many white hairs. **Cypselae** ± 9 mm long, narrowly turbinate, often ± curved and 3-angled, closely ribbed, hirsute. Colonies in coastal grassland; Indian Ocean Coastal Belt (Bizana, Lusikisiki, Port St Johns).

MACLEDIUM Cass.

(Mutisieae)

Species 20, tropical and South Africa; 6 in sthn Afr., LIM, NW, G, M, KZN, WC, EC.

Studies of genus *Dicoma* Cass. (Ortíz 2001) indicated that this taxon was paraphyletic comprising 3 groups, of which one was differentiated as the genus *Macledium* Cass.

spinosum (L.) S.Ortíz

Steekblom (A)

Cushion-forming, usually grey-felted shrublet, up to 0.2 m high. **Leaves** obovate, slightly toothed and pungent, glabrescent above. **Capitula** obscurely radiate, solitary at branch tips, pink or white; bracts broad below, narrow and spiny above. **Flowering time** Sept.–June. Dry rocky shale slopes; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Du Toitskloof to Graaff-Reinet S, from Willowmore E to Grahamstown).

zeyheri (Sond.) S.Ortíz subsp. **argyrophyllum** (Oliv.) S.Ortíz

Erect, robust, perennial herb, up to 0.4 m high; rootstock woody. **Leaves** discolorous, mostly up to 130 × 47 mm, narrowly obovate to oblanceolate, apex subacute, midrib winged, ± stem-clasping at base, sparsely denticulate, upper surface green, glabrous, white araneose-sericeous below. **Capitula** solitary and terminal; involucre up to 40 × 50 mm, broadly campanulate; involucral bracts many, silvery-green, sometimes reddish-tinged, coriaceous, apices acuminate-pungent. **Corollas** creamy to brownish with purplish lobes, up to 11 mm long, infundibuliform. **Flowering time** Feb., Mar.? **Pappus** copious, several seriate, of plumose, white setae up to 10 mm long, seta bristles ± 1 mm long. **Cypselae** ± 2 mm long, narrowly turbinate, densely long-ascending hispid; Grassland or open bush-grassland on stony soil usually on hillsides; Sub-Escarpment Grassland, Sub-Escarpment Savanna (East Griqualand, Clydesdale).

MACOWANIA Oliv.

(Gnaphalieae)

Species 12, 2 in Arabian Peninsula and Ethiopia; 10 in sthn Afr., G, M, KZN, L, EC.

conferta (Benth.) E.Phillips

Dwarf, much-branched shrub, up to 0.5 m high, forming low, compact cushions, young stems densely leafy. **Leaves** closely imbricated, linear, abruptly acute, up to 15 × 2 mm, margins strongly revolute, both surfaces glandular-pilose, midrib strongly raised below. **Capitula** sessile, solitary at branch tips; involucre turbinate, 12 × 10–12 mm; bracts pale brown or straw-coloured, lightly woolly, minutely glandular. **Flowers** yellow, rays female, discs hermaphrodite. **Flowering time** Jan. **Pappus** of ± 17 bristles, subequal, the longest equalling the corolla of disc flowers, persistent. **Achene** 10-ribbed, ± 3–5 mm long, pilose. Rock outcrops on steep grassy mountain slopes, alt. 1 500–1 830 m; Drakensberg Grassland (known only from Ngeli Mtn and an area to the W in Pondoland).

pulvinaris N.E.Br.

Dwarf, much-branched shrub, 0.45–0.90 m high, forming low, compact cushions, young stems densely leafy. **Leaves** linear, acute, up to 20 × 1.25 mm, margins strongly revolute, lower surface white-woolly, glabrescent, upper surface glandular-hispid. **Capitula** solitary at branch tips; involucre turbinate, ± 8–10 × 10 mm; bracts straw-coloured. **Flowers** yellow, rays female, discs hermaphrodite. **Flowering time** Dec. **Pappus**

of ± 17 bristles, subequal, the longest equalling disc corolla, persistent. Mountainous fynbos communities, alt. 2 000–2 950 m, but as low as 1 220 m in western limit of distribution; Drakensberg Grassland, Sub-Escarpment Grassland (Drakensberg and Witteberg Mts S to Queenstown, Maraisburg between Hofmeyr and Tarkastad).

[E]revoluta Oliv.

Erect shrub, 1.2–1.5 m high, young stems densely leafy. **Leaves** linear, soon reflexed, up to 30 × 3 mm, margins revolute, thinly woolly below, glandular-hispid above, very acute. **Capitula** few in terminal corymbs; involucre campanulate, 12–14 mm long; bracts margined dark brown, glandular-hispid. **Flowers** yellow, rays female and fertile, 8–10, discs functionally male. **Flowering time** Sept.–Nov., Jan., May. **Pappus** of setae, half as long as tube of disc, soon caducous. **Achene** narrowly barrel-shaped, closely ribbed, glabrous or nearly so, almost always derived from ray florets. Mountainous areas and forest margins, alt. 650–1 200 m; Drakensberg Grassland, Indian Ocean Coastal Belt (known from few localities: Pirie Mount, mountains around sources of Buffalo River, Hogsback and Wolf Ridge in Amatole Mts).

*MANTISALCA Cass.

(Cardueae)

Species 4, Mediterranean region, North Africa; 1 introduced weed in sthn Afr., NC, WC, EC.

salmantica (L.) Briq. & Cavill.

Perennial herb, 0.4–1.0 m high; with slender branches, leafless above. **Leaves** oblong, pinnately lobed; cauline leaves linear-lanceolate to narrowly oblong, remotely dentate to pinnatisect, decreasing in size upwards. **Capitula** discoid or disciform, pedunculate, solitary; involucre urceolate; bracts ovate, acute. **Ray florets** neuter; with staminodes; corolla purple, rarely white. **Disc florets** bisexual, fertile; corolla purple, rarely white. **Anthers** caudate at base. **Pappus** double, outer of linear-subulate, persistent scales; inner generally a single, abaxial scale. **Cypselae** obovoid, many-ribbed and transversely rugulose between ribs, glabrous with apical rim, lateral detachment area large and surrounded by whitish, swollen margins, with elaiosome. Closed woodland, gravel, alt. 5–1 000 m; Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Port Elizabeth, Grahamstown).

*MELANTHERA Rohr

(Heliantheae)

Species 20, SE United States, Mexico, Central America, West Indies, tropical Africa; 4 naturalised in sthn Afr., N, B, LIM, M, S, KZN, EC.

scandens (Schumach. & Thonn.) Roberty

Annual herb, up to 1 m high; scandent or erect. **Leaves** opposite, petiolate, scabrid-pubescent, deltoid to ovate, base truncate to cuneate, apex acuminate, margins subentire to serrate. **Capitula** terminal and solitary in upper leaf axils on peduncles; involucral bracts elliptic-lanceolate, scabrid-pubescent. **Receptacle** paleate; paleae oblong to obovate, boat-shaped. **Ray florets** female; corolla yellow, strap-shaped. **Disc florets** bisexual, fertile; corolla yellow; tube slightly widened upwards and abruptly contracted at base, 5-toothed. **Anthers** with ovate, apical appendage. **Style** swollen at base, with linear, apiculate, glandular-pilose branches. **Pappus** of several, short, stout, scabrid bris-

tles, soon caducous. **Cypselae** turbinate, 4-angled, laterally compressed. Streambanks, around swamps and pans, alt. 5–915 m; Indigenous Forests, Indian Ocean Coastal Belt (Pondoland, Port St Johns, Kentani District).

METALASIA R.Br.

(Gnaphalieae)

Species 53, sthn Afr., 48 endemic to WC; LIM, G, M, FS, KZN, L, WC, EC.

aurea D.Don

Erect shrub, up to 1.5(–2.0) m high. **Leaves** declinate to spreading, straight, 3.7–18.0 mm long, mostly about half-twisted, with axillary brachyblasts less than half as long as subtending leaves, pungent. **Synflorescenses** 15–50 mm wide, with capitula arranged in dense clusters. **Capitula** 3–5-flowered; involucre cyathiform, apically (1.0–)1.5–2.0 mm wide; involucral bracts in 6–9(–11) series, most bracts not petaloid, outermost acute, those inwards usually rounded to truncate, all mostly apically erect, outermost yellowish brown, those inwards dull yellow. **Flowering time** Apr.–July. **Pappus** of apically ± flat and entire bristles, acute or rarely obtuse. **Cypselae** narrowly oblong or sometimes oblong-ovoid, 1.5–1.9 mm long, with short, acute papillae. Along roadsides, on mountain slopes, in coastal scrub and on seashore, alt. 0–1 000 m; Eastern Fynbos-Renosterveld (collections at Wittebergen, mainly from Kouga Mts to Port Elizabeth).

densa (Lam.) P.O.Karis

Shrub, up to 2.5(–4.0) m high. **Leaves** straight, with brachyblasts less than half the length of subtending leaves, (0.9–)2.0–16.0 mm long, acute or acuminate, usually about half-twisted. **Synflorescenses** 10–90 mm wide, dense, usually distinctly branched, with capitula arranged in clusters. **Capitula** 3(4)- or 5-flowered, free from one another; involucre 1.5–3.0 mm wide; involucral bracts in 6–8(9) series, most bracts not petaloid, obtuse and slightly apiculate, apically erect, outermost brownish, rarely reddish or light pink, those inwards white. **Flowering time** Mar.–Sept. **Pappus** of apically flat and slightly serrate bristles, acute to obtuse. **Cypselae** narrowly oblong, 1.5–2.1 mm long, with short acute papillae. Variety of habitats, often abundant, forming large dense stands in Thicket, weed-like along roadsides or on disturbed ground; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (scattered distributions in EC: Zastron E to Mount Currie, S to Queenstown, Kentani, Tsitsikamma, Port Elizabeth, Grahamstown and East London).

muricata (L.) D.Don

Blombos (A)

Erect shrub, 0.5–3.0 m high. **Leaves** spreading, apically curved to hooked, with axillary brachyblasts less than half as long as subtending leaf, 2.6–9.0 mm long, obtuse at the very apex, with a half or full twist. **Synflorescenses** (5–)10–50 mm wide, dense, with capitula arranged in branched clusters. **Capitula** 4- or 5(6)-flowered, sessile or with pedicels up to 5 mm long, free from one another; involucre narrowly cyathiform; involucral bracts in (6)7–9(–10) series, most bracts not petaloid, all except innermost thick and faintly carinate, outermost with interlocking hairs reaching above middle of bract, light to dark brown, those inwards yellowish brown to creamy white to white. **Flowering time** mainly May–Sept. **Pappus** subterete or thickened towards the very apex, usually obtuse. **Cypselae** narrowly oblong, 1.5–1.9 mm long, with short acute papillae. On sand or dunes close to sea, alt. 0–300 m; Sub-Escarpment Grassland, Lower Karoo,

Drakensberg Grassland, Albany Thicket, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld (from WC mainly along coast to Port Edward).

pungens D.Don

Erect shrub, 0.5–2.5 m high. **Leaves** usually erect-spreading to erect, straight to ± strongly incurvate, or rarely curved inwards with reflexive apex, with or without axillary brachyblasts, 1.8–18 mm long, usually acuminate, mostly non-twisted, with a distinct midvein. **Synflorescenses** 5–15 mm wide, dense to very dense. **Capitula** 3(4)-flowered, free from one another; involucre narrowly cyathiform; involucral bracts in 5–7 series, most bracts not petaloid, outermost to inner very acute to acuminate, innermost often rounded and slightly apiculate, outermost with comparatively few interlocking hairs not reaching above middle of bract, light to dark brown, those inwards reddish brown to white or sometimes pink. **Flowering time** May–Oct. **Pappus** apically subterete to ± flat and slightly serrate to slightly dentate. **Cypselae** oblong-elliptic, 1.3–2.0 mm long, with obtuse papillae. In mountainous areas on limestone, sand or rocky soils, alt. 0–1 800 m; Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore E to Witteberg, Kouga and Suurberg Mts, from Joubertina to Humansdorp, Uitenhage, Port Elizabeth and Grahamstown).

trivialis P.O.Karis

Erect shrub, sometimes rigid, much-branched, 0.6–3.0 m high. **Leaves** spreading to erect-spreading, straight, with conspicuous, axillary brachyblasts usually at least half as long as subtending leaf, 3.4–16.0 mm long, acute, sometimes sharply pungent, carinate, mostly about half-twisted, with a distinct midvein. **Synflorescenses** 10–50 (–85) mm wide, dense. **Capitula** 3- or 4-flowered, sessile or with pedicels up to 4 mm long, free from one another; involucre narrowly cyathiform; involucral bracts in 5 or 6(7) series, most bracts not petaloid, outermost acute to acuminate, with interlocking hairs to middle of bract, light brown to brown or reddish, those inwards white. **Flowering time** Jan.–Apr. **Pappus** of bristles, usually obtuse. **Cypselae** narrowly oblong-ovoid, 1.5–1.8 mm long, mostly with short, acute papillae. On slopes and flats in rocky, sandy or clayey places, alt. 5–1 500 m; Sub-Escarpment Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Cathcart and Stutterheim southwards, from Storms River to Steytlerville, Humansdorp, Uitenhage and Port Elizabeth to Grahamstown).

MICROGLOSSA DC.

(Astereae)

Species ± 10, tropical and sthn Afr., Madagascar and Asia; 2 in sthn Afr., KZN, EC.

[E]**caffrorum** (Less.) Grau

Much-branched shrub, up to 1.5 m high. **Leaves** alternate, lanceolate, entire, margins revolute, ciliate, subsessile, midvein glandular, otherwise glabrous. **Capitula** radiate, many, corymbose, pedunculate; involucral bracts in 3 or 4 rows, imbricate. **Ray florets** blue. **Disc florets** yellow. **Flowering time** Sept., Oct. **Pappus** of barbellate bristles. **Cypselae** yellowish brown, obovate, compressed, ribbed, glabrous. Rocky slopes or forest margins, alt. 300–700 m; Eastern Fynbos-Renosterveld (Kouga Mts and around Grahamstown).

mespilifolia (Less.) B.L.Rob.

Scandent shrub, 0.3–4.6 m high. **Leaves** alternate, petiolate, deltoid, base cuneate, apex acute, margins with a few broad teeth, thinly hairy. **Capitula** radiate, many in dense,

terminal corymbs, pedunculate; involucral bracts in 4 rows, imbricate. **Ray florets** short, white. **Disc florets** yellow. **Flowering time** Jan., Dec. **Pappus** of barbellate bristles. **Cypselae** elliptic, compressed, ribbed, thinly appressed-hairy. Forest and forest margins, open woodland, grassland, hill slopes, alt. 15–915 m; Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (from KZN S to Keiskammahoek, East London and to Humansdorp).
According to Hilliard (1977) also in the WC as far as Stellenbosch.

MIKANIA Willd.

(Eupatorieae)

Species ± 430, pantropical; 3 in sthn Afr., N, B, LIM, M, S, KZN, EC.

capensis DC.

Perennial herb, twining, wide-climbing. **Leaves** opposite, petiolate, ovate, base cordate to hastate, apex acuminate, margins subentire, sinuate-dentate; glabrous to thinly hairy above; glabrous to velvety below. **Capitula** cylindric, 4-flowered, shortly pedicelled to almost sessile, many in rounded, congested trichotomous corymbs; involucral bracts 4, with smaller fifth outer bract, lanceolate, acute to acuminate. **Receptacle** small, naked. **Florets** white or whitish. **Anthers** linear, obtuse at base, with ovate, membranous, apical appendage. **Style** with branches elongate. **Pappus** of many scabrid bristles. **Cypselae** subcylindric, 5-angled. Along streams, forest, alt. 5–1 500 m; Indigenous Forests, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Port St. Johns, Stutterheim, Joubertina).

MIKANIOPSIS Milne-Redh.

(Senecioneae)

Species ± 15, tropical Africa; 1 in sthn Afr., LIM, M, KZN, EC.

cissampelina (DC.) C.Jeffrey

Branching, herbaceous twiner, stems up to 5 m long, ± cobwebby, ± glabrescent, becoming woody. **Leaves** up to 70 × 70 mm, outline rhomboid or deltoid-ovate, bluntly 3–5-angled or shallowly lobed, base broadly cuneate to subtruncate, lower surface ± cobwebby, glabrescent, thick, digitately 3-nerved; petioles up to 50 mm long, prehensile, becoming woody in lower part, forming a persistent hook after leaf has fallen. **Capitula** discoid, in small, axillary, corymbose panicles; involucre narrowly campanulate; bracts 5–7, 5 mm long, swollen at base, nerves resinous, calyculus bracts few, small; flowers creamy white or pale yellow. **Flowering time** July, Aug. **Pappus** of many fine bristles. **Cypselae** 2.5 mm long, oblong, ribbed, glabrous. Climber in montane forests; Indigenous Forests (Tabankulu S to Hogsback, Kentani and Stutterheim).

*__MONTANOA__ La Llave & Lex.

(Heliantheae)

Species 25, in Mexico, Central America, northern part of South America; 2 naturalised in sthn Afr., KZN, WC, EC.

hibiscifolia Benth.

Perennial subshrub up to 6 m high; scarcely branched. **Leaves** opposite, broadly ovate in outline, palmately lobed, softly pubescent, base deeply cordate with pair of auricles

at apex of petiole, apex acuminate. **Capitula** radiate, many in terminal, corymbose panicles; involucral bracts lanceolate-acuminate, pubescent. **Ray florets** neuter; corolla strap-shaped, white. **Disc florets** bisexual, fertile; corolla yellow, tubular below, campanulate above, 5-lobed. **Anthers** obtuse at base, apical appendage narrowly deltoid. **Style** branches oblong, apices deltoid, papillae present on outside. **Pappus** absent. **Cypselae** narrowly obovate, 4-angled, apically with ring-shaped collar. Roadsides, forest, alt. up to 155 m; Indigenous Forests (Port St Johns).

NIDORELLA Cass.

(Astereae)

Vleikruid (A)

Species ± 13, mainly Africa, 1 in Madagascar; 11 in sthn Afr., widespread.

agria Hilliard

Harshly pubescent, unbranched, perennial herb, up to 0.6 m high. **Leaves** basal ones in a rosette, elliptic, apex obtuse, base tapering to petiole-like region, margins entire or callose-denticulate to crenate, long-hairy on both surfaces or hairs only along margins and veins, glandular; cauline leaves alternate, similar but decreasing in size upwards; upper leaves oblong to lanceolate, acute to acuminate, all cordate clasping. **Capitula** inconspicuously radiate, many in compact, corymbose clusters; involucral bracts in 2 rows, glandular. **Ray florets** very small, in 2–many rows, pale yellow. **Disc florets** yellow. **Flowering time** Feb., Mar. **Pappus** of barbellate bristles. **Cypselae** turbinate, slightly compressed, thinly hairy. Dry grassland or grassy mountain slopes, alt 1 525–2 350 m; Drakensberg Grassland, Sub-Escarpment Grassland (Drakenberg Mts S to Matatiele as far as Andriesberg).

anomala Steetz

Mokoteli (SS)

Stiffly erect, viscid, annual, occasionally perennial herb, up to 0.6 m high. **Leaves** alternate, entire, linear, linear-lanceolate or ovate-lanceolate, often folded lengthwise, apex acute, scabrid hairy and viscid. **Capitula** disciform, crowded in corymbose clusters; involucral bracts in 2 rows, minutely glandular. **Outer florets** 3- or 4-toothed, in 2–many rows. **Disc florets** bright yellow. **Flowering time** Jan.–Mar. **Pappus** of few barbellate bristles. **Cypselae** elliptic, slightly compressed, faintly ribbed, thinly hairy. In grassland and on edge of marshes; also invading overgrazed grassland and roadsides, alt. 975–2 250 m; Drakensberg Grassland, Sub-Escarpment Grassland (widespread to Queenstown).

auriculata DC.

Perennial herb, up to 1.5 m high. **Leaves** alternate, variable in shape, from linear-lanceolate, tapering to base and apex to oblong-elliptic or obovate, narrowing gradually or abruptly to a petiole-like, clasping base; upper leaves narrower, tapering to base or not, most distinctly eared at base, main and side veins strongly raised below, margins entire or coarsely toothed, pubescent. **Capitula** minutely radiate, small, in compact, corymbose clusters. **Outer florets** with a short ray, yellow. **Disc florets** deep yellow. **Flowering time** all year. **Pappus** of barbellate bristles. **Cypselae** elliptic, slightly compressed, ribbed, appressed-pubescent. On grassy slopes, in marshy places or forest margins; sometimes invading disturbed areas, alt. 1–2 500 m; Drakensberg Grassland,

Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (widespread, from the north to Tsitsikamma Mts).

resedifolia DC.

Stinkkruid, *wurmbossie* (A); *kgôtôdúa* (T)

Roughly pubescent, annual herb, up to 1 m high. **Leaves** alternate, variable, often pinnatipartite with 1 or 2 pairs of lateral lobes, sometimes simple, the simple ones oblong or oblong-obovate, apex obtuse, base narrowed, half-clasping, not auriculate at base, margins entire, pubescent or nearly glabrous. **Capitula** minutely radiate, small, in compact corymbose clusters. **Outer florets** with a short ray, bright yellow. **Disc florets** bright yellow. **Flowering time** Dec.–June. **Pappus** of barbellate bristles. **Cypselae** elliptic, slightly compressed, appressed-pubescent. A weed of roadsides, cultivated land and overgrazed grassland, alt. 10–2 135 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (widely distributed in FSA to Komga).

undulata (Thunb.) Sond. ex Harv.

Unbranched, perennial herb, up to 1 m high. **Leaves**: basal leaves in a rosette, linear-oblong or lingulate, attenuate to broadly winged petiole-like base, apex obtuse, margins entire, repand-dentate or serrate; cauline leaves alternate, decreasing in size upwards, subcordate-clasping, passing into elliptic-oblong to lanceolate, obtuse or acute to acuminate upper leaves, glabrous. **Capitula** minutely radiate, many in compact, corymbose clusters, on glandular peduncles. **Outer florets** with a short ray, yellow. **Disc florets** yellow. **Flowering time** Nov.–May. **Pappus** of barbellate bristles. **Cypselae** turbinate, slightly compressed, thinly hairy. Marshy places or damp hollows in grassland, alt. 335–2 525 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (from the north S to Joubertina area).

NOLLETIA Cass.

(Astereae)

Species ± 10, Africa; 8 in sthn Afr., widespread, but absent in WC.

ciliaris (DC.) Steetz

Kaalriekte (A)

Suffrutex, up to 0.5 m high, with erect, almost unbranched stems. **Leaves** alternate, entire, close-set, imbricate, linear or lanceolate, strongly ciliate. **Capitula** disciform, solitary, terminal, shortly pedunculate. **Ray florets** female, in 1 row, filiform, yellow. **Disc florets** bisexual, tubular below, somewhat campanulate above, 5-lobed, yellow. **Flowering time** Jan.–Apr. **Pappus** of barbellate bristles. **Cypselae** obovate, compressed, thinly ciliate. Grassland in sandy soil, hill slopes or dry plains, alt. 1 030–1 900 m; Mesic Highveld Grassland, Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland (widespread to Lady Grey, Middelburg, Queenstown areas).

rarifolia (Turcz.) Steetz

Simple or sparingly branched, erect suffrutex, up to 0.45 m high. **Leaves** alternate, entire, distant, filiform, < 1 mm wide, glabrous. **Capitula** disciform, solitary, terminal; involucral bracts with large, embedded, orange oil sacs. **Ray florets** female, in 1 row, filiform, yellow. **Disc florets** bisexual, tubular below, somewhat campanulate

above, 5-lobed, yellow. **Flowering time** Sept. **Pappus** of barbellate bristles. **Cypselae** obovate, compressed, thinly appressed-pubescent. Open grassland, alt. 945–2 000 m; Sub-Escarpment Grassland (1 record from Matatiele area).

OEDERA L.

(Gnaphalieae)

Species 18, sthn Afr., endemic to WC, EC.

capensis (L.) Druce

Densely leafy, sprawling shrublet, 0.1–0.3 m high. **Branches** rigid, often dichotomous. **Leaves** leathery, lanceolate, sessile, spreading or recurved, glandular-scabrid on margins, sometimes silky. **Capitula** radiate, several in terminal, sessile clusters within a common involucre. **Receptacle** paleate. **Ray florets** female, marginal, orange or yellow. **Disc florets** bisexual, fertile or some sterile; corolla tube campanulate or abruptly widening above. **Flowering time** June–Sept. **Pappus** a crown of short paleae. Dry stony flats and mountain slopes, alt. 50–600 m; Eastern Fynbos-Renosterveld (Albertinia, Humansdorp and Baviaanskloof).

genistifolia (L.) Anderb. & K.Bremer

G(h)ombossie, *peperbos(sie)* (A)

Erect, moderately branched shrub, 0.2–0.6 m high. **Leaves** alternate, erect-spreading-squarrose, flat and straight, 2–14 × 1–3 mm, glabrous or sparsely pilose, glandular-punctate, apically hooked. **Capitula** 3–15 together. **Peduncles** 2–10 mm long; involucre urceolate-cyathiform, 2–4 mm wide; involucral bracts 15–40, up to 6 × 2 mm, obtuse-rounded. **Receptacle** paleate. **Ray florets** 7–15, tube glandular, lamina elliptic, 1.5–3.5 × 0.8–1.5 mm; cypselae triquetrous, oblong, 1.4–2.3 mm long, densely pilose. **Disc florets** 16–35, perfect, tube glandular; cypselae almost terete, glabrous. **Flowering time** mainly Aug.–Dec. **Pappus** crown-like, connate scales up to 1 mm long. Stony, sandy or clayey soil on flats and lower slopes of mountains, alt. 500–2 000 m; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore, Uitenhage and Grahamstown).

imbricata Lam.

Densely leafy, rigid shrublet, 0.2–0.4 m high. **Leaves** leathery, broadly lanceolate to ovate, spreading or recurved, glandular-scabrid on margins, sometimes silky. **Capitula** radiate, several crowded in a large, false head, orange or yellow. **Flowering time** Aug.–Nov. Mountain slopes, alt. 70–1 500 m; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp to Grahamstown).

laevis DC.

Densely leafy shrublet, 0.2–0.6 m high. **Leaves** lanceolate, striate, pungent, minutely toothed. **Capitula** shortly radiate, small, subsessile, crowded in terminal umbels, with 1 female ray floret and 8 or 9 sterile disc florets per head, yellow. **Flowering time** Oct. **Pappus** sheath-like, up to $^{3}/_{4}$ length of the tube. Rocky sandstone slopes, alt. 250–700 m; Eastern Fynbos-Renosterveld (Langeberg Mts, Humansdorp).

squarrosa (L.) Anderb. & K.Bremer

Erect shrub, 0.2–1.6 m high. **Leaves** alternate or decussate and in 4 distinct rows, squarrose-recurved, elliptic, 2–15 × 1.5–7.0 mm, glabrous, indistinctly glandular-punctate, with hooked apex. **Capitula** 3–12 in terminal cymes; peduncles 2–10 mm long; involucre campanulate, 2–6 mm wide; involucral bracts 25–60, up to 8 mm long, obtuse-rounded.

Receptacle flat-conical, paleate, paleae 5–8 mm long. **Ray florets** 7–20, tube 2–3 mm long, glandular, lamina elliptic, 2.0–3.5 mm long. **Disc florets** 20–60, perfect. **Flowering time** mainly Aug.–Dec. **Pappus** of crown-like scales, up to 0.6 mm long. **Cypselae** almost terete, linear, 1.8–4.5 × 0.3–0.6 mm, glabrous. On stony, sandy or clayey soil on flats and lower slopes of mountains, alt. 500–1 600 m; Eastern Fynbos-Renosterveld (widespread along mountains from NC to Baviaanskloof).

OLDENBURGIA Less.

(Mutisieae)

Species 4, endemic to sthn Afr., WC, EC.

[E]**grandis** (Thunb.) Baill.

Rabbits' ears; *bastersuikerbos*, *kreupelboom*, *wagenboom*, *donkie-ore* (A)

Small tree, 1–5 m high with gnarled stems and branches. **Leaves** obovate or oblanceolate, up to 200 mm long, dark green and shiny above, densely tomentose below. **Capitula** large, homogamous, radiate, up to 80 mm wide, 3–5 on terminal peduncles; peduncles up to 500 mm long. **Ray florets** ± 60, white; outer lip 3-toothed, 16–22 mm long; inner lobes 11–15 mm long; **Disc florets** ± 800, white, tube 14–16 mm long, lobes 14–16 mm long. **Flowering time** Oct.–Jan. **Pappus** of ± 18–26 bristles, 25–30 mm long. **Cypselae** 12–15 mm long. Outcrops of Witteberg quartzite, alt. 500–690 m; Suurberg Quartzite Fynbos; Eastern Fynbos-Renosterveld, Albany Thicket, Sub-Escarpment Savanna (Port Elizabeth, Uitenhage, Suurberg Mts, Grahamstown and Port Alfred).

OLIGOCARPUS Less

(Calenduleae)

Species 1, sthn Afr., KZN, NC, WC, EC.

calendulaceus (L.f.) Less.

Glandular-pubescent, strong-smelling, annual herb. **Leaves** oblong, oblanceolate or lanceolate, the lowermost narrowed to linear, apex acute or obtuse, mucronate, margins repand or denticulate; involucral bracts subuniseriate, lanceolate, glandular. **Ray florets** yellow. **Disc florets** yellow. **Flowering time** all year. **Cypselae** polymorphic, straight or curved, wingless or irregularly winged, beaked or not, obovoid, obconic, cylindric or fusiform, with or without an apical cavity, smooth or transversely wrinkled. Riverbanks, grassy fields, loamy to gravelly soil next to road, hill slopes, alt. 20–1 465 m; Upper Karoo, Sub-Escarpment Grassland, Indigenous Forests, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Middelburg, inland to Alice, King William's Town S to Greater Addo Elephant National Park).

ONCOSIPHON Källersjö

(Anthemideae)

Stinkkruid (A)

Species 8, endemic to sthn Afr., N, NW, G, M, FS, KZN, L, NC, WC, EC.

piluliferum (L.f.) Källersjö

Cattle bush; *beestekruid*, *karoostinkkruid*, *miskruie*, *stinkkruid*, *stinknet* (A)

Aromatic, annual herb, up to 0.6 m high. **Leaves** alternate, bipinnatisect with narrow lobes, petiolate. **Capitula** discoid, globose, solitary, terminal on long peduncles. **Corolla**

always 4-lobed, tube conspicuously swollen and of thick and brittle texture, limb campanulate, yellow. **Flowering time** Apr.–Jan. **Pappus** of a small, apically dentate crown. **Cypselae** yellowish brown, ± terete but tapering at base, 4-ribbed, glandular between ribs especially on adaxial side. Grassland, sandy places, along rivers and streams, often on old cultivated lands and disturbed places, alt. 8–1 645 m; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (widespread, Grootfontein (Middelburg) and Queenstown S to Willowmore, Uitenhage and Bushman's River Mouth).

OSMITOPSIS Cass. emended K.Bremer

(Anthemideae)

Belskruie (A)

Species 9, endemic to sthn Afr., WC, EC.

osmitoides (Less.) K.Bremer

Basterbelskruie (A)

Erect or ascending suffrutex, 0.15–0.60 m high. **Leaves** alternate, petiolate, narrowly elliptic or oblanceolate, acute, cuneate, margins serrate in upper half, upper leaves smaller and with fewer teeth, glabrous. **Capitula** radiate, solitary, terminal, pedunculate; involucre campanulate; bracts in 2 or 3 rows, imbricate, apically minutely and irregularly serrulate-dentate, sometimes purplish. **Receptacle** flat to conical, paleate, paleae as long as disc florets and somewhat enclosing them, oblong, apically irregularly serrate. **Ray florets** white. **Disc florets** many, yellow, tubular, gradually widening upwards, lobes 5, ovate-triangular. **Flowering time** Nov. **Pappus** crown-like, light brown, of scarious, subulate, basally connate scales. **Cypselae** brown, obovate-oblong, flattened or somewhat 3- or 4-edged. Along watercourses and on hill or mountain slopes, alt. 90–1 380 m; Eastern Fynbos-Renosterveld (WC to Uitenhage).

OSTEOSPERMUM L.

(Calenduleae)

Species ± 45, S and tropical Africa, St Helena, Somalia, SW Arabian Peninsula; 35 in sthn Afr., widespread.

1a Leaves opposite (section Oppositifolia*)*

herbaceum L.f.

Lax, subscandent, perennial herb, 0.8–1.0 m high. **Leaves** opposite, membranous, ± pyriform, apex acute margins repand or irregularly toothed, teeth callose-tipped. **Capitula** solitary on long peduncles, terminating axillary and terminal shoots; involucral bracts subbiseriate, elliptic-lanceolate, gland-dotted. **Flowers** yellow. **Flowering time** Nov.–May. **Cypselae** obovoid, ± angled or sulcate. Forest margins, closed woodland, mountain slopes, alt. 0–1 000 m; Sub-Escarpment Savanna, Sub-Escarpment Grassland, Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Bizana, Komga SW to Suurberg Nature Reserve).

1b Leaves alternate

2a Branches spinescent (section Spinosa*)*

leptolobum (Harv.) Norl.

Beesghombossie, *draaibos*, *geelbos*, *goud* (A)

Perennial shrub, 0.3–0.6 m high, **Leaves** semi-terete, midribbed below, glandular, either 3-lobed or pinnately 5–7-lobed, lobes very blunt, linear; involucral bracts subuniseriate,

oblong, subacute, margined. **Flowers** yellow. **Flowering time** all year. **Cypselae** with 3 narrow membrane wings. Plateaus, stony soil, along the road, grassland areas, hill slopes, alt. 500–1 650 m; Upper Karoo, Sub-Escarpment Grassland (Oviston S to Cradock).

spinescens Thunb.

Rivier-/geel-/draaibos, *geelrivier* (A)

Robust, perennial shrub, 0.5–1.0 m high; old twigs and peduncle spinous, glabrous. **Leaves** linear-spathulate, thick, narrowed to base, mucronulate, some entire, some 3-toothed or lobed; involucral bracts uniseriate, oblong, subacute, equalling disc florets. **Flowers** yellow. **Flowering time** all year. **Cypselae** rough-sided, 3-winged; wings rigid thick, undulate, transversely lacerate at length. River-/streambanks, well-drained stony or sandy soil, shale, alt. 305–1 800 m; Upper Karoo, Dry Highveld Grassland (Aliwal North S to Middelburg).

2b Branches unarmed

3a Cypselae homomorph, or heteromorph, all or at least few winged (section Trialata*)*

leptolobum (Harv.) Norl. (see 2a above)

microphyllum DC.

Wolfolie (A)

Perennial, dwarf shrub, robust, glabrous, old twigs subspinescent, axils somewhat woolly. **Leaves** rigid, linear-lanceolate, acuminate to mucronate, flat, 1-nerved, entire, thick-edged. **Pedicels** scarcely longer than leaves, glabrous; involucral bracts oblong, membrane edged, subobtuse.

3b Cypselae homomorph, without wings, terete or subterete without processes/projections and tuberculae (section Homocarpa*)*

grandidentatum DC.

Uqoboquba (X, Z); *umadinsane* (Z)

Sprawling, perennial herb, with several stems from a woody stock, 0.3–0.6 m long. **Leaves** alternate, sessile, pyriform, panduriform, elliptic or oblong, cuneate and half-clasping at base, sinuate, toothed, apex obtuse to acute. **Capitula** solitary on long peduncles; involucral bracts ± uniseriate, elliptic lanceolate, ± 10 mm long, glandular-pubescent and with long pointed hairs. **Flowers** yellow. **Flowering time** Aug.–May. **Cypselae** fusiform-cylindric, smooth. Outcrops, forest margins, stream-/riverbanks, hill or mountain slopes, grassland, alt. 30–1 600 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket (Port St Johns, Hogsback, Kentani, S to Grahamstown).

pterigoideum Klatt

Perennial suffrutex, up to 0.5 m long, sprawling, thinly woolly. **Leaves** entire and floccosely cobwebbed when young. **Capitula** radiate, small, yellow; involucral bracts shortly hispidulous on dorsal side. **Ray florets** as long as or occasionally slightly longer than inner involucral scales. **Flowering time** Nov.–May. **Cypselae** smooth. Rare, sandstone slopes, alt. 0–250 m; Indigenous Forests, Eastern Fynbos-Renosterveld (Clarkson).

3c Cypselae with blunt angles, ellipso-trigonous (section Acerosa*)*

glabrum N.E.Br.

Erect, corymbosely-branched, perennial shrub, with crowded leaves, 0.45–7.00 m high. **Leaves** linear, triquetrous, needle-shaped; involucral bracts narrowly lanceolate.

Flowers yellow or orange with dark reverse. **Flowering time** Sept. **Cypselae** ellipsoid-trigonous with blunt angles. Rare. Hill slopes, riverbanks, alt. ± 1 700 m; Eastern Fynbos-Renosterveld (Humansdorp Division, N of Kouga River).

3d Cypselae with transverse ridges, obovate to subterete (section Polygalina*)*

imbricatum L.

Perennial shrub or suffrutex, 0.5–2.0 m high, stems and leaves clothed with copious, long, silky hairs, or woolly in axils. **Leaves** imbricate, sessile, erect, entire, obovate or oblong, glabrous or sometimes loosely silky woolly, apex mucronate. **Peduncle** long, sometimes glandular-hispid; involucral bracts oval-lanceolate, acute. **Flowers** yellow. **Flowering time** all year. **Cypselae** obovate to subterete, transversely ridge-netted or ridge-furrowed, 2- or 3-angled. Mountain slopes, calcrete, quartzite, sandstone, alluvium soil derived from Enon conglomerate, grassland, closed woodland, alt. 0–1 000 m; Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Grassland, Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Mount Fletcher, Mkambati Nature Reserve, inland to Alice, S to Humansdorp).

3e Cypselae with processes or tuberculate, ± conspicuously angular (section Xenismia, *section* Coriacea*)*

junceum P.J.Bergius

Bergbietou, *bloubietou* (A)

Perennial suffrutex, 1–3 m high, white and woolly when young. **Leaves** linear, acuminate, carinate and sessile, toothed; lower and medial ones ± petiolate; lamina elliptic or lanceolate or narrowly obovate. **Capitula** radiate, in lax, branched corymbs on woolly peduncles, yellow. **Flowering time** all year. **Cypselae** obovoid to broadly ellipsoid-trigonous. Well-drained stony soil, along the road, mountain slopes, closed woodland, quartzite, alt. 300–1 000 m; Eastern Fynbos-Renosterveld, Indigenous Forests, Albany Thicket (Willowmore, Van Stadens Wild Flower Reserve, Grahamstown SW to Humansdorp).

muricatum E.Mey. ex DC. subsp. **muricatum**

Bietou, *boegoebossie* (A)

Perennial herb, with herbaceous or quite lignified stems in lower part, and short, rigid, glanduliferous hairs, 0.2–0.6 m high. **Leaves** sessile, linear, linear-lanceolate or oblong, dentate and pinnatifid or entire. **Capitula** yellow. **Ray florets** are longer or slightly longer than involucral scales. **Flowering time** Nov.–Apr. **Cypselae** obovoid or obpyramidal-triangular with ± strongly marked cross-furrows. Along roads, alt. 364–1 973 m; Mesic Highveld Grassland, Upper Karoo, Sub-Escarpment Grassland, Lower Karoo (Lady Grey, Grootfontein to Kamdeboo Mts, Graaff-Reinet).

OTHONNA L.

(Senecioneae)

Species ± 120, Africa, mainly sthn Afr., widespread, except B, NW.

1a Capitula discoid
2a Leaves linear, terete, up to 150 mm long

carnosa Less. var. **discoidea** Oliv.

Glabrous, fleshy, foetid, bushy, perennial herb, up to 0.6 m high; stems leafy below, often decumbent, sometimes rooting. **Leaves** dense, grey-green. **Inflorescence** a terminal,

several-headed corymb; peduncle up to 200 mm long; pedicels ± 25 mm long. **Capitula** campanulate, ± 10 mm in diam., yellow; involucral bracts ovate, 5–6 mm long. **Flowering time** Apr.–Sept. **Pappus** of white hairs, 4 mm long, soon caducous. **Cypselae** silvery white-hairy, 2.5 mm long, mucilaginous when wet. Colonies in coastal grassland and on dunes; Albany Thicket (very rare, East London).

2b Leaves not as above, oblong-obovate, stem-clasping
3a Inflorescence terminal, 1- or 2-headed; involucral bracts 10–12

gymnodiscus (DC.) Sch.Bip.

Erect, glabrous, fleshy, perennial herb, tuberous-rooted, crown woolly, stems up to 0.5 m high, ± unbranched. **Leaves** sessile, round-eared, subacute, entire. **Capitula** broadly campanulate, 15 mm in diam., yellow; involucral bracts oblong-lanceolate, acute, basally connate, 8 mm long. **Flowering time** June–Oct. **Pappus** of reddish silky hairs, 12 mm long. **Cypselae** striate, hairy, 7 mm long. Sandy soil, often after fires; Albany Thicket, Eastern Fynbos-Renosterveld (very rare, Port Elizabeth).

3b Inflorescence a terminal, 3–5-headed corymb; involucral bracts ± 5

[E]eriocarpa (DC.) Sch.Bip.

Glabrous, fleshy, perennial herb, up to 200 mm high, tuberous-rooted; stems simple or branched. **Leaves** sessile, ± entire to pinnatifid, lobes ± 3 on each side, up to 60 mm long, base petiolate, axils woolly. **Capitula** campanulate, 15 mm in diam., yellow; peduncles up to 60 mm long; pedicels up to 50 mm long; involucral bracts ovate-oblong, subacute, basally connate, 10 mm long. **Flowering time** June–Aug. **Pappus** of yellowish, silky hairs, 20 mm long. **Cypselae** hirsute, yellowish, 6 mm long. Rocky outcrops, sandy soil; Albany Thicket, Eastern Fynbos-Renosterveld (very rare, Port Elizabeth to Grahamstown).

1b Capitula radiate
4a Perennial herbs with erect, mostly leafless, 1- or 2-forked scapes (peduncles) with solitary capitula; leaves many, rosulate
5a Involucral bracts ± 8
6a Leaves faintly midveined

burttii B.Nord.

Glabrous, glaucous, semi-fleshy, perennial herb, forming mats; stems branching, up to 200 mm long, soon defoliated, leaf bases persistent. **Leaves** at branch tips, linear-oblanceolate, flat, 20–80 mm long, base ± clasping. **Capitula** broadly campanulate, up to 40 mm in diam., rays (5–8) and disc yellow; peduncles (scapes) terminal, up to 220 mm long; involucral bracts oblong-ovate, acute, basally connate, 7–10 mm long. **Flowering time** Oct.–Feb. **Pappus** of whitish bristles, up to 15 mm long. **Cypselae** oblong-obovate, ribbed, white-villous, up to 6.5 mm long, mucilaginous when wet. Montane, dolerite and sandstone rock edges and cliff faces; Drakensberg Grassland, Sub-Escarpment Grassland (very rare, Mount Fletcher, Matatiele).

6b Leaves with a very distinct midvein

natalensis Sch.Bip.

Geelbossie (A)

Variable, glabrous, glaucous, semi-fleshy, perennial herb, stock woody with cushion-like woolly crown up to 200 mm in diam. **Leaves** erect, linear to broadly lanceolate, entire, up to 200 mm long, base petiole-like, woolly. **Peduncles** (scapes) up to 600 mm high. **Capitula** up to 45 mm in diam., rays (± 8) and disc yellow; involucral bracts lance-

olate, 10–15 mm long. **Flowering time** Aug.–Feb., mainly Aug.–Oct. **Pappus** of copious, buff-coloured hairs, up to 20 mm long, conspicuous. **Cypselae** ribbed, hairy, up to 10 mm long, mucilaginous when wet. Colonies in grassland on sandy or loamy soil; Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna (uMzimkhulu to Bizana and Peddie, ± coastal).

5b Involucral bracts 12–14, lanceolate, connate to ± $^1/_2$, edges membranous

auriculifolia Licht. ex Less.

Sandkool (A)

Glabrous, glaucous, ± fleshy, perennial herb; ± stemless, crown woolly, rootstock tuberous. **Leaves** radical, oblanceolate, subpetiolate, entire or variably incised, denticulate or sinuate, up to 100 mm long, axils woolly. **Peduncles** (scapes) to 150 mm long. **Capitula** campanulate, up to 30 mm in diam.; rays 12–14, yellow above, often red-brown below, dries ± blue, disc yellow. **Flowering time** Apr.–Sept. **Pappus** of buff-coloured hairs, 20 mm long. **Cypselae** silky, 8 mm long. Stony slopes and flats, on clay or loam; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket (Middelburg to Queenstown and Grahamstown).

4b Perennial herbs or shrubs; inflorescences and leaves not as above
7a Glabrous shrubs or subshrubs, woody at least below, up to 2 m high
8a Leaves linear or pinnatipartite with linear lobes
9a Leaves pinnatipartite with linear lobes

pavonia E.Mey.

Erect shrub, up to 1.8 m high, ± fleshy; stems reddish purple. **Leaves** sessile, up to 60 mm long, pale green, pinnatipartite, lobes linear. **Inflorescence** a terminal or lateral, few-headed, loose corymb; pedicels and peduncles straw-coloured; peduncles 2- or 3-forked, up to 100 mm long; pedicels shorter. **Capitula** 25–30 mm in diam.; involucral bracts 5, oblong, up to 10 mm long, basally connate; rays (5) and disc yellow. **Flowering time** July–Jan. **Pappus** of straw-coloured bristles, 8 mm long. **Cypselae** dark, glabrous, 2 mm long. Stony hillsides, full sun; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland (Steynsburg to Middelburg, Cradock and Queenstown).

9b Leaves linear, ± terete, fleshy

carnosa Less. var. **carnosa**

Fleshy, decumbent or prostrate shrublet, up to 1 m high. **Leaves** linear, ± round, ± acute, tapering basally, up to 70 mm long. **Inflorescence** a terminal, few-headed, ± corymbose panicle; peduncles to up 120 mm long; pedicels up to 70 mm long. **Capitula** 20–25 mm in diam.; involucral bracts 6–8, oblong, membrane-edged, up to 7 mm long, basally connate; rays (± 12) and disc yellow. **Flowering time** mainly Apr.–Sept. **Pappus** of white hairs, 4 mm long. **Cypselae** glabrous, 1.5 mm long. Among scrub and grass on sandy or stony slopes; Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Middelburg to Humansdorp and East London, rather common).

8b Leaves not as above; oblong to elliptical or obovate
10a Leaves with tapered petioles, drying thin

[E]triplinervia DC.

Glaucous, semi-fleshy shrub, up to 1.5 m high; stems brittle, nude and scarred below. **Leaves** crowded at branch tips, obovate, obtuse, up to 80 mm long, margins entire to repand, 3-nerved. **Inflorescences** terminal, loosely corymbose, capitula few–several;

peduncles and pedicels up to 100 mm long. **Capitula** up to 20 mm in diam.; involucral bracts ± 5, oblong, up to 7 mm long; rays (± 5) and disc yellow. **Flowering time** all year, mainly Mar. **Pappus** of white hairs, 5 mm long. **Cypselae** hairy, 4 mm long. Rocky slopes, in bush or forest, also near water; Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Hogsback to Komga and Humansdorp).

10b Leaves sessile, not drying thin
11a Capitula 20–25 mm in diam.

[E]membranifolia DC.

Erect shrublet, up to 1 m high, stems simple, leafy. **Leaves** ± sessile, broadly elliptical or obovate, membranous, midribbed, entire or remotely toothed above middle; floral leaves sessile, ± ovate. **Inflorescence** a laxly branched, few-headed, corymbose, leafy panicle; pedicels long. **Capitula** 20–25 mm in diam.; involucral bracts ± 8, oblong to ovate, connate below, ± 9 mm long; rays (± 8) and disc yellow. **Flowering time** Apr.–Aug. **Pappus** of white bristles, 4 mm long. **Cypselae** glabrous, 3 mm long. In scrub and riverine bush; Albany Thicket, Eastern Fynbos-Renosterveld (very rare, Uitenhage, Port Elizabeth and Humansdorp).

11b Capitula up to ± 12 mm in diam.
12a Leaves eared; inflorescence a much-branched, level-topped, many-headed, terminal, corymbose panicle

parviflora P.J.Bergius

Bobbejaankool, *wildekool* (A)

Erect, fleshy shrub, up to 2 m high; stems robust, leafy. **Leaves** sessile, ± decurrent, ± clasping at base, broadly obovate to oblong, penninerved, margins entire or finely toothed, leathery, lower leaves up to 200 mm long, upper smaller. **Pedicels** up to 50 mm long. **Capitula** up to 12 mm in diam.; involucral bracts 8, oblong, basally connate, 5 mm long; rays (8) and disc yellow. **Flowering time** Aug.–Dec., mainly Sept. **Pappus** of white hairs, 2.5 mm long. **Cypselae** silky-villous, 2 mm long. Fynbos on well-drained sandstone slopes; Albany Thicket, Eastern Fynbos-Renosterveld (Willowmore, Humansdorp).

12b Leaves not eared; inflorescence a loose, terminal panicle

quinquedentata Thunb.

Straggling shrublet, up to 1.5 m high, ± fleshy; stems slender, erect, closely leafy below. **Leaves** sessile, ± clasping, ± decurrent, ascending, cuneate-oblong, up to 150 mm long, ± 5-toothed near apex to entire, callous-margined, ± leathery, veins prominent. **Inflorescence** a loose, terminal panicle. **Capitula** ± 12 mm in diam.; involucral bracts 7 or 8, oblong, acute, connate below, 4–5 mm long; rays (± 8) and disc yellow. **Flowering time** Sept.–Apr. **Pappus** of white hairs, 2 mm long. **Cypselae** silky-villous, 1–2 mm long. Mainly on stony slopes with scrub and grass; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage to Alexandria and Humansdorp).

7b Glabrous, perennial herbs, tuberous-rooted or stems rooting, stems up to 400 mm high or long, if prostrate
13a Stems rigid, erect, leafy, sparsely branching, up to 400 mm high; tuberous rootstock with a woolly crown and radical leaves

[E?]rufibarbis Harv.

Perennial herb, ± fleshy. **Leaves**: radical leaves ovate, acute, up to 50 mm long, 3–5-nerved at base; petioles up to 120 mm long; cauline leaves sessile, stem-clasp-

ing, eared, oblong or ovate-oblong, obtuse to acute, up to 50 mm long, entire, margins undulate. **Inflorescence** terminal and axillary, mostly 1-headed; peduncles up to 170 mm long. **Capitula** 20–25 mm in diam.; involucral bracts ± 12, lanceolate, connate below, 8 mm long; rays (± 12) and disc yellow. **Flowering time** Apr.–July. **Pappus** of buff-coloured to purplish hairs, 10 mm long. **Cypselae** ribbed, ± hairy, 8 mm long. Mostly in scrub on coastal sand dunes; Eastern Fynbos-Renosterveld, Albany Thicket (rare, Humansdorp to Port Elizabeth and Alexandria).

13b Stems weak or prostrate, rooting
14a Stems branched at base, weak, rooting at nodes; leaves often in imperfect whorls with bare spaces between

[E]capensis L.H.Bailey

Fleshy, perennial herb, stems 0.2 m long. **Leaves** ± terete, linear-oblong, mostly acute, up to 30 mm long. **Inflorescence** a terminal, 2–5-headed subcorymb; peduncles up to 100 mm long; pedicels up to 50 mm long, slender. **Capitula** 15 mm in diam.; involucral bracts ± 8, oblong, acute, margined, 5 mm long, basally connate; rays (8–10) and disc white or yellow. **Flowering time** May. **Pappus** of white hairs, 3–4 mm long. **Cypselae** glabrous, 1.5 mm long. Mostly sandy soil in grassland, scrub, coastal bush and on dunes; Eastern Fynbos-Renosterveld, Albany Thicket (Port Elizabeth to Alexandria and Grahamstown).

14b Stems radiating, prostrate, rooting; leaves never in whorls

[E]patula Schltr.

Fleshy, perennial herb, stems radiating, prostrate, up to 150 mm long, rooting. **Leaves** glaucous, dense, sessile, linear, ± terete, up to 40 mm long. **Inflorescence** terminal; peduncles up to 70 mm long, 1- or 2-headed; pedicels up to 30 mm long. **Capitula** ± cup-shaped, 15 mm in diam.; involucral bracts ± 8, oblong-lanceolate, margins membranous, 8 mm long, basally connate; rays (± 12) and disc yellow. **Flowering time** mainly Jan. **Pappus** of white hairs, 4 mm long. **Cypselae** ± glabrous, 3 mm long. Cave sandstone and dolerite outcrops; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Lower Karoo (Dordrecht, Middelburg, Queenstown, Graaff-Reinet).

PEGOLETTIA Cass.

(Inuleae)

Draaibos (A)

Species 9, Africa and Middle East; 9 in sthn Afr., widespread.

baccaridifolia Less.

Ghwarrieson, *guarrieson* (A)

Moderately to much-branched, erect shrub, 0.25–1.00 m high. **Leaves** alternate, shortly petiolate, broadly lanceolate to spathulate or elliptic to rounded, dentate to serrate, occasionally some leaves entire, glabrous, shiny. **Capitula** discoid, solitary to laxly corymbose, pedunculate, terminal. **Florets** yellow, occasionally turning purplish with age. **Flowering time** Apr.–Nov. **Pappus** of barbellate bristles in several rows and outer row of large, deeply incised bristle-like scales. **Cypselae** narrowly cylindrical, ribbed. Dry streambeds, mountain slopes, on stony and rocky soil, as well as sandy soil, alt. 0–500 m; Dry Highveld Grassland, Upper Karoo, Albany Thicket, Sub-Escarpment Grassland (Jamestown, W to Graaff-Reinet, S to Port Elizabeth and Grahamstown).

retrofracta (Thunb.) Kies

Beesbossie, *draaibos*, *geelbergdraaibos*, *perdebossie*, *skerpbossie* (A)

Moderately to much-branched, dwarf shrub, up to 0.6 m high. **Leaves** alternate, subsessile or shortly petiolate, entire, narrowly elliptic to ovate, glabrous. **Capitula** discoid, solitary or corymbosely arranged terminally. **Florets** yellow or purplish, corolla lobes recurved outwards. **Flowering time** June–Mar. **Pappus** of barbellate bristles in several rows and outer row of large acuminate, slightly incised scales. **Cypselae** narrowly cylindrical, ribbed, hairy. Sandy, gravelly and stony places, hill slopes, alt. 305–2 336 m; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Dry Highveld Grassland, Eastern Fynbos-Renosterveld (Colesberg, Aliwal North and Queenstown S to Willowmore).

PENTZIA Thunb.

(Anthemideae)

Skaapkaroo (A)

Species 23, Africa; 21 in sthn Afr., widespread, but absent in S.

1a Capitula together in terminal corymbs

cooperi Harv.

Skaapkaroo (A)

Aromatic shrub, up to 1.5 m high, young parts cobwebby floccose. **Leaves** alternate, sessile, oblong or narrowly cuneate, entire or 2- or 3(–5)-toothed at apex, gland-dotted. **Capitula** discoid, subglobose, many in terminal, compound corymbs. **Florets** bright yellow. **Flowering time** Jan.–July. **Pappus** a single oblique membranous scale. **Cypselae** obliquely wedge-shaped. Grassland on rocky hillsides and mountain slopes, streambanks, alt. 1 000–3 320 m; Mesic Highveld Grassland, Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Albany Thicket (Rhodes, Middelburg and Adelaide).

dentata (L.) Kuntze

Grootkaroo, *grootskaapkaroo* (A)

Much-branched shrub, 0.3–2.0 m high, greyish canescent. **Leaves** alternate, petiolate, cuneate, apex truncate and dentate, 3-nerved. **Capitula** discoid, funnel-shaped or cylindrical, many together in terminal corymbs on short peduncles. **Florets** bright yellow. **Flowering time** Nov., Dec. **Pappus** an auriculately shaped scale. **Cypselae** obliquely wedge-shaped. Mountain slopes and streambanks, alt. 120–3 020 m; Upper Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Middelburg, S to Joubertina and E to Grahamstown).

punctata Harv.

Beesbossie, *beeskaroo(bos)*, *berggansie* (A)

Much-branched shrub, 0.3–1.5 m high. **Leaves** alternate, petiolate, upper half pinnatisect or bipinnatisect, segments entire or 3–5-lobed, glabrous or faintly hairy, glandular-punctate. **Capitula** discoid, many together in terminal corymbs, pedunculate; involucral bracts oblong, obtuse. **Florets** yellow. **Flowering time** Feb.–May (Sept., Nov.). **Pappus** an auriculately shaped scale. **Cypselae** obliquely wedge-shaped. Grassland on mountain and hill slopes, alt. 245–1 920 m; Upper Karoo, Dry Highveld Grassland, Albany Thicket (widespread, Middelburg, Graaff-Reinet and Cradock).

1b Capitula solitary, shortly to distinctly pedunculate
2a Leaves petiolate, base cuneate, apex 3–5-lobed or -toothed

quinquefida (Thunb.) Less.

Erect shrub, 0.22–0.75 m high, all the young parts silky canescent. **Leaves** alternate, petiolate, base cuneate, apex truncate, 3–5-toothed or lobulate, teeth or lobes obtuse, upper leaves linear, entire. **Capitula** discoid, solitary, pedunculate; involucral bracts obtuse. **Florets** yellow. **Flowering time** July–Jan. (Apr.). **Pappus** an auriculately shaped scale. **Cypselae** obliquely wedge-shaped. Hill slopes, alt. 1 000–1 730 m; Upper Karoo, Mesic Highveld Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (widespread, Oviston and Lady Grey to Graaff-Reinet and Willowmore).

tortuosa (DC.) Fenzl ex Harv.

Much-branched, cushion-formed, dwarf shrub, 0.075–0.300 m high. **Leaves** alternate, petiolate, cuneate, apex shortly and bluntly 3–5-lobed, glabrous. **Capitula** discoid, solitary, pedunculate; involucral bracts broad, obtuse. **Florets** yellow. **Flowering time** Dec.–Feb. (June). **Pappus** absent. **Cypselae** obliquely wedge-shaped. Mountain grassland, wet rock sheets, seepage areas, alt. 914–2 450 m; Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland (Rhodes, Middelburg and Queenstown areas).

2b Leaves pinnate, pinnatipartite or bipinnatipartite, sessile or petiolate
3a Leaves petiolate

incana (Thunb.) Kuntze

Karoo bush, sheep bush; *alsbos*, *bewerasie*, *gansie*, *skaapbos(sie)*, *vaalkaroo*, *witkarobos* (A); *mohantsoana* (SS)

Much-branched shrub, up to 1 m high, ± grey-pubescent. **Leaves** alternate, petiolate, small, trifid at apex or pinnatipartite, lobes linear. **Capitula** discoid, terminal, solitary, pedunculate; involucral bracts obtuse. **Florets** yellow. **Flowering time** Jan., Dec. **Pappus** an auriculately shaped scale. **Cypselae** obliquely wedge-shaped. Rocky or sandy soil, open grassland, mountain or hill slopes, alt. 25–1 600 m; Upper Karoo, Lower Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Albany Thicket (widespread, Middelburg S to Steytlerville and E to Grahamstown).

sphaerocephala DC.

Large karoo bush; *berggansiekaroo*, *gansie(s)karoo*, *karoobossie*, *langsteelkaroo* (A)

Rigid, erect shrub, 0.3–0.6 m high. **Leaves** alternate, petiolate, pinnatipartite, lobes linear, upper leaves trifid or entire, thinly hairy. **Capitula** discoid, large, solitary, long pedunculate; involucral bracts oblong, obtuse. **Florets** yellow. **Flowering time** Nov.–July. **Pappus** an auriculately shaped scale, dentate above. **Cypselae** obliquely wedge-shaped. Hills or flats, alt. 320–1 525 m; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Albany Thicket (widespread, Middelburg, Graaff-Reinet, Queenstown to Uitenhage).

3b Leaves sessile

globosa Less.

Bitter karoo bush, hair karoo; *bitterbultkaroo*, *bitterkaroobossie*, *bitterskaapbos*, *langbeenkaroo*, *skaapbossie*, *vaalkaroo* (A)

Much-branched, dwarf shrub, up to 0.7 m high. **Leaves** alternate, sessile, pinnatipartite, very short, scarcely as long as internodes. **Capitula** discoid, terminal, solitary, on pedunculoid branches; involucral bracts linear-lanceolate. **Florets** yellow. **Flower-**

ing time Sept.–May. **Pappus** an auriculately shaped scale. **Cypselae** obliquely wedge-shaped. Grassland, on mountain slopes, streambanks on sandy soil, alt. 550–1 830 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (widespread, Colesberg to Barkly East, S to Suurberg, Grahamstown and Kei River).

lanata Hutch.

Langsteelkaroo, *springbokkaroo* (A)

Much-branched shrub, up to 1 m high, young branches densely white-tomentose. **Leaves** alternate, sessile, pinnatipartite or bipinnatipartite, ultimate segments linear. **Capitula** discoid, solitary, terminal, pedunculate; involucral bracts in 4 rows, outer bracts linear to lanceolate, inner bracts oblanceolate-elliptic, conspicuously membranous. **Florets** yellow. **Flowering time** Jan.–Mar. **Pappus** an auriculately shaped scale. **Cypselae** obliquely wedge-shaped. Grassland in flats and hill slopes, alt. 120–1 500 m; Upper Karoo (widespread, Colesberg and Middelburg).

There is considerable confusion between *Pentzia globosa* and *P. lanata*. The main differences are the densely white-tomentose branches, the bigger capitula and longer leaves in *P. lanata*. However there are a lot of intermediate forms and these two taxa might prove to be conspecific.

viridis Kies

Much-branched, bright green, dwarf shrub, up to 0.5 m high. **Leaves** alternate, sessile, pinnate, lobes stiffly spreading, arising in more than one plane from leaf rachis. **Capitula** discoid, terminal, solitary, on leafy branchlets. **Florets** golden-yellow. **Flowering time** Nov., Dec. **Pappus** an oblique, coroniform scale, somewhat lacerated at margins. **Cypselae** obpyramidal, ribbed. Vleis, soil or damp sand near dams and rivers, alt. 1 100–1 405 m; Upper Karoo (widespread, Middelburg).

PHYMASPERMUM Less. emended Källersjö

(Anthemideae)

Bankrotbos (A)

Species 19, Zimbabwe and sthn Afr.; 18 in sthn Afr., widespread, but absent in B.

1a Primary leaves with axillary leaf tufts or shoots
2a Leaves entire

parvifolium (DC.) Benth. & Hook. ex B.D.Jacks.

Good karoo; *galsteenbossie*, *karoobossie*, *skaapbossie*, *skaapkaroo*, *swartkaroo*, *witblommetjie(karoo)* (A)

Much-branched, dwarf shrub, 0.1–0.8 m high, with leaf tufts or leafy shoots in axils of primary shoots. **Leaves** alternate, linear, entire, glabrous. **Capitula** radiate, small, in terminal corymbs. **Ray florets** white. **Disc florets** yellow. **Flowering time** July–May. **Pappus** absent. **Cypselae** cylindric, ribbed, with thickened rim. Grassland on slopes and open veld, alt. 155–1 890 m; Upper Karoo, Drakensberg Grassland, Dry Highveld Grassland, Lower Karoo, Albany Thicket, Sub-Escarpment Savanna (Venterstad and Aliwal North S to the Witteberg and Grahamstown areas).

pubescens Kuntze
Similar to *P. parvifolium* and possibly conspecific with it. **Flowering time** Mar.–May. Open veld, alt. 1 200–1 525 m; Upper Karoo (Middelburg area).

2b Leaves pinnate or pinnately divided

acerosum (DC.) Källersjö
Well-branched shrub or stems simple or subsimple, up to 2 m high, with leaf tufts or leafy shoots in axils of primary shoots. **Leaves** alternate, sessile, pinnate, filiform, sometimes simple, bi- or trifid, glabrous, sparsely hairy or villous. **Capitula** discoid, narrowly cylindrical, many in dense, terminal, compound corymbs; involucral bracts narrow, gutter-shaped, imbricate. **Florets** bright yellow. **Flowering time** Dec.–July. **Pappus** absent. **Cypselae** cylindric, ribbed, crowned with a thickened rim. Open grassland or forest margin scrub, alt. 90–2 200 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (Kokstad to Komga).

villosum (Hilliard) Källersjö
Silky villous, subshrub or perennial herb, up to 0.5 m high, primary leaves with dwarf shoots in their axils. **Leaves** alternate, pinnately divided, lobes filiform or narrowly linear. **Capitula** discoid, narrowly campanulate, many in dense, terminal corymbs. **Florets** bright yellow. **Pappus** absent. **Cypselae** narrowly obovate, ribbed, crowned with thickened rim. In grassland on stony slopes or among rock outcrops, alt. 600–1 370 m; Sub-Escarpment Grassland (Pondoland, Insizwa).
No EC flowering material in PRE.

woodii (Thell.) Källersjö
Villous to glabrous, sparsely branched, subshrub or perennial herb, up to 500 mm high. **Leaves** alternate, pinnately divided, segments filiform, decreasing in size upwards, primary leaves with compact axillary leaf tufts or shoots, villous at first but soon glabrous. **Capitula** discoid, narrowly campanulate, in compact, compound, terminal corymbs; involucral bracts ovate-lanceolate, flat. **Florets** bright yellow. **Flowering time** no EC flowering material in PRE. **Pappus** absent. **Cypselae** cylindrical, ribbed, crowned with thickened rim. Grass slopes, alt. 1 140–2 745 m; Sub-Escarpment Grassland (Kokstad).

1b Primary leaves without axillary leaf tufts or shoots
3a Capitula solitary at ends of branches

[E]peglerae (Hutch.) Källersjö
Sparsely branched shrub, 0.60–0.75 m high. **Leaves** alternate, linear, entire, softly brown hairy. **Capitula** discoid, solitary at ends of branches. **Florets** yellow. **Flowering time** Jan. **Pappus** absent. **Cypselae** cylindric, ribbed, glabrous, with thickened rim. Along riverbank, alt. 500–1 000 m; Sub-Escarpment Savanna (Mthatha District).

3b Capitula grouped together in dense or lax, terminal corymbs or racemes

aciculare (E.Mey. ex Harv.) Benth. & Hook. ex B.D.Jacks.
Grootwitblommetjie, *witheuningkaroo* (A)
Dwarf shrub, up to 0.9 m high. **Leaves** alternate, linear, entire, pungent-tipped. **Capitula** discoid or radiate, 12–15-flowered, in lax corymbs. **Ray florets** 1 or 2, white, sometimes absent. **Disc florets** yellow. **Flowering time** Oct.–Mar. **Pappus** absent. **Cypselae** cylindric, ribbed. Grassy, stony hillsides or plains, alt. 655–2 100 m; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket (Middelburg, Queenstown and Cradock areas).

[E]erubescens (Hutch.) Källersjö

Dwarf shrub or perennial herb, 0.3–0.6 m high. **Leaves** alternate, linear, entire, near-appressed to stem, glabrous. **Capitula** discoid, campanulate, solitary or a few together in lax, terminal corymbs. **Florets** yellow. **Flowering time** Nov. **Pappus** absent. **Cypselae** cylindric, ribbed, with thickened rim. Grassy, rocky slopes or plains, alt. 460–1 065 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (rare, Lady Frere, King William's Town and Peddie areas).

scoparium (DC.) Källersjö

Rigid, much-branched shrub, 0.6–0.9 m high, some branches spinescent. **Leaves** alternate, small, oblong or linear, obtuse, entire, thick, appressed-hairy. **Capitula** discoid, subsessile in terminal racemes or spicate-racemose. **Florets** cream-coloured or yellow. **Flowering time** Sept.–Nov. (Mar.). **Pappus** absent. **Cypselae** cylindrical, ribbed, with thickened rim, rough hairy. Plains, alt. 1 000–1 640 m; Upper Karoo (Middelburg and Graaff-Reinet areas).

*PICRIS L.

(Cichorieae)

Species 45, Europe, Mediterranean region, Asia, mountains of Africa; 2 introduced weeds in sthn Afr., NW, G, FS, KZN, WC, EC.

echioides L.

Bristly ox tongue, ox tongue; *ostong*, *stekelpicris*, *stekelrige-beestong* (A)

Hispid annual or perennial herb, up to 1 m high, with milky latex. **Leaves** alternate, radical and lower cauline leaves oblanceolate, narrowed to petiole-like base, irregularly toothed, upper leaves lanceolate to oblong, sessile, clasping, sometimes decurrent on stem. **Capitula** ligulate, on short peduncles arranged in irregular corymb; outer involucral bracts large, ovate-cordate; inner linear-lanceolate with long subulate apex. **Florets** yellow. **Flowering time** Nov.–Feb. (May, Aug.). **Pappus** of outer florets of reduced bristles, of inner florets of plumose bristles. **Cypselae** of 2 kinds: outer hairy, with short beak, embraced by involucral bracts, inner glabrous, wrinkled, long-beaked. A weed of disturbed places, riverbanks, grassy slopes, cultivated land, alt. 300–1 400 m; Upper Karoo, Sub-Escarpment Savanna, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Aliwal North and Middelburg S to Humansdorp and E to Grahamstown).

PLATYCARPHA Less.

(Arctotideae)

Species 3, endemic to sthn Afr., N, B, NW, G, FS, NC, WC, EC.

glomerata (Thunb.) Less.

Usiphahluka (Z)

Perennial herb, up to 0.6 m high; stemless, with stout, fleshy, underground runners. **Leaves** flat on ground, radiating from white, silky, woolly root crown, elliptic in outline; tapering to broad petiole-like base, pinnatisect; coarsely and deeply toothed, teeth spinose; cobwebby above at first, later glabrous; white-felted below. **Capitula** sessile, crowded; involucral bracts glumaceous, in few–many rows. **Receptacle** flat, paleate. **Florets** bisexual, fertile; corolla purple; tube widened above, glandular-hairy. **Anthers**

with ovate to lanceolate, apical appendage. **Style** linear below, terete above; branches short, oblong. **Pappus** of narrow, acuminate scales. **Cypselae** ribbed, glabrous. Poor stony, sandy soils, alt. 5–460 m; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Uitenhage, Port Elizabeth, Humansdorp).

PLECOSTACHYS Hilliard & B.L.Burtt

(Gnaphalieae)

Vaaltee (A)

Species 2, endemic to sthn Afr., S, KZN, WC, EC.

polifolia (Thunb.) Hilliard & B.L.Burtt

Much-branched, straggling, dwarf shrub, 0.30–1.06 m high, stems often with axillary leaf tufts. **Leaves** alternate, elliptic, tapering to short petiole-like base, apex obtuse, apiculate, entire, upper surface cobwebby and soon glabrous or persistently white-tomentose, lower surface white-tomentose. **Capitula** disciform, many in congested clusters, terminating branchlets; involucral bracts in ± 4 rows, imbricate, apex obtuse, dirty white. **Outer female florets** more than disc florets, narrowly tubular, yellow, sometimes tinged purple. **Disc florets** tubular below, slightly expanded above, yellow, sometimes tinged purple. **Flowering time** Oct.–Dec. **Pappus** of scabrid bristles, bases cohering lightly by patent cilia. **Cypselae** small, oblong, hairy. Damp, often partially shaded places, such as streamsides, forest margins and damp cliff faces, usually near forest, alt. 90–1 525 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Indigenous Forests (Engcobo and Tabankulu Mts southwards to Hogsback and Katberg and W to Kouga Mts).

serpyllifolia (P.J.Bergius) Hilliard & B.L.Burtt

Vaaltee (A)

Much-branched, straggling, dwarf shrub, 0.25–1.21 m high. **Leaves** alternate, subsessile, broadly elliptic to suborbicular, apex mucronate, margins entire but undulate, upper surface thinly white-tomentose or glabrous, lower surface white-tomentose. **Capitula** disciform, many in small, congested clusters, terminating branchlets; involucral bracts in ± 3 rows, imbricate, apex obtuse, milk white. **Outer female florets** usually fewer than disc florets, narrowly tubular, yellow, sometimes tinged pink. **Disc florets** tubular below, slightly expanded above, yellow, sometimes tinged pink. **Flowering time** Oct.–Apr. **Pappus** of scabrid bristles, bases cohering lightly by patent cilia and lightly fused. **Cypselae** small, oblong, hairy. Damp sandy places often near sea, but also on the lower mountain slopes, alt. 5–1 524 m; Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (coastal, Port Edward S to East London and to Humansdorp).

POECILOLEPIS Grau

(Astereae)

Species 2, endemic to sthn Afr., WC, EC.

ficoidea (DC.) Grau

Decumbent, succulent, annual or perennial herb, rooting at nodes, flowering stems erect, up to 0.21 m high. **Leaves** opposite, sessile and bases fused around stem, oblanceolate, entire, apex obtuse. **Capitula** shortly radiate, solitary in leaf axils, long pedunculate; peduncle glandular in upper part; involucral bracts multiseriate, imbricate, glandular. **Receptacle** paleate. **Ray florets** white. **Disc florets** yellow. **Flowering time** Sept.–

Dec. **Pappus** of barbellate bristles. **Cypselae** obovate, brown, smooth with a few hairs. Along coast in mud or sandbanks at or above spring tide level, alt. 1–10 m; Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Nxaxo River Mouth to St Francis Bay).

PRINTZIA Cass.

(Astereae)

Species 6, endemic to sthn Afr., LIM, M, FS, KZN, L, WC, EC.

auriculata Harv.

Much-branched shrub, up to 2 m high. **Leaves** alternate, ovate, petiolate, auricles often conspicuous particularly on main cauline leaves, sometimes absent, margins coarsely and irregularly toothed, upper surface thinly cobwebby and glandular to glabrous, lower surface densely tomentose and somewhat glandular or glabrescent, thin-textured. **Capitula** radiate, solitary at ends of branches but the whole forming a large, compound, pyramidal inflorescence; involucral bracts in many rows, imbricate, lightly hairy and glandular. **Ray florets** conspicuous, longer than involucre, white, pink or mauve. **Disc florets** white often tinged mauve or yellow. **Flowering time** Mar.–June (Sept.). **Pappus** of many, barbellate bristles. **Cypselae** narrowly turbinate, brown, ribbed, hairy and glandular. In scrub on forest margins and on mountainsides, along rocky and cliff-backed watercourses, alt. 610–2 450 m; Sub-Escarpment Grassland, Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket (Insizwa S to Stutterheim and Grahamstown).

huttoni Harv.

Much-branched, scrambling shrub, up to 0.75 m high, branches zigzag towards the tip. **Leaves** alternate, petiolate, broadly lanceolate to narrowly ovate, margins remotely toothed, hairy on both sides; petioles auricled at base. **Capitula** radiate, solitary at ends of side branches; involucral bracts in many rows, imbricate, lightly hairy and glandular. **Ray florets** very short, not or scarcely exceeding involucre, white tipped pink. **Disc florets** yellow or white. **Flowering time** June–Sept. **Pappus** of many, barbellate bristles. **Cypselae** cylindrical, brown, ribbed, hairy and glandular. Mountain grassland in kloofs and along watercourses, forest margin, alt. 1 000–1 712 m; Sub-Escarpment Grassland, Drakensberg Grassland (Boschberg, Katberg and Hogsback).

polifolia (L.) Hutch.

Much-branched shrub, 0.3–2.0 m high. **Leaves** alternate, sessile, obovate, margins dentate, bases running down stem forming stem wings, upper surface sparsely hairy and glandular, lower surface densely felty hairy and glandular. **Capitula** radiate, solitary, sessile at ends of branches; involucral bracts in 4 or 5 rows, imbricate, hairy. **Ray florets** distinct, blue or purple. **Disc florets** yellow. **Flowering time** July–Oct. **Pappus** of many, subplumose bristles. **Cypselae** cylindrical, brown, ribbed and hairy. Rocky mountain slopes, alt. 60–1 200 m; Eastern Fynbos-Renosterveld (Port Elizabeth).

pyrifolia Less.

Erect, sparsely branched shrub, 0.9–1.6 m high. **Leaves** alternate, sessile to shortly petiolate, ovate, margins closely and regularly denticulate, upper surface glabrescent, lower surface densely white- or grey-felty-hairy, discolorous, thick textured. **Capitula** radiate, pedunculate, solitary at ends of branches; involucral bracts in many rows, imbricate, hairy. **Ray florets** distinct, white or pale to dark purple. **Disc florets** white, yellow or purple. **Flowering time** Dec.–May. **Pappus** of many, barbellate bristles. **Cypselae**

conical, brown, ribbed and hairy. Damp, rocky grassland on mountain slopes, often near rivers and streams, alt. 600–1 700 m; Sub-Escarpment Grassland, Drakensberg Grassland (Bosberg, Katberg and Hogsback).

PSEUDOGNAPHALIUM Kirp.

(Gnaphalieae)

Species ± 90, Africa, Asia, Europe and America; 3 in sthn Afr., widespread.

luteo-album (L.) Hilliard & B.L.Burtt

Cudweed, jersey cudweed; *roerkruid*, *vaalbossie* (A); *manku*, *musuwane* (SS); *mgilane* (Z)

Annual, thinly greyish white-woolly herb, decumbent and occasionally rooting at nodes, then erect, 0.5 m high. **Leaves** alternate, sessile, lower leaves oblanceolate, obtuse, becoming smaller and lanceolate to linear upwards, acute to acuminate, margins entire, concolorous. **Capitula** disciform, in clusters cymosely arranged (dense glomerules) at tips of branches; involucral bracts palest golden-brown, buff-coloured or whitish. **Outer florets** female, filiform, more than disc florets, whitish, tipped reddish. **Disc florets** tubular, whitish or yellow, tipped reddish. **Flowering time** Sept.–May. **Pappus** of barbellate bristles. **Cypselae** oblong, hairy. Originally from sthn Europe, widespread weed of cultivation, sandy or clayey soils near streams and marshes, or in gardens, alt. 5–2 408 m; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Aliwal North, Naude's Neck, Graaff-Reinet and Hogsback to Grahamstown).

oligandrum (DC.) Hilliard & B.L.Burtt

Undulate cudweed; *groenbossie* (A)

Erect, white-woolly, annual herb, up to 1 m high. **Leaves** alternate, sessile, oblong, oblong-lanceolate or lanceolate, apex subacute to acute, base cordate-clasping, not decurrent, margins entire, upper surface glandular, lower surface white-felted, discolorous. **Capitula** disciform, several together in tight clusters arranged in a large, corymbose panicle; involucral bracts whitish. **Outer florets** female, filiform, more than disc florets, yellowish. **Disc florets** tubular, yellowish. **Flowering time** Jan.–Mar. **Pappus** of barbellate bristles. **Cypselae** oblong, glabrous. Dry sandy or stony places, often on roadsides, alt. 5–2 135 m; Mesic Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Lady Grey, Mthatha to Komga).

undulatum (L.) Hilliard & B.L.Burtt

Cudweed, undulated cudweed; *groenbossie* (A); *mothepetelle* (SS)

Spreading, aromatic, grey-woolly, annual herb, up to 0.6 m high. **Leaves** alternate, sessile, oblong-lanceolate or lanceolate, upper ones linear-lanceolate, apex acute to acuminate, base cordate, main cauline leaves decurrent, wings often reaching the node below, margins entire, upper surface glandular, lower surface white-felted, discolorous. **Capitula** disciform, several together in dense clusters, these arranged in a large, corymbose panicle; involucral bracts whitish. **Outer florets** female, filiform, more than disc florets, yellowish. **Disc florets** tubular, yellowish. **Flowering time** Aug.–May. **Pappus** of barbellate bristles. **Cypselae** oblong, glabrous. Damp places, particularly around rock outcrops or on streambanks and riverbanks, or forest margins, alt. 40–2 745 m; Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment

Savanna, Dry Highveld Grassland, Albany Thicket (Lady Grey, Graaff-Reinet, Mthatha, Port Elizabeth and East London).

PTERONIA L.

(Astereae)

Gombos (A)

Species 70, mainly sthn Afr., N, B, FS, NC, WC, EC.

1a Leaves tufted, alternate

camphorata (L.) L.

Sandgombos (A)

Slender, aromatic shrub, up to 2 m high. **Leaves** tufted, or if scattered, then alternate or opposite or subopposite in var. *laevigata*, linear to filiform, long, acute, glabrous except for ciliate margins (short white teeth) (var. *longifolia*), setose all over or totally glabrous (var. *laevigata*), glandular. **Capitula** discoid, 1–few at branch tips, pedunculate; involucral bracts in many rows, imbricate, linear to linear-lanceolate, acute, straw-coloured, shortly and closely ciliate, shorter than florets. **Florets** yellow. **Flowering time** Oct. **Pappus** of straw-coloured, subplumose bristles, outer more slender than inner, basally connate in a ring. **Cypselae** elliptic, flattened, with thickened margins, glabrous and shining. Mountain tops and sides, alt. 10–1 600 m; Lower Karoo, Eastern Fynbos-Renosterveld (known from 2 localities in EC, Willowmore District and Kouga Mts).
Two varieties in EC: *P. camphorata* var. *laevigata* Harv. and *P. camphorata* var. *longifolia* Harv.

glaucescens DC.

Geelbergdraaibos (A)

Straggly shrub, 0.3–0.9 m high. **Leaves** tufted or when scattered, alternate, linear or subspathulate-linear, apex obtuse, narrowed to base, glabrous, succulent. **Capitula** discoid, solitary, terminal; involucral bracts in a few rows, imbricate, linear or linear-lanceolate, subobtuse, membranous, shortly ciliate, otherwise glabrous. **Florets** yellow. **Flowering time** Nov.? **Pappus** of yellowish, subplumose bristles. **Cypselae** narrow, with thickened margins, shortly villous. Habitat not recorded for EC, alt. 1 000–1 525 m; Upper Karoo, Albany Thicket (two uncertain records for EC, Middelburg and Graaff-Reinet).

stricta Aiton

Kaatjiegert (A)

Shrub, 0.5–3.0 m high. **Leaves** clustered or alternate, densely set, long-acicular, subterete, apex acute, succulent, margins sometimes ciliate in lower part. **Capitula** discoid, corymbose at ends of branches; involucral bracts in many rows, imbricate, longer than florets, linear or linear-lanceolate, tailed-acuminate, margins slightly ciliate. **Florets** greenish yellow. **Flowering time** Sept.–Nov., Feb. **Pappus** straw-coloured, plumose, united basally into a ring, outer more slender than inner. **Cypselae** elliptic, flattened, glabrous, margins thickened. On mountains, alt. 240–2 000 m; Eastern Fynbos-Renosterveld (along Swartberg Mts to Kouga and Tsitsikamma Mts).

teretifolia (Thunb.) Fourc.

Much-branched, erect shrub, 0.45–1.20 m high. **Leaves** alternate, linear-trigonous, apex acute or subacute, glabrous. **Capitula** discoid, crowded at ends of branches, shortly

pedunculate; involucral bracts in many rows, imbricate, lanceolate or narrowly lanceolate, apex subacute, glabrous. **Florets** yellow. **Flowering time** Jan.–May, Sept. **Pappus** of straw-coloured, barbellate bristles, outer more slender than inner. **Cypselae** turbinate, appressed-hairy. Grassland on hill slopes, alt. 45–800 m; Eastern Fynbos-Renosterveld, Albany Thicket, Sub-Escarpment Savanna (Kouga Mts, Humansdorp, Uitenhage, Port Elizabeth and Grahamstown).

1b Leaves opposite
2a Leaves glabrous

callosa DC.

Much-branched, dwarf shrub, up to 0.15 m high. **Leaves** linear, apex subobtuse, entire, glabrous, thickish. **Capitula** discoid, terminal, solitary, sessile; involucral bracts imbricate, apex obtuse and callous, margins ciliate. **Florets** yellow. **Cypselae** compressed, long-hairy. **Flowering time** and habitat unknown; Albany Thicket (Jansenville). Uncertain status, might be confused with e.g. *P. ciliata* Thunb.

paniculata Thunb.

Gombossie, *kambrobos*, *kraak-kraak* (A)

Much-branched shrub, up to 1.5 m high. **Leaves** opposite, connate at base and encircling branchlet, long, linear, with recurved subobtuse apices, fleshy, glabrous, viscid. **Capitula** discoid, narrowly turbinate, several in crowded corymbs at branch tips; involucral bracts in ± 4 rows, imbricate, outer ones ovate-oblong, obtuse, inner ones oblanceolate, obtuse, all with narrow hyaline, jagged margins. **Florets** golden-yellow. **Flowering time** Aug.–Feb. **Pappus** of whitish, barbellate bristles, inner much broader than outer. **Cypselae** with long hairs. Karroid slopes on shale, sandy soil, edges of bush clumps, alt. 10–1 524 m; Lower Karoo, Sub-Escarpment Savanna, Albany Thicket (fairly widespread, Uitenhage to Port Elizabeth and Grahamstown).

sordida N.E.Br.

Gombos(sie), *perdebossie*, *swartkaroo* (A)

Small shrub, 0.2–0.6 m high. **Leaves** opposite, subconnate at base, closely set, linear or lanceolate-linear, obtuse, ericoid, glabrous, minutely puberulous when young. **Capitula** discoid, terminal, solitary or few together, subcorymbosely arranged; involucral bracts in several rows, imbricate, oblong-linear, obtuse, green along middle with membranous margins, glabrous. **Florets** yellow. **Flowering time** July–Sept. **Pappus** of straw-coloured, subplumose bristles, outer more slender than inner. **Cypselae** oblong, densely long-hairy. Sandy soil or stony flats, alt. 790–1 435 m; Upper Karoo (Middelburg, Aberdeen, Cradock).

tricephala DC.

Biltongbos (A)

Small shrub, 0.3–0.8 m high. **Leaves** opposite, linear-trigonous, acute and hooked at apex, almost free from each other at base, glabrous or slightly scabrous on margins. **Capitula** discoid, in threes at branch tips, rarely solitary; involucral bracts in many rows, imbricate, acute or subacute, keeled near apex, glabrous, margins membranous and finely ciliate. **Florets** yellow. **Flowering time** Nov.–Jan. **Pappus** of straw-coloured, subplumose bristles, outer more slender than inner. **Cypselae** obovate-oblong, densely hairy. Grassland and hill slopes, alt. 1 200–1 600 m; Upper Karoo (Middelburg area).

2b Leaves hairy on both surfaces or ciliate along margins
3a Leaves hairy on both surfaces or at least papillate

acuta Muschl.

Shrub, 0.15–0.22 m high. **Leaves** small, opposite, densely set, connate at base, linear, acute or subobtuse, entire, thick, woolly pubescent with silvery hairs. **Capitula** discoid, solitary, terminal; involucral bracts in many rows, imbricate, bright greenish yellow, linear-lanceolate to linear-oblong, all with narrow, membranous margins, acutely cuspidate-acuminate, woolly villous. **Florets** yellow. **Flowering time** Nov., Dec. **Pappus** of straw-coloured, barbellate bristles, outer more slender than inner. **Cypselae** obconic, densely appressed villous. Limestone flats and slopes, alt. 1 150–1 190 m; Upper Karoo (Middelburg District).

bolusii E.Phillips

Wildebeestgombos (A)

Straggling shrub, up to 0.6 m high, branches recurving. **Leaves** small, opposite but not connate at base, linear-lanceolate or ovate, keeled below, white-woolly on both surfaces. **Capitula** discoid, solitary at branch tips, cylindric; involucral bracts in many rows, imbricate, broadly ovate-triangular to ovate-lanceolate, acute or subacute, with broad band of grey-woolly hairs up middle. **Florets** yellow. **Flowering time** Oct. **Pappus** of brownish yellow or straw-coloured barbellate bristles, outer more slender than inner. **Cypselae** shortly hairy in lower part. Sandy soil in open plains, alt. 790–1 310 m; Upper Karoo (Graaff-Reinet).

erythrochaeta DC.

Boegoebossie, *boegoekaroo* (A)

Shrub, 0.3–0.9 m high, branches arching. **Leaves** opposite, ovate or ovate-lanceolate, subacute, entire, finely canous-pubescent. **Capitula** discoid, solitary, terminal; involucral bracts in many rows, imbricate, lanceolate, acute or subacute, margins membranous, minutely ciliate, red-tinged, finely puberulous. **Florets** yellow. **Flowering time** Sept., Oct. **Pappus** of purplish red, barbellate bristles. **Cypselae** oblong-linear, densely villous. Sandy soil, grassland, alt. 1 000–1 435 m; Upper Karoo (Middelburg and Cradock Districts).

glauca Thunb.

Bittergibbie, *boegoekaroo*, *draaibos*, *geelboegoekaroo*, *perdekaroo*, *ribbokbos*, *vaalkraak-kraak*, *vaalt'ibbie* (A)

Shrub, up to 0.7 m high. **Leaves** opposite, small, lanceolate or linear-lanceolate, obtuse or subacute, entire, canous-tomentose. **Capitula** discoid, solitary, terminal, sessile; involucral bracts in many rows, imbricate, ovate-lanceolate or oblong-lanceolate, subacute with membranous margins, distinct midrib and band of canous hairs up middle. **Florets** yellow. **Flowering time** May–Aug., Jan. **Pappus** of straw-coloured, barbellate bristles, outer more slender than inner. **Cypselae** obovate, hairy in lower half. Sandy to gravelly areas, on rocky outcrops and hill slopes, alt. 500–2 500 m; Upper Karoo, Dry Highveld Grassland, Rainshadow Valley Karoo, Albany Thicket (Middelburg, Graaff-Reinet, Cradock to Tarka River and Peddie).

incana (Burm.) DC.

Blue bush, wild lavender bush; *bloubos*, *kraakbos*, *laventelbossie*, *perdebossie*, *ribbokbos*, *scholtzbos*, *t'kaibebos* (A)

Divaricately branched, grey-leaved shrub, up to 1.5 m high. **Leaves** opposite, small, linear or spathulate-linear, obtuse, narrowed to and connate at base, coriaceous, white-

woolly. **Capitula** discoid, solitary and sessile at branch tips; involucral bracts in many rows, imbricate, narrowly ovate to oblong-linear, obtuse, glabrous, with narrowly membranous, hyaline margins. **Florets** yellow. **Flowering time** Aug.–Dec. **Pappus** of yellowish white, subplumose bristles, outer more slender than inner. **Cypselae** obovate, compressed, shortly hairy in lower part, glandular. Stony slopes on sand or clay, grassland, savanna, river valleys, invading overgrazed and disturbed areas, alt. 0–2 500 m; Eastern Fynbos-Renosterveld, Albany Thicket, Lower Karoo, Sub-Escarpment Savanna (Keiskamma, Baviaanskloof, Port Elizabeth, Peddie, Grahamstown and Humansdorp).

membranacea L.f.

Bierbos (A)

Shrub, up to 1 m high, older branches quadrangular. **Leaves** opposite, small, oblong to oblong-lanceolate, acute, slightly narrowed to a broad base, densely papillate (puberulous) on both surfaces. **Capitula** discoid, large, solitary at branch tips; involucral bracts in many rows, imbricate, oblong-lanceolate, apex rounded, with broad membranous, jagged margins. **Florets** pale yellow. **Flowering time** Sept.–Dec. **Pappus** of yellowish, subplumose bristles, outer more slender than inner. **Cypselae** densely long-villous. Mostly dry sandstone slopes, watercourses, alt. 500–1 530 m; Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Somerset East, Willowmore, Joubertina, Port Elizabeth and Grahamstown).

[E]quinqueflora DC.

Dwarf shrub, up to 0.2 m high. **Leaves** opposite, slightly connate at base, linear or lanceolate-linear, subobtuse or subacute, hairy on both surfaces. **Capitula** discoid, solitary, terminal, sessile; involucral bracts in ± 4 rows, imbricate, ovate, subacute, with band of short hairs up middle. **Florets** yellow. **Flowering time** Nov.? **Pappus** of reddish brown, barbellate bristles, outer more slender than inner. **Cypselae** obovate-oblong, long-hairy. Habitat unknown, alt. ± 855 m; Albany Thicket, Sub-Escarpment Grassland (known from literature, Stormberg and Voëlrivier).

3b Leaves ciliate or dentate along margins

adenocarpa Harv.

Anyskruie, *gombos(sie)*, *grootknopboegoebossie* (A)

Twiggy shrublet, up to 0.9 m high. **Leaves** opposite, small, oblong-oblanceolate or obovate-elliptic, flat, acute or subacute, recurved at apex, narrowed to and slightly connate at base, scabrid on margins otherwise glabrous. **Capitula** discoid, solitary at branch tips, large; involucral bracts in many rows, imbricate, broadly ovate to oblanceolate, apex obtuse or truncate, viscid, margins membranous and sometimes jagged, pinkish. **Florets** pinkish mauve, fragrant. **Flowering time** Aug.–Nov. **Pappus** of brownish or straw-coloured, subplumose, outer more slender than inner. **Cypselae** obovate, with thickened margins, densely glandular and sometimes a few long hairs. Hill slopes and ridges, alt. 305–1 370 m; Upper Karoo, Dry Highveld Grassland, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld, Lower Karoo (Middelburg S to Willowmore, Port Elizabeth and Grahamstown).

elongata Thunb.

Gomknopboegoebossie (A)

Shrub, 0.3–0.6 m high. **Leaves** opposite, not connate at base, linear, obtuse or subacute, keeled below, glabrous, margins sharply and roughly dentate. **Capitula** discoid, terminal,

solitary, sessile; involucral bracts in many rows, ovate-elliptic, oblong or oblong-linear, obtuse to acute, glabrous, margins membranous and somewhat jagged. **Florets** yellow?. **Flowering time** not recorded for EC. **Pappus** of yellowish brown, barbellate bristles. **Cypselae** oblong-obovoid, with tufted ring of hairs at base, otherwise glabrous or nearly so. Slopes, alt. 150–1 370 m; Albany Thicket (Sundays River).

glomerata L.f.

Geelboegoekaroo, *gombossie*, *perdebossie* (A)

Low, twiggy shrublet, up to 0.76 m high, branches often viscid above. **Leaves** opposite, minute, oblong or oblong-lanceolate, in tight clusters, shortly ciliate on margins, fleshy. **Capitula** discoid, solitary at branch tips; involucral bracts in many rows, imbricate, broadly ovate to oblong, apex rounded, viscid, minutely ciliolate. **Florets** yellow. **Flowering time** Aug.–Oct., Jan. **Pappus** straw-coloured, barbellate bristles, outer more slender than inner. **Cypselae** obovate, covered with long hairs. Clay slopes, stony or sandy soil, alt. 460–1 890 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland (Middelburg, Graaff-Reinet, Somerset East and Adelaide).

mucronata DC.

Much-branched shrub, up to 1 m high. **Leaves** small, opposite, shortly connate at base, linear, apex obtuse, margins serrulate-ciliolate. **Capitula** discoid, solitary, terminal; involucral bracts in many rows, imbricate, ovate to oblong-linear, membranous and straw-coloured, apex mucronate, recurved, margins jagged, ciliate, glabrous. **Florets** yellow. **Flowering time** not recorded for EC. **Pappus** of yellowish, subplumose bristles. **Cypselae** densely hairy. Plains; Albany Thicket (near Graaff-Reinet and Jansenville).

punctata E.Phillips

Perdeboegoebos (A)

Sparingly branched subshrub, 0.15–0.60 m high. **Leaves** opposite, upper ones sometimes alternate, obovate-oblong to linear-oblong, apex obtuse, narrowed at base, punctate with black dots, glabrous, margins ciliate. **Capitula** discoid, terminal, solitary; involucral bracts in many rows, imbricate, oblong-orbicular, saccate below apex, margins membranous, glabrous. **Florets** yellow. **Flowering time** Aug.–Oct. **Pappus** of straw-coloured, subplumose bristles, outer more slender than inner. **Cypselae** oblong, densely appressed-hairy. Hillsides, river flats or vlei areas, alt. 730–1 310 m; Upper Karoo, Lower Karoo, Albany Thicket (Middelburg, Graaff-Reinet, Cradock and Willowmore Districts).

staehelinoides DC.

Gomknopboegoebossie (A)

Rigid shrub, 0.30–0.45 m high. **Leaves** opposite, linear or linear-lanceolate, apex acute, free at base, margins ciliate, glabrous. **Capitula** discoid, large, terminal, solitary, sessile; **involucral bracts** in many rows, imbricate, ovate to ovate-lanceolate, apex subacute or subobtuse, margins membranous. **Florets** yellow. **Flowering time** June–Sept. **Pappus** of whitish, barbellate bristles. **Cypselae** glabrous except for tuft of hairs at base and some glands. Stony or gravelly soil, alt. 550–1 370 m; Upper Karoo, Albany Thicket, Dry Highveld Grassland (Middelburg, Graaff-Reinet and Cradock areas).

viscosa Thunb.

Anyskruie, *gombos(sie)* (A)

Shrublet, 0.2–0.9 m high. **Leaves** opposite, only slightly connate at base, small, lanceolate or oblong-lanceolate, apex slightly mucronate, keeled, ciliate on margins and often

lower surface, thick and fleshy. **Capitula** discoid, large, solitary, terminal; involucral bracts in many rows, imbricate, outer ovate, subacute, inner linear-lanceolate, acute, rugulose outside. **Florets** yellow. **Flowering time** July, Oct. **Pappus** of straw-coloured, subplumose bristles, outer more slender than inner. **Cypselae** obovate, compressed, margins ribbed, glabrous. Stony hill slopes, alt. 430–1 524 m; Lower Karoo, Rainshadow Valley Karoo (Traka River, Aberdeen and Jansenville areas).

PULICARIA Gaertn.

(Inuleae)

Fleabane

Species 77, Europe, Africa and Asia; 1 in sthn Afr., widespread.

scabra (Thunb.) Druce

Aambeibos (A); *umkhathula* (Z)

Pubescent to glabrescent, annual herb, up to 1.52 m high. **Leaves** alternate, sessile, linear-oblong, decreasing in size upwards, base cordate-amplexicaul, margins entire or remotely denticulate. **Capitula** shortly radiate or disciform, solitary, pedunculate, arranged in large or small spreading corymbs; involucral bracts in 4 or 5 rows, linear-lanceolate, glandular, hairy. **Ray florets** female, shortly radiate, arranged in 1 or 2 rows, corolla yellow. **Disc florets** many, tubular, yellow. **Flowering time** Dec.–Apr. **Pappus** of inner row of barbellate bristles, outer row of small scales. **Cypselae** narrowly cylindric, ribbed, thinly hairy. In marshy or damp places, alt. 5–2 200 m; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Dry Highveld Grassland, Drakensberg Grassland, Albany Thicket (widespread, Aliwal North and Clydesdale to Cradock, Uitenhage and Grahamstown).

Can be confused with *Doellia cafra* but that species has purple florets and outer female florets are filiform and arranged in many rows.

RELHANIA L'Hér.

(Gnaphalieae)

Species 13 with 4 subspecies, endemic to sthn Afr., FS, KZN, L, NC, WC, EC.

calycina (L.f.) L'Hér.

Sparsely branched shrub, 0.3–0.5(–1.0) m high. **Leaves** alternate, erect-spreading, flat to slightly canaliculate, hard and rigid, distinctly 3–5-nerved, lanceolate, 8–22 mm long, glabrous or pilose, acute to pungent. **Capitula** solitary, sessile; involucre widely campanulate, 8–20 mm wide; involucral bracts 30–75, outer ovate, inner gradually longer, spreading. **Receptacle** paleate, paleae 7.0–11.5 mm long, acute, persistent. **Ray florets** 15–40, tube 3–5 mm long, with scattered hairs, lamina 8.5–14.0 mm long; cypselae triquetrous, 2.4–3.5 mm long, shortly pilose. **Disc florets** 50–250, perfect, 5–8 mm long. **Flowering time** mainly Oct.–Jan. **Pappus** of crown-like scales, up to 2 mm long. **Cypselae** flat, 2.2–3.5 mm long, glabrous or pilose. Stony and rocky mountain slopes, alt. 0–1 000 m; Lower Karoo, Eastern Fynbos-Renosterveld (George, Knysna, Humansdorp and Grahamstown).

Three subspecies are recognised over the distribution area from the Cedarberg, Witteberg and Swartberg Mts to EC.

decussata L'Hér.

Sparsely branched shrublet, up to 0.3 m high. **Leaves** decussate, in 4 indistinct rows, somewhat incurved, narrowly triangular, 3–10 mm long, glabrous dorsally, densely lanate and whitish above, acute or pungent. **Capitula** solitary, sessile, terminal; involucre campanulate, 6–15 mm wide; involucral bracts 40–60, outer ovate, innermost narrowly oblong, up to 17 mm long, acute. **Receptacle** flat, paleate; paleae 6–9 mm long, acute, persistent. **Ray florets** 14–35, tube 2.5–3.5 mm long, lamina 11–15 mm long. Cypselae somewhat triquetrous, 2–3 mm long, villose. **Pappus** crown-like, scales, up to 2 mm long. **Disc florets** > 50, perfect, 6.0–7.5 mm long. **Flowering time** Sept.–Nov. **Pappus** of crown-like, ± connate scales, up to 1 mm long. **Cypselae** somewhat triquetrous, 2.0–2.5 mm long, glabrous or sparsely pilose. Stony mountain slopes, alt. 1 000–2 700 m; Eastern Fynbos-Renosterveld (Blesberg, Slypsteenberg, Antoniesberg, Kouga and Tsitsikamma mts).

dieterlenii (Phillips) Bremer

Moderately branched, up to 1.5 m high, upright or hanging shrub. **Leaves** decussate, in 4 distinct rows, spreading, linear, 5–16 mm long, glabrous or tomentose dorsally, densely lanate and whitish above. **Capitula** solitary, sessile, terminal; involucre cyathiform, 3–6 mm wide; involucral bracts 25–35, in 4 rows, ovate to oblong, up to 9.5 × 2.5 mm long, dorsally gland-dotted, obtuse-rounded. **Receptacle** flat-convex, epaleate. **Ray florets** 6–10, lamina elliptic, 5.5–6.5 mm long, 2.2–2.8 mm wide, 4–6-veined. **Disc florets** 20–30, perfect, corolla lobes 0.7–0.8 mm long, dorsally gland-dotted. **Flowering time** Oct.–Jan. **Pappus** of crown-like, ± connate scales, up to 1.2 mm long. **Cypselae** almost terete, narrowly oblong, 4.5–5.5 mm long, glabrous. Stony and rocky mountain slopes and sometimes hanging from cliffs; Drakensberg Grassland (endemic to L and sthn Drakensberg, Rhodes and Mount Ben Macdhui).

pungens L'Hér.

Sparsely branched shrublet, 0.25–0.60 m high. **Leaves** alternate or decussate, erect to spreading, straight or slightly twisted and curved, distinctly 3–9-nerved, linear-lanceolate or narrowly elliptic, 8–25 mm long, glabrous or ± deciduously tomentose dorsally, densely lanate and whitish above, acute, often pungent. **Capitula** solitary, sessile; involucre campanulate, 6–18 mm wide; involucral bracts 25–60, spreading, brownish apical limb, up to 18 × 4.5 mm. **Receptacle** paleate, paleae canaliculate, subulate, 5.5–10.0 mm long, persistent. **Ray florets** 15–30, tube triquetrous, 2.5–5.0 mm long, glabrous or with scattered hairs, lamina 6.5–14.0 mm long. **Disc florets** 25–100, perfect, 4.5–7.5 mm long. **Flowering time** Oct.–Feb. **Pappus** of crown-like scales, up to 1.9 mm long. **Cypselae** flat or triquetrous, 1.9–3.5 mm long, glabrous or shortly hispid-pilose. In fynbos and grassland on stony, sandy or clayey soil on flats and lower mountain slopes, alt. 10–1 800 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Weza State Forest to Port Edward southwards, from Queenstown across Amatole Mts to Kei River Mouth and from Humansdorp to Port Elizabeth and Grahamstown).

Three subspecies recognised over the extensive distribution area from the SW Cape, Bredasdorp and George to EC and KZN.

speciosa (DC.) Harv.

Sparsely branched, 0.7–1.0 m high shrub. **Leaves** spreading or recurved, distinctly 5–9-nerved, 8–35 mm long, glabrous, pungent. **Capitula** solitary, sessile; involucre

widely campanulate, 12–30 mm wide; involucral bracts 50–90, entire or apically slightly crenulate, up to 20 mm long. **Receptacle** paleate, paleae 7–12 mm long, persistent. **Ray florets** 25–45, tube somewhat triquetrous, 3–6 mm long, with mainly laterally and dorsally, ± laxly scattered, subulate-triangular hairs, lamina 15–25 mm long, yellow but dorsally brownish purple, 4–10-veined. **Disc florets** 175–250, perfect, 6–8 mm long. **Flowering time** mainly Sept.–Dec. **Pappus** of crown-like, ± connate scales, up to 1.6 mm long. **Cypselae** triquetrous or flattened, 2.8–4.2 mm long, glabrous or shortly hispid-pilose. Rocky and stony mountain slopes, alt. 600–1 500 m; Eastern Fynbos-Renosterveld (Swartberg Mts to Baviaanskloof, Humansdorp and Port Elizabeth).

RHYNCHOPSIDIUM DC.

(Gnaphalieae)

Species 2, endemic to sthn Afr., NC, WC, EC.

sessiliflorum (L.f.) DC.

Annual herb, 0.02–0.15(–0.25) m high. **Leaves** alternate, spreading, linear, 5–20 mm long, 0.3–1.3 mm wide, glandular. **Capitula** solitary, mostly sessile; involucre urceolate, ovate in outline, 1.5–3.0 mm wide; involucral bracts 7–25, outer ovate, inner ovate-oblong with a spreading apical limb, up to 6 mm long. **Receptacle** flat, paleate. **Ray florets** 3–9, tube cylindrical, with scattered hairs, lamina elliptic, 1.5–2.2 mm long, 0.7–1.3 mm wide. **Disc florets** 5–25, perfect, with scattered hairs in upper half. **Flowering time** mainly Aug.–Dec. **Pappus** of crown-like, ± connate scales, up to 0.6 mm long. **Cypselae** narrowly elliptic, 2–3 mm long, 0.4–0.7 mm wide, ± densely villose with apically hooked hairs. On flats and in open areas in sandy and clayey soil, often on disturbed ground, alt. 600–1 200 m; Eastern Fynbos-Renosterveld (from WC to Humansdorp and Port Elizabeth).

ROSENIA Thunb. emended K.Bremer

(Gnaphalieae)

Species 4, endemic to sthn Afr., N, B, NW, FS, NC, WC, EC.

humilis (Less.) K.Bremer

Bekkerbos(sie), *gemsbok-karoo*, *perdebossie*, *springbok-karoo*, *volstruisbossie*, *blouper-de-karoo*, *hartebeeskaroo* (A)

Densely branched, compact shrub, 0.01–1.06 m high. **Leaves** variable, linear to obovate, 1–20 mm long, glabrous and bright green, glandular; involucre urceolate, cyathiform or campanulate, 2–11 mm wide; involucral bracts 10–55, up to 9 × 3 mm, mostly glabrous. **Receptacle** mostly epaleate. **Ray florets** 5–22, lamina 3.5–13.0 mm long. **Disc florets** 5–40. **Flowering time** mainly Aug.–Oct. **Pappus** of crown-like, minutely toothed, connate scales, up to 1.5 mm long, often also with 1–3 bristles. **Cypselae** almost terete, oblong, 2.0–4.8 mm long, glabrous or sparsely pilose, always with a basal tuft of hairs. Mostly in stony soil, sand, shale or clayey karoo flats. Sometimes in partially moist, partially dried-up areas, alt. 300–1 500 m; Upper Karoo, Dry Highveld Grassland, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Albert District to Burgersdorp southwards, from Middelburg to Molteno and from Bosduiwerivier to Graaff-Reinet, Pearston, Uitenhage and Grahamstown).

oppositifolia (DC.) K.Bremer
Moderately branched shrub, 0.1–1.0 m high. **Leaves** triquetrous with projecting midrib dorsally, linear, 1.5–12 × 0.4–0.8 mm, tomentose on both sides, dark greyish green; involucre narrowly cyathiform-campanulate, 2–6 mm wide; involucral bracts 12–45, outer elliptic, inner gradually longer and obovate-oblong, apically spreading and brown with scarious margins. **Receptacle** minute, epaleate. **Ray florets** 3–8, lamina elliptic, 3.0–4.5 mm long. **Disc florets** 5–15, corolla 4.0–5.3 mm long. **Flowering time** Sept., Oct. **Pappus** of crown-like, connate scales, up to 1.3 mm long, often also with 1 or 2 bristles. **Cypselae** oblong, 2.0–3.3 mm long, glabrous. Shaly, sandy or stony karoo veld, often regarded as undesirable for grazing, alt. 600–1 800 m; Upper Karoo (Middelburg, Kompasberg and Sneeuberg Mts).

SCHISTOSTEPHIUM Less.

(Anthemideae)

Species 12, south-tropical Africa; 9 in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, WC, EC.

1a Leaves petiolate

[E]flabelliforme Less.
Erect shrub, 0.45–1.00 m high. **Leaves** alternate, petiolate, fan-shaped, 3–5-nerved, lobes rounded, base cuneate, densely sericeous. **Capitula** disciform, small, in terminal corymbs; involucral bracts hairy. **Receptacle** epaleate. **Outer female florets** in 1 row, corolla short, tubular, tube shorter than style, yellow. **Disc florets** tubular, 4-lobed, glandular, yellow. **Flowering time** May–Aug. **Pappus** absent. **Cypselae** of outer florets flattened, long-hairy, of disc florets glabrous, angular. Hill or mountain slopes, forest margins, usually in damp situations, alt. 300–1 465 m; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Lower Karoo (endemic to EC Mts, Katberg, Amatole Mts, Hogsback, Suurberg near Grahamstown).

rotundifolium (DC.) Fenzl ex Harv.
Robust, erect, branched shrub, up to 1.6 m high. **Leaves** alternate, petiolate, broadly ovate to rotund in outline, margins coarsely crenate-dentate, lobes broad and deep, mucronate, silky tomentose. **Capitula** disciform, in corymbs. **Receptacle** epaleate. **Outer female florets** with short corolla tube, shorter than style, bright yellow. **Disc florets** tubular, widening upwards, yellow. **Flowering time** Apr.–July (Dec.). **Pappus** absent. **Cypselae** of outer florets flattened, long-hairy, of disc florets angular, sparsely glandular. Forest margins, alt. 2–2 000 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (Bizana, Port St Johns and East London).

1b Leaves sessile or subsessile
2a Leaves entire

umbellatum (L.f.) Bremer & Humphries
Little-branched shrub, 0.45–2.00 m high. **Leaves** alternate, sessile, elliptic, entire, densely pilose with straight, appressed hairs. **Capitula** discoid, solitary or a few grouped together in a lax, terminal cyme. **Receptacle** epaleate. **Florets** tubular, widening upwards, yellow. **Flowering time** all year. **Pappus** absent. **Cypselae** brown, obovate, flattened, winged, glandular. Forest margins, on cliffs and in fynbos on hillsides, alt. 0–1 500 m; Eastern Fynbos-Renosterveld, Indigenous Forests (Humansdorp).

Plants from higher altitudes have a more condensed growth habit, with fewer capitula and smaller, densely pubescent leaves.

2b Leaves variously cut
3a Capitula solitary

griseum (Harv.) Hutch.
Erect, densely silky-canescent, perennial herb, up to 0.75 m high. **Leaves** alternate, sessile, pinnately divided, lobes linear, acute, margins entire, strongly revolute. **Capitula** discoid, solitary, on long, nude peduncles. **Receptacle** epaleate. **Florets** tubular, widening above, bright yellow. **Flowering time** Dec. **Pappus** absent. **Cypselae** angled, glabrous. Short, stony grassland, alt. 300–1 300 m; Sub-Escarpment Grassland (2 old records from Clydesdale).

3b Capitula in terminal corymbs

crataegifolium (DC.) Fenzl ex Harv.
Grey-silky-villous to glabrescent, decumbent or erect, perennial herb, up to 1.2 m high. **Leaves** alternate, sessile, ovate or oblong-ovate in outline, sharply and deeply toothed, pinnately lobed or incised almost to midrib, margins of lobes entire or with 1 or 2 teeth. **Capitula** disciform, in terminal corymbs. **Receptacle** epaleate. **Ray florets** female, few, tubular, swollen, bright yellow. **Disc florets** tubular, 4-lobed, bright yellow. **Flowering time** Jan.–Apr. **Pappus** absent. **Cypselae** oblong-obovate, slightly angled. Stony grass slopes, particularly around rock outcrops, alt. 300–2 950 m; Mesic Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket (widespread, Lady Grey area to Clydesdale, Queenstown, Grahamstown and Bathurst).

heptalobum (DC.) Oliv. & Hiern
Pubescent or thinly hairy subshrub, up to 1.5 m high. **Leaves** alternate, sessile, roughly oblong in outline, pinnatisect, lobes lanceolate to oblong, mucronate. **Capitula** disciform, small, in corymbs. **Receptacle** paleate. **Outer florets** female, in 1 row, tubular, swollen, bright yellow. **Disc florets** tubular, widening upwards, yellow. **Flowering time** (Sept.) Dec.–May. **Pappus** absent. **Cypselae** angled, glandular. Margins of forest and bush clumps, alt. 5–2 300 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Clydesdale to Kentani).

hippiifolium (DC.) Hutch.
Shrub, up to 1.4 m high, glabrous or nearly so. **Leaves** alternate, subsessile, oblong in outline, once or twice pinnatisect, lobes lanceolate, mucronate, entire or few-toothed. **Capitula** discoid, small, many in terminal corymbs. **Receptacle** epaleate. **Florets** tubular, widening upwards, bright yellow. **Flowering time** Mar.–Nov. **Pappus** absent. **Cypselae** angled, glandular. Grassland on hillsides, alt. 120–1 830 m; Sub-Escarpment Grassland, Indigenous Forests, Drakensberg Grassland (Glengarry to Stutterheim).

*SCHKUHRIA Roth

(Helenieae)

Species 6, North and South America; 1 naturalised in sthn Afr., widespread.

pinnata (Lam.) Cabrera
Annual herb, 0.15–0.60 m high; much branched, sparsely glandular-pubescent. **Leaves** alternate, sessile, dissected, segments narrow, margins entire. **Capitula** radiate

or discoid, several flowered, on long peduncles, terminal and axillary; involucre turbinate or campanulate; bracts in 1–3 rows. **Receptacle** epaleate. **Ray florets** when present, female, fertile; corolla yellow, strap-shaped; style branches linear, obtuse. **Disc florets** bisexual, fertile; corolla yellow or tinged reddish, tubular below, campanulate above, 5-toothed. **Anthers** with base and apical appendage both obtuse; style branches linear, apex rotundate-truncate or shortly appendaged. **Flowering time** (July) Dec.–Apr. **Pappus** of 8–10 scales, midrib prominent. **Cypselae** narrowly obpyramidal, 4-angled. Naturalised, widespread weed of disturbed areas, alt. 5–2 125 m; Upper Karoo, Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket (Albert District S, from Middelburg to Queenstown, Adelaide to Alice and Kabonga to Grahamstown).

SENECIO L.

(Senecioneae)

Species ± 1 250; cosmopolitan, mostly South America and Africa; ± 300 in sthn Afr., widespread, some weedy, some toxic; 128 in EC.

1a Plants erect or decumbent, occasionally prostrate, but never scandent, twining nor diffuse
2a Succulent herbs with thick leaves; flowers white, discoid
3a Leaves linear-cylindrical or linear-fusiform
4a Involucral bracts ± 20 mm long; capitula single

acaulis (L.f.) Sch.Bip.

Glabrous, perennial herb, succulent, up to 0.3 m high, rhizomes ± tuberous. **Stems** few, short, thick, simple, erect, rough with leaf bases, leaf rosette above. **Leaves** linear-cylindrical, sessile, up to 150 × 4 mm, clasping at base, ± grooved window above, longitudinal transparent stripes 12–16. **Inflorescence** simple, 1-headed; peduncle up to 200 mm high. **Capitula** discoid, white; involucral bracts 10–16, ± 20 mm long; calyculus bracts few, small. **Flowering time** mainly Oct., Nov. **Cypselae** cylindrical, 2 mm long, ribbed, hairy on ribs. Karroid scrub; Eastern Fynbos-Renosterveld, Albany Thicket (rare, Port Elizabeth, Albany).

4b Involucral bracts 7–14 mm long; capitula 1–several
5a Leaves with a distinct window within a central groove on the upper surface

pondoensis Van Jaarsv. & A.E.van Wyk

Glabrous, perennial herb, succulent. **Stems** greyish to purplish green, spreading, ± prostrate, rooting. **Leaves** ascending, linear-fusiform, pruinose, 45–60 mm long, apex mucronate, purplish; upper (inner) surface flat to longitudinally grooved, with a 2 mm wide translucent window. **Inflorescence** a lax corymb. **Capitula** ± few, discoid, white; involucre campanulate; bracts ± 8, 10 mm long; calyculus bracts 1 or 2. **Flowering time** Aug.–Oct. **Cypselae** ± cylindrical, 1.5 mm long. Cliff faces; Indian Ocean Coastal Belt, Indigenous Forests (Pondoland, Mzamba River Gorge, very rare endemic).

5b Leaves not as above
6a Stems prostrate and mat-forming

radicans (L.f.) Sch.Bip.

Bobbejaantoontjies, *-vingertjies* (A)

Glabrous, perennial herb, prostrate, succulent, mat-forming, rooting, leafy. **Leaves** fusiform, ± sessile, up to 50 × 9 mm, drying ± linear-falcate. **Inflorescence** on up to 150 mm high, ± nude, erect, terminal peduncles. **Capitula** 1 or 2, discoid, white; involucre turbinate-campanulate; bracts 12–14, 9–14 mm long; calyculus bracts short, several.

Flowering time mainly Mar.–June. **Cypselae** cylindrical, 3 mm long, ± glabrous. Dry scrub; Upper Karoo, Lower Karoo, Dry Highveld Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Steynsburg S to Willowmore, Port Elizabeth and Peddie, common).

6b Stems erect or sprawling, not prostrate and mat-forming
7a Involucral bracts 7 or 8

ficoides (L.) Sch.Bip.

Glabrous, powdery-glaucous, succulent, perennial herb or shrublet, erect or sprawling, up to 1 m high. **Stems** brittle, leafy above, leaf scars below. **Leaves** fusiform, both ends tapered, sessile, ± compressed laterally, up to 150 mm long, many longitudinal, translucent stripes. **Inflorescence** a terminal subcorymb. **Capitula** several, discoid, white; involucre tubular; bracts 7 or 8, 7–8 mm long; calyculus bracts few, minute. **Flowering time** mainly Mar.–July. **Cypselae** cylindrical, 4 mm long, ribbed, hairy. Rocky slopes, also cultivated; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp, Port Elizabeth).

7b Involucral bracts ± 12

crassulaefolius (DC.) Sch.Bip.

Glabrous, grey-green, succulent, perennial herb, erect or sprawling, up to 0.3 m high. **Stems** short, simple, rough with old leaf bases. **Leaves** crowded above, linear-cylindrical, grey-green, up to 65 mm long. **Inflorescence** terminal; peduncle up to 200 mm long, 1–few-headed. **Capitula** discoid, mostly white; involucre campanulate; bracts ± 12, 7–8 mm long; calyculus bracts few, minute. **Flowering time** May–Sept. **Cypselae** 2.5 mm long, ± cylindrical, ribbed, hairy. Rocky slopes, karroid; Albany Thicket, Eastern Fynbos-Renosterveld (Willowmore and Humansdorp to Albany).

3b Leaves not as above, or absent
8a Leaves ± globular

rowleyanus H.Jacobsen

String-of-beads senecio

Glabrous, succulent, perennial herb, creeper, mat-forming. **Stems** thin, prostrate, up to 200 mm long. **Leaves** sessile or subsessile, ± globular, ± compressed, 5–8 mm in diam., glaucous-green. **Inflorescence** terminal; peduncle erect, up to 80 mm long. **Capitula** 1 or 2, discoid, white to cream-coloured; involucre tubular; bracts ± 10, 8–10 mm long; calyculus bracts few, minute. **Flowering time** June–Nov. **Cypselae** cylindrical, 2 mm long, ribbed, hairy. Karroid, also cultivated; Lower Karoo, Upper Karoo, Albany Thicket (rare, Willowmore to Cradock and Alexandria).

8b Leaves ± deltoid in outline, or absent

articulatus (L.) Sch.Bip.

Worsies, *worsplantjie* (A)

Glabrous, succulent, perennial, herbaceous shrublet, up to 0.6 m high, also leafless. **Stems** decumbent to erect, cylindrical, swollen, jointed, grey-green, sometimes mottled purple or darker green. **Leaves** glaucous, long-petioled, outline ± deltoid, up to 30 mm long, often deeply 3-lobed, terminal lobe large. **Inflorescence** terminal, corymbose, few–several-headed; peduncle up to 150 mm long. **Capitula** discoid, white or yellowish; involucre tubular; bracts 8–10, 8 mm long; calyculus bracts few, minute. **Flowering time** Apr.–July. **Cypselae** cylindrical, 4 mm long, ribbed, hairy. Rocky slopes, karoo, scrub, bush, also cultivated; Albany Thicket, Eastern Fynbos-Renosterveld (Steytlerville and Komga to Humansdorp).

2b Plants herbaceous to woody or somewhat succulent; if succulent, then flowers various shades of yellow or purple
9a Flowers purple, blue, mauve, pink, pale creamy or mustard yellow or white, never bright clear yellow nor orange-yellow
10a Capitula radiate, rays pale yellow or white
11a Leaves auricled, at least upper
12a Leaf lobes blunt

glutinosus Thunb.

Taaigeelhongerblom (A)

Erect, annual herb, glandular-hairy. **Stems** robust, branched above, up to 1 m high. **Leaves** up to 150 mm long, oblong to oblong-obovate in outline, pinnatifid, lobes blunt, bluntly toothed or repand, lower leaves petiolate, upper sessile, auricled. **Inflorescence** laxly corymbose. **Capitula** several, radiate, disc and rays (6–8) yellow; involucre campanulate; bracts ± 12, 6 mm long; calyculus bracts very few, minute. **Flowering time** mainly Aug. **Cypselae** cylindrical, 4 mm long, ribs shortly hairy. Grassland; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp to Victoria East and Bathurst).

12b Leaf lobes not blunt

poseideonis Hilliard & B.L.Burtt

Biennial(?) herb, branching, up to 1.3 m high. **Stems** glandular-pubescent, leafy. **Leaves** ± lyrate, up to 150 × 65 mm, sessile, apical lobe triangular, acute, base auricled, clasping, margins remotely callose-denticulate, ± hairy both sides. **Inflorescence** an open, corymbose panicle. **Capitula** few–many, radiate (rarely discoid), disc and rays (± 8) white, mauve, purple; involucre turbinate-campanulate; bracts 12–14, 6–7 mm long, glandular-pubescent, calyculus bracts 2 or 3, very small. **Flowering time** Nov.–Jan. **Cypselae** cylindrical, 2.5 mm long, ribbed, furrows hispid. Colonies, damp places, forests, forest margins; Sub-Escarpment Savanna (very rare, Bizana).

11b Leaves not auricled
13a Leaves elliptic to ovate, or obovate
14a Involucral bracts 7–9, 5–6 mm long

crenatus Thunb.

Perennial shrub or shrublet, up to 1 m high. **Stems** erect, subsimple, cobwebby, striate, closely leafy. **Leaves** ovate to obovate, up to 50 mm long, apex obtuse to acute, base tapering into petiole up to 12 mm long, margins serrulate, clearly net-veined, cobwebby to glabrous. **Inflorescence** a terminal, compound corymb. **Capitula** many, rays (4 or 5) and disc pale yellow; involucre turbinate; bracts 7–9 × 5–6 mm; calyculus bracts few, linear-lanceolate, up to 3 mm long. **Flowering time** mainly Apr., May. **Cypselae** cylindrical, 3 mm long, ribbed, thinly and shortly hairy. Fynbos, marshy ground, also montane; Albany Thicket, Eastern Fynbos-Renosterveld (Steytlerville, Uitenhage, Port Elizabeth and Humansdorp).

14b Involucral bracts 10–12, 4.0–4.5 mm long

scoparius Harv.

Perennial herb, rootstock woody. **Stems** 1–several, simple, erect, up to 1.5 m high, woody, leafless below, closely leafy above, glandular-pubescent to ± glabrous. **Leaves** up to 80 × 60 mm, ± sessile to shortly petiolate, ovate or elliptic, apex acute, base rounded to subcordate, margins sharply serrate, 6–9 veins each side, both sides cobwebby at first. **Inflorescence** a flat-topped corymbose panicle. **Capitula** very many, rays (5, spreading)

and disc creamy white or pale yellow; involucre campanulate; bracts 10–12, 4.0–4.5 mm long; calyculus bracts few. **Flowering time** Oct.–Jan. **Cypselae** cylindrical, 2.5 mm long, ribbed, white-pilose. Grassland; Indian Ocean Coastal Belt, Sub-Escarpment Savanna (very rare, Kentani, Komga).

13b Leaves linear to lanceolate

[E]puberulus DC.
(including *S. hirtellus* DC.)

Annual or perennial herb, roughly grey-hairy, ± erect, much branched, up to 0.45 m high. **Stems** ± woody and nude below, leafy above. **Leaves** linear to lanceolate, ± dentate, up to 45 mm long, sessile, base stem-clasping, margins revolute. **Inflorescence** 1–5-headed, terminal. **Capitula** broadly campanulate, radiate, disc and rays (10–12) yellow; involucral bracts 18–20, 5 mm long; calyculus bracts several, short. **Flowering time** mainly Apr.–July. **Cypselae** narrowly cylindrical, ribbed, ± glabrous, 1.5 mm long. Dunes, grassland, also weedy; Albany Thicket, Sub-Escarpment Savanna (Albany, Alexandria, Bathurst).

10b Capitula discoid or radiate; if radiate, rays pink, blue or purple
15a Capitula radiate; plants glabrous or pubescent
16a Involucral bracts 4–7 mm long
17a Branching herbs, in forests; involucral bracts 6–7 mm long; rays ± 8

poseideonis Hilliard & B.L.Burtt (see 12b above)

17b Plants of open, marshy places; involucral bracts 4–7 mm long; rays 8–18

polyodon DC. var. **subglaber** (Kuntze) Hilliard & B.L.Burtt

Similar to *S. polyodon* var. *polyodon* (see 36a below) except: **Capitula** radiate, rays pink, purple, blue. **Flowering time** Oct.–Jan. Marshes, damp grassland; Drakensberg Grassland, Sub-Escarpment Grassland (Barkly East to Victoria East and KZN Border).

16b Involucral bracts 8–15 mm long
18a Basal leaf rosette absent
19a Stems branched throughout
20a Leaves sessile

elegans L.

Veld cineraria, *strandblommetjie* (A); *izuba* (X)

Annual herb, glandular-hairy. **Stems** erect or decumbent, up to 1 m high, much branched. **Leaves** ± fleshy, sessile, auriculate basally, oblong in outline, up to 80 mm long, pinnatifid to bipinnatipartite, margins revolute. **Inflorescence** laxly corymbose, several headed. **Capitula** radiate, disc yellow, rays pale mauve to purple, rarely absent(?); involucre broadly campanulate; bracts 12–15, 8–9 mm long, black-tipped, calyculus bracts many, ciliate, black-tipped. **Flowering time** mainly Sept.–Dec. **Cypselae** cylindrical, 3.0–3.5 mm long, ribbed, hairy. Mainly coastal dunes; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp to Bathurst).

20b Leaves petiolate

[E]carnosus Thunb.

Klambossie (A)

Similar to *S. elegans* L. except: **Leaves** petiolate, lyrate (large terminal lobe and small lateral ones), margins dentate to incised. **Flowering time** June–Jan. Coastal dunes; Albany Thicket (Humansdorp to Kentani).

19b Stems branched above only
21a Leaves lanceolate

multibracteatus Harv.

Annual (occasionally perennial) herb, glabrous to ± scabrid or viscid-hairy. **Stems** erect, up to 0.45 m high, branched above. **Leaves** sessile, up to 65 mm long, lanceolate, entire to dentate or ± pinnatifid, leaf bases entire to coarsely toothed or auricled. **Inflorescence** a few-headed corymb. **Capitula** radiate, disc yellow, rays (± 12) pink to purple; involucre broadly campanulate; bracts ± 20, up to 10 mm long; calyculus bracts many, up to 8 mm long. **Flowering time** mainly Oct. **Cypselae** cylindrical, up to 2.5 mm long, ribbed, hairy. Grassland; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp, Port Elizabeth, Uitenhage).

21b Leaves oblong to lanceolate-oblong

glastifolius L.f.

Waterdissel (A)

Glabrous, perennial shrub or shrublet, up to 1 m high. **Stems** erect, rigid, densely leafy. **Leaves** sessile, leathery, ± clasping, oblong to lanceolate-oblong, up to 75 mm long, lower leaves ± decurrent, margins revolute, coarsely toothed. **Inflorescence** a corymbose panicle, corymbs 3–5-headed. **Capitula** radiate, disc yellow, rays (± 12) pink to purple; involucre broadly campanulate, flat-bottomed; bracts ± 20, up to 10 mm long; calyculus bracts many, up to 3 mm long. **Flowering time** Aug.–Dec. **Cypselae** cylindrical, 2.5 mm long, ribbed, ± hairy. Fynbos, damp areas, forest margins; Eastern Fynbos-Renosterveld, Indigenous Forests (Willowmore, Humansdorp, Port Elizabeth).

18b Basal leaf rosette present, as well as cauline leaves or bracts at flowering
22a Radical leaves mostly with a long, broad, flat petiole, margins deeply lobed or toothed; capitula in corymbs; involucral bracts mostly 10 mm long

speciosus Willd.

Umdambiso (X)

Perennial herb, up to 0.75 m high, rootstock stout, woody. **Stems** several, decumbent basally, then erect, simple below, ± glabrous to glandular-pilose, sparsely leafy. **Leaves** mostly radical, rosetted, ± 100–200 × 20–40 mm, spathulate or elliptic, base broad, flat, petiole-like, clasping, margins dentate to lobed, mostly glandular-pubescent; upper leaves smaller, narrower, sessile. **Inflorescence** corymbose. **Capitula** few–many, disc and rays (8–20) pink to purple; involucral bracts 16–20, ± 10 mm long, glabrous to glandular-pilose; calyculus bracts very few, short. **Flowering time** mostly July–Jan. **Cypselae** cylindrical, ± 3 mm long, hairy between ribs. Damp grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket (Ramatseliso's Beacon to uMzimkhulu southwards, from Bailey to Port St Johns, Somerset East to Kei River Mouth, Coldstream Station to East London and Humansdorp).

22b Radical leaves narrowed to base but scarcely petioled, margins entire, repand or shallowly toothed; capitula in racemes; involucral bracts mostly 12 mm long

macrocephalus DC.

Mountain senecio; *bergsenecio* (A); *ihlaba lenkomo* (X)

Perennial herb, rootstock stout, woody. **Stems** several, decumbent, then erect, up to 0.5 m high, glandular-pilose, sparsely to closely leafy. **Leaves** mostly radical, rosetted,

oblong to spathulate, up to 150 × 30 mm, base broad, flat, ± petiolate, margins entire to denticulate, shortly glandular-pubescent; cauline leaves smaller, base clasping. **Inflorescence** racemose. **Capitula** few–many, disc and rays (12–18) deep pink to purple; involucral bracts 16–20, 10–15 mm long, villous to pilose with long, jointed, gland-tipped hairs (also on inflorescence branches); calyculus bracts few, short; disc and rays (12–18) deep pink to purple. **Flowering time** mainly Sept.–Dec. **Cypselae** cylindrical, ± ribbed, shortly hairy, 3 mm long. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Matatiele and Bizana S to Alexandria).

15b Capitula discoid
23a Flowers buff-coloured or pale creamy yellow
24a Leaves long-linear or linear-lanceolate; both leaf surfaces glabrous or with a sparse, minute, rough pubescence

chrysocoma Meerb.

Branched, biennial herb or shrub, up to 2 m high. **Stems** woody, pubescent, closely leafy. **Leaves** linear to linear-lanceolate, up to 150 × 3 mm, margins revolute, smooth or denticulate, both sides ± glabrous or ± roughly hairy. **Inflorescence** corymbose. **Capitula** few–many, discoid, buff-coloured or pale yellow; involucre campanulate; bracts ± 20, 8–11 mm long; calyculus bracts many. **Flowering time** Sept., Oct. **Cypselae** cylindrical, 2.5 mm long, ribbed, glabrous. Disturbed grassland, roadside weed; Eastern Fynbos-Renosterveld, Albany Thicket (coastal, Humansdorp to East London).

24b Leaves not as above
25a Annual herb; leaves oblong

***vulgaris** L.

Groun(d)sel

Annual herb, ± cobwebby to glabrous. **Stems** erect, up to 0.5 m high, mostly branching. **Leaves** stem-clasping, sessile, oblong, up to 65 mm long, bluntly pinnatifid and toothed. **Inflorescence** corymbose. **Capitula** crowded or scattered, nodding, discoid, yellow; involucre narrowly campanulate; bracts 7 mm long, ± 12; calyculus bracts few–several, small. **Flowering time** all year. **Cypselae** cylindrical, 2.5 mm long, ribbed, hairy. Gardens, disturbed places. Native to Europe, introduced cosmopolitan weed; Sub-Escarpment Savanna (Alice).

25b Perennial herb; leaves elliptic to ovate-oblong or ovate-lanceolate

paucifloculosus C.Jeffrey
(including *S. thunbergii* Harv.)

Perennial shrublet. **Stems** rigid, ± simple, light grey- or rusty-woolly, up to 0.9 m high, densely leafy. **Leaves** sessile, elliptic to ovate-oblong, up to 20 mm long, entire or upper half 3–5-toothed, margins subrevolute, glabrous or dark grey-woolly above, light grey- or rusty-woolly below. **Inflorescence** terminal, densely corymbose. **Capitula** discoid, pale yellow; involucre narrowly campanulate; bracts 5–7, tomentose, 5–6 mm long; calyculus bracts few, small. **Flowering time** Feb.–June. **Cypselae** cylindrical, 2.5 mm long, ribbed, glabrous. Grassland, fynbos; Albany Thicket, Eastern Fynbos-Renosterveld (Somerset East, Humansdorp to Alexandria).

23b Flowers purple or mauve, if yellowish or whitish, then leaves not long-linear
26a Cypselae glabrous, or if minutely and sparsely hispid between the ribs, then leaves glabrous or nearly so
27a Leaves ± fusiform-cylindrical, succulent

[E]vitalis N.E.Br.

Glabrous, glaucous, succulent, perennial shrublet, up to 0.9 m high. **Stems** erect, leafy. **Leaves** sessile, suberect, up to 150 mm long, ± fusiform-cylindrical, ± striate. **Inflorescence** terminal, corymbose; peduncles up to 150 mm long. **Capitula** few–several, discoid, light yellow; involucre campanulate; bracts 6–8, 6–7 mm long; calyculus bracts few, minute. **Flowering time** mainly Nov.–Apr. **Cypselae** linear, glabrous, 3 mm long, ribbed. Rocky slopes; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Albany Thicket (Queenstown SE to Komga, Steytlerville and Alexandria).

27b Leaves not as above
28a Leaf margins entire, callose-dentate or denticulate; capitula few–many in open inflorescences
29a Leaves and stems ± glabrous

cathcartensis O.Hoffm.

Perennial herb, ± glabrous, rootstock stout, woody. **Stems** 1–few, erect, up to 0.6 m long. **Leaves** ± leathery, ± dense on lower part of stem, elliptic, base narrow, winged, petiole-like, clasping, up to 110 × 30 mm, smaller, narrower upwards, margins ± dentate. **Inflorescence** an open corymbose panicle. **Capitula** few–many, discoid, purple; involucre campanulate; bracts ± 16, up to 7 mm long, glandular-pilose; calyculus bracts very few, small. **Flowering time** Nov.–Apr. **Cypselae** cylindrical, 3 mm long, ribbed, ± glabrous. Damp or wet grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket (L and KZN Border, S to Cathcart).

29b Leaves and stems not ± glabrous

discodregeanus Hilliard & B.L.Burtt

Perennial herb, thinly white-woolly cobwebby, particularly in leaf and bract axils and on involucre. **Flowering stem** up to 1 m high, single, simple, leafy below. **Leaves** leathery, lanceolate to broadly elliptic, up to 400 mm long, lower half petiole-like, upper leaves and bracts sessile, broad-based, margins thickened, callose-denticulate. **Inflorescence** corymbose or racemose; peduncles long. **Capitula** few–many, discoid, dull, deep violet; involucre campanulate; bracts ± 20, ± 9 mm long; calyculus bracts few, not descending on peduncle. **Flowering time** Aug.–Mar. **Cypselae** cylindrical, 5–6 mm long, ribbed, glabrous. Colonies in grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (rare, Engcobo to Port St Johns).

28b Leaf margins coarsely toothed to lyrate-pinnatifid; capitula many in congested clusters arranged in corymbose panicles
30a Lower cauline leaves broad-based, cordate-clasping, nerves reticulate below, not raised

purpureus L.

Perennial herb. **Stems** up to 1.5 m high, hollow, glandular-pubescent, leafy. **Leaves** up to 750 × 150 mm including petiole, elliptic, lyrate-pinnatifid, lobes large, lobed or repand, denticulate, sinuses broad, both surfaces glandular-pubescent, upper leaves smaller, broad-based and cordate-clasping. **Inflorescence** a large, corymbose panicle. **Capitula** many, discoid, purple; involucre turbinate; bracts ± 10–12, 6–7 mm long, glandular-hispid; calyculus bracts very few. **Flowering time** Oct.–Feb. **Cypselae** cylindrical, 2 mm long, ribbed, glabrous. Damp places, streamsides; Sub-Escarpment

Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Fort Beaufort E to Kentani and Humansdorp).

30b Lower cauline leaves ± abruptly contracted to a narrow, winged, petiole-like base then expanded into 2 large, rounded, toothed auricles; closely penninerved, nerves strongly raised below

gerrardii Harv.

Perennial herb. **Stems** up to 2 m high, ± woody, glandular-pubescent, leafy. **Leaves** up to 200 × 130 mm, elliptic or ovate-elliptic, all but uppermost contracted to a winged petiole, expanded basally into 2 rounded, toothed auricles, uppermost leaves sessile, broad-based, margins toothed, also lyrate-pinnatifid, callose-denticulate, both surfaces scabrid-pubescent, nerves raised below. **Inflorescence** a large, corymbose panicle. **Capitula** many, discoid, purple; involucre turbinate; bracts 10–12, 5–6 mm long, glandular-hispid; calyculus bracts very few. **Flowering time** Nov.–Apr. **Cypselae** cylindrical, 2–3 mm long, ribbed, glabrous. Damp places, forest margins; Sub-Escarpment Grassland, Sub-Escarpment Savanna (very rare, uMzimkhulu).

26b Cypselae hispid at least between the ribs, or more densely hairy; involucre calycled though bracts sometimes very few

31a Backs of involucral bracts and peduncles with short, very broad-based white hairs, giving a peculiar scaly look (delicate, gland-tipped hairs often present as well)

variabilis Sch.Bip.

Perennial herb, sweet-smelling, rootstock stout, woody. **Stems** 1–several, up to 0.6 m high, glandular-pubescent, simple below. **Leaves** mostly basal, outline ± elliptic, up to 150 mm long, margins toothed, also lobed or often lyrate-pinnatifid in lower half, base decurrent onto petiole, up to 150 mm long; cauline leaves few, smaller, sessile, all shortly, harshly glandular-pubescent. **Inflorescence** a corymbose panicle. **Capitula** few–many, discoid, white to purple, ± 12 mm in diam.; involucre turbinate; bracts ± 12, ± 9 mm long, shortly white-hairy; calyculus bracts few, short. **Flowering time** mainly Aug.–Jan. **Cypselae** cylindrical, 3 mm long, ribbed, greyish hairy. Grassland, mainly coastal area; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket (Lusikisiki S to Albany and Fort Beaufort).

31b Broad-based hairs absent

32a Flowering stems closely leafy; capitula in congested, racemose panicles; all parts clothed in long, soft, shaggy, gland-tipped hairs

barbatus DC.

Perennial herb, indumentum of long, soft, yellow-brown to purple, jointed, shaggy, glandular hairs. **Stems** several, simple, closely leafy, ± decumbent to erect, up to 0.3 m high. **Leaves** radical, rosetted, elliptic to spathulate, up to 70 × 20 mm, base broad, flat, petiole-like, margins ± entire or dentate; cauline leaves narrowly oblong, base subcordate, clasping, margins denticulate. **Inflorescence** a congested, racemose panicle. **Capitula** discoid, whitish, yellowish, purple, blue; involucre narrowly campanulate; bracts 14–22, 10 mm long; calyculus bracts very few, short. **Flowering time** Nov.–Jan. **Cypselae** cylindrical, 3 mm long, ± ribbed, shortly hairy. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Barkly East to Port St Johns, from Stockenström to Victoria East).

32b Plants not as described above
33a Capitula ± twice as long as broad, sometimes whole plant with a strong sweet scent

rhyncholaenus DC.

Perennial herb, sweetly scented, glabrous to ± glandular-pubescent, viscid, rootstock stout, elongated, woody. **Stems** tufted, annual, up to 0.6 m high, branching above, leafy. **Leaves**: radical leaves up to 200 × 70 mm, lower $^1/_3$ petiolar, bipinnatisect or bipinnatifid, lobes linear or lanceolate, acute; cauline leaves ± similar, ± sessile, ear-clasping. **Inflorescence** a spreading, corymbose panicle. **Capitula** few–many, ± 10 × 5 mm, discoid, flowers white; involucre turbinate; bracts 8–12, 6–8 mm long, glands mostly sessile; calyculus bracts very few, short. **Flowering time** all year, mainly Feb.–July. **Cypselae** cylindrical, 2.5 mm long, ribbed, furrows hispid. Colonies in grassland; Sub-Escarpment Savanna, Indian Coastal Belt (very rare, Bizana to Port St Johns).

33b Capitula not twice as long as broad, whole plant not sweetly scented
34a Involucral bracts 9–11 mm long

glanduloso-lanosus Thell.

Perennial herb, honey-scented, tuber woody. **Stems** 1–few, ± erect, up to 0.45 m high, glandular-pubescent, densely leafy below. **Leaves** elliptic to ovate, up to 90 × 55 mm, apex subacute or obtuse, margins toothed, lower part often lobulate, lower leaves with petioles up to 35 mm long, both sides densely glandular-pubescent, upper leaves smaller, sessile. **Inflorescence** a corymbose panicle. **Capitula** few–several, discoid, purple; involucre turbinate; bracts 16–20, 9–11 mm long, pilose; calyculus bracts very few, small. **Flowering time** Dec.–Feb. **Cypselae** cylindrical, 4 mm long, ribbed, hispid between ribs. Forest margins; Sub-Escarpment Grassland, Sub-Escarpment Savanna (very rare, Bizana, Mount Ayliff).

34b Involucral bracts 4–12 mm long
35a Basal rosette of leaves at flowering, cauline leaves often reduced; leaves soft with dense, glandular pubescence
36a Plants of marshy places and steamsides; involucral bracts 4–7 mm long

polyodon DC. var. **polyodon**

Perennial herb, ± glabrous to glandular-pubescent. **Flowering stems** solitary, up to 0.9 m high, often ± decumbent basally and rooting, leafy. **Leaves**: radical leaves rosetted, up to 300 × 40 mm, spathulate or elliptic, base petiole-like, margins toothed, lower side ± purplish; cauline leaves up to 100 mm long, narrowly spathulate to oblong then lanceolate, base cordate-clasping, margins entire to subpinnatifid. **Inflorescence** corymbose-paniculate. **Capitula** few–many, discoid, whitish to purple; involucre campanulate; bracts 12–20, 4–7 mm long; calyculus bracts few. **Flowering time** Oct.–Jan. **Cypselae** cylindrical, 2.5 mm long, ribbed, furrows hairy. Damp grassland and marshes; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Drakensberg Grassland (Barkly East to Port St Johns and Stutterheim).

36b Plants of grassland or stony places; involucral bracts mostly 6–12 mm long
37a Radical leaves with a long thin petiole; leaves pinnately cut

arabidifolius O.Hoffm.

Perennial herb, tufted, rootstock stout, branching. **Stems** up to 0.25 m high, glandular-pubescent, closely leafy. **Leaves** in a basal rosette, up to 70 × 10 mm, outline oblanceolate, lower half petiolar, deeply pinnately lobed, coarsely glandular-pubescent both sides; cauline leaves smaller and narrower upwards, sessile. **Inflorescence** a corym-

bose panicle; peduncles long. **Capitula** few, discoid, purple to red-purple; involucre campanulate; bracts 10–12, ± 6 mm long, glandular-pubescent; calyculus bracts few, very small. **Flowering time** Nov.–Feb. **Cypselae** cylindrical, ± 3 mm long, closely ribbed, white-hispid. Montane, sandy or rocky soils, also weedy; Drakensberg Grassland, Sub-Escarpment Grassland (Molteno to Engcobo and Matatiele).

37b Radical leaves with a broad flat petiole
38a Veins several from base, ascending and ± parallel

subcoriaceus Schltr.

Perennial herb, ± glandular-pilose. **Flowering stems** 1–many, simple, up to 0.4 m high. **Leaves** mostly radical, pressed flat, up to 50 × 40 mm, subrotund, spathulate or rhomboid, base short, broad, petiole-like, margins ± entire; cauline leaves few, small, oblong to lanceolate. **Inflorescence** corymbose, 3–5-headed; peduncles long, nude. **Capitula** discoid, ± white, yellow to ± brown; involucre campanulate; bracts 16–20, 6 mm long; calyculus bracts 1 or 2. **Flowering time** Sept.–Dec. **Cypselae** cylindrical, 2.5 mm long, ribbed, furrows hairy. Montane, colonies in short, stony grassland; Sub-Escarpment Grassland, Drakensberg Grassland (very rare, KZN and Maclear S to Victoria East).

38b Veins pinnate
39a Capitula ± corymbose-paniculately arranged
40a Flowering stem forking only above

erubescens Aiton var. **erubescens**

Perennial herb, glandular-pilose. **Flowering stems** 1 or 2, lax, remotely leafy, decumbent at base, up to 0.6 m long, simple below. **Leaves**: radical leaves in a basal rosette, up to 100 × 35 mm, spathulate, base flat, petiole-like, clasping, margins ± sinuately or pinnately lobed or toothed; cauline leaves much smaller, few, oblong to lanceolate, margins sharply lobed or toothed. **Inflorescence** an open, corymbose panicle, up to 12-headed. **Capitula** discoid, purplish to dull brownish; involucre campanulate; bracts 6.5–9.0 mm long; calyculus bracts 1–3, small. **Flowering time** mainly Dec., Jan. **Cypselae** cylindrical, 3.5 mm long, ribbed, hairy. Grassland; Albany Thicket, Eastern Fynbos-Renosterveld (Albany SW to Humansdorp).

40b Flowering stem forking near base

erubescens Aiton var. **dichotomus** DC.

Perennial herb, glandular-hairy. **Flowering stems** erect or decumbent, up to 0.6 m high, few sessile, reduced leaves below. **Radical leaves** in basal rosette, subrotund, ovate or elliptic, up to 200 mm long, base petiole-like, margins ± entire to toothed. **Inflorescence** a corymbose panicle. **Capitula** discoid, dull purple; involucre campanulate; bracts 16–20, 7–9 mm long; calyculus bracts very few, short. **Flowering time** Nov.–Jan. **Cypselae** cylindrical, 3 mm long, ribbed, furrows hairy. Grassland; Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket (Molteno E to Port St Johns and S to East London).

39b Capitula ± racemosely arranged

erubescens Aiton var. **crepidifolius** DC.

Uvelemonti (X)

Perennial herb, glandular-pilose. **Flowering stem** often solitary, decumbent then erect, up to 0.7 m long, simple, leafy below, branched above. **Leaves** ± pushed to one side of stem, up to 140 × 20 mm, oblong-elliptic to -spathulate to ± lanceolate, base broad, cordate-clasping, margins coarsely to finely toothed. **Inflorescence** racemose. **Capitula**

discoid, purplish; involucral bracts 18–20, 6.5–8.0 mm long; calyculus bracts few, small. **Flowering time** Nov.–Feb. **Cypselae** cylindrical, 3 mm long, ribbed, furrows hairy. Grassland; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (KZN Border to Maclear and Victoria East to Komga).

35b Leaves mostly cauline at flowering
41a Involucral bracts 4–7 mm long; plants often in marshy or damp places or along streamsides
42a Stem simple below the inflorescence branches, leaf margins entire to irregularly toothed

polyodon DC. var. **polyodon** (see 36a above)

42b Well-branched herb with at least the lower leaves lyrate-pinnatifid

poseideonis Hilliard & B.L.Burtt (see 12b above)

41b Involucral bracts 6.5–9.0 mm long; grassland plants; capitula campanulate; bracts 6.5–8.0 mm long
43a Leaf margins denticulate to coarsely toothed

erubescens Aiton var. **crepidifolius** DC. (see 39b above)

43b Leaves pinnately incised

erubescens Aiton var. **incisus** DC.

Similar to *S. erubescens* var. *crepidifolius*, except: **Leaves** deeply and finely dissected. **Flowering time** mainly Dec. Damp grassland; Sub-Escarpment Savanna, Indian Ocean Coastal Belt (very rare, Bizana, Lusikisiki).

9b Flowers bright clear yellow or sometimes orange-yellow
44a Ovaries variously pubescent
45a Capitula radiate
46a Leaves with a cobwebby, cottony or woolly tomentum, at least on lower surface or in leaf axils, often glabrescent, hairs then persisting in wisps, particularly in leaf axils or as silky wool on crown, though sometimes hidden by fibres derived from old leaf bases
47a Involucral bracts 3–5 mm long
48a Leaves linear to linear-lanceolate
49a Involucre with white wool at least on the calyculus bracts

juniperinus L.f. var. **epitrachys** (DC.) Harv.

Similar to *S. polyanthemoides* (see 52b) and *S. pterophorus* (see 51b) except: Rounded, compact, herbaceous shrub, up to 1 m high. **Leaves** linear to linear-lanceolate. **Capitula** larger than *S. polyanthemoides*; involucral bracts white-woolly, up to 6 mm long, rays 13. **Flowering time** Oct.–Apr., mainly Jan. Grassland, weed in disturbed areas; Sub-Escarpment Grassland, Lower Karoo, Drakensberg Grassland (Elliot SW to Pearston and to Stutterheim).

49b Involucre not white-woolly

rosmarinifolius L.f.

Gryshongerblom (A)

Shrubby, rounded perennial, up to 1 m high, ± glabrous to whitish cobwebby. **Stems** erect, branched, leafy. **Leaves** in axillary tufts, linear to linear-lanceolate, sessile, up to 80 mm long, margins revolute, entire or denticulate. **Inflorescence** densely corymbose, many-headed. **Capitula** radiate, disc and rays (8–10) yellow; involucre campanulate; bracts 12–15, 3 mm long; calyculus bracts several, minute. **Flowering time** mainly Nov.–Apr. **Cypselae** cylindrical, 1.5 mm long, hairy on ribs. Scrub, also sand dunes; Lower Karoo, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Fish River Station E to Stutterheim, from Port Elizabeth to Kowie and to Humansdorp).

48b Leaves not as above, oblong to ovate, lanceolate or fiddle-shaped
50a Main cauline leaves narrowed to a petiole-like base
51a Rays ± 5–8
52a Rays 5, leaves ovate, up to 25 mm long

hollandii Compton

Perennial shrublet or shrub, up to 1 m high. **Stems** white-woolly to grey, densely leafy above, ± nude below. **Leaves** ovate, up to 25 mm long, margins ± revolute, shortly dentate, leathery, glabrescent to ± glossy above, densely white-woolly below; petioles 5–8 mm long. **Inflorescence** a dense, terminal corymb. **Capitula** radiate, disc and rays (± 5) yellow; involucre campanulate; bracts ± 8, 4 mm long; calyculus bracts few, minute. **Flowering time** Apr.–Oct. **Cypselae** cylindrical, ± ribbed, 2.5 mm long, ± glabrous, light brown. Sandstone slopes in dry fynbos; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp, Uitenhage).

52b Rays 8, leaves lanceolate to 150 mm long

polyanthemoides Sch.Bip.

Bushy, annual herb, up to 1.8 m high. **Stems** woody at base, leafy. **Leaves** up to 150 × 40 mm, lanceolate, apex ± acute, base narrowed, petiole-like, margins revolute, entire to serrate or pinnate, smooth or scabrid above, thinly white-felted below. **Inflorescence** a spreading panicle; peduncles short. **Capitula** few–many, radiate, disc and rays (± 8) canary yellow; involucre campanulate; bracts 16–20, 3–4 mm long, glabrous, resinous; calyculus of several small bracts. **Flowering time** all year, mainly Sept., Oct. **Cypselae** ± cylindrical, 1.5 mm long, striate, minutely puberulous. Forest margins, weed in disturbed areas; Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Savanna (Bizana, Lusikisiki, Port St Johns).

51b Rays mostly 11–13

pterophorus DC.

Inkanga (X)

Similar to *S. polyanthemoides* (above) except: **Capitula** larger, involucral bracts 4–5 mm long, rays ± 13. **Flowering time** mainly Nov.–Jan. Dune scrub, forest margins, grassland (also recently burnt), weed in disturbed areas, weed in Australia; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Albany Thicket, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Bizana, southwards to Queenstown, Maclear, Port St Johns, Humansdorp, Grahamstown and East London).

50b Leaves with a broad clasping base
53a Rays ± 12

ilicifolius L.

Sprinkaanbos (A); *inkanga* (X)

Perennial herb or subshrub, erect, up to 1 m high. **Stems** rigid, leafy, cobwebby. **Leaves** sessile, oblong-lanceolate, up to 65 mm long, acute, base clasping, auriculate, margins acutely and coarsely toothed, revolute; glabrous to scabrid, green above, white-cobwebby below. **Inflorescence** a much-branched, spreading corymb. **Capitula** many, radiate, disc and rays (± 12) yellow; involucre campanulate; bracts 12–15, 4–5 mm long; calyculus bracts many, small. **Flowering time** mainly Sept.–Nov. **Cypselae** cylindrical, ribbed, 2.5 mm long, ± hairy. Weedy, poisonous plants in grassy patches, disturbed areas; Albany Thicket, Eastern Fynbos-Renosterveld (Stutterheim and King William's

Town southwards, from Lottering State Forest to Port Alfred and from Witte Els Bosch to Humansdorp and Skoenmakerskop).

53b Rays 5–8
54a Stems solitary, unbranched

lanceus Aiton
(including *S. mimetes* Hutch. & R.A.Dyer)
Vleibos (A)

Stout perennial (biennial?) herb, glabrous to white-cobwebby. **Stems** solitary, up to 2.4 m high, simple below inflorescence branches, closely leafy. **Leaves** oblong to oblong-lanceolate, up to 140 × 40 mm, smaller upwards, base broad, often cordate-clasping, apex obtuse to acute or acuminate, margins thickened, ± entire to finely or coarsely toothed. **Inflorescence** a dense cluster, in sometimes large panicles. **Capitula** many, radiate, disc and rays bright yellow, rays 8, short, spreading; involucre campanulate; bracts 14–20, 4.5–5.0 mm long, glabrous; calyculus bracts few, along whole peduncle. **Flowering time** Sept.–May. **Cypselae** cylindrical, 1.5 mm long, ribbed, ± glabrous. Streambanks, damp and wet sites; Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Amatole Mts, Uitenhage, Port Elizabeth, Idutywa).

54b Stems not solitary, branched

rigidus L.
(including *S. subcanescens* (DC.) Compton)
Rough ragwort

Herbaceous, perennial shrub, up to 1.5 m high. **Stems** much branched, ribbed, roughly hispid. **Leaves** dense, sessile, oblong, obovate-oblong or fiddle-shaped, up to 75 mm long, base stem-clasping, auriculate, margins revolute, sharply and unequally toothed, green and rough above, cobwebby and net-veined below. **Inflorescence** a much-branched corymb. **Capitula** many, small, disc and rays (5–8) bright yellow; involucre campanulate; bracts ± 20, 3–4 mm long; calyculus bracts several, minute. **Flowering time** Sept.–Jan. **Cypselae** cylindrical, 2 mm long, ribbed, hairy. Damp areas in fynbos; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp to Grahamstown).

47b Involucral bracts at least 6 mm long
55a Plants succulent

[E]pyramidatus DC.

Succulent, perennial shrub, up to 1 m high, erect. **Flowering stems** simple, short, thick, white-woolly, densely leafy below, nude above. **Leaves** sessile, ± linear, acute, glabrous or cobwebby, up to 75 mm long. **Inflorescence** a thyrsoid raceme, 50–300 mm long. **Capitula** many, radiate, disc and rays (10–12, broad, spreading) bright yellow; involucre campanulate, white-woolly bracts 10–12, 8 mm long; calyculus bracts few, white-woolly. **Flowering time** July–Nov. **Cypselae** cylindrical, 2.5 mm long, ribbed, furrows ± hairy. Scrub and thicket; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (King William's Town S to Humansdorp and Uitenhage).

55b Plants not succulent
56a Leaves decurrent in long stem wings

decurrens DC.

Stout, biennial(?) herb. **Stem** up to 1 m high, simple, cobwebby, glabrescent, leafy. **Leaves**: radical leaves up to 600 mm long, up to 300 mm petiolar, blade elliptic,

up to 70 mm wide, passing into petiole; cauline leaves smaller, sessile, becoming bracts, decurrent on stem, wings broad, margins ± entire to coarsely toothed, upper surface glabrescent, lower surface cobwebby. **Inflorescence** corymbose. **Capitula** few–many, disc and rays bright yellow, rays ± 8, 10–20 mm long; involucre campanulate; bracts ± 20, 8–12 mm long; calyculus bracts long, lanceolate, in ± 2 series. **Flowering time** Oct.–Feb. **Cypselae** cylindrical, ± 6 mm long, ribbed, glabrous or ± hairy. Open grassland; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Kokstad District S to Queenstown, Port St. Johns, Seymour, Komga and Peddie).

56b Cauline leaves often clasping, but not decurrent in long wings
57a Involucral bracts 15–18 mm long

macrospermus DC.

Stout, perennial herb, pale grey-woolly; rootstock thick, woody, crowned with fibrous leaf bases; leaf rosettes several. **Flowering stems** up to 1.2 m high, simple, leafy. **Leaves**: radical leaves elliptic, up to 600 mm long, base broad, petiole-like, clasping, margins minutely and closely callose-denticulate, tomentum becoming cobwebby; cauline leaves ± similar, oblong-elliptic, sessile, base broad, ± cordate-clasping, becoming bracts. **Inflorescence** a corymbose panicle. **Capitula** up to 8, radiate, disc and rays bright yellow, rays ± 13, long, spreading; involucre campanulate; bracts ± 20, 15–18 mm long; calyculus bracts many. **Flowering time** Dec.–Mar. **Cypselae** cylindrical, ± 10 mm long, ribbed, hairy. Montane, colonies on steep, damp slopes; Drakensberg Grassland, Sub-Escarpment Grassland (Barkly East, Elliot, Maclear, Mthatha).

57b Involucral bracts up to 11 mm long
58a Perennial herbaceous shrublet; flowering stems branched; radical leaves absent
59a Leaves linear-subulate to linear-lanceolate

juniperinus L.f. var. **juniperinus**

Perennial herb, up to 1 m high, branching at woody base. **Stems** rigid, tomentose to glabrous. **Leaves** variable, ± linear-subulate to -lanceolate, up to 50 mm long, base half-clasping, margins revolute, entire to ± toothed, tomentose to glabrous above, tomentose below. **Inflorescence** a loose corymb. **Capitula** many, disc and rays (± 12) yellow; involucre campanulate; bracts 12–15, 7–8 mm long, glabrous to tomentose; calyculus bracts several. **Flowering time** Aug.–Mar., mainly Nov. **Cypselae** cylindrical, 2 mm long, ± glabrous. Karoo, grassland, weedy in disturbed places; Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Queenstown, Graaff-Reinet, Willowmore, Albany, Humansdorp).

59b Leaves ovate-oblong to ovate-lanceolate

oederiifolius DC.

Kouterbossie (A)

Perennial, herbaceous shrublet. **Stems** erect, up to ± 1 m high, straight, ribbed, cobwebby at first, densely leafy. **Leaves** rigid, sessile, ± clasping, ovate-oblong to ovate-lanceolate, up to 40 mm long, margins reflexed, ± entire to sharply and distantly toothed, glabrous and glossy green above, white-woolly below. **Inflorescence** terminal, solitary or 2–5 in a corymb. **Capitula** radiate, disc and rays (12–15) yellow; involucre broad, flat-bottomed; bracts 25–30, 7–8 mm long; calyculus bracts many. **Flowering time** Aug.–Dec., mostly Sept. **Cypselae** cylindrical, 2 mm long, ribbed, ± hairy. Damp grassland, fynbos; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp, Port Elizabeth, Alexandria).

58b Perennial herbs; flowering stems mostly simple; radical leaves present
60a Leaf margins entire, strongly revolute, blade of at least young leaves enveloped in grey-silky woolly felt

gramineus Harv.

Perennial herb. **Flowering stems** simple, solitary, up to 0.45 m high, sparsely leafy, grey-cottony, glabrescent, old fibrous leaf bases crowded basally. **Leaves**: radical leaves linear, up to 200 mm long, both sides with grey, closely felted, silky woolly indumentum, ± glabrescent; cauline leaves ± similar, fewer, becoming bracts. **Inflorescence** a 1–3-headed corymb; peduncles long. **Capitula** radiate, disc and rays (8–13) bright yellow; involucre campanulate, thinly woolly; bracts 14–20, 7–9 mm long; calyculus bracts few. **Flowering time** Nov.–Jan. **Cypselae** ± 1.5 mm long, cylindrical, ribbed, ± hairy. Montane, short grass and rock sheets; Drakensberg Grassland, Sub-Escarpment Grassland, Upper Karoo, Eastern Fynbos-Renosterveld (Rhodes, Maclear, Middelburg, Stutterheim, Uitenhage).

60b Leaf margins denticulate to more coarsely toothed, if entire or nearly so, then leaves not clothed in grey-silky woolly felt
61a Crown clothed in long silky woolly hairs; involucral bracts 7–10 mm long

coronatus (Thunb.) Harv.

Sybossie (A); *indlebe yebokwe* (X)

Perennial herb, rootstock silky woolly. **Flowering stems** 1–several, up to 0.8 m high, simple, loosely woolly, glabrescent, leafy below. **Leaves**: radical leaves very variable, narrowly to broadly elliptic, 50–400 mm long, lower half petiole-like, ± clasping, silky-woolly, margins minutely callose-denticulate, both sides ± cobwebby, glabrescent; cauline leaves similar but sessile, becoming bracts. **Inflorescence** a 2–20-headed corymb. **Capitula** radiate, disc and rays bright yellow, rays 8–13, long, spreading; involucre campanulate; bracts 16–20, 7–10 mm long; calyculus bracts few, short. **Flowering time** mainly Aug.–Nov. **Cypselae** cylindrical, 4 mm long, ribbed, hairy. Colonies in grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (KZN Border to Barkly East, S to Queenstown, Seymour, Komga, Grahamstown and Humansdorp).

61b Crown fibrous from old leaf bases, if silky woolly as well, then involucral bracts 6–7 mm long
62a Involucral bracts 6–7 mm long; capitula many, in corymbose panicles; cauline leaves linear, tapering to a long, acute apex

striatifolius DC.

Perennial herb, rootstock woody. **Flowering stem** solitary, simple, up to 0.75 m high, leafy, ± cobwebby, woolly patches and old fibrous leaf bases later. **Leaves**: radical leaves up to 400 mm long, linear, ± glabrous, base petiole-like, clasping, margins closely and minutely callose-denticulate, revolute; cauline leaves ± similar, sessile, auricled, half-clasping. **Inflorescence** a corymbose panicle; peduncles very long, sparsely bracteate. **Capitula** up to 30, discoid or radiate, disc and rays (8, spreading) bright yellow; involucre campanulate; bracts 16–20, ± 6 mm long; calyculus bracts many, short, thinly woolly. **Flowering time** Sept.–Mar. **Cypselae** cylindrical, 3–4 mm long, ribbed, villous. Grassland; Upper Karoo, Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Molteno E to Mount Fletcher, S from Amatole Mts to Kei River Mouth and to Grahamstown and Alexandria).

62b Involucral bracts 8–11 mm long; leaf margins ± regularly callose-denticulate, side nerves clearly visible

albanensis DC. var. **doroniciflorus** (DC.) Harv.

Unodlwabiyele (X)

Perennial herb, glabrescent to glabrous, stock stout, woody. **Flowering stems** up to 0.6 m high, mostly simple, distantly leafy. **Leaves**: radical leaves up to 400 mm long, lanceolate to elliptic, lower half petiolar, margins callose-denticulate, subrevolute; cauline leaves similar, soon sessile, becoming bracts. **Inflorescence** a corymbose panicle, up to 20-headed; peduncles long. **Capitula** radiate, disc and rays (8–13) yellow to orange-yellow, rays long, spreading; involucre campanulate; bracts 12–20, 8–11 mm long; calyculus bracts few. **Flowering time** Aug.–Apr. **Cypselae** narrowly cylindrical, ± 3 mm long, glabrous, faintly ribbed. Grassland; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Pondoland, Enshlewzi Mtn S to Mkambati Nature Reserve and Kei River Mouth).

46b Leaves glabrous, glandular or pubescent, but then hairs not cobwebby, cottony nor woolly
63a Plants without a tuft of radical leaves; stems ± uniformly leafy
64a Rays 1–4

intricatus S.Moore

Perennial, dwarf shrub, up to 0.45 m high, much-branched, younger parts shortly grey-woolly. **Stems** later dark, woody, brittle. **Leaves** subsessile or shortly petiolate, oblong-spathulate to oblong-obovate, up to 13 mm long, margins revolute, dentate to lobulate in upper half. **Inflorescence** terminal, 1-headed. **Capitula** radiate, disc and rays (1–4) yellow, rays dark purplish below; involucre campanulate; bracts ± 12, 7 mm long; calyculus bracts few, short. **Flowering time** Sept.–Feb. **Cypselae** cylindrical, 2 mm long, hairy. Karroid vegetation; Upper Karoo (rare, Graaff-Reinet, Middelburg).

64b Rays 5–19
65a Rays 5–11
66a Leaves flat
67a Plants fleshy

crassiusculus DC.

Erect, glabrous, loosely branched shrublet, ± succulent, up to 0.6 m high. **Stems** nude, striate, scarred below, leafy above. **Leaves** flat, sessile, variable, linear to lanceolate or spathulate or ± pinnate-lobed and/or toothed, margins hard, teeth and lobes rigid. **Inflorescence** terminal, loosely corymbose, few-headed; peduncles ± nude. **Capitula** radiate, rays (8–10) and disc yellow; involucre campanulate; bracts 10–12, ± 7 mm long; calyculus bracts few, minute. **Flowering time** mainly Apr., May. **Cypselae** cylindrical, 2 mm long, ribbed, shortly hairy. Scrub on stony slopes; Albany Thicket, Eastern Fynbos-Renosterveld (Graaff-Reinet and Bathurst to Humansdorp).

67b Plants not fleshy

burchellii DC.

Half-woody shrublet, roughly hairy to glabrous, up to 0.5 m high. **Stems** erect, striate. **Leaves** sessile, in axillary tufts, linear, up to 50 mm long, base minutely eared and toothed, margins revolute, entire or toothed. **Inflorescence** few-headed, loosely corymbose or panicled or subsolitary. **Capitula** radiate, disc and rays (5–8) yellow; involucre ± conical; bracts ± 12, up to 6 mm long, glabrous; calyculus bracts several, small. **Flowering time** mainly Apr.–July. **Cypselae** cylindrical, 3 mm long, ribbed, hairy. Sandy and stony slopes; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp, Port Elizabeth, Uitenhage).

66b Leaves not flat
68a Leaves linear and sessile, fleshy
69a Leaves up to 15 mm long

acutifolius DC.

Glabrous, perennial shrublet, erect, up to 0.6 m high. **Branches** many, nude below. **Leaves** sessile, linear, fleshy, apex acute, up to 15 mm long. **Capitula** terminal, sessile, solitary, radiate, disc and rays (5 or 6, very short) yellow; involucre cylindrical; bracts 7–9, 9 mm long; calyculus bracts few, small. **Flowering time** mainly Apr.–Sept. **Cypselae** cylindrical, 3.5 mm long, hairy. Karroid vegetation; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (Graaff-Reinet, Cradock, Steytlerville).

69b Leaves up to 100 mm long
70a Involucral bracts 4 mm long

linifolius L.

Shrubby perennial, glabrous, up to 1.2 m high. **Stems** much branched, flexuous, older stems greyish, nude, scarred, younger stems closely leafy. **Leaves** ± fleshy, linear, entire, sessile, both ends tapering, up to 100 mm long, margins revolute, drying dark. **Inflorescence** a loose, much-branched, terminal corymb; peduncles naked. **Capitula** few–several, radiate, disc and rays (± 5) yellow; involucre campanulate; bracts 10–12, 4 mm long; calyculus bracts few, very small. **Flowering time** Oct.–July. **Cypselae** cylindrical, 2 mm long, ribs shortly hairy. Bush and scrub; Mesic Highveld Grassland, Upper Karoo, Albany Thicket, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (Lady Grey S to Middelburg, from Graaff-Reinet to Kei River Mouth and from Willowmore to Alexandria and Humansdorp).

70b Involucral bracts 10 mm long

cotyledonis DC.

Glabrous, perennial shrublet, succulent, up to 0.6 m high. **Branches** thick, nude and scarred below, densely leafy above. **Leaves** sessile, glaucous, linear, ± keeled, acute, up to 55 mm long. **Inflorescence** a dense corymb; pedicel and flower head shorter than leaves. **Capitula** radiate, disc and rays (5–7) bright yellow; involucre cylindrical; bracts 10–12, 10 mm long; calyculus bracts few, short. **Flowering time** May–Sept. **Cypselae** cylindrical, 3–4 mm long, densely hairy. Stony karroid slopes; Upper Karoo, Albany Thicket, Lower Karoo (Middelburg, Graaff-Reinet).

68b Leaves not linear and sessile
71a Shrubby; leaves distinctly petiolate

oxyodontus DC.

(including *S. surculosus* MacOwan, leaves narrowly lanceolate)

Inkwandla (X)

Perennial shrub, herbaceous, erect, up to 1 m high, ± succulent. **Stems** glabrous, leafy above. **Leaves** variable, up to 60 × 60 mm, elliptic to ovate, apex acute, base ± truncate to cuneate, margins crenate to toothed or lobed, glabrous to pubescent; petioles 10–50 mm long, often with 2 leaf-like lobes basally. **Inflorescence** an open panicle. **Capitula** few–many, disc and rays (5–7) yellow; involucre turbinate; bracts ± 12, 3.0–5.5 mm long, calyculus bracts small, few. **Flowering time** Nov.–July. **Cypselae** cylindrical, 2.5–3.0 mm long, ribbed, mainly glabrous. Scrubby growth, among rocks; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Dry Highveld Grassland, Drakensberg Grassland, Albany Thicket (Lusikisiki and Mount Ayliff southwards, from Hogsback to Mtentu, Cradock to Kentani and Suurberg to Alexandria).

71b Herbaceous perennials with simple stems; cauline leaves broad-based, not petiolate, margins entire to coarsely serrate

lanceus Aiton (see 54a above)

65b Rays at least 13
72a Involucral bracts 11–14 mm long

caudatus DC.

Perennial herb, ± glabrous. **Flowering stem** simple, up to 0.7 m high, leafy. **Leaves**: radical leaves oblong to lanceolate-oblong, up to 200 mm long, base broad, clasping, margins ± entire to callose-denticulate; cauline leaves similar, smaller, becoming bracts. **Inflorescence** corymbose, 1–5-headed; peduncles long. **Capitula** radiate, disc and rays bright yellow, rays 13–19, long, spreading; involucre broadly campanulate; bracts ± 20, 11–14 mm long; calyculus bracts few, margins often with long, white, cellular hairs. **Flowering time** Sept.–Nov. **Cypselae** cylindrical, 6–8 mm long, ± glabrous, ribbed. Marshy places; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Drakensberg Grassland, Sub-Escarpment Savanna (uMzimkhulu, Bizana, Fort Beaufort, King William's Town).

72b Involucral bracts 4–9 mm long
73a Strand plant with fleshy leaves

skirrhodon DC.

(including *S. litorosus* Fourc.)

Perennial(?) herb, bushy, glabrous. **Stems** erect or decumbent, becoming woody, sometimes rooting, leafy. **Leaves** fleshy, very variable, up to 100 × 20 mm, lanceolate to broadly elliptic, base petiole-like, half-clasping, apex acute to obtuse, margins mostly denticulate. **Inflorescence** a corymb; peduncles sparsely bracteate. **Capitula** few, radiate, disc and rays (± 13) canary yellow; involucre campanulate; bracts ± 20, 6–7 mm long, resinous; calyculus bracts short, broad. **Flowering time** all year. **Cypselae** 2.5 mm long, cylindrical, hispid between ribs. Coastal dunes, sandy grassland; Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (coastal, Bizana to Humansdorp).

73b Plants of open, often disturbed areas, not the seashore; leaves membranous
74a Annual herb, stems often simple below; involucral bracts 4–6 mm long

madagascariensis Poir.

Annual herb, up to 0.3 m high, ± glabrous. **Stems** leafy, often simple below, branching above. **Leaves** very variable, up to 120 × 25 mm, mostly linear- to elliptic-lanceolate, base petiole-like, half-clasping, sometimes ± eared, apex acute, margins denticulate to pinnately lobed. **Inflorescence** paniculate. **Capitula** few–many, radiate, disc and rays canary yellow, rays ± 13, often rolled under; involucre campanulate; bracts ± 20, 4–6 mm long, resinous; calyculus bracts few, small. **Flowering time** all year. **Cypselae** cylindrical, 1.5–2.0 mm long, hispid between ribs. Weedy, roadsides, disturbed areas, introduced into Argentina, Australia; Sub-Escarpment Savanna, Albany Thicket (Mthatha and Kentani S to Albany and Peddie).

74b Perennial herbs, stems branching from base
75a Involucral bracts 4–6 mm long; calyculus bracts few, not overlapping, much shorter than involucre

inaequidens DC.

Canary weed; *geelopslag* (A); *inkwandlankwandlane* (X)

Bushy, perennial herb, up to 1 m high, ± glabrous. **Stems** branching from a woody base, leafy, often with axillary leaf tufts. **Leaves** up to 100 × 10 mm, mostly linear to narrowly

lanceolate, rarely lobed, apex acute, base half-clasping, often hastately eared, margins ± revolute, mostly denticulate. **Inflorescence** an open panicle; peduncles long. **Capitula** few–many, radiate, disc and rays (7–13) canary yellow, rays often rolled under; involucre campanulate; bracts ± 20, 4–7 mm long, resinous; calyculus bracts few, often dark-tipped. **Flowering time** all year, mainly Oct.–Feb. **Cypselae** cylindrical, 2.0–2.5 mm long, hispid between ribs. Grassland, weedy in disturbed areas, weed in Europe; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Middelburg E to Mateku Waterfall southwards, from Winterberg Mts to King William's Town, from Suurberg Mts to East London and to Humansdorp).

75b Involucral bracts 5–9 mm long; calyculus bracts in 3 or 4 series, overlapping, innermost ± $^1/_3$–$^1/_2$ as long as involucre

harveianus MacOwan

Similar to *S. inaequidens* DC. (above) except: **Involucral bracts** 5–9 mm long. **Calyculus bracts** in 3 or 4 series, mostly dark-tipped, overlapping, innermost ± $^1/_3$–$^1/_2$ as long as involucre. **Flowering time** Feb.–May. Grassland, ± montane, weedy in disturbed areas; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket (Lady Grey and Mount Currie, S to Middelburg, Cradock and Grahamstown).

63b Plants with a tuft of radical leaves; cauline leaves rapidly becoming distant and bracteate upwards
76a Leaf blade glabrous
77a Plants with rooting, prostrate stolons

reptans Turcz.

Perennial herb, ± glabrous, stoloniferous, stolons prostrate, rooting. **Stems** ascending, simple, leafy below, up to 0.15 m high. **Leaves** in tufts at stolon tips, radical leaves many, shortly petiolate, linear-oblong, deeply dentate, up to 35 mm long; cauline leaves sessile, linear, entire to crenate, up to 12 mm long **Capitula** solitary, terminal, radiate, disc and rays yellow, rays 6–8, short; involucre campanulate; bracts 18–20, 7 mm long; calyculus bracts few, minute. **Flowering time** Aug.–Dec. **Cypselae** cylindrical, 4 mm long, ribbed, hairy. Damp places; Upper Karoo, Mesic Highveld Grassland, Dry Highveld Grassland, Drakensberg Grassland (Lady Grey to Barkly East, S to Graaff-Reinet and Cradock).

77b Plants without stolons
78a Radical leaves oblong or lanceolate-oblong, not narrowed to a distinct petiolar region

caudatus DC. (see 72a above)

78b Radical leaves lanceolate to elliptic, sometimes oblong, always narrowed to a distinct petiole-like base

heliopsis Hilliard & B.L.Burrt

Perennial herb, glabrous, rootstock stout, woody. **Flowering stem** up to 1 m high, simple, leafy below, with old fibrous leaf bases. **Leaves**: radical leaves ± fleshy, up to 300 mm long?, broadly elliptic, lower half a broad, petiole-like clasping base, margins ± entire to callose-denticulate; cauline leaves ± similar, smaller, becoming bracts. **Inflorescence** corymbose; peduncles long. **Capitula** 3–9, radiate, disc and rays bright yellow, rays 13–15, long, spreading; involucre broadly campanulate; bracts ± 20, 8–13 mm long; calyculus bracts few–several, margins often with stalked glands. **Flowering time** Sept.–Nov. **Cypselae** narrowly cylindrical, 5 mm long, ribbed, glabrous. Colonies

in grassland; Sub-Escarpment Grassland, Drakensberg Grassland (rare, KZN Border, S to Maclear and Stockenström).

76b Leaf blade variously pubescent, sometimes only margin of midrib ciliate
79a Involucral bracts (not calyculus bracts) glandular or pilose, sometimes sparsely so
80a Involucral bracts 6.0–7.5 mm long

hieracioides DC.

Perennial herb, glandular-pubescent, rootstock woody. **Stems** several, up to 0.45 m high. **Leaves**: radical leaves many, lanceolate, up to 100 × 10 mm, apex acute, lower half petiole-like, ± clasping, margins serrate to pinnatisect; cauline leaves few, remote, up to 30 × 5 mm, linear-lanceolate, base eared, ± clasping, margins serrate. **Inflorescence** a corymbose panicle; peduncles long. **Capitula** several, radiate, disc and rays (8–11) bright yellow, short, soon reflexed; involucre campanulate; bracts 13–18, 6.0–7.5 mm long; calyculus bracts very few, short. **Flowering time** Sept.–Nov. **Cypselae** narrowly cylindrical, 3 mm long, closely ribbed, hispid. Colonies in poor grassland, among rocks, also weedy; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland (Albert to Maclear and Cathcart).

80b Involucral bracts at least 8 mm long, mostly 9 mm or more
81a Leaves lyrate-pinnatisect

hirsutilobus Hilliard

Perennial herb, glandular-pilose, rootstock woody. **Stems** several, lateral to basal leaf rosette, often decumbent, then erect, up to 0.6 m high, branched, distantly leafy. **Leaves**: radical leaves up to 70 mm long, lyrate-pinnatisect, base broad, clasping, apical lobe ± deltoid, up to 60 × 40 mm, margins sinuate-serrulate, toothed or sparsely lobed, petioles up to 130 mm long; cauline leaves oblong to oblanceolate, base broad, clasping, margins lobulate to serrulate. **Inflorescence** a sparse corymbose panicle; peduncles long, ± nude. **Capitula** few, radiate, disc and rays pale yellow, rays 8–12, long and spreading; involucre campanulate; bracts ± 12, 12–13 mm long; calyculus bracts few. **Flowering time** Nov.–Jan. **Cypselae** narrowly cylindrical, ± 4 mm long, closely ribbed, furrows white-hispid. Grassland; Drakensberg Grassland, Sub-Escarpment Grassland (rare, Matatiele, Engcobo to Flagstaff).

81b Leaves not lyrate-pinnatisect (though sometimes pinnately lobed)
82a Capitula 10–11 mm long measured from base of involucral bracts to top of pappus about the time the rays are withering; montane plants
83a Radical leaves mostly > 10 mm wide, often pinnately cut; capitula several–many in corymbose panicles

hastatus L.

Groundsel

Perennial herb, glandular-pubescent to softly pilose, rhizomatous. **Stems** several, up to 0.4 m high, lateral to leaf rosettes, branching low down, leafy. **Leaves**: radical leaves up to 200 × 40 mm, outline oblong or oblanceolate, pinnatifid or lobulate, base broad, flat, half-clasping, petiole-like, margins ± toothed; cauline leaves similar to smaller, linear-lanceolate, base eared, half-clasping, margins serrate. **Inflorescence** a spreading, corymbose panicle; peduncles long. **Capitula** few to ± 20, radiate, disc and rays yellow, rays 8–12, long, spreading; involucre campanulate; bracts 12–14, 9–12 mm long; calyculus bracts very few. **Flowering time** Feb.–Apr. **Cypselae** narrowly cylindrical, 4.0–4.5 mm long, ribbed, furrows white-hispid. Rocky areas; Drakensberg Grassland,

Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Ben Macdhui to Naude's Neck, S from Andriesberg to Cala, Graaff-Reinet to Hogsback, Port Elizabeth to Kasouga River Mouth and to Humansdorp).

83b Radical leaves mostly < 10 mm wide; capitula solitary or few (± 4–6) in corymbose panicles

dissimulans Hilliard

Perennial herb, glandular-pubescent, rhizomatous. **Stems** 1–several, up to 0.4 m high, lateral to leaf rosettes, decumbent, then erect, simple below, remotely leafy. **Leaves**: radical leaves linear-lanceolate to oblanceolate, up to 150 × 15 mm, base broad, flat, petiole-like, clasping, margins serrate or serrulate; cauline leaves few, smaller, sessile, linear or linear-oblong, half-clasping. **Inflorescence** a corymbose panicle. **Capitula** 1–few, disc and rays bright yellow, rays 8, long, spreading; involucre campanulate; bracts 13, 9–12 mm long; calyculus bracts very few. **Flowering time** Jan.–Mar. **Cypselae** cylindrical, ± 4.5 mm long, ribbed, furrows white-hispid. Montane, stony grassland, rock sheets; Drakensberg Grassland (very rare, Barkly East).

82b Capitula 12–14 mm long; if shorter, then plants from coastal areas
84a Involucral bracts ± 12
85a Inflorescence branches with reduced leaves

monticola DC.

Perennial herb, rhizomatous. **Stems** several, up to 0.3 m high, lateral to basal rosette, simple below, harshly pubescent to softly pilose, leafy. **Leaves**: radical leaves up to 120 × 20 mm, oblanceolate, thick, leathery, base flat, petiole-like, half-clasping, margins pinnately cut, serrate or lobulate, upper surface glabrous to scabrid, lower surface glabrous to ± puberulous; cauline leaves smaller and narrower, base broad, half-clasping. **Inflorescence** a corymbose panicle. **Capitula** 1–6, radiate, disc and rays yellow, rays 8–13, long, spreading; involucre campanulate; bracts 14–20, 10–12 mm long; calyculus bracts very few, all with long, fine white hairs. **Flowering time** Jan.–Mar. **Cypselae** narrowly cylindrical, 4 mm long, closely ribbed, white-hispid. Stony grassland, damp places, cliff faces; Drakensberg Grassland (very rare, Barkly East).

85b Inflorescence branches with small, remote, linear bracts

ingeliensis Hilliard

Perennial herb, ± glabrous to ± glandular-pubescent. **Stems** several, up to 0.7 m high, lateral to basal leaf rosette, decumbent then erect, simple below, ± sparsely leafy. **Leaves**: radical leaves up to 350 × 50 mm, oblanceolate, base clasping, broad, flat, petiole-like, margins ± lobed or deeply toothed; cauline leaves smaller, oblanceolate to lanceolate, base broad, clasping, margins toothed. **Inflorescence** a loose, corymbose panicle. **Capitula** few, radiate, disc and rays yellow, rays 8–12, long, spreading; involucre campanulate; bracts ± 12, 11–14 mm long; calyculus bracts few. **Flowering time** Dec.–Mar. **Cypselae** cylindrical, 4–5 mm long, ribbed, furrows white-hispid. Montane, damp grassland; Drakensberg Grassland (rare, Barkly East, Elliot, Maclear).

84b Involucral bracts ± 16–20
86a Involucral bracts 8–10 mm long; coastal species

natalicola Hilliard

Perennial herb, ± glandular-hairy, rootstock woody. **Stems** several, up to 0.6 m high, simple, lateral to basal rosette, decumbent then erect, remotely leafy. **Leaves**: radical leaves oblanceolate, up to 300 × 50 mm, base clasping, broad, flat, petiole-like,

margins toothed or lobulate; cauline leaves smaller, oblong to lanceolate, broad-based, clasping, margins toothed. **Inflorescence** corymbose-paniculate; peduncles long. **Capitula** few, radiate, disc and rays pale yellow, rays 12 or 13, long, spreading; involucre campanulate; bracts 18–20, 8–10 mm long; calyculus bracts very few. **Flowering time** Aug.–Nov. **Cypselae** cylindrical, ± 3.5 mm long, closely ribbed, furrows white-hispid. Damp grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna (very rare, Flagstaff, Bizana).

86b Involucral bracts 10–13 mm long; montane species
87a Radical leaves oblanceolate in outline, mostly pinnately cut or lobulate, the lobes minutely toothed

monticola DC. (see 86a above)

87b Radical leaves linear-oblong, margins serrate or doubly serrate
88a Leaves thick textured and rigid

hypochoerideus DC.

Perennial herb, glandular-hairy, branched, rootstock thick. **Stems** 1–many, up to 0.9 m high, lateral to leaf rosettes, leafy. **Leaves**: radical leaves in many dense rosettes, up to 300 mm long, bases persistent, oblong or oblanceolate, base broad, flat petiole-like, clasping, ± thick, rigid, both sides harshly glandular-hairy, margins doubly callose-serrate; cauline leaves ± similar, smaller. **Inflorescence** a corymbose panicle. **Capitula** 3–10, discoid or radiate, disc and rays yellow, rays 8–13, long, spreading; involucre campanulate; bracts 16–20, 10–13 mm long; calyculus bracts few. **Flowering time** Dec.–Apr. **Cypselae** narrowly cylindrical, 4–5 mm long, ribbed, white-hairy. Montane, colonies on rocky, grassy slopes; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (rare, Somerset East to Barkly East).

88b Leaves thin, not thick textured and rigid

macowanii Hilliard

Perennial (biennial?) herb, very viscid. **Stems** up to 1 m high, simple, densely leafy below, rosette lateral to radical. **Leaves**: radical leaves elliptic-lanceolate or oblanceolate, up to 150 mm long, base broad, flat, petiole-like, margins callose-dentate or serrate; cauline leaves smaller, oblong-lanceolate, sessile. **Inflorescence** a corymbose panicle; peduncles long, sparsely bracteate. **Capitula** 4–15, discoid, yellow; involucre campanulate; bracts ± 14, 10–15 mm long; calyculus bracts few, small. **Flowering time** Jan., Feb. **Cypselae** narrowly cylindrical, 4.5 mm long, closely ribbed, furrows white-hispid. Montane grassland; Drakensberg Grassland, Eastern Fynbos-Renosterveld (Stockenström, Maclear).

79b Involucral bracts (not calyculus bracts) glabrous except for apical tufts of hairs
89a Involucral bracts 11–14 mm long

ingeliensis Hilliard (see 85b above)

89b Involucral bracts 7–8 mm long

brevidentatus M.D.Hend.

Perennial herb. **Flowering stems** simple, up to 0.6 m high, thinly hairy. **Leaves**: radical leaves erect or flat, elliptic to subrotund, up to 150 × 60 mm, base short, flat, petiole-like, margins thickened, ± entire to crenulate or denticulate, ciliate, both sides glabrous to pubescent; cauline leaves similar or ± spathulate to oblong, ± cordate-clasping, becoming bracts. **Inflorescence** corymbose; peduncles remotely bracteate. **Capitula** 1–18, radiate, disc and rays bright yellow, rays 8–13, long, spreading; involucre cam-

panulate; bracts ± 20, 7–8 mm long; calyculus bracts few; disc and rays bright yellow, rays 8–13, long, spreading. **Flowering time** Nov., Dec. **Cypselae** cylindrical, 1.5 mm long, ribbed, hairy. Colonies in damp places; Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket (Mount Ayliff to Queenstown and Peddie).

45b Capitula discoid
90a Plants herbaceous, not succulent
91a Stems and leaves glabrous
92a Involucral bracts 8–10, 12–13 mm long

incomptus DC.

Glabrous, perennial herb or shrublet, up to 0.6 m high. **Stems** herbaceous, rigid, much branched basally. **Leaves** sessile, narrowly oblong to linear-lanceolate, up to 100 mm long, margins coarsely serrate or dentate. **Inflorescence** ± dichotomous. **Capitula** discoid, yellow; involucre narrowly cylindrical; bracts 8–10, 12–13 mm long; calyculus bracts few, minute. **Flowering time** mainly Jan., Feb. **Cypselae** narrowly cylindrical, 3–4 mm long, ribbed, hairy. Rocky karroid slopes, riverbanks; Upper Karoo (Middelburg, Graaff-Reinet, Cradock).

92b Involucral bracts 12–14, 6–7 mm long

angustifolius (Thunb.) Willd.

Glabrous, perennial shrublet or herb, base woody, up to 0.6 m high. **Stems** much branched, rigid, erect, thin. **Leaves** sessile, up to 40 mm long, narrowly linear, entire, margins revolute. **Inflorescence** loosely panicled or subcorymbose, 3–5-headed. **Capitula** discoid, yellow; involucre campanulate; bracts 12–14, 6–7 mm long; calyculus bracts very small, few–several. **Flowering time** mainly Oct.–Apr. **Cypselae** cylindrical, 3 mm long, ribbed, hairy. Grassland, low shrubs; Lower Karoo, Dry Highveld Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Graaff-Reinet E to Kei River Mouth, S from Baviaanskloof to East London and to Humansdorp).

91b Stems and leaves variously pubescent, though sometimes sparsely so; involucral bracts ± 12–20; leaves sometimes toothed but never pinnately cut
93a Involucral bracts at least 10 mm long
94a Whole plant white-felty

haworthii (Sweet) Sch.Bip.

Woolly senecio; *tontelbossie* (A)

Erect, perennial shrublet, up to 0.5 m high, white-felty. **Stems** few, branching basally, leafy above. **Leaves** sessile, fusiform or subcylindrical, up to 100 mm long. **Inflorescence** terminal; peduncle ± 90 mm long. **Capitula** solitary, campanulate, discoid, yellow; involucral bracts 8–12, 15–18 mm long; calyculus bracts few, large. **Flowering time** July–Mar. **Cypselae** cylindrical, ± ribbed, hairy, 3.5 mm long. Stony slopes, karroid; Lower Karoo, Rainshadow Valley Karoo, Albany Thicket (very rare, Kamdeboo Mts, Steytlerville, Uitenhage).

94b Whole plant not white-felty
95a Apex of radical leaves acute or acuminate, margins either entire or ± so or callose-toothed, the teeth themselves rarely toothed, though sometimes interspersed with smaller teeth

asperulus DC.

Perennial herb, rootstock thick, leaf rosettes many, dense, older parts with thick withered leaf bases. **Stems** several, up to 0.75 m high, remotely leafy, roughly hairy, simple.

Leaves: radical leaves linear-lanceolate, up to 300 × 10 mm, thick, rigid, rough, petiole-like base broad, flat, stem-clasping, margins often revolute, entire to serrate; cauline leaves similar, smaller. **Inflorescence** corymbose; peduncles long, scaly. **Capitula** 1–several, discoid, bright yellow; involucre campanulate; bracts 14–20, 10–12 mm long, calyculus bracts few. **Flowering time** Dec.–Apr. **Cypselae** narrowly cylindrical, 4.0–4.5 mm long, densely ribbed, white-hispid. Colonies in poor stony soil, roadside weed; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket (Burgersdorp E to Insizwa southwards, from Penhoek Pass to Cala, Cradock to Stutterheim and S to Grahamstown and Alexandria).

95b Apex of radical leaves obtuse or subobtuse, margins callose-serrate, margins of at least some of the teeth with one or several minute teeth

hypochoerideus DC. (see 88a above)

93b Involucral bracts 6–8 mm long
96a Branched shrublet, up to 1 m high
97a Leaf base minutely eared

leptophyllus DC.

Herbaceous shrublet, rigid, erect, thinly cobwebby, up to 1 m high. **Stems** branching. **Leaves** up to 35 mm long, linear, entire, base minutely eared, margins revolute. **Inflorescence** a lax, few-headed corymb. **Capitula** discoid, yellow; involucre campanulate; bracts ± 15, 6–7 mm long; calyculus bracts few, small. **Flowering time** mainly Aug.–Jan. **Cypselae** cylindrical, 3 mm long, ribbed, hairy. Dry stony karroid slopes, disturbed areas; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket (Middelburg E to Indwe and S from Cradock to Albany and Grahamstown).

97b Leaf base not minutely eared

niveus (Thunb.) Willd.

Perennial shrub, shrublet, white-woolly to glabrescent, up to 1 m high. **Stems** long, lax, sparsely to densely leafy. **Leaves** sessile, linear, ± fleshy, up to 50 mm long, margins revolute. **Inflorescence** corymbose, few-headed. **Capitula** discoid, yellow; involucre campanulate; bracts 14–16, up to 8 mm long; calyculus bracts few–several, small, white-woolly. **Flowering time** Aug.–Feb. **Cypselae** cylindrical, 3.5 mm long, ribbed, hairy. Karroid grassland; Upper Karoo, Dry Highveld Grassland, Eastern Fynbos-Renosterveld (Middelburg, Graaff-Reinet, Willowmore).

96b Unbranched perennial herb; flowering stem solitary, up to 0.75 m high

striatifolius DC. (see 62a above)

90b Plants herbaceous, somewhat succulent, stems and leaves glabrous; involucral bracts ± 8–12
98a Leaves on long (up to 150 mm) terete petioles, often ± peltate

oxyriifolius DC.
(including *S. tropaeolifolius* MacOwan)

Perennial herb, glabrous, fleshy, rootstock tuberous, ± creeping. **Flowering stem** simple, single, up to 1 m high, leafy basally, nude above. **Leaves** very variable, up to 90 × 90 mm, orbicular to deltoid or angled, peltate or petiolate at base of sinus, margins entire to callose-dentate; petioles up to 150 mm long. **Inflorescence** a corymbose panicle; peduncles long, nude. **Capitula** few–many; discoid (*S. tropaeolifolius* radiate), bright yellow; involucre turbinate-campanulate; bracts 8–10, 7–12 mm long; calyculus bracts few, very small. **Flowering time** Sept.–Jan. **Cypselae** cylindrical, 3.5–4.5 mm long,

ribbed, furrows hairy. Grassland; Sub-Escarpment Savanna, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket (Bizana, S from Queenstown to Mkambati Nature Reserve, Stutterheim to Willowvale and from Uitenhage to Grahamstown).

98b Leaves tapering to a broad, flat, petiole-like, half-clasping base

rhomboideus Harv.

Perennial herb, glabrous, ± glaucous, fleshy, rootstock tuberous, woody, up to 80 × 15 mm. **Flowering stems** 1–several, simple, stout, up to 1 m high, leafy near base. **Leaves** rhomboid or obovate, up to 200 mm long, base broad, flat, petiole-like, margins ± callose-denticulate, sinuate-lobed or dentate. **Inflorescence** a corymbose panicle; peduncles long, nude. **Capitula** few–many, discoid, bright yellow (rarely radiate?); involucre turbinate-campanulate; bracts 10–12, 8–10 mm long; calyculus bracts 1 or 2, minute. **Flowering time** Nov.–Mar. **Cypselae** cylindrical, 5 mm long, ribbed, furrows hairy. Grassland, scrub margins, among rocks; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Mount Fletcher S to Maclear, Alice, Kei River Mouth and Alexandria).

44b Ovaries glabrous
99a 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
100a Capitula discoid; involucral bracts 8–10; leaves panduriform, persistently cobwebby-cottony below

panduriformis Hilliard

Biennial(?) herb, up to 2.4 m high, woody below. **Stem** simple and leafless below, cobwebby and leafy above. **Leaves** panduriform, up to 220 × 110 mm long, ovate, then contracted abruptly to broadly winged, petiole-like part, base eared, half-clasping, apex acute, margins ± dentate; cobwebby above, glabrescent, cobwebby below. **Inflorescence** many clusters in a very large, leafy, corymbose panicle. **Capitula** many, discoid, yellow; involucre narrowly campanulate, ± cobwebby; bracts 8–10, ± 6 mm long; calyculus bracts many, short. **Flowering time** Mar.–May. **Cypselae** cylindrical, 4 mm long, ribbed, glabrous. Forest margins; Sub-Escarpment Grassland (Mount Frere to Engcobo).

100b Capitula radiate
101a Leaf hairs various, but not woolly, cottony nor cobwebby
102a Involucral bracts 3–7 mm long
103a Shrub with ± uniformly leafy stems

oxyodontus DC. (see 72a above)

103b Herbaceous perennials with leaves mainly on lower part of stem; crown without fibres; capitula turbinate, involucral bracts ± 12–14

tugelensis J.M.Wood & M.S.Evans

Perennial herb, underground stock slender, creeping, branching. **Flowering stem** simple, solitary, erect, up to 0.3 m high, slender, glabrous, leafy below. **Leaves**: lower leaves thick, elliptic, up to 50 mm long, base narrowed, flat, petiole-like, decurrent on stem, margins ± serrulate, glandular-ciliate, ± glabrous both sides, often purplish below; upper leaves few, bracteate. **Capitula** mostly solitary, radiate, disc and rays bright yellow, rays ± 13, long, spreading; involucre turbinate; bracts 12–14, 7 mm long; calyculus bracts few. **Flowering time** Feb., Mar. **Cypselae** cylindrical, ± 3 mm long, ± ribbed, glabrous. Montane, colonies in grassland; Drakensberg Grassland, Sub-Escarpment Grassland (very rare, Barkly East, Maclear).

102b Involucral bracts 9–16 mm long
104a Leaves lyrate-pinnatisect

napifolius MacOwan

Perennial herb, rhizomatous. **Stems** erect, single, unbranched, up to 0.75 m high, hollow, ± glabrous to glandular-pilose, leafy below. **Leaves** lyrate-pinnatisect, up to 200 × 90 mm, up to 5 lobes each side, apical lobe triangular, sinuately lobed, base ± clasping, petiole-like, margins coarsely, irregularly, sharply toothed; both sides harshly glandular-pubescent. **Inflorescence** a compact, rounded, corymbose panicle. **Capitula** many in dense clusters; radiate, disc and rays bright yellow, rays 8, long, spreading; involucre campanulate; bracts ± 20, 9–12 mm long, glandular-hispid; calyculus bracts few, long. **Flowering time** Nov.–Jan. **Cypselae** cylindrical, 6 mm long, ribbed, glabrous. Montane, colonies in grassland, moist places; Sub-Escarpment Grassland, Albany Thicket, Drakensberg Grassland (rare, uMzimkhulu to Somerset East and Katberg).

104b Leaves not lyrate-pinnatisect; involucral bracts ± 20, rays ± 13 or more

caudatus DC. (see 72a above)

101b Leaf hairs woolly, cottony or cobwebby (glandular hairs sometimes present as well)
105a 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)
106a Leaves lyrate-pinnatifid
107a Lower leaf surface thinly cobwebby, sometimes glabrescent, apex of marginal teeth frequently incurved; plants of grassland and open woodland

serratuloides DC.

Perennial herb, rootstock woody, creeping. **Stems** solitary, unbranched, up to 1 m high, densely leafy above, glandular-hairy to ± glabrous. **Leaves** lyrate-pinnatifid, up to 120 × 25 mm, sessile; apical lobe very large, ± falcate, lanceolate to narrowly elliptic, acute; lower lobes 2–4 each side of petiole-like base, lanceolate, up to 15 mm long, margins ± doubly serrate, apex of main teeth ± incurved, upper surface ± glabrous, lower surface ± thinly cobwebby. **Inflorescence** a dense corymbose panicle. **Capitula** many, radiate, disc and rays yellow, rays 8–13, short, soon recurved; involucre campanulate; bracts 12, 3.0–3.5 mm long, resinous, glabrous. **Flowering time** Mar.–May. **Cypselae** cylindrical, 1.75 mm long, ribbed, glabrous. Grassland, open woodland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Mount Newton E to uMzimkhulu, S from Andriesberg to Indwe and from Amatole Mts to Komga).

107b Lower leaf surface glabrous, apex of marginal teeth not incurved; plants of streambanks and marshes, often growing in water

gregatus Hilliard

Similar to *S. serratuloides* DC. (above) except: **Stems** simple or branching low down, branches stiffly erect, glabrous, closely leafy. **Leaves** up to 120 mm long, flat, not folded, apical lobe very long, linear to lanceolate, basal lobes sometimes one pair only, margins thickened, serrate or serrulate, teeth not incurved, both surfaces glabrous or almost. **Flowering time** Mar.–May. Wet places, streambanks and marshes; Mesic Highveld Grassland, Sub-Escarpment Grassland, Drakensberg Grassland (Lady Grey E uMzimkhulu and S to Victoria East).

106b Leaves pinnatisect or bipinnatisect
108a Leaves persistently grey- or white-woolly at least on lower surface

tanacetopsis Hilliard

Perennial shrublet, spreading. **Stems** erect, ascending or pendulous, up to 0.45 m high, grey-woolly, glabrescent or densely glandular-pilose, closely leafy. **Leaves** up to 30 mm long (including broad, ± clasping, petiole-like base), oblong, pinnatisect to bipinnatisect, lobes up to 4 mm long; grey-woolly or glandular-pilose. **Inflorescence** an open corymbose panicle. **Capitula** radiate, disc and rays bright yellow, rays ± 13, long and spreading; involucre turbinate; bracts ± 12, 4–7 mm long, glandular-pilose; calyculus bracts few, up to 6 mm long. **Flowering time** Feb., Mar. **Cypselae** cylindrical, ± 2.5 mm long, ribbed, glabrous. Montane, cliff faces, rock sheets; Mesic Highveld Grassland, Sub-Escarpment Grassland, Upper Karoo, Drakensberg Grassland, Sub-Escarpment Savanna (Lady Grey to Clydesdale, S from Middelburg to Queenstown and Katberg to Kei River).

108b Leaves without wool at maturity though sometimes glandular
109a Vegetative and inflorescence branches virgate (straight and rod-like)

achilleifolius DC.

Slootopdammer (A)

Perennial, herbaceous shrub, up to 1.2 m high. **Stems** long, stiff, prostrate, decumbent or ascending, can root at nodes, loosely woolly, glabrescent, young stems closely leafy. **Leaves** oblong in outline, up to 40 mm long, petiolate or sessile, pinnatisect or bipinnatisect, woolly to glabrous, lobes entire or toothed, 2–20 mm long. **Inflorescence** a solitary capitula or several in a corymb. **Capitula** radiate, disc and rays bright yellow, rays ± 13, long and spreading; involucre turbinate; bracts 8–12, 4.5–6.0 mm long, glandular, base often cobwebby; calyculus bracts few, up to 4 mm long. **Flowering time** Jan.–Apr. **Cypselae** cylindrical, 3 mm long, ribbed, glabrous. Damp places, along streams; Drakensberg Grassland, Upper Karoo, Albany Thicket, Sub-Escarpment Grassland (Barkly East to Middelburg, Graaff-Reinet and King William's Town).

109b Vegetative and inflorescence branches divaricate (branched)

seminiveus J.M.Wood & M.S.Evans
(including *S. prostratus* Klatt)

Perennial, dwarf shrub, compact, up to 0.25 m high. **Stems** erect or prostrate and rooting, glabrous or loosely woolly at first, upper parts and peduncles glandular-pilose, densely leafy. **Leaves** oblong, up to 30 mm long, sessile, pinnatisect or bipinnatisect, lobes to 4 mm long, base broad, ± clasping, unfurled leaves densely white-woolly, later glabrous. **Inflorescence** 1–3 capitula in terminal corymbs. **Capitula** radiate, disc and rays bright yellow, rays ± 13, long, spreading; involucre turbinate; bracts ± 12, 6–8 mm long, glandular-pilose, base often cobwebby; calyculus bracts few, up to 5 mm long. **Flowering time** Jan.–Mar. **Cypselae** cylindrical, ± 3 mm long, ribbed, glabrous. Montane, rocky areas; Drakensberg Grassland, Sub-Escarpment Grassland (rare, Barkly East to Matatiele).

105b Leaves not pinnately cut, margins entire to coarsely toothed
110a Involucral bracts mostly 3.5–5.5 mm long, if up to 7 mm, then rays only 5
111a Leaves narrowed to a minute petiole

baurii Oliv.

Perennial herb, ± cobwebby, glabrescent, rootstock woody, creeping. **Stems** many, erect, up to 0.35 m high, mostly simple, ± cobwebby, densely leafy. **Leaves** leathery, lance-

olate, up to 25 × 5 mm long, ± sessile, apex acute, margins entire to serrate in upper half, thinly cobwebby to glabrescent. **Inflorescence** a corymbose panicle. **Capitula** few–many, radiate, disc and rays yellow, rays 6 or 7, short, soon recurved; involucre campanulate; bracts 8, 3.5–4.0 mm long; calyculus bracts few. **Flowering time** mainly Dec., Jan. **Cypselae** cylindrical, 2 mm long, ribbed, glabrous. Grassland, ± montane; Sub-Escarpment Grassland, Drakensberg Grassland (Mount Currie S to Maclear and Stutterheim).

111b Cauline leaves broad-based, often decurrent
112a Rays 8 or more; leaf bases often cordate-clasping

lanceus Aiton (see 54a above)

112b Rays 5 or 6; leaf bases often decurrent in broad or narrow stem wings
113a Leaf bases minutely lobulate

lineatus (L.f.) DC.
(including *S. quinquenervius* Sond.)

Perennial, herbaceous shrublet, up to 0.8 m high. **Stems** erect, simple, grey-felted, densely leafy. **Leaves** sessile, elliptic to lanceolate, up to 60 mm long, margins revolute, base ± lobulate, upper half entire to coarsely few-toothed, grey-felted, 3-nerved below, dark grey-felted to glabrescent above. **Inflorescence** a dense, 12–30-headed, terminal corymb. **Capitula** radiate, disc and rays (5 or 6) yellow; involucre narrowly campanulate; bracts 8 or 9, hairy, 5.5 mm long; calyculus bracts few, small. **Flowering time** Jan.–Aug. **Cypselae** cylindrical, 1.5–2.0 mm long, ribbed, glabrous. Fynbos, forest edges; Dry Highveld Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Somerset East S to Albany and Humansdorp).

113b Leaf bases not minutely lobulate, often decurrent in broad or narrow stem wings

inornatus DC.

Perennial herb, glabrescent, rootstock stout, woody. **Flowering stem** solitary, simple, up to 1.8 m high, leafy, old fibrous leaf bases below. **Leaves**: radical leaves elliptic, up to 600 mm long, lower half petiolar, base broad, clasping, margins callose-crenulate or denticulate; cauline leaves similar, soon sessile, base broad, ± decurrent, sometimes stem wings broad. **Inflorescence** a many-headed, flat-topped, corymbose panicle. **Capitula** radiate, disc and rays bright yellow, rays 5, short, soon reflexed; involucre turbinate-campanulate; bracts 10–12, 4–7 mm long; calyculus bracts few, small. **Flowering time** Nov.–Mar. **Cypselae** fusiform, ± 4 mm long, ribbed, glabrous. Grassland, colonies; Sub-Escarpment Grassland, Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Savanna (KZN Border S to Maclear, Graaff-Reinet, Somerset East and Komga).

110b Involucral bracts mostly 6–13 mm long, if shorter, then rays at least 8
114a Cauline leaves decurrent in broad or narrow wings running to node below
115a Involucral bracts 8–12 mm long, calyculus bracts few, in ± 2 series; rays ± 8

decurrens DC. (see 56a above)

115b Involucral bracts 7–8 mm long, calyculus bracts many, in several series; rays ± 13

digitalifolius DC.

Stout herb, biennial(?). **Stem** simple, up to 1.5 m high, glabrous, leafy. **Leaves**: radical leaves oblong-lanceolate, up to 400 mm long, lower third petiole-like; cauline leaves smaller, becoming bracts, base auriculate, decurrent on stem, margins callose-denticulate, wings conspicuous, upper surface cobwebby, glabrescent or glabrous, lower surface cobwebby or glabrous. **Inflorescence** a broad, flat-topped, corymbose panicle.

Capitula many, radiate, disc and rays bright yellow, rays ± 13, ± 8 mm long, often reflexed; involucre campanulate; bracts ± 20, 7–8 mm long; calyculus bracts many, series several. **Flowering time** Nov.–Mar. **Cypselae** cylindrical, ± 5 mm long, ribbed, glabrous. Grassland, colonies; Sub-Escarpment Savanna, Sub-Escarpment Grassland (Bizana to Queenstown).

114b Cauline leaves not decurrent or sometimes very shortly decurrent but not running to node below;
116a Leaves linear-cylindrical, fleshy

scaposus DC.

Perennial herb, succulent, cobwebby (young) to glabrous (old). **Stems** absent, very short or up to 0.4 m long and branched. **Leaves** crowded at tips of stems or basally, cylindrical, linear, apex often flattened, subspathulate, up to 80 mm long, silvery. **Inflorescence** a lax panicle, 1–5-headed; peduncles up to 400 mm long, ± nude. **Capitula** radiate, disc and rays (± 12) yellow; involucre cobwebby, broadly campanulate; bracts 10–12, 7–8 mm long; calyculus bracts few, up to 4 mm long. **Flowering time** Dec., Jan. **Cypselae** cylindrical, 2.5 mm long, ribbed, ± glabrous. Rocky areas, cliffs, coastal bush, grassland; Drakensberg Grassland, Eastern Fynbos-Renosterveld (Victoria East to Humansdorp).

116b Leaves not as above
117a Leaves persistently white-felted below

tysonii MacOwan

Perennial herb, rhizomatous. **Stems** 1 or 2, subsimple, erect, up to 1.5 m high, woody below, white-pilose, closely leafy. **Leaves** sessile, lanceolate, up to 70 × 10 mm, base broad, auricled, ± clasping, apex acuminate, margins dentate or denticulate, revolute, hispidulous above, white-felted below, upper leaves becoming bracts. **Inflorescence** in 1–6-headed corymbs. **Capitula** radiate, disc and rays (13) bright yellow; involucre campanulate, hispidulous; bracts ± 14, ± 12 mm long; calyculus bracts few, long. **Flowering time** Feb., Mar. **Cypselae** cylindrical, 3 mm long ± ribbed, glabrous. Grassland; Sub-Escarpment Grassland (very rare, uMzimkhulu).

117b Leaves not persistently white-felted below
118a Leaves all radical, flowering stems only bracteate, crown silky-woolly

cryptolanatus Killick

Perennial herb, ± glabrous, rootstock thick, creeping, crown white-silky-woolly. **Flowering stem** simple, solitary, up to 0.45 m high; bracts few. **Leaves** radical, rosetted, ± fleshy, spathulate, up to 90 mm long, base broad, clasping, margins thick, ± red, entire to ± denticulate-serrulate. **Inflorescence** corymbose; peduncles long, bracteate. **Capitula** 1–4, radiate, disc and rays bright yellow, rays ± 20, long, spreading; involucre campanulate; bracts ± 20, 8–9 mm long; calyculus bracts several, descending and white-woolly on peduncle. **Flowering time** Jan.–Mar. **Cypselae** cylindrical, ± 3 mm long, ribbed, glabrous. Montane, wet places, ± aquatic; Drakensberg Grassland (rare, Barkly East).

118b Leaves radical and cauline, crown fibrous from old leaf bases, margins closely and ± uniformly callose-denticulate or callose-dentate
119a Involucral bracts much shorter than pappus of disc flowers

affinis DC.

Perennial herb, stock stout, woody. **Flowering stems** 1–many, up to 1 m high, simple, glabrous to ± cobwebby, leafy, old fibrous leaf bases below. **Leaves**: radical leaves

linear-lanceolate, up to 350 mm long, lower half petiolar, narrowly winged, then expanded, clasping, mostly glabrous, margins closely, minutely callose-denticulate; cauline leaves ± similar, sessile, becoming bracts. **Inflorescence** a corymbose panicle; peduncles long, sparsely bracteate. **Capitula** up to 35, radiate, disc and rays bright yellow, rays 8, ± short, reflexed; involucre campanulate; bracts ± 12, 5.5–7.0 mm long; calyculus bracts many. **Flowering time** mainly Dec., Jan. **Cypselae** fusiform, ± 4 mm long, ribbed, glabrous. Colonies in grassland; Mesic Highveld Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Drakensberg Grassland, Albany Thicket (Lady Grey E to KZN Border, Queenstown E to Port St Johns, Mpofu Game Reserve to Stutterheim and to Albany).

119b Involucral bracts ± equalling pappus of disc flowers, if ± shorter, then involucral bracts ± 16–20
120a Calyculus ample, longest bracts ± equalling involucre

conrathii N.E.Br.

Perennial herb, coarse, sweet-smelling, white-cobwebby first, then glabrous, rootstock stout, woody. **Stem** simple, up to 1.5 m high, leafy. **Leaves**: radical leaves broadly elliptic, up to 600 mm long, base broad, petiole-like, clasping, margins callose-dentate to denticulate; old fibrous leaf bases persistent; cauline leaves similar, soon distant, sessile, becoming bracts. **Inflorescence** a corymbose panicle; peduncles long. **Capitula** up to ± 30, radiate, disc and rays bright yellow, rays 8–11, short, reflexed; involucre campanulate; bracts 16–20, 6.5–9.0 mm long; calyculus bracts many. **Flowering time** Dec.–Feb. **Cypselae** narrowly barrel-shaped, ± 4 mm long, ribbed, glabrous. Colonies in grassland; Sub-Escarpment Savanna (very rare, Bizana to Komga).

120b Calyculus bracts either very short, or, if long, subbiseriate
121a Involucral bracts 12–20, longest calyculus bracts $^1/_3$–$^1/_2$ as long as involucre, peduncles sparsely bracteate; rays 8–13; involucral bracts 8–11 mm long

albanensis DC. var. **doroniciflorus** (DC.) Harv. (see 62b above)

121b Involucral bracts 12–16, calyculus bracts very short, < $^1/_4$ the involucral bracts, descending on the densely bracteate peduncle; rays 8

albanopsis Hilliard

Perennial herb, ± glabrous, rootstock woody, crown fibrous. **Flowering stem** simple, up to 1.5 m high, leafy. **Leaves**: radical and lower cauline leaves up to 350 × 25 mm, linear-lanceolate, lower half tapering into thin petiole, margins minutely callose-denticulate, often subrevolute; cauline leaves similar, soon sessile, becoming bracts. **Inflorescence** corymbose-paniculate; peduncles long, very scaly. **Capitula** up to 20, radiate, disc and rays bright yellow, rays 8, long, spreading; involucre turbinate; bracts 12 or 13, 7.5–11.0 mm long; calyculus bracts short, few. **Flowering time** mainly Dec.–Apr. **Cypselae** fusiform, 6 mm long, ribbed, glabrous. Grassland; Indian Ocean Coastal Belt (very rare, Port St Johns).

99b Leaf blade glabrous, lacking woolly or cottony hairs, though the crown of the plant and the lowest nodes may be woolly and then with woolly hairs hidden in leaf axils
122a Calyculus composed of several or many bracts, if bracts only 1 or 2, then bracts or base of involucre hairy or glandular
123a Crown of plant woolly; leaves all crowded in a basal rosette

cryptolanatus Killick (see 118a above)

123b Crown of plant not woolly, often fibrous; all leaves not crowded in a basal rosette
124a Shrubby; leaves linear or triplinerved
125a Leaves linear

pinifolius (L.) Lam.

Glabrous, perennial shrublet, sparsely branched, up to 0.5 m high. **Stems** curved or erect, densely leafy above, nude and scarred below. **Leaves** rigid, linear, up to 25 mm long, erect or spreading. **Inflorescence** mostly solitary. **Capitula** large or small, radiate, yellow, rays 3–8, spreading; involucre campanulate; bracts 12–18, up to 8 mm long; calyculus bracts several, up to 4 mm long. **Flowering time** mainly Mar.–May. **Cypselae** cylindrical, 3 mm long, ribbed, glabrous. Sandstone slopes in fynbos; Albany Thicket, Eastern Fynbos-Renosterveld (Albany to Humansdorp).

125b Leaves triplinerved
126a Leaves lyrate-pinnatifid, basal lobes very small

microglossus DC.

Perennial herb, glabrous, rootstock woody, creeping. **Stems** several, erect, simple, up to 1.3 m high, leafy above, woody and leafless below. **Leaves** leathery, up to 70 × 25 mm, lyrate-pinnatifid, main lobe very large, elliptic, triplinerved, margins thick, serrulate; lower lobes 2–4 each side of petiole-like base, linear-lanceolate, small. **Inflorescence** a spreading, corymbose panicle. **Capitula** many, radiate, disc and rays yellow, rays 5–7, short, soon recurved; involucre campanulate; bracts ± 8, 3.5–4.0 mm long; calyculus bracts few. **Flowering time** Dec.–Feb. **Cypselae** cylindrical, 2 mm long, 5-ribbed, glabrous. Grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna (very rare Queenstown, Komga).

126b Leaves elliptic to ovate, often toothed or deeply cut, but not lyrate-pinnatifid

oxyodontus DC. (see 71a above)

124b Herbaceous perennials, if ± woody, stems simple below the inflorescence branches; leaves penninerved
127a Rays 5

inornatus DC. (see 113b above)

127b Rays 8 or more
128a Leaves lyrate-pinnatifid, apical lobe very large, basal lobes very small, reduced to 1 or a few pairs of linear teeth

serratuloides DC. (see 107a above)

128b Leaves not lyrate-pinnatifid; rays much exceeding the disc flowers
129a Involucral bracts 4–5 mm long

lanceus Aiton (see 54a above)

129b Involucral bracts 5.5–14.0 mm long
130a At least some of the leaves decurrent on the stem in broad or narrow wings reaching ± to the node below (not conspicuous in S. tugelensis*)*
131a Capitula solitary or paired

tugelensis J.M.Wood & M.S.Evans (see 103b above)

131b Capitula 1–many in a corymbose panicle
132a Involucral bracts 12–16, 5.5–7.0 mm long, rays 8–11; streambanks or marshes, roots often in water

lygodes sensu Hilliard

Perennial herb, glabrous, rhizomes slender with terminal rosettes. **Stem** simple, leafy, up to 1 m high. **Leaves** elliptic to lanceolate, often decurrent on stem, up to 300 mm long,

smaller upwards, becoming bracts, lowermost with petiole-like base, margins closely, minutely crenulate or denticulate. **Inflorescence** a corymbose panicle, up to 50-headed; peduncles long, scaly. **Capitula** radiate, disc and rays bright yellow, rays 8–11, spreading; involucre turbinate-campanulate; bracts 12–16, 5.5–7.0 mm long; calyculus bracts many, dark-tipped. **Flowering time** Mar., Apr. **Cypselae** fusiform, 3 mm long, ribbed, glabrous. Marshes, streamsides; Sub-Escarpment Grassland, Drakensberg Grassland (Cathcart, Victoria East).

132b Involucral bracts 20, 7–8 mm long, rays 13; grassland

digitalifolius DC. (see 115b above)

130b Leaves not decurrent or very shortly so, but not running to the node below
133a Involucral bracts 5.5–7.0 mm long, much shorter than the pappus of the disc flowers

affinis DC. (see 119a above)

133b Involucral bracts 7.5–14.0 mm long, ± equalling the pappus of the disc flowers
134a Involucral bracts 11–14 mm long, calyculus bracts equalling or exceeding the involucral bracts; marshes

caudatus DC. (see 72a above)

134b Involucral bracts 7.5–11.0 mm long, calyculus bracts shorter than the involucre; grassland
135a Longest calyculus bracts ± $^1/_3$–$^1/_2$ as long as the involucre; peduncles sparsely bracteate; rays 8–13

albanensis DC. var. **doroniciflorus** (DC.) Harv. (see 62b above)

135b Longest calyculus bracts < $^1/_4$ the length of the involucral bracts, descending on the richly bracteate peduncles; rays 8

albanopsis Hilliard (see 121b above)

122b Calyculus wanting or composed of 1 or 2 bracts, they and base of the involucre glabrous and eglandular
136a Capitula discoid
137a Involucral bracts 8 or more
138a Involucral bracts at least 7 mm long
139a Crown of plant glabrous; leaves orbicular, obovate, deltoid or rhomboid in outline
140a Leaves orbicular to deltoid in outline, ± peltate, petioles terete

oxyriifolius DC. (see 98a above)

140b Leaves rhomboid or obovate in outline, narrowed to a broad, flat petiole-like base

rhomboideus Harv. (see 98b above)

139b Crown of plant woolly; leaves oblong or lanceolate-oblong

othonniflorus DC.

Melktou (A); *idwara* (X)

Perennial herb, glabrous, glaucous, ± fleshy, rhizomatous, crown woolly. **Flowering stems** up to 1 m high, several, simple, leafy below. **Leaves** oblong to oblong-lanceolate, up to 120 mm long, sessile, base narrowed, smaller, fewer upwards, margins entire or ± callose-denticulate, ± revolute. **Inflorescence** corymbose-paniculate; peduncles long. **Capitula** 1–8, discoid, bright yellow, involucre turbinate-campanulate; bracts 12–16, 8.5 × 11 mm long; calyculus bracts 1 or 2, minute. **Flowering time** mainly Dec.–Feb. **Cypselae** cylindrical, 5–6 mm long, ribbed, glabrous. Grassland; Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland (Aliwal North E to Mount Fletcher, S to Graaff-Reinet, King William's Town, Grahamstown and Humansdorp).

138b Involucral bracts 3.5–5.0 mm long

glaberrimus DC.

Perennial herb, glabrous, rootstock woody, crown woolly. **Flowering stem** solitary, simple, up to 0.9 m high, leafy. **Leaves** 3–8, variable, becoming bracts, up to 140 mm long, lanceolate to oblong-elliptic or ovate, base ± cordate-clasping, often ± decurrent, margins thickened, entire or ± callose-denticulate, often ± revolute; leaves drying leathery or rigid, reticulate venation invisible to raised. **Inflorescence** corymbose-paniculate; peduncles long. **Capitula** few–many, discoid, disc and rays (5) bright yellow; involucre turbinate; bracts 6–10, 3.5–6.0 mm long; calyculus bracts 0–2, minute. **Flowering time** Aug.–Dec. **Cypselae** cylindrical, 3–4 mm long, ribbed, glabrous. Colonies in grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Barkly East and KZN Border S to King William's Town).

137b Involucral bracts 4–6; side nerves sharply ascending
141a Crown glabrous; involucral bracts 7–10 mm long
142a Main cauline leaves broadest in lower part or margins ± parallel

adnatus DC.

Perennial herb, glabrous, ± glaucous, rootstock thick, woody. **Flowering stems** solitary, up to 1.2 m high, simple, leafy. **Leaves** ± fleshy, lanceolate to oblong-lanceolate, up to 150 mm long, becoming bracts above, bases below narrowed, ± clasping, bases above broad, stem-clasping, shortly decurrent, margins entire to minutely callose-toothed, drying thick and leathery. **Inflorescence** a flat-topped, corymbose panicle. **Capitula** many, discoid, disc and rays bright yellow, rays 1–3, long and spreading; involucre narrowly cylindric; bracts 4 or 5, 7–10 mm long; calyculus bracts 0 or 1, minute. **Flowering time** Nov.–Jan. **Cypselae** cylindrical, 5 mm long, ribbed, glabrous. Colonies in dry grassland, poisonous; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Queenstown, King William's Town, East London).

142b Main cauline leaves broadest in middle or upper half

humidanus C.Jeffrey

Blouvleibossie (A)

Resembles *S. adnatus* (above) except: Perennial herb, up to 1 m high. **Leaves** elliptic, elliptic-lanceolate or oblanceolate, broadest in middle or upper half, 90–160 mm long. **Flowering time** Nov.–Jan. Damp grassy places; Sub-Escarpment Grassland, Drakensberg Grassland (very rare, Kokstad, Stockenström).

141b Crown and basal nodes woolly; involucral bracts 4.5–7.0 mm long;
leaves oblong-obovate, obtuse

isatideus DC.

Dan's cabbage; *blouvleibossie* (A); *inkanga* (X)

Perennial herb, glabrous, ± glaucous, woolly at base and leaf axils, stock stout, woody. **Flowering stem** up to 1.5 m high, solitary, simple, leafy below. **Leaves**: lower leaves up to 200 mm long, oblong-obovate, narrowed into winged petiole, half-clasping, margins thickened, denticulate or serrulate; upper leaves similar, soon sessile, shortly decurrent, becoming bracts. **Inflorescence**: a large corymbose panicle. **Capitula** many, discoid, bright yellow; involucre narrowly cylindric; bracts 4 or 5, 5–7 mm long; calyculus bracts 0–2, minute. **Flowering time** Dec., Jan. **Cypselae** cylindrical, 4.5 mm long, ribbed, glabrous. Colonies in grassland, poisonous; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Steynsburg E to Kokstad, Queenstown to Cathcart, Amatole Mts to Komga, Suurberg and Port Elizabeth to Grahamstown).

136b Capitula radiate
143a Involucral bracts 4 or 5, 7–11 mm long, main cauline leaves up to 20 mm wide, lanceolate or linear, broadest in lower part or margins nearly parallel

adnatus DC. (see 142a above)

143b Involucral bracts mostly 7–16, if only 5, then 4–5 mm long
144a Crown and leaf axils glabrous

ruwenzoriensis S.Moore

Perennial herb, glabrous, ± glaucous, rootstock tuberous, up to 50 × 10 mm. **Flowering stems** 1–several, up to 0.75 m high, simple, leafy near base, nude above. **Leaves** ± fleshy, narrowly to broadly elliptic, up to 100 mm long, triplinerved, base broad, ± clasping, margins entire to ± callose-denticulate. **Inflorescence** a corymbose panicle. **Capitula** 1–15, radiate, disc and rays bright yellow, rays 8–10, long, spreading; involucre campanulate; bracts 10–12, 6–10 mm long; calyculus bracts 1 or 2, minute. **Flowering time** Dec.–July. **Cypselae** cylindrical, 3 mm long, ribbed, glabrous. Grassland, shrubland, rocky places; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Albany Thicket, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Queenstown E to Port St Johns, S from Cradock to Willowvale and Uitenhage to Grahamstown).

144b Crown and lowest nodes woolly, wool hidden deep in leaf axils; leaves cauline, sometimes crowded on lower part of stem, but not rosulate nor obovate
145a Stems with 3–8 leaves passing abruptly into much smaller inflorescence bracts
146a Leaves at least 8–10× as long as broad
147a Involucre turbinate; bracts ± 8; rays 5 or 6; leaves 3–7, margins entire or distantly callose-denticulate

bupleuroides DC.

Idwarane (X)

Perennial herb, glabrous, rootstock woody, crown woolly. **Flowering stems** solitary, up to 0.75 m high, leafy below. **Leaves** leathery or rigid, 3–7, linear-lanceolate, up to 225 × 18 mm, length:width = 10:1, base ± eared, clasping, margins thick, entire to ± callose-denticulate, ± revolute. **Inflorescence** corymbose-paniculate; peduncles long. **Capitula** few–many, radiate, disc and rays bright yellow, rays 5 or 6; involucre turbinate; bracts 8, 3.0–5.5 mm long; calyculus bracts minute, 1 or 2. **Flowering time** mainly Aug.–Oct. **Cypselae** cylindrical, 3.5 mm long, ribbed, glabrous. Colonies in grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Drakensberg Grassland (Mtentu Bridge to Malowe, Ntsubane Forest Station to Mkambati Nature Reserve and S to Stutterheim).

147b Involucre turbinate-campanulate; bracts 10–16; rays 5–8

scitus Hutch. & Burtt Davy

Perennial herb, glabrous, rootstock woody, crown woolly. **Flowering stem** solitary, simple, up to 0.6 m high, leafy below. **Leaves** 3–6, leathery, linear-lanceolate, up to 160 mm long, becoming inflorescence bracts, base ± eared, clasping, margins entire or ± callose-denticulate, ± revolute. **Inflorescence** corymbose-paniculate; peduncles long. **Capitula** many, radiate, disc and rays bright yellow, rays mostly 8; involucre turbinate-campanulate; bracts 8–16, 4–6 mm long; calyculus bracts 1 or 2, minute. **Flowering time** mainly Aug.–Dec. **Cypselae** cylindrical, 3.5 mm long, ribbed, glabrous. Montane, colonies in grassland; Drakensberg Grassland, Sub-Escarpment Grassland (very rare, Matatiele).

146b Leaves 2–8× as long as broad
148a Leaves 4–8× as long as broad, main side nerves ± 5, often rather indistinct; involucral bracts 4–7 mm long; rays 6–8, very rarely 5; leaves usually ± spread over lower half of stem

scitus Hutch. & Burtt Davy (see 147b above)

148b Leaves 2–5× as long as broad; rays 2–5, very rarely 8; involucral bracts 6–12, 3.5–6.0 mm long

glaberrimus DC. (see 138b above)

145b Stems generally with many leaves passing ± gradually into inflorescence bracts
149a Stems ± uniformly leafy up to inflorescence branches; involucral bracts 4–7 mm long

latifolius DC.

Idwara (X)

Perennial herb, glabrous, rootstock stout, woody, crown woolly. **Flowering stems** solitary, simple, up to 1 m high, leafy throughout. **Leaves** leathery, oblong to oblong-elliptic or -ovate, up to 140 mm long, ± smaller upwards, base ± cordate, half-clasping, side nerves sharply ascending, margins thick, entire to ± callose-denticulate. **Inflorescence** a large, well-branched, corymbose panicle. **Capitula** many, radiate, disc and rays (5) bright yellow; involucre turbinate; bracts 7 or 8, 4–7 mm long; calyculus bracts ± absent. **Flowering time** mainly Sept.–Dec. **Cypselae** cylindrical, 4–5 mm long, ribbed, glabrous. Colonies in grassland, savanna; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Naude's Neck to Bizana, S from Maclear to Port St Johns and Seymour to King William's Town and East London).

149b Leaves crowded on lower part of stem, then decreasing rapidly in size upwards; involucral bracts 4–6 mm long

retrorsus DC.

Molteno disease plant; *dunsiektebossie* (A); *idwarane* (X)

Perennial herb, glabrous, rootstock stout, woody, crown woolly. **Flowering stem** solitary, up to 0.8 m high, simple or branching near base, leafy below. **Leaves** leathery, lanceolate to linear-lanceolate, up to 150 mm long, base ± cordate and half-clasping, fewer and smaller upwards, margins thick, subentire or ± callose-denticulate. **Inflorescence** corymbose-paniculate. **Capitula** many, radiate, disc and rays (2–5) bright yellow; involucre turbinate; bracts 5–8, 3.5–6.0 mm long; calyculus bracts ± absent. **Flowering time** Sept.–Mar. **Cypselae** cylindrical, 3.5 mm long, ribbed, glabrous. Colonies in grassland, poisonous; Mesic Highveld Grassland, Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Lady Grey E to Kokstad southwards, from Penhoek Pass E to Komga, Mpofu Game Reserve to Willowvale and from Grahamstown to East London).

1b Scandent, succulent shrubs or herbaceous or semi-succulent twiners or trailers
150a Capitula discoid
151a Flowers bright yellow or orange
152a Involucral bracts < 5 mm long; herbaceous or subsucculent twiners with thin stems; ultimate branchlets zigzag

deltoideus Less.

Undenze (X)

Perennial, herbaceous scrambler, glabrous to ± pubescent. **Stems** slender, internodes zigzag, ± glabrous, up to 2.5 m long. **Leaves** deltoid to deltoid-hastate, up to 80 mm

long, base ± cordate, margins dentate or denticulate; petioles ± 30–40 mm long, base often auricled. **Inflorescence** a branched, corymbose panicle, terminating branchlets. **Capitula** discoid, bright yellow; involucre turbinate; bracts 5–8, 3–4 mm long; calyculus bracts few, short. **Flowering time** Apr.–July. **Cypselae** cylindrical, 2 mm long, ribbed, furrows hispid. Forest margins; Sub-Escarpment Grassland, Indigenous Forests, Drakensberg Grassland, Indian Ocean Coastal Belt, Albany Thicket (Ngele Forest S to Amatole Mts and Dwessa Forest, from Grahamstown to Umtana River Valley).

152b Involucral bracts at least 10 mm long
153a Cypselae glabrous
154a Margins of leaf lobes straight or slightly concave; corolla of disc flowers 10.5–12.0 mm long

macroglossoides Hilliard

Perennial, herbaceous twiner, glabrous, ± fleshy. **Stems** up to 1.8 m long. **Leaves** up to 60 × 80 mm, outline deltoid-ovate, 3–5 acute lobes either side, base ± cordate; petioles up to 60 mm long. **Inflorescence** a solitary capitula or up to 12 in terminal corymbs. **Capitula** radiate, disc and rays (± 8) yellow, rays conspicuous; involucre turbinate; bracts ± 12, 10–13 mm long; calyculus bracts ± 6 mm long, spreading or reflexed, margins thinly ciliate. **Flowering time** mainly May, June. **Cypselae** cylindrical, ± 5 mm long, ribbed, glabrous. Forest margins; Indian Ocean Coastal Belt, Indigenous Forests (very rare, Bizana, Lusikisiki).

154b Margins of leaf lobes slightly convex; corolla of disc flowers 9.5–11.0 mm long

quinquelobus (Thunb.) DC.

Uchantikhulu (X)

Perennial, herbaceous twiner, ± succulent, ± glabrous. **Stems** up to 4 m long. **Leaves** up to 50 × 60 mm, outline deltoid-ovate, 2 or 3 acute, deltoid lobes either side, base ± cordate; petioles up to 55 mm long. **Inflorescence** solitary or a few in terminal corymbs. **Capitula** discoid, yellow; involucre turbinate; bracts ± 12, 10–11 mm long; calyculus bracts ± 5 mm long, ± spreading, margins not ciliate. **Flowering time** Apr.–June. **Cypselae** cylindrical, ± 5 mm long, ribbed, glabrous. Forest margins; Sub-Escarpment Grassland, Drakensberg Grassland, Indigenous Forests, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Queenstown S to Victoria East and Komga, from Patensie to East London and from Joubertina to Humansdorp).

153b Cypselae hispid

helminthioides (Sch.Bip.) Hilliard

Perennial, herbaceous twiner, ± fleshy, ± glabrous. **Stems** up to 4.5 m long. **Leaves** up to 60 × 70 mm, outline ovate-deltoid, shallowly and acutely lobed or toothed, base ± cordate; petioles up to ± 60 mm long. **Inflorescence** a few-headed, open corymb, terminal on side branches or solitary. **Capitula** discoid, yellow or orange; involucre narrowly campanulate; bracts ± 12, 10–11 mm long; calyculus bracts broadly elliptic, foliaceous, spreading. **Flowering time** Apr.–July. **Cypselae** cylindrical, 5–6 mm long, ribbed, furrows hairy. Forest margins, scrub, woodland, ± dry areas; Sub-Escarpment Savanna, Albany Thicket (coastal, Komga, Port Alfred to Kowie West).

151b Flowers white or pale creamy yellow

radicans (L.f.) Sch.Bip. (see 6a above)

150b Capitula radiate
155a Involucral bracts 3–4 mm long
156a Succulent shrub with thick (up to 10 mm) stems; inflorescence branches straight
157a Stems scandent; leaves elliptic in outline

brachypodus DC.

Iphunga (X)

Perennial shrub, scandent, ± succulent, glabrous. **Stems** weak, leafy, up to 4.5 m long. **Leaves** up to 120 mm long, elliptic, base tapering to a petiole up to 20 mm long, margins ± entire to denticulate. **Inflorescence** a many-headed corymb in large corymbose panicles, terminal. **Capitula** radiate, disc and rays (2–5) bright yellow; involucre narrowly campanulate; bracts 5–8, 3–4 mm long; calyculus bracts few, short. **Flowering time** Apr.–July. **Cypselae** cylindrical, 3 mm long, ribbed, ± glabrous. Forest and bush; Sub-Escarpment Savanna, Albany Thicket (Gundrift S to Komga, from Enon E toGrahamstown and Kowie).

157b Stems erect; ± leafless

junceus (DC.) Harv.

Sambokbos (A)

Shrubby, herbaceous perennial, glabrous, succulent. **Stems** many from base, up to 1.2 m high, rod-like, striate, erect, ± leafless. **Leaves** scale-like, few, minute. **Inflorescence** a terminal, few–several-headed corymb. **Capitula** radiate, disc and rays (± 5) yellow; involucre cylindrical; bracts 9 or 10, ± 8 mm long; calyculus bracts few, small. **Flowering time** mainly Jan.–May. **Cypselae** cylindrical, up to 4 mm long, ± ribbed, glabrous, with cup-like disc. Dry rocky slopes, in scrub; Lower Karoo, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Graaff-Reinet E to Kei River, S from Wolwefontein District to Port Elizabeth and Grahamstown).

156b Herbaceous twiner with thin stems, leaves deltoid to deltoid-hastate in outline; inflorescence branches zigzag

deltoideus Less. (see 152a above)

155b Involucral bracts up to 9 mm long
158a Involucral bracts up to 7 mm long

angulatus L.f.

Cape ivy; *ichungwane* (X)

Perennial, shrubby scrambler, glabrous, ± succulent. **Stems** up to 1.5 m long. **Leaves** ovate to lanceolate, angle-lobed, lobes few, sinuate to dentate, base cuneate; petioles up to 35 mm long. **Inflorescence** corymbose, much-branched, many-headed; pedicels ± nude. **Capitula** radiate, disc and rays (4–6) yellow; involucre up to 7 mm long; bracts 10–12, narrowly campanulate; calyculus bracts few, short. **Flowering time** mostly May. **Cypselae** cylindrical, 2.5 mm long, ± ribbed, ± hairy. Forest margins; Drakensberg Grassland, Eastern Fynbos-Renosterveld, Indigenous Forests, Albany Thicket (Fort Beaufort S to Baviaanskloof, Port Elizabeth, Grahamstown and Port Alfred and from Storms River Mouth to Humansdorp).

158b Involucral bracts at least 8 mm long
159a Calyculus bracts 1 or 2, small, appressed; rays ± 5

tamoides DC.

Canary creeper; *kanarieklimop* (A)

Perennial twiner, herbaceous, much-branched, ± fleshy, ± glabrous. **Stems** up to 6 m long. **Leaves** up to 80 × 80 mm, outline ± deltoid, unequally lobed, lobes acute, deltoid,

base ± hastate or cuneate; petioles up to 80 mm long. **Inflorescence** a many-headed, subumbel or corymb, on leafy, lateral branchlets. **Capitula** radiate, disc and rays (± 5) bright yellow; involucre turbinate; bracts 6–8, 8–9 mm long; calyculus bracts few, small. **Flowering time** Apr., May. **Cypselae** cylindrical, 3.5 mm long, ribbed, glabrous. Forest margins, often cultivated; Indigenous Forests, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Dwessa and Ntafufu Forests S to Pirie Forest, Kei River Mouth and East London).

159b Calyculus bracts several, long, erect, spreading or reflexed; rays ± 8
160a Leaves entire or sometimes obscurely lobed, margins mostly irregularly dentate, rarely nearly smooth

bryoniifolius Harv.

Perennial, herbaceous twiner, glabrous, ± fleshy. **Stems** up to 2.5 m long. **Leaves** up to 50 × 55 mm, ovate-deltoid, margins denticulate, upper surface sometimes mottled grey-green on dark green, lower surface sometimes rich violet; petioles as long as blade. **Inflorescence** 1–7-headed, corymbs or subumbels; peduncles axillary and terminal, long, ± nude. **Capitula** radiate, disc and rays (± 8, long) bright yellow; involucre turbinate; bracts ± 12, 8 mm long; calyculus bracts few, short. **Flowering time** mainly Apr.–June. **Cypselae** cylindrical, 4.5 mm long, ribbed, glabrous. Forest margins; Indigenous Forests (coastal, very rare, Umtiza Forest Reserve near East London).

160b Leaves acutely 3–10-lobed, margins of lobes smooth; involucral bracts 9–13 mm long
161a Leaves deltoid-hastate in outline with 3 main lobes, the 2 lower lobes sometimes with a smaller tooth on lower margins; calyculus bracts ± equalling involucral bracts, appressed at least in the dried state

macroglossus DC.

Natal ivy

Perennial, herbaceous twiner, ± fleshy, glabrous. **Stems** up to 2.45 m long. **Leaves** ± deltoid, 45 × 80 mm, 3-lobed, hastate, lower 2 lobes spreading; petioles 15–30 mm long. **Inflorescence** a solitary or up to 3-headed corymb; peduncles axillary or terminal, up to 100 mm long; bracts conspicuous. **Capitula** radiate, disc yellow, rays (± 8) ± creamy yellow, conspicuous; involucre turbinate; bracts ± 12, 9–10 mm long; calyculus bracts ± similar to involucre. **Flowering time** all year, mostly Mar.–July. **Cypselae** cylindrical, 4.5 mm long, ribbed, glabrous. Forest margins, mostly rocky places; Indigenous Forests, Sub-Escarpment Savanna, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (between Msikaba and uMzimvubu, S from Fort Cunynghame to Komga and Longmore Forest Reserve to East London).

161b Leaves deltoid-ovate in outline with 3–5 lobes on either side; calyculus bracts ± $^1/_2$ the length of involucral bracts, spreading or reflexed

macroglossoides Hilliard (see 154a above)

*SIGESBECKIA L.

(Heliantheae)

Species 12, natives of tropical and warm temperate lands especially in the Old World; 1 naturalised in sthn Afr., LIM, KZN, EC.

orientalis L.

Indian weed, common St. Paul's wort; *kleefgras*, *Pauluskruid* (A)

Annual herb, up to 1 m high; stems pubescent. **Leaves** petiolate or subsessile, narrowly to broadly ovate, base broadly cuneate to truncate, apex acute, margins coarsely and irreg-

ularly toothed. **Capitula** many in lax, leafy panicles; Involucral bracts 5, linear-spathulate, with spreading gland-tipped hairs. **Ray florets** inconspicuous, yellow. **Disc florets** yellow. **Pappus** absent. **Cypselae** narrowly obovate, 4-angled, curved, apex truncate. Common on forest margins or as a weed of cultivation in high rainfall areas, alt. 10–2 010 m; Indigenous Forests (Port St Johns).

*SILYBUM Adans.

(Cardueae)

Species 2, Mediterranean region; 1 introduced weed in sthn Afr., G, WC, EC.

marianum (L.) Gaertn.

Blessed milk-thistle, holy thistle; *disseldoring*, *melkdissel* (A)

Annual or biennial herb, up to 2 m high; stems simple or sparingly branched, hollow, slightly cottony, leafy. **Leaves** oblong in outline, sinuate-lobate or pinnatifid, undulate, margins spiny; basal leaves narrowed to sessile. **Capitula** discoid, solitary, terminal; involucral bracts ovate-oblong, smooth at base, with long, triangular appendage, spine-tipped and spinose-ciliate at base. **Receptacle** flat, densely setose. **Florets** bisexual, fertile; corolla reddish purple; tube slender below, abruptly expanded above, deeply 5-lobed. **Anthers** with short tails; filaments connate into papillose tube. **Style** scarcely thickened below branches. **Pappus** of feathery bristles, soon caducous. **Cypselae** faintly transversely wrinkled. Waste places, alt. 600–1 600 m; Dry Highveld Grassland, Sub-Escarpment Savanna (Somerset East, Grahamstown).

*SOLIVA Ruiz & Pav.

(Anthemideae)

Species 8, mainly South America but also North America and Australia; 1 naturalised in sthn Afr., KZN, WC, EC.

sessilis Ruíz & Pav.

Jo-jo

Hairy, prostrate, annual herb, 0.05–0.20 m long. **Leaves** alternate, pinnatisect. **Capitula** disciform, solitary, sessile, surrounded by leaves; involucral bracts in 2 subequal rows. **Ray florets** female, fertile, in several rows; tube and lamina absent. **Style** persistent and spinescent in fruit. **Disc florets** with corolla 3- or 4-lobed, insignificantly yellowish green. **Flowering time** Oct., Nov. **Pappus** absent. **Cypselae** glabrous, dorsiventrally flattened, laterally winged; wings sometimes projected into apical teeth, sometimes transversely rugose. Originally from Chile and Brazil, introduced in Australia, California, SA, weed of cultivation, usually in lawns; Eastern Fynbos-Renosterveld (Humansdorp).

SONCHUS L.

(Cichorieae)

Species ± 60, Eurasia to tropical Africa; 11 in sthn Afr., widespread.

*asper (L.) Hill

Common sowthistle, spiny annual sowthistle; *doringsydissel*, *gewone sydissel* (A)

Simple, erect, annual or perennial herb, up to 1.5 m high, with milky latex. **Stems** hollow, reddish purple-tinged, glabrous or sometimes ± densely glandular-setose. **Leaves** in

a basal rosette, as well as alternate upwards (subsp. *glaucescens*), glabrous, oblanceolate-panduriform, seldom pinnatifid, sinuate-dentate to runcinate-pinnatilobed, apices acute, margins irregularly dentate, basal auricles rounded and appressed, semi-amplexicaul, margins spinulose-dentate, lower leaves exauriculate and with petiole-like midribs, upper leaves smaller and sessile. **Capitula** ligulate, stalked, in corymbiform, cymose clusters; involucral bracts in many rows, imbricate, densely white-tomentose at base, soon glabrescent. **Florets** 5-lobed, pale yellow. **Flowering time** Aug., Nov. **Pappus** of many, white, barbellate bristles intermixed with down-like hairs. **Cypselae** reddish brown, broadly oblong-ellipsoid, strongly compressed with broad marginal wings which are ciliate and recurved, body ribbed and rugulose, < 3 mm long. Native to Europe and Asia, weed of cultivation and roadsides, alt. 5–1 700 m; Drakensberg Grassland, Sub-Escarpment Savanna (Alice, Stutterheim, Komga Districts (subsp. *glaucescens*)).

dregeanus DC.

Sowthistle; *leharasoana* (Sotho)

Erect, glabrous, perennial herb, up to 0.9 m high, with milky latex. **Leaves** in a basal rosette, sessile, lower leaves narrowly oblanceolate to linear-elliptic, remotely lobed to sinuate-dentate or sharply denticulate, sometimes entire, attenuate-acute apically, lobes recurved, narrowly lanceolate; cauline leaves few, lanceolate, entire, apex attenuate, base semi-amplexicaul and sagittate-auriculate. **Capitula** ligulate, few in lax, corymbiform cymes, sometimes solitary; involucral bracts in several rows, imbricate, bases of outer ones densely white-woolly, often fleshy glandular-setose on midribs. **Florets** 5-lobed, yellow. **Flowering time** Aug., Oct.–Apr. **Pappus** of few, white, barbellate bristles intermixed with down-like hairs. **Cypselae** pale brown, narrowly ellipsoid, slightly compressed, ribbed rugulose, ± 5 mm long. Open grassland in moist localities, often on sandy soil, also in disturbed ground, alt. 3–2 200 m; Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Rhodes, Middelburg, Queenstown, Komga, Grahamstown and Humansdorp).

integrifolius Harv.

Erect, glabrous, perennial herb, up to 0.4 m high, with milky latex. **Leaves** sometimes crowded towards base, but peduncles remotely leafy upwards, entire to sinuate-dentate, sometimes with remote, spreading lobes, basal leaves narrowly oblanceolate; cauline leaves linear-elliptic to narrowly elliptic becoming lanceolate upwards, base semi-amplexicaul and sagittate. **Capitula** ligulate, few in lax, corymbiform cymes, or solitary, terminal; involucral bracts imbricate, glabrous at base. **Florets** 5-lobed, yellow. **Flowering time** Aug.–Nov. **Pappus** of few, white, barbellate bristles intermixed with down-like hairs. **Cypselae** pale brown, narrowly ellipsoid, slightly compressed, ribbed, glabrous. Open grassland, in moist localities, invading disturbed areas, alt. 0–2 200 m; Upper Karoo, Indigenous Forests, Indian Ocean Coastal Belt (Lootsberg, Port St Johns and Kei Mouth).

***oleraceus** L.

Annual sowthistle, milk thistle, wild thistle; *melkdissel*, *pypdissel*, *suigdissel*, *wilde latuw* (A); *lesese* (Pedi); *ingabe* (S); *lesabe*, *bono-sa-lekhoaba* (SS); *shashe* (Venda); *ihlaba* (X); *ihahabe* (Z)

Erect, annual herb, up to 1.5 m high, with milky latex. **Stems** hollow, reddish tinged, glabrous or sometimes densely glandular-setose, setae purplish. **Leaves**: lower leaves crowded, oblanceolate in outline, pinnately lobed to coarsely runcinate-pinnatipartite,

with broad ovate-hastate apical lobe, rounded to acute at apex, margins coarsely and somewhat irregularly dentate, midrib narrowly winged, ± auriculate and semi-amplexicaul, auricles ± sagittate-spreading, entire to dentate; upper leaves sessile, smaller, lanceolate, ± deeply lobed to subentire, margins coarsely and sharply dentate, basal auricles large with acute spreading lobes. **Capitula** ligulate, many in stalked, corymbiform cymes, stalks glabrous or glandular-setose; involucral bracts in many rows, imbricate, bases of outer ones densely white-tomentose, soon glabrescent, sometimes with large glandular setae along midrib. **Florets** 5-lobed, yellow. **Flowering time** Aug.–Feb., May. **Pappus** of white, barbellate bristles intermixed with down-like hairs. **Cypselae** light to reddish brown, narrowly obovoid, slightly compressed, many ribbed, transversely wrinkled, minutely retrorsely hispid. Native to Europe, Asia and North Africa, cosmopolitan weed, widespread in sthn Afr., roadsides and waste places, alt. 3–1 800 m; Upper Karoo, Dry Highveld Grassland, Indigenous Forests, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Colesberg, Port St Johns, Stutterheim, Grahamstown, East London).

wilmsii R.E.Fr.

Glabrous, erect, perennial herb, up to 1 m high, with milky latex. **Leaves** sessile, oblanceolate to panduriform in outline, lanceolate-ovate and smaller upwards, runcinate-dentate throughout or remotely and narrowly lobed pinnatisect throughout, apex acute, mucronate, base semi-amplexicaul or auriculate-sagittate, margins denticulate to sharply and irregularly dentate. **Capitula** ligulate, few in a reduced, corymbiform-cymose cluster, or aggregated with stalked capitula subtended by subsessile, immature capitula or sometimes capitula solitary on long stalks; involucral bracts imbricate, outer white-woolly at base. **Florets** 5-lobed, yellow. **Flowering time** Nov.–Mar. **Pappus** of minute, white, barbellate bristles intermixed with down-like hairs. **Cypselae** pale brown, narrowly ellipsoid, slightly compressed, glabrous, ribbed, rugulose. Along roadsides, in secondary grassland and in disturbed or cultivated ground, alt. 0–1 500 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Queenstown, Amatole Mts, King William's Town and Port Elizabeth).

SPHAERANTHUS L.

(Inuleae)

Species ± 40, mostly Africa to Asia and Australia; 4 in sthn Afr., N, B, LIM, M, S, KZN, EC.

peduncularis DC.

Erect or decumbent, aromatic, perennial herb, up to 0.9 m high. **Stems** winged, wings entire, strongly dentate or slightly denticulate, hairy. **Leaves** alternate, linear, oblong or narrowly oblong to lanceolate, apex obtuse to acute and mucronate to apiculate, base decurrent into stem wings, margins mucronate-dentate to denticulate, hairy, glabrescent. **Capitula** disciform, many grouped together in globose-ovoid glomerules, surrounded on outside by many bracts; peduncles hairy or scabrid; involucral bracts few, oblong and truncate, ciliate. **Outer female florets** few, corolla narrowly tubular, reddish or purple. **Disc florets** few, functionally male, corolla narrowly funnel-shaped to cylindric, reddish or purple. **Flowering time** Nov.–Feb. **Pappus** absent. **Cypselae** narrowly ellipsoid, hairy. In seasonally and permanently marshy places, alt. 30–1 005 m; Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Coffee Bay, Kentani and Kei River Mouth).

SPILANTHES Jacq.

(Heliantheae)

Species 6, pantropical; 2 (1 introduced weed) in sthn Afr., LIM, M, S, KZN, EC.

*decumbens (Sm.) A.H.Moore

Annual herb, up to 0.5 m high; stems decumbent, leafy. **Leaves** opposite, linear to lanceolate, margins entire or subserrate. **Capitula** terminal, solitary; involucral bracts in 2 series, ovate, subequal. **Receptacle** conical. **Ray florets** limb narrow; corolla yellow, strap-shaped. **Disc florets** bisexual, fertile; corolla yellow. **Anthers** with small, obtuse, apical appendage. **Style** branches of ray florets linear, of disc florets oblong, truncate, minutely penicillate. **Pappus** of 3 bristles. **Cypselae** elliptic, compressed, apex truncate. Roadsides, alt. 45–1 065 m; Dry Highveld Grassland, Sub-Escarpment Grassland (Bedford District, East London).

mauritiana (Pers.) DC.

Isisilili, *isisinini* (Z)

Annual herb, up to 0.4 m high; stems branching from base, creeping and ascending, rooting at nodes, leafy. **Leaves** opposite, ovate, base truncate to broadly cuneate, apex obtuse, margins entire to serrate-crenate. **Capitula** axillary and terminal, solitary; involucral bracts linear-lanceolate. **Receptacle** conical, paleate; paleae boat-shaped, enclosing florets. **Ray florets** female, fertile; corolla yellow or white, strap-shaped. **Disc florets** bisexual, fertile; corolla yellow. **Anthers** obtuse or minutely sagittate at base, with small, obtuse, apical appendage. **Style** branches of ray florets linear, of disc florets oblong, truncate, minutely penicillate. **Pappus** absent. **Cypselae** elliptic, compressed, margins hyaline. Often in damp places, alt. 5–2 550 m; Indigenous Forests, Indian Ocean Coastal Belt (Port St Johns, Kentani District).

STOEBE L.

(Gnaphalieae)

Species 34, tropical and sthn Afr., Madagascar and Reunion; mostly endemic to WC, some species widespread.

alopecuroides (Lam.) Less.

Katstert-slangbos (A)

Robust, erect, single-stemmed shrub, up to 1.8 m high. **Branches** often candelabrum-like, covered with rather shaggy hairs; very densely leafy. **Brachyblasts** many, generally 10–30 mm long. **Leaves** filiform, ericoid, spirally twisted, usually < 10 mm long, apex mucronate. **Synflorescences** thick, finger-like, terminal spikes (20–)50–150 × 15–20 mm; involucral bracts ± 13; outer much shorter than inner, partly foliaceous, tomentose, apex obtuse; inner bracts scarious and brown, apex acuminate. **Florets** white, lobes spreading. **Nectaries** absent. **Pollen** spines short. **Flowering time** (July) Aug.–Nov. (Dec.). **Pappus** of 15–19 setae, free, plumose in upper part. **Cypselae** with ± 10 ribs, tomentose. Moist fynbos mountain slopes, alt. 100–1 200 m; Eastern Fynbos-Renosterveld (from WC to Uitenhage).

burchellii Levyns
(= *Seriphium plumosum* L.)

A much-branched, erect shrub up to 1.5 m high. **Stems** with short-shoots in axils of leaves, shortly woolly. **Leaves** minute < 1 mm in length; deltoid on main stems, fleshy, slightly gibbous at base, concave above, green and glabrous on lower surface; smaller on short-shoots. **Capitula** many, borne singly or in small groups in axils of main shoots; involucral bracts in several rows, innermost scarious, brown, acute slightly longer han corolla. **Florets** purplish brown ± 2 mm long. **Flowering time** Feb.–June. **Pappus** of ± 12 bristles. **Cypselae** with 5 ribs, scabrid. Eastern Fynbos-Renosterveld (Langkloof).

cinerea (L.) Thunb.
(= *Seriphium cinereum* L.)

Vaal-hartebeeskaroo (A)

Multi-stemmed shrub, up to 1.5 m high. **Branches** usually woolly; secondary branches often arranged candelabrum-like, terminating in synflorescences. **Leaves** ericoid, twisted, 3–9 mm long, squarrose or spreading horizontally, basally appressed with a distinct, globose, basal swelling caused by 2 resin cavities on either side of midrib; sharply mucronate. **Synflorescences** of small, globose clusters of capitula, globules often like a string of beads or closely spaced and spike-like; up to 200 mm long. **Capitula** 1-flowered; involucral bracts in a few rows. **Disc florets** bisexual, brown or purple; with small lobes. **Nectaries** absent. **Flowering time** Mar.–May. **Pappus** of ± 12 setae, plumose. **Cypselae** 5-ribbed, scabrid. Sandy loam, often close to water, frequent among boulders, alt. 0–1 600 m; Drakensberg Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (Amatole Mts, Keiskammahoek, Humansdorp and Grahamstown).

microphylla DC.

Wiry shrub, up to 0.35 m high. **Leaves** minute, lanceolate, ± 4 mm long, tightly appressed. **Synflorescence** of many, terminal, globose capitula, up to 15 mm diam.; involucral bracts 6–10; innermost 5.0–5.5 mm long, milky white in upper part, often pinkish below. **Florets** plum-red; lobes spreading. **Nectaries** present. **Flowering time** mainly Mar., occasionally Jan.–May. **Pappus** of 12–16 setae, slightly fused at base; plumose in upper part. **Cypselae** narrow cylindrical, yellowish, ± 2 mm long, smooth with short appressed or ascending hairs in upper part. Sandstone soils on arid northern hill slopes, alt. 1 100–1 400 m; Eastern Fynbos-Renosterveld (Central S Cape, with a disjunct distribution at Cockscomb, in the Great Winterhoek Mts).

phyllostachya (DC.) Sch.Bip.

Multi-stemmed shrub, up to 0.4 m high. **Leaves** linear-lanceolate, up to 10 mm long, lower surface with dense or sparse, long, flexible, appressed hairs, upper surface hairs often geniculate, curled or with a loose loop in middle, apex subaristate. **Synflorescence** globular to cylindrical; involucral bracts 8–14, in few rows, innermost brown, scarious, acuminate to mucronate with a long aristate tip. **Florets** white or pink, lobes spreading. **Nectaries** present. **Flowering time** Mar., Apr. **Pappus** of 12–15 setae, slightly joined at base. **Cypselae** short-hairy, hairs appressed. Mountain slopes, alt. 100–1 000 m; Eastern Fynbos-Renosterveld (sthn Cape from Greyton to Kareedouw).

plumosa (L.) Thunb.

Slangbos (A)

Much-branched, woody, grey or green shrub, up to 1.0(–1.5) m high. **Leaves** in fascicles; subtending leaves ovate to triangular, involute, up to 3 mm long; densely woolly above, cobwebby to almost glabrous below. **Capitula** grouped in small clusters in axils of leaves, terminal on main shoots; sometimes forming a spike-like inflorescence, but more often a panicle; involucral bracts in a few rows; innermost brown, scarious. **Disc florets** bisexual, up to 2 mm long, purple or brown; lobes small, erect. **Nectaries** absent. **Flowering time** mainly Apr., May. **Pappus** of ± 12 setae, slightly joined at base. **Cypselae** 5-ribbed, scabrid. Variable habitats, but often on rocky soils; flourishes on overgrazed and disturbed soils, alt. 0–2 000 m; Upper Karoo, Indian Ocean Coastal Belt, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Aliwal North E to Port Edward, across Amatole Mts, from Cape St Francis to Humansdorp, Port Elizabeth and East London).

vulgaris Levyns

Bankrotbos (A)

Much-branched, grey shrub, 1.0–1.5 m high. **Stems** with short-shoots in leaf-axils, ± woolly. **Leaves** on main stems patent, up to 3 mm long, slender, subulate, straight or slightly twisted, often pungent, acuminate or obtuse, involute; densely woolly above, glabrous to cobwebby below; those on short-shoots ± half length of main leaves, blunt or slightly mucronate. **Capitula** grouped in small heads in axils of main leaves forming a spike-like or branched inflorescence; involucral bracts in several rows, outermost short and leaf-like, innermost scarious, brown, acuminate, longer than florets. **Florets** brownish ± 2 mm long. **Flowering time** Mar.–May. **Pappus** of ± 12 bristles. **Cypselae** 5-ribbed, scabrid. Stony, rocky soil, invasive in poorly managed land and disturbed areas; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Lady Grey District SE to Elliot, Cala and Egoso, Seymour to Pirie Mts and to Port Elizabeth).

*SYMPHYOTRICHUM Nees

(Astereae)

Species ± 92, mostly North America, some Mexico and South America, few widely naturalised; 1 naturalised in sthn Africa, N, B, LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

squamatum (Spreng.) G.L.Nesom
[= *Aster squamatus* (Spreng.) Hieron.]

Swamp aster; *moroko-hloko* (S)

Slender, glabrous, annual herb, 0.05–2.00 m high. **Leaves** alternate, lanceolate, entire or obscurely toothed. **Capitula** disciform, small, many in compound panicles; involucral bracts variegated, imbricate. **Receptacle** epaleate. **Outer female florets** filiform, whitish or very pale mauve. **Disc** florets bisexual, 5-lobed, white or yellow. **Flowering time** Dec.–May. **Pappus** of scabrid bristles. **Cypselae** subcylindric, slightly compressed, 5-ribbed, appressed-pubescent. Widely distributed introduced weed, native to North America; damp places, riverbanks, old and abandoned or waste land, weed in gardens; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket, Indigenous

Forests (Middelburg E to Umtentu River southwards, from Mpofu Game Reserve to Alice and from Humansdorp to East London).

SYNCARPHA DC.

(Gnaphalieae)

Everlasting; *sewejaartjie* (A)

Species 25, endemic to sthn Afr., NC, WC, EC.

Pappus bristles plumose

canescens (L.) B.Nord.

Pienksewejaartjie, *rooisewejaartjie* (A)

Sparsely branched, closely leafy, grey-felted shrublet, up to 1.5 m high. **Leaves** alternate, small, densely set, elliptic, oblong or obovate, acute or obtuse, entire, sessile, ascending and imbricate, silvery white sericeous on both surfaces. **Capitula** discoid, mostly solitary at closely leafy branch tips, or distinctly pedunculate; involucral bracts imbricate, papery, acuminate, white, pink to red or mottled with red, brown and white. **Florets** maroon to purple. **Flowering time** July, Aug. **Pappus** of basally connate, plumose bristles, white but sometimes purplish pink. **Cypselae** oblong or ellipsoid, angular or ribbed, densely globose hairy. Rocky sandstone or granite slopes, alt. 10–1 980 m; Eastern Fynbos-Renosterveld (Joubertina).

eximia (L.) B.Nord.

Strawberry everlasting

Robust, closely leafy shrub, 0.6–2.0 m high. **Leaves** alternate, large, broadly ovate or broadly elliptic, apex acute to acuminate, densely set, imbricate, densely and softly long-hairy, sessile, semi-amplexicaul, entire. **Capitula** discoid, large, many in dense, sessile or subsessile corymbs at ends of branches; involucral bracts imbricate, red. **Florets** pink, reddish or orange. **Flowering time** Feb.–Apr. **Pappus** of basally connate, plumose bristles. **Cypselae** yellow, oblong, angular or ribbed, densely globose hairy. Mountain slopes, alt. 150–1 600 m; Eastern Fynbos-Renosterveld (Uitenhage).

ferruginea (Lam.) B.Nord.

Robust, sparingly branched suffrutex, 0.15–1.60 m high. **Leaves** alternate, small, densely set, imbricate, narrowly obovate to narrowly elliptic, acute, callous tipped, entire, silver sericeous on both sides, sessile. **Capitula** discoid, solitary or few together on short, scaly peduncles; involucral bracts imbricate, lemon-yellow or tawny. **Florets** dark yellow or orange. **Flowering time** Aug.–Nov. **Pappus** of basally connate, plumose bristles. **Cypselae** grey, oblong or obovate, ribbed or angular, globose hairy. Mountain slopes, alt. 900–1 625 m; Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Willowmore District).

milleflora (L.f.) B.Nord.

Knoppiessewejaartjie (A)

Robust, closely leafy shrub, 0.9–2.0 m high. **Leaves** alternate, large, densely set, imbricate, narrowly elliptic to elliptic, acute to acuminate, densely and softly long-hairy, sessile, semi-amplexicaul, entire. **Capitula** discoid, small, many in much-branched, corymbose panicle at ends of bracteate peduncles; involucral bracts imbricate, white, cream-coloured or pale rosy. **Florets** yellow. **Flowering time** July–Jan. **Pappus** of basally connate, plumose bristles. **Cypselae** black, elliptic, densely white globose

hairy. Grassland on mountain slopes and tops, alt. 160–1 630 m; Eastern Fynbos-Renosterveld, Albany Thicket, Indigenous Forests (Ladismith to Grahamstown).
Very similar to *S. eximia* but capitula smaller and much more many at ends of branches, leaves narrower.

Pappus bristles barbellate

argentea (Thunb.) B.Nord.

Silver everlasting

Erect, dwarf shrub, 0.3–0.6 m high. **Leaves** alternate, small, obovate to oblanceolate, acute, sessile, silvery sericeous, entire, sometimes with 3 main veins apparent, apex mucronate, recurved, upper leaves rapidly decreasing in size. **Capitula** discoid, a few together corymbosely arranged at ends of nude branches/peduncles, sometimes sessile; involucral bracts in many rows, imbricate, white or pink. **Florets** tubular, broadened above, corolla yellow. **Flowering time** Apr.–Feb. **Pappus** of basally connate, sparsely barbellate bristles. **Cypselae** cylindrical, globose hairy. In sand on coastal dunes, alt. 0–250 m; Eastern Fynbos-Renosterveld, Albany Thicket (coastal, from Knysna to Port Alfred).

paniculata (L.) B.Nord.

Sewejaartjie (A)

Erect, corymbosely branched shrub, 0.2–1.2 m high. **Leaves** alternate, sessile, fairly densely set, imbricate, linear to linear-lanceolate or very narrowly obovate, often folded lengthwise, apex acuminate, often recurved, 3-nerved, silvery sericeous. **Capitula** discoid, small, few–many, corymbosely arranged at branch tips, on branched peduncles; involucral bracts imbricate, acute to acuminate, white, cream-coloured, pale yellow, pink or purplish or white and purplish at base. **Florets** yellow. **Flowering time** Sept.–Nov., Mar. **Pappus** of basally connate, sparsely barbellate bristles. **Cypselae** cylindric, globose hairy. Sandy soil on rocky slopes, alt. 10–1 800 m; Eastern Fynbos-Renosterveld, Indigenous Forests (Gifberg to Port Elizabeth).

[E]**recurvata** (L.f.) B.Nord.

Much-branched shrub, 0.15–0.45 m high. **Leaves** alternate, small, fairly densely set, ovate or linear-lanceolate, folded lengthwise, acuminate, sessile, semi-amplexicaul, entire, recurved, upper surface glabrous, lower surface densely long, white-hairy. **Capitula** discoid, small, solitary, terminal, pedunculate; involucral bracts imbricate, silvery white or purplish pink. **Florets** yellow. **Flowering time** July–Dec. **Pappus** of basally connate, sparsely barbellate bristles. **Cypselae** mature fruit not seen, globose hairy. Beach sand, limestone, alt. 0–150 m; Albany Thicket, Indigenous Forests (Port Elizabeth and Alexandria).

[E]**sordescens** (DC.) B.Nord.

Much-branched, dwarf shrub or suffrutex, 0.15–0.60 m high. **Leaves** alternate, linear or linear-spathulate, acute, mucronate, 3–5-nerved from base, sessile, entire, recurved, both surfaces densely silky villous. **Capitula** discoid, small, pedunculate, solitary in upper leaf axils, forming corymbose synflorescence; involucral bracts imbricate, white, pale creamy or greenish. **Florets** yellow. **Flowering time** Sept.–Feb. **Pappus** of basally connate, sparsely barbellate bristles. **Cypselae** obovate or ovate, globose hairy. Coastal cliffs and sandy beaches, alt. 0–20 m; Eastern Fynbos-Renosterveld, Albany Thicket (Port Elizabeth to Port Alfred).

striata (Thunb.) B.Nord.

Erect, branched shrub, 0.3–0.9 m high. **Leaves** alternate, densely set on upper branches, imbricate, lower branches naked, sessile, linear to narrowly lanceolate-subulate, channelled, acute, rigid, young leaves densely villous, becoming sparsely villous, entire. **Capitula** discoid, small, pedunculate, many together at ends of branches, corymbose; peduncles long-hairy; involucral bracts imbricate, white or pale pink. **Florets** yellow. **Flowering time** all year. **Pappus** of basally connate, sparsely barbellate bristles. **Cypselae** oblong, globose hairy. Sandy flats, sandy grassland, hill slopes, alt. 0–550 m; Eastern Fynbos-Renosterveld, Albany Thicket (from Knysna to East London).

vestita (L.) B.Nord.

Cape snow

Robust shrub or suffrutex, 0.3–1.5 m high. **Leaves** alternate, long, linear, narrowly oblong or very narrowly obovate, apex broadly acute, mucronate, thickly clothed with whitish, interwoven wool, entire, sessile, upper leaves tipped with scabrous-membranous scale. **Capitula** discoid, large, pedunculate, terminal, solitary or corymbose; involucral bracts imbricate, snow-white. **Florets** pinkish or purplish. **Flowering time** Jan. **Pappus** of basally connate, sparsely barbellate bristles. **Cypselae** black, oblong, 4-angular, globose hairy. Rocky slopes and flats, alt. 30–1 550 m; Indigenous Forests (one record in PRE from Storms River).

*TAGETES L.

(Helenieae)

Species ± 50, North and South America; 1 weed in sthn Afr., widespread.

minuta L.

Khakibush(-weed); *kakiebos* (A); *jeremane* (SS); *insangwana*, *unukani* (Z)

Annual herb, up to 3 m high; erect, glabrous, strongly aromatic. **Stems** simple or diffusely branched. **Leaves** opposite or alternate, sessile, pinnate, lobes lanceolate, margins sharply serrate. **Capitula** radiate, few-flowered, solitary on long peduncles or corymbosely arranged; involucre cylindric; bracts in 1 row. **Receptacle** flat, epaleate. **Ray florets** female, fertile; corolla pale to lemon-yellow, strap-shaped. **Style** branches linear-lanceolate. **Disc florets** bisexual, fertile; corolla yellow, tubular, expanded above, 5-fid. **Anthers** with obtuse base, apical appendage lanceolate. **Style** branches narrowly oblong, truncate and penicillate, papillose on outer faces. **Flowering time** Oct.–Apr. **Pappus** of few scales, sometimes awned. **Cypselae** linear, narrowed to base, compressed or angled. Widespread weed, alt. 14–2 125 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Oviston to Barkly East S, from Middelburg to Queenstown, and Alicedale to Grahamstown).

*TARAXACUM F.H.Wigg.

(Cichorieae)

Species 60, north temperate regions and temperate South America; 15 in sthn Afr., N, NW, G, M, S, FS, KZN, L, NC, WC, EC.

bessarabicum (Hornem.) Hand.-Mazz.

Acaulescent, perennial herb, 0.13 m high, with milky latex. **Leaves** rosulate, up to 100 mm long, narrowly oblong in outline, pinnately lobed, lobes 4 or 5 on each side,

triangular, apex blunt, patent or slightly recurved, all margins entire; petioles short, not winged. **Capitula** ligulate, solitary, terminal, pedunculate. **Peduncle** hollow; involucral bracts in 2 rows, inner row erect, outer row shorter, also erect, ± 3.5 mm long. **Florets** yellow. **Flowering time** Dec., Jan. **Pappus** of many, buff-coloured, barbellate bristles. **Cypselae** buff-coloured, conical, ribbed, with a long beak. Native to Mediterranean region, damp places like edges of pans, weed of cultivation, alt. 100–1 500 m; Upper Karoo, Drakensberg Grassland (Middelburg and Stutterheim).

brachyglossum (Dahlst.) Dahlst.

Acaulescent, perennial herb, up to 0.15 m high, with milky latex. **Leaves** rosulate, up to 200 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; petioles purplish, not winged. **Capitula** ligulate, solitary, terminal, pedunculate; peduncle hollow, often purplish, cobwebby at first, glabrescent; involucral bracts in 2 rows, inner bracts ± 10 mm long, margins white-membranous, outer bracts ± 7 mm long, reflexed, often purplish. **Florets** yellow, purplish on the back. **Flowering time** Oct.–Dec. **Pappus** of many, creamy white, barbellate bristles. **Cypselae** bright red-brown, conical, ribbed, with a long beak. Native to central and north-western Europe and sthn Scandinavia, widespread weed in America, moist grassland, edges of wetlands, alt. 750–3 000 m; Sub-Escarpment Grassland, Drakensberg Grassland (Kokstad, Naude's Neck and Rhodes).

breviscapum A.J.Richards

Acaulescent, perennial herb, up to 0.3 m high, with milky latex. **Leaves** rosulate, pinnately lobed, with 4 or 5 lobes on each side, apical lobe triangular, others broadly to narrowly triangular, acute, patent or slightly recurved, both margins often filiform-dentate, sinuses filiform-dentate to acutely lobulate; petioles not winged, they and midrib often purplish. **Capitula** ligulate, solitary, terminal, pedunculate; peduncle hollow, purplish, white-cottony, glabrescent, initially much shorter than leaves, elongating in fruit; outer involucral bracts (7–)10 × 2 mm, reflexed. **Florets** yellow. **Cypselae** straw-coloured, greyish on back, conical, ribbed, with long beak. **Flowering time** July–Oct. **Pappus** of many, creamy white, barbellate bristles. Native to Europe and Asia, weed in lawns and other grassy sites, alt. 10–2 200 m; Upper Karoo, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Aliwal North, Alice, Port Elizabeth and East London).

cophocentrum Dahlst. (according to Hilliard 1977)

Acaulescent, perennial herb, up to 0.2 m high, with milky latex. **Leaves** rosulate, pinnately lobed, lobes 1–3 on each side, broad, triangular, terminal lobe ± a quarter of total leaf length, apex rounded, margins entire or dentate in lower part, lateral lobes acute to acuminate; petioles purplish, scarcely winged. **Capitula** ligulate, solitary, terminal, pedunculate; peduncle hollow, glabrous; outer involucral bracts 8 × 2 mm, reflexed. **Florets** yellow. **Pappus** of many, creamy white, barbellate bristles. **Cypselae** straw-coloured, conical, ribbed, with long beak. Native to England, restricted to countries around English Channel, disturbed wet places; Sub-Escarpment Grassland (1 record from SA, Tabankulu Mtn).

disseminatum G.E.Haglund

According to Hilliard (1977).

Acaulescent, perennial herb, up to 0.2 m high, with milky latex. **Leaves** rosulate, pinnately lobed, lobes 4–6 on each side, apical lobe small, triangular, other lobes variable,

narrowly triangular to linear or laciniate, acute, upper 2 slightly recurved, others patent or slightly upward pointing, mostly entire, lower sinuses filiform-dentate; petioles green or tinged purplish, not winged. **Capitula** ligulate, solitary, terminal, pedunculate; peduncle hollow, initially cobwebby, glabrescent; outer involucral bracts 4–6 × 1.75–2.50 mm, reflexed. **Florets** yellow, greyish on the back. **Pappus** of many, creamy white, barbellate bristles. **Cypselae** brown, conical, ribbed, with long beak. Native to Europe, widespread in Australasia and America, weed of cultivation, pastures and along roadsides; Sub-Escarpment Savanna (uMzimkhulu District).

duplidens H.Lindb. (after Hilliard 1977)

Acaulescent, perennial herb, up to 0.2 m high, with milky latex. **Leaves** rosulate, pinnately lobed, lobes 3–6 on each side, apical lobe triangular, all lobes acute, recurved, upper margin convex with usually 2 small teeth, lower entire; petioles ± $^1/_3$–$^1/_4$ total leaf length, with or without a narrow wing, purplish. **Capitula** ligulate, solitary, terminal, pedunculate; peduncle hollow, initially white-cottony, glabrescent; outer involucral bracts 9 × 2 mm, reflexed. **Florets** yellow, greyish on the back. **Pappus** of many, creamy white, barbellate bristles. **Cypselae** pale brown, conical, ribbed, with long beak. Native to Europe, wet situations, alt. ± 2 500 m; Drakensberg Grassland (Naude's Neck).

eckmanii Dahlst.

Acaulescent, perennial herb, up to 0.3 m high, with milky latex. **Leaves** rosulate, pinnately lobed, lobes 3–6 on each side, apical lobe very large, triangular or elliptic, acute, margins coarsely and sharply dentate, teeth recurved, lateral lobes triangular, acute, recurved, upper margin convex, laciniate-dentate, lower margin straight or curved, often entire; petioles short, winged, purplish, thinly white-hairy. **Capitula** ligulate, solitary, terminal, pedunculate; peduncle hollow, glabrous, much elongated in fruiting stage; outer involucral bracts 10–12 × 2 mm, reflexed. **Florets** yellow, dark on the back. **Flowering time** Nov. **Pappus** of many, creamy white, barbellate bristles. **Cypselae** greyish, conical, ribbed, with long beak. Native to Europe, wet, disturbed areas in grassland; Sub-Escarpment Grassland (Swartberg District).

officinale Weber, aggregate species

Common dandelion, dandelion, lion's tooth; *perdeblom*, *platdissel* (A)

Acaulescent, perennial herb, 0.01–0.40 m high, with milky latex. **Leaves** rosulate, oblanceolate in outline, recurved-dentate to runcinate-pinnatifid, glabrous or somewhat pubescent, apical lobe ovate-hastate, lateral lobes in 2–6 pairs, spreading recurved-falcate to broadly triangular, acute, margins entire to laciniate-dentate, sinuses sometimes strongly dentate. **Capitula** ligulate, solitary, terminal, pedunculate; peduncle hollow, densely lanate initially, glabrous, very long (up to 400 mm); outer involucral bracts up to 17 mm long, reflexed. **Florets** yellow, with dark line on lower surface. **Flowering time** Aug., Sept., Feb. **Pappus** of many, white, barbellate bristles. **Cypselae** pale to dark brown, oblanceolate, ribbed, with long beak. Probably native to Europe and Asia, weed of cultivation, alt. 400–2 500 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (Kokstad, Stutterheim and Grahamstown).

TARCHONANTHUS L.

(Tarchonantheae)

Wild camphor bushes; *wildekanferbosse* (A)

Species 6, Africa; 6 in sthn Afr., widespread.

littoralis P.P.J.Herman

Coastal camphor bush; *kuskanferbos* (A)

Tree or shrub, 1–8 m high. **Leaves** alternate, large, oblanceolate, elliptic to narrowly elliptic, rarely obovate, discolorous, upper surface bright or dark green, glabrous, lower surface densely white-hairy, base cuneate, apex obtuse to acute, margins often faintly denticulate in upper part, rarely totally entire, distinctly petiolate. **Capitula** discoid, terminal, paniculate, pedunculate; involucral bracts in a single row in male florets, fused halfway, in 2 or 3 rows in female florets, free. **Florets** male and female florets on different plants, dark, brownish. **Flowering time** Jan.–July. **Pappus** absent. **Cypselae** obovate to elliptic, ribbed, densely long, white-hairy. Coastal bush, alt. 3–700 m; Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (coastal, Port St Johns, East London, Grahamstown, Port Elizabeth and Humansdorp).

minor Less.

Small-leaf camphor bush; *kleinblaarkanferbos* (A)

Shrub or small tree, up to 5 m high. **Leaves** alternate, small, narrowly elliptic, discolorous, upper surface bright to dark green, glabrous, lower surface densely whitish hairy, base cuneate, apex acute, margins entire, rarely denticulate, shortly petiolate. **Capitula** discoid, dense spicate terminal and axillary clusters, sessile; involucral bracts in both male and female florets in 2 or 3 rows, free. **Florets** male and female florets on different plants, dark, brownish. **Flowering time** Aug.–Dec. **Pappus** absent. **Cypselae** densely long, white-hairy. Stony or rocky hillsides, grassland on mountain slopes, alt. 450–1 800 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket (Aliwal North, Middelburg, Queenstown, Pearston).

parvicapitulatus P.P.J.Herman

Small-head camphor bush; *kleinhofiekanferbos* (A)

Shrub or tree, up to 8 m high. **Leaves** alternate, oblanceolate or rarely obovate, discolorous, upper surface pale, dark green, glabrous, lower surface densely whitish hairy, base cuneate, apex obtuse to obtuse-mucronate, sometimes acute, margins often faintly denticulate in upper part, rarely totally entire, shortly petiolate. **Capitula** discoid, terminal, paniculate, pedunculate; involucral bracts in a single row in male florets, fused halfway, in 2 or 3 rows in female florets, free. **Florets** male and female florets on different plants, dark, brownish. **Flowering time** Mar.–June. **Pappus** absent. **Cypselae** pale or dark brown, obovate, ribbed, densely long, white-hairy. Habitat not known for EC, alt. 30–1 850 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Tabankulu, Kei River and Fort Brown near Grahamstown).

trilobus DC. var. **trilobus**

Trident camphor bush; *drietandkanferbos* (A)

Tree or shrub, 2.7–10.0 m high. **Leaves** alternate but crowded at ends of branches, petiolate, variable in shape, obovate-elliptic to oblong-obovate, rounded or 3-lobed

at apex (var. *trilobus*), base cuneate, margins subentire to irregularly coarsely dentate and undulate in upper half, upper surface glabrous, lower surface white-woolly. **Capitula** discoid, terminal and axillary, paniculate, pedunculate; involucral bracts of male and female florets linear, free. **Florets** male and female florets on different plants, dark, brownish. **Flowering time** Aug. **Pappus** absent. **Cypselae** somewhat flattened obovoid, densely long, white-hairy. Along edges of Table Mountain Sandstone cliffs, alt. 460–1 830 m; Sub-Escarpment Savanna (KZN to ± Port St Johns).

TENRHYNEA Hilliard & B.L.Burtt

(Gnaphalieae)

Monotypic, endemic to sthn Afr., LIM, M, S, KZN, EC.

phylicifolia (DC.) Hilliard & B.L.Burtt

Shrub, up to 1 m high. **Leaves** alternate, lanceolate, margins entire, sessile, bases decurrent on stem in long narrow wings, discolorous, green above drying grey, white-tomentose below. **Capitula** disciform, in terminal clusters forming a corymbose panicle; involucral bracts in several rows, imbricate, apex shortly exceeding florets, radiating, opaque milk-white or occasionally pink. **Receptacle** flat, paleate, paleae resembling inner involucral bracts. **Outer florets** female, corolla purple, narrowly tubular or filiform. **Disc florets** outnumbering female florets, corolla purple, tubular below, campanulate above, 5-lobed. **Flowering time** Mar.–May. **Pappus** of scabrid bristles above, cilia ± fused, shaft scabridulous, base nude, not cohering. **Cypselae** oblong, with rounded hairs. Grassland, often in coarse herbage near forest margins, alt. 120–1 220 m; Sub-Escarpment Savanna, Indigenous Forests (Port St Johns).

TOLPIS Adans.

(Cichorieae)

Species 20, Macronesia, Mediterranean region, northern and tropical Africa; 1 in sthn Afr., LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

capensis (L.) Sch.Bip.

Fukuthoane (SS)

Erect, perennial herb, up to 0.6 m high, with milky latex. **Leaves** in a basal rosette, elliptic to oblanceolate, apex acute to rounded, base narrowly cuneate to attenuate, remotely and minutely toothed or more deeply cut, glabrous or sparsely hairy. **Capitula** ligulate, few–many on long peduncles, arranged in corymbose panicle; involucral bracts unequal, in 2 or 3 rows. **Florets** yellow. **Flowering time** Aug.–Apr. **Pappus** of many, barbellate bristles, often with outer row of small bristles. **Cypselae** narrowly obconic, apex truncate, finely ribbed, ribs rough. Native to countries of sub-Saharan Africa and Madagascar, open grassland, seasonally wet areas or disturbed areas, alt. 300–3 000 m; Upper Karoo, Drakensberg Grassland, Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (from Burgersdorp to Port St Johns and Humansdorp).

*__TRAGOPOGON__ L.

(Cichorieae)

Species 50, temperate Eurasia, Mediterranean region; 3 weeds of cultivation in sthn Afr., LIM, G, M, FS, KZN, L, NC, WC, EC.

dubius Scop.

Grass-like, biennial herb, up to 1 m high, with milky latex. **Leaves** alternate, linear-lanceolate, long acuminate, base broad, amplexicaul, margins entire, glabrous or with white wool in leaf axils. **Capitula** ligulate, solitary, terminal, long pedunculate; involucral bracts in 1 row, usually 13, sometimes more, occasionally 8. **Florets** yellow, corolla shorter than involucral bracts. **Flowering time** Sept.–Jan. **Pappus** of plumose bristles. **Cypselae** fusiform, strongly ribbed and muricate, narrowed upwards into a long beak. Native to sthn Europe, introduced weed in America, weed along roadsides and old fields, alt. 650–1 950 m; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (from Albert District to Grootfontein, Middelburg, Barkly East, Cathcart and Grahamstown).

porrifolius L.

Oyster plant, purple goat's beard, salsify, vegetable-oyster, wild salsify; *bokbaard*, *persbokbaard*, *sydissel* (A)

Grass-like, biennial herb, up to 1 m high, with milky latex. **Leaves** alternate, linear-lanceolate, long acuminate, base broad, amplexicaul, margins entire, glabrous. **Capitula** ligulate, solitary, terminal, long pedunculate; involucral bracts in 1 row, usually 8, rarely up to 12. **Florets** violet, corolla shorter than involucral bracts. **Flowering time** Oct.–Dec. **Pappus** of plumose bristles. **Cypselae** fusiform, strongly ribbed and muricate, narrowed upwards into a long beak. Native to Europe and Asia, escaped from cultivation, alt. 500–2 300 m; Upper Karoo, Sub-Escarpment Grassland (Aliwal North and Molteno).

TRICHOGYNE Less.

(Gnaphalieae)

Naaldebos (A)

Species 9, endemic to sthn Afr., N, M, FS, L, NC, WC, EC.

decumbens (Thunb.) Less.

Dwarf shrub, stems up to 0.2 m long, erect or decumbent and then sometimes rooting where stems touch the ground. **Leaves** alternate, sessile, linear-filiform, thick, closely set along stems, margins entire, involute, upper surface white-tomentose, but not obvious, lower surface thinly hairy. **Capitula** disciform, several together in terminal clusters, surrounded by leaves; involucral bracts in several rows; outer bracts brown, thinly hairy; inner bracts thinly hairy to glabrous, often with obtuse or abruptly acute, white apex. **Outer florets** filiform, female, 3–7, purple. **Disc florets** 8–14, bisexual with sterile ovaries, yellow. **Flowering time** Feb., Sept. **Pappus** absent in female florets, in disc florets of bristles with white plumose upper half and naked below. **Cypselae** triangular, hairy. Bare sandy or stony ground or on rock platforms; Upper Karoo (Middelburg area).

TRIPTERIS Less.

(Calenduleae)

Species ± 22, south and tropical Africa N to Egypt, Arabian Peninsula and Jordan; 20 in sthn Afr., widespread, but absent in S, KZN.

Leaves opposite

sinuata DC.

Karoobietou, *hardeveld-bietou* (A)

Perennial shrub, 0.3–0.9 m high. **Leaves** opposite, oblong, lanceolate or linear, tapering at base, apex subobtuse to acute; sometimes somewhat fleshy, dark green, margins entire, sparsely denticulate, subsinuate or toothed. **Capitula** yellow or yellow with a dark heart; involucral scales subbiseriate, powdery scabrid at back, lanceolate, membrane-edged. **Flowering time** mostly in Aug. **Cypselae** smooth, 3-winged, pale brown and highly palatable. Drought resistant, adapted to both summer and winter rainfall, alt. 80–1 600 m; Lower Karoo, Upper Karoo, Albany Thicket (Middelburg, Conway Farm to Aberdeen, S to Cradock).

Leaves alternate or only lower leaves opposite

aghillana DC.

Skaapbos (A)

Perennial, succulent herb, 0.1–0.4 m high or semi-prostrate. **Leaves** cuneate, tapering much at base, either entire or coarsely and sharply 3-toothed at apex, sometimes glabrous or sprinkled with thick hairs especially along margins. **Involucral scales** biseriate, ovate-lanceolate, acute, dorsally scabrous, membrane edged. **Ray florets** yellow or pale yellow to cream-coloured. **Disc florets** dark yellow. **Flowering time** all year. **Cypselae** nearly smooth, 3-winged. Mountain slopes, streambanks, riverbanks, alt. 100–1 900 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Aliwal North, Mountain Zebra National Park, Steytlerville).

rosulata (Norl.) B.Nord.

Perennial herb, 0.2–0.5 m high. **Leaves** alternate, in a rosette. **Capitula** bright yellow to brownish below; involucre subuniseriate, with white margins. **Flowering time** Nov.–Jan. **Cypselae** 3-winged, with an apical cavity. Rare, mountain slopes and ridges, alt. 1 000–1 500 m; Indigenous Forests, Sub-Escarpment Grassland (Kokstad, Cathcart).

spathulata DC.

Perennial herb, 0.2–0.5 m long. **Leaves**: lower leaves obovate-cuneate to spathulate, obtuse, tapering much at base, glabrous, entire; upper leaves oblong, half clasping at base; pedicels scabrous. **Involucral scales** linear, obtuse. **Cypselae** smooth, with 3 narrow wings. Rare, alt. 150–550 m; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (Uitenhage).

spinigera Norl.

Xeromorphous, much-branched, dwarf shrub, 0.10–0.15 m high. **Leaves** oblanceolate. **Flowering time** Mar. **Cypselae** with an apical cavity, trifenestrated, 3-winged. Mountain peaks, alt. 2 000–3 000 m; Sub-Escarpment Grassland (Andriesberg, Bailey).

TROGLOPHYTON Hilliard & B.L.Burtt

(Gnaphalieae)

Species 6, endemic to sthn Afr., N, FS, KZN, L, NC, WC, EC.

capillaceum (Thunb.) Hilliard & B.L.Burtt

Delicate, white-woolly, annual herb, up to 0.3 m high. **Leaves** alternate, small, filiform-petiolate, elliptic to elliptic-ovate, or ovate, ± tapering at both ends, or sometimes base

truncate to broadly rounded, mucronate, margins entire, pale green and glabrescent above. **Capitula** discoid, up to 3 mm long, few together, subracemosely arranged on long, filiform peduncles; involucral bracts in 3 rows, apex of bracts obtuse, generally emarginate, erose or rounded, white with purple blotch or rarely totally purple. **Florets** yellow, sometimes tipped pink. **Flowering time** all year. **Pappus** of barbellate bristles. **Cypselae** oblong, hairy. Damp shady slopes under shrubs or rocks, alt. 45–2 100 m; Upper Karoo, Drakensberg Grassland, Dry Highveld Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Lower Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (from Aliwal North to Humansdorp and Port Alfred).

*UROSPERMUM Scop.

(Cichorieae)

Species 2, Mediterranean region; 1 introduced weed in sthn Afr., KZN, WC, EC.

picroides (L.) Scop. ex F.W.Schmidt

Annual or biennial herb, up to 1.2 m high, stems hollow, with milky latex. **Leaves** rosulate or alternate along branched stems, entire or lyrate-pinnatifid, lobes coarsely and irregularly toothed, lower leaves petiolate, upper sessile, base broad, stem clasping, decreasing in size upwards, setose. **Capitula** ligulate, 1–3 corymbosely arranged, terminal at ends of long peduncles; involucral bracts in 1 row, connate at base, elliptic-lanceolate, with long setose hairs. **Florets** pale yellow. **Flowering time** Oct.–Dec. **Pappus** of plumose, basally widened bristles. **Cypselae** linear-oblong, subterete, usually curved, ribbed, beaked, beak basally swollen into bulbous, hollow part crowning the flattened, embryo-containing part of cypsela. Native to the Mediterranean, introduced, mostly in sand along the coast, alt. 0–300 m; Indian Ocean Coastal Belt, Albany Thicket (from Mtata River to Port Elizabeth).

URSINIA Gaertn.

(Anthemideae)

Species 43, mainly sthn Afr., 2 in Ethiopia, Zimbabwe and Mozambique, distribution in sthn Afr. B?, N, LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

1a Cypsela with uniseriate pappus; coma of hairs at base of cypsela
2a Perennial herb (not woody)

alpina N.E.Br.

Tufted, perennial herb, 0.08–0.38 m high. **Leaves** crowded in tufts, pinnatisect, lobes short and broad. **Capitula** solitary; peduncles long with many bracts; involucral bracts glabrous, glandular, with black margins; outer linear, apex lanceolate; middle oblong, apex ± round; inner with round appendages. **Paleae** ± acute and trifid. **Ray florets** yellow above, reddish below. **Flowering time** Feb. **Pappus** of 5 scales, white, elliptic, striate with brown spot towards base. **Cypselae** slightly curved, obconical, rugulose-smooth, with glands scattered throughout, broadly ribbed, surface with undulating markings; length with pappus scales 2 mm. Mat-forming on rock cliffs, steep slopes, against rocky outcrops and earth terraces, alt. 1 525–2 745 m; Sub-Escarpment Grassland, Drakensberg Grassland (Qacha's Neck-Ntsikeni Nature Reserve).

nudicaulis (Thunb.) N.E.Br.

Creepers or prostrate, tufted, perennial herb, 0.15–0.60 m high, **Leaves** crowded below, pinnatisect, lobes linear. **Capitula** solitary; peduncles long; involucral bracts glabrous, glandular; outer and middle bracts with black margins, outer without appendages, ovate; middle oblong with appendages; inner with round appendages. **Paleae** oblong. **Ray florets** yellow both sides or coppery below. **Flowering time** Nov.–Mar. **Pappus** of 5 scales, white, striate, with brown spot towards base. **Cypselae** slightly curved, narrowly obconical, rugulose-smooth, spiral wall thickening at base; length with pappus scales 1.7–2.6 mm. Riverbeds, alt. 15–1 525 m; Indigenous Forests, Eastern Fynbos-Renosterveld (Storms River to Algoa Bay).

saxatilis N.E.Br.

Tufted, perennial herb, 0.05–0.70 m high. **Leaves** pinnatisect, lobes long and slender. **Capitula** solitary; peduncles long, nude or with few scattered bracts; involucral bracts glabrous, sometimes hairy; outer linear, lanceolate, ovate without appendages; middle ovate without appendages but membrane-edged; inner with round appendages. **Paleae** ± acute and trifid. **Ray florets** yellow above, coppery below. **Flowering time** Jan. **Pappus** of 5 scales, white, elliptic, striate with brown spot towards base. **Cypselae** slightly curved, obconical, transversely rugose, with spiral wall thickenings at base and glands in between ridges; length with pappus scales 2.4–2.5 mm. Stony areas, alt. 600–2 400 m; Sub-Escarpment Grassland, Indigenous Forests (Insizwa Forest).

2b Perennial shrubs or plants suffruticose (woody only at base)

anethoides (DC.) N.E.Br.

Perennial shrub, 0.2–0.5 m high. **Leaves** pinnatisect, 5–20 mm long. **Capitula** solitary; peduncles long; involucral bracts ± pubescent, glandular, with black margins; outer linear, ovate without appendages; middle oblong, membrane-edged; inner with round, transparent, apical appendages. **Paleae** oblong. **Ray florets** yellow. **Flowering time** all year. **Pappus** of 5 scales, white, elliptic to round, striate with brown spot towards base. **Cypselae** slightly curved, obconical, rugulose-smooth, base of cypsela with spiral wall thickening, glands scattered throughout cypsela; length with pappus scales 2.1–2.5 mm. Sandstone/mountain slopes, quartzite, open plateaus, grassland, stream-/riverbanks, forest margins, along the road, alt. 5–900 m; Eastern Fynbos-Renosterveld, Indigenous Forests, Albany Thicket, Sub-Escarpment Savanna (Tsitsikamma Forest to Albany).

discolor (Less.) N.E.Br.

Perennial suffrutex, 0.2–0.4 m high. **Leaves** densely cobwebby, rarely glabrescent tinny, ± 1 mm long, entire, 3-lobed or single. **Capitula** solitary with long peduncles; involucral bracts glabrous, glandular, all with appendages; outer acute-round; middle oblong. **Paleae** oblong. **Ray florets** yellow above, coppery below. **Flowering time** Dec.–May. **Pappus** of 5 scales, white, striate, elliptic with brown spot towards base. **Cypselae** slightly curved, obconical, rugulose-smooth, ribbed, base of cypsela with spiral wall thickening, glands scattered throughout; length with pappus scales 2.0–2.5 mm. Hill slopes, alt. 12–1 450 m; Eastern Fynbos-Renosterveld, Indigenous Forests (Uitenhage S to Humansdorp).

heterodonta (DC.) N.E.Br.

Perennial suffrutex, 0.3–0.5 m high. **Leaf** with apex unevenly 3-lobed, middle lobe recurved, mucronate, often much smaller than lateral lobes. **Capitula** solitary;

peduncles long; involucral bracts outer without appendages, membrane-edged, acute; middle oblong, apex round; inner with round apical appendages. **Paleae** oblong. **Ray florets** yellow on both sides or coppery below. **Flowering time** Sep.–Dec. **Pappus** of 5 scales, white, elliptic, striate with brown spot towards base. **Cypselae** slightly curved, obconical, rugose, ribbed, base of cypsela with spiral wall thickening; length with pappus scales 2.1–2.7 mm. Mountain slopes, grassland, alt. 15–1 320 m; Eastern Fynbos-Renosterveld, Indigenous Forests (Willowmore to Uitenhage).

paleacea (L.) Moench

Geelmagriet (A)

Perennial shrub, 0.25–0.60 m high. **Leaves** pinnatisect, lobes linear to filiform. **Capitula** solitary; peduncles varying in length; involucral bracts variable in size, shape and pubescence; outer linear-acuminate, with round apex, black margins, no appendages; middle broad at base, becoming acuminate with round appendages; inner bracts sometimes large and green, with round apical appendages. **Paleae** oblong. **Ray florets** yellow or coppery below. **Flowering time** Nov. **Pappus** of 5 scales, white, obovate, striate with brown spot towards base; length of cypsela and pappus scale 1.8–2.6 mm long. **Cypselae** slightly curved, obconical, smooth, with spiral wall thickenings at base and glands scattered throughout. Hill slopes, alt. 30–1 450 m; Albany Thicket, Eastern Fynbos-Renosterveld (Humansdorp, Kouga Hills).

scariosa (Aiton) Poir. subsp. **scariosa**

Suffrutex, 0.45–1.50 m high. **Leaves** pinnatisect. **Capitula** grouped at branch tips, pedunculate; involucral bracts glabrous, large and gold-coloured, appendages yellow-brown, with central black spot. **Paleae** oblong. **Ray florets** yellow on both sides. **Flowering time** Sept.–Feb. **Pappus** of 5 scales, white, ovate, striate with brown spot towards base. **Cypselae** obconical, rugulose, slightly curved, base of cypsela with spiral wall thickening, sometimes absent; length with pappus scales 1.8–2.3 mm. Forest margins, along roads, alt. 91–1 065 m; Indigenous Forests, Eastern Fynbos-Renosterveld (Tsitsikamma to Humansdorp).

serrata (L.f.)Poir.

Suffrutex, slender, often thinly woolly, 0.3–0.6 m high. **Leaves** serrate, leaves on peduncles minutely covered with membranous apical appendages. **Capitula** in groups at branch tips, pedunculate; involucral bracts all with large, round, brownish, membranous, apical appendages. **Paleae** oblong. **Ray florets** yellow. **Flowering time** Nov., Dec. **Pappus** of 5 scales, white, ovate, striate, with brown spot towards base. **Cypselae** ± straight, obconical, muricate, base of cypsela with spiral wall thickening; length with pappus scales 1.4–1.7 mm. Marshy areas, sandstone slopes, alt. 91–1 435 m; Indigenous Forests, Eastern Fynbos-Renosterveld (Uniondale).

1b Cypsela with biseriate pappus; coma of hairs at base of cypsela absent
3a Annual herbs

nana (DC.) subsp. **nana**

Yellow margaret; *geelmagriet* (A); *sehalikane* (SS)

Annual herb, 0.03–0.40 m high, branches upright, hairy when young. **Leaves** sometimes succulent, (bi-)pinnatipartite, leaf lobes 2–6 mm long, mucronate. **Capitula** solitary, long or short peduncles; involucral bracts ± broadly ovate, with dark marks; inner with broad scarious apex. **Paleae** tridentate. **Ray florets** yellow or white. **Disc florets**

yellow or white. **Flowering time** all year. **Pappus** of 5 scales, broadly obovate, white, spirally rolled; 5 inner, subulate or linear scales (white bristles). **Cypselae** white, oblique, obovate, broadly ribbed, muricate, glabrous, with glands between ridges, narrowed at base; length with pappus scales 2.4–2.6 mm. Hill-slopes, sandy plains; Upper Karoo, Sub-Escarpment grassland, Lower Karoo, Albany Thicket, Sub-Escarpment Savanna (weed from Ethiopia, Zimbabwe, Mpumalanga, Namaqualand, WC; between Queenstown, King William's Town and Jeffreys Bay in EC).

3b Perennial herb

chrysanthemoides (Less.) Harv.

Coral ursinia; *bergmagriet* (A)

Perennial or dwarf shrub, suffrutex, 0.15–2.00 m high. **Leaves** bipinnatisect, sometimes hairy. **Capitula** solitary on long peduncles; involucral bracts outer bracts ovate-acuminate, membranous, lacerated, silvery; middle and inner ones rounded. **Paleae** boat-shaped, shorter than disc florets. **Ray florets** yellow, reddish below. **Disc florets** yellow, purple at apex. **Flowering time** Aug.–Nov. **Pappus** of 5 scales, broadly obovate, white, spirally rolled with 5 inner subulate scales (white bristles). **Cypselae** white, oblique obovate, broadly ribbed, glabrous; length with pappus scales 3.0–3.3 mm. Coastal dunes, along road, gravel slopes, alt. 5–3 352 m; Eastern Fynbos-Renosterveld, Indigenous orests, Albany Thicket (Port Elizabeth to Jeffreys Bay).

montana DC.

Perennial, tufted herb with rhizome, 0.10–0.25 m high, often mat forming. **Leaves** often clasping, pinnatipartite, lobes linear or semi-terete, blunt, mucronulate or ending in long bristle or seta. **Capitula** solitary; peduncles long; involucral bracts ovate, obtuse, dark-edged and slightly membrane-tipped; middle broadly ovate; inner with round apical appendages. **Paleae** truncate. **Flowers** yellow, coppery below. **Flowering time** July–Apr. **Pappus** of 5 scales, white, broadly obovate, spirally rolled; inner 5 subulate or linear (white bristles). **Cypselae** white, oblique, obovate, broadly ribbed, muricate, glabrous with glands in between ridges, distinctly tapering at base; length with pappus scales 2.6–4.6 mm. Mountain or hill slopes, grassland, sandstone, shale, dolerite, alt. 457–3 355 m; Dry Highveld Grassland, Sub-Escarpment Grassland, Lower Karoo, Indigenous Forests, Drakensberg Grassland (Barkly East S to Graaff-Reinet and Grootwinterberg Mts).

tenuiloba DC.

Umuthi wezibuba (Z)

Perennial herb, stems annual, 0.1–0.3 m high, branches ± recurved, ascending. **Leaves** up to 50 mm long, lower half petiole-like, upper part (bi-)pinnatifid, leaf lobes linear, attenuate at apex. **Capitula** solitary; peduncles long, sparsely white-hairy; involucral bracts with brown margins; outer ovate, obtuse; inner with broad scarious apex. **Paleae** with broad scarious apex. **Ray florets** yellow above, coppery below. **Flowering time** July–Apr. **Pappus** of 5 scales, broadly obovate, white, striate; 5 inner scales subulate or linear (white bristles). **Cypselae** white, oblique, obovate, broadly ribbed, papillate, glabrous, glandular between ridges, tapering at base; length with pappus scales 3.2–3.8 mm. Grassland, alt. 16–2 440 m; Indigenous Forests, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (Maclear, Ntsubane Forest Station, inland to Hogsback, S to Peddie).

VELLEREOPHYTON Hilliard & B.L.Burtt

(Gnaphalieae)

Species 7, endemic to sthn Afr., NC, WC, EC; 1 naturalised in Australia and New Zealand.

dealbatum (Thunb.) Hilliard & B.L.Burtt

Prostrate to weakly erect, white-woolly annual or perennial(?) herb, up to 0.45 m long. **Leaves** alternate, oblanceolate or narrowly spathulate, apex subacute to obtuse, base attenuate, petiole-like in lower leaves, margins entire, decreasing in size upwards, both surfaces white silky-woolly. **Capitula** disciform, crowded in dense, woolly, terminal corymbs; involucral bracts in 3 rows, apex of inner bracts oblong, obtuse, white, with purplish reddish blotch in center. **Outer florets** female, outnumbering the bisexual ones, narrowly tubular or filiform, yellow, tipped red-purple. **Disc florets** tubular, yellow, tipped red-purple. **Flowering time** Oct.–Feb. **Pappus** of bristles with subplumose apex. **Cypselae** oblong, hairy. Damp, often sandy places such as streambeds, slacks in sand dunes, marshes, seepages, alt. 0–750 m; Eastern Fynbos-Renosterveld, Albany Thicket (Joubertina, Willowmore and Port Elizabeth Districts).

[E]**vellereum** (R.A.Dyer) Hilliard

Decumbent or ascending, branched, white-felty, perennial herb, up to 0.6 m long. **Leaves** alternate, oblong-spathulate or oblanceolate, apex obtuse, base narrowed, sessile, both surfaces white silky-woolly, margins entire, decreasing in size upwards. **Capitula** disciform, in small, woolly, terminal, cymose clusters; involucral bracts in 4 rows, apex rounded, milk-white. **Outer florets** female, fewer than bisexual ones, narrowly tubular or filiform, yellow, tipped red-purple. **Disc florets** tubular, yellow, tipped red-purple. **Flowering time** Nov.–Mar. **Pappus** of bristles with subplumose apex. **Cypselae** oblong, glabrous. Beach dunes and sand, alt. 0–10 m; Albany Thicket, Eastern Fynbos-Renosterveld (coastal, from Humansdorp to East London).

***VERBESINA** L.

(Heliantheae)

Species ± 300, North, Central and South America; 1 (2 varieties) introduced weed in sthn Afr., N, B, LIM, NW, FS, NC, EC.

encelioides (Cav.) Benth. & Hook.

Wild sunflower, golden crown beard; *wildesonneblom* (A)

Annual herb, 0.5–1.0 m high; with ribbed and pilose branches. **Leaves** alternate, ovate, deeply toothed, pubescent on upper surface, densely white-tomentose beneath. **Capitula** radiate; many-flowered, peduncled, terminal and axillary, corymbose; involucre campanulate; bracts in 2 rows, lanceolate, strigose on back, herbaceous. **Receptacle** flat, paleate; paleae as long as ovary, lanceolate in profile, boat-shaped, acuminate, keeled, ciliate on keel, pilose above. **Ray florets** yellow; tube very much shorter than lamina, pilose; lamina broadly linear, obtuse. **Disc florets** bisexual, fertile; corolla yellow; tube pilose below. **Anthers** linear, faintly eared at base, with lanceolate apical appendage. **Style** terete, globose at base; branches linear. **Pappus** of 2 awns. **Cypselae** laterally compressed. Roadsides and along railroads, in sandy and waste ground, alt. 30–1 465 m; Sub-Escarpment Savanna, Albany Thicket (Grahamstown, East London).

VERNONIA Schreb.

(Vernonieae)

Species over 1 000?, fairly cosmopolitan?; 18 in sthn Afr., widespread, except WC.

The genus *Vernonia* is currently under revision, *Vernonia s.s.* occurs in the New World only (Anderberg et al. 2007).

galpinii Klatt

Simple or subsimple, erect, leafy, perennial herb, up to 0.6 m high. **Leaves** alternate, sessile, lanceolate or oblong-lanceolate, apex acute or subacute, mucronate, margins entire, roughly pubescent. **Capitula** discoid, large, solitary or occasionally up to 3 or 4 at stem apex; involucral bracts lanceolate-acuminate, subequal and uniform. **Florets** purple. **Flowering time** Sept., Oct., Jan.–Apr. **Pappus** of outer short, narrow scales, and inner setae barbellate. **Cypselae** narrowly cylindric, glabrous, glandular. Submontane and high plateau grassland, alt. 91–2 100 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Indigenous Forests (Thornham (Kokstad), Engcobo and Port St Johns Districts).

*__XANTHIUM__ L.

(Heliantheae)

Species 3, widespread weeds in warm parts of the world; 2 in sthn Afr., widespread, but absent in N.

spinosum L.

Burrweed, spiny clotbur; *speldebos*, *boeteklits* (A); *iligcume* (Z)

Coarse, annual herb, up to 1 m high; stem yellowish. **Leaves** alternate, narrowly rhomboidal, commonly 3-lobed; white-felted below. **Male capitula** spherical, in upper leaf axils; involucre short; bracts few, narrow, in 1 or 2 rows; receptacle hemispherical, paleate; corolla tubular, 5-toothed; anthers with small apical appendage, base obtuse; filaments connate; ovary abortive; style undivided. **Female capitula** solitary, in lower leaf axils; involucre completely enveloping 2 female florets, 2-locular within; corolla absent; style branches long, linear, acute. **Pappus** absent. **Cypselae** ellipsoid, closely covered in hooked spines, inconspicuous. Weed, dry habitats, alt. 45–1 620 m; Upper Karoo, Sub-Escarpment Grassland (Middelburg, Queenstown).

strumarium L.

Large cocklebur; *rivierklits*, *groete boetebossie* (A)

Coarse, annual herb, up to 1.5 m high; stems reddish or brownish. **Leaves** alternate, petiolate, deltoid or broadly ovate, base cuneate, then cordate, margins coarsely and irregularly toothed. **Male capitula** terminal on short, axillary inflorescence; involucre short; bracts few, narrow, in 1 or 2 rows; receptacle hemispherical, paleate; corolla tubular, 5-toothed; anthers with small apical appendage, base obtuse; filaments connate; ovary abortive; style undivided. **Female capitula** below; involucre completely enveloping 2 female florets, 2-locular within; corolla absent; style branches long, linear, acute. **Pappus** absent. **Cypselae** ellipsoid, closely covered in hooked spines, inconspicuous. Weed, in disturbed places, along streams and riverbanks, alt. 30–2 125 m; Upper Karoo, Sub-Escarpment Grassland (Aliwal North, Queenstown).

*ZINNIA L.

(Heliantheae)

Species 22, America, Peru, Mexico; 1 introduced weed in sthn Afr., widespread, but absent in N, WC.

peruviana (L.) L.

Redstar zinnia, wild zinnia; *engelsmannetjies*, *regopjakop* (A)

Annual herb, 0.3–1.0 m high; sometimes shrubby. **Leaves** opposite, sessile or subpetiolate, oblong-lanceolate, base connate and sheathing stem, margins entire, roughly hairy. **Capitula** radiate, large, solitary, terminal on long, hollow peduncle, swollen below capitulum; involucre campanulate; bracts in 4 series, oblong-elliptic, apex rounded, papery, dark margined. **Receptacle** conical to concave, with paleae conduplicate. **Ray florets** female, fertile; corolla strap-shaped, inner surface reddish or brownish red, drying purplish, persistent. **Disc florets** bisexual, fertile; corolla brownish yellow, tubular, 5-toothed. **Anthers** with small apical appendage, base obtuse. **Style** branches long, linear. **Pappus** of a single lateral awn. **Cypselae** 3-angled or compressed, narrowly oblong-obovate in outline. In dry places, along roadsides in dry river valleys, alt. 40–2 125 m; Sub-Escarpment Savanna (Cathcart).

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AVICENNIACEAE

(Order Lamiales)

Compiled by C.L. Bredenkamp

AVICENNIA L.

White mangrove; *witseebasboom* (A)

Monotypic family; species 14, tropics and subtropics of both the Old and New World, a major constituent of almost all coastal mangrove lagoons; 1 in sthn Afr., KZN, EC.

marina (Forssk.) Vierh.

Shrub or small tree, 2–15 m high, of the mangrove zone; pneumatophores present; nodes swollen. **Leaves** opposite, simple, lanceolate to elliptic, sessile, entire, coriaceous, petiolate; stipules absent. **Flowers** bisexual, regular, small; in contracted or capitate cymes. **Corolla** 4- or 5-lobed, somewhat fleshy, yellow; tube funnel-shaped or campanulate; lobes longer than tube, ovate, glandular-pubescent on outer surface. **Stamens** 4, arising in throat of corolla. **Ovary** superior. **Flowering time** Aug.–Jan. **Fruit** a broadly ellipsoid, compressed capsule. Estuaries and intertidal areas along the coast; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Sub-Escarpment Savanna (Lusikisiki, along coast to Nahoon Area N of East London).

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BALANOPHORACEAE

(Order Santalales)

Compiled by M. Struwig

SARCOPHYTE Sparrm.

Monotypic with 2 subspecies, confined to tropical east and sthn Afr.; 1 in sthn Afr., LIM, M, KZN, EC.

sanguinea Sparrm. subsp. sanguinea

Wolwekos (A); *umavumbuka* (X)

Perennial herb, parasite, 0.2–0.3 m high; reddish, fleshy; tuber subspheroidal, furrowed; dioecious. **Leaves** spirally arranged, scale-like, coloured. **Inflorescences** fleshy, paniculately branched; branches subtended by bract smaller than leaves. **Male plants**: flowers in groups of 2 or 3 on secondary branches, shortly pedicellate; 3(4)-merous; tepals valvate; stamen filaments well developed; anthers many-thecous. **Female plants**: 5–12 subglobular, almost sessile, spadix-like clusters of ± 200 flowers; perianth absent; ovary 3(4)-merous, fused; stigma discoid, sessile, peltate on reduced style. **Flowering time** Nov., Dec. **Fruit** syncarp, individual fruit develop into a globose pseudoberry. Woodland, thicket, on a variety of hosts; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Indigenous Forests (Alice and Komga southwards to Fish River Valley, Uitenhage and East London).

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BALSAMINACEAE

(Order Ericales)

Compiled by M. Struwig

IMPATIENS L.

Impatiens, busy lizzy, touch-me-not; *kruidjie-roer-my-nie* (A); *ihlula*, *umadolwane* (Z)

Species ± 850, mainly northern hemisphere, tropical Africa, tropical Asia to North America; 4 in sthn Afr., widespread in moist eastern parts, except N, B, NC.

flanaganiae Hemsl.

Perennial herb, 1–2 m high; tuberous, glabrous, fleshy, stems upright, branched. **Leaves** spirally arranged, petiolate, oblong to oblong-elliptic, margins crenate-dentate. **Inflorescence** a raceme, 6–12(–15) flowers. **Flowers** pink; pedicels long. **Sepals**: lateral sepals 4, linear-lanceolate to ovate-lanceolate; lower sepals gradually tapering into a curved spur. **Petals**: dorsal petal cucullate, apically produced on short, blunt point; lateral united petals suborbicular, upper petal entire, lower petal emarginate along inner margin. **Ovary** glabrous. **Flowering time** Dec.–Feb. Stony or rocky soil; Indian Ocean Coastal Belt, Indigenous Forests (Port St Johns District).

hochstetteri Warb.

Annual or perennial herb, 0.2–1.2 m high; erect to procumbent, glabrous. **Leaves** spirally arranged, petiolate, membranous, glabrous or pubescent, ovate to ovate-lanceolate, elliptic or elliptic-oblanceolate, margins crenate or crenate-dentate. **Flowers** axillary, solitary or fascicles of 2 or 3(4), pale pink, mauve, whitish, sometimes with small white or yellowish dots. **Sepals**: lateral sepals glabrous, ovate-lanceolate; lower sepals navicular, constricted into curved, filiform spur. **Petals**: dorsal petals with narrow crest, cucullate; upper lateral united petals oblong to obovate, entire or emarginate, lower elliptic, oblong or suborbicular, margins with ligulate appendages. **Ovary** glabrous. **Flowering time** Dec.–Apr. **Fruit** fusiform, glabrous. Stony or rocky soil, humus-rich soil, watersides; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Mount Frere District southwards to Port St Johns, Katberg and Humansdorp).

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BASELLACEAE

(Order Caryophyllales)

Compiled by M. Struwig

*ANREDERA Juss.

Bridal wreath, Madeira vine; *Madeira ranker* (A)

Species 10–15, from S Florida and Texas to Argentina, the majority in northern South America; 1 naturalised in sthn Afr., cultivated as ornamental, M, S, KZN, L, WC, EC.

cordifolia (Ten.) Steenis

Perennial climber, succulent, 1.5–8.0 m high; much branched, stems semi-succulent, drapes itself over other plants. **Leaves** semi-succulent, bright glossy green. **Inflorescences** spikes, ± 300 mm long. **Flowers** ± 5 mm in diam., white, showy, fragrant. **Stigma** 3-cleft, style division varies. **Fruit** none, reproducing from aerial tubers; tubers produced in leaf axils which later drop to the ground. In bush clumps, riverbanks; origin subtropical South America, potential transformer, declared weed (category 1), with poisonous water extracts; Sub-Escarpment Savanna, Sub-Escarpment Grassland, Albany Thicket (Harding S to Bedford and Alice Districts).

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BEGONIACEAE

(Order Cucurbitales)

Compiled by C.L. Bredenkamp

BEGONIA L.

Species ± 1 400, pantropical, grouped in 63 sections; continental Africa by far the fewest species, only 111 species in 12 sections; 6 (perhaps only 5) in sthn Afr., LIM, M, S, FS, KZN, L, EC.

1a Leaves symmetrical or nearly so, suborbicular, all, or nearly all, radical

geranioides Hook.f.

Tuberous, often stemless, perennial herb, up to 0.5 m high. **Leaves** several from crown; blade suborbicular, up to 80 × 200 mm, base deeply cordate, apex very obtuse, both surfaces thinly clad with long, white hairs; petioles up to 200 mm long. **Inflorescences** up to 300 mm high, often pinkish or reddish; bracts in pairs subtending each di- or trichotomy. **Flowers** white, 20–30 mm in diam.; tepals of male flowers generally 4 and female generally 5. **Flowering time** Dec.–Mar. **Fruit** 3-winged, cuneiform in outline, placentae undivided. Damp earth banks and rock faces; Indigenous Forests (Kokstad, Suurberg and Ngeli slopes on KZN Border).

1b Leaves mostly asymmetrical, cauline
2a Flowers orange (but often drying pink), male tepals generally 4

sutherlandii Hook.f.

Herbaceous perennial, with one or several stems from a tuber, stems 0.01–1.00 m high. **Leaves** very oblique, elliptic-lanceolate to ovate, up to 250 × 150 mm, base cordate to truncate, apex acuminate to long acuminate, margins acutely, irregularly serrate or lobed, thin-textured, light bright green above, paler below; petioles up to 150 mm long. **Flowers** orange, up to 35 mm in diam., showy; male flowers with 4 tepals, female with 5. **Flowering time** Dec., Jan. **Fruit** cuneiform in outline. Steeply sloping forest floor, earth banks, rock faces or mossy boulders, escarpment forest; Indigenous Forests (Ntabankulu).

2b Flowers white or pink, male tepals usually 2

***cucullata** Willd.

Herbaceous perennial, caudex absent, stems erect. **Leaves** cucullate or hooded, leaf bases curled inwards into funnel shape, slightly asymmetrical and ovate, base rounded, apex obtuse, glabrous. **Flowers** white or pink. In forest on substrate of loose boulders; origin S Brazil, Paraguay and N Argentina, widely naturalised in tropics and probably elsewhere, also in warmer summer rainfall areas of SA; Indian Ocean Coastal Belt, Indigenous Forests (Mzimvubu River near Port St Johns).

dregei Otto & A.Dietr.

Glabrous, herbaceous perennial, with one or several stems from a caudex, up to 0.3 m high. **Leaves** obliquely ovate to obliquely ovate-lanceolate, up to 80 × 35 mm, base shallowly cordate to subtruncate, apex narrowly triangular-acute to acuminate, margins ± regularly lobed, somewhat fleshy, light bright green above, paler below; petioles up to 90 mm long. **Flowers** up to 30 mm in diam.; male flowers with 2 tepals, female with 5. **Flowering time** Dec.–Mar. Rocky cliffs, steep earth banks, among rock falls in forest; Indian Ocean Coastal Belt, Indigenous Forests (Qudeni, Ngotshe and Ngoye Forests N of Tugela River, along coast S to East London).

homonyma Steud.

Glabrous, herbaceous perennial, with one or several erect stems from a caudex, 0.15–1.05 m high, stout and fleshy. **Leaves** obliquely ovate, up to 130 × 70 mm, base shallowly cordate, apex broadly acute, margins entire, sinuate or shallowly lobed, thin-textured, light bright green above, paler below; petioles up to 130 mm long. **Flowers** up to 30 mm in diam.; male flowers with 2 tepals, female with 5. **Flowering time** Dec.–Mar. Coastal districts, rock falls and cliffs in forest; Indian Ocean Coastal Belt, Indigenous Forests (southern end of Lebombo Mts along coastal belt to Mbashe River).

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BIGNONIACEAE

(Order Lamiales)

Compiled by S.J. Smithies & M. Struwig

1a Capsule beaked ..... **Rhigozum**
1b Capsule not beaked:
2a Capsule woody, broadly oval ..... ***Jacaranda**
2b Capsule not woody:
3a Calyx inflated; scrambling shrub or subshrub; flowers pink ..... **Podranea**
3b Calyx not inflated:
4a Shrub or small tree, not scrambling; flowers yellow ..... **Tecoma**
4b Shrub, scrambler or small tree; flowers orange or scarlet ..... **Tecomaria**

*JACARANDA Juss.

Species ± 49 species, neotropical; 1 in sthn Afr., naturalised in warmer parts, LIM, NW, G, M, S, KZN, EC.

mimosifolia D.Don

Jacaranda; *jakaranda* (A)

Tree, up to 22 m high; deciduous or semi-deciduous, round spreading crown. **Leaves** fern-like, bipinnate, dark green turning yellow in autumn or winter, pubescent. **Flowers** in loose pyramidal sprays, carried on end of leafless branchlets; mauvish blue, rarely white. **Corolla** tubular-campanulate above narrow base. **Flowering time** Sept.–Nov. **Fruit** a woody capsule, broadly oval, flattened, green turning brown, splits open after ± a year. **Seeds** flat, winged. Savanna, wooded kloofs, riverbanks; widely cultivated as an ornamental, origin South America, transformer, declared invader (category 3); Albany Thicket, Indigenous Forests, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Lower Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland (Queenstown S to Grahamstown and E to East London).

PODRANEA Sprague

Species 1 or 2, Africa; 1 in sthn Afr., KZN, EC.

Possibly conspecific with *P. brycei* (N.E.Br.) Sprague, from Zimbabwe, Malawi and Mozambique.

ricasoliana (Tanfani) Sprague

Port St Johns creeper; *Port St Johns klimop* (A)

Scrambler, occasional shrub; evergreen, branches terete, ribbed, glabrous with few minute scales, nodes pilose. **Leaves** compound, 7–9 leaflets, ovate, deep green, glabrous, lower surface gland-dotted, margins crenate. **Inflorescence** many-flowered panicles; rachis and pedicles glabrous. **Flowers** pink, scented. **Calyx** campanulate, glandular above, lobes deltoid-ovate, mucronate, ciliolate. **Corolla** funnel-shaped, 5-lobed, glabrous outside, nearly so inside. **Flowering time** Nov.–Apr. **Fruit** a long, narrow, flattened capsule. **Seeds** brown, ovate, flat, papery winged. Creeper in forest, locally abundant; Indian Ocean Coastal Belt, Indigenous Forests (Port St Johns District).

RHIGOZUM Burch.

Species 7, Africa and Madagascar; 5 in sthn Afr., widespread, mainly in karroid areas, except L.

brevispinosum Kuntze

Short-thorned pomegranate; *kort-doringgranaat* (A)

Shrub, 0.6–4.0 m high; erect, rigid, branches spiny, young branches grey-brown, glabrous or pubescent. **Leaves** simple, subsessile to sessile, oblanceolate to linear oblanceolate, slender, glabrescent, pubescent when young, margins entire. **Flowers** single or clustered on a stalk, pedicellate, pubescent, sweetly scented. **Calyx** 5-lobed, pubescent outside, upper part glandular. **Corolla** golden-yellow, sometimes with reddish streaks; tube campanulate, lobes crinkled, emarginate, margins ciliate. **Flowering time** Sept.–Dec. **Fruit** a beaked capsule, valves thin, light brown. **Seeds** winged. Dolerite, sandy, stony soil, well-drained, full sun; Upper Karoo, Dry Highveld Grassland (Middelburg District S to Graaff-Reinet District).

obovatum Burch.

Yellow pomegranate; *geel-berggranaat* (A)

Compact shrub or small tree, 0.7–4.5 m high; branches grey, smooth, rigid, spiny, spreading. **Leaves** 1-jugate, rarely simple, fascicled on spur-branchlets, petiolate, greyish green, obovate to oblong-obovate, finely notched at apex; margins entire, revolute. **Flowers** in clusters of 1–3, pedicellate. **Calyx** 5-lobed, lobes short, rounded, minutely mucronate. **Corolla** bright yellow, tube campanulate to funnel-shaped, lobe margins entire. **Flowering time** Sept.–Jan. **Fruit** a beaked capsule, brown, smooth, thin-walled. **Seeds** winged. Stony or rocky soil, gravel, well-drained, full sun; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Sub-Escarpment Savanna, Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Albert and Middelburg Districts southwards to Graaff-Reinet, Grahamstown and Peddie).

TECOMA Juss.

Species ± 14, neotropics, 1 in sthn Afr., LIM, NW, G, M, S, KZN, EC.

The sinking of *Tecomaria* under *Tecoma* is questionable and a close study of the two genera is needed. Recent authors vary in their use of the two names. Here Coates Palgrave (2002) is followed in separating the genera.

***stans** (L.) Juss. ex Humb., Bonpl. & Kunth

Yellow bells; *geelklokkies* (A)

Shrub or small tree, 2–4(6) m high; evergreen. **Leaves** pinnate, leaflets 5–13, lanceolate, bright green above, paler below; margins toothed. **Flowers** in terminal sprays, bright

yellow, reddish striated. **Corolla** tubular-campanulate above narrow base, five-lobed. **Flowering time** Oct.–May. **Pollination** by bees. **Fruit** a brown, linear capsule. **Seeds** papery winged. Watercourses, gardens, urban open spaces, roadsides, mainly in warmer areas; origin possibly Mexico and southern United States, potential transformer, declared weed (category 1); Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt (Port St Johns S to Grahamstown District).

TECOMARIA (Endl.) Spach

Species 2, Africa; 1 in sthn Afr., LIM, NW, G, M, S, KZN, WC?, EC.

capensis (Thunb.) Spach

[= *Tecoma capensis* (Thunb.) Lindl.]

Cape honeysuckle; *Kaapse kamferfoelie* (A); *morapa-šitšane* (S); *icakatha* (X); *umunyane* (Z)

Shrub, scrambler or small tree, 0.5–7.5(10.0) m high; many-stemmed, bark pale brown, many lenticels on branches. **Leaves** opposite, petiolate, imparipinnate, rachis winged, hairy, leaflets ovate to oblong-ovate, dark green above, paler below, margins scalloped to toothed. **Inflorescence** a raceme. **Flowers** bisexual, ± 50 mm long, orange to scarlet. **Calyx** 5-lobed, campanulate. **Corolla** narrowly cylindrical, widening a little upwards, 2-lobed; upper lobe hooded, lower lobe lipped. **Flowering time** Mar.–Dec. **Pollination** by birds. **Fruit** a linear, flat, long capsule. **Seeds** papery winged. Stony or rocky soil, loam, widely cultivated as an ornamental; Sub-Escarpment Grassland, Indigenous Forests, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Komga S to Uitenhage and East London).

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BORAGINACEAE

(Order Boraginales)

Compiled by E. Retief

1a Style terminal; plants shrubs, trees or herbs:
2a Fruit a drupe:
3a Style 2-fid; calyx with a shallow tube, 5-lobed..... **Ehretia**
3b Style 4-fid; calyx tubular or campanulate, lobes weakly developed..... **Cordia**
2b Fruit of nutlets..... **Heliotropium**
1b Style gynobasic; plants predominantly perennial herbs, occasionally shrubs:
4a Calyx strongly accrescent in fruit; anthers with connectives prolonging into long, appendages, twisted above thecae..... **Trichodesma**
4b Calyx not or slightly accrescent in fruit; anthers not prolonged into long appendages:
5a Stamens exserted:
6a Corolla with fornices in throat; lobes folding back..... **Afrotysonia**

6b Corolla naked in throat:
7a Flower with annulus of hairy lobules at base of corolla tube ..... ***Echium**
7b Flower with annulus absent..... **Lobostemon**
5b Stamens included:
8a Corolla naked in throat..... ***Amsinckia**
8b Corolla with fornices in throat:
9a Nutlets glabrous:
10a Corolla lobes contorted in bud..... **Myosotis**
10b Corolla lobes imbricate in bud:
11a Nutlets smooth or pitted..... **Lithospermum**
11b Nutlets rugose, tuberculate and verrucose:
12a Corolla throat with 5 well-developed, elongated, vertical lines of hairs; fornices absent.... ***Buglossoides**
12b Corolla throat without vertical lines of hairs; fornices present..... **Anchusa**
9b Nutlets glochidiate:
13a Inflorescence ebracteate ..... **Cynoglossum**
13b Inflorescence bracteate ..... **Lappula**

AFROTYSONIA Rauschert

Species 3, Africa; 2 in sthn Afr., KZN, L, EC.

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 greyish, hairs on upper surface antrorse, those on lower surface retrorse. **Flowers** in 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. **Flowering time** Dec.–Apr. **Fruit** of wingless, densely glochidiate nutlets. Grassy plains, along watercourses; Sub-Escarpment Grassland (Engcobo).

***AMSINCKIA** Lehm.

Ironweeds, yellow burr weeds, tarweeds, fiddleneck, ystergras (A)

Species 15, western United States; 2 naturalised in sthn Afr., NW, NC, WC, EC.

retrorsa Suksd.

Vioolnek, *kakiegras* (A)

Annual herb, up to 0.5 m high; roughly pubescent. **Leaves** sessile; blade narrowly ovate to ovate, basal blades 100–110 × 7–9 mm, base cordate, apex acute to rounded, margins entire, diminishing in size towards inflorescence. **Flowers** in tightly rolled scorpioid cymes. **Calyx** deeply divided; lobes narrowly ovate, accrescent, up to 9 mm in mature fruit. **Corolla** naked in throat, yellow to orange. **Stamens** included. **Flowering time** July–Nov. **Fruit** of rugose, tuberculate and verrucose nutlets. Weed in sandy soil, disturbed areas; Albany Thicket, Sub-Escarpment Savanna (Willowmore, Alicedale).

ANCHUSA L.

Cape-forget-me-not

Species 35, Europe, western Asia, North Africa; 3 in sthn Afr., NW, FS, L, NC, WC, EC.

***azurea** Mill.

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 ovate, 6–8 mm long in flower, 12–15 mm long in fruit. **Corolla** tube equalling or longer than limb; limb (8–)10–15 mm in diam.; corolla with tube ± 6 mm long, lobes ± 4 mm long, violet or deep blue. **Flowering time** Oct.–Mar. **Fruit** of erect nutlets, longer than wide, at least 6 mm long. Margins of cultivated lands, amongst grain seed, weed in garden; origin Europe, Asia and Eurasia; Upper Karoo, Drakensberg Grassland (Middelburg, Jamestown, Queenstown).

riparia DC.

(= *A. capensis* Thunb. *sens. auct.*)

Perennial herb, with annual flowering stems up to 0.4 m high. **Stems** erect or decumbent, sparingly setose. **Leaves** with blade narrowly ovate, up to 90 × 9 mm, apex acute. **Flowers** in scorpioid cymes. **Calyx** not divided to base, accrescent, inflated in fruit. **Corolla** up to 7 mm in diam.; tube 3–4 mm long, white; lobes 1–2 mm long, bright blue, fornices white. **Flowering time** Sept.–Mar. **Fruit** of ± 3 mm long nutlets, rugose, tuberculate, verrucose. Grassland, mountain slopes, dunes, disturbed places, roadsides; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Aliwal North, Rhodes, Wapadsberg Pass, Middelburg, Steynsburg, Queenstown, Mountain Zebra National Park, Kouga Mts, Kommadagga, Alicedale, Cape St Francis, Oyster Bay).

*BUGLOSSOIDES

Ironweed; *naaldjiebossie* (A)

Species ± 15, Europe to China; 2 naturalised in sthn Afr., NW, G, FS, L, NC, WC, EC.

arvensis (L.) I.M.Johnst. subsp. **arvensis**

Sheepweed, white ironweed, gromwell; *naaldjiebossie* (A)

Annual herb, up to 0.6 m high; greyish green, densely covered with appressed bristles. **Stems** branching from base. **Leaves** narrowly ovate or narrowly obovate, 15–45 × 3–8 mm, slightly clasping at base, apex acute, margins entire, densely setulose. **Flowers** in scorpioid cymes, cymes bracteate. **Calyx** with a white indumentum, enlarging in fruit. **Corolla** white; tube cylindric, 5–7 mm long, 5 hairy longitudinal bands inside, scale-like lobes at base. **Flowering time** Aug.–Dec. **Fruit** of ± ovoid nutlets, rugose and tuberculate. Weed of waste and disturbed places; Upper Karoo, Dry Highveld Grassland, Albany Thicket (Middelburg, Wapadsberg Pass, Graaff-Reinet).

CORDIA L.

Species ± 350, central and South America, Africa and Asia; 8 in sthn Afr., N, B, LIM, M, S, KZN, EC.

caffra Sond.

Septee tree; *ouhout*, *septee* (A); *mlovulovu* (X)

Tree or shrub, 2–10 m high; occasionally stunted. **Leaves** petiolate; blade ovate, 50–100 × 20–40 mm, base cuneate, apex long acuminate, margins irregularly finely toothed, glabrous; petioles up to 30 mm long. **Flowers** in scorpioid cymes. **Calyx** irregularly toothed. **Corolla** creamy white. **Flowering time** Aug.–Apr. **Fruit** a globose drupe, ± 15 mm long, orange. Forest edges, bush clumps, coastal scrub forest, sand dunes, hillsides, grey sandy loam, black loam; Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Ngqeleni, Port St Johns, Mazeppa Bay, Kei River Mouth, Komga, Baviaanskloof, Hopewell, Bathurst, Alexandria, Port Alfred, East London).

CYNOGLOSSUM L.

Hound's tongue; *knoppiesklits* (A)

Species 55, temperate and warm regions; 6 in eastern regions of sthn Afr., LIM, NW, M, FS, KZN, WC, EC.

alticola Hilliard & B.L.Burtt

Perennial herb, 0.5–0.6 m high; densely hairy. **Leaves** sessile; basal leaves with blade decurrent, narrowly obovate, up to 170 × 13 mm, apex acute; upper leaves diminishing in size towards inflorescence, appressed to stem, blade narrowly obovate to elliptic, apex acute, densely hairy. **Flowers** in a helicoid cyme. **Corolla** with tube ± 2 mm long; lobes ± 1 mm long, blue or purplish blue. **Flowering time** Nov., Dec. **Fruit** with nutlets, ± 6 mm in diam., densely covered with bulbous-based glochidia. Mountain slopes, along streams, black soil; Drakensberg Grassland (Ben McDhui, Naude's Neck).

austroafricanum Hilliard & B.L.Burtt

Annual, occasionally perennial herb, 0.3–1.0 m high. **Leaves** sessile; blade obovate, up to 100 × 16 mm, base truncate, apex acute. **Flowers** in helicoid cymes. **Corolla** bright blue to purple. **Flowering time** Dec.–Apr. **Fruit** of nutlets, covered by cylindrical, slender glochidia. Grassland, mountain slopes, hillsides, stony grassland, damp places, waste patches, shade; Drakensberg Grassland, Sub-Escarpment Grassland (Naude's Neck, Cala, Hogsback).

hispidum Thunb.

Hound's tongue; *beestongblaar*, *knoppiesklitsbossie*, *ossetongblaar* (A)

Perennial herb, up to 0.6 m high in flower; stems erect, annual or biennial from rootstock. **Leaves** sessile; basal leaves with blade narrowly obovate, up to 130(350) × 27(35) mm, apex obtuse. **Flowers** in a helicoid cyme. **Corolla** dark red to purplish red. **Flowering time** Oct.–Mar. **Fruit** of nutlets, densely covered by bulbous-based glochidia; stalk deflexed, up to 20 mm long. Open grassland with slightly shaded areas, grassy slopes, disturbed places; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Venterstad, Aliwal North, Mount Frere and Kokstad southwards, from Queenstown to Mthatha, Graaff-Reinet to Sada, Menziesberg, Mpofu Game Reserve, Fort Beaufort, Cathcart, Komga and Kei River Bridge, from Port Elizabeth to Alexandria District, Suurberg Mts, Port Alfred and East London).

lanceolatum Forssk.

Knoppiesklits (A)

Annual or biennial herb, 0.3–1.2 m high, divaricately branched. **Leaves** sessile; blade obovate, up to 120 × 15 mm, apex acute, venation of lower surface prominent. **Flowers** in helicoid inflorescences, divaricately branched. **Corolla** white or pale blue. **Flowering time** Nov.–Feb. **Fruit** of sessile or shortly stalked nutlets, stalks not more than 3 mm long, covered by glochidia. Grassland, savanna, along watercourses, in riverine forest and vleis, weed in plantations, clay, sandy loam black soils; Sub-Escarpment Grassland, Indigenous Forests, Indian Ocean Coastal Belt, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Queenstown to Port St Johns S, from Menziesberg to Fort Beaufort, Fort Cunynghame, Hogsback, Komga and Kentani, and to Grahamstown).

spelaeum Hilliard & B.L.Burtt

Perennial herb, up to 1 m high. **Leaves** sessile; blade decurrent, obovate, up to 100 × 40 mm, base truncate, apex acute, margins entire. **Flowers** in helicoid cymes. **Corolla** lobes white. **Flowering time** Dec.–Mar. **Fruit** of nutlets, glochidia cylindrical, well-spaced, concentrated along margins and median line of nutlet. Mountainous grassland, dolerite cliffs, loose soil in shade of large boulders; Dry Highveld Grassland, Drakensberg Grassland (Molteno, Gaika's Kop).

*ECHIUM L.

Species 60, Macronesia, Europe, western Asia, North Africa; 3 naturalised in sthn Afr., M, FS, KZN, L, WC, EC.

plantagineum L.

Paterson's curse, salvation Jane, purple bugloss; *bloudissel*, *bloudisseldoring* (A)

Annual or biennial herb, with 1–many flowering stems, up to 0.8 m high. **Stems** erect or decumbent. **Leaves**: basal leaves with blade broadly ovate to narrowly obovate, 50–300 × 10–70 mm, base attenuate, apex rounded to somewhat acute, decurrent, lateral veins prominent on both surfaces, petioles up to 55 mm long; cauline leaves sessile, blade narrowly ovate. **Flowers** in helicoid cymes. **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. **Stamens** with lower pair long-exserted, other 3 enclosed; filaments with long hairs. **Flowering time** Sept.–Mar. **Fruit** with nutlets 2–3 × 2.0–2.5 mm, greyish brown, rugose, tuberculate. Roadsides, waste ground, weed of cultivation; origin Europe; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Albert and Barkly East Districts S, from Middelburg to Somerset East, Fort Beaufort, Stutterheim, Toise River and Kentani, from Misgund to Groendal Nature Reserve, Port Elizabeth, Alicedale, Grahamstown and Kowie, and to Humansdorp).

vulgaris L.

Blue devil, blue weed, viper's bugloss

Biennial or perennial herb, up to 1 m high. **Stems** erect or decumbent. **Leaves**: 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. **Calyx**: lobes 6–8 mm long in fruit. **Corolla** brilliant blue, fading to mauve, broadly funnel-shaped, ± 10–15 mm long, outer surface puberulous and with long, simple hairs on veins and margins. **Stamens** included, 4 long-exserted, 1 short. **Flowering time** Nov.–Mar. Weed of old cultivated lands, waste places, roadsides, occasionally in montane grassland; origin Europe; Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (Lady Grey, Barkly East, Ongeluksnek, Matatiele, Naude's Neck, Jamestown, Dordrecht, Tarkastad, Fort Beaufort, Assegaaibosch).

EHRETIA P.Browne

Species 33, tropics of both the Old and New World; 6 in sthn Afr., widespread.

rigida (Thunb.) Druce subsp. **rigida**

Cape lilac

Much-branched shrub or multi-stemmed tree, often stunted. **Leaves** petiolate; blade obovate, 20–35 × 12–23 mm, base cuneate, apex acute or rounded, margins entire,

glabrous or main veins with setae, other veins with scattered setae, usually coriaceous; petioles 3–8 mm long. **Flowers** in scorpioid cymes, cymes terminal or clustered in a head; peduncles and pedicels thick, up to 1.5 mm in diam. **Corolla** cylindric, 8–10 mm long; tube white; lobes shorter than tube, lilac, blue, bluish purple or purple. **Flowering time** Oct.–Mar. Scrub, bush clumps, *Euphorbia* thicket, valley bushveld, dune bush; Upper Karoo, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Albany Thicket, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld. (Albert District, Cliftonvale Farm S to Middelburg, from Graaff-Reinet to Cradock, Fort Beaufort, King William's Town and Nahoon River Mouth, from Hankey to Uitenhage, Port Elizabeth, Grahamstown and Port Alfred).

rigida (Thunb.) Druce subsp. **silvatica** Retief & A.E.van Wyk

Scandent shrub or multi-stemmed tree, up to 12 m high. **Leaves** petiolate; blade broadly obovate or elliptic, 40–60 × 30–35 mm, apex obtuse or acute, base cuneate, margins entire, upper surface glabrous, lower surface glabrous or with setae on veins only, thin in texture; petioles up to 20 mm long. **Flowers** in scorpioid cymes, cymes terminal on young shoots or occasionally terminal on short young shoots at tip of abbreviated branchlets, few-flowered; peduncles and pedicels thin, up to 1 mm in diam. **Corolla** cylindric; tube 4–6 mm long; lobes as long as tube, pale mauve or pale lilac. **Flowering time** July–Oct. Forest, forest scrub, forest margin; Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Port St Johns S to Komga and Dwesa Forest, from Suurberg Pass to Alexandria and East London).

HELIOTROPIUM L.

Heliotrope

Species ± 250, tropical and warm regions; 17 in sthn Afr., widespread.

Calyx and fruit dispersed together

***supinum** L.

Annual herb, densely hairy. **Stems** procumbent, trailing. **Leaves** petiolate; blade broadly ovate to elliptic, 5–25 × 3–17 mm, veins deeply sunken on upper surface, prominent on lower surface; petioles 2–15 mm long. **Flowers** in helicoid cymes. **Calyx** ± as long as corolla tube. **Corolla** white, lobes rounded. **Flowering time** Mar.–Dec. **Fruit** enclosed by calyx, nutlets usually one, obscurely tuberculate on dorsal side, margins winged. Dry riverbeds, pans, weed in old lands, disturbed, damp places or in full sun; Rainshadow Valley Karoo or Eastern Fynbos-Renosterveld (Willowmore).

Calyx persistent

***amplexicaule** Vahl

Perennial herb, up to 0.5 m high, with annual or biennial stems from a woody rootstock. **Stems** procumbent or decumbent. **Leaves** sessile or petiolate; blade ovate to elliptic; petioles up to 15 mm long. **Flowers** in a helicoid cyme. **Calyx** lobes shorter than corolla. **Corolla** light mauve to dark purple, tube and throat orange-yellow; tube glandular-hairy on outside, hairy in throat; lobes shallow, crinkled. **Flowering time** Oct.–Mar. **Fruit** of glabrous, tuberculate nutlets. Weed of disturbed places, roadsides, riverbanks; origin temperate regions of South America, extreme southern Brazil, northern and central Argentina and southern Bolivia; Eastern Fynbos-Renosterveld, Albany Thicket (Port Elizabeth to Grahamstown, Alexandria and Bushman's River Mouth).

ciliatum Kaplan

Perennial herb, much branched from a woody base, 0.2–0.8 m high. **Stems** erect. **Leaves** petiolate; blade narrowly ovate to ovate; petioles 3–12 mm long. **Flowers** in helicoid cymes. **Calyx** much shorter than corolla. **Corolla** white, throat orange. **Flowering time** Oct.–May. **Fruit** of glabrous, rugose nutlets. Grassland, rocky hills, roadsides, dry pans; Upper Karoo (Oviston Nature Reserve, Middelburg).

***curassavicum** L.

Smooth heliotrope; *brakganna*, *panbrak* (A)

Perennial herb with annual, succulent stems from a woody rootstock, glabrous. **Stems** procumbent or erect (flowering branches), up to 0.5 m high. **Leaves** sessile; blade narrowly obovate, decurrent, attenuate, bluish green. **Flowers** in helicoid cymes. **Calyx** shorter than corolla. **Corolla** white or light cream-coloured. **Flowering time** Sept.–Apr. **Fruit** of 4 glabrous, rugose nutlets. Margins of streams, vleis, pans in mud, disturbed areas, grey-black alluvial soils, calcrete; origin New World; Upper Karoo, Albany Thicket, Rainshadow Valley Karoo (Middelburg, Graaff-Reinet, Willowmore, Uitenhage, Redhouse, Ecca River Valley).

ovalifolium Forssk.

Annual or occasionally perennial herb, up to 0.6 m high. **Leaves** shortly to long-petiolate; blade elliptic to obovate, somewhat silvery; petioles up to 8 mm long. **Flowers** in helicoid cymes. **Calyx** much shorter than corolla. **Corolla** white with yellow throat. **Fruit** of 4 densely pubescent nutlets. Grassland, open woodland, along watercourses, disturbed places, common in shade; Albany Thicket (Uitenhage).

LAPPULA Moench

Species 50, mainly temperate Eurasia; 2 in sthn Afr., NW, G, FS, WC, EC.

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. **Flowering time** Sept.–Apr. **Fruit** of glochidiate nutlets, glochidia a single row, flattened, confluent at base. Disturbed places, banks of watercourses, roadsides; Upper Karoo, Lower Karoo, Eastern Fynbos-Renosterveld (Middelburg and Wapadsberg Pass S to Aberdeen District and to Swartkops River).

***heteracantha** (Ledeb.) Gürke

European stickseed; *klitsgras*, *steeksaadgras* (A)

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. **Flowering time** Sept.–Mar. **Fruit**: 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; Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Albany Thicket (Albert District, Cliftondale Farm to Aliwal North, Naude's Neck and Mount Currie southwards, from Middelburg to Sneeuberg, Steynsburg and Indwe, Mountain Zebra National Park to Fort Beaufort, Alice and Komga, and from Aloes and Red House to Bushman's River Mouth).

LITHOSPERMUM L.

Species 59, temperate regions, excluding Australia; 7 in sthn Afr., N, NW, G, M, S, FS, KZN, L, NC, EC.

Stems appressed-pubescent

cinereum DC.

Naelbossie (A)

Perennial herb, 0.1–0.3 m high; closely appressed greyish strigose. **Stems** corymbosely branched; appressed-hairy. **Leaves** with blade linear-oblong, base cuneate, apex obtuse. **Flowers** terminal between leaves. **Corolla** with tube 1.5–2.0 mm long; lobes white or yellowish white, throat with 5 slightly convex areas; style included. **Flowering time** Nov.–Apr. **Fruit** with white or rufescent nutlets, 2.5–3.0 mm long, surface glabrous, smooth and pitted. Grassland, along watercourses, disturbed places, roadsides, stony soil; Upper Karoo, Sub-Escarpment Grassland (Middelburg, Sterkstroom, Queenstown, Indwe, Cala, Kokstad).

Stems patently pubescent

diversifolium DC.

Straggling, perennial herb, ± 0.3 m high. **Stems** patently pubescent. **Leaves** with blade obovate, some hairs bent. **Flowers** terminal between leaves. **Corolla** ± 3 mm long, white. **Flowering time** Nov.–Mar. **Fruit** of white, smooth nutlets. In shelter of rocks; Upper Karoo, Dry Highveld Grassland (Cradock, Mountain Zebra National Park).

papillosum Thunb.

Perennial herb, 0.15–0.30 m high; densely leafy. **Leaves** appressed; blade ovate. **Flowers** in leafy, scorpioid cymes. **Corolla** with tube ± 3 mm long; lobes 1–2 mm long, white. **Flowering time** Sept.–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; Drakensberg Grassland, Sub-Escarpment Grassland, Dry Highveld Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Rhodes to Kokstad S, from Molteno to Wodehouse, Queenstown and Maclear, Bosberg to Hogsback, Cathcart, Fort Cunynghame, Keiskammahoek, Stutterheim, King William's Town and Komga, from Groendal Nature Reserve to Suurberg and Grahamstown).

scabrum Thunb.

(= *L. affine* A.DC.)

Perennial herb with annual stems from rootstock. **Leaves** with 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. **Flowering time** Sept.–Mar. **Fruit** of nutlets, white, smooth, shining. Rocky hillsides, disturbed places; Drakensberg Grassland, Upper Karoo, Albany Thicket (Rhodes S, from Middelburg to Graaff-Reinet, Alice and Fort Cunynghame).

LOBOSTEMON Lehm.

Agtdaegeneesbos (A)

Species 29, sthn Afr., mostly WC, also NC, EC.

argenteus (P.J.Bergius) H.Buek

Dwarf shrublet, 0.3–0.6 m high. **Leaves** with blade linear to narrowly ovate, 20–25 × 8–9 mm, apex acute, margins entire, slightly revolute, hairy with long and short hairs.

Flowers in a pseudo-spike, 1 flower per bract. **Calyx** with lobes dissimilar in width. **Corolla** irregular, 15–25 mm long, blue, outer surface glabrous except for midvein and margins. **Staminal scales** inserted well below throat of corolla tube. **Stamens** exserted. **Flowering time** July–Feb. Grassland, false macchia, hillsides, dunes, granitic soil, shale or sandstone; Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Adelaide S, from Uitenhage, to Grahamstown and Humansdorp to Jeffreys Bay and Cape St Francis).

echioides Lehm.

Dwarf shrub, 0.2–0.8 m high. **Leaves** with blade oblong to narrowly ovate, 6–30 × 2–5 mm, apex acute or obtuse, margins entire, hairy, often with soft silvery hairs. **Flowers** in scorpioid cymes. **Calyx** with lobes similar in width. **Corolla** irregular, 17–30 mm long, blue, outer surface hairy. **Staminal scales** inserted in throat of tube. **Stamens** exserted. **Flowering time** Aug.–Oct. Stony slopes and flats, mostly sandstone derived soils; Albany Thicket, Sub-Escarpment Savanna (Graaff-Reinet, Glen Melville Dam, Grahamstown).

marlothii Levyns

Dwarf shrub, 0.6–1.0 m high. **Leaves** with blade narrowly ovate to oblong, 25–50 × 4–5 mm, apex acute or obtuse, margins entire, hairy. **Flowers** in scorpioid cymes. **Calyx** with lobes similar in width. **Corolla** irregular, 15–25 mm long, deep violet-blue. **Stamens** included. **Staminal scales** well below throat of corolla tube. **Flowering time** Aug.–Oct. Mountain slopes, kloofs, rocky or sandy soil; Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld [Antoniesberg and Willowmore (Suurberg Poort) S, from Baviaanskloof to Misgund, Cockscomb, Kouga Mts and Uitenhage].

stachydeus DC.

Dwarf shrub, 0.3–0.6 m high. **Leaves** with blade narrowly oblong to ovate, 25–35 × 4–7 mm, apex acute, margins entire, hairy. **Flowers** terminal in a pseudo-spike, cymes 2-flowered. **Calyx** similar in width. **Corolla** irregular, 13–15 mm long, dark violet-blue. **Stamens** dissimilar, all exserted but short. **Staminal scales** inserted well below throat of corolla tube. Roadsides, kloofs, sandy soil; Upper Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld [Sneeukop and Graaff-Reinet S, from Willowmore to Studtis, Langkloof (Hoeree Farm), Joubertina, Kareedouw and Cockscomb].

trigonus (Thunb.) H.Buek

Dwarf shrub, 0.3–0.8 m high. **Leaves** with blade oblong to narrowly ovate, 10–20 × 4.5–7.0 mm, apex obtuse, margins entire. **Flowers** in scorpioid cymes. **Calyx** with lobes similar in width. **Corolla** irregular, 18–20 mm long, violet-blue. **Stamens** exserted. **Staminal scales** inserted well below throat of corolla tube. **Flowering time** Jan.–Sept. Grassland, coastal bush, hill slopes, roadsides; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage E to Port Elizabeth and Alexandria, and to Humansdorp).

MYOSOTIS L.

Species 100, in Europe, Asia and Africa, North and South America, Australia and New Zealand; 7 in sthn Afr., LIM, M, S, FS, KZN, L, WC, EC.

***arvensis** (L.) Hill

Annual or biennial herb, 0.15–0.20 m high. **Stems** patently hairy. **Leaves** sessile; blade narrowly obovate. **Flowers** in scorpioid cymes. **Calyx** 3-nerved, hairs spreading, some crisped or hooked. **Corolla** ± 1.5 mm long; tube white; lobes white, blue or purplish blue,

fornices yellow. **Flowering time** Aug.–Dec. **Fruit** with stalk spreading, up to twice as long as calyx. Grassland, moist places, margin of dune forest, wet places, under shrubs; Drakensberg Grassland, Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld [Rhodes S, from Koudeveldberge (Doornbosch) to Enon, Port Elizabeth, Grahamstown, Alexandria, Kasouga River Mouth, Port Alfred and Kowie].

galpinii C.H.Wright

Perennial herb, 0.5–0.7 m high. **Stems** glabrous, purplish black when dry. **Leaves** basally with blade elliptic, up to 50 × 24 mm, decurrent, base attenuate, apex acute, pubescent on upper surface, lower surface glabrous except for some setae near apex and along main. **Calyx** 3-nerved. **Corolla** ± 3 mm long, blue. **Flowering time** Oct.–Mar. Grassland, margins of watercourses, amongst rocks, in shade at margins of bush clumps, in undergrowth of bush; Drakensberg Grassland, Sub-Escarpment Grassland (Naude's Neck, Rhodes, Mount Currie S, from Maclear to Engcobo and Hogsback).

graminifolia DC.

Perennial herb, 0.2–0.4 m high. **Stems** pilose. **Leaves** sessile; blade basally broadly linear, up to 20 × 4, base attenuate, apex obtuse, decurrent, upper surface scabrid, lower surface almost glabrous. **Calyx** 1-nerved. **Corolla** ± 2–3 mm long, blue. **Flowering time** Dec.–Mar. Wet places; Dry Highveld Grassland, Drakensberg Grassland (Aliwal North E to Naude's Neck, Ben McDhui, Joubert and Rhodes).

semiamplexicaulis DC.

(= *M. afropalustris* C.H. Wright *sens. auct.*)

Perennial herb, up to 0.5 m high. **Stems** patently hirsute. **Leaves**: basal leaves with blade oblong, up to 100 × 13 mm, base attenuate, apex acute, decurrent, hirsute-pilose on both surfaces; upper leaves ovate, semi-amplexicaule. **Calyx** 3-nerved. **Corolla** ± 3 mm long, blue. **Flowering time** Nov.–Mar. Grassland, along watercourses; Drakensberg Grassland, Sub-Escarpment Grassland (Ongeluksnek, Naude's Neck, Molteno, Queenstown, Mjika).

***sylvatica** Hoffm.

Perennial herb, 0.4–0.6 m high; hirsute. **Leaves**: basal leaves with blade elliptic, base attenuate, apex acute, decurrent; upper leaves sessile, narrowly obovate, apex acute, margins entire. **Flowers** in scorpioid cymes, cymes usually forked. **Calyx** 3-nerved, hairs hooked. **Corolla** 3–4 mm long, bright blue, fornices yellow. **Flowering time** Sept.–Dec. Grassland; Sub-Escarpment Grassland, Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad S, from Middelburg to Queenstown and Graaff-Reinet to Great Winterberg).

TRICHODESMA R.Br.

Species 45, tropical and warm regions of the Old World; 5 in sthn Afr., N, LIM, NW, G, M, S, FS, KZN, NC, WC, EC.

africanum (L.) Lehm.

Annual or biennial herb, up to 0.5 m high; harshly scabrid. **Leaves** opposite, petiolate or sessile; blade ovate to narrowly ovate, 50–105 × 5–30 mm, base auriculate, apex acute, coarsely white-hispid; petioles up to 40 mm long. **Flowers** in terminal, scorpioid cymes; corolla pale pink or white; calyx as long as corolla, lobes with dark apex, margins and midrib hairy. **Flowering time** all year. **Fruit** of nutlets, ovoid, up to 4 mm long, glochidia

along serrate, raised margins. Stony slopes and dry riverbeds; Upper Karoo, Dry Highveld Grassland (Nieu-Bethesda).

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BRASSICACEAE (Cruciferae)

(Order Brassicales)

Compiled by M. Struwig

1a Inflorescences lateral, mostly opposite leaves ..... ***Coronopus**
1b Inflorescences terminal or in leaf axils:
2a Fruit transversely articulate with 2 or more segments which separate at maturity; lower segment indehiscent or whole fruit breaking into 1-seeded portions:
3a Upper segment of fruit cylindrical, oblong-ovoid or ± conical, sometimes constricted between seeds ... . ***Raphanus**
3b Upper segment of fruit ovoid, oblate or orbicular ..... ***Rapistrum**
2b Fruit not transversely articulate; siliquae (dry, dehiscent fruit formed from a superior ovary of 2 carpels) or siliculae (a short siliqua, not much longer then wide) opening by valves or breaking into 1-seeded portions, or hard and indehiscent:
4a Fruit at least 4× as long as wide (including length of style or beak):
5a Hairs simple or absent:
6a Upper cauline leaves with clasping auricles:
7a Upper cauline leaves not divided; stems round ..... ***Brassica**
7b Upper cauline leaves divided; stems angled ..... ***Barbarea**
6b Upper cauline leaves without clasping auricles:
8a Cauline leaves pinnate, pinnatisect, trifoliolate or digitate:
9a Seeds in 2 rows, rarely irregularly in 1 row; flowers white or yellow; fruit subterete, valves with inconspicuous midrib ..... **Rorippa**
9b Seeds in 1 row; flowers white, mauve, lilac or purple:
10a Valves 1–3(–7)-nerved; leaves pinnately or sub-bipinnately partite ..... **Heliophila**
10b Valves apparently nerveless; leaves trifoliolate or pinnate with petiolulate leaflets or leaves pinnately lobed ..... **Cardamine**
8b Cauline leaves simple, toothed or lobed to pinnatifid:
11a Petals white, blue, lilac, pink, mauve or purple ..... **Heliophila**
11b Petals yellow (sometimes white):
12a Seeds in 2 rows in each locule ..... ***Diplotaxis**
12b Seeds in 1 row in each locule:
13a Valves of fruit 1-nerved:
14a Cotyledons incumbent or longitudinally folded around the incumbent radicle; style never beak-like and seed-bearing ..... **Sisymbrium**
14b Cotyledons always longitudinally folded around the incumbent radicle; style beak-like, often seed-bearing ..... **Erucastrum**

13b Valves of fruit 3- or more-nerved:
15a Fruit appressed, < 1.5 mm in diam., valves 3-nerved, the nerves obscure in ripe fruit; seeds oblong to ovoid ..... ***Hirschfeldia**
15b Fruit spreading, > 2.5 mm in diam., valves 3–5-nerved; seeds globose ..... ***Sinapis**
5b Hairs stellate, branched or a mixture of simple and branched hairs:
16a Plants glandular; petals > 10 mm long; stigma deeply 2-lobed, lobes erect, each frequently with a dorsal swelling or horn ..... ***Matthiola**
16b Plants not glandular; petals < 10 mm long:
17a Cauline leaves amplexicaul ..... ***Turritis**
17b Cauline leaves not amplexicaul ..... ***Descurainia**
4b Fruit < 3.5× as long as wide:
18a Fruit angustiseptate (septum narrow because fruit is flattened at right angles to the septum):
19a Ovules 1–4; cotyledons narrow, linear ..... **Lepidium**
19b Ovules 6–24; cotyledons broad, elliptic to circular:
20a Fruit obovate-circular, 10–15 mm long, broadly winged all around, but wings broadest apically ..... ***Thlaspi**
20b Fruit obcordate-triangular, 6–9 mm long, 4–8 mm wide, emarginate, lateral margins almost straight ..... ***Capsella**
18b Fruit latiseptate (septum broad, fruit flattened parallel to the septum):
21a Plants with stellate, branched or medifixed hairs, sometimes mixed with simple hairs:
22a Plants with branched hairs; petals obovate, finely puberulous ..... **Aplanodes**
22b Plants with medifixed hairs; petals with a circular blade, glabrous ..... ***Lobularia**
21b Plants with simple hairs or completely glabrous ..... ***Nasturtium**

APLANODES Marais

Species 2, restricted to sthn Afr., KZN, L, EC.

sisymbrioides (Schltr.) Marais

Perennial herb, 0.4–0.5 m high, branched. **Stems** finely pubescent, hairs branched. **Leaves** pinnate, 7–15-lobed, puberulous, hairs branched; lateral lobes opposite, elliptic-oblong, entire or dentate; terminal lobes of upper leaves similar to lateral lobes, terminal lobes of lower leaves broader, lobulate or dentate; uppermost leaves lanceolate, bract-like; petioles slightly widened at base. **Inflorescence** a terminal raceme. **Sepals** oblong, puberulous, margins membranous; outer 2 cucullate, inner saccate. **Petals** obovate or obovate-cuneate, emarginate. **Filaments** thickened at base. **Ovary** linear-oblong, puberulous, hairs branched; stigma capitate. Mountainous areas, under overhanging rocks; Drakensberg Grassland, Sub-Escarpment Grassland (Andriesberg near Bailey, Barkly Pass).

***BARBAREA** R.Br.

Species 12, Europe, North America and N Asia; 1 naturalised in sthn Afr., WC, EC.

verna (Mill.) Asch.

Waterkerwel (A)

Biennial herb, 0.3–0.9 m high, erect, glabrous or puberulous. **Leaves**: basal leaves rosulate, pinnate, 6–10-jugate, lateral lobes short, broad, rounded, margins entire or sinuate, terminal lobes larger, ovate to subcircular; lower cauline leaves in 5–7 pairs, oblong, upper ones sessile, few, lobes narrow. **Flowers** small. **Petals** 5–7 mm long, obovate, bright yellow. **Fruit** a linear siliqua, ascending-arcuate, on stout pedicels. **Seeds** oval. Mountainous area; Albany Thicket, Drakensberg Grassland, Indigenous Forests (Fort Beaufort District, Juanasberg).

*BRASSICA L.

Species ± 40, mainly Eurasia; 5 naturalised in sthn Afr., widespread.

1a Upper cauline leaves cordate at base

rapa L.

Turnip, rape; *beesraap* (A)

Annual or biennial herb, 0.3–1.5 m high, slender or stout, with tuberous taproots. **Leaves**: basal leaves lyrate-pinnatisect, ± 5-jugate, petiolate, hispid or setose, green margins dentate, terminal lobe broadly ovate, lobulate; upper cauline leaves simple, sessile, glabrous or nearly glabrous, obovate-oblong, margins repand-dentate to entire. **Inflorescence** a raceme, dense in flower, lax in fruit. **Flowers** yellow. **Fruit** a linear siliqua, valves bulged by seeds, 1-nerved. **Seeds** dark-coloured with a reticulate seed coat. Cultivated land; Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Middelburg S to Redhouse and Alexandria District).

1b Upper cauline leaves petiolate or cuneate
2a Upper leaves petiolate

elongata Ehrh.

Biennial herb, 0.2–1.0 m high, basally hirsute, rarely glabrous. **Stems** erect, branched basally and above. **Leaves**: lower leaves obovate to elliptical, margins dentate, repand or entire, petioles long; upper leaves petiolate or subsessile linear, lanceolate or oblong, margins dentate or entire. **Sepals** oblong, erect or ascending. **Petals** yellow, obovate. **Anthers** ovate. **Fruit** a linear siliqua, terete or slightly flattened, valves with prominent midvein. **Seeds** brown or greyish, globose. Sub-Escarpment Grassland (Fort Beaufort Pools).

juncea (L.) Czern. & Coss.

Chinese mustard

Annual herb, up to 1 m high, branches slender, ascending. **Stems** hispid near base, glabrous above. **Leaves**: lower leaves lyrate-pinnatisect, lateral lobes in 1 or 2 pairs, small, broad, terminal lobes large, ovate or obovate; upper leaves smaller, simple, shortly petiolate, glabrous, margins entire or dentate. **Inflorescence** a raceme, dense in flower, lax in fruit. **Flowers** yellow. **Petals** obovate, shortly clawed. **Fruit** a linear siliqua, tapering, valves convex, irregularly bulged by ripe seeds. **Seeds** 16–24 in one row, globose, brown, seed coat reticulately pitted. Cultivated land; Albany Thicket, Lower Karoo (Pearston District).

2b Upper leaves sessile

tournefortii Gouan

Annual herb, 0.1–0.6 m high, slender. **Stems** erect, lower part hispid or hairy, upper part subglabrous or glabrous. **Leaves**: basal leaves rosulate, petiolate, runcinate-pinnatisect, 4–12-jugate, ciliate and hispid beneath, lower lobes smallest, gradually becoming bigger upwards, oblong, margins dentate or serrate-dentate, terminal lobes ovate to subcircular, obtuse, lobulate, margins serrate-dentate; cauline leaves smaller, sessile, oblong-lanceolate to linear, margins entire or denticulate. **Inflorescence** a terminal raceme. **Flowers** pale yellow, sometimes tinged with mauve on fading. **Fruit** a linear-attenuate siliqua, valves bulged by seeds. **Seeds** globose, brown. Roadsides; Lower Karoo, Albany Thicket (Rietbron, Alexandria District).

*CAPSELLA Medik.

Species 5, eastern Mediterranean and W Asia; 1 naturalised in sthn Afr., widespread.

bursa-pastoris (L.) Medik.

Shepherd's purse

Annual herb, 0.25–0.60 m high, erect, slender, simple or branched. **Stems** and leaves covered with appressed branched and spreading simple hairs. **Leaves**: basal leaves rosulate, petiolate, oblanceolate, margins entire or lobulate, dentate or pinnatipartite, lobes broad to short; cauline leaves few, smaller, oblong-lanceolate, margins entire or distantly denticulate. **Inflorescence** a raceme, glabrous or thinly hairy. **Sepals** green. **Petals** clawed, white. **Flowering time** Aug.–Nov. **Fruit** a siliqua on nearly horizontally spreading pedicels, obcordate-triangular, emarginate, lateral margin almost straight. Roadsides, sidewalks, lawns; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Maclear District S to Graaff-Reinet, Port Elizabeth and Komga).

CARDAMINE L.

Species 130, cosmopolitan; 5 (3 introduced) in sthn Afr., widespread.

africana L.

Perennial herb, 0.15–0.30 m high, erect or decumbent, long internodes. **Stems** root at lower nodes, glabrous or hispid. **Leaves** alternate, petiolate, leaflets 3, petiolulate, membranous, crenate or crenate-dentate, each crenation with a mucronulate nerve-ending, both surfaces glabrous or strigulose or only lower surface strigulose, margins ciliolate. **Inflorescence** a raceme. **Sepals** erect, oblong, thin, green or tinged purple. **Petals** broadly obovate to oblong-obovate, clawed. **Stamens** 6. **Fruit** a linear siliqua, valves 1-nerved, smooth. **Seeds** oblong, brown. Shaded soil or sand; Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Port St Johns S to Humansdorp and Howison's Poort).

*CORONOPUS Zinn

Species 10, Mediterranean, southeast Africa and South America, but now almost cosmopolitan; 3 naturalised in sthn Afr., widespread.

All leaves pinnatipartite or pinnatifid

didymus (L.) Sm.

Bitter cress, twin cress; *peperbossie* (A)

Biennial herb, 0.1–0.3 m high, procumbent or erect. **Stems** pilose, glabrescent. **Leaves**: basal leaves pinnatipartite, segments pinnatifid, sometimes only upper margins of segments lobed; cauline leaves smaller, pinnatifid. **Inflorescence** a short, dense raceme; rachis pilose. **Sepals** greenish white. **Petals** white. **Stamens** 2, filaments swollen at base. **Flowering time** Sept.–Feb. **Fruit** a siliqua, on recurved-spreading or spreading pedicels, compressed, longer than wide, each half reniform-semicircular, rounded on the back, reticulately netted and pitted. Cultivated land, open urban spaces; Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Albany Thicket (Port St Johns S to Uitenhage, Grahamstown and East London).

All or at least the upper leaves entire

integrifolius (DC.) Spreng.

Peperbossie (A)

Perennial herb, 0.1–0.5 m high, prostrate, decumbent or erect. **Stems** and branches puberulous with hyaline or clavate hairs. **Leaves**: basal leaves in a rosette, pectinately 7–15-lobed, lobes semi-lunate, puberulous on upper surface, margins entire or shallowly toothed; cauline leaves lanceolate to oblanceolate, margins entire, with few hairs in lower half. **Inflorescence** a many-flowered raceme; rachis puberulous. **Sepals** greenish white or tinged with purple. **Petals** white. **Stamens** 2; filaments subulate. **Fruit** a siliqua, on erect pedicels, keeled, warted or pitted. Cultivated areas; Lower Karoo (Rietbron District).

*DESCURAINIA Webb & Berthel.

Species ± 55, mostly North America, some from South America, Europe and Asia; 1 naturalised in sthn Afr., in arid areas, seldom recorded in G, NC, EC.

sophia (L.) Webb ex Prantl

Flixweed, tansymustard, herb-sophia

Annual herb, 0.1–1.0 m high; erect, branched. **Stem** stellate-pubescent below, sparsely in upper part. **Leaves**: lower leaves petiolate; upper sessile**,** 2- or 3-pinnatisect, 6–9 pairs of primary pinnae; lobes narrowly oblong, stellate-pubescent. **Inflorescence** a many-flowered, terminal raceme; rachis puberulous. **Sepals** linear-oblong, puberulous. **Petals** whitish or yellowish**,** linear-spathulate. **Stamens** exserted. **Fruit** a linear siliqua, torulose, pedicellate. Riverbanks; Albany Thicket, Dry Highveld Grassland, Upper Karoo, Sub-Escarpment Grassland (Cradock District, Fish River).

*DIPLOTAXIS DC.

Species ± 27, Mediterranean and central Europe, some extending eastwards into India; 1 naturalised in sthn Afr., NW, G, FS, WC, EC.

muralis (L.) DC.

Wall rocket

Annual, occasionally perennial herb, 0.1–0.5 m high, woody at base, sparsely hispid in lower part, hairs almost retrorse. **Leaves** mostly basal, older plants laxly tufted, petiolate, lyrate-pinnatifid or dentate, glabrous or hispid on lower surface, oblanceolate or spathulate; cauline leaves few or none, subsessile. **Inflorescence** few- to many-flowered raceme. **Flowers** small, yellow, tinged with violet when fading. **Fruit** a linear siliqua, valves smooth, margins straight, bulged by seeds. **Seeds** in 2 rows, ovoid, subcompressed, smooth, brown. Industrial and urban open areas, sandy soil; Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Albany Thicket (Port Elizabeth, Grahamstown, East London).

ERUCASTRUM (DC.) C.Presl

Species ± 18, central and southern Europe, Africa, Arabian Peninsula; 3 in sthn Afr., widespread.

Siliqua emarginate at apex

strigosum (Thunb.) O.E.Schulz

Annual herb, 0.5–1.0 m high, erect. **Stems**: upper part simple or freely branched; lower part appressed-strigose with retrorse hairs. **Leaves**: basal leaves hispid, lyrate-pinnatifid,

4–6-jugate, lateral lobes small, deltoid-oblong or oblong-ovate, terminal lobes large, ovate, petioles retrorsely hispid; cauline leaves sessile, oblong-lanceolate, serrate-dentate or repand dentate-lobate, thinly hispid or subglabrous. **Inflorescence** a terminal raceme. **Sepals** oblong, hairy or glabrous. **Petals** oblanceolate to obovate, clawed. **Fruit** a linear siliqua, erect or ascending, midrib conspicuous. **Seeds** oblong-orbicular, red-brown, seed coat reticulate. Valleys, sandy places,, calcrete; Upper Karoo, Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Middelburg and Graaff-Reinet Districts SE to Port Elizabeth, Uitenhage and East London).

Siliqua clavate at apex

austroafricanum Al-Shehbaz & Warwick
(= *Sisymbrium thellungii* O.E.Schultz)

Annual herb, 0.25–0.60 m high, small or simple or robust and much branched. **Stems** and branches retrorsely scabro-hispid. **Leaves**: basal leaves petiolate, lyrate-pinnatifid, 3–7-jugate, terminal lobe large, ovate, oblong or obovate, obtusely denticulate, lateral lobes short and broad, obtuse, sometimes pointing backwards; cauline leaves similar but petioles gradually reduced to sessile in uppermost leaves, oblong to broadly lanceolate, margins dentate or serrate-denticulate, scabro-hispid, somewhat glabrescent. **Inflorescence** a bracteate raceme. **Sepals** linear-oblong, puberulous or sparsely hispid. **Petals** oblanceolate. **Flowering time** Aug.–Dec. **Fruit** a linear siliqua, puberulous. **Seeds** ovoid-oblong, reticulate, emarginate, light brown. Low hills, railway side, garden, stony or rocky soil; Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Queenstown E to Butterworth District S, to Uitenhage and Grahamstown).

HELIOPHILA L.

Species 75, endemic to sthn Afr., mostly from winter rainfall areas of NC, WC, EC, but a few widespread.

1a Perennials and shrublets
2a Petals clawed
3a Plants glabrous or papillate

[E?]brachycarpa Meisn.

Perennial shrub or dwarf shrub, up to 2 m high, wood brittle. **Stems** striate, ridges sometimes of fine, contiguous, cuticular papillae. **Leaves** subtended by minute subulate stipules; glabrous, glaucous, linear-subspathulate to oblanceolate. **Inflorescence** a short raceme, terminal on side branches. **Flowers** white or cream-coloured tinged mauve. **Sepals** oblong or obovate-oblong, margins broad, membranous, outer 2 slightly saccate, inner 2 strongly saccate. **Petals** spathulate, obtuse with a long papillate claw. **Flowering time** Mar.–Oct. **Fruit** lanceolate to elliptic-lanceolate, narrow at both ends, shortly stipitate. **Seeds** subcircular. Mountain slopes, riverbanks, roadsides; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Albany Thicket, Lower Karoo, Sub-Escarpment Savanna (Witpoortberg and Willowmore Districts E to Grahamstown).

[E]brassicifolia Eckl. & Zeyh.

Perennial herb, 0.2–0.6 m high, glabrous, annual stems from perennial crown. **Leaves** sessile, oblanceolate-oblong, acute. **Inflorescence** a terminal, many-flowered raceme. **Flowers** rose-pink. **Sepals** oblong, outer 2 cucullate, shortly horn-tipped; inner 2 saccate. **Petals** broadly obovate, clawed, each with a large papillate appendage. Mountainous areas and summits; Sub-Escarpment Grassland, Drakensberg Grassland (Queenstown, Winterberg Range).

carnosa (Thunb.) Steud.

Perennial dwarf shrub, up to 0.6 m high, erect, glabrous, tussock forming, leaves in a dense rosette. **Stems**: lower part reddish or purplish. **Leaves** stipulate, filiform to strap-shaped or lobed in upper half; lobes short, long or pinnately lobed, entire. **Flowers** white, pink to violet. **Sepals** oblong, outer 2 cucullate, horn-tipped; inner 2 saccate, margins broad, membranous. **Petals** narrowly obovate to obovate-circular, rounded, claw thick, minutely papillate. **Flowering time** Sept.–Mar. **Fruit** broadly linear, margins straight, faintly reticulate, flat. **Seeds** subcircular or broadly oblong, winged. Stony or rocky soil; Drakensberg Grassland, Mesic Highveld Grassland, Upper Karoo, Albany Thicket (Barkly East District S to Middelburg, Graaff-Reinet and Baviaanskloof Mts).

elongata (Thunb.) DC.

Perennial dwarf shrub, up to 0.6 m high, erect or virgate, or annual stems from woody crown, branches grooved, glabrous. **Leaves** subtended by 2 stipules; leathery or fleshy, obovate-elliptic to oblanceolate or elliptic to lanceolate to linear, toothed or lobed, entire; some lower leaves with paired glands in axils. **Inflorescence** a terminal raceme. **Flowers** white, yellowish or tinged mauve. **Sepals** outer 2 oblong to elliptic, cucullate; inner 2 oblong, saccate, margins membranous. **Petals** oblong-spathulate to elongate-cuneate, broadly clawed. **Flowering time** Sept.–May. **Fruit** linear, margins straight. **Seeds** subcircular to oblong-rectangular, brown, margined. Stony or rocky soil, bare rock, sand, loam, quartzite, well drained; Indian Ocean Coastal Belt, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Mkambati Nature Reserve S to Hogsback and Kei River Mouth, SW to Humansdorp District, Uitenhage, Port Elizabeth and Grahamstown).

glauca Burch. ex DC.

Perennial shrub, up to 2 m high, virgate, sometimes annual branches from a short woody crown, glabrous. **Leaves** mucronate, fleshy, glaucous, oblanceolate, oblong or oblong-lanceolate. **Inflorescence** a terminal, many-flowered raceme. **Flowers** white or mauve. **Sepals** oblong, margins membranous, broad; outer 2 cucullate, thickened at apex; inner 2 saccate. **Petals** obovate, claw narrow. **Fruit** linear-oblong or shorter ones elliptic, margins straight. **Seeds** subcircular, margins narrow, seed coat of large cells. Stony or rocky soil, loam; Eastern Fynbos-Renosterveld (Joubertina, Steytlerville, Humansdorp).

rigidiuscula Sond.

Grassland heliophila; *bloubekkie* (A); *'musa-pelo-oa-mangope*, *semameloana* (SS); *uvemvane oluncane* (Z)

Perennial herb, 0.25–0.90 m high, erect, crown woody, tussock-forming or basal stem branched. **Stems** glabrous, striate, slender or robust. **Leaves** stipulate, thin or fleshy, linear to narrowly lanceolate or oblanceolate-subulate. **Inflorescence** a terminal raceme; peduncle ± leafless. **Flowers** shades of pink, mauve, lilac, blue or purple. **Sepals** oblong, caducous; outer 2 cucullate; inner 2 saccate. **Petals** circular-obovate; claw with papillate appendage on one side or hollow; cup-like gland on inside. **Flowering time** Nov.–Feb. **Fruit** linear-oblong or lanceolate, margins straight, stipitate. **Seeds** subcircular to oblong, broadly winged. Stony, rocky or sandy soil, well drained; Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Drakensberg Grassland (Kokstad and Queenstown Districts E to Mkambati Nature Reserve, S to Hogsback and Komga).

BRASSICACEAE

scandens Harv.

Bridal wreath; *bruidskransie* (A)

Perennial climber, up to 3 m high, straggling, glabrous. **Leaves** minutely stipulate; glabrous, fleshy, lanceolate to broadly elliptic above narrow petioles, mucronulate, margins often revolute in dried specimens. **Inflorescence** a terminal raceme, leafless. **Flowers** scented, white. **Sepals** outer 2 narrowly oblong, cucullate; inner 2 ovate with broad membranous margins. **Petals** obovate-oblong to circular-obovate, clawed. **Fruit** elliptic-lanceolate to elliptic, shortly stipitate. **Seeds** subcircular, narrowly margined. Forest, closed woodland, near beach; Indigenous Forests, Indian Ocean Coastal Belt (Mthatha District E to Port St Johns).

3b Plants pubescent, puberulous or glandular-puberulous

suavissima Burch. ex DC.

Bloubekkie, *ruikpeperbossie* (A)

Perennial dwarf shrub, up to 0.6 m high, woody, lax or straggly, young branches densely (older ones less) glandular-puberulous or finely papillate-glandular. **Leaves** often fascicled on old branches, 2 subulate stipules; young leaves thinly glandular-puberulous, fleshy, linear. **Inflorescence** a terminal raceme. **Flowers** scented, blue or purple. **Sepals** narrowly oblong; outer 2 cucullate, shortly horn-tipped; inner 2 saccate. **Petals** obovate-circular, clawed. **Flowering time** Jan.–Oct. **Fruit** submoniliform. **Seeds** oblong-circular, sometimes oblique, narrowly winged. Mountain slopes, sandstone, stony, rocky or sandy soil; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Burgersdorp District S to Kouga Mts and E to Grahamstown).

subulata Burch. ex DC.

Perennial, occasionally annual shrublet or herb, 0.1–0.5 m high. **Stems** erect or procumbent, puberulous or scabro-puberulous. **Leaves** minutely stipulate; fleshy, glabrous or only lower surface puberulous, filiform to lanceolate, entire. **Inflorescence** a terminal raceme; rachis glabrous or puberulous in lower part. **Flowers** mauve, violet or purple. **Sepals** narrowly oblong; outer 2 shortly horn-tipped; inner 2 cucullate, thickened at apex. **Petals** elliptic or obovate, clawed, rounded or subacute. **Flowering time** Aug.–Dec. **Fruit** linear, margins straight. **Seeds** oblong-circular, flat, narrowly winged. Coastal grassland, moist slopes, forest, urban spaces; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Matatiele District, Port Edward, Kei River Mouth SW to Humansdorp and East London).

2b Petals not clawed
4a Fruits moniliform

cornuta Sond.

Perennial dwarf shrub, up to 1.5 m high, erect, virgate or straggling. **Stems** glabrous, lower young branches puberulous, glaucous. **Leaves** terete, glaucous, glabrous or lower leaves puberulous, filiform to linear-oblanceolate. **Inflorescence** a raceme. **Flowers** white, mauve or blue. **Sepals** narrowly oblong, glabrous or puberulous; outer 2 cucullate, tip thickened or with a hollow horn; inner 2 saccate, occasionally with a short horn. **Petals** elliptic-lanceolate to broadly elliptic, subacute or rounded, each with a large appendage. **Fruit** linear. **Seeds** narrowly winged. Loamy soil, well drained, full sun. Eastern Fynbos-Renosterveld (Humansdorp District).

4b Fruits bulged by seeds but not moniliform, margins straight

alpina Marais

Perennial herb, 0.10–0.15 m high, procumbent. **Stems** several, young parts puberulous, glabrescent. **Leaves** minutely stipulate, puberulous, glabrescent, pinnately 5–7-lobed; lobes linear, entire. **Inflorescence** pseudo-terminal, few-flowered, subtended by 2 minute bracts. **Sepals** ovate-oblong to oblong-elliptic, puberulous, outer 2 cucullate, shortly horn-tipped; inner 2 saccate and with broad membranous margins. **Petals** narrowly obovate, cuneate, very minutely puberulous at base outside. **Fruit** shortly stipitate, oblong or linear-oblong, bulged by seeds. **Seeds** oblong-oval, subcompressed, seed coat minutely papillose. Montane grassland at high altitudes; Drakensberg Grassland (Maclear District).

formosa Hilliard & B.L.Burtt

Perennial herb, 0.3–0.6 m high, forming large leafy clumps, stems procumbent. **Leaves** rosulate, simple, glabrous, oblanceolate, apex acute. **Flowering stems** drooping downwards; flower apex turning upward; stipules minute. **Flowers** violet, sweet smell similar to that of *Nerium oleander*. **Sepals** outer cucullate; inner saccate. **Petals** obovate. **Fruit** with margins ± sinuate, styles persistent. Partially shaded, low damp cliffs, overhanging stream gullies; Drakensberg Grassland (Barkly East District).

[E]katbergensis Marais

Perennial herb, up to 0.2 m high, procumbent. **Stems** many, glabrous, with minute cuticular ridges. **Leaves** subtended by 2 stipules; oblanceolate or oblanceolate-elliptic, margins entire. **Inflorescence** a terminal, many-flowered raceme. **Flowers** deep mauve. **Sepals** oblong, margins membranous; outer 2 thickened at apex; inner 2 saccate. **Petals** obovate. **Fruit** oblong. Stony or rocky soil; Drakensberg Grassland (on top of Katberg Mtn).

linearis (Thunb.) DC.

Perennial herb, 0.2–0.9 m high, woody near base, stout, erect, straggly or decumbent, glabrous or pilose, glaucous. **Leaves** sessile, glabrous or hairy, ciliate, mucronate, filiform to elliptic-oblong or obovate, entire or with small lobes. **Flowers** white, purple or mauve. **Inflorescence** a raceme. **Sepals** oblong to oblong-ovate, glabrous to hairy; outer 2 cucullate, horn-tipped or thickened at apex; inner 2 saccate or all 4 with horn-like or callose tip. **Petals** obovate-oblong or obovate-circular, each with large papillate appendage. **Fruit** linear, margins straight or irregularly wavy. **Seeds** flat, winged. Mainly coastal, river mouths and -banks, limestone cliffs, disturbed land; Eastern Fynbos-Renosterveld, Albany Thicket (Tsitsikamma E to Port Elizabeth and Grahamstown).

[E]macrosperma Burch. ex DC.

Perennial shrub, up to 0.6 m high, branches virgate, glabrous, striate. **Leaves** often fascicled, thick and wrinkled when dry, folded, flat, mucronulate; 2 minute subulate stipules; linear or linear-oblanceolate. **Flowers** fragrant, pale pink to mauve. **Inflorescence** a terminal, many-flowered raceme. **Sepals** oblong with membranous margins; outer 2 cucullate and shortly horn-tipped; inner 2 saccate. **Petals** oblong-oblanceolate, rounded. **Fruit** lanceolate or narrowly elliptic-lanceolate, shortly stipitate. **Seeds** subcircular, rough but not papillate. Shale, full sun; Albany Thicket (Uitenhage to East London).

1b Annuals
5a Fruits moniliform

adpressa O.E.Schulz

Annual herb, 0.15–0.50 m high, slender or stout, erect, simple or branched, mostly glabrous, puberulous for the first few nodes, axils of lower branches, upper surface of leaves and lower part of pedicels. **Leaves** mostly in lower half of stem, simple or 3-lobed

near the tip, filiform or linear; upper leaves few, smaller, simple. **Inflorescence** a raceme. **Flowers** blue, deep blue, pale pink. **Sepals** linear-oblong; outer 2 cucullate, apex thickened or horn-tipped; inner 2 saccate. **Petals** oblong-obovate or elliptic-obovate, rounded, each with a small appendage. **Fruit** linear, shallowly moniliform. Gravel, sandstone, well drained, full sun; Drakensberg Grassland (Rhodes District).

*coronopifolia L.

Annual herb, 0.1–0.6 m high, single stem or branching above, lower parts or basal nodes puberulous or scabro-puberulous. **Leaves** puberulous, exstipulate or subtended by 2 filiform stipules; simple or pinnately 3–13-lobed; lobes filiform, linear or flat; upper leaves smaller, lobes fewer. **Flowers** blue with white or greenish centre. **Sepals** glabrous; outer 2 narrowly oblong, cucullate, horn-tipped; inner 2 oblong, saccate at base, margins membranous. **Petals** narrowly obovate to obovate-circular, rounded, clawed, each with an appendage. **Fruit** linear, moniliform. **Seeds** oblong, flattened, margins narrow. Stony or rocky soil; Sub-Escarpment Savanna (Grahamstown).

5b Fruits bulged by seeds but not moniliform, margins straight

pendula Willd.

Annual herb, 0.08–0.50 m high, glabrous, erect, decumbent or diffuse. **Leaves** pinnate, subtended by 2 stipules; lower leaves 7–13-lobed; upper leaves smaller, with fewer lobes; lobes linear or filiform. **Inflorescence** a few- to many-flowered raceme. **Flowers** white, tinged with mauve or purple. **Sepals** narrowly ovate-oblong; outer 2 cucullate; inner 2 saccate, margins membranous. **Petals** obovate, papillate across the claw. **Fruit** moniliform. **Seeds** subcircular, narrowly winged. Coastal parts, sandy soil; Albany Thicket, Eastern Fynbos-Renosterveld (Uitenhage E to Humansdorp, Port Elizabeth and Grahamstown).

*HIRSCHFELDIA Moench

Species 2, Mediterranean and Socotra; 1 introduced in sthn Afr., recorded as a rare escape in WC, EC.

incana (L.) Lagr.-Foss.

Greek mustard, shortpod mustard

Annual herb, 0.5–1.0 m high, branches ascending. **Stem**: lower part retrorsely hairy. **Leaves**: basal leaves rosulate, lyrate-pinnatifid, somewhat runcinate, margins dentate, densely white-hairy, lateral lobes 5 or 6 pairs, short and broad, terminal lobes large, oblong-ovate, obtuse; lower cauline leaves similar but smaller, upper ones sessile, simple, small, oblong to lanceolate. **Inflorescences** a raceme. **Sepals** narrow. **Petals** spathulate, rounded, pale yellow. **Fruit** an appressed-erect siliqua, pedicellate, narrowly cylindrical. **Seeds** reddish brown. Loamy soil, well drained, full sun; Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests, Sub-Escarpment Savanna (Dordrecht District S to Grahamstown District).

LEPIDIUM L.

Species ± 150, cosmopolitan in temperate and subtropical regions of the world; 17 (2 introduced) in sthn Afr., widespread.

1a Siliculae not or very slightly emarginate
2a Nectaries filiform
3a Fruiting pedicels wide-spreading, arcuate

desertorum Eckl. & Zeyh.

Peperbossie (A)

Annual herb, 0.20–0.25 m high, low-growing. **Stems** decumbent or ascending, puberulous. **Leaves**: basal leaves rosulate, pinnately lobed, lobes lobulate or dentate, smaller leaf blades obovate or ovate-lanceolate, laciniate-serrate, glabrous, petioles puberulous; upper cauline leaves pinnately lobed, narrowly obovate or oblanceolate, serrate to entire, petiolate. **Inflorescence** a terminal raceme; rachis puberulous. **Sepals** broadly ovate, green with a broad membranous margins, sometimes tinged purple. **Petals** absent or rarely present. **Nectaries** filiform. **Fruit** a silicula, obcordate or obcordate-ovate. Roadsides, disturbed areas, stony or rocky soil; Upper Karoo, Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Middelburg S to Willowmore and E to Grahamstown).

3b Fruiting pedicels appressed-erect, straight

schinzii Thell.

Perennial herb, 0.1–0.5 m high, branches ascending, stem and branches retrorse-puberulous, papillae subclavate, glabrescent. **Leaves**: basal leaves rosulate, petiolate, pinnatipartite, 6–11-lobed, each lobe variously lobed, becoming smaller in size and less intricately lobed; lower cauline leaves sessile, pinnately lobed with short, blunt lobes, upper ones cuneate, bluntly toothed or entire, puberulous. **Inflorescence** a terminal raceme; rachis retrorsely papillose, glabrescent. **Sepals** oblong, green or tinged purple, margins membranous. **Petals** absent or present. **Nectaries** filiform. **Fruit** a silicula, elliptic to ovate-oblong or broadly ovate, shallowly emarginate. **Seeds** light brown. Mountain slope, flat bed rock, stony or rocky soil, loam, moist or damp, full sun; Drakensberg Grassland, Dry Highveld Grassland, Upper Karoo (Rhodes District SW to Stormberg Mts and Middelburg District).

2b Nectaries triangular, elongate-triangular or rounded

capense Thunb.

Perennial herb, 0.15–0.60 m high, woody at base. **Stems** erect or procumbent, pubescent. **Leaves**: basal leaves rosulate, lyrate-pinnatisect, lobes short, rounded, incised, toothed or entire, terminal lobe ovate, obovate or oblong, incised or serrate; lower cauline leaves pinnatisect, lanceolate, entire or toothed or oblanceolate, incised-serrate, upper ones oblanceolate, few-toothed near apex; all leaves pubescent. **Inflorescence** a raceme; rachis pubescent. **Sepals** ovate-oblong, green or tinged purple. **Petals** white. **Nectaries** triangular-elongate. **Fruit** a silicula, elliptic or obovate-elliptical. **Seeds** ellipsoid, dark brown. Cultivated land; Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Middelburg and Uitenhage Districts).

***draba** (L.) Desv.
[= *Cardaria draba* (L.) Desv.**]**

Hoary cardaria, pepper cress; *peperbos* (A)

Perennial herb, 0.15–0.90 m high, erect, finely retrorsely puberulous in lower half, glabrous in upper half. **Leaves**: basal leaves petiolate, sublyrate or sinuately lobed, sometimes canescent, obovate; cauline leaves sessile, sagittate, lower ones puberulous in low-

er surface, upper ones glabrous, ovate-oblong, sinuate-dentate. **Inflorescence** a dense panicle. **Flowers** white, sweetly scented. **Petals** obovate, clawed, white. **Fruit** a siliqua, inflated, obcordate, indehiscent, valves faintly reticulate. **Seeds** almost smooth, subcompressed, emarginate. Old lands; origin Mediterranean and Eurasia, ruderal and agrestal weed, declared weed (category 1); suspected for livestock poisoning; Upper Karoo, Albany Thicket (Cradock District).

myriocarpum Sond.

Peperbossie (A)

Perennial herb, 0.3–0.7 m high, erect, much branched, leafy, glabrous except leaf margins and sometimes upper surface of midrib minutely puberulous. **Leaves**: upper leaves linear-oblanceolate, acuminate, margins entire. **Inflorescence** a terminal raceme; pedicels slender, erect, slightly arcuate. **Sepals** narrowly oblong, green tinged with mauve, margins membranous. **Petals** linear-oblong, white. **Nectaries** elongate-triangular. **Fruit** a silicula, ovate or ovate-elliptic, not emarginate; style short, projecting. In valleys; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Grahamstown District).

1b Siliculae emarginate
4a Siliculae broadly obovate or subcircular, > 2.5 mm *wide*

***bonariense** L.

Pepper cress, pepper weed; *peperbossie* (A)

Annual herb, 0.15–0.60 m high, erect, not branching from base. **Stems** puberulous, leafy. **Leaves**: basal leaves rosulate, petiolate, bipinnatipartite, densely hairy; upper leaves pinnatifid, puberulous, glabrescent. **Inflorescence** a terminal raceme; rachis hairy or puberulous. **Sepals** oblong, green, often tinged with purple, margins membranous, puberulous when young. **Petals** linear or subulate-lanceolate, white. **Nectaries** triangular-rounded. **Fruit** a silicula, obovate or subcircular, emarginate with small, apical wings. **Seeds** semi-ovoid, margins narrowly winged, rounded, minutely papillose. Cultivated land; Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Grahamstown District).

4b Siliculae ovate, oblong-ovate, oblong-obovate or elliptic, < 2.5 mm *wide*
5a Nectaries filiform

basuticum Marais

Perennial herb, 0.1–0.3 m high, taproot long. **Stems** prostrate or erect, with sickle-shaped hairs. **Leaves**: basal leaves rosulate, petiolate, pinnate, 8–10-jugate, covered with short, flattened hairs; cauline leaves pinnately lobed with fewer, narrower, less lobulate lobes, upwards becoming smaller; uppermost oblanceolate, 3-fid or entire. **Inflorescence** a terminal raceme; rachis puberulous. **Sepals** oblong, margins membranous. **Petals** absent. **Nectaries** filiform. **Fruit** a silicula, elliptical, shallowly emarginate. **Seeds** brown. Mountain peak, alt. ± 3 000 m; Drakensberg Grassland (Barkly East District, Ben McDhui).

5b Nectaries triangular, elongate-triangular or rounded

africanum (Burm.f.) DC.

Pepper cress, bird weed; *peperbossie*, *kanariesaadgras* (A)

Biennial herb, 0.2–1.0 m high, 1- or several-stemmed, much branched in upper flowering part, pale or yellowish green, glabrous to papillose-puberulous. **Leaves**: basal leaves

rosulate, oblanceolate, serrate-dentate, bigger teeth near apex, glabrous or puberulous, petioles ciliate; cauline leaves similar but smaller, upper ones less serrate, few teeth near apex or entire. **Inflorescence** a terminal raceme; rachis glabrous or puberulous. **Sepals** oblong, green or tinged purple, margins membranous. **Petals** linear-oblong, white. **Nectaries** triangular or elongate-triangular. **Flowering time** Oct.–Jan. **Fruit** a silicula, ovate to ovate-oblong. **Seeds** yellow-brown or red-brown. Mountain slopes, riverbanks, disturbed areas, stony or rocky soil, gravel; Drakensberg Grassland, Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Oviston E to Rhodes District, southwards from Middelburg to Komga, and from Grahamstown to Alexandria District).

ecklonii Schrad.

Perennial herb, 0.05–0.60 m high. **Stems** erect or spreading, puberulous. **Leaves**: basal leaves pinnately 9–11-lobed, lobes short, oblanceolate to narrowly obovate, terminal lobe large, serrate or dentate, 2 or 3 pairs of small lateral lobes, blades and lobes ciliolate and puberulous, petioles ciliate; lower cauline leaves similar, upper ones oblanceolate or narrowly obovate, serrate or dentate, ciliolate and puberulous or subglabrous. **Inflorescence** a terminal raceme; rachis puberulous, glabrescent. **Sepals** oblong, green or tinged purple, margins membranous. **Petals** linear-oblong. **Nectaries** triangular or elongate-triangular. **Fruit** a silicula, emarginate, marginal wings in upper part. **Seeds** red-brown. Cultivated land, disturbed areas, sandy soil; Drakensberg Grassland, Albany Thicket, Sub-Escarpment Savanna (Stutterheim E to Komga, from Port Elizabeth E to Grahamstown and East London).

trifurcum Sond.

Perennial herb, 0.3–0.6 m high, woody at base, much branched, branches spreading, completely glabrous. **Leaves** petiolate, pinnately 3–11-lobed, margins revolute, leaves and their lobes appear linear-filiform, glabrous. **Inflorescence** an elongated raceme; rachis glabrous. **Sepals** oblong, green or tinged with purple, margins membranous. **Petals** narrowly oblong, white. **Nectaries** triangular. **Fruit** a silicula, oblong-obovate, elliptic to ovate-elliptic, emarginate. **Seeds** light brown. Upper Karoo, Dry Highveld Grassland (Burgersdorp District).

*LOBULARIA Desv.

Species 5, Cape Verde, Canary Islands and Mediterranean region; 1 naturalised in sthn Afr., G, WC, EC.

maritima (L.) Desv.

Sweet alyssum, seaside lobularia

Annual, occasionally perennial herb, 0.1–0.3 m high, erect or procumbent, branching from base; stems, leaves, pedicels, sepals and ovaries strigose with appressed medifixed hairs, glabrescent, siliqua eventually glabrous. **Leaves** linear-lanceolate, acute, margins entire. **Inflorescence** a many-flowered raceme, lax in fruit. **Pedicels** spreading horizontally with the fruits erect. **Petals** clawed, circular. **Fruit** a siliqua, broadly elliptic to obovate. **Seeds** solitary in each cell. Dune shrub forest; Eastern Fynbos-Renosterveld, Albany Thicket (Port Elizabeth E along coastline to Port Alfred).

*MATTHIOLA R.Br.

Species 55, Macronesia, western Europe, Mediterranean; 3 introduced in sthn Afr., recorded in drier parts as garden escapes, N, NW, FS, L, NC, WC, EC.

torulosa (Thunb.) DC.

Perennial shrublet, 0.20–0.45 m high, stunted, almost cushion-like or spreading-erect, branched, lower dead leaves persistent; all vegetative parts, as well as sepals, ovary and fruit covered with hairs and with scattered stalked glands. **Leaves** linear-oblanceolate, margins entire, subentire, repand-dentate or shallowly sinuately few-lobed. **Inflorescence** a raceme. **Sepals** linear to linear-oblong, margins membranous, subpersistent. **Petals** spathulate, claw membranous, blade bent outwards, margins wavy. **Fruit** a siliqua, linear, terete, submoniliform, erect-spreading, subsessile. **Seeds** broadly oblong, subcompressed. Cultivated land, grazed grassland, weedy roadsides; Upper Karoo, Drakensberg Grassland (Middelburg, Burgersdorp, Barkly East).

*NASTURTIUM R.Br.

Species 80, 25 in Eurasia, 1 naturalised in sthn Afr., in water or in wet places, cultivated as a salad crop, LIM, NW, G, M, FS, KZN, L, WC, EC.

officinale R.Br.

Watercress; *bronkhorstslaai* (A)

Perennial, aquatic herb, 0.15–0.60 m high, creeping or floating, rooting at nodes, without taproot. **Stems** hollow, glabrous or puberulous in axils of branches. **Leaves** pinnate, 3–9 leaflets; lateral leaflets dark green, elliptical, margins entire or repand; terminal leaflet elliptical to broadly ovate-circular; petioles glabrous or puberulous, auriculate. **Inflorescence** a terminal raceme. **Flowers** white. **Petals** spathulate. **Fruit** a siliqua, often curved-ascending, bulged by seeds, brown. **Seeds** with coat minutely reticulate. Rivers, riverbanks, wetlands; origin Europe, special effect weed (competitive); Upper Karoo, Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket (Middelburg, Cradock, Alice, Bedford, Grahamstown).

*RAPHANUS L.

Species ± 8, western and central Europe; 2 naturalised in sthn Afr., widespread.

raphanistrum L.

Jointed charlock, wild radish, ramenas; *wildemostert* (A)

Annual or biennial herb, 0.25–1.00 m high. **Stems** erect, branched, lower part hispid, less hairy above. **Leaves**: basal leaves petiolate, lyrate-pinnatipartite, 2–5-jugate, lobes ovate, dentate, terminal lobes large, lobulate; lower cauline leaves similar, upper ones petiolate, subglabrous, oblong to lanceolate, cuneate, sharply dentate, incised at base. **Inflorescence** a terminal raceme. **Flowers** white, yellow, violet, lilac or purple. **Sepals** elliptic-lanceolate, glabrous or with a few hairs at apex. **Petals** obovate, rounded or emarginate, clawed. **Flowering time** all year. **Fruit** a siliqua, on ascending pedicels. **Seeds** subglobose, reticulate. Ploughed land, floodplain, gardens, gravel, quartzite; Sub-Escarpment Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Queenstown E to Amabele, from Willowmore District E to Port Elizabeth, Grahamstown and Alexandria).

*RAPISTRUM Crantz

Species 3, central Europe, Mediterranean region and W Asia; 1 naturalised in sthn Afr., N, NW, KZN, NC, WC, EC.

rugosum (L.) All.

Annual herb, 0.35–1.00 m high, branched from base. **Stems** retrorsely hispid near base, glabrescent above. **Leaves**: basal leaves petiolate, lyrate-pinnatipartite, 2- or 3-jugate, lateral lobes ovate-triangular, obtuse, incise-dentate, terminal lobes ovate, coarsely dentate, hispid; upper leaves petiolate, lanceolate, cuneate, margins dentate or subentire; all leaves sparsely puberulous or upper surface glabrous. **Inflorescence** a raceme. **Petals** clawed, pale yellow. **Fruit** a siliqua, pedicellate, smooth or ribbed, glabrous or hairy, 1-seeded. Cultivated land, roadsides; Upper Karoo, Lower Karoo, Albany Thicket, Drakensberg Grassland (Middelburg S to Beaufort West District and Hogsback, from Port Elizabeth E to Riebeek East).

RORIPPA Scop.

Species ± 80; fairly cosmopolitan, chiefly in temperate regions; 5 in sthn Afr., widespread.

Semi-aquatic herb

fluviatilis (E.Mey. ex Sond.) Thell.

Perennial herb, 0.10–0.75 m high. **Stems** stout, sometimes branched in lower parts. **Leaves**: basal leaves rosulate, not present at flowering time, petiolate, lyrate-pinnatifid, 4–7(–9)-jugate; lower cauline leaves shortly petiolate, oblanceolate or lanceolate, pinnatifid with lobes reduced to teeth, upper ones sessile, lanceolate or linear-lanceolate, margins dentate or entire. **Inflorescence** a terminal raceme. **Petals** obovate, cuneate or clawed, bright yellow. **Fruit** a siliqua, linear-oblong, valves reticulately veined. Sandy soil, water or moist places, weed in irrigated lands; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Alice District E to Komga and S to Grahamstown District).

Perennial herb, often in moist places but not generally aquatic

nudiuscula Thell.

Perennial herb, 0.3–0.6 m high. **Stems** minutely and sparsely tuberculate in lower half or smooth. **Leaves**: basal leaves rosulate, petiolate, lyrate-pinnatifid, 2–9-jugate, lateral lobes short, rounded or lobulate, terminal lobe ovate or oblong-ovate, dentate to lobulate; or leaves oblanceolate to obovate, serrate or dentate, not lobed; cauline leaves small, broadly petiolate or sessile, lanceolate or oblanceolate, incised-lobate, 2- or 3-jugate, dentate or subentire. **Inflorescence** a raceme. **Petals** narrowly obovate, cuneate. **Fruit** a siliqua, linear-oblong, erect or ascending. **Seeds** oval, compressed, with coat minutely papillate. Clay soil, well drained; Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket, Sub-Escarpment Savanna (Queenstown S to Komga).

*SINAPIS L.

Species ± 10, Mediterranean region but some now widespread in other parts of Europe; 2 naturalised in sthn Afr., as weeds of cultivation, G, M, FS, KZN, EC.

All leaves pinnately lobed, beak flattened

alba L.

White mustard

Annual herb, 0.3–0.6 m high, erect, branched. **Stems** densely retrorsely hairy below, sparsely above, rarely glabrous. **Leaves** petiolate, lyrate-pinnatisect or pinnatifid, 2- or 3-jugate; lateral lobes oblong to lanceolate, margins serrate-dentate or repand; terminal

lobe similar, larger, hispid. **Inflorescence** an ebracteate raceme. **Flowers** yellow. **Fruit** a siliqua, hispid, valves 3–5-nerved, bulged by seeds, beak flattened, ensiform, ribbed. **Seeds** globose, yellow to pale brown, with coat minutely punctate. Weed of arable land; Albany Thicket (East London District).

Upper leaves not lobed, beak conical-subulate

arvensis L.

Charlock, wild mustard

Annual herb, 0.5–1.0 m high, erect, branched. **Stems** hispid in lower part, sparsely hispid to subglabrous in upper part. **Leaves** hispid on lower surface of nerves; lower leaves petiolate, lyrate-pinnatifid, 4–6-jugate, lateral lobes oblong, dentate, terminal lobes obovate, obtuse, coarsely dentate; upper leaves sessile or shortly petiolate, ovate-oblong to lanceolate, serrate-dentate. **Inflorescence** a raceme. **Flowers** yellow. **Fruit** a siliqua, terete, valves 3–5-nerved, glabrous or hispid, beak conical-subulate. **Seeds** globose, reddish brown to brown-black. Usually a weed of arable land; origin probably Mediterranean region; Eastern Fynbos-Renosterveld (Port Elizabeth).

SISYMBRIUM L.

Species 80, Eurasia, Mediterranean, Africa, South America; 8 (2 naturalised) in sthn Afr., widespread.

1a Hairs branched, or a mixture of simple and branched hairs on the same plant

burchellii DC.

Wildemostert (A)

Perennial herb, 0.1–0.3 m high. **Stems** with a mixture of simple and branched hairs, lower parts mostly simple hairs, upper parts mostly branched hairs. **Leaves**: basal leaves rosulate, petiolate, pinnately angular-dentate or pinnatisect, 4–11-jugate, lobes oblong or obovate, angular-dentate or crispate; cauline leaves similar, gradually smaller, petioles shorter, upper ones sessile or subsessile, fewer and narrower lobes; all leaves hairy. **Inflorescence** a terminal raceme; rachis hairy. **Sepals** outer cucullate, hairy or glabrous. **Petals** linear-oblong or oblong, claw membranous. **Fruit** a linear siliqua, terete, glabrous or scabrid. **Seeds** oblong, brown. Stony, rocky or sandy soil; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Middelburg and Rietbron Districts SE to Uitenhage).

1b Hairs always simple
2a Siliquae stoutly subulate, tapering, puberulous

***officinale** (L.) Scop.

Hedge mustard

Annual or biennial herb, 0.5–0.9 m high, erect. **Stems** and branches scabro-puberulous. **Leaves**: basal leaves rosulate, petiolate, runcinate-pinnatisect, 3–7-jugate, lobes opposite or alternate, lower lobes narrow, subentire, upper lobes broadest, dentate, terminal lobe biggest, 3-lobed, dentate; uppermost cauline leaves petiolate, hastate, oblong-elliptic, irregularly dentate-lobate to entire, terminal lobe and 2 lateral lobes oblong or linear-oblong, strigose on both surfaces. **Inflorescence** a terminal raceme. **Sepals** hairy. **Petals** narrowly obovate, cuneate, yellow. **Fruit** a siliqua, subterete, erect on stout pedicels. **Seeds** oblong, brown. Rocky outcrops, disturbed land, stony or rocky soil; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Lower Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Burgersdorp S to Queenstown southwards, from Rietbron District to Uitenhage).

2b Siliquae terete, linear, not tapering, glabrous, puberulous or scabrid
3a Siliquae glabrous

capense Thunb.

Cape wild mustard; *strandmostert*, *bergmostert* (A)

Annual herb, 0.3–1.0 m high, erect. **Stems** grey-hairy in lower part, less dense higher up. **Leaves**: lower leaves subrosulate, petiolate, pinnately lobed, lobes opposite or alternate, hairy on both or only lower surface, glabrescent, lanceolate, dentate; cauline leaves petiolate, lobes smaller, fewer, narrower, less hairy, uppermost ones glabrous, sessile, lanceolate or linear-lanceolate, lobed or dentate to subentire. **Inflorescence** a raceme. **Sepals** linear-oblong, glabrous or sparsely hairy. **Petals** spathulate or oblanceolate, clawed, yellow. **Flowering time** all year. **Fruit** a siliqua, subterete, linear-filiform, slightly bulged by seed. **Seeds** ellipsoid. Cultivated, irrigated land, riverbanks, coastal dunes, roadsides; Drakensberg Grassland, Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Sub-Escarpment Savanna (Rhodes District S to Rietbron District and SE to Port Elizabeth, Grahamstown and Port Alfred).

3b Siliquae hairy, at least in lower half
4a Siliquae puberulous in lower half only

***orientale** L.

Indian hedge mustard

Annual or biennial herb, 0.3–1.0 m high, branched. **Stems** puberulous. **Leaves**: basal leaves rosulate, petiolate, pinnatisect, 4- or 5-jugate, lateral lobes opposite or alternate, triangular or semi-ovate–triangular, subentire denticulate, terminal lobe triangular-ovate, 3-lobed, denticulate; cauline leaves 1–3-jugate, puberulous, terminal and lateral lobes become narrower and longer, terminal lobe hastate, upper ones hastately 3-lobed, lateral lobes progressively smaller, uppermost leaves lanceolate, entire. **Inflorescence** a terminal raceme. **Sepals** puberulous. **Petals** oblanceolate, clawed, yellow. **Fruit** a linear siliqua, terete. **Seeds** ovoid, brown. Water furrows, roadsides; Upper Karoo, Dry Highveld Grassland, Lower Karoo, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Middelburg S to Rietbron District and Grahamstown).

4b Siliquae strigose with coarse, thick-based hairs

turczaninowii Sond.

Annual herb, 0.35–0.45 m high, erect. **Stems** with simple hairs. **Leaves**: basal leaves rosulate, petiolate, pinnatifid, ± 10 pairs of lobes, lobes short, broad, ovate-triangular, dentate, terminal lobes small, ovate; lower cauline leaves petiolate, pinnatifid, 5 or 6 pairs of lobes, broad, dentate, upper ones sessile, pinnatifid or pinnately serrate-dentate, lobes and teeth dentate-crispate, hairy, glaucous. **Inflorescence** a terminal raceme; rachis hairy. **Flowers** small, yellow. **Sepals** hairy. **Fruit** a siliqua, stout-linear, terete, pedicellate. **Seeds** oblong. Disturbed areas on farms, roadsides, stony or rocky soil, well drained, full sun; Drakensberg Grassland, Upper Karoo, Albany Thicket, Sub-Escarpment Savanna (Rhodes District S to Middelburg and Grahamstown).

*THLASPI L.

Species 60, widespread in temperate regions of the northern hemisphere; 1 introduced in sthn Afr., only in EC.

arvense L.

Pennycress, field pennycress

Annual or biennial herb, 0.1–0.3 m high, erect, glabrous. **Leaves**: basal leaves petiolate, oblanceolate to obovate, dying off early; lower cauline leaves shortly petiolate, upper ones sessile, oblong, obovate-oblong to lanceolate, sagittate-amplexicaul, margins entire or repand-serrate. **Inflorescence** a many-flowered raceme, dense in flower, lax in fruit. **Flowers** small, white. **Fruit** a silicula, on ascending petioles, obovate-circular, broadly winged all around, wings broadest apically, emarginate. **Seeds** 5–8 per locule. Escape from cultivation, urban open space; Albany Thicket, Sub-Escarpment Savanna (Grahamstown District).

*TURRITIS L.

Species 3, Europe, W Asia and Africa; 1 introduced in sthn Afr., LIM, M, KZN, L, EC.

glabra L.

Tower cress, towermustard

Biennial herb, 0.3–1.0 m high, erect, densely leafy, unbranched. **Stem** retrorsely hairy near base, glabrous above. **Leaves**: basal leaves rosulate, petiolate, both surfaces scabrid with branched hairs, oblanceolate, margins sharply dentate or repand-dentate; cauline leaves sessile, sagittate, glabrous, glaucous, erect and overlapping, becoming smaller upwards, oblong-lanceolate, margins entire. **Inflorescence** a raceme. **Flowers** small. **Petals** oblanceolate, white, becoming tinged with pink on fading. **Fruit** a siliqua, erect, linear, straight. **Seeds** compressed. Closed shrubland, stony or rocky soil; Drakensberg Grassland, Dry Highveld Grassland (Molteno and Somerset East Districts).

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BRUNIACEAE

(Order Bruniales)

Compiled by E.G.H. Oliver & R. Claßen-Bockhoff

The taxonomy of this predominantly WC family has undergone a radical reshaping since the classical revision published by Pillans (1947) in which 12 genera were recognised. The new classification is based on molecular and morphological data (Claßen-Bockhoff et al. 2011) and includes 6 redefined genera and 79 species: *Audouinia* [including *Tittmannia*], *Thamnea*, *Linconia*, *Staavia*, *Brunia* [including *Raspalia*, *Nebelia*,

Mniothamnea and *Lonchostoma*] and *Berzelia*. Only *Brunia* and *Berzelia* reach into the EC with 6 species.

1a Flowers with two styles:
2a Stamens exserted ..... **Brunia noduliflora**
2b Stamens not exserted:
3a Leaves ovate to lanceolate, often cordate at base, at least 5 mm long..... **Brunia cordata**
3b Leaves lanceolate, < 2 mm long..... **Brunia trigyna**
1b Flowers with one style:
4a Inflorescences arranged on woody shoots as in a double raceme; petals 2–3 mm long; anthers 0.75–1.25 mm long ..... **Berzelia intermedia**
4b Inflorescences arranged on woody shoots as in a compound raceme; petals usually 1.50–1.75 mm long (if up to 2.8 mm, then anthers only 0.75 mm long):
5a Shrubs ± 1 m high; leaves narrowly lanceolate, 0.8–1.1 mm wide ..... **Berzelia commutata**
5b Shrubs 1.5–2.0 m high; leaves linear-filiform, 0.3–0.8 mm wide ..... **Berzelia lanuginosa**

Species descriptions mainly based on Pillans (1947), Claßen-Bockhoff (2000), Goldblatt & Manning (2000) and Hall (2001).

BERZELIA Brongn.

(= *BRUNIA* Lam. in part)

Species 14, endemic to sthn Afr., WC, EC.

The 3 species occurring in the EC are very similar in morphology. Hall (2001) included *B. commutata* and *B. intermedia* as subspecies under *B. lanuginosa*, but molecular data do not clearly support this. A revision of the group is urgently needed.

commutata Sond.

Shrub, up to 1 m high. **Leaves** erect-spreading, 3–7 × 0.8–1.1 mm; narrowly lanceolate, flat with prominent median vein on upper half of ventral surface, glabrous. **Inflorescences** arranged in a compound raceme; globose, 4–7 mm in diam., with ± 50 flowers. **Bracts** and bracteoles slightly overtopping calyx lobes, spathulate, villous on lower half of dorsal surface. **Calyx**: tube obconic, clothed with deciduous unicellular hairs. **Petals** ± 1.5 mm long. **Stamens** well exserted. **Ovary** slightly more than half-inferior, tomentose on upper part. **Flowering time** Oct.–Jan. Swampy places and streambanks, alt. low to high; Eastern Fynbos-Renosterveld (Kogelberg area E to Grahamstown area).

intermedia Schltdl.

Shrub, 1.0–1.5 m high. **Leaves** closely set, erect spreading or recurved from base, usually somewhat incurved about middle, 2–7 × 0.3–1.0 mm, linear-lanceolate to ovate-lanceolate, glabrous, tetragonal, almost equal sided. **Inflorescences** arranged in a double raceme; globose, 8–10(–14) mm in diam., with ± 100 flowers. **Bracts** and **bracteoles** shortly overtopping calyx, spathulate with long, caducous, unicellular hairs on dorsal side. **Calyx**: tube obconic, clothed with caducous unicellular hairs. **Petals** 2–3 mm long. **Stamens** well exserted; anthers 0.75–1.25 mm long. **Ovary** almost entirely inferior, tomentose on top. **Flowering time** Nov.–Feb. Drier sandstone slopes, alt. low to high; Eastern Fynbos-Renosterveld (WC east to Grahamstown area).

lanuginosa (L.) Brongn.

Shrub, 1.5–2.0(–5.0) m high. **Leaves** erect, spreading, usually slightly curved outwards or straight, 2–7 × 0.1–0.8 mm, linear to lanceolate, slightly convex and keeled on ventral surface, glabrous or very sparsely pilose on margins. **Inflorescences** arranged in a compound raceme; globose, 4–12 mm in diam., with ± 100 flowers. **Bracts** and bracteoles spathulate, almost as long as flower, with deciduous hairs on dorsal side. **Calyx**: tube

narrowly obconic, clothed with caducous, unicellular hairs, half as long a petals. **Petals** 1.50–1.75(–2.80) mm long. **Stamens** well exserted; anthers 0.75 mm long. **Ovary** almost entirely inferior. **Flowering time** Sept.–Dec. Damp sandstone slopes, seeps and streambanks, alt. low to high; Eastern Fynbos-Renosterveld (WC east to Cockscomb and Van Stadens areas).
The species includes polyploid populations (along the N2) with larger inflorescences and longer stamens than the populations known from the WC.

BRUNIA Lam.

(= *LONCHOSTOMA* Wikstr., *MNIOTHAMNEA* Nied., *NEBELIA* Neck. ex Sweet, *PSEUDOBAECKEA* Nied. in part, *RASPALIA* Brongn.)

Species 37, endemic to sthn Afr., KZN, WC, EC.

cordata (Burm.f.) Class.-Bockh. & E.G.H.Oliv.
[= *Pseudobaeckea cordata* (Burm.f.) Nied.]

Shrub, 1–2 m high, young stems villous. **Leaves** imbricate, erect spreading, 4–13 mm long; ovate to lanceolate, often cordate at base, ± villous. **Inflorescences** arranged in a compound raceme; terminal inflorescences usually present; ovoid to globose, 2–5 mm long, with 3–20 flowers. **Bract** leaf-like, shorter than flower; bracteoles as long as calyx tube. **Calyx**: tube broadly obconic; segments 0.50–0.75 mm long. **Petals** 1.3–1.6 mm long. **Stamens** shorter than corolla; anthers scarcely 0.5 mm long. **Ovary** $^{2}/_{3}$ inferior, pubescent at top. **Flowering time** Oct.–Jan. Alongside streams and seeps, alt. low to high; Eastern Fynbos-Renosterveld (WC E to Van Stadens/Uitenhage area).

noduliflora Goldblatt & J.C.Manning
(= *Brunia nodiflora auct.*)

Fonteinbos, *stompie* (A)

Shrub, 0.5–1.5 m high. **Leaves** sessile, imbricate, 1.5–4.0 mm long; lanceolate, acuminate, weakly villous to glabrous. **Inflorescences** laterally arranged in loose clusters on a main axis that continues to grow for several seasons; globose, 8–15 mm in diam., with ± 100 flowers; persistent for more than one season. **Bract** spathulate, villous; bracteoles lacking. **Calyx**: tube densely villous. **Petals** 3.5–4.8 mm long. **Stamens** exserted; filaments unequal in length. **Ovary** half-inferior, villous. **Flowering time** mainly Mar.–June. Dry stony slopes, alt. low to high; Eastern Fynbos-Renosterveld (mountains and flats from WC east to Uitenhage area).

trigyna (Schltr.) Class.-Bockh. & E.G.H.Oliv.
[= *Raspalia trigyna* (Schltr.) Dummer]

Shrub, 1.4–2.0 m high. **Leaves** imbricate, appressed, 0.9–1.8 mm long; lanceolate, usually glabrous. **Inflorescences** densely arranged along shoot systems; minute, 2–4 mm in diam., with ± 5 flowers. **Bracts** foliaceous or as bracteoles linear-oblong, villous on dorsal side. **Calyx**: tube villous, with a shallow cup-shaped free upper part. **Petals** 1.0–1.5 mm long. **Stamens** included. **Ovary** $^{3}/_{4}$ inferior, villous. **Flowering time** May–Oct. Moist sandy soils near streams and drainage lines on Msikaba Formation sandstone, alt. up to 90 m; Indian Ocean Coastal Belt (Pondoland coast of EC and KZN).
Hall (2001) regards this taxon as a subspecies of *Brunia* (= *Raspalia*) *angulata* (E.Mey. ex Sond.) Class.-Bockh. & E.G.H.Oliv. from SW Cape, but molecular analyses place them in 2 well-separated clades; a detailed investigation of the taxa is urgently needed.

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BUDDLEJACEAE see SCROPHULARIACEAE

BURSERACEAE

(Order Sapindales)

Compiled by M.H. Steyn

COMMIPHORA Jacq.

Corkwoods; *kanniedoodbome* (A); *umhlunguthi* (X); *iminyela* (Z)

Species nearly 200, mostly in Africa, some in India and the Arabian Peninsula; 33 in sthn Afr., mostly in LIM, 2 in KZN, NC, WC, EC, mostly in coastal regions.

Bark distinctly peeling off in large, coppery or reddish, papery flakes or chunks; flower length ± 4× that of width

harveyi (Engl.) Engl.

Red-stemmed corkwood, copper-stem corkwood; *rooistam-kanniedood*, *koperstam-kanniedood*, *bruin-kanniedood* (A); *umhlunguthi*, *ulonwaba* (X); *iminyela*, *ithlunguthi*, *umbumbungane*, *umbumbu* (Z)

Medium to large tree, 4–8 m high; bark peeling into large, coppery, papery flakes. **Leaves** alternate, trifoliolate, 2- or 3-jugate. **Leaflets** broadly lanceolate, apex acute, margins crenate-serrate, sparsely pubescent. **Inflorescences** axillary paniculate cymes; conspicuous bracts up to 6 mm long. **Flowers** small, green to yellow, unisexual, hypogynous, pedicel 2–3 mm long, pedicel and calyx sparsely pubescent; bracteoles up to 3 mm long. **Disc** 4-lobed, not adnate to perianth. **Stamens** 8. **Flowering time** Oct.–Dec. **Fruit** a subglobose drupe, 2-valved, glabrous, putamen (endocarp) smooth; pseudo-aril light red, with 4 arms, 2 long commisurate and two short facial arms. Rocky slopes, grassland and coastal sand forest; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Indian Ocean Coastal Belt (W of Queenstown, Fort Beaufort and King William's Town Districts, E to Komga and S to Peddie and East London).

Bark greenish to grey, rather mottled with white, not peeling; flower width and length ± the same

woodii Engl.

Forest corkwood; *bos-kanniedood* (A); *umhlunguthi*, *iminele*, *umhluguthi wehlathi* (X); *iminyela*, *umde wehlathi*, *umubu wehlathi* (Z)

Medium to large tree, up to 15 m high; bark greenish to grey, not peeling. **Leaves** alternate, trifoliolate, 2- or 3-jugate. **Leaflets** elliptic, apex acute, margins crenate-serrate, glabrous. **Inflorescences** axillary, paniculate, simple or dichasial cymes. **Flowers** small, green to yellow, unisexual, perigynous, pedicel < 1 mm long, pedicel and calyx glabrous; bracteoles up to 2 mm long. **Disc** 4-lobed, adnate to hypanthium.

Stamens 8. **Flowering time** Oct.–Dec. **Fruit** a subglobose drupe, 2-valved, glabrous, putamen smooth; pseudo-aril red, cupular with 1 very short, facial lobe. On slopes of mountains or in kloofs as part of coastal and mist belt forests; sometimes urban, shrubland, woodland, mostly forest; Indigenous Forests (King William's Town, Pefferskop in Victoria East District, E to Komga, S to Nahoon River Mouth and East London).

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BUXACEAE

(Order Buxales)

Compiled by C.L. Bredenkamp

BUXUS L.

Boxwoods; *buksbome* (A)

Species 80, mainly north temperate, 9 in Africa; 2 in sthn Afr., in addition, *B. sempervirens* is occasionally cultivated, LIM, NW, M, KZN, EC.

macowanii Oliv.

Cape box; *Kaapse buksboom* (A); *umgala-gala* (X); *umNgquzu* (Z)

Tree, 1.5–10.0 m high, bark longitudinally fissured, greenish brown; twigs angled. **Leaves** opposite, narrowly rhombic-elliptic to ovate-oblong, 12–40 × 6–18 mm, apex obtuse, base cuneate, stiffly coriaceous, dark green, shiny. **Inflorescences** ± sessile, axillary racemes, male and female flowers separate. **Flowers** very small, greenish. **Flowering time** July–Oct. **Fruit** a loculicidal, 3-horned, greenish brown capsule, ± 7 mm in diam. Sandy soil in inland and coastal forests; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Umtamvuna Nature Reserve S to Kologha, Cwebe, Manubi, Dwessa and Kwelega forests, from East London Coastal State Forest to Alexandria Coastal Forest).

natalensis (Oliv.) Hutch.

Natal box; *Natalse buksboom* (A); *umgala-gala* (X); *umhlulambazo* (Z)

Shrub or small tree, 1–5 m high, bark rough, pale brown, young stems bright green, twigs grooved. **Leaves** opposite, elliptic, 50–100 × 20–50 mm, apex with a drip tip, base cuneate, thinly coriaceous, dark green, shiny. **Inflorescences** ± sessile, axillary clusters with both male and female flowers. **Flowers** small, white, pale grey, green or yellow. **Flowering time** Sept.–Dec. **Fruit** a loculicidal, 3-horned, greenish brown capsule, ± 12 mm in diam. Mostly coastal forests; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (endemic to KZN and adjacent Transkei, Umtamvuna Nature Reserve along coast S to Manubi Forest in Kentani District).

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CACTACEAE

(Order Caryophyllales)

Compiled by P.J.D. Winter & C.L. Bredenkamp

1a Woody climber; stems not modified to cylindrical or flattened cladodes; more vigorous shoots with paired recurved spines specially adapted for climbing; leaves conspicuous in growing season, flat, > 15 mm wide; glochidia absent (Pereskioideae)..... ***Pereskia**

1b Shrublets, shrubs or small trees, or climbers with cladodes; shoots never with paired, recurved spines; leaves usually inconspicuous and caducous (except in *Austrocylindropuntia*), subulate or terete, < 8 mm wide (Opuntioideae) or absent (Cactoideae); glochidia present or absent:

2a Glochidia absent; flowers white, either large (> 60 mm in diam.), often nocturnal, or < 40 mm wide, diurnal (Cactoideae):

3a Branches cylindric, < 7 mm wide, not ribbed; flowers usually 4–10 mm in diam.; fruit up to 8 mm wide, cream-coloured or somewhat translucent, smooth ..... **Rhipsalis**

3b Branches winged, ribbed, or tubercled, > 10 mm wide; flowers > 20 mm in diam.; fruit > 8 mm wide, red, bearing scales (though these may be inconspicuous in *Myrtillocactus*):

4a Branches scrambling or pendent (never erect or columnar), slender, often segmented, sometimes emitting aerial roots, 3- or 4(–7)-winged or angled, or 4- or 5-ribbed:

5a Climbers; branches often emitting aerial roots; stem wings 3, prominent, acute; spines absent or few, up to 7 mm long..... ***Hylocereus**

5b Shrubs, usually scandent or clambering; branches not rooting aerially (except occasionally at tip); ribs 4 or 5, low, obtuse or rounded, lending the stems an appearance of plaited rope; spines present, > 10 mm long..... ***Harrisia**

4b Branches erect (sometimes columnar) or ascending, not scrambling, slender to very stout, not producing aerial roots, 3- or 4-winged or angled, or few- to many-ribbed, or tubercled:

6a Stems columnar or arching, only rarely branched above 0.5 m from base; ribs 10–15; troughs between ridges obscured by radial spines extending over them and interlacing; pericarpel and hypanthium with long, blackish hairs..... ***Echinopsis**

6b Stems erect, columnar when young, later usually with at least some branching above 0.5 m from base; ribs usually 5–8; troughs between ribs exposed, radial spines not extending over them, not interlacing; pericarpel (at anthesis) nearly naked, or with scales only:

7a Ribs 5 or 6, low; central spine 10–70 mm long, 3–6 mm wide at base; flowers diurnal, very small (± 20 × 25 mm), up to 9 per areole; fruit 10–20 mm in diam., dark purple..... ***Myrtillocactus**

7b Ribs (3–)6–8(–12), prominent (irregularly broken and wavy in 'monstrous' forms); central spines 1–4, 10–50(–80) mm long, 1(–3) mm wide at base; flowers open from 20:00 to 10:00, large (150–290 mm long, 100–200 mm in diam.), solitary in each areole; fruit > 40 mm in diam., red, pink or orange.. ..... ***Cereus**

2b Glochidia present in areoles; flowers coloured (rarely white), 30–70(–105) mm in diam., and diurnal (Opuntioideae):

8a Spines with the epidermis separating either completely, or only at spine apex, as a deciduous papery sheath ..... ***Cylindropuntia**

8b Spines without a papery sheath:

9a Branches compressed, i.e. modified to cladodes (at least the terminal ones), or, if all branches cylindric, then only up to 10 mm in diam.; flowers yellow to orange ..... ***Opuntia**

9b Branches, including terminal ones, cylindric or globose, > 15 mm in diam.; flowers scarlet, orange, or white to pale pink:

10a Arborescent; branches not segmented, growth indefinite, cylindric; areoles not sunken; flowers (50–)60–70 mm long, scarlet to orange; fruit > 50 mm long..... ***Austrocylindropuntia**

10b Low shrubs; branches segmented, moniliform, segments with determinate growth, globose or cylindric, up to 50 mm long; areoles sunken; flowers up to 45 mm long, white or pale pink; fruit < 20 mm long..... ***Tephrocactus**

*AUSTROCYLINDROPUNTIA Backeb.

Species 8, the Andes Mountain Range in South America (Argentina, Bolivia, Ecuador and Peru); 2 naturalised in sthn Afr., N, LIM, NW, G, FS, KZN, WC, EC.

Leaves up to 15 mm long and tepals up to 17 mm long

cylindrica (Lam.) Backeb.
[= *Opuntia cylindrica* (Lam.) DC.**]**

Shrub or small tree, up to ± 2 m high; branch segments distinctly rhomboid-tuberculate, dark or bluish green. **Leaves** rather persistent, finally deciduous. **Spines** 2–5(–8), 10(–30) mm long, sometimes with later accruals on older growth. **Flowers** up to 70 mm long; pericarpel elongate-urceolate; areoles many, glochidiate; spines occasional, bristly. **Tepals** hardly spreading, ± $^{1}/_{4}$ of flower length, scarlet. **Fruit** ellipsoid to oblong-urceolate, up to 90 mm long. **Seed** subglobose, 4–6(–10) mm in diam., girdle narrow, not prominent. Origin Ecuador (Pichincha, Chimborazo and Cañar); Albany Thicket (Katrivier Catchment).

Leaves 40–80 mm long and tepals 20–30 mm long

subulata (Muehlenpf.) Backeb.
[= *A. subulata* (Muehlenpf.) Backeb. subsp. *exaltata* (A.Berger) D.R.Hunt, *Opuntia exaltata* A.Berger, *Opuntia subulata* (Muehlenpf.) Engelm.**]**

Devil's rope, long-spine cactus; *langdoringkaktus* (A)

Much-branched shrub, 2–4 m high. **Branches** cylindrical, up to 0.5 m long, green or somewhat glaucous; tubercles in a few spirals, sharply defined, vertically rhomboid to decurrent-obovate; spines (1)2–4, strong, straight, up to 80(–130) mm long. **Leaves** subulate, persistent, with areoles at upper extremities of tubercles. **Perianth** not widely flaring, $^{1}/_{3}$ of flower length; tepals scarlet, orange or yellowish. **Fruit** elongate, obovoid-oblong to clavate or ± spherical, ± spiny, sometimes successively proliferous (mostly sterile in SA). **Seeds** (1–)19, globose or isodiametric, 8–10 mm in diam. Origin S America (La Paz, Bolivia to Junín, Peru), proposed for classification [Category 1b under NEMBA (National Environmental Management: Biodiversity Act) and CARA (Conservation of Agricultural Resources Act)]; Sub-Escarpment Grassland, Upper Karoo (uMzimkhulu S, road between Middelburg and Steynsburg).

*CEREUS Mill.

Species 25, Caribbean and South America; 1 or 2 (locally often incorrectly referred to as **C. peruvianus*) naturalised in sthn Afr., N, LIM, NW, G, M, S, FS, KZN, NC, WC, EC.

jamacaru DC.

Peruvian apple cactus, pitaya, queen of the night; *bobbejaanpaal*, *môrester nagblom* (A)

Stem-succulent tree, 3–10(–18) m high, often with a short trunk up to 2 m high. **Branches** 6–8-winged. **Areoles** with 1–4 or more central spines 10–20(–60) mm long, yellow or brown when young, and (4–)7 or 8(–12) peripheral spines up to 35 mm long, yellow or brown when young. **Flowers** nocturnal, 210–300 × 150–200 mm. **Tepals** 80–100 × 20–27 mm, outer tepals greenish, inner tepals white. **Stamens** oblique in mature flower. **Flowering time** Nov.–Jan. **Fruit** red when ripe, succulent berries, ellipsoid, skin smooth, pulp white. **Seeds** black. Savanna and rocky ridges; origin South America, N & E Brazil, declared invader (Category 1b under NEMBA and CARA); Upper Karoo, Albany Thicket, Dry Highveld Grassland (Middelburg S, from Graaff-Reinet to Tarkastad and Willowmore to East London).

*CYLINDROPUNTIA Mill.

Species 33, Central America, Caribbean, southwestern USA, northwestern South America; imported for agricultural and horticultural use, number in sthn Afr. unknown, N, B, LIM, NW, G, M, S?, FS, KZN, L?, NC, WC, EC.

1a Fruits smooth to shallowly tuberculate, green to yellow-green, sometimes tinged red to purple at maturity, usually forming long chains in large plants, sometimes simple

fulgida (Engelm.) F.M.Knuth var. **mamillata** (A.Schott ex Engelm.) Backeb.
[= *C. fulgida* (Engelm.) F.M.Knuth var. *mamillata* (A.Schott ex Engelm.) Backeb. forma *monstruosa* (J.M.Coult) P.V.Heath]

Boxing glove cactus (applied only to the crested morphotype, forma *monstruosa*), coral cactus

Shrub, 1(–3) m high; branch segments ovoid to narrowly ovoid-cylindric, 60–230 × 20–305 mm, glaucescent, terminal segments easily detached; tubercles salient, 8–13 (–19) mm high, broadly ovoid, strongly mamillate; areoles with gold-coloured or brown wool; glochidia 1–3 mm long, yellow. **Spines** inconspicuous, absent to ± 12, short 10–20 mm long, not or only slightly interlacing with those from adjacent areoles; sheaths tightly fitting, whitish to yellowish. **Flowers** opening late afternoon. **Tepals** obovate to ligulate, usually recurved, pink to magenta. **Fruit** obconical, 20–55 × 13–45 mm, mostly spineless, fleshy. **Seed** aborted (sterile). Origin from both sides of the Gulf of California, in Baja California and the Sonoran Desert, declared weed (Category 1, also proposed as a Category 1b invasive alien plant under NEMBA and CARA); Albany Thicket (near Port Elizabeth).

1b Fruits strongly tuberculate, yellow-green to yellow (sometimes tinged red to purple) or orange-yellow at maturity, simple (rarely with a secondary fruit produced in C. imbricata*), clustered at end of terminal cladodes, but not proliferating in chains*

2a Distal stem segments firmly attached to next segment; spines scattered, not or little obscuring stem; flowers usually dark pink to magenta or purple-red

imbricata (Haw.) Knuth
[= *Opuntia imbricata* (Haw.) DC.]

Imbricate prickly pear; *kabelturksvy* (A)

Branched, succulent shrub, often arborescent, ± 3 m high. **Branch segments** whorled or sub-whorled, dull grey-green, cylindrical, with elliptic tubercles creating the effect of a woven rope, 400 × 50 mm; areoles with spines up to 30 mm long, initially covered with loose, white papery sheaths. **Leaves** subulate, 10–20 mm long, caducous. **Flowers** dark pink, magenta or reddish magenta, showy. **Flowering time** Nov.–Jan. **Fruit** yellow, succulent berries 24–45 mm long, spineless. Invades karoo, dry savanna and grassland; origin N and central America, declared weed (Category 1, proposed as a Category 1b invasive alien plant under NEMBA and CARA); Upper Karoo, Albany Thicket, Dry Highveld Grassland, Rainshadow Valley Karoo (Middelburg S, Graaff-Reinet and Cradock Districts, from Willowmore to Steytlerville, Uitenhage and Alexandria District).

2b Distal stem segments easily detached from next segment; spines crowded, obscuring stem; flowers always rose-coloured (pale shade of pink)

pallida (Rose) F.M.Knuth
[= *Opuntia pallida* Rose, *Opuntia rosea sensu auct. non* DC. (misapplied name)]

Rosea cactus; *roseakaktus* (A) (in SA somewhat confusingly used for *C. fulgida* var. *fulgida*)

Shrub, branching basally with ascending stems, (0.2–)0.5–1.0 m high (1.5 m in Australian form); branch segments cylindric, 100–150 × 16–25 mm, grey-green; tubercles distinct; areoles large, 20–35 mm apart. **Spines** (1–)4–9, acicular, 10–40 mm long, yellow, reddish or grey; sheaths papery, yellowish, not completely covering spines. **Flowers** 3.8–4.0 mm long, pink. **Fruit** obconical to obovoid, 16–18 × 11–14 mm, spiny, yellow (Jansenville), able to root and form new plants. Origin provinces of Hidalgo, Mexico, Puebla and Tlaxcala of central Mexico, proposed invasive (under NEMBA and CARA); Albany Thicket (Graaff-Reinet, Jansenville, Cradock and Addo).

*ECHINOPSIS Zucc.

Species 77, South America; imported for agricultural and horticultural use, number in sthn Afr. unknown, N, B, LIM, NW, FS, NC, WC, EC.

schickendantzii F.A.C.Weber
(= *Trichocereus schaferi* Britton and Rose)

Columnar torch cactus; *orrelkaktus* (A)

Multi-stemmed shrub, 1.0–2.5 m high. **Stems** cylindrical, ascending, ribs 10–15, obscured by spines. **Areoles** ± 14 mm apart, 1 central spine, 8–10 peripheral spines (4–)6–10 mm long, yellow when young, ageing brown. **Flowers** solitary, showy, ± 200 mm long overall, mouth ± 15 mm in diam.; pericarpel and hypanthium covered with long, dark hairs. **Tepals** white. **Flowering time** Nov.–Mar. **Fruit** spherical, clothed with long, dark hairs, pulp white. **Seeds** dull black, ± warty. Dry savanna, karoo; origin Argentina, declared weed, potential transformer (Category 1); Dry Highveld Grassland, Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Drakensberg Grassland, Rainshadow Valley Karoo (Aliwal North District S, from Middelburg to Queenstown and Ngangelizwe District, Graaff-Reinet to Stutterheim and Willowmore to Uitenhage, Port Elizabeth and Grahamstown Districts).

*HARRISIA Britton

Species 7–9; Caribbean, USA and South America; 2 invasive in sthn Afr., LIM, NW, G, M, FS, KZN, WC, EC.

martinii (Labour.) Britton
[= *Eriocereus martinii* (Labour.) Riccob.]

Harrisia cactus, Martin's harrisia, moon cactus; *toukaktus* (A)

Plant much branched, clambering, up to 2 m long. **Stems** green to grey-green, 20–25 mm in diam.; young stems pointed, 4- or 5-angled; older stems round in cross section, spineless. **Spines**: central spine single, stout, yellowish with dark tip, 20–30 mm long; radial spines 5–7, short. **Flowers** up to 200 mm long; pericarpels with scales and brown wool. **Fruit** red, 35 mm long with scales and spines. Origin Gran Chaco region of Argentina, declared weed, transformer (Category 1); Albany Thicket (Cookhouse).

*HYLOCEREUS (A.Berger) Britton & Rose

Species ± 18, tropical America; 1 in sthn Afr., M, KZN, WC, EC.

undatus (Haw.) Saff.

Perennial, climbing, stem-succulent shrub, 1–2 m high. **Branches** 3-winged, ribs compressed, margins strongly undulate, becoming horny with age. **Areoles** up to 40 mm apart, with 1 central spine 2–4 mm long and 1 or 2 peripheral spines 2–4 mm long. **Flowers** solitary. **Sepals** lorate, greenish or yellowish, apex acuminate. **Petals** spathulate, green, apex acute. **Stamens** of mature flower roughly parallel to perianth. **Style** cream-coloured; stigma lobes ± 24. **Fruit** red (ripe), oblong, scaly. **Seeds** black. Invasive weed (category 2); Albany Thicket (Port Elizabeth District).

*MYRTILLOCACTUS Console

Species 4, apparently closely related, endemic to Guatemala and Mexico (Hunt 2006); 1 naturalised in sthn Afr., NW, EC.

geometrizans (Pfeiff.) Console

Bilberry cactus, whortleberry cactus; *rosyntjiekaktus* (A)

Shrub or tree, up to 4–5 m high; trunk short, branches many, up curving, 60–100 mm in diam., blue-green; ribs 5 or 6, smooth, low, rounded; areoles 5–30 mm apart. **Central spine** 1, 10–70 mm long, dagger-like and sometimes 6 mm wide at base, almost black; radial spines 5–9, 2–10 mm long, red-brown to blackish at first, fading to grey. **Flowers** diurnal, 20 × 25–35 mm, creamy or greenish white, scales small; hypanthium very short; perianth rotate; pericarpel areoles slightly woolly. **Stamens** relatively few. **Fruit** globose, spineless, 10–20 mm in diam., fleshy, dark red or purple, very tasty. **Seeds** broadly ovoid, 1.6 × 1.3 mm, black-brown, dull, relief low-domed; hilum-micropylar region of large size, basal, impressed. Origin Guatemala and throughout the central and northern central parts of Mexico; Albany Thicket (Greater Addo Elephant National Park).

*OPUNTIA Mill.

Species ± 181, Canada S to southern Argentina, E through the Caribbean, W to Galápagos Islands; at least 14 naturalised in sthn Afr., N, LIM, NW, G, M, S, FS, KZN, NC, WC, EC.

Serious infestation in EC, *O. aurantiaca* and *O. ficus-indica* both declared weeds; several species widespread.

1a Plants low spreading; cladodes semi-terete

aurantiaca Lindl.

Jointed cactus; *litjieskaktus* (A)

Perennial, spiny, much branched, spreading, succulent shrublet, ± 1 m high; underground tubers. **Cladodes** cylindrical to slightly flattened, bright green, sometimes reddish purple-tinged, 60–200 mm long × 10–30 mm wide; armed with barbed spines 10–30 mm long. **Leaves** absent. **Flowers** bright yellow. **Flowering time** Nov.–Jan. **Fruit** reddish, succulent berries, sterile. Karoo, savanna and pastoral land; origin E Argentina and Uruguay, declared weed, transformer (Category 1); Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket, Drakensberg Grassland, Eastern Fynbos-Renosterveld (Aliwal North to Matatiele District S, from Queenstown to Ngangelizwe District, Graaff-Reinet to Stutterheim and Humansdorp District to Port Alfred).

1b Plants arborescent or shrubby; cladodes flattened
2a Cladodes orbicular, ± as long as wide

engelmannii Salm-Dyck ex Engelm.
(= *O. lindheimeri* Engelm.)

Small round-leaved prickly pear; *kleinrondeblaarturksvy* (A)

Succulent, branched shrub, 1.0–1.5 m high. **Cladodes** flattened, orbicular to broadly obovate, 200 × 160 mm, glaucous-green; areoles widely spaced, raised, woolly, spines 1–3, up to 50 mm long, flattened, stout, curved, pale grey to yellow, mainly towards apex. **Flowers** yellow. **Flowering time** Oct.–Dec. **Fruit** obovoid, ± 70 mm long, purple, fairly smooth. Invades savanna, minor weed due to biocontrol; origin southern USA and Mexico; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna, Rainshadow Valley Karoo (Cradock E to Fish River Basin, Fort Beaufort District and Alice, and to Willowmore and Uitenhage Districts).

robusta H.L.Wendl.

Erect, stem-succulent shrub, up to 5 m high. **Cladodes** flattened, elliptic, ovoid to orbicular, sometimes massive, up to 400 × 400 mm, young cladodes glaucous; spines 2–12 unequal, longest up to 50 mm, white, brownish or yellowish below, terete (some cultivars are spineless). **Flowers** yellow. **Fruit** spherical to ellipsoid, 70–80 mm long, deep red. Naturalised mainly in semi-arid interior of sthn Afr., cultivated for edible fruits; origin central Mexico; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket, Lower Karoo, Rainshadow Valley Karoo (abundant from Oviston to Lady Grey District and southwards throughout western parts of EC including Middelburg, Graaff-Reinet, Willowmore and Port Elizabeth).

spinulifera Salm-Dyck

Saucepan cactus; *grootrondeblaarturksvy* (A)

Spiny, much-branched, succulent shrub, ± 3 m high, not arborescent. **Cladodes** flattened, orbicular, 200–400 mm in diam., glaucous-green; areoles dense, sub-spirally arranged, with 3–6 spines, the longest ± 20 mm long. **Flowers** yellow. **Flowering time** Nov., Dec. **Fruit** small berries, ± 25 mm long. Savanna and grassland; origin central America (Mexico), declared weed, potential transformer (Category 1); Drakensberg Grassland (a pest in Stockenström District and Katrivier Basin).

2b Cladodes elliptical, ovate or obovate, attenuate towards base
3a Areoles large, > 10 mm *in diam.; spines 4–7, coarse, hard and brown*

stricta (Haw.) Haw.

Australian pest pear; *suurturksvy* (A)

Spreading, much-branched, succulent, dwarf shrub, 0.6–2.0 m high, forming thickets. **Cladodes** flattened, broadly to narrowly obovate, 230 × 100 mm, glaucous-green; areoles prominent with 4–7 straight, spreading, acicular, yellow-brown spines up to 50 mm long. **Flowers** yellow. **Flowering time** Nov.–Jan. **Fruit** red turning purple, succulent berries, narrowly obovoid, 40–60 mm long, flesh purple inside, sour tasting. Savanna and dry grassland; origin N America and West Indies; declared weed, transformer (Category 1); Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna, Rainshadow Valley Karoo (Fort Beaufort District S, from Willowmore to Port Elizabeth and Grahamstown).

3b Areoles smaller, ± 5 mm in diam.; spines 0–6, thinner, greyish or unarmed

ficus-indica (L.) Mill.

Sweet prickly pear; *boereturksvy* (A)

Succulent, branched shrub or tree, 2–5 m high, forming sturdy trunks with age. **Cladodes** flattened, narrowly elliptic to ovate, 300–600 × 60–120 mm, attenuate below, fairly thick, glaucous-green; areoles with 3–6 radiating, greyish white spines ± 30 mm long (spineless in older plants and certain cultivars). **Leaves** early deciduous. **Flowers** yellow or orange. **Flowering time** Oct.–Dec. **Fruit** ellipsoid, ± 70 mm long, reddish, succulent berries, edible. Invades mainly dry and rocky places in savanna and karoo, widespread; origin central America; declared weed, excluding spineless cultivars, potential transformer (Category 1); in all bioregions, especially Upper Karoo, Lower Karoo, Albany Thicket and Sub-Escarpment Savanna (pest in most parts of EC, abundant around Uitenhage).

humifusa (Raf.) Raf.

Large-flowered or creeping prickly pear

Succulent, low, spreading shrublet, up to 0.3 m high. **Cladodes** prostrate or reclining, green to grey-green, flattened, round to obovate, up to 150 mm long; areoles with dense glochidia (barbed bristles or hooked hair), spines absent, or with 1 or 2 main spines in upper half of cladode. **Leaves** small, pointed, up to 10 mm long, deciduous. **Flowers** golden-yellow. **Flowering time** Oct.–Dec. **Fruit** red or purple, succulent berries, narrow, elongated, edible. Dry grassland and savanna; origin N America, central and E USA, declared weed, potential transformer (Category 1); Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Middelburg, Graaff-Reinet and Port Elizabeth Districts).

microdasys (Lehm.) Pfeiff.

Teddy bear cactus

Erect or prostrate, stem-succulent shrub, up to 0.6 m high. **Cladodes** flattened, oblong, elliptical or obovate, 100–150 mm long, glaucous when young; glochidia usually yellow, also white or reddish brown, spines 0(1), very short. **Leaves** soon deciduous. **Flowers** many on each pad, clear yellow. **Fruit** purple to red when ripe, round, skin with glochidia. Cultivated as rockery ornamentals; origin central and N Mexico, invasive in very localised areas, usually close to habitation; Upper Karoo, Rainshadow Valley Karoo, Albany Thicket (near Steytlerville and Sundays River Basin).

monacantha Haw.

(= *O. vulgaris* Mill. misapplied name)

Cochineal or drooping prickly pear; *luisiesturksvy*, *suurturksvy* (A)

Succulent shrub or tree, 4–5 m high, often with a definite trunk. **Cladodes** flattened, fairly thin, bright green when young, narrowly obovate to narrowly elliptic, 100–300 × 50–100 mm, base attenuate; spines 1 or 2(3) per areole, 20–30(–70) mm long, greyish with a brown point. **Flowers** yellow, outer petals with red markings. **Flowering time** Oct.–Apr. **Fruit** obovoid berries, ± 60 mm long, reddish purple, edible. Coastal bush and moist savanna; origin S America, declared weed, minor due to biocontrol (category 1); Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (EC Coast from Port St Johns to Kei River Mouth and from Uitenhage E to Bushman's River Mouth, Bathurst and East London).

*PERESKIA Mill.

Species 20, Central and South America; 1 in sthn Afr., a serious pest in coastal forest, LIM, G, M, KZN, WC, EC.

aculeata Mill.

Barbados gooseberry, lemon vine

Climbing, stem-succulent shrub, 3.0–15.2 m high. **Branches** terete, green. **Areoles** with 1–3 charcoal-grey spines; paired hooked thorns present. **Leaves** oblong to ovate, up to 70 mm long. **Flowers** in panicles; bracts few, elongated, leaf-like. **Sepals** 4–7, greenish. **Petals** 7–12, white, apex obtuse. **Stamens** of mature flower oblique. **Ovary** dark green, surface with spines. **Fruit** yellow when ripe, ± 20 mm in diam., skin smooth. **Seeds** black. Garden escape from KZN in forests; origin Caribbean, northern, eastern and southeastern South America; Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Albany Thicket (Port St Johns S to Knysna, Port Elizabeth, Grahamstown and Port Alfred).

RHIPSALIS Gaertn.

Species 35 (Barthlott & Taylor 1995) and their classification was adopted by the International Cactaceae Systematics Group. *R. baccifera* (J.S.Muell.) Stearn is the most widespread of all cactus species. Six subspecies are recognised, of which subsp. *mauritiana* (DC.) Barthlott occurs in the Old World from Tropical Africa to Sri Lanka and in sthn Afr., M, S, KZN, EC.

baccifera (J.S.Muell.) Stearn subsp. mauritiana (DC.) Barthlott

Perennial, epiphytic or lithophytic, succulent, leafless shrublet or shrub, 0.5–3.0 m high. **Branches** terete or leaf-like, often jointed, sometimes epiphytic. **Leaves** scale-like or absent. **Areoles** with 1 or 2 spines. **Flowers** solitary, usually lateral. **Calyx** not united above ovary; lobes 3–many, scale-like, greenish. **Petals** 6–10, oblong, spreading, green or white. **Stamens** many; filaments subequal, perpendicular to perianth; anthers short. **Ovary** smooth, usually glabrous; style divided into 2–many stigmas. **Fruit** a subglobose berry, crowned with persistent perianth, sometimes with a few spines, cream-coloured; flesh white. **Seeds** somewhat pearshaped, dark brown to black. In coastal evergreen forests on trees or rocks, alt. up to 1 750 m; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (KZN Coast into EC near Komga).

*TEPHROCACTUS Lem.

Species 7, endemic to western Argentina in South America; 1 in sthn Afr., N, NC, WC, EC.

articulatus (Pfeiff.) Backeb.

(= *Opuntia glomerata sensu auct. non* Haw.)

Paper-spine cholla, pine cone cactus; *papierdoringkaktus* (A)

Dwarf shrub, erect, up to 0.2–0.3 m long; branch segments globose to oblong, usually 25–50 × 25–50 mm, easily detached. **Leaves** tiny, cylindric, caducous; areoles ± immersed, with hairs and glochidia; glochidia dark brown or maroon, conspicuous. **Spines** absent or 1–4, up to or more than 50 × 7 mm, flat, papery or raffia-like, pale brown or white. **Flowers** 30–40 mm in diam., white or pale pink. **Stamens** usually many, sensitive. **Fruit** dry, dehiscent, 10–15 mm long, terminal, persistent, often sterile, pulp none.

Seed highly specialised, laterally compressed, winged; aril (funicular envelope) glabrous, girdle strongly protruding, spongy. Karoo; origin dry north-central and north-western parts of Argentina, from Catamarca and Santiago del Estero, S to Mendoza and San Luis (Hunt 2006); Lower Karoo (sporadically around Jansenville).

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CAMPANULACEAE *s.l.*

(including LOBELIACEAE)

(Order Asterales)

Campanulaceae *s.s.* compiled by C.N. Cupido, Lobeliaceae by O.A. Leistner & C.L. Bredenkamp

APG II (2003) suggests as an option keeping Lobeliaceae separate from Campanulaceae, but the two are best combined in view of their substantial similarities (see APG III 2009) and as a practical matter for the time being. Based on molecular data, details of the main pattern of relationships within the relevant clade are unclear (Stevens 2008).

1a Flowers zygomorphic, 1- or 2-lipped; anthers cohering in a tube around style, very rarely free, persistent after anthesis:
2a Anthers free or apically loosely united ..... **Cyphia**
2b Anthers united into a tube:
3a Ovary 1-locular; capsule prismatic, elongate, 3-valved ..... **Grammatotheca**
3b Ovary 2-locular:
4a Corolla tube slit down one side to base:
5a Lobes of stigma short, subrotund or oval ..... **Lobelia**
5b Lobes of stigma filiform, elongate ..... **Monopsis**
4b Corolla tube funnel-shaped, not slit ..... **Wimmerella**

1b Flowers actinomorphic; anthers free, deciduous at anthesis:
6a Capsule dehiscing by apical valves ..... **Wahlenbergia**
6b Capsule not dehiscing by apical valves:
7a Perennial herbs, prostrate, often mat-forming; capsule dehiscing by terminal lid; ovary (2)3-locular .... **Craterocapsa**
7b Shrublets; ovary 2-locular:
8a Capsule dehiscing longitudinally into 4 or 5 segments, each corresponding to a calyx lobe .... **Prismatocarpus**
8b Capsule dehiscing by an apical plug or many longitudinal slits not corresponding to a calyx lobe ... **Roella**

CRATEROCAPSA Hilliard & B.L.Burtt

Species 5, sthn Afr., with one extending into Zimbabwe, LIM, M, S, FS, KZN, L, EC, mainly on eastern high mountains.

congesta Hilliard & B.L.Burtt

Perennial herb, prostrate, 0.03–0.08 m high. **Leaves** alternate, linear to lanceolate, margins ciliate mainly in lower half. **Flowers** bluish mauve, sessile, terminal, solitary or several grouped together. **Style**: base not expanded but surrounded by a flat fleshy disc. **Hypanthium** usually glabrous. **Flowering time** Dec.–Mar. **Fruit** a capsule, with flattish lid. Stony grassland at high altitudes; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland (Maraisburg between Hofmeyr and Tarkastad N to Barkly East and the Mt Ayliff and Mt Currie districts).

insizwae (Zahlbr.) Hilliard & B.L.Burtt

Perennial herb, prostrate, 0.03–0.05 m high. **Leaves** ovate, abruptly contracted to a petiole-like base. **Flowers** mauve-blue, pedicellate, solitary, apparently axillary. **Flowering time** Jan., Feb. Stony grassland; Sub-Escarpment Grassland (Mt Insizwa, S of Kokstad).

montana (A.DC.) Hilliard & B.L.Burtt

Perennial herb, prostrate, 0.03–0.05 m high. **Leaves** opposite or alternate, lanceolate to elliptic, tapering to a broad, flat petiole-like base, margins ciliate. **Flowers** mauve-blue, pedicellate, solitary in upper axils or pseudoterminal. **Hypanthium** villous. **Flowering time** Oct.–Dec. Stony grassland; Lower Karoo, Drakensberg Grassland, Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket (Koueveld Mts near Murraysburg, NW of Graaff-Reinet to Amatole Region).

tarsodes Hilliard & B.L.Burtt

Carpet bell flower

Perennial herb, prostrate, mat forming, 0.02–0.05 m high. **Leaves** mostly rosetted at tips of branchlets, lanceolate to elliptic, tapering to a broad, flat, petiole-like base, margins of base ciliate. **Flowers** pale blue or white, sessile, solitary in axils of rosette leaves. **Style**: base expanded but not surrounded by a fleshy disc. **Hypanthium** usually glabrous. **Flowering time** mid Nov.–Mar. Stony Grassland; Sub-Escarpment Grassland (Mt Currie District).

CYPHIA P.J.Bergius

Baroe (A)

Species over 60, Africa; ± 35 in sthn Afr., widespread, but absent in N, rare in B.

1a Plant erect or weakly twining
2a Corolla tubular, ± equally 5-lobed
3a Leaves linear, sessile, margins ± revolute

[E]**persicifolia** C.Presl

Perennial herb with tuberous root; stem erect, simple, angled, glabrous, ± leafy, up to 0.5 m high. **Leaves** sessile, linear or linear-lanceolate, 20–70 × 2–3 mm, margins denticulate-revolute, glabrous. **Flowers** in a pedunculate, multiflowered, ± lax, terminal raceme. **Peduncle** with very small leaves. **Bracts** lanceolate, denticulate, longer than pedicels. **Pedicels** 2 mm long, with 2 bracteoles at apex, glabrous. **Calyx**: tube turbinate, glabrous; lobes narrowly triangular, somewhat denticulate, up to 3 mm long. **Corolla** 10–12(–14) mm long, inside and outside glabrous; tube slightly curved, 4–6 mm long. **Flowering time** Jan.–Mar. Grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Mthatha to Port St Johns S, from King William's Town to Kentani).

3b Leaves oblong-lanceolate, shortly petiolate

[E]**phillipsii** E.Wimm.

Perennial herb; stem glabrous, erect, round, ± 0.5 m high, densely leafy. **Leaves** subsessile, oblong to lanceolate, 40–50 × 8–14 mm, margins faintly wavy or unequally remotely denticulate. **Peduncle** 40 mm long. **Flowers** in a terminal raceme. **Bracts** sublinear, leaf-like, 3–5 mm long. **Pedicels** 4 mm long, glabrous, with 2 bracteoles above. **Calyx**: tube turbinate, 2–3 mm long; lobes linear, 3 mm long, denticulate, spreading, somewhat recurved at apex. **Corolla** 17 mm long, glabrous, red?, 2-lipped; tube narrow; lobes lanceolate. **Stamens** with anthers glabrous on back. **Flowering time** Dec. Habitat?; Sub-Escarpment Savanna, Albany Thicket (Kentani, East London).

2b Corolla split to base into 2 lips, the upper 3-lobed, the lower consisting of 2 free petals
4a Flowers ± sessile, in a dense spike

revoluta E.Wimm.

Perennial herb with erect, simple, leafy stem up to 0.8 m high. **Leaves** sessile, subamplexicaul, chartaceous, glabrous, triangular to heart-shaped, shiny, broadly rounded at base and there with 2 or 3 acute teeth on both sides, or margins entire and revolute, 30–45 × 6–16 mm long, apex acute. **Spike** terminal, dense, ± 100 mm long, somewhat interrupted below, axis puberulous. **Flowers** in dense spikes, bracteate. **Bracts** triangular, 8–15 mm long. **Calyx**: tube turbinate; lobes narrowly triangular, 5 mm long, exserted, erect. **Corolla** 7 mm long, glabrous, puberulous inside. **Stamens** 4 mm long; anthers 1.5 mm long, hairy on back. **Flowering time** Apr. Habitat?; Indian Ocean Coastal Belt (Port St Johns).

4b Flowers pedicellate, 1–3 on an axillary peduncle in a lax raceme
5a Leaves palmately divided into 3 linear lobes

triphylla E.Phillips

Baroe (A)

Perennial herb with ovoid tuber (± 65 × 26 mm), with stem erect or weakly twining, round, glabrous, up to 0.5 m high. **Leaves** sparse, shortly petiolate, glabrous, divided into 3, rarely more, lobes arising above base of leaf, narrowly linear, entire or sparsely dentate, 30–60 mm long, middle lobes often longer. **Flowers** in terminal racemes, many-flowered. **Corolla** 5–10 mm long, pink to mauve and obscurely spotted at base of lower petals or lilac, glabrous. **Stamens** with anthers elliptic, 3 sparsely hairy on back,

2 glabrous. **Flowering time** Jan.–May. Grassland, often in moist places, rocky flats and hillsides, alt. 100–2 165 m; Upper Karoo, Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Bethulie E to Aliwal North southwards, from Bailey to Elliot, Graaff-Reinet to Winterberg Mts, Humansdorp and Jeffreys Bay).

5b Leaves not divided, linear to lanceolate or oblong
6a Inflorescence puberulous

longifolia N.E.Br.

Intikintiki (Z)

Perennial herb with globose tuber 25 × 20 mm; stem erect, up to 0.6 m high, simple, rarely branched, ± glabrous below, densely puberulous above, especially inflorescence. **Leaves** sessile, linear, acute, rarely linear-lanceolate, 25–150 × 2–10 mm, remotely denticulate or entire. **Inflorescence** a terminal, pedunculate raceme, 20–200 mm long, many-flowered, often secund. **Flowers** solitary in axils of bracts. **Corolla** 2-lipped, 9–11 mm long, creamy white, pale mauve or lilac, puberulous outside; petals linear, dilated above, acuminate, recurved at apex. **Stamens** with anthers hairy on back and at apex. **Flowering time** Sept.–Mar. Grassland, usually in full sun, often in moist places, alt. 600–2 075 m; Drakensberg Grassland, Sub-Escarpment Grassland (Ongeluksnek Nature Reserve E to Mount Malowe S, from Maclear to Cathcart).

6b Inflorescence glabrous
7a Stamens less than half as long as corolla; filaments ± as long as anthers

[E]assimilis Sond.

Baroe (A)

Perennial herb, root tuberous; stem erect, simple or rarely branched, leafy in lower and middle part, leafless above and sometimes flexuose or twining, glabrous, up to 0.6 m high. **Leaves** sessile, elongate-linear, 25–70 × 0.8–2.5 mm, acute, margins remotely denticulate, often suberect, glabrous. **Flowers** in lax, pedunculate, terminal racemes, often secund, few- or many-flowered. **Pedicels** 2–7 mm long, with 2 bracteoles above middle, entire or denticulate, 3–10 mm long. **Corolla** 11–15 mm long, white suffused reddish or lilac, inside puberulous towards base; lobes sublinear, acute. **Stamens** with anthers hairy on back. **Flowering time** Jan.–May. Grassland, in full sun, alt. 600–1 400 m; Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Queenstown E to Maclear southwards, from Graaff-Reinet to Kei River Mouth and from Grahamstown to Port Alfred).

7b Stamens more than half as long as corolla; filaments ± twice as long as anthers
8a Leaves oblong to lanceolate

[E]undulata Eckl. var. **undulata**

Veldbaroe, *vlaktebaroe* (A)

Perennial herb, root tuberous; stem erect or often also twining, striate, glabrous, somewhat branched, sparsely leafy, > 0.2 m long. **Leaves** sessile, lanceolate (20 × 5 mm), oblong (25 × 10 mm) to linear (10–70 × 1–3 mm), apex acute, at base on both sides with a large tooth or lobe, further on appressed-denticulate or crenulate or coarsely toothed, somewhat thickened, glabrous. **Flowers** in a secund, many-flowered, often lax, terminal raceme. **Pedicels** 1(–3)-flowered, 3–4 mm long. **Corolla** 7–13 mm long, glabrous, white, puberulous inside towards base. **Stamens** with anthers hairy on back. **Flowering**

time Feb.–Oct. Grassland, roadsides, stony slopes, alt. 30–70 m; Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Somerset East S, from Kouga to Bathurst and Humansdorp).

8b Leaves linear, short or somewhat elongate

linarioides (C.Presl ex Eckl. & Zeyh.) E.Wimm.

Veldbaroe, *kameka* (A)

Perennial herb with stem erect or often twining, glabrous or sparsely hairy above. **Leaves** narrowly linear, with small, appressed teeth and often with larger teeth or short lobes towards base, lamina sometimes very short. **Flowers** usually racemose, rarely solitary and axillary on an often flexuose inflorescence. **Corolla** 8–9(–12) mm long. **Flowering time** Feb.–May. Grassveld, damp soil, hillsides, alt. 30–800 m; Albany Thicket, Eastern Fynbos-Renosterveld (Albany, Port Elizabeth).

1b Plant twining
9a Corolla tubular, ± equally 5-lobed
10a Anthers hairy on the back

tysonii E.Phillips

Perennial herb, root bulbous, stem twining, sparsely leafy, up to 0.4 m long or longer, glabrous. **Leaves** sessile, narrowly linear, 20–60 × 0.7–4.0 mm, tapering into a rigid point, margins entire or with tiny, widely separated teeth. **Flowers** in terminal, many-flowered, twining racemes. **Corolla** lilac or white, 13–18 mm long, short-tubed, at length splitting into 2 lips, glabrous outside, inside puberulous below, gradually splitting into 2 lobes. **Flowering time** Jan.–Mar. Grassland, often in moist places, alt. 1 500–1 700 m; Drakensberg Grassland, Sub-Escarpment Grassland (Naude's Neck E to Kokstad and S to Maclear).

10b Anthers glabrous on the back

rogersii S.Moore subsp. **winteri** E.Wimm.

Perennial, herbaceous climber, with stem twining, thread-like, up to 0.7 m long. **Leaves** narrowly linear, 10–40 × 1–2 mm; petioles short, glabrous. **Raceme** terminal, distinct, often secund and many flowered, rachis often puberulous. **Pedicels** 2–4 mm long, puberulous, with 2 bracteoles at base. **Calyx**: tube broadly turbinate, ± glabrous; lobes 1–2 mm long, obsoletely denticulate, spreading to reflexed. **Corolla** 9–11 mm long, pale lavender, reddish white or white; tube 4–5 mm long; lobes lanceolate, 4 mm long. **Flowering time** Jan.–Mar. Grassland, rocky grassy slopes, thicket; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Qumbu).

9b Corolla split to base into 2 lips, the upper 3-lobed, the lower consisting of 2 free petals
11a Leaves ± clearly 3–5-lobed, often resembling an ivy leaf

heterophylla (C.Presl) Eckl. & Zeyh.

Baroe (A)

Perennial herb, with stem twining, glabrous, branched, sparsely leafy, up to 0.6 m long. **Leaves** 3–5-lobed, lower leaves up to 50 × 50 mm; lobes ovate, subacute, middle lobe up to 25 × 25 mm, lateral lobes up to 11 × 11 mm, margins crenulate, rarely distinctly dentate, glabrous; petioles 4–20 mm long. **Flowers** solitary in axils of ovate-lanceolate bracts with a conspicuous basal tooth on both sides. **Corolla** white with purple stripes, 12–15 mm long, glabrous outside becoming slightly hairy towards base, 2-lipped, outer lobes lanceolate. **Stamens** 6.5–8.0 mm long; filaments pubescent; anthers hairy on back. Closed shrubland, full sun, alt. 0–150 m; Eastern Fynbos-Renosterveld, Albany Thicket (Otterford Forest Reserve E to Kowie, S to Humansdorp and Jeffreys Bay).

11b Leaf shape not as above
12a Leaves palmate-partite to pinnatifid-laciniate
13a Leaves ± divided into 3 lobes, glabrous; flowers in many-flowered racemes

triphylla E.Phillips (see 5a above)

13b Leaves divided into 3–5 entire, narrowly linear lobes; flowers solitary in axils of leaves, racemosely arranged

digitata (Thunb.) Willd. subsp. **gracilis** E.Wimm.

Aardboontjie, *barup*, *berou* (A)

Twining, glabrous, perennial herb, with stem slender, ± 1.2 m long, distantly leafy. **Leaves** petiolate, divided into 3–7 entire or obscurely toothed, narrowly linear, pointed segments 5–20 × 1 mm. **Flowers** solitary in axils of gradually diminishing leaves, racemosely arranged towards apex. **Corolla** slender, 8–14 mm long; tube slit and lips diverging; outer lobes oblong, acute. **Stamens** with all or only 2 anthers hairy on back. **Flowering time** Mar.–Nov. Sandstone and clay slopes, alt. ± 630 m; Upper Karoo, Eastern Fynbos-Renosterveld (Cradock, Willowmore, Witteberg Mts).

12b Leaves entire, not divided, sometimes with 1 or 2 long teeth or lobes above base
14a Leaves narrow: linear or lanceolate, sessile or petiolate
15a Calyx lobes denticulate

[E]maculosa E.Phillips

Perennial herb, with stem twining, terete, glabrous, sparsely leafy, ± 0.6 m long. **Leaves** lanceolate, 30–60 × 5–10 mm, gradually narrowing towards an acute apex, cuneate at base and narrowing shortly into petioles 2–6 mm long and above that (in larger leaves) on both sides with an obtuse tooth, margins further on obsoletely dentate, glabrous. **Flowers** 1–3 on a peduncle in axil of upper leaves, often without lower teeth. **Corolla** white with lilac markings, 13 mm long, 2-lipped; tube slit down sides, glabrous; lobes linear, puberulous towards base, outer ones lanceolate. **Stamens** 7.5 mm long, anthers white-hairy on back. Habitat?; Sub-Escarpment Savanna (Kentani).

15b Calyx lobes entire
16a Lowest leaves and some lower ones spathulate, the others lanceolate or linear

tortilis N.E.Br.

Perennial herb, with fleshy, ovoid, subterranean tuber 16 × 10 mm, stem twining, branched, glabrous, sparsely leafy, up to 0.6 m long. **Leaves** variable: lower ones and those on new branches spathulate or obovate-oblong (20–30 × 10 mm), narrowing into petioles ± 10 mm long at base, other leaves lanceolate (30 × 4–5 mm), narrowing into short petioles, all crenulate-denticulate, glabrous. **Flowers** solitary in axils of upper, lanceolate, deflected leaves, gradually decreasing. **Corolla** lilac, glabrous outside, pubescent inside, upper lip fenestrate towards base. **Stamens** with anthers hairy on back. **Flowering time** May. Habitat?; Albany Thicket (Albany District).

16b Leaves all similar, linear or lanceolate
17a Leaves with margins strongly revolute (rolled back) and midrib prominent below

[E]galpinii E.Wimm.

Perennial herb, with stem twining, slender, branched, sparsely leafy, up to 1.5 m long. **Leaves** sessile, lanceolate-linear to linear, 20–40 × 1.0–3.5 mm, margins entire, narrowly revolute, somewhat thickened. **Flowers** in lax, terminal, scarcely distinct, many-flowered racemes. **Corolla** 10 mm long, glabrous outside, inside puberulous on narrow part of lobes. **Stamens** with anthers hairy on back, except apical parts. **Flowering time** Oct. Habitat?, alt. 500–700 m; Sub-Escarpment Savanna (Grahamstown).

17b Leaves with margins denticulate, crenulate or entire, sometimes base with 1 or 2 long, narrow or lobe-shaped teeth
18a Leaves petiolate, elongate lanceolate-linear

sylvatica Eckl. var. **sylvatica**
Bosbaroe, *berou* (A)

Perennial herb, with large tuber, stem twining, glabrous, branched, sparsely leafy, up to 1.6 m long. **Leaves** ovate-lanceolate to linear, 30–100 × 1.5–15.0 mm, narrowing into petioles ± 5 mm long, margins with minute and often appressed and remote teeth or almost entire, rarely 2-lobed at base, glabrous. **Flowers** solitary in axils of upper leaves. **Peduncles** 1(–3)-flowered. **Corolla** white with purple or maroon spots, 7–12 mm long, glabrous outside, inside often puberulous. **Stamens** with all anthers bearded on back. **Flowering time** Feb.–Dec. Grassland, thornveld, thicket, fynbos, stony slopes, alt. 20–1 900 m; Drakensberg Grassland, Lower Karoo, Dry Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Maclear S, from Graaff-Reinet to Victoria East and from Greater Addo Elephant National Park to Port Alfred and to Humansdorp).

18b Leaves sessile
19a Calyx tube and pedicels glabrous; flowers in lax, terminal racemes
20a Leaves linear, 20–50 × 1–2; calyx lobes ovate-acuminate

[E]alicedalensis E.Wimm.

Perennial herb, with stem twining, round, glabrous, sparsely leafy. **Leaves** sessile, entire, sparsely hairy above, linear, 20–50 × 1–2 mm, apex obtuse. **Flowers** in lax, terminal racemes. **Bracts** leaf-like, 4–15 mm long, hardly longer than pedicels. **Pedicels** 4–5 mm long, with 2 finely hairy bracteoles above middle. **Calyx**: tube turbinate, sparsely hairy, 2 mm long and nearly as wide; lobes entire, 2 mm long, spreading, soon reflexed. **Corolla** 9 mm long, white?, glabrous outside, inside puberulous at base; lobes lanceolate. **Stamens** with anthers white-hairy on back. **Flowering time** Apr. Habitat?; Albany Thicket (Albany District, Alicedale).

20b Leaves very small and triangular or short-linear; calyx lobes narrowly triangular

campestris C.Presl var. **nudiuscula** E.Wimm.

Perennial herb, above middle stem twining or flexuose, 0.2–0.5 m long, often ± leafless. **Leaves** minute, triangular or small and shortly linear. **Bracts** linear, 2–8 mm long. **Pedicels** 5–8 mm long. **Calyx**: tube broadly turbinate, often puberulous at base. **Corolla** 7–8 mm long, white. **Flowering time** Feb.–Apr. Habitat?; Albany Thicket (Albany District, Port Elizabeth).

19b Calyx tube and pedicels tomentose; flowers solitary in axils of upper leaves
21a Leaves ovate-lanceolate to linear, 20–100 × 1.5–15.0 mm

sylvatica Eckl. var. **salicifolia** (C.Presl ex Eckl. & Zeyh.) E.Wimm.

Perennial herb, with large tuber, stem twining, branched, sparsely leafy, shortly hairy above or glabrous, up to 1 m long. **Leaves** sessile to subpetiolate, ovate-lanceolate, lanceolate to linear. **Flowers** solitary in axils of upper leaves. **Pedicels** slightly hairy. **Calyx** ± tomentose. **Corolla** 8–10 mm long. **Stamens** 6–7 mm long; filaments puberulous, cohering below; anthers hairy on back. **Flowering time** Jan.–July. Shrubland, scrub on slopes; Drakensberg Grassland, Albany Thicket (Hogsback, between Fort Brown and Botha's Ridge).

21b Leaves narrowly linear, 20–50 × 0.8–1.2 mm

[E]angustifolia C.Presl ex Eckl. & Zeyh.

Perennial herb, with tuberous root, stem twining, branched, glabrous or slightly pubescent, up to 3 m high. **Leaves** scattered on stem, sessile, narrowly linear, margins remotely denticulate or ± entire, glabrous or somewhat pubescent above. **Flowers** solitary in axils of upper leaves. **Calyx**: tube turbinate, hairy, rarely tomentose; lobes triangular, 1–2 mm long, entire, at first ± spreading, at length subreflexed. **Corolla** (7–)9–11 mm long, outside puberulous or ± glabrous, inside puberulous in part, split in 2 lips; outer lobes lanceolate. **Stamens** with anthers hairy on back. **Flowering time** Feb.–June. Habitat?, alt. 60–900 m; Albany Thicket (Uitenhage, Alicedale).

14b Leaves broad: oblong or broader
22a Lower leaves oblong-ovate, the others ovate-lanceolate, 30–100 × 3–35 mm

natalensis E.Phillips

Perennial, glabrous herb, with stem twining, terete, sparsely leafy, up to 1.5 m high. **Leaves** gradually long-acute at apex, base rounded to shortly cuneate, narrowing slightly into petioles 7–15 mm long, margins crenulate with appressed teeth or serrate with remote teeth often acute towards base. **Flowers** pedicellate, solitary or 2–4 on a short peduncle. **Corolla** 9–10 mm long, glabrous outside, inside puberulous towards base, split in 2 lips, at length often 5-petalled. **Stamens** with anthers hairy on back. **Flowering time** Jan.–Apr. Grassland, forest margin, forest understorey, alt. 850–2 100 m; Drakensberg Grassland (Mpofu Game Reserve, Menziesberg in Amatole Mts).

22b Leaves ovate, with one lobe or short tooth at base on both sides, 30–40 × 16–26 mm

[E]basiloba E.Wimm.

Perennial herb, with stem twining, glabrous, somewhat branched, sparsely leafy, up to 1.5 m high. **Leaves** ovate, apex acute, base nearly truncate and on both sides with an oblong obtuse lobe up to 6 mm long or a drawn-out tooth, margins flat-crenate, nerves and veins nearly flat below; petioles 4–7 mm long. **Flowers** solitary in axils of upper leaves. **Peduncles** 1- or 2-flowered, 7 mm long; pedicels ± 5 mm long, glabrous. **Corolla** 8 mm long, white?, glabrous. **Stamens** with anthers hairy on back. **Flowering time** Sept. Grassland near streams, alt. 10–675 m; Albany Thicket (Port Alfred).

GRAMMATOTHECA C.Presl

Species 1, sthn Afr., also recorded from Australia, KZN, WC, EC.

bergiana (Cham.) C.Presl var. **bergiana**

Semi-succulent, glabrous herb, 0.2–0.6 m long; stems diffuse, creeping to suberect, angular to winged, sparsely branched, rooting at lower nodes. **Leaves** sparse, obovate-oblong to linear-lanceolate, 20–50 × 2–6 mm, sessile, tip hardened and acute, margins remotely finely dentate. **Flowers** solitary, axillary, sessile. **Calyx** mauve; tube pedicel-like. **Corolla** 2-lipped, 5-lobed, bluish violet, throat white, at length entirely orange, 11 mm long; tube dorsally slit to near base; upper lobes sublinear, recurved, lower lobes ovate-acute, finely hairy towards throat and with 2 folds. **Stamens** with anther tube purple, finely hairy, anthers shortly penicillate. **Flowering time** Nov.–Mar. Moist, shady places, in and along streams often in forest; Indian Ocean Coastal Belt, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Mkambati Nature Reserve southwards, across Amatole Mts to Stutterheim, from Baviaanskloof to Southwell).

LOBELIA L.

UbuLawu (X)

Species ± 300, cosmopolitan, mostly tropics and subtropics; ± 70 in sthn Afr., widespread.

1a All anthers with a brush-like tuft of white hairs at top
2a Flowers solitary in axils of upper leaves, sometimes in a leafy or bracteate raceme towards apex
3a Leaves narrowly linear, sparse to almost absent; broom-like shrublet

linearis Thunb.

Broom-like shrublet, 0.3–0.7 m high, with many erect, ± unbranched, rugose-striate, glabrous stems arising from root. **Leaves** sparse, almost absent at flowering time, sessile, very narrowly linear, 26 × 1 mm, apex with callus, entire, flat, glabrous, spreading. **Flowers** solitary in leaf axils, racemosely arranged, glabrous. **Pedicels** 5–10 mm long, with 2 small bracts at base. **Calyx**: tube cone-shaped, 10-ribbed, minutely pubescent; lobes subulate, slightly ciliate, 2 mm long. **Corolla** dark blue to purple, pubescent, (10–)16–18 mm long; upper lobes oblong, acute, villous on back, ± 4 mm long, lower lobes ovate. **Flowering time** Sept.–June. Dry stony and rocky slopes, alt. 60–2 000 m; Rainshadow Valley Karoo (Steytlerville).

3b Leaves rounded to ovate or elliptic
4a Leaves petiolate

ardisiandroides Schltr.

Sprawling, villous, perennial herb, ± 0.1 m high, stem branched, ± cylindric, sparsely leafy. **Leaves** rounded to ovate, 12–18 × 12–22 mm, base cordate, apex obtuse, margins unequally coarsely crenate or many-angled, hirsute on both sides; petioles marginate, 3–25 mm long. **Flowers** solitary in axils of leaves. **Calyx**: tube cone-shaped; lobes subulate, 2 mm long, hirsute. **Corolla** white with mauve markings, 4 mm long, finely pilose outside towards apex; upper 2 lobes sublanceolate, erect, lower lip trifid, with 2 lines at base, lobes shorter, oblong, ciliate. **Flowering time** Nov.–Jan. Rocky, sheltered, usually shady places, alt. 900–1 220 m; Drakensberg Grassland (Rhodes District).

4b Leaves sessile or subsessile
5a Stem erect, ± 0.2 m high

[E]**decurrentifolia** (Kuntze) K.Schum.

Annual or perennial herb, with a single, erect, rigid stem ± 0.2 m high, not rooting at lower nodes. **Leaves** suborbicular, ± 30 mm long, acute, narrowly winged-decurrent, sessile, margins doubly coarsely crenate-dentate, glabrous. **Flowers** solitary, axillary. **Calyx**: tube obconical, glabrous, 3× as long as sepals; lobes 5 mm long, lanceolate, dentate. **Corolla** twice as long as calyx, blue; upper 2 lobes ovate, abruptly long-subulate at apex, 3 lower lobes oblong, obtuse. Habitat?, alt. ± 100 m; Albany Thicket (East London).

5b Stem prostrate

thermalis Thunb.

Creeping herb, up to 0.1 m high, rooting at nodes, branched, forming small clumps, sparsely hairy or ± glabrous. **Leaves** lower ones subsessile, others sessile, elliptic to oblong, 5–12 × 3–6 mm, margins serrate, somewhat succulent. **Flowers** solitary in leaf axils. **Calyx**: tube narrowly obconical, hairy, ± 4 mm long; lobes narrowly triangular, 4 mm long. **Corolla** blue, throat yellow or violet, 16–18 mm long, hairy outside; upper 2 lobes triangular-oblong, hairy on back, erect, lower lip trilobed, ± 9 mm

long, lobes obovate, finely mucronate. **Flowering time** Oct.–Apr. Dry to moist open grassveld, often near streams, alt. 360–1 920 m; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna (Aliwal North to Lady Grey District southwards, from Queenstown to Flagstaff, Graaff-Reinet to Komga and from Uitenhage to Kabouga).

2b Flowers in distinct 1- to few-flowered pedunculate racemes; peduncles axillary and/or terminal
6a Leaves linear to spathulate-linear

tomentosa L.f.

Bluebell; *iTshilizi* (X)

Dwarf shrub, with stems erect to somewhat sprawling, 0.15–0.60 m high, branching from leafy base. **Leaves** sessile or indistinctly petiolate, canaliculate, linear-lanceolate or linear, usually tomentose, 12–30 × 1–4 mm, margins rolled under, with a few distant teeth 1–2 mm long. **Flowers** in (1-)few-flowered terminal racemes; pedicels 7 mm long. **Calyx**: tube very short, semi-globose or oblique, appressed-hairy. **Corolla** slightly saccate from base, purplish blue, dark violet or pink, occasionally mauve or white, (10–)14–18 mm long, outside, at least lips, appressed-hairy; upper lobes oblanceolate, reclinate, lower lobes oblong-cuneate, lips tripartite. **Flowering time** Nov.–June, sometimes all year. Open and coastal grassland, fynbos, grassy fynbos, alt. 15–200 m; Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket, Sub-Escarpment Savanna (Mkambati Nature Reserve S to Gonubie, from Baviaanskloof to East London and to Humansdorp).

6b Leaves suborbicular, triangular, ovate or oblong
7a Calyx tube very short to almost absent

malowensis E.Wimm.

Perennial herb, 0.15–0.10 m high, with stem branched, erect, striate, sparsely hirsute or becoming glabrous. **Leaves** triangular to ovate, 30–60 × 13–36 mm, base subcordate or rounded and narrowing into a narrowly winged, 10–30 mm long petiole, margins unequally dentate or repand-denticulate. **Flowers** in a lax, secund raceme. **Calyx**: tube very shortly semi-globose or almost absent; lobes subulate, 3 mm long. **Corolla** white, sometimes tinged red, glabrous, 8 mm long; upper 2 lobes linear-lanceolate, recurved, lower lobes tripartite with 2 folds in throat, lobes oblong, 2.5 mm long. **Flowering time** Dec.–May. Moist shady places in forest or between rocks, alt. 30–1 525 m; Indigenous Forests (Griqualand East, Malowe Mtn, Mkambati Nature Reserve).

7b Calyx tube conspicuous, turbinate or subglobose
8a Leaves suborbicular, truncate or cordate

preslii A.DC.

Prostrate-ascending, perennial herb, 0.08–0.60 m high, diffuse, branched, perhaps stoloniferous; branches with horizontally spreading hairs or becoming glabrous. **Leaves** ovate-rounded, 15–20 mm long and ± as wide; petioles 20–50 mm long. **Flowers** in terminal, few-flowered racemes. **Calyx**: tube turbinate, finely appressed-hairy; lobes subulate, 2 mm long. **Corolla** blue and violet or pale violet-white, 16 mm long, pubescent inside; lobes hairy outside, 2 upper lobes lanceolate, erect-reclinate, short, lower lip tripartite, with oblong-obovate lobes. **Flowering time** Nov.–Mar. Open grassland, rocky slopes or in shelter of rocks, alt. 1 800–2 990 m; Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland (Lady Grey District E to Barkly East S, from Queenstown to Baziya Mtn and to Seymour).

8b Leaves triangular, broadly ovate or broadly spathulate
9a Leaves broadly spathulate

chamaedryfolia (C.Presl) A.DC.

Subshrub branching from base, up to 0.3 m high with stem prostrate to ascending, round, branches with narrow lines and somewhat hirsute. **Leaves** lower ones spathulate, 30 × 20 mm, upper ones gradually narrower to obovate-oblong and oblong-linear, ± 12 × 2–5 mm, margins with ovate or broadly triangular teeth, glabrous above, usually sparsely hairy below, base with short, winged, ciliate petiole. **Flowers** in lax racemes; pedicels 5–8 mm long, appressed-hairy as calyx, reflexed in fruit. **Calyx**: tube obliquely and shortly conical. **Corolla** red, 10–14 mm long; upper 2 lobes linear, erect, lower lobes obovate. **Flowering time** all year. Littoral grassland or scrub, near rivers or sometimes between rocks, alt. 350–1 525 m; Indian Ocean Coastal Belt (Port St Johns, Ndindini).

9b Leaves triangular, ovate or oblong
10a Leaves sessile or subsessile

neglecta Roem. & Schult.

Wild lobelia

Subshrub, 0.15–0.50 m high with erect, round, branched, sparsely hirsute stems, marked with narrow lines from decurrent leaves. **Leaves** ovate to oval to oblong, 5–15 × 2–8 mm, margins revolute, entire, slightly sinuate or obtusely few-toothed, subcoriaceous; sessile or with very short petioles. **Flowers** in (1-)few-flowered pedunculate racemes, sometimes axillary, sometimes terminal. **Calyx**: tube shortly hemispherical; lobes subulate, 3–4 mm long. **Corolla** violet; tube becoming whitish, appressed-pilose mainly towards apex, 12–15 mm long; upper lobes linear, erect, reclinate; lower lip tripartite, at base with 2 yellowish pleats and obovate lobes. **Flowering time** all year. Open grassland, forest and fynbos, rocky slopes, streams and riverbeds, alt. 5–1 000 m; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Dassie Krantz S to Cradock Mtn, from Baviaanskloof Mts to Grahamstown and to Humansdorp).

10b Leaves distinctly petiolate
11a Petioles slender, not winged

vanreenensis (Kuntze) K.Schum.

Many-stemmed, branched, ascending perennial, 0.2–0.6 m high with round, glabrous, distantly leafy stems. **Leaves** cordate or broadly ovate, 20–40 mm long, equally wide, margins coarsely toothed and lobed, glabrous or sparsely fine-hairy on nerves below; petioles 20–50 mm long, equally narrowly marginate, glabrous or minutely puberulous. **Flowers** in lax, terminal, few-flowered racemes. **Calyx**: tube turbinate, appressed-hairy; lobes subulate, 1.5 mm long. **Corolla** white to pale blue, yellow in mouth, 8–10 mm long, glabrous; tube slender, becoming pale; upper lobe lanceolate, recurved, 2 mm long; lower lip tripartite, with 2 spots at base, lobes obovate. **Flowering time** Dec.–May. Damp grassland, moist shady places below and between rocks, alt. 750–2 500 m; Drakensberg Grassland (Rhodes District SE to Maclear).

11b Petioles winged
12a Corolla 6–7 mm long, appressed-hairy outside

patula L.f.

Dwarf shrub, with many unbranched or remotely dichotomously branched, round, striped, glabrous stems, 0.3–0.6 m high. **Leaves** few or absent, ovate to oblong,

± 20 × 17 mm, upper ones lanceolate to linear, sharply dentate, entire above; narrowing into a cuneate-winged petiole. **Flowers** in terminal, few-flowered racemes. **Pedicels** ± 5 mm long, as calyx and corolla finely appressed-setose. **Calyx**: tube obconical; lobes subulate, 2–3 mm long, erect. **Corolla** 6–7 mm long with tube 4 mm long, becoming pale; lobes lanceolate or oblong, blue, pink or white. **Flowering time** mainly July–Dec. Moist places along streams, between rocks, in forest, alt. 275–1 220 m; Eastern Fynbos-Renosterveld (Humansdorp).

12b Corolla ± 15 mm long, glabrous

pteropoda (C.Presl) A.DC.

Perennial or annual herb, 0.1–1.0 m high, with stem erect or scrambling, branched, ± round, ribbed, glabrous. **Leaves** broadly ovate or triangular, ± 50 × 40 mm, margins lobed to very broadly toothed, veins protrude beneath; petioles ± 40–60 mm long, broadly winged. **Flowers** in terminal, few-flowered, secund racemes. **Calyx**: tube semi-globose, ± 1 × 2 mm; lobes subulate, spreading to geniculate-subrecurved, 3–4 mm long. **Corolla** white, purplish or pale violet, with 2 crests and yellow in mouth, glabrous, ± 16 mm long; 2 upper lobes oblanceolate, lower lobes obovate. **Flowering time** mainly Dec.–Mar. Moist, shady places below and between rocks, near streams, sometimes on grassy slopes, alt. 15–1 200 m; Indigenous Forests, Indian Ocean Coastal Belt (Ntsubane Forest, Port St Johns).

1b Only the lower 2 anthers with a brush-like tuft of hairs at top, the upper 3 anthers with sparse fine hairs or with scale-like appendages
13a Corolla distinctly 2-lipped; lips clearly unequal: 2 lobes of upper lip erect or bent downwards and smaller than 3 lobes of lower lip
14a Stems ± leafless, most leaves in a basal rosette

laxa MacOwan

Perennial, ± glabrous herb, with stem erect, leafless or slightly leafy, 0.3–0.4 m long. **Leaves** mostly in a rosette, spathulate or obovate-oblong, 20–50 × 10–20 mm; cauline leaves lanceolate or oblanceolate or linear, 30–60 × 2–8 mm, all narrowing into a 5–15 mm long petiole, margins faintly crenate or dentate or very obtusely dentate. **Flowers** in a lax, secund, 5–11-flowered raceme. **Calyx**: tube oblong-obconic; lobes subulate, entire, 3 mm long. **Corolla** blue, 11–13 mm long; upper lobes sublinear, lower ones obovate-oblong. **Flowering time** Sept.–Mar. Damp grassland near rivers and in vleis, alt. 1 200–1 800 m; Dry Highveld Grassland (Molteno).

14b Stems leafy, except below inflorescence
15a Stems and branches broadly winged

anceps L.f.

Swamp lobelia

Erect to sprawling, much-branched, perennial herb, up to 0.5 m high, stems winged, glabrous, rooting at lower nodes. **Leaves** glabrous, petiolate to subsessile, slightly fleshy, linear to oblanceolate to very broadly spathulate, 15–80 × 5–20 mm, margins slightly wavy, denticulate or dentate. **Flowers** in lax, many-flowered racemes; pedicels glabrous, 5–10 mm long. **Calyx**: tube obconical to obovoid, glabrous; lobes entire, glabrous, 2–3 mm long. **Corolla** 8–10(–15) mm long, blue or violet, slit up to ± 0.5 mm from base. **Flowering time** all year. Wet soil, swamps and vleis, forest and forest margins, alt. 5–1 500 m; Sub-Escarpment Grassland, Indigenous Forests, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket, Sub-Escarpment Savanna (Cintsa West E to Mkambati Nature Reserve southwards, from Bathurst to Gonubie, Zuurberg to East London and from Tsitsikamma to Humansdorp).

15b Stems and branches angular or round to very narrowly winged at top
16a Stems prostrate, usually rooting at nodes

galpinii Schltr.

Small, ± glabrous annual, with stems prostrate and rooting. **Leaves** spathulate, 5–7 × 3–5 mm, narrowing into a marginate petiole 4 mm long, apex obtuse, margins subentire. **Flowers** solitary in leaf axils. **Pedicels** 5 mm long. **Calyx**: tube semi-globose; lobes ovate, acute, 1.5 mm long. **Corolla** bluish red, throat with 2 swellings, becoming yellowish, glabrous, ± 8 mm long; upper lobes sublanceolate, lower lobes oblong-elliptic. **Flowering time** Dec.–Mar. Moist to wet marshy places, alt. up to 3 230 m; Drakensberg Grassland (Naude's Neck Pass).

16b Stems decumbent to ascending or erect, not rooting at nodes
17a Corolla < 10 mm long; calyx lobes ± 2 mm long, entire, glabrous
18a Flowers solitary in leaf axils; leaves spathulate and cuneate

dregeana (C.Presl) A.DC.

Completely glabrous annual, with ascending or erect stems ± leafy, up to 0.4 m high. **Leaves** spathulate and cuneate, 5–20 × 3–8 mm, mostly dentate towards tip, obtuse or acute; petioles absent to short. **Flowers** solitary in leaf axils, arranged in racemes; pedicels 7–12 mm long. **Calyx**: tube broadly turbinate or almost hemispherical; lobes triangular, fairly acute, entire, 2 mm long. **Corolla** 8 mm long; tube pale, limb blue, base with yellowish spots; upper lobes narrowly lanceolate, lower lobes oblong. **Flowering time** Sept.–Dec. Next to or in shallow water, alt. 180–2 560 m; Drakensberg Grassland, Dry Highveld Grassland, Upper Karoo (Dordrecht S, from Wapadsberg to Barkly Pass and SW to Koudeveldberge).

18b Flowers in lax racemes; leaves rotund-ovate (basal) to lanceolate

erinus L.

Wild lobelia, edging lobelia; *mahlo-a-konyana*, *napjane-ea-phiri*, *tsoinyane* (SS); *impenjana*, *incamathela*, *isidala esiluhlaza* (Z)

Annual or perennial herb, 0.05–0.85 m high; stems ± erect or ascending, angular, branched, somewhat hairy at base. **Leaves** lower ones rotund-ovate, spathulate or obovate-oblong, ± 10 × 4–8 mm, margins mostly crenulate- or repand-dentate, other leaves narrower to lanceolate, acute, subsessile, margins acutely dentate, glabrous. **Flowers** in lax racemes; pedicels 10–20 mm long. **Calyx**: tube obconical; lobes subulate, entire, glabrous, 2 mm long. **Corolla** blue, with white or blue markings, 2 swellings in throat, 8–9 mm long. **Flowering time** all year. Grassland, forest glades, streambanks, alt. 2–2 500 m; Drakensberg Grassland, Indigenous Forests, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Barkly East to Insizwa southwards, from Indwe to Port St Johns, Katberg Mtn to Dwessa Forest Reserve, Baviaanskloof to East London and from Storms River to Humansdorp).

17b Corolla > 10 mm long; calyx lobes 3–7 mm long, entire or with few teeth
19a Stem narrowly winged; leaves ovate-lanceolate; calyx lobes 3–5 mm long with 1 or 2 hard teeth on either side

flaccida (C.Presl) A.DC. subsp. **flaccida**

Wild lobelia; *motlapa-tsoinyane* (SS); *itshilizi*, *ubulawu* (X); *isidala esiluhlaza* (Z)

Annual or perennial herb, 0.15–1.00 m high; stems weak, distantly leafy, decumbent to ascending, angled, narrowly winged, glabrous or sparsely hirsute. **Leaves** lanceolate

to ovate, 20–70 × 2–10 mm, margins remotely dentate, mostly glabrous; petioles short. **Flowers** laxly racemose. **Calyx**: tube oblong-obconical; lobes sublinear, acute, 3–5 mm long, with 1(2) strong, hardened teeth on both sides. **Corolla** deep blue, mauve or whitish, white-spotted and with 2 pleats towards throat, up to 15 mm long, glabrous; upper lobes lanceolate, lower lobes elliptic or subobovate. **Flowering time** Oct.–May. Moist, semi-shady places in grassland, alt. up to 3 230 m; widespread in all bioregions, excluding drier parts as Upper Karoo, Lower Karoo, Rainshadow Valley Karoo (Naude's Neck Pass S, from Queenstown to Msikaba River Mouth, Mountain Zebra National Park to Kei River Mouth and from Patensie to East London).

19b Stem round; leaves rotund-ovate; calyx lobes 7 mm long, entire

cuneifolia Link & Otto var. **cuneifolia**

Perennial herb, up to 0.4 m high, with stems decumbent-ascending, glabrous or sparsely hairy, branches nearly glabrous. **Leaves** all petiolate, rotund-ovate and ovate, 20–30 × 20–24 mm, base subcordate or cuneate, margins sinuate- to crenulate-dentate, glabrous or sparsely pubescent; narrowing into petioles. **Flowers**: lower ones solitary in leaf axils, in racemes above. **Calyx** oblong-obconical; lobes linear-subulate, 7 mm long, glabrous. **Corolla** 16–20 mm long, pale blue to white, faintly blue-spotted in throat and punctate in tube; upper lobes narrowly lanceolate, lower lobes oblong. **Flowering time** Sept.–Jan. (Apr.). Meadows near streams or in forest clearings, alt. 5–500 m; Albany Thicket, Eastern Fynbos-Renosterveld (Somerset East S to Humansdorp).

13b Corolla indistinctly 2-lipped; lips ± similar
20a Corolla 1–2 mm long; leaves lanceolate

[E]zwartkopensis E.Wimm.

Glabrous, prostrate herb, 0.03–0.10 m high, with stems ascending, rooting below, sparsely leafy. **Leaves** sessile, lanceolate, acute, slightly narrowed at base, ± 5 × 2 mm, margins absolutely entire. **Flowers** solitary in axils of upper leaves, minute; pedicels up to 5 mm long, ± as long as leaves. **Calyx**: tube semi-globose, scarcely 1 mm long and wide. **Corolla** white or blue, 1.5 mm long; petals lanceolate, free. **Staminal tube** 0.5 mm long, glabrous, 2 lower anthers with 2 awns at base. Swamps, near stagnant water, alt. up to 370 m; Albany Thicket (Uitenhage).

20b Corolla 3–5 mm long; leaves ovate or obovate-elliptic

angolensis Engl. & Diels

Glabrous annual or perennial herb, 0.05–0.10 m high with stems decumbent, branched, with ascending branches, leafy. **Leaves** linear to ovate or obovate-elliptic, 4–15 × 2–6 mm, margins entire; narrowing into very short petioles at base. **Flowers** solitary in leaf axils, crowded corymb-like at top of branches; pedicels 6–12 mm long. **Calyx**: tube obliquely turbinate, slightly swollen in lower part. **Corolla** violet, 2.5–5.0 mm long; upper lobes free, 3 lower lobes fused into a trifid lip, all linear-lanceolate. **Flowering time** Aug.–Feb. Along streams, around swamps and pools, in vleis, alt. 20–2 500 m; Dry Highveld Grassland, Sub-Escarpment Savanna, Sub-Escarpment Grassland, Drakensberg Grassland (Bethulie E to Insizwa S, from Queenstown to Ugie and to Cathcart).

MONOPSIS Salisb.

Species ± 20, Africa; 18 in sthn Afr., widespread.

M. simplex (L.) E.Wimm. said to be naturalised in Australia.

1a Flowers blue, purple or white to pale mauve, sometimes brownish
2a Flowers white to pale mauve

alba Phillipson

Perennial herb, almost glabrous or ± scabrous due to patent recurved hairs, with many prostrate to decumbent, weak, much-branched, angular stems up to 0.1 m long, sometimes rooting from lower nodes. **Leaves** usually subopposite, ovate to elliptic, up to 12(–20) × 4(–6) mm but mostly < 10 mm long, serrate with (0)1–3(4) teeth, surface, margins and midrib prominent below, scabrous; petioles up to 1 mm long. **Flowers** apparently solitary in leaf axils or only a single one; pedicels scabrous, straight, 10–40 mm long; corolla 5–7(–9) mm long, white to pale mauve with violet and yellow markings in throat. **Flowering time** Oct.–Feb. Damp, shady places, often beneath S-facing cliffs, alt. 600–2 000 m; Eastern Fynbos-Renosterveld (Groot-Winterhoek Mts, Cockscomb).

2b Flowers blue or purple, sometimes brownish
3a Flowers with pedicel twisted so that upper lip is 2-lobed

decipiens (Sond.) Thulin

Butterfly lobelia/monopsis; *skoenlapperplant* (A); *isidala somkhuhlane* (Z)

Perennial, slender, erect or ascending herb, up to 0.6 m high, with creeping rhizome, stem sparsely branched, ribbed, ± pubescent with upturned hairs. **Leaves** alternate, sessile, linear, up to 8–15(–25) × 0.8–1.5 mm, tip acute, roughly hairy on margins and midrib underneath, entire or rarely with a pair of small teeth. **Flowers** solitary, axillary or apparently terminal; pedicels 15–55 mm long; corolla 10–18 mm long, blue or blue and purple with 2 yellow markings on lower lip, sometimes ± brownish. **Flowering time** Oct.–Apr. Open grassland, usually in poorly drained, often moist areas such as vleis, alt. 50–2 225 m; Sub-Escarpment Grassland, Drakensberg Grassland (Clydesdale to Kokstad SW, from Dordrecht to Cala and across Amatole Mts to Stutterheim).

3b Flowers with pedicel not twisted, and upper lip therefore 3-lobed
4a Leaves ± opposite; plant rough to the touch

stellarioides (C.Presl) Urb.

Sticky-leaved monopsis; *inamathela* (Z)

Annual or perennial, prostrate herb, up to 0.6 m long, often supported by other plants, rough to touch, retrorse hairs sticking to clothing; stems weak, stoloniferous, square in cross section, often rooting at lower nodes. **Leaves** opposite, subsessile, linear to elliptic, up to 10–35 × 2–9 mm, margins thickened, slightly revolute, crenate or serrate. **Flowers** solitary, axillary, scattered on stem; pedicels scabrous, deflexed after anthesis, 8–35 mm long; corolla 7–12 mm long, purple or purplish blue with 2 crests in mouth. **Flowering time** Oct.–June. On poorly drained, often damp soil in grassland, among reeds, in forest, on forest margins, alt. 30–3 000 m; Sub-Escarpment Grassland, Drakensberg Grassland, Sub-Escarpment Savanna (Matatiele to Clydesdale S, from Engcobo Mtn to Port St Johns and from Somerset East to Elliotdale).

4b Leaves alternate; plant smooth to slightly rough to the touch
5a Corolla ± 6 mm long; stamens up to 5 mm long

simplex (L.) E.Wimm.

Erect, annual herb, up to 0.3 m high, with many decumbent to ascending, glabrous to scabrous stems. **Leaves** alternate, linear to narrowly elliptic, sessile with acute tip, sometimes acutely dentate in upper part to subentire, lower leaves often oblanceolate-linear

and cuneate at base, 10–30 × 1–2 mm, surface glabrous to sparsely hairy, margins and midrib scabrous. **Flowers** solitary in axils of upper leaves; pedicels straight, pubescent, up to 35 mm long; corolla bluish purple, with a darker centre, 6–10 mm long, tube 3–5 mm long, lower lobes spreading. **Flowering time** Nov.–Mar. Usually damp or shady places often on disturbed ground or forest margins, alt. 0–600 m; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Paterson District to Grahamstown S, from Storms River Forest Reserve to Humansdorp).

5b Corolla mostly > 8 mm long; stamens mostly > 5 mm long

unidentata (Dryand.) E.Wimm. subsp. **unidentata**

Wild violet

Perennial herb, with few to many, prostrate to erect, angular stems up to 0.8 m long, but usually much shorter, glabrous, very sparsely hairy or finely scabrous. **Leaves** alternate, opposite or in whorls, ± sessile, linear to broadly elliptic, usually 1- or 2(3)-dentate, 5–20(–24) × 0.5–5.0(–9.0) mm, sometimes scabrous, margins thickened below. **Flowers** in few- to many-flowered racemes; pedicels 35–100 mm long; corolla 7–14 (–16) mm long, violet to bluish purple. **Flowering time** Sept.–May. Usually moist places, forest margins, grassland, fynbos, also disturbed ground, alt. 0–400 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Drakensberg Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Storms River Gorge E to Redhouse S, from Tsitsikamma Coastal National Park to Humansdorp).

See also 6b for *M. unidentata* subsp. *intermedia* and subsp. *laevicaulis* below

1b Flowers usually mustard-yellow to brown, often with purple centre, and turning purple when withering

6a Stems decumbent to ascending-erect, scabrous

scabra (Thunb.) Urb.

Wild violet, brown lobelia

Slender, decumbent to ascending-erect, perennial herb, up to ± 0.4 m high, rough to touch with many simple or branched stems, often forming large dense patches. **Leaves** ± sessile, alternate, opposite or in whorls, 0.5–12 × 1–2 mm, lanceolate or lanceolate-linear, entire, lower ones rarely with a few teeth, margins hardened. **Flowers** solitary, axillary; pedicels 25–60 mm long; corolla orange-brown with dark purple centre, 12–15 mm long. **Flowering time** Oct.–Apr. Damp to waterlogged, open, often disturbed grassland, eastern half of EC, alt. 0–1 800 m; Sub-Escarpment Grassland, Indian Ocean Coastal Belt, Indigenous Forests, Drakensberg Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Queenstown E to Mkambati Nature Reserve S, from Katberg Pass to Idutywa and from Uitenhage to East London).

6b Stems erect to ascending, rooting at lower nodes, smooth to slightly scabrous

[E]**unidentata** (Dryand.) E.Wimm. subsp. **intermedia** Phillipson

Wild brown violet

Perennial, erect to ascending, robust or slender herb, up to 0.75 m high, smooth to somewhat rough to touch. **Leaves** alternate, opposite or in whorls, ± sessile, lower leaves suborbicular or obovate to lanceolate, acute, upper leaves usually lanceolate or linear, 8–20 × 1–2(–5) mm, margins hardened and entire or rarely 1- or 2-toothed. **Flowers** solitary, axillary, sometimes only one; pedicels 20–80 mm long; corolla mustard-orange, brown-

ish yellow, often with deep purple centre, 10–14 mm long. **Flowering time** Sept.–Apr. Moist to well-drained, often disturbed grassland, damp depressions and pond margins; Drakensberg Grassland, Indian Ocean Coastal Belt, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (Queenstown E to Coffee Bay S, from Alice to Gonubie, Swartkops River to East London and to Humansdorp).

E unidentata (Dryand.) E.Wimm. subsp. **laevicaulis** (C.Presl) Phillipson

Style and capsule like subsp. *intermedia*, but corolla sometimes greyish purple. **Stems** robust strongly ascending or erect, 2–3 mm thick. **Leaves** dense, sub-whorled, linear, entire 15–20 × 1 mm; surfaces and midrib glabrous. **Inflorescences** many-flowered. **Flowering time** Oct.–May. Moist Grassland, marshes; Indian Ocean Coastal Belt (Bizana District, Lusikisiki to Port St Johns).

PRISMATOCARPUS L'Hér.

Species 30, endemic to sthn Afr., NC, WC, EC.

campanuloides (L.f.) Sond.

Shrublet, erect or sprawling, 0.2–0.8 m high. **Leaves** alternate, linear or linear-lanceolate, flat or revolute, ciliate or toothed. **Flowers** white or tinged with pink or violet, sessile, solitary in upper axils, crowded at branch tips. **Hypanthium** elongated, pedicel-like. **Flowering time** Dec.–Apr. Dry mountain slopes and flats; Albany Thicket, Eastern Fynbos-Renosterveld (Somerset East, Uitenhage to East London).

ROELLA L.

Species 24, endemic to sthn Afr., KZN, NC, WC, EC.

glomerata A.DC.

Shrublet, erect, 0.3–0.6 m high. **Leaves** linear, ciliate or toothed, axillary clusters of smaller glabrous leaves often present. **Flowers** white, pale blue or pinkish, in dense heads at branch tips. **Hypanthium** glabrous. **Flowering time** Jan., Feb. Coastal sandy flats and grassland; Indian Ocean Coastal Belt, Albany Thicket (East London to KZN Border).

secunda H.Buek

Shrublet, prostrate or sprawling with many short, often secund branches, 0.1–0.5 m high. **Leaves** ± squarrose, flat, ciliate, axillary clusters of smaller glabrous leaves present. **Flowers** white, solitary or in terminal heads, heads sometimes grouped. **Hypanthium** hairy. **Flowering time** Dec.–Mar. Dry sandy or stony slopes; Eastern Fynbos-Renosterveld (Joubertina to Uitenhage).

spicata L.f.

Shrublet, erect or diffuse, 0.2–0.4 m high. **Leaves** linear, crowded, axillary clusters of smaller glabrous leaves often present. **Flowers** white in terminal or lateral heads aggregated into a spike-like inflorescence. **Hypanthium** hairy. **Flowering time** Jan.–Mar. Rocky mountain slopes; Eastern Fynbos-Renosterveld (Jeffreys Bay to Port Elizabeth).

WAHLENBERGIA Schrad. ex Roth

(= *LIGHTFOOTIA* L'Hér., *THEILERA* E.Phillips)

Species ± 269, mainly southern hemisphere; ± 170 in sthn Afr., widespread.

1a Flowers hypocrateriform

[E]robusta (A.DC.) Sond.

Manning & Goldblatt (2012)

[= *Lightfootia robusta* A.DC., *Theilera capensis* D.Y.Hong, *T. robusta* (A.DC.) Cupido]

Shrublet, diffuse, spinescent, up to 0.3 m high. **Leaves** alternate, scale-like, deltoid-ovate, inconspicuous, cluster of oblong leaves present in axils of scale-like leaves. **Flowers** light blue-mauve, pedicellate, solitary or paired in axils. **Corolla** narrowly tubular with spreading lobes. **Filaments** dilated, ciliate. **Flowering time** Feb.–July. Shallow loamy soils on sandstone boulders; Rainshadow Valley Karoo (Willowmore to Steytlerville).

1b Flowers campanulate
2a Shrublets
3a Leaves linear-ericoid or linear-lanceolate

albens (Spreng. ex A.DC.) Lammers

Shrublet, slender, much branched, 0.2–0.5 m high. **Leaves** linear-ericoid, ciliate at base, appearing greyish, axillary cluster of leaves present. **Flowers** yellow or white, in divaricate clusters. **Calyx**: lobes slightly revolute. **Flowering time** Oct.–Jan. Gentle mountain slopes and hilltops, well-drained sand, dolerite; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Aliwal North S to Grahamstown, W to Uitenhage, N to Graaff-Reinet and Middelburg).

cinerea (L.f.) Lammers

Shrublet, erect or sprawling, woolly-hairy, 0.1–0.5 m high. **Leaves** linear-lanceolate, margins revolute, sometimes toothed at base, axillary cluster of leaves present. **Flowers** white with darker reverse, solitary or groups of up to 6 in upper axils. **Calyx**: lobes leaf-like, revolute. **Flowering time** Nov.–May. Grassy fynbos, steep S-facing slopes; Albany Thicket, Eastern Fynbos-Renosterveld (Louterwater to Uitenhage).

rubens (H.Buek) Lammers

Shrublet, erect, 0.2–0.5 m high. **Leaves** often in clusters, spreading, linear-lanceolate, margins revolute, often toothed near base. **Flowers** white with darker reverse, in groups in upper axils. **Flowering time** Sept.–Mar. Arid fynbos on stony shallow soil or grassland; Dry Highveld Grassland, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Somerset East S, from Willowmore to Louterwater and Port Elizabeth).

thunbergii (Schult.) B.Nord.

[= *Wahlenbergia uitenhagensis* (H.Buek) Lammers]

Shrublet, sprawling or prostrate, 0.1–0.5 m high. **Leaves** recurved, linear-lanceolate, margins slightly revolute. **Flowers** white or blue with darker reverse, solitary in upper axils. **Flowering time** Sept.–May. Sand, stony, rocky soil, calcrete, grassland or open shrubland, roadsides; Dry Highland Grassland, Eastern Fynbos-Renosterveld, Albany Thicket, Sub-Escarpment Savanna (Somerset East, Humansdorp to Mthatha).

unidentata (L.f.) Lammers

Shrublet, slender, erect, 0.15–0.40 m high. **Leaves** appressed-ascending, linear-lanceolate, margins revolute, toothed near base. **Flowers** white or blue, in a contracted, racemose panicle. **Flowering time** Dec.–Apr. Gravelly soil; Eastern Fynbos-Renosterveld (Joubertina to Humansdorp).

3b Leaves ovate or ovate-lanceolate

neorigida Lammers

Shrublet, erect, rigid, 0.3–0.6 m high. **Leaves** recurved, ovate-lanceolate, concave, margins thickened. **Flowers** white, blue or purple reverse, terminal, solitary or subumbellate; placentation basal. **Flowering time** Nov.–Apr. Sand, stony, rocky soil, moderate slopes, arid fynbos; Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Willowmore, Humansdorp to Uitenhage).

nodosa (H.Buek) Lammers

Muistepelkaroo (A)

Shrublet, erect or diffuse, rigid, 0.2–0.45 m high. **Leaves** recurved, ovate-lanceolate, concave, axillary clusters of leaves present. **Flowers** white, fading to yellow, in divaricately branched panicles. **Flowering time** Oct.–May. Stony, rocky soil in grassland; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Graaff-Reinet to Queenstown and Uitenhage to Grahamstown).

tenella (L.f.) Lammers

Shrublet, erect or sprawling, 0.15–0.8 m high. **Leaves** recurved, ovate, concave, margins thickened. **Flowers** white or blue, aggregated in upper axils. **Flowering time** Nov.–May. Sand or gravelly soil, moderate slopes, grassland or open woodland; Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo, Sub-Escarpment Savanna (Willowmore to Port Elizabeth, E to Alexandria, Grahamstown and Keiskammahoek).

tenerrima (H.Buek) Lammers

Shrublet, diffuse or sprawling, rarely erect, 0.2–0.5 m high. **Leaves** recurved, ovate-lanceolate, concave, margins thickened. **Flowers** blue or white, in slender pseudoracemes. **Flowering time** Oct.–May. Dry, rocky, shale-derived soils; Dry Highveld Grassland, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (Somerset East, Willowmore to Port Elizabeth).

2b Herbs, annual or perennial
4a Annuals

androsacea A.DC.

Hare-bell

Annual, erect herb, 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, white, pale blue or mauve. **Stigma**: lobes 3 with glands present below pollen-collecting hairs. **Flowering time** Sept.–Nov. Riverbanks and grassland in sandy and damp places; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Aliwal North S to Grahamstown, W to Uitenhage, N to Graaff-Reinet and Middelburg).

bowkerae Sond.

Annual, erect herb, 0.1–0.3 m high. **Leaves** scattered, linear, margins denticulate. **Flowers** funnel-shaped, terminal, solitary or in groups. Habitat?; Sub-Escarpment Grassland (Somerset East).

denudata A.DC.

Annual, slender herb, 0.15–0.35 m high. **Leaves** linear-lanceolate, margins undulate, whitish. **Flowers** blue, solitary, terminal on long peduncles. **Calyx**: lobes as long as tube,

margins revolute. **Flowering time** Dec.–Mar. Grassland, riverbanks; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Bedford District, East London to Mthatha).

kowiensis R.A.Dyer

Annual, erect herb, 0.1–0.2 m high. **Leaves** linear, serrulate. **Flowers** white or pale blue, often in cymes. **Stigma**: lobes 3. **Hypanthium** ribbed. **Flowering time** Oct.–Jan. Grassland, open woodland in sand, river mouths; Albany Thicket (Alexandria to Hamburg).

lobulata Brehmer

Annual herb, with thickened taproot, erect or sprawling, 0.05–0.15 m high. **Leaves** narrowly spathulate with axillary clusters of smaller leaves. **Flowers** pale blue or purple, pedicellate. **Calyx**: lobes with broad, rounded, basal appendages. **Ovary** 3-locular. **Flowering time** Dec.–Mar. Habitat?; Drakensberg Grassland (Barkly East).

madagascariensis A.DC.

Annual herb, prostrate or decumbent, 0.1–0.5 m high. **Leaves** opposite, sessile, elliptic to narrowly obovate, margins cartilaginous, ± undulate-crenate. **Flowers** white, in dichotomous forks or terminal, appearing lateral. **Flowering time** Jan.–Mar. Forest margins or clearings, usually in shady or moist locations; Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket (Hogsback, King William's Town, Komga to Mtentu Bridge).

E oocarpa Sond.

Annual herb, slender, erect, 0.1–0.15 m high. **Leaves** alternate or opposite below, linear, flat, entire or distinctly denticulate. **Flowers** small, in dichotomous panicles. **Flowering time** Sept.–Dec. Habitat?; Eastern Fynbos-Renosterveld (Swartkopsrivier near Port Elizabeth).

stellarioides Cham. & Schltdl.

Annual or perennial herb, erect or sprawling, 0.1–0.3 m high. **Leaves** lanceolate, margins cartilaginous and revolute. **Flowers** white or pale blue, solitary or in groups at branch tips. **Flowering time** Sept.–May. Sandy flats and grassy slopes; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Somerset East, E to Grahamstown, along coast to Mthatha, inland to Dordrecht).

4b Perennials
5a Plants erect

capillacea (L.f.) A.DC.

Perennial herb, erect, 0.15–0.50 m high. **Leaves** sessile, linear to filiform, entire or lower leaves sparsely dentate, crowded, often clustered. **Flowers** blue. **Corolla**: tube hairy inside, half length of corolla. **Stigma**: lobes without glands. **Flowering time** Jan.–July. Mountain slopes, moist areas in mist belt, streambanks; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Misgund to East London, inland to Queenstown and Maclear).

cuspidata Brehmer

Perennial or annual herb, 0.3–0.6 m high. **Leaves** sessile, half clasping stem, ovate to lanceolate, hairy, margins undulate-dentate. **Flowers** campanulate in a lax inflorescence, violet-blue, large. **Calyx**: lobes narrowly triangular, elongate, margins ± dentate. **Flowering time** Dec.–Mar. Humus-rich, moist mountain slopes, often sea-facing; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Elliot and Maclear Districts to Mthatha southwards, from Amatole Mts to Port Alfred).

[E]dentata Brehmer
Perennial or annual herb, erect, much branched near base, 0.15–0.35 m high. **Leaves** sessile, linear to lanceolate, margins thickened, dentate. **Flowers** funnel-shaped, pedicellate in a lax inflorescence. **Stigma** with 3 or 4 flattened lobes. **Flowering time** Nov.–Feb. Grassland in sand; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Mthatha, Mbashe River).

denticulata (Burch.) A.DC.
Perennial herb, decumbent and ascending, 0.10–0.45 m high. **Leaves** sessile, ± spreading, linear to linear-lanceolate, margins cartilaginous and denticulate. **Flowers** blue to white or yellow. **Corolla** deeply split into linear-lanceolate lobes, hairy inside near base. **Stigma** without glands. **Flowering time** Nov.–Mar. Mountain slopes in grassland; Upper Karoo, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Aliwal North S to Grahamstown, W to Uitenhage, N to Graaff-Reinet and Middelburg).

ecklonii H.Buek
Perennial herb, with a thickened taproot, erect or sprawling, hairy, 0.1–0.3 m high. **Leaves** opposite or alternate, linear-lanceolate, slightly hairy, margins slightly thickened, dentate, crowded towards base. **Flowers** blue, in lax cymose panicles. **Calyx**: lobes elongate. **Ovary** 5-locular. **Flowering time** Oct.–Jan. Stony, rocky soil; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Misgund to Sidbury).

fasciculata Brehmer
Moopetsane (SS)
Perennial herb, erect, slender, 0.15–0.35. **Leaves** crowded, linear, axillary cluster of leaves present. **Flowers** blue-mauve, sessile, crowded in upper axils. **Flowering time** Feb.–Apr. Mountain slopes and summits, dolerite, in grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Baziya Mtn near Mthatha to Maclear and Qacha's Neck).

grandiflora Brehmer
Umnqantula (Z)
Perennial herb, erect, robust, 0.3–0.9 m high. **Leaves** alternate, sessile, lanceolate, hairy, margins undulate. **Flowers** mauve to pale blue, on long pedicles in a lax inflorescence. **Stigma**: lobes 3 with glands present between their bases. **Flowering time** Aug., Sept. Mountain slopes, along streams in kloofs, ravines and gorges, dolerite; Sub-Escarpment Grassland, Albany Thicket (Amatole Mts, Menziesberg to East London).

huttonii (Sond.) Thulin
Moopetsane (SS)
Perennial herb or shrublet, erect, 0.10–0.45 m high. **Leaves** sessile, linear to lanceolate, entire, crowded, sometimes hairy. **Flowers** blue or mauve, in a spike-like, sometimes branched inflorescence. **Corolla** deeply split into linear lobes; tube < 1 mm long. **Flowering time** Dec.–Feb. Open grassland and savanna; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Fort Beaufort to Engcobo and Baziya Mtn, N to Mount Fletcher).

juncea (H.Buek) Lammers
Perennial herb, slender, 0.2–0.5 m high. **Leaves** crowded and larger below, scattered and smaller above, elliptic-lanceolate or oblong, margins thickened, revolute. **Flowers**

white or yellow, in a lax raceme. **Stigma**: lobes 2. **Flowering time** Dec.–Feb. Mountain slopes and plateaus, dolerite; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket (Aliwal North Queenstown S, from Graaff-Reinet to East London).

krebsii Cham.

Fairy-bellflower; *tenane* (SS)

Perennial herb, erect or procumbent, 0.1–1.0 m high. **Leaves** sessile, almost linear to oblanceolate or obovate, margins cartilaginous, undulate-dentate, crowded towards base or scattered along stem. **Flowers** blue to violet, often with dark veins, in a lax inflorescence. **Flowering time** Nov.–May. Open Grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket, Lower Karoo (Somerset East, W to Grahamstown along coast to Port St Johns and inland to Qacha's Neck).

orae Lammers

Perennial herb, erect, 0.15–0.30 m high. **Leaves** sessile, lanceolate, margins cartilaginous, ± undulate-crenate. **Flowers** solitary, pedicellate. **Corolla** campanulate. **Ovary** 2- locular. **Flowering time** Dec.–Mar. Sand dunes; Albany Thicket (Kei River Mouth, East London).

paucidentata Schinz

Perennial herb, erect, 0.3–0.6 m high. **Leaves** inconspicuous, lanceolate, widely scattered, margins cartilaginous, sparsely denticulate. **Flowers** white, blue or mauve, pedicellate, in a lax inflorescence. **Corolla** campanulate. **Stigma**: lobes 2, with glands at their bases. **Flowering time** Oct.–Feb. Mountain slopes and summits in grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Seymour to Barkly East and Mount Fletcher, E to Lusikisiki).

rivularis Diels

Perennial herb, 0.4–0.7 m high. **Leaves** elliptic to lanceolate, sparsely hairy. **Flowers** blue to mauve to almost white, in a lax inflorescence. **Flowering time** Aug., Sept. Montane grasslands and forest margins; Indigenous Forests (Hogsback).

undulata (L.f.) A.DC.

African bluebell

Perennial or annual herb, erect, 0.15–1.0 m high. **Leaves** sessile, lanceolate to linear, margins cartilaginous, ± undulate-crenate. **Flowers** campanulate, in a lax inflorescence, blue. **Stigma**: lobes 3, with glands present between their bases. **Flowering time** Oct.–Dec. Grassland, often in rocky or seasonally moist places, also roadsides, cultivated or waste ground; Upper Karoo, Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna, Indian Coastal Belt, Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld, Rainshadow Valley Karoo (widespread).

5b Plants mat-forming

polytrichifolia Schltr.

Perennial herb, mat-forming, 0.03–0.12 m high. **Leaves** linear, crowded. **Flowers** white or blue, sometimes with darker blue spots in throat, in terminal groups of 2–5 or solitary. **Flowering time** Jan.–Mar. Mountain summits in grassland; Drakensberg Grassland, Sub-Escarpment Grassland (Queenstown to Dordrecht, E to Maclear).

procumbens (Thunb.) A.DC.

Wild violet

Perennial herb, mat-forming, 0.05–0.40 m high. **Leaves** opposite, elliptic, slightly crenulate. **Flowers** white, blue or mauve, solitary in axils. **Flowering time** Nov.–Apr. Mountain ridges, forests and grassland; Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Mthatha across Amatole Mts to Clarkson and Grahamstown, from Tsitsikamma to Humansdorp).

Species excluded – poorly known or probably conspecific with one of the above:

W. congestifolia Brehmer, **W. dilatata** Brehmer, **W. galpiniae** Schltr., **W. laxiflora** (Sond.) Lammers, **W. longisquamifolia** Brehmer, **W. pseudoandrosacea** Brehmer, **W. pseudoinhambanensis** Brehmer, **W. pseudonudicaulis** Brehmer, **W. robusta** Sond. = *Theilera gutheriei* (L.Bolus) E.Phillips, **W. virgulta** Brehmer.

WIMMERELLA L.Serra, M.B.Crespo & Lammers

Species 10, sthn Afr., KZN, NC, WC, EC.

1a Leaves spathulate to linear

arabidea (C.Presl) L.Serra, M.B.Crespo & Lammers

Small, delicate annual, 0.2–0.3 m high. **Leaves** 10–30 mm long, spathulate to linear, glabrous. **Flowers** in 5–15-flowered inflorescences; corolla funnel-shaped, not slit, 6–12 mm long, blue, sometimes with a white patch in throat. **Stamens** arising from base of corolla tube; filaments connate, glabrous; anthers united into a tube. **Flowering time** Dec.–Feb. Swamps, marshy ground, alt. 195–1 390 m; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Amatole Mts, Hogsback S to Grahamstown and Humansdorp).

1b Leaves ± round or broadly heart-shaped

2a Leaves broadly heart- to kidney-shaped with dense, very short hairs

hederacea (Sond.) L.Serra, M.B.Crespo & Lammers

Small, very delicate, very finely and densely hairy, branched, decumbent annual. **Leaves** broadly heart- to kidney-shaped, on both sides densely finely hairy, 5–6 × 6–9 mm, 5–9-dentate with teeth acute to blunt; petioles ± as long as leaf blades. **Flowers** solitary, axillary; corolla 3–4 mm long, tube scarcely 2 mm long; pedicels 8–11 mm long. **Stamens** with tube 2.5 mm long; 2 lower anthers with 2 bristles at apex. **Flowering time** Feb. Moist, shady, rocky places, alt. 500–2 000 m; Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (Albany District, near Coldspring).

2b Leaves ± round, with sparse, longer hairs

pygmaea (Thunb.) L.Serra, M.B.Crespo & Lammers

Small, very delicate, branched, sparsely hairy, decumbent annual. **Leaves** ± round, on both sides sparsely hairy, 5–8 × 5–9 mm, shallowly 5–9-lobed to -dentate, lobes/teeth acute to rounded to almost absent. **Flowers** solitary, axillary; pedicels 9–25 mm long; corolla white to bluish, 6 mm long, tube narrowly cylindrical. **Stamens** with anthers glabrous, lower 2 with 2 bristles at apex. **Flowering time** Oct.–Mar. Damp, shady places such as rock shelters and forest, alt. 400–2 000 m; Eastern Fynbos-Renosterveld (near Joubertina, Great Winterhoek Mts, Cockscomb).

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CANNABACEAE

(Order Rosales)

Compiled M. Struwig

*CANNABIS L.

Species 1, with 3 varieties, probably originally from Asia and now widely cultivated and naturalised world-wide in warmer areas; B, LIM, NW, G, M, KZN, L, NC, WC, EC.

Due to its long association with man, the genus shows considerable variation in growth form, achene size and chemical content. The revisions by Wilmot-Dear (1991, 1999), considering *Cannabis* as comprising 1 very variable species with 3 infraspecific taxa, are currently accepted.

sativa L.

Hashish; *dagga* (A)

Annual herb, 1–2 m high; with simple or branched taproot, robust, stems angular, internodes often hollow; plants monoecious or dioecious. **Leaves** petiolate, membranous-chartaceous, both surfaces coarse-hairy and yellow-glandular; 3–7(–11)-foliolate, leaflets sessile, narrowly lanceolate, margins serrate-biserrate. **Male inflorescences** few- to ± 20-flowered, ± 200(–300) mm long; pedicellate; perianth lobes appressed-pubescent outside. **Female inflorescences** few-flowered, green. **Fruit** uniformly coloured, pale, prominent reticulate pattern of venation; if persistent perianth present, shiny, brownish or greyish, mottled with light and dark marbled pattern, venation visible beneath. Abandoned or cultivated land; Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Albany Thicket, Sub-Escarpment Grassland (Komga District E to Kentani District and SW to Grahamstown).

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CAPPARACEAE

(Order Brassicales)

Compiled by M. Struwig

1a Androphore elongated, longer than sepals..... **Cadaba**
1b Androphore short, not as long as sepals:
2a Receptacle or calyx not tubular:

3a Branches with stipulate spines; sepals imbricate, orbicular, rarely ovate ..... **Capparis**
3b Branches without spines; sepals valvate, lanceolate ..... **Boscia**
2b Receptacle or calyx tubular:
4a Flowers in abbreviated racemes on old wood; calyx lobes not or scarcely spreading; androphore very short; disc absent ..... **Bachmannia**
4b Flowers solitary, fascicled or in terminal racemes or corymbs; sepals spreading; androphore ± equalling the receptacle; disc present ..... **Maerua**

BACHMANNIA Pax

Species 1, Mozambique and sthn Afr., KZN, EC.

woodii (Oliv.) Gilg

Four-finger bush; *viervingerbos* (A); *umtswantswantsa* (X)

Tree, shrub or climber, 1–3 m high, bark often conspicuously lenticellate. **Leaves** stipulate, glabrous, coriaceous; digitately 3- or 4-foliolate; leaflets elliptic or obovate. **Flowers** cauliflorous, pink to pale mauve, 2–6 in abbreviated racemes. **Calyx**: tube campanulate; lobes 4 or 5, oblong. **Petals** absent. **Stamens** 13–18, on a short torus; filaments terete; anthers oblong. **Ovary** on a long, terete gynophore, ellipsoid, ± 7 ovules; style absent; stigma capitate. **Fruit** subglobose to ovoid. **Seeds** ovoid, compressed. Stony soil or rocky, humus-rich soil or loam, sandstone, well drained, light shaded; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Mkambati Nature Reserve District).

BOSCIA Lam.

Species 37, throughout Africa and 1 in Arabian Peninsula; 9 in sthn Afr., widespread.

[E]**oleoides** (Burch. ex DC.) Toelken

Karoo shepherd tree; *karoo-witgat* (A); *umgqomo-gqomo* (X)

Tree, 2–4 m high, branches ridged when young, yellowish, glabrous. **Leaves** alternate, yellowish green, glabrous, slightly shiny, oblanceolate to elliptic, pointed or emarginate, mucronate, cuneate at base; petioles grooved above, glabrous. **Inflorescence** terminal racemes. **Bracts** lanceolate, usually 3-partite. **Sepals** obovate-elliptic, glabrous with hairs on margins. **Petals** 2–4, spathulate, slightly fleshy, caducous. **Stamens** 4–6. **Ovary** elongate-ovoid, 12 ovules. **Flowering time** June–Nov. **Fruit** a spherical berry, glabrous. **Seeds** usually 1 or 2. Stony soil or rocky, sand, well drained; Sub-Escarpment Savanna, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Dry Highveld Grassland, Upper Karoo, Eastern Fynbos-Renosterveld, Indigenous Forests, Rainshadow Valley Karoo (Mount Frere SW through Queenstown to Willowmore District and E to Port Alfred).

CADABA Forssk.

Species 30, Old World tropics including Arabian Peninsula, India, Australia, Madagascar and islands of the Indian Ocean; 4 in sthn Afr., widespread.

Leaves absent; stamens 8

aphylla (Thunb.) Wild

Leafless worm bush; *swartstorm* (A); *usitorhom* (X)

Tree or shrub, 1–3 m high, leafless, branches somewhat weak, dark green often with purple bloom, glabrous. **Leaves** present only on seedlings and very young branches; alternate, subsessile, green, thin, drying leathery, glabrous, oblong. **Flowers** corymbose or racemose, pedicellate. **Sepals** 4, yellowish green, orange or dark red, free, decussate. **Petals** absent. **Stamens** usually 8. **Ovary** cylindric. **Flowering time** all year.

Fruit cylindric, verrucose, glabrous to glandular. **Seeds** embedded in a powdery matrix, reniform, with verrucose, black to brown testa. Stony soil or rocky, clay, loam, sand, well drained; Dry Highveld Grassland, Upper Karoo, Lower Karoo, Albany Thicket, Sub-Escarpment Savanna, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Indigenous Forests (Middelburg District S to Port Elizabeth and SE to King William's Town).

Leaves normally present; stamens 5 or 6

natalensis Sond.

Green-leaved worm bush; *groenblaar-wurmbos* (A); *amangwe-amnyama* (Z)

Tree or shrub, 1–4 m high, branches flexible, grey to yellow brown, lenticels white, prominent; glabrous or hairy. **Leaves** alternate or crowded on side shoots, petiolate, dark green, thin, drying papery, pubescent, elliptic to obovate. **Flowers** solitary, corymbose or racemose, pedicellate. **Sepals** 4, pale mauve or purple-flushed, free, glabrous to pubescent, margins of inner sepals pubescent. **Petals** absent. **Stamens** usually 5. **Ovary** cylindric. **Fruit** cylindrical, verrucose, glabrous to pubescent. **Seeds** embedded in a scarlet powdery matrix, reniform; verrucose black to brown testa. Roadside; Albany Thicket (Grahamstown District, Trumpeter's Drift to Committees Drift).

CAPPARIS L.

Species ± 250, widespread in the tropical and subtropical areas of the world; 5 in sthn Afr., widespread.

1a Inflorescence corymbose to umbellate
2a Sepals tomentose; fruit 30–50 mm in diam.

tomentosa Lam.

Woolly caper bush; *wollerige kapperbos* (A); *intshihlo* (X); *iqwaningi* (Z)

Tree, shrub, climber or scrambler, 1–15 m high; robust plant, branches yellow, tomentose; spines recurved, tomentose. **Leaves** alternate, spirally arranged, petiolate, pubescent, glabrous on upper surface, oblong to broadly elliptic, emarginate, mucronulate. **Inflorescence** terminal corymbose. **Sepals** orbicular; outer ones often fused for 1–2 mm; inner ones free, broadly obovate, puberulous to glabrous, margins crisped or serrulate. **Stamens** 45–60. **Ovary** ovoid. **Fruit** a spherical berry, glabrous, brownish or yellowish. **Seeds** many, embedded in a pink flesh. Soil, gravel, well drained, full sun; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Port St Johns District S to Uitenhage District).

2b Sepals glabrous or with ciliate margins; fruit up to 20 mm in diam.
3a Stigma capitate; leaves at least 3× longer than wide

brassii DC.

Climber or scrambler, 0.3–5.0 m high; branches long, slender, pubescent, becoming glabrous; spines glabrous, recurved. **Leaves** alternate, spirally arranged, puberulous to glabrous; narrowly elliptic or elliptic-lanceolate, bluntly pointed, often emarginate, margins undulate or crisped; petioles pubescent. **Inflorescence** axillary corymbs, pedicellate. **Sepals** broadly obovate, glabrous. **Petals** obovate to oblong, slightly falcate. **Stamens** 20–30 in male flowers, ± 10 in bisexual flowers. **Ovary** ovoid. **Fruit** a spherical berry, orange-brown, glabrous. Habitat?; Albany Thicket, Sub-Escarpment Savanna (King William's Town, Mount Coke).

3b Stigma not capitate; leaves < 3× longer than wide

sepiaria L.

Shrub, climber or scrambler, height variable; branches with white spreading hairs to glabrous, thorns recurved, pubescent, becoming glabrous. **Leaves** alternate, spirally arranged; petiolate; glabrous to hairy especially on lower surface; lanceolate, elliptic or oblong, margins revolute. **Inflorescence** terminal, corymbose to subumbellate, pedicellate. **Sepals** orbicular to obovate, outer ones broader than inner ones, glabrous, margins sometimes ciliate. **Petals** oblong, obovate, hairy within, villose at base. **Stamens** 30–50. **Ovary** ovoid. **Flowering time** Sept.–Dec. **Fruit** a spherical berry, glabrous, soft, purplish black. Stony soil or rocky, sand, clay, loam, sandstone, light shade to full sun, well drained; Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket, Dry Highveld Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt, Indigenous Forests, Lower Karoo (Queenstown S to Port Elizabeth W through Somerset East and E through King William's Town).

1b Inflorescence racemose or raceme-like

fascicularis DC.

Climber or scrambler, height variable; branches long, slender, pubescent, becoming glabrous; spines recurved. **Leaves** alternate, spirally arranged, petiolate, puberulous to glabrous, narrowly elliptic or elliptic-lanceolate, bluntly pointed, often emarginate, margins undulate or crisped. **Inflorescence** axillary corymbs, pedicellate. **Sepals** broadly obovate, glabrous. **Petals** obovate to oblong, slightly falcate. **Stamens** 20–30 in male flowers, ± 10 in bisexual flowers; filaments often with long hairs. **Ovary** ovoid; stigma papillose, capitate, almost sessile. **Flowering time** all year. **Fruit** a spherical berry, orange-brown, glabrous. Soil, sand; Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (King William's Town District S through Bathurst to Port Elizabeth).

MAERUA Forssk.

Species ± 100, tropical Asia, India and Africa; 11 in sthn Afr., widespread.

1a Leaves 3–5-foliate, if also simple, then petioles jointed at base
2a Leaflets linear to narrowly elliptic

rosmarinoides (Sond.) Gilg & Gilg-Ben.

Needle-leaved spider bush; *naaldblaar-witbos* (A); *untswantswane* (Z)

Tree or shrub, 0.5–5.0 m high, much branched. **Leaves** petiolate, glabrous; (1)3(–5)-foliate, leaflets linear, middle leaflet longer than laterals, margins revolute, apex prominently mucronate. **Inflorescence** terminal, corymbose racemes, few-flowered, on short side branches, pedicellate. **Receptacle** cylindrical, smooth or faintly ribbed; disc lobed. **Sepals** 4, elliptic, margins ciliate. **Petals** 4, ovate to broadly ovate, clawed at base. **Stamens** 10–30. **Ovary** oblong. **Fruit** ellipsoid-cylindrical, colliculate. **Seeds** several, subglobose, brown. Habitat?; Sub-Escarpment Savanna, Sub-Escarpment Grassland, Indigenous Forests (Lusikisiki District, Msikaba Drift).

2b Leaflets elliptic, broadly elliptic, ovate or obovate

cafra (DC.) Pax

Spider bush; *witbos* (A); *umphunzisa* (X); *untswantswane* (Z)

Tree or shrub, 1.5–9.0 m high; bark white, mottled; younger branches yellowish or grey-green, lenticels conspicuous. **Leaves** petiolate, chartaceous to coriaceous, glabrous;

3(–5)-foliate, leaflets elliptic or obovate, median leaflet longer than laterals. **Inflorescence** terminal corymbs, 3–12 flowered, pedicellate. **Receptacle** infundibular, margins entire or scalloped. **Sepals** 4, ovate, margins ciliate. **Petals** absent. **Stamens** 30–45. **Ovary** ellipsoid to oblong. **Flowering time** May–Dec. **Fruit** oblong-ellipsoid, smooth to faintly colliculate. **Seeds** subglobose, verrucose. Stony soil or rocky, loam, gravel, sand, sandstone, well drained, full sun; Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt, Indigenous Forests, Lower Karoo (Komga S to Port Elizabeth and SW to Baviaanskloof District).

1b Leaves always simple
3a Fruit globose or ellipsoid

racemulosa (A.DC.) Gilg & Gilg-Ben.

Forest spider bush; *witboshout* (A); *umphunziza* (X); *imphunziso* (Z)

Tree, shrub or climber, 0.8–6.0 m high; bark pale grey; younger branches brown or green, older branches dark grey. **Leaves** petiolate, alternate, chartaceous, glabrous, narrowly elliptic, elliptic or obovate. **Inflorescence** axillary racemes, 4–8-flowered, pedicellate. **Receptacle** cylindrical, smooth or slightly ribbed, margins entire or scalloped. **Sepals** 4, obovate-spathulate, margins irregularly crenulate, occasionally entire. **Petals** absent. **Stamens** 15–30. **Ovary** broadly ellipsoid-globose. **Flowering time** Apr.–Aug. **Fruit** globose, smooth to colliculate. **Seeds** 3–5, reniform, crustaceous, smooth. Stony soil or rocky, clay, loam, gravel, sand, sandstone, well drained, full sun; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Eastern Fynbos-Renosterveld, Albany Thicket (Lusikisiki District SW to Port Elizabeth).

3b Fruit cylindric, torulose or moniliform

angolensis DC.

Bead-bean; *knopiesboontjie* (A); *umenwayo* (Z)

Tree or shrub, 3–10 m high; erect, young branches ochraceous-buff-coloured; lenticels conspicuous, white or cream-coloured; glabrous. **Leaves** petiolate, softly chartaceous, glabrous, rarely puberulous; elliptic or ovate, margins entire. **Inflorescence** corymbose raceme, short, terminal or on short, lateral branches, pedicellate. **Receptacle** cylindrical, slender, ribbed, glabrous, rarely puberulous; disc coronate, unequally laciniate. **Sepals** elliptic or ovate, glabrous or puberulous. **Petals** absent. **Stamens** 40–60. **Ovary** cylindrical. **Fruit** moniliform, faintly colliculate. **Seeds** globose, smooth, beige. Stony soil or rocky; Sub-Escarpment Savanna (Bizana District).

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CARYOPHYLLACEAE

(Order Caryophyllales)

Compiled by C.L. Bredenkamp

1a Leaves with stipules; petals absent or small; styles at least partly fused:
2a Leaves alternate ..... **Corrigiola**
2b Leaves opposite:
3a Fruit a nutlet:
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; stipules sometimes large ..... **Herniaria**
3b Fruit a capsule:
5a Leaves linear to filiform; plants often glandular-viscid:
6a Leaves pseudoverticillate; petals white; stipules 4 per node; styles (3)5 ..... ***Spergula**
6b Leaves decussate; petals white or pink; stipules 2, connate and sheathing the node; styles 3(5) ..... **Spergularia**
5b Leaves broader than above; plants usually not glandular-viscid:
7a Petals 2–4-lobed or partite; leaves ovate, 3–7-nerved from base ..... **Drymaria**
7b Petals entire, emarginate or dentate; leaves rarely ovate, 1-nerved at base ..... **Polycarpon**
1b Leaves without stipules; petals often conspicuous, rarely absent or minute (**Scleranthus*); styles free:
8a Sepals free or only basally connate; petals and stamens basally free; petal venation mostly open or semi-closed; episepalous stamens often with a nectary gland at abaxial base:
9a Fruit a nutlet; perianth becoming crustaceous with age ..... ***Scleranthus**
9b Fruit a capsule; perianth not becoming crustaceous with age:
10a Stamens 5; styles (2)3 ..... ***Stellaria**
10b Stamens 10; styles (4)5 ..... **Cerastium**
8b Sepals connate, often for most of their length; petals mostly clawed, petals and stamens basally ± connate; petal venation ± closed; abaxial base of episepalous stamens without nectary glands:
11a Calyx tube with 1–12 pairs of bracts at base ..... **Dianthus**
11b Calyx tube without bracts at base:
12a Calyx tube 5-winged; styles 2 ..... ***Vaccaria**
12b Calyx tube with 10, 20 or 30 ± prominent veins or ribs; styles 3 or 5 ..... **Silene**

CERASTIUM L.

Chickweed, mouse-ear

Species ± 100, almost cosmopolitan, many weeds, cultivated as ornamentals; 5 in sthn Afr., LIM, G, M, S, FS, KZN, L, NC, WC, EC.

*Capsule with dry valve teeth erect, divergent and with lateral margins revolute (*Orthodon *type)*

arabidis E.Mey. ex Fenzl

Annual or perennial herb, up to 0.3 m high, glandular-hairy. **Leaves** opposite, spathulate, ovate or oblong-lanceolate. **Flowers** in cymes. **Sepals** pilose and glandular-hairy, glabrous below apex. **Petals** white, mostly 1.3–2.6× longer than sepals, retracting to sepal length after anthesis. **Flowering time** Nov.–Jan. **Fruit** elongating to 1.5–2.0× as long as sepals, 12–13 × 2.7 mm. Hillsides in grassland; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland (Bethulie, E to Lady Grey, Maclear and the Alfred District).

capense Sond.

Horingblom (A)

Annual herb, up to 0.45 m high, glandular-hairy. **Leaves** opposite, obovate or oblong. **Flowers** in open cymes. **Sepals** pilose and glandular-hairy below apex. **Petals** white,

shorter than sepals, emarginate. **Flowering time** Aug.–Jan. **Fruit** elongating to 1.5–2.0× as long as sepals, 7–12 × 2 mm. Woodland, grassland, in damp, shady places, weed in gardens; Drakensberg Grassland, Sub-Escarpment Grassland, Indigenous Forests, Sub-Escarpment Savanna (from Kokstad to Barkly East and S to Port Elizabeth).

*Capsule with dry valve teeth rolled back from apex and with lateral margins not revolute (*Strephodon *type)*

indicum Wight & Arn.

Annual or perennial herb, 0.60–0.63 m high, glandular-hairy. **Leaves** lanceolate or oblong-elliptical, acute to shortly acuminate. **Flowers** solitary or in cymes. **Sepals** glandular, apex glabrescent. **Petals** white, 1.5–2.0× longer than sepals. **Flowering time** Sept.–Dec. **Fruit** ± as long as sepals, 4–6 × 3 mm. Ground cover in shade; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland (uMzimkhulu District to Amatole Mts near Hogsback).

CORRIGIOLA L.

Strapwort

Species 11, mainly Europe, Africa and Chile; 2 in sthn Afr., N, B, LIM, NW, G, M, FS, KZN, L, NC, WC, EC.

litoralis L.

Glabrous annual, 0.01–0.10 m high, stems decumbent. **Leaves** alternate, subsessile, spathulate or linear, glaucous. **Inflorescences** dense, terminal and lateral cymes. **Flowers** bisexual, small, slightly perigynous. **Sepals** 5, persistent, green, margins white. **Petals** 5, membranous, white, shorter than sepals, oval. **Stamens** 5, filaments short. **Ovary** 1-locular; ovule solitary; style short; stigmas 3, subsessile; cleistogamous. **Fruit** a trigonous nutlet. **Seeds** globose-ovoid. Along muddy lake shores, in gardens; Upper Karoo, Drakensberg Grassland, Eastern Fynbos-Renosterveld (discontinuous distribution, Oviston Nature Reserve, Dohne Reserve Station and Kraggakamma).

DIANTHUS L.

Pink

Species ± 300, Europe, Asia, especially Mediterranean, Africa; 15 in sthn Afr., B, LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

Some cultivated as ornamentals e.g. **Dianthus caryophyllus* L. and **D. chinensis* L.

1a Petal margins fimbriate or lacerate, or rarely dentate with lamina at least twice as long as wide; petal lamina generally oblong or elliptic
2a Inflorescence terminal on erect, often clustered flowering shoots, springing direct from woody base of plant

mooiensis F.N.Williams

Wild pink; *wilde-angelier* (A)

Glabrous, glaucous, caespitose herb, 0.30–0.45 m high. **Leaves of flowering shoots** linear-lanceolate, shorter than corresponding internode, 5–11-nerved; margins above lamina base thickened, smooth or sparsely denticulate with membranous teeth; sheath length ± equaling leaf width. **Inflorescences** 5–15-flowered. **Calyx** surrounded at base by 2(3) pairs of bracts. **Sepals** green-tinged, purple in upper part, united, tubular,

firm, finely striate, 5-toothed. **Petals** white or pale pink; limb lacero-fimbriate on antical margin, tapering into claw. **Flowering time** Nov.–Feb. **Fruit** a capsule. **Seeds** black. Grassland and slopes of stony hills; Drakensberg Grassland, Sub-Escarpment Grassland, Indian Ocean Coastal Belt (from Rhodes to Kokstad and Mtamvuna River).

2b Inflorescence axillary, springing from leafy shoots which are either very short so that leaves appear in rosettes or tufts, or ± elongated and then often decumbent

laingsburgensis Hooper

Slender, erect, scabrid herb, 0.08–0.30 m high. **Leaves of flowering shoots** glaucous, linear, linear-setaceous, 3- or 5-nerved; margins above lamina base entire and shortly recurved towards apex; sheath length 1.5–2.0× leaf width. **Inflorescences** 1–5-flowered. **Calyx** surrounded at base by 3 pairs of bracts. **Sepals** pale green, united, cylindrical, 15–20 mm long, membranous margins of bracts and lobes shining. **Petals** pink, white or cream-coloured; lamina 5 mm long; limb lacero-fimbriate on the margins, tapering into claw. **Flowering time** summer. **Fruit** a capsule, slightly exceeding calyx length. **Seeds** orbicular. Undergrowth on gravelly slopes; Drakensberg Grassland (Barkly East, Naude's Neck).

namaensis Schinz

Loosely caespitose or scabrid herb, 0.06–0.60 m high. **Leaves of flowering shoots** up to 100 × 1 mm, spreading; sheath whitish, persistent. **Inflorescences** with peduncles up to 300 mm high, unbranched. **Calyx** surrounded at base by 2 pairs of broadly elliptic bracts. **Sepals** united, cylindrical, 24–42 mm long, membranous margins of bracts and lobes not shining. **Petals** pale pink or white; lamina 10 mm long; limb deeply fimbriate, tapering into claw. **Flowering time** summer. **Fruit** a capsule, equaling calyx length. **Seeds** broadly elliptic to orbicular. Stony soil in open woodland or karoo; Albany Thicket, Lower Karoo, Sub-Escarpment Savanna (Graaff-Reinet and Aberdeen Districts to Thomas River at Cathcart).

1b Petal margins entire, crenulate, emarginate, or dentate with lamina less than twice as long as wide; petal limb generally obovate, deltoid or rounded

3a Plant densely caespitose; inflorescence axis axillary, springing from a hummock or mat of short leafy shoots

basuticus Burtt Davy

Glabrous herb, 0.08–0.25 m high. **Leaves of flowering shoots** erect, 4–120 mm long; sheath length 1.5× leaf width. **Inflorescences** with peduncles up to 250 mm high, mostly unbranched, 3-flowered. **Calyx** with 2 pairs of bracts, half as long as calyx. **Sepals** united, cylindrical, 24–28 mm long. **Petals** pink or purple; lamina 6–13 mm long, broadly elliptic to obovate, spreading, margins finely dentate, claw included. **Flowering time** Dec.–Apr. **Fruit** a capsule, equaling calyx length. Stony soil on mountain slopes in grassland; Upper Karoo, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Dry Highveld Grassland (Oviston E to Underberg District and S to Somerset East District and Mthatha).

micropetalus Ser.

Scabrid herb, 0.06–0.60 m high. **Leaves of flowering shoots** linear-subulate or narrowly linear, 50 mm long; sheath very short, membranous. **Inflorescences** with peduncles up to 200 mm high, simple or more often branched, 3-flowered. **Calyx** with 2 pairs of bracts, loosely surrounding base. **Sepals** united, cylindrical, 25 mm long. **Petals** creamy white or pale purple-pink; lamina small, up to 5 mm long, deltoid

or obovate, often recurved, margins crenulate or coarsely dentate incised, suddenly contracted into a narrow claw. **Flowering time** Dec.–Apr. **Fruit** a capsule, equaling calyx length. **Seeds** orbicular. Stony soil on mountain slopes in grassland or karoo; Upper Karoo, Drakensberg Grassland, Dry Highveld Grassland, Sub-Escarpment Grassland, Lower Karoo (Oviston E to Rhodes District and from Beaufort West to Grahamstown).

3b Plants not densely caespitose; inflorescence axis either axillary on ± elongated often decumbent leafy shoots, or erect and terminal arising from a woody base

albens Aiton

Loosely tufted or straggling herb, up to 0.40 m high. **Leaves of flowering shoots** linear, ± 60 mm long; sheath length ± twice leaf width. **Inflorescences** with peduncles up to 350 mm high, mostly branched. **Calyx** with 2 pairs of bracts, less than half calyx length. **Sepals** united, oblong-cylindrical, 12–18 mm long; lobes ovate to deltoid. **Petals** white, pink or purple; limb oblanceolate, entire or toothed; claw not or slightly exserted beyond calyx. **Flowering time** Sept.–Feb. **Fruit** a capsule, exserted from calyx when ripe. River valleys and hillsides; Albany Thicket, Sub-Escarpment Savanna (limited distribution at Zwartkops River near Uitenhage and at Grahamstown).

caespitosus Thunb.

Loosely tufted or decumbent herb, up to 0.40 m high. **Leaves of flowering shoots** wiry, linear, ± 100 mm long; sheath length 1.0–1.5× leaf width. **Inflorescences** with peduncles up to 300 mm high. **Calyx** with mostly 3 pairs of bracts, half calyx length, with a short awn 1–2 mm long. **Sepals** united, narrowly cylindrical, 38–65 mm long; lobes brown, lanceolate. **Petals** pale pink or purple; limb obovate, crenulate or finely dentate; claw not or shortly exserted beyond calyx. **Flowering time** Sept.–Jan. **Fruit** a capsule, equaling calyx length. On top of mountain; Eastern Fynbos-Renosterveld (Willowmore District, Studtis in Kouga Mts).

crenatus Thunb.

Stout, glabrous herb, 0.25–0.60 m high. **Leaves of flowering shoots** yellow-green, narrowly lanceolate to elliptic-oblanceolate, ± 60 mm long, tufted at base of inflorescence axis; sheath length shorter or equal to leaf width. **Inflorescences** with peduncles 250–600 mm high, unbranched or subpaniculate, with up to 20 flowers. **Calyx**: bracts straw-coloured, mostly 2 pairs, acute or acuminate. **Sepals** united, cylindrical, 20–36 mm long; lobes brown, lanceolate. **Petals** pale pink; limb broadly obovate or deltoid, narrowed rapidly into included claw. **Flowering time** Nov.–Jan. **Fruit** a capsule, not exserted from calyx. In valley bushveld and on adjacent hillsides; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Eastern Fynbos-Renosterveld, Albany Thicket (Maclear District to Port Edward, and from Winterhoek Mts at Uitenhage to Peddie).

thunbergii Hooper

Loosely caespitose or spreading herb, 0.1–0.4 m high. **Leaves of flowering shoots** glaucous, linear 80 × 1–2 mm; sheath white, membranous, length 1.0–1.5× leaf width. **Inflorescences** with peduncles curved or erect, ± 200 mm long, simple or sparingly branched, with 2–5 flowers. **Calyx**: bracts 2–4 pairs, with membranous border, minutely ciliolate margins. **Sepals** united, cylindrical, 20–30 mm long. **Petals** pink; limb oblong-ovate or obovate, not hairy, dentate to shortly fimbriate. **Flowering time** Sept.–Feb. **Fruit** a capsule, equaling calyx length. Stony soil in grassland, closed shrubland or at sea level; Eastern Fynbos-Renosterveld (Port Elizabeth E to Grahamstown and to Humansdorp).

zeyheri Sond.

Robust, glabrous herb, 0.5–0.7 m high. **Leaves of flowering shoots** glaucous, erect, linear-lanceolate to lanceolate-elliptic, ± 40 mm long; sheath length equal to leaf width. **Inflorescences** with peduncles simple or sparingly branched in upper half, with 2–5 flowers. **Calyx** with 3 or 4(5) pairs of bracts, up to one third of calyx length. **Sepals** united, cylindrical, 28–45 mm long. **Petals** pale pink to mauve; limb narrowly to broadly obovate or orbicular, not hairy, dentate to shortly fimbriate. **Flowering time** Sept.–Jan. **Fruit** a capsule, shorter than calyx. Grassland of eastern coast, roadsides; Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Port Shepstone District S, to Port Edward and Komga).

DRYMARIA Willd. ex Schult.

Species ± 48, restricted to New World from W United States to Patagonia, Galapagos Islands; 1 in sthn Afr., pantropical, M, KZN, WC, EC.

The position of the genus is dubious, even its placement in subfamily Paronychioideae, as it shows some alsinoid characters and the ontogeny of its stipules differs from that of other Paronychioideae.

cordata (L.) Willd. ex Roem. & Schult.

West Indian chickweed, drymaria, tropical chickweed

Annual herb, 0.25–1.50 m high; procumbent or ascending, branching dichotomously, quadrangular, glabrous or papillose. **Leaves** petiolate, stipulate, glabrous, ovate to broadly ovate, rather widely spaced. **Inflorescences** axillary or terminal dichotomous cymes; flowers pedicellate. **Sepals** green with white margins, narrowly lanceolate, acute, keel viscid-papillose. **Petals** white, deeply bilobed, shorter than sepals, sometimes absent. **Stamens** 3–5. **Ovary** ovoid-ellipsoid. **Flowering time** Aug.–Apr. **Fruit** a capsule, ellipsoid. **Seeds** flattened-reniform, testa brown, minutely or bluntly tubercled. Humus-rich soil in forests; Indigenous Forests, Indian Ocean Coastal Belt (Port Edward S to Kologha Forest near Stutterheim and Keurbooms River near Oudtshoorn).

HERNIARIA L.

Rupture-wort

Species ± 47, some widely distributed in Eurasia and North Africa, the rest narrow endemics to Canary Islands, 1 isolated species in Somalia; 5 in sthn Afr., N, NW, G, M, FS, L, NC, WC, EC.

erckertii Herm.

Biennial or mostly perennial, small herb; stems much branched from compact base, 0.1–0.2 m long. **Leaves** narrowly-elliptic to obovate-oblanceolate. **Inflorescences** 7–12-flowered in small, cymose clusters. **Flowers** with stiffly spreading rough hairs. **Sepals** distinctly unequal. **Petals** as long as filaments. **Stamens** with filiform filaments; anthers quadrangular, orange-brown. **Styles** 2, short, subsessile, with notched stigmas. **Flowering time** Sept.–May. **Fruit** an ovoid to narrowly ellipsoid, membranous nutlet. Grassland, limestone slopes, gravelly flats; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Upper Karoo (Lady Grey District, E to Mount Fletcher and S from Middelburg to Queenstown).

[E?]grimmii Herm.

Perennial herb, caudex thick and woody; prostrate stems up to 0.07 m long. **Leaves** obovate-elliptic, shortly appressed-pubescent with crisped hairs. **Inflorescences** 3–6-flowered in small, cymose clusters. **Flowers** with stout patent hairs; receptacle prominent. **Sepals** equal. **Petals** filiform. **Stamens** with linear-lanceolate filaments; anthers 0.25 mm in diam., quadrangular, orange. **Style** bilobed to bifid, with small, dot-like, often divergent stigmas. **Flowering time** Mar. **Fruit** an ellipsoid nutlet. Alpine regions; Drakensberg Grassland (Witteberg Mts, Barkly East District).

POLLICHIA Aiton

Monotypic, northern Arabian Peninsula and Ethiopia, through E tropical Africa to sthn Afr., widespread.

campestris Aiton

Waxberry; *aarbossie*, *suikerbostee* (A)

Perennial herb, 0.08–1.50 m high; branches terete, white-woolly. **Leaves** opposite, verticillate, stipulate, grey-green, hairy with white crinkled hairs, glabrescent later, narrowly oblanceolate, linear-oblanceolate or very narrowly elliptic. **Inflorescence** a cyme, 5–many-flowered. **Sepals** lanceolate-oblong, apex subobtuse, pubescent or glabrous. **Petals** white, deltoid. **Stamens** 1 or 2. **Ovary** ellipsoid. **Flowering time** Aug.–Apr. **Fruit** a capsule, ellipsoid, surrounded by persistent, fleshy, waxy, white bracts. **Seeds** ellipsoid. Rocky outcrops and moderate slopes in grassland and grassy fynbos; Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Oviston to Maclear and from Port Elizabeth to East London).

POLYCARPON L.

Allseed

Species ± 16, Europe and the Mediterranean, 2 in S America; 2 in sthn Afr., cosmopolitan in warm and temperate situations, N, B, M, FS, KZN, NC, WC, EC.

***tetraphyllum** (L.) L. subsp. **alsinifolium** (Biv.) Ball

Four-leaved allseed; *naaldvrug* (A)

Prostrate, annual or perennial herb, up to 0.2 m high. **Leaves** in whorls of 4, obovate. **Inflorescences** crowded in many-flowered cymes. **Flowers** white, with 5 small, entire, hyaline petals, shorter than sepals. **Flowering time** Sept.–Dec. **Fruit** a capsule, dehiscent almost to base into 3 spirally twisting valves. **Seeds** many, ovoid or lenticular. Weed of waste places; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Albany Thicket (Uvongo to Komga, from Humansdorp to Alexandria).

*SCLERANTHUS L.

Species ± 10, temperate Eurasia, Mediterranean, Ethiopia, Australasia; 1 naturalised in sthn Afr., introduced from Europe, a weed in wheat and lucerne lands, suspected of causing poisoning in sheep, KZN, NC, WC, EC.

annuus L.

Annual scleranthus; *knawel* (A)

Erect or decumbent, annual herb, 0.02–0.20 m high, rigid, much dichotomously branched; stems angled, with a single line of reversed hairs. **Leaves** opposite, subu-

late, pungent, expanding into membranous, connate bases; stipules absent. **Inflorescences** axillary, solitary or few-flowered cymes; bracts leaf-like. **Flowers** bisexual, perigynous, sessile, very small, green. **Calyx**: tube campanulate, crustaceous with age; lobes 5. **Petals** absent. **Ovary** ovoid, 1-locular; ovule 1(2); styles 2. **Flowering time** Aug.–Apr. **Fruit** a nutlet, enclosed by enlarged and indurated wall of perigynous zone and persistent, hardened calyx tube and crowned by persistent calyx lobes. **Seed** 1, subglobose to horseshoe-shaped, smooth. Cultivated land; Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket (Ugie, Cathcart, Dohne, Grahamstown).

SILENE L.

Campion, catchfly

Species ± 700, Eurasia (± 600 species), Africa (± 92 species), North America (± 50 species); ± 19 (3 naturalised) in sthn Afr., widespread.

Flowers large, arranged in cymes; calyx 20–35 mm long

bellidioides Sond.

Wild tobacco

Erect, shortly glandular-hairy, perennial herb, up to 0.9 m high. **Leaves** rosulate, oblanceolate. **Flowers** in cymes, white or pink to crimson; calyx 18–22 mm long; petals bifid; carpophore ± 2 mm long. **Flowering time** Oct.–Mar. Grassland, riverbeds and mountain slopes; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Indigenous Forests, Eastern Fynbos-Renosterveld (Albert District to Port St Johns, S to Port Elizabeth).

undulata Aiton

Similar to *S. bellidioides* but an annual, occasionally perennial herb, up to 0.8 m high, sometimes sprawling. **Flowers** white to pink; calyx 22–35 mm long; carpophore 4–6 mm long. **Flowering time** Aug.–Apr. Grassland, rocky outcrops and steep slopes; Dry Highveld Grassland, Sub-Escarpment Grassland, Upper Karoo, Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Bethulie to Port St Johns, S to Port Alfred and Humansdorp).

Flowers smaller, arranged in raceme-like monochasia; calyx up to 20 mm long

crassifolia L.

Sprawling, densely hairy, perennial herb, up to 0.6 m high. **Leaves** fleshy, felted beneath, obovate. **Flowers** in subsecund, raceme-like, monochasial cymes, white to yellow; calyx ± 13 mm long; petals bifid; carpophore ± 4 mm long. **Flowering time** Aug.–Mar. Coastal sand dunes, river mouths; Albany Thicket (Port Elizabeth to Kowie).

***cretica** L.

Shortly hairy annual, up to 0.45 m high. **Leaves** linear-oblanceolate. **Flowers** in raceme-like, monochasial cymes, whitish, open and scented at night; calyx 9–16 mm long; petals bifid; carpophore 1–5 mm long. **Flowering time** Aug.–Jan. European weed of riverbanks and roadsides; Albany Thicket, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (Somerset East and Swartkops River at Port Elizabeth).

eckloniana Sond.

Annual herb, stem ascending, leafy, villous. **Leaves** coriaceous, spathulate, obtuse or subretuse, margins revolute, ciliate. **Flowers** in cymes; calyx 16–20 mm long, villous, 10-ribbed, with lanceolate teeth; petals bifid; carpophore a quarter length of capsule. Seashore; Eastern Fynbos-Renosterveld (Cape Recife at Port Elizabeth).

*gallica L.

Small catchfly, French silene; *Franse silene* (A)

Glandular-hairy annual, up to 0.45 m high. **Leaves** oblanceolate, ciliate. **Flowers** in subsecund, spike-like, monochasial cymes, white or pink; calyx coarsely hairy, 7–10 mm long; petals entire; carpophore ± 1 mm long. **Flowering time** Sept.–Feb. European weed of disturbed places; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (St Michaels-On-Sea S, to Grahamstown and Humansdorp).

pilosellifolia Cham. & Schltdl.
(= *S. burchellii* Otth)

Perennial herb, up to 0.8 m high, stems branching low down, decumbent at base, coastal forms often with procumbent, vegetative shoots. **Leaves**: upper ones linear-lanceolate; median ones spathulate-lanceolate; apex acute or mucronulate, crowded lower down the stem. **Flowers** in lax, one-sided, 2–7-flowered racemes, reddish brown, purple, pinkish or white; calyx 11–20 mm long; petals bifid; carpophore up to 6 mm long. **Flowering time** Sept.–Apr. Sandy soil in grassland, shrubland, on dunes in coastal fynbos; Eastern Fynbos-Renosterveld, Albany Thicket (Grahamstown, Swartkops River, Addo, Uitenhage).

[E]**primuliflora** Eckl. & Zeyh.

Sprawling, shortly hairy perennial, up to 0.50 m high. **Leaves** leathery, oblanceolate. **Flowers** in subsecund, raceme-like monochasial cymes, white, yellowish or pink; calyx 12–15 mm long; petals bifid; carpophore 4–7 mm long. **Flowering time** Sept.–Mar. Coastal sand dunes, river mouths, forests; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Port Shepstone SW to Port Elizabeth and East London).

*vulgaris (Moench) Garcke

Bladder campion

Glaucous, rhizomatous perennial, up to 0.75 m high. **Leaves** lanceolate or oblanceolate. **Flowers** in cymes, white to purple; calyx inflated, 12–15 mm long; petals deeply bifid; carpophore ± 2 mm long. **Flowering time** Oct.–Dec. European weed of disturbed lands; Indigenous Forests, Eastern Fynbos-Renosterveld (Hogsback, SW to Langkloof in Willowmore).

*SPERGULA L.

Species 6, 5 in temperate Eurasia, chiefly in Europe and the Mediterranean; 1 in sthn Afr., NW, G, M, KZN, L, WC, EC.

arvensis L.

Corn spurry; *sporrie* (A)

Annual herb, 0.05–0.30 m high; erect, branches cylindric, glabrous or sparsely glandular-pubescent above. **Leaves** linear, sparsely glandular-pubescent or glabrescent. **Inflorescences** few- to many- flowered, pedicellate. **Flowers** bisexual, subperigynous. **Sepals** 5, free, herbaceous and often ± fleshy, with scarious margins. **Petals** 5, entire, white. **Stamens** 10, arising on a perigynous ring. **Ovary** 1-locular; ovules many; styles (3–)5, alternating with sepals. **Flowering time** Aug.–Apr. **Fruit** a capsule, ± globose, opening by 5 valves or teeth not separating completely. **Seeds** many, grey-black, compressed, biconvex, very narrowly winged. Cosmopolitan weed of waste places, cultivated land;

Upper Karoo, Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket (Middelburg, Maclear S to Grahamstown).

SPERGULARIA (Pers.) J.Presl & C.Presl

Species ± 40, cosmopolitan, especially some halophytes with nearly worldwide distribution; 4 in sthn Afr., mainly in Cape region, but also scattered in N, NW, FS, KZN.

bocconii (Scheele) Asch. & Graebn.

Red sandwort spurrey

Slender perennial with many, much-branched, glandular stems up to 0.23 m long. **Leaves** 12–15 mm long, glandular, awned; stipules triangular. **Flowers** 2 mm in diam., in elongated, unilateral cymes; sepals densely glandular, a little longer than capsule; petals pink, ± as long as sepals. **Flowering time** summer. **Seeds** cuneiform, wingless, brownish. Waste places; Albany Thicket, Eastern Fynbos-Renosterveld (East London and Tsitsikamma National Park).

***media** (L.) C.Presl ex Griseb.

Sea spurrey

Glabrescent, sprawling perennial from a thick, woody rootstock, up to 0.5 m high. **Leaves** opposite and in axillary tufts, linear. **Flowers** in open, glandular-hairy cymes, white or pink; sepals usually > 4 mm long. **Flowering time** Oct.–Jan. **Seeds** winged. Cosmopolitan weed of coastal or inland marshes; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (Cintsa River Mouth along coast to East London and SW to Humansdorp).

***rubra** (L.) J.Presl & C.Presl

Sand spurrey

Sprawling annual or perennial, from slender taproot, up to 0.20 m high. **Leaves** opposite, linear. **Flowers** in open cymes, pink or lilac; sepals < 4 mm long. **Flowering time** Sept.–Dec. **Seeds** not winged. Cosmopolitan weed of sandy places (distribution in EC uncertain).

***STELLARIA** L.

Chickweed

Species 150–200, mainly in Eurasia, with a centre of distribution in the mountains of East Central Asia, some species in afromontane Africa, some species with cosmopolitan distribution; 3 introduced to sthn Afr., widespread weeds of cultivation, N, B, LIM, NW, G, FS, KZN, L, WC, EC.

Sepals 5; styles 3

media (L.) Vill.

Starwort; *gewone sterremuur* (A)

Diffuse annual, up to 0.30 m high, with a line of hairs down each internode. **Leaves** opposite, ovate. **Flowers** in terminal cymes, white; sepals 4.5–5.0 mm long; petals bilobed; stamens mostly 5–10. **Flowering time** June–Nov. Cosmopolitan weed of waste places; Mesic Highveld Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket, Indigenous Forests (Zastron, E to Lusikisiki, S to Somerset East and Hogsback).

pallida (Dumort.) Piré
Lesser chickweed

Annual, much-branched, prostrate herb very similar to *S. media*. **Leaves** usually all petiolate, < 7 mm long. **Flowers**: sepals 2.0–3.5 mm long; petals absent or vestigial; stamens 1–3. **Flowering time** summer. Weed of disturbed places; origin Britain; Upper Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (Cradock, East London and Humansdorp).

Sepals 4; styles 2

sennii Chiov.

Tender, annual herb, with procumbent or weakly ascending stems up to 0.4 m long. **Leaves** all petiolate, lamina up to 18 × 14 mm, ovate to broadly ovate, apex acute, base cordate. **Flowers** solitary and axillary towards ends of branches; sepals 4, 3–4 mm long; petals absent or vestigial teeth; stamens 4. Forests and forest margins, alt. up to 2 446 m (distribution in EC uncertain).

*VACCARIA Medik.

Species 1 or 4, central and eastern Europe, Mediterranean, temperate Asia; 1 introduced in sthn Afr., NW, G, M, FS, NC, WC, EC?.

hispanica (Mill.) Rauchert
Cow soapwort; *akkerkoeikruid* (A)

Erect, glabrous, annual herb, 0.2–0.7 m high, dichotomously branched. **Leaves** opposite, ovate or lanceolate, glaucous, clasping at base. **Inflorescences** lax terminal dichasia. **Flowers** with anthophores. **Calyx** with tube inflated below, whitish, prominently 5-ribbed, accrescent and becoming 5-winged in fruit. **Petals** 5, clawed; limb, exserted from calyx, pink or purple. **Stamens** 10. **Ovary** 2-locular below, 1-locular above; styles 2, linear, several times as long as ovary, glandular. **Fruit** a capsule. **Seeds** many, reniform or subglobose, black. Weed of disturbed places (distribution in EC uncertain).

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CASUARINACEAE

(Order Fagales)

Compiled by C.L. Bredenkamp

*CASUARINA L.

Species 17, tropical to warm-temperate habitats in Malaysia, Australia and Polynesia; 2 in sthn Afr., have become partially naturalised in KZN and EC, originally planted for stabilising coastal sands, G, WC, EC.

cunninghamiana Miq.

Beefwood, horsetail tree; *kasuarisboom*, *perdestertboom* (A)

Tree, dioecious or rarely monoecious, 20–38 m high, with persistent, bark-covered, woody branches from which arise many, slender, flexible, deciduous, *Equisetum*-like, articulate branchlets, with several short, basal articles (segments) and 1–many longer, distal articles; articles with as many as 4–20 laterally rounded, longitudinal ridges. **Leaves** reduced to small, triangular scales, in a whorl of 4–20 at apex of each article (1 per longitudinal ridge). **Flowers** unisexual, wind-pollinated, much reduced, sessile, solitary in axil of a bract, grouped into unisexual inflorescences with closely spaced alternating whorls of bracts similar to scale leaves. **Male inflorescences** short to elongated catkin-like spikes, terminating deciduous branches. **Male flowers**: single stamen enclosed in bud by 1 or 2 concave perianth segments. **Female inflorescences** subsessile, globular heads. **Female flower**: perianth absent; carpels 2; ovules 2; style 2-branched and 2 filiform, well-exserted stigmas. **Infructescences** cone-like, globular, ± woody, formed by enlargement and thickening of accrescent bracts and bracteoles of individual flowers. **Fruit** a small samara, laterally compressed, apex produced into large, ± translucent wing. **Seed** solitary. Declared invader (category 2), potential transformer, coastal dunes and sandy seashores (Port St Johns, SW to Grahamstown and Patensie districts).

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CELASTRACEAE

(Order Celastrales)

Compiled by M. Jordaan

1a Fruit capsular, dehiscent when dry and mature; seeds with or without aril:
2a Plants with thorns; leaves fasciculate on brachyblasts, at least on older branches:
3a Suffrutices, shrubs or small trees; flowers nearly always functionally unisexual with staminodes in female flowers and pistillodes in male flowers; ovules 2 per locule; ovary (2)3(4)-locular; seeds completely or incompletely enveloped by a well- or weakly developed aril ..... **Gymnosporia**
3b Shrubs or woody climbers; flowers always bisexual; ovules 3–12 per locule; ovary always 3-locular; seeds completely enveloped by a well-developed aril ..... **Putterlickia**
2b Plants without thorns; leaves alternate or opposite, never fasciculate:
4a Leaves alternate; seeds ellipsoid, with or without membranous aril:
5a Capsules with wing-like emergences ..... **Pterocelastrus**
5b Capsules smooth or verruculose, without wing-like emergences:
6a Capsules > 20 mm long, tardily dehiscent; pericarp thick and woody, verruculose; ovary almost completely immersed in disc; seeds without an aril..... **Pseudosalacia**
6b Capsules < 15 mm long, freely dehiscent; pericarp thin and ± smooth; ovary almost free or up to half immersed in disc; seeds covered by a thin membranous aril ..... **Maytenus**
4b Leaves opposite, at least on flowering shoots; seeds flattened or irregularly shaped, with wings, aril reduced or absent:
7a Capsule expanded laterally, forming 3 dehiscent mericarps, each dehiscing by median suture into 2 caducous valves; seeds with wings; stamens 3, inside disc ..... **Pristimera**
7b Capsule elongated, narrow, dehiscing loculicidally in 3 valves; seeds winged, aril reduced or absent; stamens 5, outside disc:
8a Seeds with wings; leaves narrowly elliptic to elliptic, very rarely widely ovate..... **Catha**
8b Seeds without wings, exarillate; leaves widely elliptic to ovate..... **Lydenburgia**
1b Fruit indehiscent; seeds without an aril:
9a Fruit drupaceous; leaves alternate, opposite or fasciculate:
10a Endocarp thick and woody (stone); leaves usually opposite or fasciculate, glabrous; sepals ± subcircular with margins entire ..... **Elaeodendron**
10b Endocarp thin and crustaceous; leaves alternate, pubescent or glabrous; sepals ± deltoid with laciniate margins:
11a Latex threads evident in leaves and bark on pulling apart; fruit white or yellow ..... **Robsonodendron**
11b Latex threads absent; fruit red or reddish..... **Mystroxylon**
9b Fruit baccate or small and nut-like; leaves opposite or subopposite, rarely alternate:
12a Fruit small, nut-like and asymmetrical with persistent lateral style or stylar scar; ovules 2–4 per locule ..... **Pleurostylia**
12b Fruit baccate; ovules 2–8 per locule:
13a Fruit often large and globose, 1–20-seeded; seeds (pyrenes?) irregular, large; ovary with 2–8 ovules per locule ..... **Salacia**
13b Fruit usually smaller, globose or ellipsoid, 1–3(–6)-seeded; ovary with 2 ovules per locule:
14a Shrubs or trees; inflorescence a compound dichasium; flowers pedicellate; ovary 2- or 3-locular; ripe fruit light to dark brown or purplish, succulent or ± fleshy ..... **Cassine**
14b Lianes, scrambling shrubs or small trees; inflorescence a compact dichasium or thyrsoid; flowers sessile; ovary 2-locular; ripe fruit red or purple, fleshy or leathery:
15a Lianes or scrambling shrubs; leaves opposite to alternate; inflorescence a compact dichasium; flowers 5-merous; sepals triangular, coriaceous; berries elliptic ..... **Allocassine**
15b Lianes, scrambling shrubs or small trees; leaves opposite; inflorescence thyrsoid with simple or compound cymules arranged along the axis; flowers 4- or 5-merous; sepals ± suborbicular, fleshy; berries spheroid..... **Lauridia**

ALLOCASSINE N.Robson

Monotypic, SE Africa, Zimbabwe, Mozambique, Swaziland and eastern parts of SA; KZN, EC.

laurifolia (Harv.) N.Robson

Laurel-saffron, bay-leaf saffron; *louriersaffraan* (A)

Scrambling shrub, climber or tree, up to 7 m high. **Branches** dark purplish red with age. **Leaves** opposite, alternate on young shoots, leathery, glossy blue-green; lamina elliptic to oblong, 60–140(–180) × 25–65(–85) mm, apex rounded to obtuse, tip hooked downwards, base rounded to cuneate, margins glandular-denticulate to subentire; petioles 3–9 mm long. **Inflorescences** 1–3(7)-flowered cymes; peduncle 6–24 mm long. **Flowers** 5-merous, yellow-green, sessile. **Sepals** lanceolate, ± 2 mm long, margins fimbriate. **Petals** ± 3 mm long, spreading above erect sepals. **Stamens** united with base of disc. **Ovary** immersed in disc. **Fruit** baccate, obovoid, 18–28 mm long, orange-red, smooth. **Seeds** flattened-ellipsoid, dark brown. Forest understorey, forest margin, on sandy soil; Indigenous Forests (Port Edward S to Mbashe Mouth).

CASSINE L.

Spoonwoods; *lepelhoutbome* (A)

Species 3, endemic to sthn Afr., especially WC, M, S, KZN, L, WC, EC.

Most non-southern African species previously referred to as *Cassine* are best classified in *Elaeodendron*.

1a Leaves elliptic to widely elliptic to circular; venation conspicuous on both sides

peragua L.

Forest spoonwood; *boslepelhout* (A); *ikhukhuzi* (X); *umkhukhuze* (Z)

Evergreen shrub or tree, up to 15 m high. **Branchlets** subangular, becoming terete. **Bark** with layers of yellow pigment revealed when exposed. **Leaves** opposite, leathery, dark green above, paler below; lamina elliptic to obovate, 20–45(–75) × 10–30(–40) mm, apex rounded to emarginate, base cuneate, margins glandular-crenate; petioles 4–8 mm long. **Inflorescences** axillary, 10–20-flowered cymes; peduncle ± 10 mm long. **Flowers** 4- or 5-merous, whitish. **Sepals** ovate, 1.5 × 1.0 mm. **Petals** oblong, ± 2.5 × 1.5 mm. **Stamens** arising from disc. **Ovary** 2(3)-locular. **Fruit** baccate, spherical, ± 10 mm in diam., brown to purplish when ripe. Coastal forest, forest margins, dune scrub, in kloofs, often on limestone; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Port Edward S to Tsitsikamma).

1b Leaves elliptic to narrowly elliptic; venation inconspicuous on lower surface
2a Leaf margins entire, thick and revolute; flowers 5-merous

parvifolia Sond.

Mountain spoonwood; *berglepelhout* (A)

Evergreen shrub or tree, up to 4 m high. **Branchlets** angular to terete, brownish purple. **Leaves** opposite or subopposite, finely leathery, glossy dark green above, paler below; lamina elliptic to obovate, 15–45(–55) × 5–15(–25) mm, apex acute, rounded to emarginate, base attenuate, margins entire, rolled under; petioles 2–4 mm long. **Inflorescences** axillary, sessile, 1–8-flowered cymes. **Flowers** cream-coloured to white; pedicels 2–3 mm long. **Sepals** deltoid, 1 × 1 mm, margins laciniate. **Petals** oblong, ± 2.2 × 1.0 mm. **Stamens** arising from margin of disc. **Ovary** 2-locular. **Fruit** baccate, spherical, ± 7–10 mm in diam., brown to purplish when ripe. **Seeds** 1–3, brown. Mountain fynbos, forest margins; Eastern Fynbos-Renosterveld, Indigenous Forests (Tsitsikamma E to Humansdorp).

2b Leaf margins glandular-crenate, flat; flowers 4-merous

schinoides (Spreng.) R.H.Archer

Spoonwood, ladlewood; *lepelhout* (A)

Evergreen shrub or tree, up to 5 m high. **Branchlets** subangular or terete, greyish brown. **Bark** with layers of powdery yellow pigment. **Leaves** leathery, pale green above, grey-green below; lamina narrowly elliptic to oblanceolate, 15–55(–70) × 5–20(–35) mm, apex rounded to emarginate, base narrowly cuneate, venation inconspicuous; petioles ± 7 mm long. **Inflorescences** axillary, 5–10-flowered cymes; peduncle 5–10 mm long. **Flowers** whitish, ± 3 mm in diam.; pedicels 2 mm long. **Sepals** deltoid, ± 0.8 × 0.8 mm, margins ciliolate. **Petals** elliptic to oblong, ± 2.5 × 1.7 mm, margins entire. **Stamens** arising from disc. **Ovary** 2-locular. **Fruit** baccate, spherical, ± 5–10 mm in diam., brown to purplish when ripe. **Seeds** spheroid, brown. Fynbos, forest margins, dry scrub; Eastern Fynbos-Renosterveld, Indigenous Forests (Tsitsikamma E to Humansdorp).

CATHA Forssk. ex Scop.

Monotypic, widespread in eastern tropical and sthn Afr., Madagascar and the Arabian Peninsula; M, S, KZN, L, EC.

edulis (Vahl) Forssk. ex Endl.

Khat, bushman's tea; *boesmanstee* (A); *igqwaka* (X); *umhlwazi* (Z)

Evergreen tree, up to 15 m high. **Branchlets** with waxy bloom, flattened, becoming vinous red or pinkish and terete. **Leaves** subleathery; lamina oblong, elliptic or obovate, 30–50(–110) × 8–45(–60) mm, apex obtuse, acute to acuminate, base cuneate to angustate, margins glandular-toothed; dense reticulate venation more prominent below than above; petioles 3–10 mm long. **Inflorescences** axillary cymes. **Flowers** 5-merous, greenish white; peduncle 6–12 mm long. **Sepals** broadly ovate, ± 0.5 mm long, margins ciliate-fimbriate. **Petals** elliptic-oblong, 1–2 mm long, margins ciliolate. **Ovary** broadly ovoid; style short. **Fruit** a 3-valved capsule, narrowly oblong-trigonous, 6–10 mm long, smooth, reddish to brown. **Seeds** with basal wing, exarillate. Forest, forest margins, grassland, rocky outcrops; Sub-Escarpment Grassland, Indigenous Forests (Port St Johns westwards to Queenstown and Stutterheim). The leaves are chewed for an amphetamin-like stimulant action.

ELAEODENDRON Jacq.

Saffrons, saffraanbome (A)

Species ± 30, cosmopolitan, 8 widespread in Africa; 4 in sthn Afr., M, S, KZN, L, WC, EC.

Lenticels conspicuous; leaf margins glandular-toothed to prominently spine-tipped on young shoots; fruit up to 32 × 15 mm, white or cream-coloured

croceum (Thunb.) DC.

Forest saffron; *bossaffraan* (A); *umbimvane* (X); *umbomvane* (Z)

Evergreen shrub or tree, up to 10 m high. **Bark** with layers of powdery, yellow pigment. **Leaves** opposite, leathery; lamina elliptic to oblong, 15–75(–220) × 10–45(–70) mm, apex acute to acuminate, base cuneate; petioles ± 10 m long. **Inflorescences** axillary, 1–15-flowered cymes; peduncle 3–12 mm long. **Flowers** 4-merous, whitish; pedicels short. **Sepals** ovate, 1.5 × 1.0 mm, fleshy. **Petals** broadly ovate, 1.5 × 1.5 mm, spreading. **Disc** quadrangular, subentire with sinuses. **Stamens** erect or spreading. **Ovary**

2–4-locular. **Fruit** drupaceous, ellipsoid, 20–32 × 10–15 mm, tapering at both ends. Coastal and montane forest margins, dry forest, dune forest; Albany Thicket, Eastern Fynbos-Renosterveld, Indian Ocean Coastal Belt, Indigenous Forests (Port Edward S to Tsitsikamma).

Lenticels inconspicuous; leaf margins glandular-toothed, 8–15 teeth on each side, never spine-tipped; fruit up to 25 × 14 mm, yellowish

zeyheri Spreng. ex Turcz.

Small-leaf saffron; *kleinblaarsaffraan*, *fynblaarsaffraan* (A)

Evergreen tree, up to 10 m high. **Bark** with layers of powdery, yellow pigment. **Leaves** opposite to ternate at apex, leathery; lamina elliptic to obovate, 10–40(–60) × 5–25 (–35) mm, apex rounded, rarely acute, base cuneate to rounded; petioles ± 5 mm long. **Inflorescences** axillary, 3–7-flowered cymes; peduncle 5–10 mm long. **Flowers** 4-merous, cream-coloured or greenish; pedicels 2–5 mm long. **Sepals** subcircular, 1.3 × 1.5 mm, membranous, margins entire. **Petals** oblong to ovate, 3 × 2 mm, margins entire. **Disc** entire, convex, thick. **Stamens** erect to spreading. **Ovary** 4-locular. **Fruit** drupaceous, spheroid, yellowish. Forest, forest margins, thicket, rocky outcrops; Indigenous Forests, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Elliot S to Patensie).

GYMNOSPORIA (Wight & Arn.) Hook.f.

Spikethorns; *pendorings* (A)

Species > 100, Old World, Africa, Madagascar, Spain, near Middle East, Pakistan, India, Sri Lanka, Malesia, NE Australia and Polynesian Islands; 27 in sthn Afr., widespread.

1a Plants rhizomatous suffrutices or dwarf shrubs, < 1.5 m high

elliptica (Thunb.) Schönland

Suffrutex, up to 0.8 m high; stems from underground rootstock; thorns few, mostly on basal stems. **Branches** angular, becoming terete. **Leaves** fasciculate or alternate, coriaceous, grey-green; lamina linear-obovate, 25–50 × 4–8 mm, apex obtuse to round, mucronate, base long-tapering; margins subentire or with few teeth in upper half; venation smooth above, wrinkled below when dry; petioles ± 0.5 mm long. **Inflorescence** axillary, few-flowered cymes; peduncles 4–10 mm long. **Flowers** white. **Sepals** triangular, ± 0.8 mm long, margins laciniate. **Petals** oblong, ± 2 mm long, margins uneven. **Male flowers**: stamens shorter than petals. **Female flowers**: staminodes shorter than in male flowers; ovary 3-locular; stigma 3-branched. **Fruit** a 3-valved capsule, globose, 3–4 mm long, rugose, with reddish brown patches. **Seeds** partially enveloped by yellow aril. Coastal grassy fynbos; Eastern Fynbos-Renosterveld (Tsitsikamma to Port Elizabeth).

heterophylla (Eckl. & Zeyh.) Loes.

Dwarf shrub, seldom > 1.5 m high, with many thorns. **Branchlets** angular-striate, both in young and mature stage. **Leaves** alternate or fasciculate, becoming smaller towards apex, stiff, coriaceous, shortly petiolate; lamina obovate, spathulate, 5–15 × 2–11 mm, apex acute, mucronate, base narrowly cuneate, margins spinulose-serrate; reticulate venation distinct below; petioles very short. **Inflorescence** much shorter than leaves. **Flowers** creamy white, up to 3 mm long. **Male flowers**: stamens shorter than petals. **Female flowers**: staminodes smaller than stamens of male flowers; ovary 3-locular; stigma 3-branched. **Fruit** a 3-valved capsule, globose, 2–7 mm long, rugose, pale brown

with darker reddish brown patches. **Seeds** partially enveloped by yellow aril. Rocky places in grassland associated with forest patches; Indian Ocean Coastal Belt, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Port Edward S to Alexandria).

uniflora Davison

Suffrutex, up to 1 m high; stems erect and spreading from underground rootstock. **Branchlets** striate, angular when young, becoming terete. **Leaves** fascicled, coriaceous, green; lamina lanceolate-oblong, 15–50 × 3–8 mm, apex acute, obtuse or mucronate, base long-tapering, margins entire or with few teeth or rudiments of teeth; petioles very short. **Inflorescences** axillary, few-flowered cymes. **Flowers** white. **Sepals** triangular, ± 1 mm long, margins laciniate. **Petals** oblong, ± 1.5 mm long, margins laciniate. **Disc** sulcate, margins crenate. **Male flowers**: stamens shorter than petals. **Female flowers**: staminodes shorter than ovary; ovary 3-locular; stigma 3-branched. **Fruit** a 3-valved capsule, globose, 4–5 mm long, yellowish, smooth, transversely striate when dry. **Seeds** partially enveloped by yellow aril. Grassland slopes, rocky places, on dolerite and sandstone; Sub-Escarpment Grassland, Indian Ocean Coastal Belt (Umtamvuma Nature Reserve E to Ngonyama River).

vanwykii (R.H.Archer) Jordaan

Suffrutex, up to 0.5 m high, with few, slender thorns, with orange-tinged rhizomes. **Branchlets** angular-striate. **Leaves** alternate, rarely fascicled, subcoriaceous, pale green above, whitish green below; lamina elliptic or elliptic-ovate, 9–25(–40) × 4–23(–32) mm, apex acute to rounded, base attenuate, margins glandular-serrulate; midrib slightly raised on both sides; petioles 2–4 mm long. **Inflorescence** solitary, axillary; peduncles 3–11 mm long. **Flowers** white. **Sepals** triangular, 1.0 × 0.8 mm, margins entire to laciniate. **Petals** obovate, ± 2.5 mm long, margins entire to ± laciniate. **Male flowers**: stamens exserted. **Female flowers**: staminodes shorter than petals; ovary 3-locular; stigma 3-branched, exserted. **Fruit** a 3-valved capsule, obconic-trigonous, 7–8 mm long, yellowish green, tinged red, smooth, semi-fleshy. **Seeds** completely enveloped by orange-yellow aril. Coastal grassland, between sandstone rocks; Indian Ocean Coastal Belt (Umtamvuma Nature Reserve S to Port St Johns).

1b Plants shrubs or trees, > 2 m high
2a Shrubs or trees, growing in forest understorey
3a Aril orange, completely enveloping seed

bachmannii Loes.

Willow spikethorn; *wilgerpendoring* (A)

Evergreen shrub or straggling tree, up to 4 m high, infrequently with thorns. **Branchlets** angular-striate. **Leaves** alternate, rarely fascicled, bright green above, paler below; lamina narrowly elliptic, 15–60 × 3–13 mm, apex and base tapering, margins closely serrulate; petioles pinkish, up to 5 mm long. **Inflorescence** axillary. **Flowers** 2–7 per cyme, creamy white. **Sepals** triangular, ± 0.5 mm long, margins uneven. **Petals** oblong, ± 2 mm long, margins uneven. **Disc** narrow, undulate. **Male flowers**: stamens slightly shorter than petals. **Female flowers**: staminodes shorter than stamens in male flowers; ovary 3-locular; style 3-branched. **Fruit** a 3-valved capsule, pyriform, 2–5 mm long, smooth, chartaceous, reddish. **Seeds** completely enveloped by orange aril. Riverine forest, along sandstone streambanks; Indian Ocean Coastal Belt, Indigenous Forests (Port Edward S to Lusikisiki).

CELASTRACEAE

harveyana Loes.

Black forest spikethorn; *swartbospendoring* (A)

Evergreen shrub or tree, up to 6 m high, with slender thorns. **Branches** angular, becoming terete, with pale lenticels. **Stipules** conspicuous, thread-like. **Leaves** fascicled or alternate; lamina ovate, lanceolate to subcircular, 10–40 × 6–25 mm, apex acute to rounded, base subcordate to cuneate, margins irregularly toothed; midrib raised on both sides; petioles 2–10 mm long. **Inflorescence** axillary cymes. **Flowers** white. **Sepals** 0.4–1.0 mm long, margins ciliolate. **Petals** 1.5–2.7 mm long, margins ciliolate. **Male flowers**: stamens slightly shorter than petals. **Female flowers**: staminodes much shorter than stamens in male flowers; ovary 3-locular; stigma 3-branched. **Fruit** a 3-valved, globose capsule, 7–13 mm long, white, becoming pink to red, smooth, semi-fleshy. **Seeds** completely enveloped by orange aril. Coastal and inland forest; Indigenous Forests (Matatiele E to Port Edward S to Stutterheim).

nemorosa (Eckl. & Zeyh.) Szyszyl.

White forest spikethorn; *witbospendoring* (A)

Evergreen shrub or tree, up to 5 m high, with slender to robust thorns. **Branchlets** subangular, reddish brown, with pale lenticels. **Leaves** fascicled, glossy green above, paler below; lamina obovate or elliptic, 30–65 × 15–35 mm, apex acute, rounded to slightly emarginate, base tapering, margins dentate-serrate; venation distinct, midrib prominent on both sides; petioles 2–8 mm long. **Inflorescences** much shorter than leaves. **Flowers** creamy white, sweet-smelling. **Sepals** suborbicular, 1–2 mm long, margins uneven. **Petals** ± 2.0 mm long, margins undulate. **Male flowers**: stamens as long as petals. **Female flowers**: staminodes smaller than style and stigmas; ovary 3-locular; stigma 3-branched. **Fruit** a 3-valved, pear-shaped capsule, 2–4 mm long, smooth, chartaceous, greenish yellow, becoming reddish. **Seeds** completely enveloped by orange aril. Coastal and inland forest, dune scrub, thicket; Albany Thicket, Indigenous Forests (Bizana S to Tsitsikamma).

rubra (Harv.) Loes.

Redflower spikethorn; *rooiblompendoring* (A)

Shrub, up to 2 m high, with few slender thorns. **Branchlets** with rigid white hairs. **Leaves** fascicled or alternate, shortly petiolate, green, glabrous; lamina ovate or ovate-rotund, 5–35 × 6–15 mm, apex rounded, base subcordate or rounded, margins serrulate, or acutely denticulate. **Inflorescence** lax, few-flowered; peduncle hairy. **Flowers** very small, ± 2 mm in diam., pink to dark red; pedicels ± 1 mm long, hairy. **Sepals** ovate-triangular, ± 0.5 mm long, margins ciliolate. **Petals** oblong, ± 1 mm long, margins subentire, wavy. **Male flowers**: stamens shorter than petals. **Female flowers**: staminodes shorter than stamens in male flowers; ovary 3-locular; stigma 3-branched. **Fruit** a 3-valved, obconic-trigonous capsule, 8–10 mm long, reddish, smooth, glabrous. **Seeds** completely enveloped by orange aril. Forest understorey; Indigenous Forests (Port Edward S to Kei Road).

3b Aril yellow or white, partially enveloping seed

devenishii Jordaan

Drakensberg spikethorn; *Drakensbergpendoring* (A)

Shrub or tree, up to 8 m high, with slender thorns. **Branchlets** angular, becoming terete. **Leaves** fascicled or alternate, shortly petiolate, subcoriaceous, dark green; lamina

elliptic or ovate, 20–27 × 14–18 mm, apex acute, rounded to emarginate, base cuneate or rounded, margins serrate; midrib prominently raised on both sides. **Inflorescences** few-flowered; peduncles 4–6 mm long. **Flowers** whitish; pedicels 2–3 mm long. **Sepals** triangular, ± 0.8 mm long, margins ciliolate. **Petals** oblong, ± 1.5 mm long, margins uneven. **Male flowers**: stamens slightly shorter than petals. **Female flowers**: staminodes shorter than stamens in male flowers; ovary 3-locular; stigma 3-branched. **Fruit** a 3-valved, subglobose capsule, 5–6 mm long, yellow or pink, smooth, prominently sulcate, with 6–12 slightly imbricate ridges, thickly leathery. **Seeds** partially enveloped by yellow aril. Afromontane forest understorey; Indigenous Forests (Matatiele E to Kokstad).

grandifolia (Davison) Jordaan

Large-leaf spikethorn; *grootblaarpendoring* (A)

Tree, up to 7 m high, with thorns. **Branchlets** angular, becoming terete. **Brachyblasts** well-developed. **Leaves** fascicled or alternate, coriaceous, green; lamina lanceolate to obovate, 25–70 × 20–40 mm, apex acute to rounded, mucronate, base cuneate, margins irregularly serrate; midrib distinctly raised below, drying yellowish; petioles 2–6 mm long. **Inflorescence** many-flowered cymes; peduncle 3–4 mm long. **Flowers** white. **Sepals** triangular, ± 2 mm long, margins laciniate. **Petals** obovate, ± 4 mm long, margins ciliolate. **Male flowers**: stamens shorter than petals. **Female flowers**: staminodes shorter than ovary; ovary (2)3-locular; stigma 2- or 3-branched. **Fruit** a 2- or 3(4)-valved, globose capsule, woody, 7–10 mm in diam., whitish, with brown patches, rugose. **Seeds** partially enveloped by yellow aril. Coastal and inland forest, near streams; Indigenous Forests (Port Edward S to East London).

2b Shrubs or trees, usually growing outside forests

buxifolia (L.) Szyszyl.

Common spikethorn; *gewone pendoring* (A)

Shrub or tree, up to 5 m high, with thorns, sometimes vicious. **Branchlets** subangular becoming terete, often with insect galls. **Leaves** fascicled or alternate, membranous or chartaceous; lamina obovate to obovate-rhomboid, 25–45(–80) × 8–20(–25) mm, apex obtuse, rounded, emarginate, base narrow, tapering, margins irregularly toothed, only in upper half; petioles short. **Inflorescences** many-flowered cymes; peduncle 10–20 mm long. **Flowers** whitish, unpleasantly smelling. **Sepals** triangular, ± 1.5 mm long, margins ciliolate. **Petals** elliptic-oblong, 1–3 mm long, margins laciniate. **Male flowers**: stamens shorter than petals. **Female flowers**: staminodes shorter than ovary; ovary 3-locular. **Fruit** a 3-valved, globose capsule, 2–5 mm long, whitish grey-brown, rugose. **Seeds** partially enveloped by aril. Forest margins, bushveld, karroid scrub, often pioneer in disturbed areas; Sub-Escarpment Savanna, Sub-Escarpment Grassland, Drakensberg Grassland, Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (Port Edward W to Graaff-Reinet and S to Tsitsikamma).

capitata (E.Mey. ex Sond.) Loes.

Ashen spikethorn; *vaalpendoring* (A)

Rigid, small shrub, up to 2.5 m high, exceedingly thorny. **Brachyblasts** well-developed. **Leaves** fascicled, thick, leathery, discolorous, sessile; lamina obovate, 10–25 × 3–11 mm, apex rounded to emarginate, base cuneate, margins entire, yellowish when dry; venation obscure. **Inflorescences** reduced cymes, appearing as fasciculate glomerules. **Flowers** cream-coloured, fragrant. **Sepals** deltoid, ± 1.5 mm long, margins

laciniate. **Petals** oblong, ± 2 mm long, margins subentire. **Male flowers**: stamens longer than staminodes in female flowers. **Female flowers**: ± 4 mm long; ovary 3-locular; stigma 3-branched. **Fruit** a 3-valved, triquetrous capsule, ± 6 mm long, with apiculate apex, smooth, yellow to bright orange-red. **Seeds** partially enveloped by white aril. Valley bushveld, thicket; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Stutterheim S to Patensie).

linearis (L.f.) Loes.

Eastern Cape narrow-leaf spikethorn; *Oos-Kaapse smalblaarpendoring* (A)

Shrub or tree, up to 6 m high, with few thorns. **Branchlets** terete. **Leaves** alternate, rarely fascicled, leathery, glaucous-green; lamina linear or narrowly lanceolate, 25–90 × 1–2 mm, apex acute or obtuse, base cuneate, margins entire, sometimes denticulate; only midrib and lateral veins conspicuous; petioles 2–3 mm long. **Inflorescences** shorter than leaves. **Flowers** yellow or greenish, sweetly scented. **Sepals** deltoid, ± 0.5 mm long, margins ciliate. **Petals** oblong-ovate, ± 2 mm long, margins ciliate. **Male flowers**: stamens slightly shorter than petals. **Female flowers**: staminodes shorter than stamens of male flowers; ovary 2-locular; stigma 2-branched. **Fruit** a 2-valved, globose capsule, 2–4 mm long, chestnut-brown, mucronate, smooth. **Seeds** partially enveloped by white aril. Valley bushveld, karroid scrub; Lower Karoo, Albany Thicket (Graaff-Reinet S to Patensie and E to Grahamstown).

polyacanthus (Sond.) Szyszyl.

Hedge spikethorn; *kraalpendoring* (A)

Rigid shrub or tree, up to 3 m high; long shoots curving downwards and inwards, giving plant a drooping habit, with thorns. **Branches** terete, whitish grey, smooth. **Leaves** fascicled or alternate, subsessile; lamina oblanceolate or linear-oblanceolate, 10–40 × 2–8 mm, apex obtuse or emarginate, base cuneate, margins entire or slightly serrate. **Inflorescences** shorter than leaves. **Flowers** cream-coloured or white; pedicels 1.0–1.5 mm long. **Sepals** 0.75 mm long, margins ciliate. **Petals** oblong, ± 2 mm long, margins uneven, somewhat undulate. **Male flowers**: stamens as long as or longer than petals. **Female flowers**: staminodes shorter than stamens of male flowers; ovary 3-locular; stigma 3-branched. **Fruit** a 3-valved, triquetrous capsule, ± 4 mm long, smooth, reddish. **Seeds** partially enveloped by yellow aril. Open valley bushveld; Albany Thicket (Uitenhage to Peddie).

LAURIDIA Eckl. & Zeyh.

Climbing-saffrons; *ranksaffraanbome* (A)

Species 2, endemic to sthn Afr., LIM, M, S, KZN, WC, EC.

Erect shrub to small tree; branchlets usually weakly 4-lined or terete; leaf margins usually entire; flowers 4-merous

reticulata Eckl. & Zeyh.

Eastern Cape climbing-saffron; *Oos-Kaapse ranksaffraan* (A)

Shrub or tree, up to 4 m high. **Bark** with layers of yellow powdery pigment. **Leaves** opposite, leathery, dark green on both sides; lamina elliptic to broadly elliptic, 15–45 (–70) × 7–25 mm, apex acute to acuminate, base cuneate, margins occasionally glandular-toothed; venation ± raised below, less prominent above; petioles 2–5 mm long. **Inflorescences** sessile, compact thyrsoid with 5–15 cymules on straight axis.

Flowers cream-coloured. **Sepals** broadly ovate, ± 1.0 mm long, margins ciliolate. **Petals** broadly elliptic, ± 2.5 × 1.5 mm, rounded, spreading. **Stamens** flattened, arising from margin of disc. **Ovary** 2-locular; stigma lobed. **Fruit** baccate, ± 8 mm in diam., red to purplish black when ripe. Bush clumps in grassland, valley bushveld; Albany Thicket (Uitenhage to Grahamstown).

Scrambling shrub or liana; branchlets often retrorse, conspicuously 4-lined; leaf margins glandular-crenulate; flowers 4- or 5-merous

tetragona (L.f.) R.H.Archer

Climbing-saffron, bobcherry; *ranksaffraan* (A); *umbovana* (X)

Scrambling shrub or liana, up to 3 m high. **Bark** with yellow pigment in root bark only. **Leaves** opposite, subleathery, bright green on both sides; lamina elliptic, oblong or ovate, 15–93 × 10–25 mm, apex acute, rounded to emarginate, base rounded to cordate; venation ± raised on both sides; petioles 2–5 mm long. **Inflorescences** irregular, compact dichasium. **Flowers** white, sessile. **Sepals** broadly ovate, ± 1 mm long, margins ciliolate. **Petals** ovate, ± 2.0 × 1.5 mm, apex rounded, ± erect. **Stamens** shorter than petals. **Ovary** 2-locular; stigma lobed. **Fruit** baccate, 5–8 mm long, red to purple when ripe. Coastal and afromontane forest, forest margins, dune scrub; Sub-Escarpment Grassland, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad SW to Queenstown and Humansdorp).

LYDENBURGIA N.Robson

Species 2, narrow endemics to sthn Afr., in Sekhukhuneland and Pondoland, LIM, M, KZN, EC.

abbottii (A.E.van Wyk & Prins) Y.Steenkamp, A.E.van Wyk & Prins

Pondo bushman's tea; *Pondoboesmanstee* (A)

Tree, up to 20 m high. **Branchlets** ± terete, reddish brown, with few lenticels. **Bark** with layers of powdery yellow pigment. **Leaves** opposite, subleathery, dark glossy green above, dull below; lamina elliptic to broadly ovate, 25–70(–90) × 15–40(–70) mm, apex acute to rounded or emarginate, base attenuate, round or truncate, margins glandular-toothed; petioles 6–10 mm long. **Inflorescences** very lax, axillary cymes; peduncle 10–30 mm long. **Flowers** 5-merous, white, sweetly scented. **Sepals** triangular, 1.0 × 1.5 mm, margins ciliolate. **Petals** oblong, 3.0 × 1.7 mm, margins laciniate. **Stamens** erect, becoming recurved. **Ovary** 3-locular; stigma 3-lobed. **Fruit** a 3-valved, trigonous capsule, ± 3.5 mm long. **Seeds** exarillate and wingless. Coastal forest, riverbanks, on sandstone; Indigenous Forests (Umtamvuma Nature Reserve S to Mzamba River).

Possibly extinct.

MAYTENUS Molina

Silkybarks and koko trees; *sybas- en kokobome* (A)

Species ± 150, mostly in tropics, subtropics and temperate regions of South America, Africa and Madagascar; 14 in sthn Afr., B, LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

1a Broken leaf reveals silky elastic threads

abbottii A.E.van Wyk

Pondo silkybark; *Pondosybas* (A)

Erect or scandent shrub or tree, up to 4 m high. **Branchlets** 4-lined, becoming terete. **Leaves** alternate, thick, leathery, dark glossy green above, paler below; lamina

broadly ovate, 46–110(–125) × 30–70(–80) mm, apex acute to emarginate, base cuneate to rounded, margins glandular-toothed, occasionally subentire; midrib and lateral veins prominently raised below; petioles 5–10 mm long. **Inflorescences** few-flowered, axillary cymes; peduncles 0.5–2.0 mm long. **Flowers** 4-merous, cream-coloured, 8–10 mm in diam. **Sepals** unequal, margins erose. **Petals** broadly elliptic, ± 3 × 4–5 mm, margins erose. **Ovary** 2–4-locular; stigma 3-lobed. **Fruit** a 2–4-valved, flattened-globose capsule, ± 10 × 15 mm, green, leathery. **Seeds** with white, hairy aril, partially enveloping seed. Coastal forest understorey, riverbanks, on sandstone; Indigenous Forests (Umtamvuma Nature Reserve).

acuminata (L.f.) Loes.

Silkybark; *sybas* (A); *umnama* (X); *umnama* (Z)

Shrub or tree, up to 15 m high. **Branchlets** angular, becoming terete, sometimes reddish. **Leaves** alternate, membranous or subcoriaceous, dark glossy green above, paler below; lamina elliptic to ovate, (9–)17–50(–80) × 8–40 mm, apex acute to long acuminate, base cuneate, margins serrate; midrib of young leaves reddish; petioles 2–10 mm long. **Inflorescences** monochasial cymes; peduncles 0.5–2.0 mm long. **Flowers** 5-merous, whitish, yellow, orange to pink; pedicels 3–13 mm long. **Sepals** subcircular, ± 12 mm long, margins entire. **Petals** subcircular, 1.5–2.5 mm long, margins entire. **Stamens** much shorter than petals. **Fruit** a 2- or 3-valved, or abortively 1-locular, obovoid capsule, 3–11 mm long, smooth, yellow to red. **Seeds** completely enveloped by orange aril. Forest margins, mountain fynbos, wooded kloofs (valleys?), hill slopes, often near rivers; Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (Kokstad S to Tsitsikamma).

cordata (E.Mey. ex Sond.) Loes.

Water silkybark; *watersybas* (A)

Shrub or tree, up to 4 m high, single-stemmed. **Branchlets** angular, purplish brown, becoming terete. **Leaves** alternate, subleathery, dark glossy green above, paler below, sessile or subsessile; lamina ovate, 25–70 × 15–40 mm, apex acute or obtusely acuminate, mucronate, base distinctly cordate or rounded, margins serrate or subentire; midrib sunken above, prominently raised below. **Inflorescences** axillary, cymose, few-flowered. **Flowers** 5-merous, greenish yellow. **Sepals** suborbicular, ± 1.5 mm long, margins laciniate. **Petals** suborbicular, ± 3 mm long, narrowed to a short claw. **Ovary** 3-locular; stigmas 3. **Fruit** a 3-valved, obcordate capsule, ± 10 mm long, green. **Seeds** enveloped by thin aril. Coastal forest understorey, near water; Indian Ocean Coastal Belt, Indigenous Forests (Umtamvuma Nature Reserve S to Kentani).

1b Broken leaf lacks silky elastic threads
2a Inflorescences fasciculate (axillary clusters); ovary usually 3-locular

oleosa A.E.van Wyk & R.H.Archer

Pondo koko tree; *Pondokokoboom* (A)

Tree, up to 6 m high. **Branchlets** angular, becoming terete. **Leaves** alternate, subleathery, glossy dark green above, yellowish green below; lamina narrowly elliptic or lanceolate, 25–60(–90) × 5–12(–23) mm, apex acuminate, base attenuate, margins glandular-toothed; reticulate venation very conspicuous below; midrib prominently raised above, less so below. **Inflorescences** 2–8-flowered, sessile or pedunculate. **Flowers** whitish; pedicels 3–5 mm long. **Sepals** unequal, ± deltoid, margins ciliate. **Petals** obovate, ± 2 mm long, margins densely ciliolate. **Stamens** ± 1 mm long. **Fruit** a 3-valved, obovoid to subglobose capsule, slightly lobed between valves, 8–10 mm long, green-

ish, smooth. **Seeds** completely enveloped by yellow aril. Forest understorey, along sandstone streams and rivers; Indigenous Forests (Umtamvuma Nature Reserve S to Cwaka and Mzamba rivers).

procumbens (L.f.) Loes.

Dune koko tree; *duinekokoboom* (A); *umphono-phono* (X)

Scrambling shrub or tree, up to 6 m high. **Branchlets** angular, reddish or pinkish orange. **Leaves** alternate, leathery, glossy above, paler below; lamina oblong-elliptic to oblanceolate, 10–60 × 13–40 mm, apex acute to obtuse or rounded, mucronate, base cuneate, margins glandular-toothed, strongly recurved; venation distinct; petioles 1–4 mm long. **Inflorescences** 2–10-flowered. **Flowers** greenish white, ± 4 mm in diam.; pedicels 5–10 mm long. **Sepals** orbicular, ± 1 mm long, margins laciniate. **Petals** broadly oblong, 1–3 mm long, margins uneven. **Stamens** ± 1 mm long. **Ovary** subglobose; style almost absent; stigma 3-lobed. **Fruit** a 3-valved, obovoid-trigonous capsule, 4–5 mm long, bright yellow, smooth. **Seeds** completely enveloped by orange aril. Coastal dune forest, coastal thicket, scrub; Indian Ocean Coastal Belt, Albany Thicket (Port Edward S to Jeffreys Bay).

undata (Thunb.) Blakelock *s.l.*

Koko tree; *kokoboom* (A)

Four forms are recognised here:

(i) **Maytenus deflexa** (Sprague) E.Schmidt & Jordaan

Tree, up to 10 m high. **Branchlets** subterete, pallid, glaucous. **Leaves** alternate, coriaceous, dark green above, white below; lamina lanceolate or obovate, (65–)100–150 × (35–)45–60 mm, apex obtuse, base cuneate, margins serrate-dentate; midrib and reticulate venation prominent above, less so below, lateral veins in 9–14 pairs; petioles ±10 mm long. **Inflorescences** many-flowered, axillary clusters. **Flowers** whitish; pedicels 15–20 mm long, articulated 5–6 mm above base. **Sepals** deflexed, ovate-oblong, 1–2 mm long, margins laciniate. **Petals** deflexed, ± suborbicular, ± 5 mm long, margins uneven. **Stamens** ± 1.5 mm long. **Ovary** 3-locular; style ± 0.5 mm long; stigmas 3. **Fruit** a 3-valved, trigonous-globose capsule, 7–9 mm long, smooth, dark brown to blackish. **Seeds** enveloped by orange aril. Forests, in wooded kloofs, on riverbanks; Indigenous Forests (Kokstad S to Stutterheim).

(ii) **Maytenus**?

(= *Gymnosporia peglerae* Davison)

Known only from the forests in Kentani. This taxon seems to be distinctive and needs further investigation.

(iii) **Maytenus undata** (Thunb.) Blakelock *s.s.*

Shrub or tree, up to 8 m high. **Branchlets** angular, with whitish waxy bloom. **Leaves** alternate, sessile, concolorous, often mottled when dry; lamina elliptic to obovate, (15–)30–50 × 12–30(55) mm, apex acute, rounded to emarginate, base decurrent, often asymmetric, margins glandular-toothed, (3)5–7 teeth on each side, thickened, slightly undulate; midrib and lateral veins prominently raised on both sides. **Inflorescences** few-flowered, axillary clusters. **Flowers** whitish; pedicels 7–10 mm long. **Sepals** ± 1 mm long, margins laciniate. **Petals** oblong, 3.0 × 1.5 mm long, margins uneven. **Stamens** ± 2.5 mm long. **Ovary** 3-locular; style ± 1 mm long, persistent in fruit; stigmas 3. **Fruit** a 3-valved, obovoid capsule, ± 7 mm in diam., yellow, minutely verrucose. **Seeds**

enveloped by yellow aril. Ravine forest, thicket, among rocks; Albany Thicket, Rain-shadow Valley Karoo (Kei Mouth S to Baviaanskloof).

(iv) **Maytenus zeyheri** (Sond.) Loes.

Shrub, up to 2 m high. **Branchlets** angular-ribbed, smooth. **Leaves** alternate, sessile, coriaceous, dark glossy green; lamina obovate or rounded-obovate, unequal, larger ones 20–30 × 14–20 mm, smaller ones 5–15 × 5–9 mm, apex acute, obtuse to emarginate, base decurrent, margins with 1–3(4) coarse serrations on upper half, sometimes entire, margins slightly undulate; venation conspicuous. **Inflorescences** few-flowered clusters, very shortly pedunculate. **Flowers** yellow; pedicels ± 1 mm long. **Sepals** orbicular, ± 1 mm long, margins laciniate. **Petals** ± suborbicular, ± 2 mm long, margins uneven. **Stamens** ± 1 mm long. **Ovary** (2)3-locular. **Fruit** a (2)3-valved, globose-trigonous capsule, ± 4 mm long, yellow. **Seeds** enveloped by thin aril. Karroid scrub, among rocks, on dolerite koppies; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Eastern Fynbos-Renosterveld (Aliwal North SE to Queenstown, southwestwards to Willowmore).

2b Inflorescences cymose (mono- or dichasium); ovary 2-locular

3a Plants glabrous in all stages

oleoides (Lam.) Loes.

Rock candlewood, rock cherrywood; *klipkershout* (A)

Shrub or tree, up to 6 m high. **Branchlets** sub-angular, whitish, becoming terete. **Leaves** alternate, leathery, glaucescent, waxy; lamina obovate, ovate-oblong to lanceolate, 20–60 × 5–30(–40) mm, apex acute, obtuse, rounded or emarginate, base cuneate, margins entire, revolute; venation obsolete; petioles 2–6 mm long. **Inflorescences** axillary, reduced cymes; peduncles 3–5 mm long. **Flowers** whitish flecked brownish. **Sepals** unequal, deltoid, margins laciniate. **Petals** suborbicular, ± 2 mm long, margins uneven. **Stamens** ± 1 mm long. **Disc** fleshy, annular. **Ovary** 2-locular; style very short; stigma 3-lobed. **Fruit** a 2-valved, obovoid capsule, 6–10 mm long, brown to orange. **Seeds** completely enveloped by yellow or orange aril. Mountain fynbos, forest margins, mountain slopes, rocky places; Eastern Fynbos-Renosterveld (Baviaanskloof E to Grahamstown).

3b Leaves and inflorescences hairy at least in young plants

peduncularis (Sond.) Loes.

Cape-blackwood; *Kaapse swarthout* (A)

Tree, occasionally up to 20 m high. **Branches** terete, softly hairy. **Bark** grey-brown to almost black. **Leaves** alternate, dark green above, paler below, hairy when young; lamina elliptic or ovate, 20–80(–120) × 8–45 mm, apex acute to obtusely subacuminate, base broadly cuneate to rounded, margins serrate; petioles 4–10 mm long. **Inflorescences** axillary, cymose, few-flowered, hairy; peduncle 10–35 mm long. **Flowers** very small, greenish white or yellowish. **Sepals** suborbicular, ± 0.75 mm long, hairy, margins laciniate. **Petals** suborbicular, fleshy, ± 2 mm long, margins uneven. **Ovary** 2-locular; style short. **Fruit** a 2-valved, obovoid capsule, ± 10 mm long, slightly asymmetric, smooth, yellow. **Seeds** completely enveloped by white aril. Forest, scrub, along streams and rivers; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (Port Edward S to Tsitsikamma).

MYSTROXYLON Eckl. & Zeyh.

Monotypic with 4 subspecies in Africa and Mascarene Islands, 3 subspecies in sthn Afr., N, B, LIM, NW, G, M, S, KZN, WC, EC.

aethiopicum (Thunb.) Loes.

Koobooberry; *koeboebessie* (A)

Shrub or tree, up to 4 m high. **Branchlets** flattened, yellowish hairy, becoming terete and glabrous. **Leaves** alternate, yellowish hairy only on veins to densely hairy all over, dark green and glossy, paler and dull below; lamina ovate to lanceolate, 16–120(–150) × 8–56(–80) mm, base cuneate to cordate, apex obtuse, or rounded to emarginate, margins entire or wavy to glandular-toothed; petioles 4–8 mm long, hairy. **Inflorescences** axillary, cymose; peduncles up to 20 mm long, hairy. **Flowers** 5-merous, green to yellow; pedicels up to 15 mm long. **Sepals** ± suborbicular, ± 1 mm long, hairy. **Petals** suborbicular, 1–2 mm long, glabrous. **Ovary** (2)3-locular. **Fruit** a globose drupe, 8–20 mm in diam., often apiculate, bright to purplish red, smooth, glabrous or hairy. Forest, forest margins, often on rocky ridges or riverbanks; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (Port St Johns S to Tsitsikamma).

PLEUROSTYLIA Wight & Arn.

Species 3–5, in Africa, Mascarene Islands and Australasia; 1 in sthn Afr., LIM, M, S, KZN, EC.

capensis (Turcz.) Loes.

Coffee-pear; *koffiepeer* (A); *umthunywalele* (X); *umthunyelelwa* (Z)

Tree, up to 10 m high. **Branchlets** 4-ribbed, greyish brown. **Bark** sometimes peeling to reveal orange under-bark. **Leaves** opposite, subleathery, pale green on both sides; lamina elliptic to lanceolate, 20–85 × 8–20 mm, apex rounded or abruptly acuminate, sometimes emarginate, base cuneate to rounded, margins entire, sometimes wavy; venation prominent; petioles short. **Inflorescences** axillary, few-flowered cymes; peduncle 2–8 mm long. **Flowers** greenish white. **Sepals** suborbicular, ± 1 mm long, margins fringed. **Petals** ± suborbicular, ± 3 mm long, margins entire, reflexed. **Stamens** exserted. **Ovary** 1-locular; style short; stigma discoid. **Fruit** a ± ellipsoid nut, ± 7 mm long, asymmetric, curved, whitish, with scar of stigma on one side below middle. **Seeds** ellipsoid, exarillate. Montane and coastal forest, along watercourses; Indigenous Forests (Bizana S to Uitenhage).

PRISTIMERA Miers.

(= *HIPPOCRATEA* L. *s.l.*)

Species ± 30 in South America, Africa and South East Asia; ± 2 in sthn Afr., N, B, LIM, M, S, KZN, EC.

peglerae (Loes.) R.H.Archer
(= *Hippocratea schlechteri* Loes. var. *peglerae* Loes.)

Paddle-pods; *spaanvrugbome* (A)

Scrambling shrub or climber. **Branchlets** terete, with inconspicuous lenticels. **Leaves** opposite, papery; lamina elliptic to oblong, 40–92 × 20–50 mm, apex acute to bluntly acuminate, sometimes emarginate, base broadly cuneate, margins glandular-toothed; midrib yellowish, prominently raised below, reticulate venation very conspicuous on both sides; petioles short. **Inflorescences** 3–15-flowered, axillary cymes. **Flowers** yellowish green. **Sepals** 5, suborbicular, ± 1 mm long, margins fimbriate. **Petals** 5, oblong, ± 1.5–2.0 mm long, margins subentire, inrolled. **Disc** (4)5-lobed. **Stamens** 3, very short.

Ovary globose; ovules 4(5) per locule. **Fruit** oblanceolate to obovate mericarps, united at base, 30–50 × 20–26 mm, apex acute to rounded, smooth, olive- to yellow-brown, striate. **Seeds** winged, up to 30 mm long, with marginal and submedian vein. Coastal sand forest, near streams, on rocky soil; Indigenous Forests (Kentani).

PSEUDOSALACIA Codd

Monotypic, restricted to coastal sandstone regions of sthn Afr., KZN, EC.

streyi Codd

Pondo rock-lemon; *Pondokliplemoen* (A)

Shrub or tree, up to 7 m high. **Branchlets** hairless, angular and flattened, becoming terete. **Leaves** alternate, leathery, glossy dark green above, paler below; lamina oblong-elliptic to ovate-elliptic, 70–140 × 40–80 mm, apex rounded to emarginate, base broadly cuneate, margins entire, slightly thickened, veins looping along margins; petioles 6–15 mm long. **Inflorescences** shortly pedunculate or fasciculate, 1–7-flowered. **Flowers** greenish or yellowish orange, ± 15 mm in diam.; pedicels 10–20 mm long. **Sepals** triangular, ± 1 mm long. **Petals** suborbicular, ± 3 mm in diam., subentire. **Disc** fleshy, green, obscurely 5-angled. **Ovary** 3-locular; style very short. **Fruit** a globose capsule, 20–30 mm in diam.; pericarp thick, woody, pale brown, verrucose. Riverine forest, along sandstone streambanks; Indigenous Forests (Umtamvuma Nature Reserve S to Mkambati Nature Reserve).

PTEROCELASTRUS Meisn.

Candlewood trees; *kershoutbome* (A)

Species 4, SE Africa, occurring as far north as Malawi, Mozambique, Zimbabwe and in sthn Afr., LIM, NW, G, M, S, KZN, L, WC, EC.

1a Leaf apex abruptly, obtusely acuminate to rounded; capsules with 1–3 short, acute and erect horns

echinatus N.E.Br.

White candlewood; *witkershout* (A); *ibholo* (X); *usahlulamanye* (Z)

Shrub or tree, up to 15 m high. **Branchlets** angular, becoming vinous red, with whitish lenticels and orange underbark. **Leaves** alternate, glossy dark green above, paler below; lamina ovate to oblong-elliptic, 20–90 × 7–32(–46) mm, base cuneate to angustate, margins entire, often slightly undulate; reticulate venation inconspicuous; petioles 4–8 mm long, purplish red. **Inflorescences** axillary cymes. **Flowers** green, yellow or white, scented. **Sepals** unequal, ± semicircular, 0.5–1.0 mm long. **Petals** elliptic-oblong, 1.5–2.0 mm long, margins entire. **Stamens** shorter than petals. **Ovary** 3-locular. **Fruit** a 3-valved capsule, subglobose, 6–8 mm long, horned with 1–3 conic or ridge-like protuberances from each valve, yellow-orange to red. **Seeds** enveloped by yellow aril. Forest, forest margins, scrub forest, rocky mountain slopes; Sub-Escarpment Grassland, Indigenous Forests (Kokstad S to Elliot).

1b Leaf apex long acuminate, venation conspicuous below; capsules with many compressed, wing-like, erect, or decurrent horns

rostratus (Thunb.) Walp.

Red candlewood; *rooikershout* (A); *itywina* (X); *usahlulamanye* (Z)

Tree, up to 9 m high. **Branchlets** angular, reddish. **Leaves** alternate, coriaceous, glossy dark green above, paler below; lamina broadly elliptic or oblong-lanceolate, (20–)50–90

× 13–40 mm, base cuneate, margins entire, wavy; midrib pink-tinged and raised above; petioles 5–7 mm long. **Inflorescences** many-branched, many-flowered, lax cymes, up to 35 mm long. **Flowers** white, yellowish or pinkish. **Sepals** unequal, 2 outer ± 0.5 mm long, 3 inner ± 2 mm long, margins laciniate. **Petals** oblong, ± 3 mm long, slightly clawed, margins slightly irregular. **Stamens** inserted in shallow sinuses of disc. **Fruit** a 3-valved, globose capsule, with many wing-like or decurrent horns, orange-red. **Seeds** enveloped by thin yellow aril. Coastal and mist belt forest, forest margins, mountainsides; Indigenous Forests (Maclear E to Port Edward southwards to Tsitsikamma).

Ic Leaf apex obtuse to rounded; venation obscure below; capsules with many entire, toothed, lacerated, bifid or trifid horns

tricuspidatus (Lam.) Walp.

Candlewood; *kershout* (A)

Tree, up to 7 m high. **Branchlets** angular, green. **Leaves** alternate, coriaceous, glossy above, paler below, young leaves pink to red; lamina obovate, (35–)50–80 × 10–40 mm, apex slightly emarginate, base cuneate, margins entire, slightly revolute, venation obscure below; petioles 1–7 m long. **Inflorescences** dense, many-flowered, short cymes. **Flowers** cream-coloured to pale yellow, sweetly-scented. **Sepals** unequal, 3 interior longer than 2 exterior, orbicular, brown-edged, margins slightly laciniate. **Petals** oblong, ± 2 mm long, margins slightly irregular revolute. **Fruit** a 3-valved capsule, with horns entire, toothed, lacerated, bifid or trifid, up to ± 10 mm in diam., orange-yellow. **Seeds** enveloped by thin yellow aril. Coastal fynbos, coastal forest, forest margins, dune scrub, in rocky places; Indigenous Forests, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Port Edward S to Tsitsikamma).

PUTTERLICKIA Endl.

False spikethorns; *valspendorings* (A)

Species 4, southern Mozambique and sthn Afr., M, S, KZN, NC, WC, EC.

Stems with inconspicuous nonwarty lenticels; thorns straight

pyracantha (L.) Szyszyl.

False spikethorn; *valspendoring* (A)

Straggling shrub, up to 3 m high, thornescent. **Branches** terete, covered by waxy layer, with nonwarty lenticels. **Leaves** coriaceous, glossy dark green; lamina obovate, 13–7 × 8–35 mm, apex rounded, obtuse to emarginate, base cuneate, margins revolute, usually entire or spinulose-denticulate; petioles 1–4 mm long. **Inflorescences** very lax axillary cymes; peduncle 10–25 mm long, reddish. **Flowers** whitish. **Sepals** unequal, broadly triangular, ± 1 mm long, margins laciniate. **Petals** oblong, 4–5 mm long, apex rounded, margins slightly ciliate, reflexed lengthwise. **Stamens** ± 3 mm long. **Ovary** 3-locular; ovules 6–12 per locule. **Fruit** an obconic-trigonous capsule, 10–20 mm long, cream-coloured to pink or red, smooth. **Seeds** completely enveloped by orange aril. Coastal fynbos, scrub, dune forest; Albany Thicket, Eastern Fynbos-Renosterveld (Komga S to Baviaanskloof).

Stems with prominent warty lenticels; thorns straight or pointing backwards

retrospinosa A.E.van Wyk & Mostert

Pondo false spikethorn; *Pondovalspendoring* (A)

Woody climber, up to 5 m high. **Branches** greyish brown. **Thorns** pointing backwards. **Leaves** coriaceous, glossy dark green above, paler below; lamina broadly elliptic

to broadly obovate, 25–120(–150) × 15–60(–70) mm, apex rounded or retuse, mucronate, base rounded to cuneate, margins subentire or few teeth in upper half, thick; petioles 8–15 mm long. **Inflorescence** very lax cymes; peduncle 30–50 mm long. **Flowers** white. **Sepals** subrotund, ± 1 mm long, margins ciliate. **Petals** oblong, 3.5 × 2.0 mm, margins irregular. **Stamens** ± 1.5 mm long. **Ovary** 3-locular; ovules 8–10 per locule. **Fruit** an obconic-trigonous capsule, 30 × 20 mm, pink or red when ripe, smooth. **Seeds** completely enveloped by orange aril. Riverine forest, forest margins, on sandstone; Indigenous Forests (Umtamvuma Nature Reserve S to Mkambati Nature Reserve).

verrucosa (E.Mey. ex Sond.) Szyszyl.

Forest false spikethorn; *bosvalspendoring* (A)

Straggling shrub or tree, up to 3 m high. **Branches** reddish. **Thorns** slender, straight. **Leaves** coriaceous, glossy grey-green above, paler below; lamina ovate, obovate to oblanceolate-spathulate, 10–85 × 6–24 mm, apex often emarginate and mucronate, base cuneate, margins serrulate or spinulose-denticulate, sometimes subentire, thickened, revolute; petioles 1–3 mm long. **Inflorescences** lax, axillary cymes. **Flowers** whitish. **Sepals** equal, oblong to suborbicular, 1–2 mm long, margins laciniate. **Petals** oblong, 2–4 mm long, margins uneven, reflexed lengthwise. **Stamens** ± 2 mm long. **Ovary** 3-locular; ovules 6–12 per locule. **Fruit** an obconic-trigonous capsule, 15–25 mm long, reddish brown, smooth. **Seeds** completely enveloped by orange aril. Coastal and inland forest, forest margins, low-lying riverine vegetation; Indian Ocean Coastal Belt, Indigenous Forests (Port St Johns SW to Fort Beaufort).

ROBSONODENDRON R.H.Archer

False silkybark trees; *valssybasbome* (A)

Species 2, endemic to sthn Afr., LIM, M, S, KZN, WC, EC.

Tree up to 12 m *high; leaf margins not revolute, apex usually acute to rounded; petiole, midrib and young stems smooth to slightly rugulose*

eucleiforme (Eckl. & Zeyh.) R.H.Archer

False silkybark; *valssybas* (A)

Tree, up to 12 m high. **Branchlets** angular, becoming terete. **Leaves** alternate, concolorous, subcoriaceous, elastic threads evident in broken leaves; lamina elliptic to ovate or obovate, 25–45(–75) × 8–20(–35), base cuneate, margins entire or glandular-toothed, slightly thickened; midrib yellowish, prominently raised on both sides, venation otherwise obscure; petioles short. **Inflorescences** axillary, fasciculate cymes. **Flowers** creamish. **Sepals** ± deltoid, ± 1.0 × 1.5 mm, margins laciniate. **Petals** oblong, 1.7–2.5 × 0.7–1.5 mm, margins entire. **Stamens** ± 0.7 mm long. **Ovary** 2-locular; style very short. **Fruit** a spheroid drupe, ± 5 mm in diam., yellow to brown when ripe. **Seed** usually single. Forest, forest margins, rocky outcrops in bushveld; Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld (Kokstad to Umtamvuma Nature Reserve, southwards from Msikaba River and Graaff-Reinet to Humansdorp).

Shrub up to 2 m *high; leaf margins revolute, apex usually acute and mucronate; petiole, midrib and young stems prominently rugulose*

maritimum (Bolus) R.H.Archer

Dune false silkybark; *duinevalssybas* (A)

Shrub, up to 2 m high. **Branchlets** angular, becoming terete. **Leaves** alternate, concolorous, coriaceous, elastic threads evident in broken leaves; lamina elliptic to ovate, 10–

30(–40) × 4–15(–22) mm, base cuneate to rounded, margins entire, thickened, revolute; venation obscure; petioles ± 2 mm long. **Inflorescences** axillary, fasciculate cymes. **Flowers** creamish. **Sepals** ± deltoid, ± 2 × 2 mm, margins laciniate. **Petals** oblong, ± 2 mm long, margins entire. **Disc** with upturned margins. **Stamens** ± 1 mm long. **Ovary** 2-locular; style very short. **Fruit** a spheroid drupe, ± 5–10 mm in diam., yellow to brown when ripe. Coastal dune forest; Albany Thicket (Peddie SW to Jeffreys Bay).

SALACIA L.

Lemon-ropes; *lemoentjietoue* (A)

Species ± 200, cosmopolitan in tropics; 5 in sthn Afr., N, B, LIM, G, M, KZN, EC.

gerrardii Harv. ex Sprague

Forest lemon-rope; *boslemoentjietou* (A)

Scrambling shrub or woody climber, twigs form hooks for climbing. **Leaves** opposite or alternate, dark green above, paler below; lamina elliptic-oblong to ovate, 40–110 × 20–50 mm, base cuneate to rounded, apex abruptly acuminate, sometimes apiculate, margins shallowly toothed, wavy; reticulate venation prominently raised on both sides; petioles 5–10 mm long. **Inflorescences** axillary fascicles, few-flowered. **Flowers** yellowish green. **Sepals** oblong, ± 1 × 2 mm, margins ciliolate. **Petals** oblong, 4–5 mm long, margins irregular. **Disc** yellowish. **Stamens** flattened, ± 1.7 mm long, widening towards base. **Ovary** pyramidal, ± 1 mm long; style ± 1.5 mm long. **Fruit** a globose berry, fleshy, 10–20 mm in diam., orange, smooth. Forest, forest margins, rocky outcrops; Indigenous Forests (Umtamvuma Nature Reserve S to Port St Johns).

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CELTIDACEAE see ULMACEAE

CERATOPHYLLACEAE

(Order Ceratophyllales)

Compiled by R.P. Glen

CERATOPHYLLUM L.

A worldwide family of 1 genus only; ± 6 polymorphic species presently recognised, each with several varieties or formae; 2 in sthn Afr., N, B, LIM, G, M, S, KZN, WC, EC.

demersum L.

Perennial, submerged hydrophyte, height depending on water depth, rootless, monoecious. **Stem** 1 branch per node. **Leaves** whorled, 6–8 per node, filiform, once or more dichotomously branched, 2 rows of minute teeth along ultimate segments, apical segments truncate, tipped with two spines. **Flowers** unisexual, solitary in axil of 1 leaf in a whorl, male and female on alternate nodes. **Perianth**: lobes 6–13, united at base, strap-shaped or obovate. **Male flowers** subsessile; stamens up to 30 in several whorls on receptacle around pistillode; anthers oblong, extrorse, 2-thecous, mature anthers detach, float to water surface, shedding pollen onto plants below. **Female flowers** ± sessile; ovary superior, ovoid, 1-locular, 1-carpellate; style long. **Fruit** a 1-seeded nut. Stagnant to fast-flowing water, tolerant of estuarine water of high salinities; Albany Thicket (East London: Gonubie Sanctuary).

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CHENOPODIACEAE see AMARANTHACEAE *s.l.*

CLEOMACEAE

(Order Brassicales)

Compiled by M. Struwig

CLEOME L.

Species ± 275, tropical and warm temperate regions of the world, especially America; 21 in sthn Afr., widespread, except L, WC.

Leaves compound

gynandra L.

African cabbage, cat's whiskers; *oorpynpeultjie*, *palmbossie*, *vingerblaartee* (A)

Annual herb, 0.25–0.60 m high, erect, much branched, sometimes becoming woody with age. **Stems** striate, viscid glandular-pubescent to glabrescent. **Leaves** petiolate; 3–5-foliate, leaflets obovate to oblanceolate, glabrescent to finely glandular on the under surface, often with scattered multicellular hairs on the main nerves below, margins repand-denticulate. **Inflorescence** a terminal raceme. **Sepals** lanceolate-acuminate, glandular. **Petals** white, obovate-oblanceolate. **Stamens** 6; filaments purplish. **Ovary** linear-oblong, glandular. **Fruit** a linear capsule, style persistent. **Seeds** brown, circular. Cultivated land; Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Kentani District).

Leaves simple

monophylla L.

Spindel pod; *rusperbossie*, *enkelblaar cleome* (A)

Annual herb, up to 0.5 m high, erect. **Stems** striate, pubescent. **Leaves** simple, petiolate, pubescent; linear-lanceolate to oblong-ovate, margins entire. **Inflorescence** a terminal raceme. **Sepals** linear-lanceolate, pubescent. **Petals** pink to pale mauve with a transverse yellow band outlined in purple on the upper two, spathulate. **Stamens** 6. **Ovary** almost sessile, puberulous. **Fruit** a narrowly linear capsule, straight or slightly curved, spreading. **Seeds** brown to dark brown, almost circular in outline, somewhat flattened, transversely ridged. Roadside; sub-Escarpment Savanna (Clydesdale S to Mlengana).

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CLUSIACEAE

(Order Malpighiales)

Compiled by C.L. Bredenkamp

GARCINIA L.

Species 240, especially Old World, with a concentration in Asia; 2 in sthn Afr., M, S, KZN, EC.

gerrardii Harv. ex Sim

Forest mangosteen; *bosgeelmelkhout* (A); *umbande* (X); *isibinda* (Z)

Medium-sized, evergreen tree or shrub, 2.4–13.0 m high, usually with yellow juice, sometimes with leafy branches modified into thorns. **Leaves** opposite, entire, glossy on both surfaces, coriaceous; venation usually prominent, often with translucent glandular canals and brownish resin canals; petioles decurrent. **Flowers** terminal or axillary, solitary or in few- to many-flowered cymes, yellowish green, usually unisexual and plants dioecious. **Male flowers**: stamens many, free or connate in 4 or 5 fascicles (bundles), with each fascicle forming a solid staminal column bearing free or partially fused filaments above. **Female** or **bisexual flowers** usually with 4(5) stamen fascicles or staminode fascicles. **Flowering time** Aug.–Feb. **Fruit** baccate, subglobose, orange when ripe, edible. **Seeds** 1 or 2. Coastal and montane forest, river gorges; Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Savanna (Uvongo River, through Pondoland and Transkei to Port St Johns).

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COMBRETACEAE

(Order Myrtales)

Compiled by C.L. Bredenkamp

Calyx produced into a short, campanulate or cup-shaped limb above ovary ..... **Combretum**
Calyx produced into a long tube above ovary ..... **Quisqualis**

COMBRETUM Loefl.

Bushwillows; *boswilgers* (A)

Species 250, fairly cosmopolitan in warm climates, excluding Australia and Pacific Islands; ± 30 in sthn Afr., widespread, except FS (rare), L, WC.

1a Climbing or scrambling shrubs; flowers 4- or 5-merous; petals 4 mm long or longer, bright red, orange, pink or white; scales absent (subgenus Cacousia*)*

bracteosum (Hochst.) Brandis

Hiccup nut; *hik-klimop* (A); *uqotho* (X)

Coppicing, scandent shrub, 2–8 m high, branches sparingly armed with petiolar spines up to 15 mm long, fuscous (brownish grey). **Leaves** elliptic to obovate, papyraceous,

pellucid-punctate, sparsely pilose below on nerves, with tufts of hairs in nerve axils, margins ciliate; lateral nerves 7–9 pairs. **Inflorescence** a congested raceme, up to 60 mm long. **Flowers** scarlet, pentamerous. **Flowering time** Sept.–Apr. **Fruit** a 1-seeded nut, ± 23 mm in diam., subglobose or ovoid, indistinctly 5-angled, pericarp brown, apical peg absent. Coastal forests, river mouths; Indian Ocean Coastal Belt, Indigenous Forests (Port Shepstone, through Port St Johns to Coffee Bay).

1b Trees or shrubs; flowers 4-merous; petals < 3.5 mm long, whitish to yellow; scales conspicuous (subgenus Combretum*)*
2a Young stems with greyish or light brown hair; petals up to 2 × 1 mm

[E]**caffrum** (Eckl. & Zeyh.) Kuntze

Cape bushwillow; *Kaapse vaderlandswilg* (A); *umdubu* (X)

Tree, 1–9 m high. **Leaves** narrowly elliptic or lanceolate, light to medium green, very seldom dark green; lamina often slightly twisted, margins occasionally slightly wavy, lower surface glabrous except for scales; lower intersecondary veins plane. **Inflorescence** a subcapitulate spike, 15–20 mm long. **Flowers** with lower receptacle glabrous, except for scales; upper receptacle cupuliform, flat or slightly convex at base; pedicels absent. **Flowering time** Sept.–Nov. **Fruit** 4-winged, 14 × 12 mm, usually partly or completely tinged pink to dark red. Along banks of watercourses or near water; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Indigenous Forests, Eastern Fynbos-Renosterveld (Umzimvubu SW through Fort Beaufort to Greater Addo Elephant National Park, E to East London).

erythrophyllum (Burch.) Sond.

River bushwillow; *rivier-vaderlandswilg* (A); *moduba-noka* (NS); *modubu* (T); *umdubo* (X); *umdubo wehlanze* (Z)

Tree or shrub, 1–12 m high, spreading, densely foliaged. **Leaves** elliptic or oblong-elliptic, light to medium green, very seldom dark green; lamina often slightly twisted, margins occasionally, slightly wavy, lower surface distinctly hairy, at least on midrib and secondary veins, rarely glabrous; lower intersecondary veins raised. **Inflorescence** a subcapitulate spike, 15–20 mm long. **Flowers** with lower receptacle densely pubescent; upper receptacle ± campanulate; pedicels absent. **Flowering time** Aug.–Nov. **Fruit** 4-winged, yellowish green, rarely tinged pink. Banks of watercourses, near water; Indigenous Forests, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Mount Frere District E to Umtamvuma Nature Reserve, S to Kei River Mouth).

kraussii Hochst.

Forest bushwillow; *bos-vaderlandswilg* (A); *modubu* (NS); *ulandile* (X); *umdubu wehlathi* (Z)

Tree or shrub, 1–12 m high. **Leaves** elliptic or obovate-elliptic, dark green, margins occasionally slightly wavy, lamina often slightly twisted, lower surface glabrous except for scales; lower intersecondary veins plane. **Inflorescence** an elongated spike, 35–60 mm long. **Flowers** with lower receptacle glabrous, except for scales; upper receptacle cupuliform, flat, slightly concave or convex at base; pedicels up to 1 mm long. **Flowering time** Sept.–Nov. **Fruit** 4-winged, partly or completely tinged pink to dark red. Forests or forest margins; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Ntabankulu and Bizana Districts, S to Port Edward and East London).

2b Young stems with dark brown-woolly hairs; petals minute and yellow

edwardsii Exell

Forest climbing bushwillow; *bosklimop* (A)

Tree or shrub, 2–5 m high, with trailing stems and branches ascending into canopy. **Leaves** elliptic or broadly elliptic to ovate, with brownish hairs at first, becoming hairless, dark green and slightly shining above, margins entire; 5–7(–12) pairs of lateral veins, slightly indented above; petioles up to 10 mm long. **Inflorescence** a short, axillary spike, 30–40 mm long. **Flowers** with minute, yellow petals, concealed by short, soft, brownish hairs. **Flowering time** Sept., Oct. **Fruit** 4-winged, greenish yellow, tinged pink. Coastal forests; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Umtamvuma Nature Reserve, Alfred District).

QUISQUALIS L.

Species 17, Africa, India, and Philippine islands; 1 in sthn Afr., KZN, EC.

parviflora Gerrard ex Sond.
[= *Combretum sylvicola* O.Maurin (Jordaan et al. 2011b)]

African quisqualis; *hoedanig* (A); *umquotho* (X); *umbondwe-wehalathi* (Z)

Perennial climber, 1–15 m high. **Leaves** opposite or subopposite, persistent petiole bases that develop into curved spines; simple, oblong or obovate, acuminate, entire. **Flowers** showy, usually in a short, axillary or terminal spike or sometimes a raceme. **Calyx** tubular, shortly 5-lobed, lime green with dark green striations, puberulous. **Petals** 5, longer than calyx lobes, oblong or suborbicular, lime green, puberulous. **Stamens** 10, arising from within throat of calyx tube. **Ovary** with 3 or 4 ovules. **Flowering time** Feb.–May. **Fruit** dry, leathery, oblong, acutely 5-angled, 5-winged and 5-furrowed, 1-seeded. **Seed** 5-angled and 5-furrowed. Evergreen forests, sand forests, riverbanks; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Umtamvuma Nature Reserve through Port Edward to Port St Johns).

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CONNARACEAE

(Order Oxalidales)

Compiled by C.L. Bredenkamp

CNESTIS Juss.

Species ± 13, largely restricted to tropical Africa and Madagascar, but 1 in tropical Asia; 1 in sthn Afr., LIM, M, S, KZN, EC.

polyphylla Lam.

Itch-pod; *jeukpeul* (A); *monêpênêpê* (NS); *ihlozi* (Z)

Liana, shrub or rarely small tree, 2–4 m high, branches cylindrical. **Leaves** compound, leaflets often jugate (appear yoked together), opposite, asymmetric and acuminate. **Inflorescence** racemose, axillary, usually > 1 together in axil of single leaf, sometimes pseudoterminal. **Flowers** unisexual or bisexual, small, tomentose, heterostylous; pedicels with a distinct joint. **Sepals** ± free, imbricate in bud. **Petals** free, white, yellowish or red-tinged. **Gynoecium** of 5, free, sessile carpels; ovules 2 per locule. **Flowering time** Aug.–Nov. **Fruit** a follicle, 1–5 per flower, reniform or cylindrical, curved or undulated, beaked or not, opening lengthways along ventral suture, densely tomentose and sometimes also with long rigid hairs outside, easily detached, stinging hairs inside. **Seed** solitary, testa black and shiny. Evergreen forests from coast to mountains; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Weza State Forest S through Port St Johns to Kentani).

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CONVOLVULACEAE

(Order Solanales)

Compiled by W.G. Welman

1a Leaves minute, scale-like or absent; yellowish twining parasites; flowers small, usually in clusters, often many ..... **Cuscuta**

1b Leaves well developed, green:

2a Ovary 2- or 4-lobed or -cleft; styles 2, inserted between lobes of ovary; prostrate herbs:

3a Ovary 2-cleft, with 2 ovules in each locule ..... ***Dichondra**

3b Ovary 4-cleft, with 1 ovule in each locule ..... **Falkia**

2b Ovary not deeply lobed; style simple, or if 2, then terminal; plants of various habit:

4a Styles 2, free; stigmas 2, peltate or capitate ..... **Seddera**

4b Style 1; stigmas globose to linear:

5a Pollen spinulose; plants glabrous to densely hairy; stigmas biglobose or 3-lobed; style not completely caducous in fruit; fruit dehiscent or indehiscent ..... **Ipomoea**

5b Pollen smooth or with folds or ridges, but not spinulose:

6a Stigmas filiform, terete or subclavate ..... **Convolvulus**

6b Stigmas globose, ovate, oblong or elliptic:

7a Ovary 1-locular; sepals unequal; corolla white or cream-coloured with purple centre ..... **Hewittia**

7b Ovary 2(4)-locular; corolla white or yellow, often with dark centre ..... **Merremia**

CONVOLVULUS L.

Species ± 250, cosmopolitan, mainly temperate and subtropical regions; 14 (1 introduced) in sthn Afr., widespread in both summer and winter rainfall areas, 11 in EC.

1a Corolla 4–5× as long as calyx

*arvensis L.

Field bindweed, wild morning glory; *akkerwinde* (A)

Perennial herb, with long taproot and annual stems. **Stems** prostrate or twining, up to 1.75 m long, pubescent to glabrous. **Leaves** often secund, entire, ± oblong, base hastate-sagittate, 20–50 mm long; petioles shorter than blades. **Flowers** axillary, mostly solitary; bracteoles linear, ± 3 mm long; pedicel longer than calyx. **Sepals** 3.5–5.0 mm long. **Corolla** white or pink, broadly funnel-shaped, glabrous, 15–25 mm long. **Flowering time** Oct.–Mar. **Fruit** an ovoid-globose capsule, 5–8 mm long. **Seeds** 4, dark brown or black, 3–4 mm long. Cultivated soils in temperate and subtropical areas; origin Eurasia, declared weed (category 1), poisonous, medicinal; Sub-Escarpment Savanna, Albany Thicket, Upper Karoo, Indigenous Forests (± Middelburg to Barkly East and S to Bathurst and Willowvale).

1b Corolla < 4–5× as long as calyx
2a Plants glabrous on all parts

dregeanus Choisy

Glabrous perennial, with single taproot and annual stems. **Stems** trailing to suberect, up to ± 300 mm long. **Leaves** variable, 4–40 mm long; lower leaves ± sessile, oblong to ovate-suborbicular, entire to lobed; upper leaves deeply palmately 3–5-fid, lobes linear; petioles up to 10 mm long. **Peduncles** 5–45 mm long, 1-flowered; bracteoles ± 2 mm long; pedicels 1–5 mm long. **Calyx** 4–7 mm long; sepals obovate or the outer oblong. **Corolla** 12–20 mm long, pale pink or white. **Flowering time** Nov.–Mar. **Fruit** a globose capsule, ± 6 mm wide. **Seeds** scabrid to muriculate, ± 4 mm long. On sandy clay or brackish soils and in disturbed areas; Dry Highveld Grassland, Upper Karoo (Albert, Steynsburg, Molteno, Tarkastad).

2b Plants totally or partly hairy
3a Leaves linear, base hastate with patent, often deeply bifid basal lobes

bidentatus Bernh. ex C.Krauss

Glabrous to pubescent perennial, taproot thick. **Stems** several, prostrate or climbing, ± 4-angled, up to ± 3 m long. **Leaves** narrowly hastate to linear with hastate base, margins entire, 45–70 mm long, basal lobes up to 25 mm long, usually deeply bifid. **Peduncles** 2–5-flowered, 30–140 mm long; bracts 3–5 mm long; pedicels ± 4-angled, 5–15 mm long. **Calyx** 6–8 mm long, ± glabrous; sepals broadly ovate or obovate, edges membranous. **Corolla** 15–22 mm long, white or pale pink; midpetaline areas ± hairy outside near apex. **Flowering time** Oct.–Mar. **Fruit** a globose, glabrous capsule, ± 6 mm wide, ± enclosed in calyx. **Seeds** black, minutely rugose with tufts of minute brown hairs. Mostly on sandy soils; Albany Thicket, Sub-Escarpment Savanna, Indigenous Forests (from ± Uitenhage and Port Elizabeth to King William's Town).

3b Leaves various, not as above
4a Peduncles absent; flowers solitary

boedeckerianus Peter

Vlaktebobbejaantou (A)

Perennial with woody stems and long woody taproot; vegetative parts and calyx with brownish to whitish hairs. **Stems** mostly prostrate, up to 600 mm long. **Leaves** pinnately to subpalmately 5-lobed, 10–60 mm long, middle lobe largest, irregularly toothed or pinnatilobed to pinnatisect, pubescence sparse to glabrescent; petioles 1–8 mm long. **Flowers** solitary; peduncles mostly absent; bracteoles minute; pedicel 2–10 mm long. **Calyx** 4–6 mm long, sepals subequal, ovate. **Corolla** white to pale pink, 7–10 mm long; midpetaline areas silky-pubescent outside. **Flowering time** Oct.–May. **Fruit** a glabrous, globose capsule, 5–7 mm wide, straw-coloured. **Seeds** dark brown, warty, 4 mm long. Stony and sandy soils; Upper Karoo, Dry Highveld Grassland (Albert to Middelburg).

4b Peduncles usually distinct
5a Leaves up to ± 25 mm long with 5–9 narrow, palmately arranged lobes

multifidus Thunb.

Perennial with woody rootstock. **Stems** annual, suberect to prostrate, densely pubescent (like all young vegetative parts, pedicels, bracteoles and calyx), up to 750 mm long. **Leaves** ovate/oblong in outline, 5–35 mm long, palmately 5-fid with central lobe pinnatifid or -sect and basal lobes hastate and bifid; petioles up to 10 mm long. **Peduncles** 1-flowered, 0–20 mm long; bracteoles small, ± linear; pedicels up to 15 mm long. **Sepals** broadly ovate, 5–7 mm long. **Corolla** funnel-shaped, white to pale pink, 10–12 mm long; midpetaline areas densely silky. **Flowering time** Oct.–Apr. **Fruit** a ± subglobose, glabrous capsule, ± 5 mm wide. **Seeds** dark brown or black, glabrous, rough on back and angles. In deep sandy or dry rocky soil or limestone, also disturbed places and banks of dry rivers; Upper Karoo (Middelburg).

5b Leaves different in shape or well over 25 mm long
6a Peduncles usually 2–6-flowered
7a Corolla 8–14 mm long
8a Corolla 8–10 mm long

sagittatus Thunb.

Wild morning-glory; *wildeakkerwinde* (A); *ub(h)oqo* (X)

Variable perennial with long taproot and annual stems. **Stems** branched from base, prostrate, up to 600 mm long. **Leaves** entire, variable, ± hairy, up to 60 mm long, linear to hastate-sagittate, often with bifid basal lobes; petioles very short. **Peduncles** 1–few-flowered, up to 45 mm long; bracteoles small; pedicels up to 30 mm long. **Calyx** hairy; sepals 5–9 mm long. **Corolla** funnel-shaped, white to mauve-pink, sometimes with darker centre. **Flowering time** Sept.–May. **Fruit** a subglobose capsule, 6–7 mm long. **Seeds** 4, dark brown or black, 3.5 mm long. Common on various soils, often weedy, also medicinal; Albany Thicket, Upper Karoo, Dry Highveld Grassland, Sub-Escarpment Grassland (mainly central EC, from the Orange River to East London).

8b Corolla 12–14 mm long

farinosus L.

Klimop (A); *ub(h)oqo* (X)

Herbaceous perennial. **Stems** long, climbing or prostrate, pubescent, silvery when young. **Leaves** cordate-deltoid or sagittate, margins subentire to crenate, sinus broad, basal

auricles 40–120 mm long, ± glabrous; petioles up to 65 mm long. **Peduncles** ± 65 mm long, 1–6-flowered; bracts minute; pedicels short. **Sepals** unequal, oblong to suborbicular, 6–8 mm long. **Corolla** funnel-shaped, white to pale pink, 12–15 mm long; midpetaline areas hairy. **Flowering time** all year. **Fruit** a subglobose capsule, 5–8 mm wide, pale brown. **Seeds** 4, ± 3-angled, 3.5–4.0 mm long, black, rough. Common and sometimes weedy, on riverbanks, in undergrowth, on various soils, medicinal; Albany Thicket, Sub-Escarpment Savanna, Indigenous Forests, Eastern Fynbos-Renosterveld (Mount Ayliff and Bizana to Sterkstroom and Humansdorp).

7b Corolla 15–20 mm or longer
9a Leaves usually not dissected; corolla white or cream-coloured to greenish white

natalensis Bernh. ex Krauss
Ub(h)oqo (X)

Perennial with woody taproot. **Stems** annual, mainly prostrate, rather stout, up to 1 m long, covered (as are all vegetative parts, peduncles, pedicels, bracteoles and calyx) with stiff to silky or woolly, fawn to whitish short hairs, later glabrescent. **Leaves** linear to cordate-ovate or narrowly reniform, 10–90 mm long, usually undissected, margins undulate or serrate, basal sinus broad and shallow, auricles often ± angular; petioles 5–20 mm long. **Peduncles** 1–few-flowered, up to 70 mm long; bracteoles linear or lanceolate, 6–10 mm long; pedicels up to 15 mm long. **Calyx** 10–18 mm long; sepals ± lanceolate, unequal. **Corolla** white, cream-coloured or tinged with green, funnel-shaped, 20–35 mm long; midpetaline areas greenish, densely silky white-hairy. **Flowering time** Aug.–Mar. **Fruit** a subglobose or ± ovoid, glabrous capsule, 8–10 mm long and wide. **Seeds** dark brown, glabrous, warty, 5–6 mm long. Various soils; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland, Indigenous Forests (Matatiele and Mount Ayliff, also Wodehouse to Albany and Kentani).

9b Leaves dissected or entire, even on the same plant; corolla pale pink or rose
10a Leaves pinnately nerved

thunbergii Roem. & Schult.
Vlaktebobbejaantou (A)

Perennial with thin, woody rootstock and annual stems; short, stiff hairs rust-brown to silvery white. **Stems** slender, prostrate, up to 700 mm long. **Leaves** oblong to ovate, 20–50 mm long, undivided to palmately 5-lobed to bipinnatifid; petioles up to 18 mm long. **Peduncles** 1- or 2-flowered, 14–40 mm long; bracteoles subulate, minute to 9 mm long; pedicels up to 15 mm long. **Calyx** unequal, sepals 8–15 mm long. **Corolla** white to pale pink, funnel-shaped, 18–25 mm long; midpetaline areas greenish, apex densely hairy outside. **Flowering time** Sept.–Apr., mostly Oct. and Nov. **Fruit** a subglobose, glabrous capsule, 7–9 mm wide. **Seeds** black, glabrous, ± 5 mm long. Various soils; also weedy; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld, Indigenous Forests (Aliwal North and Herschel to Albany).

10b Leaves palmately nerved, palmatilobed or palmatifid

capensis Burm.f.
Klimop (A); *uvuma omhlope* (X)

Variable perennial, vegetative parts and calyx brown-pubescent to glabrous. **Stems** herbaceous, mostly climbing, up to 1.5 m long. **Leaves** variable; lower leaves reniform to hastate-oblong, up to 35 mm long, margins subentire to dentate, petioles 5 mm long;

upper leaves pinnately incised or palmately 5-fid, 10–70 mm long, lobes incised, petioles 5–40 mm long. **Peduncles** 1–few-flowered, 40–100 mm long; bracteoles linear, up to 8 mm long; pedicels 5–25 mm long. **Calyx** silky-villous outside, 6–10 mm long; sepals ovate to oblong. **Corolla** funnel-shaped, 15–35 mm long, white to pink; midpetaline areas green to brown strigose. **Flowering time** Aug.–Dec. **Fruit** a globose capsule, ± 8 mm wide. **Seeds** dark brown, warty, 4–5 mm long. Various soils; Albany Thicket, Eastern Fynbos-Renosterveld (Humansdorp, Port Elizabeth).

6b Peduncles usually 1(2)-flowered
11a Corolla usually < 15 mm long

sagittatus Thunb. (see 8a above)

11b Corolla usually > 15 mm long, often > 20 mm long
12a Whole plant usually densely hairy to tomentose or shortly villous

[E]galpinii C.H.Wright

Perennial?, whole plant densely tawny-grey-hairy. **Stems** prostrate or twining, up to 600 mm long. **Leaves** sagittate-deltoid to ovate-cordate, 20–40 mm long, margins ± crenate-serrate; basal sinus wide, basal lobes often toothed or lobed; petioles up to 12 mm long. **Peduncles** 1- or 2-flowered, up to 60 mm long; bracteoles linear, 5–8 mm long; pedicels up to 10 mm long. **Calyx** 6–10 mm long; sepals ovate to ovate-orbicular. **Corolla** funnel-shaped, white, 16–20 mm long; midpetaline areas densely silky. **Flowering time** Dec.–Mar. **Fruit** a subglobose, glabrous capsule, 6–8 mm wide. **Seeds** dark brown, 4–5 mm long, rough, hairy. Sandy soil; Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland, Indigenous Forests (from Tarkastad? down to King William's Town).

12b Plant not densely villous-hairy as above
13a Leaves usually not dissected; corolla white or cream-coloured to greenish white

natalensis Bernh. ex Krauss (see 9a above)

13b Leaves dissected; corolla often pale pink or rose
14a Leaves pinnately nerved

thunbergii Roem. & Schult. (see 10a above)

14b Leaves palmately nerved

capensis Burm.f. (see 10b above)

CUSCUTA L.

Dodder; *dodder* (A)

Species ± 140, parasites, cosmopolitan in warmer regions; 15 (3 introduced) in sthn Afr., widespread in all regions except arid areas.

1a Styles united almost to apex into a single column

cassytoides Engelm.

Parasitic, twining herb. **Stems** coarse, yellow-green with purple or brown spots. **Inflorescences** a single, short raceme or few-flowered clusters in spikes. **Flowers** subsessile, 2.5–4.5 mm long, yellow, drying dark brown. **Calyx** cupulate, as long as corolla tube; lobes ± ovate, overlapping, edges unequal. **Corolla** campanulate; lobes as long as tube, ± ovate, erect to reflexed. **Stamens** shorter than corolla lobes; filaments shorter than anthers. **Scales** triangular, adnate to tube, with small free lateral fringed portions. **Ovary** ± globose; styles in a single column, 1 mm long. **Flowering time** Feb.–Oct. **Fruit** an ovoid capsule, 5–8 mm long, circumscissile near base. **Seeds** subglobose, 3 mm long.

Mostly on woody plants; Albany Thicket, Sub-Escarpment Savanna, Indigenous Forests (Somerset East to Willowvale, down to Alexandria).

1b Styles 2, free to base or nearly so
2a Stigmas capitate-globose or ± peltate
3a Scales in corolla tube bifid at apex

bifurcata Yunck.

Parasitic, twining herb. **Stems** medium, yellowish. **Inflorescences** few-flowered; pedicels short. **Flowers** 2.0–2.5 mm long, glandular, 4-merous. **Calyx** ± equalling corolla tube; lobes oblong to lanceolate, ± obtuse, sinuses rounded. **Corolla** divided ± halfway down; tube broadly campanulate; lobes acute to obtuse, erect to spreading, lanceolate-oblong. **Stamens** ± shorter than corolla lobes; anthers shorter than filaments. **Scales** bifurcate at apex, adnate to sinus between corolla lobes. **Ovary** globose; styles slender, ± shorter than ovary. **Flowering time** Jan.–Apr. **Fruit** a depressed-globose capsule, irregularly dehiscent. **Seeds** ± 2 mm long, subglobose. Parasite on *Falkia* and *Ursinia*; Albany Thicket, Eastern Fynbos-Renosterveld (Port Elizabeth).

3b Scales in corolla tube free, not bifid at apex
4a Scales not reaching base of free part of filaments; calyx and corolla lobes subacute

***suaveolens** Ser.

Lucerne dodder; *luserndodder* (A)

Parasitic, twining herb. **Stems** slender to medium, yellowish. **Inflorescences** loose clusters; pedicels short. **Flowers** 3–4 mm long, glandular. **Calyx** shorter than corolla tube, lobed halfway down; lobes ovate-triangular, acute, edges revolute, sinuses rounded. **Corolla** long-campanulate to funnel-shaped, yellow; lobes ovate-triangular, apex acute, inflexed. **Stamens** shorter than corolla tube; filaments as long as anthers. **Scales** not reaching stamens, oblong to triangular-ovate, apex free, shortly fringed. **Ovary** globose; styles slender, often unequal, as long as ovary. **Flowering time** Jan., Feb. **Fruit** a globose capsule, irregularly dehiscent. **Seeds** 1.5–2.0 mm long, subglobose. Usually only on *Medicago sativa* (lucerne); origin South America, now ± cosmopolitan, rare declared weed in SA (Category 1); Albany Thicket, Lower Karoo, Sub-Escarpment Grassland (Pearston, Queenstown).

4b Scales mostly reaching base of free part of filaments, or if not reaching filaments, then lobes of calyx and corolla very obtuse
5a Flowers in loose paniculate cymose clusters, pedicellate, slightly longer than wide

appendiculata Engelm.

Parasitic, twining herb. **Stems** slender to medium, yellowish. **Inflorescences** loose clusters. **Flowers** 1.5–4.0 mm long, glandular. **Pedicels** as long as flowers, papillose or warty. **Bracteoles** warty, saccate at base. **Calyx** shorter than corolla tube; tube warty towards base; lobes triangular, acute. **Corolla** campanulate; lobes as long as tube, erect to spreading, ovate-lanceolate, apex inflexed. **Stamens** shorter than corolla lobes; filaments as long as anthers. **Scales** obovate, much fimbriated, equalling corolla tube. **Ovary** globose; styles slender, unequal, as long as ovary. **Flowering time** Oct.–Mar. **Fruit** a globose capsule, irregularly dehiscent. **Seeds** subglobose, 1.5 mm long. Parasite on many indigenous and introduced plants; Eastern Fynbos-Renosterveld, Indigenous Forests (Humansdorp and King William's Town).

5b Flowers in usually dense clusters, subsessile, wider than long

***campestris** Yunck.

Parasitic, twining herb. **Stems** medium, yellow. **Inflorescences** subsessile, compact, globose clusters. **Flowers** 2–3 mm long, glandular, green-yellow. **Calyx** enclosing corolla tube, broadly campanulate; lobes ovate or triangular, ± rounded. **Corolla**: tube campanulate; lobes ovate or triangular, spreading, apex acute, often inflexed. **Stamens** shorter than corolla lobes; filaments equalling anthers. **Scales** ± ovate, often exserted between corolla lobes, much fringed. **Ovary** globose; styles subequal, slender, thicker in fruit. **Flowering time** Oct.–May. **Fruit** a ± globose capsule, 3–4 mm wide, irregularly dehiscent. **Seeds** 1.5 mm long, flattened on one side. On a wide range of hosts, pest on crops; origin America, declared weed (Category 1); Albany Thicket, Upper Karoo, Sub-Escarpment Savanna, Indigenous Forests (mostly from Orange River down to Alexandria and East London).

2b Stigmas conical to clavate or filiform, usually much longer than wide
6a Stigmas and often also styles shorter than ovary; stigma much shorter than styles
7a Flowers 3–4 mm long; corolla lobes acute or obtuse; scales ± reaching base of filaments

africana Willd.

Parasitic, twining herb. **Stems** medium to thick, yellowish. **Flowers** in clusters; pedicels as long as flowers. **Calyx** shorter than corolla tube; lobes triangular-ovate. **Corolla** campanulate-funnel-shaped; lobes triangular, spreading or reflexed, as long as tube. **Stamens** shorter than corolla lobes; filaments longer than anthers. **Scales** reaching stamens, oblong, fringes rather small, free at apex. **Ovary** globose; styles longer than ovary. **Flowering time** Aug.–Dec. **Fruit** a globose capsule, irregularly circumscissile near base. **Seeds** subglobose. Mainly on woody fynbos plants; Albany Thicket, Eastern Fynbos-Renosterveld (Bedford, Humansdorp, Uitenhage and Willowmore).

7b Flowers 4–7 mm long; corolla lobes very acute, apex often reflexed; scales not reaching base of filaments

natalensis Baker

Parasitic, twining herb. **Stems** medium to thick, yellowish. **Inflorescences** cymose clusters. **Flowers** 4–7 mm long; pedicels shorter than flowers. **Calyx** shorter than corolla tube; lobes triangular-ovate, apex spreading. **Corolla** cylindrical-campanulate; lobes triangular-lanceolate, erect to spreading or reflexed, as long as tube. **Stamens** shorter than corolla lobes; filaments as long as anthers. **Scales** oblong, reaching stamens, free at apex, fringes rather short. **Ovary** globose; styles as long as stigmas. **Flowering time** Apr.–June. **Fruit** a globose capsule, circumscissile near base. **Seeds** 1 mm long, subglobose. On various plants; Sub-Escarpment Savanna (Kentani).

6b Stigmas and styles both longer than ovary; stigma filiform, as long as or longer than style
8a Calyx much shorter than corolla tube; flowers whitish, pedicellate, 4–7 mm long

natalensis Baker (see 7b above)

8b Calyx not much shorter than corolla tube; flowers reddish

***epithymum** Murray

Lucerne dodder; *luserndodder* (A)

Parasitic, twining herb. **Stems** slender, reddish or purplish. **Inflorescence** dense, many-flowered clusters. **Flowers** 3 mm long, reddish. **Calyx** as long as corolla tube; lobes triangular. **Corolla**: lobes triangular, spreading, shorter than tube. **Stamens** shorter

than corolla lobes; filaments longer than anthers. **Scales** spathulate; shorter than corolla tube, apex free, fringed. **Ovary** globose; stigmas filiform, longer than styles and ovary. **Flowering time** Jan.–May. **Fruit** a globose capsule, circumscissile near base. **Seeds** ovoid, 1 mm long, rugose. Origin Europe, now ± cosmopolitan, outside Europe mainly on leguminous crops e.g. *Medicago sativa*; Eastern Fynbos-Renosterveld, Indigenous Forests (Humansdorp).

*DICHONDRA J.R.Forst. & G.Forst.

Dewdrop lawn, kidney weed, wonder lawn; *wondergras* (A)

Species 9, mainly American, 1 introduced and widespread in warmer regions of the world including sthn Afr., LIM, NW, G, M, KZN, EC.

micrantha Urb.

Pubescent, procumbent herb. **Stems** up to 0.5 m long, rooting at nodes. **Leaves** cordate-orbicular to reniform, 4–25 mm wide, base broadly cordate and ± 7-nerved, apex broadly rounded or emarginate, upper surface glabrescent; petioles 8–70 mm long. **Pedicels** 2–19 mm long. **Sepals** 2–3 mm long. **Corolla** as long as calyx, yellow-green. **Flowering time** Sept.–May. **Fruit** a 1.5–2.5 mm wide capsule. **Seeds** subglobose, minutely granular, brown. Moist places, often grown as a groundcover or soil binder, weed in grassland and cultivated spots (Grahamstown and other urban areas in EC).

FALKIA Thunb.

Species 2 or 3, Africa; 2 in sthn Afr., widespread, except S, L.

Leaves oblong to lanceolate, usually ± twice as long as wide, never clearly cordate at base

oblonga Bernh. ex C.Krauss

Hairy to glabrous, perennial herb. **Stems** creeping underground, rooting at nodes, up to 0.5 m long. **Leaves** lanceolate to oblong-ovate, base truncate, apex rounded to emarginate, 10–70 mm long, silvery silky, glabrescent above, pilose beneath; petioles up to 80 mm long. **Pedicel** 3–60 mm long, recurved in fruit. **Calyx** 4–7 mm long; lobes oblong, acute, pilose outside, enlarged in fruit to ovate, crisped along edges. **Corolla** 5–15 mm long, lobes emarginate, white to pale pink. **Ovary** densely pilose. **Flowering time** Aug.–Jan. **Fruit** a 2 mm long capsule, enclosed by accrescent calyx. Damp places, summer rainfall areas; Upper Karoo (Aliwal North, Fort Beaufort and Middelburg).

Leaves broadly ovate to reniform, as long as or slightly longer than wide, clearly cordate at base

repens Thunb.

Oortjies (A); *umsolo* (X)

Description as for *F. oblonga*, except: **Leaves** broadly ovate to reniform, as long as wide or slightly longer than wide, clearly cordate at base. **Calyx** persistent and indurated, enclosing and protecting ripe fruit. **Flowering time** Sept.–Dec. **Fruit** geocarpic; buried into soil. Common in damp or temporarily wet soil; can be weedy or even cultivated as a soil cover or binder, also medicinal; Albany Thicket, Sub-Escarpment Savanna, Indigenous Forests (± Queenstown to Mount Ayliff, down to Mqanduli and Humansdorp).

HEWITTIA Wight & Arn.

Species 1, tropics and subtropics of Old World, also a weed, LIM, M, S, KZN, EC.

malabarica (L.) Suresh

Twining or prostrate, ± pubescent, perennial herb. **Stems** up to 3 m long, angular. **Leaves** variable, oblong to broadly ovate, 25–140 × 10–60 mm. **Peduncles** 5–100 mm long, 1-flowered; pedicels up to 5 mm long; bracteoles 5–17 mm long. **Sepals** lanceolate to ovate, up to 17 mm long; outer ones accrescent in fruit. **Corolla** campanulate to funnel-shaped, 20–35 mm long, pale yellow or white, centre usually maroon or purple; lobes very short, rounded, emarginate; midpetaline areas pilose outside. **Ovary** densely hairy, 1-locular. **Style** simple, included; stigmas 2, flattened. **Flowering time** all year, mostly Aug.–Jan. **Fruit** a 1-locular, depressed-globose capsule, 8–10 mm long, 4-valved; style persistent. **Seeds** 2–4, black, glabrous, 5–6 mm long. Coastal bush, sandy soil; Indigenous Forests, Indian Ocean Coastal Belt (Bizana, Lusikisiki and Port St Johns).

IPOMOEA L.

Species ± 500, cosmopolitan in tropical and subtropical areas; 56 in sthn Afr., widespread in all regions, but rare in NC and WC.

1a Leaves simple, entire, shallowly lobed, emarginate or toothed, but not pinnately, palmately or pedately lobed nearly to base nor compound
2a Corolla small, < 18 mm long and/or its limb < ± 15 mm in diam.

sinensis (Desr.) Choisy subsp. **blepharosepala** (Hochst. ex A.Rich.) Verdc. ex A.Meeuse

Annual herb, glabrous to pilose. **Stems** prostrate or twining, up to 2 m long. **Leaves** ± cordate, 30–80 mm long?, sinus deep and narrow; petioles 10–90 mm long. **Inflorescence** 1–3-flowered; peduncle 10–60 mm long; pedicels 5–20 mm long, reflexed in fruit. **Sepals** very unequal, 5–8 mm long, accrescent in fruit, ciliate, apex lanceolate-acute; outer ones cordate or auricled at base; inner ones narrower. **Corolla** funnel-shaped, mauve with darker centre; midpetaline areas strigose outside, 8–12 mm long. **Flowering time** Sept.–July, mostly Dec.–May. **Fruit** a globose, glabrous capsule, 10 mm wide. **Seeds** 4–5 mm long, densely hairy, grey or fawn. Sandy and calcareous soils, weed on disturbed ground; Sub-Escarpment Savanna, Indigenous Forests (Mqanduli).

2b Corolla larger to very large, > 18 mm long; flowers usually pedunculate
3a Leaves bilobed at apex; growing only on sandy beaches

pes-caprae (L.) R.Br. subsp. **brasiliensis** (L.) Ooststr.

Goat's foot; *strandpatat* (A)

Glabrous, perennial herb with a thick, woody base. **Stems** thick, hollow, laticiferous, up to 30 m long, creeping, rooting at nodes, mat-forming. **Leaves** secund, leathery, elliptic to suborbicular, 30–100 mm long, entire, apex deeply emarginate to bilobed; midrib below with 2 glands at leaf base; petioles up to 170 mm long. **Inflorescence** 1–many-flowered; peduncle secund, 30–160 mm long; bracts 3.0–3.5 mm long; pedicels up to 45 mm long in fruit. **Sepals** unequal, concave, ovate to orbicular, 5–12 mm long. **Corolla** funnel-shaped, 30–55 mm long, pink to purple with dark centre. **Flowering time** Dec.–May, mainly Jan. and Feb. **Fruit** a subglobose capsule, 12–18 mm wide. **Seeds** 6–10 mm long, dark brown, hairy. Sandy seashores, estuaries above the high-tide mark; Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld

(Port St Johns District S, from Kei River Mouth to Nahoon River, Port Elizabeth to East London District and to Cape Recife).

3b Leaves not bilobed at apex, or not found on sandy beaches
4a Leaves covered with thin, white tomentum beneath or few floccose patches; flowers mauve or magenta; bracteoles and sepals lanceolate, acute to aristate
5a Flowers in dense, globose, pedunculate heads

wightii (Wall.) Choisy

Variable herbaceous perennial. **Stems** twining or prostrate, yellow- or brown-hairy, up to 3 m long. **Leaves** 30–130 mm long, entire to 3-lobed, basal lobes rounded, sinus deep and narrow; green and strigose above, densely cobwebby below with conspicuous veins, margins entire to repand; petioles pilose, up to 90 mm long. **Inflorescence** a dense cyme; peduncle hairy, 30–130 mm long; bracteoles lanceolate, hirsute, 10–12 mm long; pedicels absent. **Sepals** equal, linear-lanceolate, 8–15 mm long, indumentum of 3 kinds: white-cottony tomentum, yellow bristles, marginal glands. **Corolla** funnel-shaped, mauve to purple, 20–40 mm long; midpetaline areas well-defined, glabrous. **Flowering time** all year, mostly Jan.–May. **Fruit** a subglobose capsule, bristly or white-tomentose, 8–10 mm long. **Seeds** ovoid, dark brown, 3 mm long, shortly pubescent or glabrous. Sandy soils; Indigenous Forests (Port St Johns).

5b Flowers in few- to many-flowered dichasia or cymes, sometimes solitary

ficifolia Lindl.

Perennial with tuberous root. **Stems** climbing, herbaceous to woody, up to 2.5 m long. **Leaves** ovate-cordate to suborbicular-reniform, 20–90 mm long, base cordate, sinus broad and shallow, apex acute, margins crenate, entire or 3-lobed, upper surface green, thinly hairy, lower surface softly white-hairy, glabrescent; petioles hairy, 10–50 mm long. **Inflorescence** lax, 1–many-flowered; peduncle pilose, 20–150 mm long; bracteoles hairy, linear-lanceolate, 7–11 mm long; pedicels up to 15 mm long. **Sepals** equal, hairy, 10–15 mm long, lanceolate. **Corolla** funnel-shaped, 40–60 mm long, pink to purple, glabrous or midpetaline areas hairy. **Flowering time** Nov.–June, mostly Mar.–May. **Fruit** an ovoid, glabrous capsule, 7–9 mm wide. **Seeds** ± globose, 3–4 mm long, yellow-pubescent, edges white-hairy. Rocky or sandy soils, weedy, medicinal; Albany Thicket, Indigenous Forests, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Port St Johns to Port Elizabeth, inland to King William's Town).

4b Leaves either not with white, cobwebby tomentum or bracts and sepals different; if so, corolla white or pale mauve
6a Leaves linear or lanceolate with narrow or ± rounded base, entire or toothed, repand, lobed or ± emarginate
7a Vegetative parts pubescent; calyx tomentose or pubescent
8a Young vegetative parts and calyx usually covered with an appressed, short and silvery pubescence

oenotheroides (L.f.) Raf. ex Hallier f.

Nuwejaarsblom (A)

Small, perennial shrub, up to 1 m high, tuberous roots up to 1.25 m long; with short, silvery, appressed-pubescence; glabrescent. **Stems** much branched. **Leaves** linear to lanceolate, 30–110 mm long, base decurrent into 0–6 mm long petiole. **Peduncles** 1-flowered, up to 15 mm long; bracteoles small; pedicels up to 10 mm long. **Sepals** sub-equal, lanceolate, 8–25 mm long. **Corolla** funnel-shaped, 35–70 mm long; midpetaline

areas silvery hairy. **Flowering time** Nov.–Mar. **Fruit** an ovoid-globose, dark brown, glabrous capsule, 15–20 mm long. **Seeds** 1–3, brown or black, glabrous, 9 mm long. Open sites with harsh winters; Albany Thicket, Upper Karoo, Sub-Escarpment Grassland, Dry Highveld Grassland (Venterstad and Aliwal North to Port Elizabeth and Bathurst).

8b Vegetative parts without appressed, short and silvery tomentum
9a Sepals unequal

crassipes Hook.

Ub(h)oqo (X)

Glabrous to hairy perennial with latex; tuberous taproot up to 100? mm wide. **Stems** annual, prostrate, up to 750 mm long. **Leaves** variable, lanceolate or ovate, 15–80 mm long; petioles up to 10 mm long. **Peduncles** 1-flowered; bracts leafy, ± lanceolate, 5–20 mm long; pedicels < 20 mm long. **Sepals** unequal, 10–28 mm long, outer ones lanceolate, inner ones linear. **Corolla** funnel-shaped, mauve to purple, centre darker, midpetaline areas lighter, 30–45 mm long. **Flowering time** Sept.–Apr., mostly Nov.–Jan. **Fruit** an ovoid-globose, glabrous capsule, 8–10 mm wide. **Seeds** 6 mm long. Sandy soils, medicinal, weedy; Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket, Sub-Escarpment Grassland (KZN Border S to Bathurst and inland to Cathcart and Mount Ayliff).

9b Sepals equal or subequal

oblongata E.Mey. ex Choisy

Ub(h)oqo (X)

Variable perennial with tuberous root, up to 1 m long. **Stems** annual, up to 2 m long, prostrate, ± zigzag, yellow-brown-hairy, as vegetative parts and calyx. **Leaves** variable, secund, oblong or elliptic, 20–150 mm long, entire, margins ciliate; petioles shorter than leaf. **Inflorescence** 1–several-flowered; peduncles shorter than leaves; bracteoles lanceolate, shorter than sepals; pedicels up to 6 mm long. **Sepals** subequal, ± lanceolate, 12–25 mm long. **Corolla** funnel-shaped, 35–70 mm long, magenta; midpetaline areas thinly silky hairy. **Flowering time** Oct.–Apr., mostly Dec., Jan. **Fruit** a subglobose, glabrous capsule, dark brown, enclosed by sepals, 12–15 mm wide, indehiscent. **Seeds** 1–4, glabrous, punctate to smooth, grey, 7 mm long. Often on wet and sandy soils, medicinal, weedy; Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Grassland (Albert and Mount Ayliff down to East London and Mqanduli).

7b Vegetative parts glabrous (at least the leaves)

simplex Thunb.

Amagantsi (X)

Glabrous perennial with tuberous rootstock, 40–100 mm long. **Stems** erect, woody, up to 90 mm underground, above ground up to 100 mm long. **Leaves** dense, linear to lanceolate, 30–100 mm long, subsessile, mostly entire. **Flowers** solitary, axillary; peduncles and pedicels short; bracteoles linear. **Sepals** subequal, lanceolate, 9–15 mm long. **Corolla** funnel-shaped, white, 20–35 mm long. **Flowering time** Sept.–Apr. **Fruit** a subglobose, glabrous capsule, 7–9 mm wide. **Seeds** 4–5 mm long, dark brown, tomentose. Grassland, on slopes or hills; Sub-Escarpment Savanna, Albany Thicket, Indigenous Forests (Maclear and Port St Johns S to Albany and Bathurst).

CONVOLVULACEAE

6b Leaves broader, not linear or lanceolate or, if narrow, broadly truncate, hastate, sagittate or cordate at base
10a Leaves distinctly cordate or sagittate at base
11a Corolla either yellow and concolorous, or white or yellow with a purple or brown centre; sepals subequal, 4–8 mm long

obscura (L.) Ker Gawl. var. **obscura**

Wild petunia; *wildepatat* (A)

Perennial herb, taproot 500 mm or longer. **Stems** glabrous to hairy, up to 3 m long, prostrate, woody below. **Leaves** secund, ± cordate, 30–90 mm long, basal sinus deep, lobes rounded, apex acuminate, thinly hairy, green above and paler beneath; petioles hairy, 15–80 mm long. **Inflorescence** 1–few-flowered; peduncle 30–80 mm long; bracts minute; pedicels 10–20 mm, hairy, reflexed, thickened in fruit. **Sepals** subequal, 4–8 mm long, glabrous, ovate, accrescent, often reflexed. **Corolla** funnel-shaped, pale yellow or white, with or without dark centre, 15–25 mm long, glabrous; midpetaline areas well defined. **Flowering time** all year, mostly Sept.–Apr. **Fruit** a subglobose, glabrous capsule, 7–12 mm wide, pale brown. **Seeds** ovoid, grey, tomentose, 5 mm long. Sandy soils, also weedy; Sub-Escarpment Savanna, Albany Thicket (Elliotdale to Fort Beaufort).

11b Corolla pink to purple/blue or white/yellowish with purple or magenta centre; sepals very unequal and > 8 mm long
12a Sepals long-attenuate or linear-acuminate at apex, 14–25 mm long

***indica** (Burm.f.) Merr.

Herbaceous climber or prostrate, sometimes perennial, pilose to glabrescent. **Stems** up to several metres long, rooting at nodes. **Leaves** orbicular, 40–170 mm, apex acuminate, base cordate, rarely broadly 3-lobed; petioles 20–180 mm long. **Inflorescence** 1–several-flowered; peduncles 5–200 mm long; pedicels 2–15 mm long; bracteoles mostly linear. **Sepals** unequal, glabrous to appressed-hairy, mainly at base, lanceolate, 14–22 mm long. **Corolla** funnel-shaped, 50–80 mm long, glabrous, blue or red-purple; limb darker than tube, tube whitish at base. **Flowering time** all year, mostly spring and summer. **Fruit** a globose, glabrous capsule. **Seeds** black, glabrous. Often cultivated; origin Americas, declared invader (Category 3); Indigenous Forests, Indian Coastal Belt (Bizana to Kentani).

12b Sepals acute, obtuse or mucronate but without long and narrow acumen

***purpurea** (L.) Roth

Morning glory; *purperwinde* (A); *urhododo* (X)

Glabrous to retrorsely hairy, herbaceous annual. **Stems** trailing or twining. **Leaves** broadly ovate to suborbicular, 40–150 mm, entire, base cordate, apex acuminate; petioles 20–150 mm long. **Inflorescence** 1–few-flowered; peduncle 30–180 mm long; bracteoles linear, up to 7 mm long; pedicels up to 20 mm long in fruit. **Sepals** unequal, 10–20 mm long, bristly patent hairs basally, oblong to linear. **Corolla** funnel-shaped, glabrous, 50–60 mm long, white, pink to purple-blue with paler tube and distinct midpetaline areas. **Flowering time** Nov.–May. **Fruit** a globose, glabrous capsule, 10 mm wide. **Seeds** glabrous, black. Garden escape, climbing on fences, in disturbed places, medicinal; origin warmer Americas, declared invader (Category 3); Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Indigenous Forests, Albany Thicket (Lusikisiki to Albany, inland to Stockenström).

10b Leaves not distinctly cordate or sagittate at base
13a Flowers in pedunculate, few-flowered heads

pellita Hallier f.

Bristly hairy to glabrescent perennial with thick rootstock. **Stems** herbaceous, robust, prostrate, up to 2 m long. **Leaves** ovate to oblong, 40–100 mm long, margins entire with dense hairs; petioles shorter than leaf blade. **Inflorescence** a dense, few-flowered head; peduncle 30–150 mm long; bracteoles linear, 12–25 mm; pedicels mostly absent. **Sepals** subequal, 18–25 mm long, similar to bracteoles, accrescent in fruit. **Corolla** funnel-shaped, 40–70 mm long, magenta, hairy on midpetaline areas. **Flowering time** Sept.–Apr, mostly Nov.–Feb. **Fruit** a subglobose, glabrous capsule, 12–15 mm in diam. **Seeds** 10 mm long, dark brown, glabrous. Recently burned or grazed grassland, road- or railway sides, hill and mountain slopes, medicinal; Sub-Escarpment Grassland, Drakensberg Grassland (Mount Fletcher to Queenstown and King William's Town).

13b Flowers solitary

[E]crispa (Thunb.) Hallier f.

Ub(h)oqo (X)

Perennial with thick taproot. **Stems** annual, prostrate, up to 750 mm long, hairy to glabrescent. **Leaves** entire, ovate to oblong, 15–40 mm long, hairy to glabrous, base subcordate, apical mucro recurved, margins crisped; petioles 5–10 mm long. **Inflorescence** 1-flowered; bracteoles lanceolate, up to 10 mm long; peduncles and pedicels thickening, pedicels up to 10 mm in fruit. **Sepals** subequal, lanceolate-oblong, hairy outside, 8–13 mm long, up to 17 mm long in fruit, then hardened and glabrescent. **Corolla** funnel-shaped, magenta or purple, 30–50 mm long. **Flowering time** Dec.–May. **Fruit** a globose, glabrous capsule, 8–9 mm wide, light brown. **Seeds** 5 mm long, densely hairy. Grassland, gentle SE-facing slopes; Albany Thicket, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna, Indigenous Forests (Adelaide, Albany, Bedford, Fort Beaufort).

1b Leaves deeply lobed (nearly to base), dissected or compound

cairica (L.) Sweet var. **cairica**

Musina creeper

Glabrous, perennial twiner, root tuberous. **Stems** up to 1.8 m long, smooth or warty. **Leaves** ovate or orbicular in outline, 30–100 mm wide, deeply palmate, lobes lanceolate, 5–7; basal lobes often bifid; petioles 20–60 mm long; pseudostipules like smaller leaves. **Inflorescence** 1–few-flowered; peduncle 5–70 mm long; pedicels 12–20 mm long. **Sepals** subequal, subovate, green with pale scaly margins; often minutely warty outside, 4–7 mm long. **Corolla** broadly funnel-shaped, 30–60 mm long; tube contracted near base, mauve with darker centre. **Flowering time** all year. **Fruit** a subglobose capsule, 8–12 mm wide. **Seeds** 5–6 mm long, black, subglobose, tomentose, long white hairs along edges. Coastal dunes, river mouths and estuaries, medicinal and weedy; Indigenous Forests, Sub-Escarpment Savanna, Indian Ocean Coastal Belt (Bizana to East London and to St Francis Bay).

MERREMIA Dennst.

Species ± 80, cosmopolitan in warm regions; 9 in sthn Afr., widespread, except WC.

Stems distinctly winged

pterygocaulos (Choisy) Hallier f.

Perennial climber or shrub, mostly glabrous. **Stems** 1–3 m long, 4-winged to -angled. **Leaves** cordate-ovate to suborbicular in outline, 30–150 mm long and wide, palmately 3–9-lobed; lobes ovate; petioles 4-angled, up to 85 mm long. **Inflorescence** a few-flowered cyme; peduncle 4-angled, up to 150 mm long; pedicels up to 30 mm long, thickened, erect in fruit. **Calyx** 9–11 mm long; sepals oblong, papery, pale yellow-green, accrescent, spreading in fruit. **Corolla** broadly funnel-shaped, pale yellow to white, throat red or purple, 25–35 mm long, 35–45 mm wide; midpetaline areas pilose outside. **Flowering time** Nov.–Apr. **Fruit** an ovoid-conical capsule, 12–15 mm long; style base persistent, brown. **Seeds** subglobose, 5–7 mm long, black. Sandy soil; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests (Mount Ayliff to Kentani).

Stems not distinctly winged

[E]malvaefolia Rendle

Annual? **Stems** herbaceous, slender, trailing, pubescent. **Leaves** triangular in outline, up to 30 mm wide, brownish hairy below; palmately 5-lobed, lobes obovate; petioles shorter than blade. **Peduncles** 40–100 mm long, 1-flowered; bracteoles small. **Calyx** 8–13 mm long, pubescent; sepals papery, oblong, outer hispid. **Fruit** a widely funnel-shaped capsule, 30–50 mm long, pale yellow; midpetaline areas silky. Habitat?; Albany Thicket, Sub-Escarpment Savanna, Indigenous Forests (Albany, Bathurst, Somerset East).

SEDDERA Hochst

Species ± 20, mainly Africa, also Madagascar, Arabia and India; 3 in sthn Afr., widespread, except WC.

capensis (E.Mey. ex Choisy) Hallier f.

Suffruticose perennial, brownish hairy. **Stems** several, prostrate to suberect, up to 300 mm long. **Leaves** ovate to oblong, sessile or shortly petiolate, 5–25 mm long, apex obtuse or subacute, base rounded to ± narrowed or truncate. **Flowers** axillary, solitary, subsessile; pedicel up to 10 mm long; bracteoles 2, lanceolate, shorter than sepals. **Sepals** broadly lanceolate, acute, 4–9 mm long. **Corolla** broadly funnel-shaped, pinkish white, 6–12 mm long; style branched nearly from base; stigmas subpeltate, bilobed. **Flowering time** Sept.–May. **Fruit** a subglobose capsule, ± 5 mm wide. **Seeds** black, smooth. Heavily grazed grassland in sandy soil; Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (Adelaide, Cathcart, Glen Grey and Queenstown).

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CORNACEAE see CURTISIACEAE

CRASSULACEAE

(Order Saxifragales)

Compiled by G.J. Bredenkamp & C.L. Bredenkamp

1a Leaves spirally arranged, often in dense clusters; flowers in a thyrse with monochasia, often single-flowered or spike-like:
2a Leaves soft, herbaceous, seasonal; inflorescence a single-flowered to branched thyrse ..... **Tylecodon**
2b Leaves usually tough, perennial; inflorescence a spike-like thyrse, rarely branched ..... **Adromischus**
1b Leaves opposite or in whorls, at least on vegetative branches; inflorescence a thyrse with dichasia ending in monochasia, rarely with a single, terminal or axillary flower (*Cotyledon woodii*):
3a Leaves opposite, ± fused to one another; stamens as many as calyx lobes ..... **Crassula**
3b Leaves opposite or spirally arranged, ± free; stamens twice as many as calyx lobes:
4a Flowers 5-merous ..... **Cotyledon**
4b Flowers 4-merous:
5a Flowers erect; filaments fused to corolla tube at or above middle ..... **Kalanchoe**
5b Flowers pendulous; filaments fused to corolla tube in lower third ..... ***Bryophyllum**

ADROMISCHUS Lem.

Species ± 28, endemic to sthn Afr., N, LIM, NW, G, M, FS, KZN, NC, WC, EC.

1a Anthers protruding from corolla tube; corolla lobes at least as wide as long (sections Adromischus *and* Boreali*)*

[E]**bicolor** Hutchison

Perennial succulent, much branched, tuberous base, short erect branches 0.08–0.12 m high, virtually no stems above ground. **Leaves** obovate to almost orbicular, 20–30 × 20–35 mm, cuneate to subpetiolate, truncate, apex rounded, straight or slightly indented, grey-green to grey, intensely spotted with dark green and purplish red. **Inflorescence** a thyrse, 0.1–0.2 m long with 1- or 2-flowered cymes, grey. **Buds** terete, abruptly tapering towards apex, spreading. **Corolla** with cylindrical tube 10.0–12.5 mm long, yellowish green tinged red; lobes broadly triangular, 1.5–2.0 mm long, cuspidate, rough, without trichomes, white to pale pink with purple mucro. **Squamae** square to transversely oblong, slightly emarginate. **Flowering time** Oct.–Jan. Exposed rock crevices; Rainshadow Valley Karoo (Willowmore to E of Steytlerville).

filicaulis (Eckl. & Zeyh.) C.A.Sm.

Perennial succulent, branched with decumbent or prostrate branches ± 0.35 m high, with flaking bark; stilt-roots stiff. **Leaves** lanceolate, terete, 20–50 × 5–10 mm, apex acute, rarely with purple spots, fragile, easily shedded. **Inflorescence** a spike-like thyrse, 0.20–0.35 m long with 1–3-flowered cymes, green tinged brown. **Buds** terete, abruptly constricted towards apex, spreading. **Corolla** with cylindrical tube 10–13 mm long, yellowish green, tinged brownish red; lobes broadly triangular, 1–2 mm long cuspidate, rough without trichomes, white to pale yellow, tinged pink or mauve with mauve mucro. **Squamae** square to transversely oblong, emarginate. **Flowering time** Dec., Jan. Dry rocky slopes in shade; Rainshadow Valley Karoo (Willowmore E to Steytlerville).
Only subsp. *marlothii* (Schönland) Toelken present in EC.

[E]orientalis (Van Jaarsv.) G.J.Bredenkamp & C.L.Bredenkamp, comb. nov. [= *A. liebenbergii* P.C. Hutch. subsp. *orientalis* Van Jaarsv. in *Aloe* 40: 38 (2003). Type: Eastern Cape, *Van Jaarsveld & Ems 16908* (PRE, holo.!)]

Diagnosis: *A. orientalis* differs from *A liebenbergii* by being a much larger and much more robust plant, with larger obtriangular leaves, without a distinct petiole and without a mucro at the leaf apex. The truncate to rounded leaf apices are not flattened. The habitat is also very different from that of *A. liebenbergii*. *A. orientalis* is an EC endemic that is restricted to N-facing shale cliffs of the lower Mbashe River.

Perennial succulent, little branched, branches erect or decumbent, ± 0.2 m high; roots fibrous. **Leaves** obtriangular, 40–55 × 30–40 mm, truncate to rounded, surface waxy, flaking, without mucro, not flattened towards apical horny ridge, grey-green without spots; petioles indistinct. **Inflorescence** a spike-like thyrse, up to 0.2 m long with 1-flowered cymes. **Buds** terete, slightly tapering towards apex, slightly ascending to spreading. **Corolla** with cylindrical tube 10–11 mm long, pale green; lobes broadly triangular, 2 mm long, cuspidate and reflexed against tube, rough, without trichomes, white, apex purplish mottled, darker mucro. **Squamae** square, slightly emarginate. **Flowering time** Nov.–Jan. Exposed N-facing Ecca shale cliffs of the lower Mbashe River; Indian Ocean Coastal Belt (Mbashe River).

subdistichus Makin ex Bruyns

Perennial succulent, branching from base, with erect or decumbent branches ± 0.12 m high, ± 0.14 m when in flower; roots fibrous. **Leaves** obovate to orbicular, 12–27 × 10–22 mm, abruptly cuneate clasping stem, rounded, with obtuse mucro at apex, dorsal surface flat, ventral surface distinctly convex, distinct horny margins around leaves, farina absent, sometimes few purple spots. **Inflorescence** a short thyrse, 0.08–0.14 m long with 1- or 2-flowered cymes. **Buds** terete, grooved longitudinally, tapering to apex, ascending, later spreading. **Corolla** with cylindrical tube, constricted towards mouth, 11–12 mm long, yellowish green, red-purple striped; lobes lanceolate-triangular, 3–4 mm long, margins folded upwards, club-shaped trichomes in throat, pink with brownish medial stripe. **Squamae** nearly square narrowing from base to apex, slightly emarginate. **Flowering time** Dec., Jan. Top of sandstone and quartzite ridges, in rock crevices, between large rocks on shallow soil; Rainshadow Valley Karoo (Willowmore District).

trigynus (Burch.) Poelln.

Bontplakkie (A)

Perennial succulent with much-branched, tuberous base, short erect branches ± 0.2 m high, ± 0.45–0.55 m when in flower; roots fibrous. **Leaves** obovate to orbicular, 20–30 × 12–20 mm, rounded, constricted towards base, horny margins right around, grey-green with dark purple spots. **Inflorescence** a thyrse, 0.15–0.25 m with 1- or 2-flowered cymes. **Buds** 5-angled, slightly grooved, tapering to apex, erect. **Corolla** with cylindrical tube 10–13 mm long, yellowish green, with thick bloom; lobes ovate, acute to acuminate, 1.5–2.5 mm long, rough with club-shaped trichomes in throat, off-white to slightly pink. **Squamae** square to ovate, deeply emarginate. **Flowering time** Nov.–Jan. Dry rocky slopes in rock crevices, shale, sandstone, granite; Upper Karoo, Dry Highveld Grassland (Oviston E to Aliwal North, S to Steynsburg, Burgersdorp and Molteno).

1b Anthers included in corolla tube; corolla lobes up to 3× longer than wide
2a Corolla tube funnel-shaped in flowers; squamae ± twice as long as wide (section Brevipedunculati*)*

caryophyllaceus (Burm.f.) Lem.
Nentabossie (A)

Perennial succulent, little branched, erect or decumbent branches ± 0.2 m high; roots fibrous. **Leaves** oblanceolate-spathulate, 10–35 × 6–16 mm, cuneate, rounded, obtuse, horny margins towards apex, grey-green without dark spots. **Inflorescence** a thyrse, 0.2–0.3 m long with 1–several monochasia each with 1–3-flowered cymes. **Buds** terete, slightly grooved, tapering to apex, erect. **Corolla** with funnel-shaped tube 18–21 mm long, grey-green; lobes ovate-triangular, acute to acuminate, 4–6 mm long, rough with club-shaped trichomes around throat, white to pink with pink to purple mid stripe. **Squamae** oblong, emarginate, broadened to base. **Flowering time** Dec., Jan. Dry rocky slopes, in shade of shrubs; Rainshadow Valley Karoo (WC Border: Willowmore W).

[E]fallax Toelken
Perennial succulent, little branched, decumbent branches ± 0.2 m high; roots fibrous. **Leaves** oblanceolate to elliptic, 20–40 × 8–15 mm, cuneate, acute to obtuse, soft without horny margins, green with or without dark spots, seldom red lines on upper leaf surface. **Inflorescence** a spike-like thyrse, 0.2–0.3 m long with 1–3-flowered cymes. **Buds** terete, slightly grooved, tapering to apex, erect. **Corolla** with cylindrical tube 10–13 mm long, grey-green; lobes ovate-triangular, acute, 3–4 mm long, with club-shaped trichomes around throat, pink to purple. **Squamae** oblong, deeply emarginate, scarcely constricted to base. **Flowering time** Jan. Ledges and crevices near S-facing cliffs, Valley of Desolation; Albany Thicket (WC Border: Graaff-Reinet District).

2b Corolla tube cylindrical in flowers; squamae usually broader than long
3a Buds cylindrical or slightly angular or spreading; club-shaped trichomes present on lower parts of lobes and in throat of corolla tube (section Inscisilobati*)*

inamoenus Toelken
Perennial succulent, little branched, decumbent to prostrate, ± 0.2 m high; roots fibrous. **Leaves** oblanceolate-spathulate, 20–28 × 15–25 mm, cuneate to subpetiolate, obtuse or rounded, horny margins restricted to upper half, grey-green tinged brown without purple spots. **Inflorescence** a spike-like thyrse, 0.2–0.3 m long with 1- or 2-flowered cymes. **Buds** terete, tapering towards apex, spreading. **Corolla** with cylindrical tube 9–12 mm long, greyish green; lobes elliptic-triangular, acute, 2.0–3.5 mm long, acute, rough, club-shaped trichomes towards throat, white or tinged pink with mauve line along margins. **Squamae** square, emarginate, broadest at middle or below. **Flowering time** Oct.–Jan. Sheltered rock outcrops on mountains; Eastern Fynbos-Renosterveld (Willowmore District, E to Grahamstown District).

maculatus (Salm-Dyck) Lem.
Bontplakkie (A)

Perennial succulent, little branched, decumbent to prostrate ± 0.15 m high; roots fibrous. **Leaves** obovate to oblanceolate, 30–70 × 20–35 mm, abruptly cuneate, apex rounded or obtuse, horny margins all around, grey-green with purple spots. **Inflorescence** a thyrse, 0.20–0.35 m long with 1- or 2-flowered cymes. **Buds** terete, tapering to apex, spreading. **Corolla** with cylindrical tube 8–11 mm long, pale yellowish green; lobes lanceolate-triangular, 2.5–5.0 mm long, acute, rough, club-shaped trichomes around throat, white

or tinged pink with mauve margins. **Squamae** oblong, almost square, slightly emarginate, broadest at middle. **Flowering time** Oct.–Jan. Rock outcrops on higher slopes of Langeberg and Swartberg; Eastern Fynbos-Renosterveld (WC Border: Willowmore).

[E]**sphenophyllus** C.A.Sm.

Pig's ears; *kleinplakkie* (A)

Perennial succulent, little branched, branches erect ± 0.2 m high; roots fibrous. **Leaves** oblanceolate, 35–70 × 18–34 mm, gradually constricted, apex rounded, with horny margins all around, grey-green without purple spots. **Inflorescence** a thyrse, 0.20–0.45 m long with 1- or 2-flowered cymes. **Buds** terete, tapering to apex, spreading. **Corolla** with cylindrical tube 9–12 mm long, pale green or tinged red; lobes triangular-lanceolate, acute, 2.5–4.0 mm long, acute, rough, club-shaped trichomes towards throat, white or tinged pink with deep mauve margins. **Squamae** square, slightly emarginate, broadest at middle. **Flowering time** Dec., Jan. Dry karroid vegetation; Albany Thicket, Lower Karoo, Eastern Fynbos-Renosterveld (Graaff-Reinet District SE to Pearston and Fort Beaufort, from Steytlerville to Joubertina, Port Elizabeth and Grahamstown).

triflorus (L.f.) A.Berger

Perennial succulent, very variable, little branched, decumbent to prostrate ± 0.2 m high; roots fibrous. **Leaves** oblanceolate-spathulate or obtriangular, 30–50 × 15–25 mm, cuneate to shortly petiolate, truncate, horny margins restricted to upper half, convex on both sides, grey-green with purple spots on upper half. **Inflorescence** a thyrse, 0.25–0.35 m long with 1–3-flowered cymes. **Buds** terete, tapering and distinctly curved towards apex, spreading. **Corolla** with cylindrical tube 8–10 mm long, yellowish green; lobes lanceolate-triangular, 3–5 mm long, acute, rough, club-shaped trichomes towards throat, white or tinged pink with mauve line along margins. **Squamae** square to oblong-ovate, emarginate, broadest at middle. **Flowering time** Nov.–Jan. Lower gravelly slopes in karroid vegetation; Rainshadow Valley Karroo (WC Border: Willowmore District).

3b Buds distinctly grooved between petals and until flowering appressed to central axis; club-shaped trichomes found only in throat of corolla tube (section Longipedunculati*)*

[E?]**cooperi** (Baker) A.Berger

Bontplakkie (A)

Perennial succulent, short, erect branches decumbent to prostrate, ± 0.1 m high, ± 0.25–0.35 m high when in flower; roots fibrous. **Leaves** oblanceolate-oblong to oblong-spathulate, 40–65 × 10–20 mm, cuneate to petiolate, obtuse to truncate, often undulate apex, dorsiventrally compressed to almost terete, green to grey-green with or without purple spots. **Inflorescence** a spike-like thyrse, 0.25–0.40 m long with 1-flowered cymes, almost white with thick bloom. **Buds** terete, slightly longitudinally grooved, tapering towards apex, erect, later spreading. **Corolla** with cylindrical tube 9–11 mm long, pale pink with thick bloom; lobes lanceolate-triangular, acute, 3.0–4.5 mm long, sharply acute, club-shaped trichomes towards throat, pink with deep pink margins and apices. **Squamae** oblong to almost square, emarginate, broadest at middle. **Flowering time** Apr.–June. Sheltered rock outcrops in shade; Dry Highveld Grassland, Albany Thicket (Queenstown, Graaff-Reinet and Somerset East Districts).

[E]cristatus (Haw.) Lem. var. **cristatus**
[= *A. cristatus* (Haw.) Lem. var. *clavifolius* (Haw.) Toelken in *Bothalia* 12: 390 (1978)]

Perennial succulent, short erect branches, with a few rosettes, decumbent to prostrate, ± 0.02–0.04 m high; stems covered with fine aerial roots; roots fibrous at base. **Leaves** broadly obtriangular or lanceolate, 20–40 × 5–13 mm, cuneate to petiolate, truncate or rounded, terete, dorsiventrally compressed towards apex with undulate horny ridge, apical ridge broadest point of leaf, grey-green with darker markings. **Inflorescence** a spike-like thyrse, 0.1–0.2 m long with 1-flowered cymes, almost white, glabrous. **Buds** terete, longitudinally grooved, tapering towards apex, erect, later spreading. **Corolla** with cylindrical tube 10–12 mm long, grey-green, glabrous; lobes ovate-triangular, 2.0–3.5 mm long, acute, club-shaped trichomes in throat, white tinged pink with darker line along margins. **Squamae** ± square, scarcely emarginate, broadest at middle or below. **Flowering time** Dec.–Feb. Rock outcrops in shade; Dry Highveld Grassland, Albany Thicket (Graaff-Reinet District to Cradock and Somerset East District and from Uniondale to Port Elizabeth, Grahamstown, Bathurst, Hopewell and East London).

[E]cristatus (Haw.) Lem. var. **mzimvubuensis** Van Jaarsv.

Perennial succulent, unbranched or sparsely branched, almost acaulescent, ± 0.04–0.06 m high, branches short, erect to decumbent; stems covered with fine aerial roots; roots fibrous at base. **Leaves** in lax to dense rosette, 110 mm in diam., lorate-obovate to broadly obovate, 40–80 × 20–30 mm, biconvex, dorsiventrally compressed, base cuneate, apex incurved, flat, truncate or rounded, straight to undulating, margins horny around leaf, pale green without darker markings, slightly hairy to glabrous. **Inflorescence** a simple or branched, spike-like thyrse, 0.15–0.23 m long with 2- or 3-flowered cymes, brownish green with club-shaped trichomes. **Buds** terete, longitudinally grooved, tapering towards apex, ascending. **Corolla** with cylindrical tube 12 mm long, pale green dotted with maroon; lobes ovate-triangular, 5 mm long, acute, club-shaped trichomes in throat, white tinged pink, darker at throat. **Squamae** ± square, scarcely emarginate. **Flowering time** Nov.–Jan. Ecca shale cliff faces; Sub-Escarpment Savanna (from Mount Frere S to Mthatha in river valleys).

[E]schonlandii (E.Phillips) Poelln.

Reinstated by G.J. Bredenkamp & C.L. Bredenkamp (originally described in *Cactus Journal* 6: 68 (1938).

[= *A. cristatus* (Haw.) Lem. var. *schonlandii* (E.Phillips) Toelken in *Bothalia* 12: 390 (1978). Type *sine loc. et leg.*, *PRE 7944* (PRE, holo.!)]

Perennial succulent, much branched, short, erect branches, decumbent to prostrate, ± 0.02–0.04 m high; stems covered with fine aerial roots; roots fibrous at base. **Leaves** pubescent, sticky glandular hairs, with herb-like smell, narrowly obtriangular or oblong-oblanceolate, 35 × 10 mm, almost terete, wider in middle, tapering towards petiole and apex, tip curving inwards, slight dark green margins on upper edge, green without darker markings; petioles narrow. **Inflorescence** a spike-like thyrse, 0.1–0.2 m long with 1-flowered cymes, almost white, with glandular hairs. **Buds** terete, longitudinally grooved, tapering towards apex, erect, later spreading. **Corolla** with cylindrical tube 10–12 mm long, grey-green, with glandular hairs; lobes ovate-triangular, 2.0–3.5 mm long, acute, club-shaped trichomes in throat, white tinged pink with darker line along margins. **Squamae** ± square, scarcely emarginate, broadest at middle or below.

Flowering time Feb., Mar. Rocky soil or rock crevices; Eastern Fynbos-Renosterveld, Albany Thicket (from Baviaanskloof and Langkloof E to Uitenhage).

zeyheri (Harv.) Poelln.

Reinstated by G.J. Bredenkamp & C.L. Bredenkamp (originally described in *Cactus Journal* 6: 68 (1938).

[= *A. cristatus* (Haw.) Lem. var. *zeyheri* (Harv.) Toelken in *Bothalia* 12: 390 (1978). Type: Western Cape, *Zeyher 2571* (K, lecto.–Aluka image K000233030, website accessed 21 Feb. 2012; S–digital image, SAM–digital image, isolecto.)]

Perennial succulent, little branched, erect branches, ± 0.4–0.8 m high, ± 0.5–1.0 m high when in flower; stems not covered with fine aerial roots; roots fibrous at base. **Leaves** without sticky glandular hairs, broadly obtriangular, 40–60 × 30–60 mm, apical margins much broadened, slightly rounded, horny, slightly undulating on upper edge, light green without darker markings. **Inflorescence** a spike-like thyrse with 1-flowered cymes, almost white, with glandular hairs. **Buds** terete, longitudinally grooved, tapering towards apex, erect, later spreading. **Corolla** with cylindrical tube 10–12 mm long, grey-green, with glandular hairs; lobes ovate-triangular, 2.0–3.5 mm long, acute, club-shaped trichomes in throat, white tinged pink with darker line along margins. **Squamae** ± square, scarcely emarginate, broadest at middle or below. **Flowering time** Sept.–Nov. Rocky soil or rock crevices; Eastern Fynbos-Renosterveld, Albany Thicket (from Kouga E to Van Stadens, Port Elizabeth).

*BRYOPHYLLUM Salisb.

Species 35, possibly originally restricted to Madagascar; 1 in sthn Afr., LIM, NW, G, M, S, FS, KZN, NC, WC, EC.

delagoense (Eckl. & Zeyh.) Schinz

Chandelier plant

Perennial, sparse, glabrous, succulent shrublet, one or few erect branches, ± 0.4–2.0 m high. **Leaves** ternate, opposite, sessile, glabrous, terete, 25–80 × 3–5 mm in diam., grooved above, with 5–8 apical teeth producing pseudobulbils in axils. **Inflorescence** a rounded thyrse with several closely clustered dichasia; flowers pendulous, 4-merous. **Corolla** fused into tube 25–33 mm long, longer than spreading lobes, pale orange to deep magenta. **Flowering time** May–Aug. Naturalised in disturbed areas and on roadsides, but also seen as a garden escape in and around towns (widespread).

COTYLEDON L.

Species 11, widespread throughout sthn Afr. extending into eastern tropical Africa, Ethiopia and the SW Arabian Peninsula; 11 in sthn Afr., N, LIM, NW, G, M, S, FS, KZN, L, NC, WC, EC.

1a Corolla lobes twice as long as tube; flowers usually glandular

campanulata Marloth

Skilpadkos (A)

Shrublets, much branched from base, spreading, later decumbent, ± 0.2 m high. **Leaves** linear, 50–80 × 10–25 mm, acute, convex below, grooved above, densely covered with

glandular hairs, yellowish green, apical margins brown and undulate. **Inflorescence** an erect thyrse with 3–5 dichasia, each with 3–8 flowers; peduncle 0.15–0.35 m long, viscid. **Calyx**: lobes triangular-ovate, 3–5 mm long, acute, covered with glandular hairs. **Corolla** yellow to yellowish green; tube cylindrical, 5–8 mm long, viscid outside, glabrous inside; lobes linear-lanceolate, reflexed and straight. **Flowering time** Oct.–Dec. Full sun or light shade under trees, rocky soil on shale, conglomerate or sandstone; Upper Karoo, Albany Thicket, Lower Karoo, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Nieu-Bethesda southwards, from Graaff-Reinet E to Fort Beaufort and from Willowmore to Uitenhage, Alexandria and Grahamstown).
Putative hybrids: *C. campanulata* × *C. orbiculata* var. *oblonga* and *C. campanulata* × *C. papillaris*.

cuneata Thunb.

Krimpsiektebos (A)

Shrublet, branches short, sparsely branched, spreading, ± 0.3 m high. **Leaves** obovate, 60–100 × 40–80 mm, cuneate, cuspidate, viscid, yellowish green, apical margins brown. **Inflorescence** a tall, erect thyrse with 3–5 dichasia, each with 3–5 flowers; peduncle 0.20–0.35 m long, viscid. **Calyx**: lobes triangular-lanceolate, 4–6 mm long, acute, viscid. **Corolla** yellow to yellowish green; tube cylindrical, 6–10 mm long, viscid outside, glabrous inside; lobes linear-lanceolate, reflexed and straight, twice as long as tube. **Flowering time** Nov., Dec. Dry rocky ridges; Upper Karoo, Albany Thicket, Rainshadow Valley Karoo (from Graaff-Reinet S to Steytlerville and Baviaanskloof).

Putative hybrid: *C. cuneata* × *C. orbiculata* var. *orbiculata* previously known as *C. deasii* Schönland.

papillaris L.f.

Ranknenta (A)

Shrublet, variable, much branched from base, branches delicate, decumbent, ± 0.25 m high. **Leaves** linear-lanceolate, elliptic, 20–40 × 4–10 mm, acute to cuspidate, fascicled at base, densely covered with glandular hairs, yellowish green, red margins or mucro. **Inflorescence** an erect thyrse with 1–3 dichasia, each with 1 or 2 flowers; peduncle 0.10–0.25 m long, glandular-pubescent. **Calyx**: lobes triangular-ovate, 3–5 mm long, acute, densely covered with glandular hairs. **Corolla** orange to red; tube cylindrical, 5–8 mm long; lobes 10–15 mm long, strongly reflexed. **Flowering time** Oct.–Dec. Gravelly slopes in light shade under trees; Upper Karoo, Albany Thicket (Nieu-Bethesda S to Graaff-Reinet and Grahamstown District).

Putative hybrids: *C. papillaris* × *C. campanulata* and *C. papillaris* × *C. orbiculata* var. *orbiculata*.

1b Corolla lobes ½–1½ × as long as tube; flowers rarely glandular
2a Corolla tube bulging to almost saccate between calyx lobes, widest at base

tomentosa Harv.

Shrublet, branched from base, spreading, later decumbent, ± 0.25 m high, rarely taller, densely covered with hair. **Leaves** oblanceolate, 15–25 × 8–14 mm, with 3–5, rarely more, apical teeth, apical margins brown, cuneate, obtuse, slightly dorsiventrally compressed, tomentose, grey-green. **Inflorescence** a thyrse with 1–3 dichasia, each with a few flowers; peduncle 0.15–0.25 m long, densely hairy. **Calyx**: lobes triangular, 3–5 mm long, bluntly acute, tomentose. **Corolla** orange-red almost yellow; tube ampullaceous

to cylindrical, 12–16 mm long, hairy outside, glabrous inside, few hairs where filaments are fused to tube; lobes straight to slightly reflexed and shorter than tube. **Flowering time** July–Sept. Shale or sandstone rocky ridges to sheer cliffs; Albany Thicket, Rainshadow Valley Karoo (Nieu-Bethesda southwards, from E of Willowmore to Steytlerville).

[E]**velutina** Hook.f.

Shrub, much branched, erect, ± 2–3 m high. **Leaves** oblanceolate, 50–90 × 20–40 mm, cuneate, with auriculate base, obtuse, mucronate, dorsiventrally flattened, glabrous to tomentose, green or grey-green, apical margins reddish. **Inflorescence** an erect thyrse with 3–5 dichasia, each with 5–10 flowers; peduncle 0.3–0.6 m long, glabrous or viscid. **Calyx**: lobes narrowly triangular, 6–8 mm long, acute, viscid. **Corolla** reddish yellow with yellow margins; tube ampullaceous to cylindrical, 14–17 mm long, rarely hairy outside, glabrous inside; lobes lanceolate, reflexed and as long as tube. **Flowering time** Nov., Dec. Full sun or light shade of trees, on shale, conglomerate and sandstone; Upper Karoo, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Mpunzi Drift on KZN boundary; from Graaff-Reinet E to Stutterheim and East London, S to Joubertina, Port Elizabeth and Port Alfred).

Putative hybrid: *C. velutina* × *C. orbiculata* var. *oblonga*.

2b Corolla tube cylindrical or gradually inflated, widest above base

[E]**adscendens** R.A.Dyer

Shrub or scrambler, little branched, ± 1.6–2.0 m high. **Leaves** obovate, 20–45 × 15–25 mm, cuneate, acute, cuspidate, dorsiventrally flattened, concave above, convex below, glabrous with flaking wax, yellowish green with reddish margins almost around leaf. **Inflorescence** a thyrse with 1–3 dichasia, each with a few flowers; peduncle 0.15–0.25 m long, glabrous. **Calyx**: lobes triangular, 3–4 mm long, acute, glabrous to pubescent. **Corolla** orange-red; tube almost cylindrical, 12–15 mm long, glabrous; lobes lanceolate, recurved, shorter than tube. **Flowering time** Oct.–Dec. In thicket on coastal dunes; Albany Thicket (restricted to Swartkops River area, Port Elizabeth).

orbiculata L.

Variable species. Shrub, ± branched, erect, ± 1.5 m high. **Leaves** obovate to oblanceolate to narrowly linear, 50–140 × 10–50 mm, cuneate, rounded or cuspidate, dorsiventrally flattened, slightly convex on both sides to terete, glabrous to hairy, green or grey, red or pale margins. **Inflorescence** a tall, erect thyrse with 3–5 dichasia, each with many flowers; peduncle 0.2–0.5 m long, glabrous to hairy. **Calyx**: lobes narrowly triangular, 2–5 mm long, acute, glabrous, rarely hairy. **Corolla** deep red to orange; tube cylindrical, 8–30 mm long, bulging in middle, glabrous; lobes lanceolate, recurved or recoiled shorter than tube. **Flowering time** Oct.–Jan. Full sun or light shade of trees; in all bioregions, except Indigenous Forests, Lower Karoo and Indian Ocean Coastal Belt (widespread).

Three varieties are recognised:

[E]**C. orbiculata** L. var. **flanaganii** (Schönland & Baker f.) Toelken

Vingerplakkie (A)

Restricted to Albany Thicket in the Kei River Valley.

Putative hybrids: *C. orbiculata* var. *orbiculata* × *C. cuneata*, *C. orbiculata* var. *orbiculata* × *C. papillaris*, *C. orbiculata* var. *oblonga* × *C. velutina*, *C. orbiculata* var. *oblonga* × *C. papillaris*.

C. orbiculata L. var. **oblonga** (Haw.) DC.
Witplakkie (A)
From east of Port Elizabeth eastwards and northwards.

C. orbiculata L. var. **orbiculata**
Pig's ear; *varkoor*, *kouterie* (A); *ipewula* (X); *intelezi* (Z)
From E of Port Elizabeth westwards and northwards.

[E]pendens Van Jaarsv.
Shrublet, much branched, pendent, flaccid with powdery bloom, ± 0.6 m long. **Leaves** elliptic to ovate, 18–25 × 10–15 mm, cuneate, mucronate, surface whitish grey-green with powdery bloom, glandular-hairy becoming glabrescent, margins rounded and maroon-spotted, more so at apex. **Inflorescence** a terminal pending thyrse, ending in simple dichasium with 1–4 flowers; peduncle 0.03–0.04 m long, glandular-hairy. **Calyx**: lobes triangular, 5 mm long, appressed to corolla. **Corolla** orange-red to red; tube cylindrical, 18–20 mm long, glabrous; lobes linear-lanceolate, spreading, 25 mm long. **Flowering time** Dec.–Feb. Sheer Ecca shale cliff faces; Indian Ocean Coastal Belt (Mbashe River Gorge).

woodii Schönland & Baker f.
Shrub, much branched, erect, ± 1.2 m high. **Leaves** oblanceolate to ovate, 23–27 × 6–12 mm, cuneate or subpetiolate, obtuse, acute, cuspidate, dorsiventrally flattened, convex on both surfaces, glabrous with flaking wax, green with reddish margins towards apex. **Inflorescence** a dichasium with a solitary flower; peduncle 0.01–0.03 m long, glabrous. **Calyx**: lobes triangular, 3.5–4.5 mm long, acute, glabrous. **Corolla** deep red to orange; tube cylindrical, 12–15 mm long, glabrous; lobes lanceolate, recurved and as long as tube. **Flowering time** Dec.–Apr., sometimes all year. On rocky outcrops in wooded valleys, in full sun or light shade of trees on sandstone; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Butterworth District, from Studtis E to East London).

CRASSULA L.

Species over 300, the centre of distribution in sthn Afr., but extending beyond Africa to Europe, America, Australia, New Zealand and southern islands; 150 in sthn Afr., widespread, but concentrated especially in semi-arid, winter rainfall areas.

Eggli et al. (1995), Van Ham (1995) and Hart (1995), as well as Stephenson (1998) suggested that the genetic divergence based on chloroplast DNA characters, between the subgenera *Tillaea* L. and *Crassula* L. is of the same order of magnitude as between the major lineages of subfamily Sedoideae and that *Tillaea* needs to be reinstated as a genus. This account, however, still follows Toelken (1985).

1a Anthers 0.1–0.2 mm long; annuals, rarely perennials, with sessile axillary inflorescences, < 3.5 mm long, or single flowers, star-shaped or shallowly cup-shaped, scarcely fused at base

2a Inflorescence with single flower in axil of one of a pair of leaves (due to sympodial growth); flowers 4-merous; calyx half as long as corolla with obtuse lobes, shallowly cup-shaped, scarcely fused at base (section Helophytum*)*

gemmifera Friedrich
Perennial, succulent herb, branches up to 0.07 m long, erect, decumbent, in moist soil around standing water, adventitious roots. **Leaves** linear, 3–5 × 1 mm, glabrous, pale green, fleshy. **Inflorescence** with terminal flowers in axil of leaf-like bracts. **Corolla**

cup-shaped, scarcely fused at base, white, 1.2–2.0 mm long, obtuse, recurved from middle; lobes elliptic-oblong, 1.5 mm long. **Flowering time** Nov.–Feb. Drakensberg Mountains in moist places at standing water or in shaded rock crevices; Drakensberg Grassland (Naude's Neck to Maclear).

inanis Thunb.

Perennial hydrophyte, branches ± 0.3 m long, upper branches floating in water, but still attached to underground rhizome. **Leaves** lanceolate to triangular, 10–20 × 2–3 mm, glabrous, green, slightly fleshy. **Inflorescence** a thyrse with sessile dichasia ending in monochasia in leaf axil. **Corolla** shallowly cup-shaped, scarcely fused at base, white, 1–2 mm long, later reflexed; lobes obovate, 1.5–2.0 mm long, strongly recurved from middle. **Flowering time** Nov.–Mar. Drakensberg Mountains in moist depressions or standing water or along slow-flowing streams; Drakensberg Grassland, Albany Thicket, Sub-Escarpment Savanna (Mzimkhulu District, S from Alice to King William's Town and Uitenhage to Port Elizabeth).

natans Thunb.

Watergras (A); *morarana* (SS)

Annual hydrophyte, branches 0.02–0.25 m long, erect, decumbent, floating in water. **Leaves** obovate, oblanceolate, 3–12 × 2–3 mm, broader towards apex, glabrous, green, slightly fleshy. **Inflorescence** with terminal flowers in axil of leaf-like bracts. **Flowers** with pedicels, 6–15 mm. **Corolla** shallowly cup-shaped, scarcely fused at base, white, tinged pink; petals 1–2 mm long recurved from middle, later reflexed; lobes obovate to spathulate, 1.5–2.0 mm long. **Flowering time** May–Nov. (winter rainfall areas), Oct.–Jan. (summer rainfall areas). Moist depressions or standing water; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Dry Highveld Grassland, Albany Thicket, Sub-Escarpment Savanna (Middelburg E to Jamestown S, from Cradock to Stutterheim and Komga, Baviaanskloof and Hankey).

*__vaillantii__ (Willd.) Roth

Annual, succulent herb, branches up to 0.15 m long, erect, decumbent, in mud around standing water, adventitious roots. **Leaves** linear, 2–4 × 1–2 mm, glabrous, green to red, fleshy. **Inflorescence** with terminal flowers in axil of leaf-like bracts. **Corolla** cup-shaped, scarcely fused at base, white tinged red, 1.2–2.0 mm long, obtuse, recurved from middle; lobes ovate to elliptic, 1.2–2.0 mm long. **Flowering time** Sept.–Jan. Naturalised in mud or moist depressions at standing water; origin south-western Europe; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Dry Highveld Grassland, Albany Thicket, Sub-Escarpment Savanna (Middelburg E to Elliot, S from Cradock to King William's Town and Port Elizabeth).

2b Inflorescence a thyrse with 1–several dichasia
3a Flowers 4- or 5-merous; calyx as long or longer than corolla (section Glomeratae*)*

campestris (Eckl. & Zeyh.) Endl. ex Walp.

Annual, succulent herb, erect branches, ± 0.1 m high, glabrous, central branch longest. **Leaves** sessile, lanceolate to narrowly triangular, 4–6 × 1–2 mm, bluntly acute, glabrous, fleshy, green to brown. **Inflorescence** a thyrse with many almost sessile dichasia; flowers on short pedicels which elongate when fruiting, 5-merous. **Calyx** with colourless awn. **Corolla** cup-shaped, scarcely fused at base, pale yellow to brown; lobes triangular-lanceolate, 0.5–0.8 mm long, acute, erect, folded along apex. **Flowering time** Aug.–Nov. Exposed sandy or gravelly slopes; Drakensberg Grassland, Sub-Escarpment

Savanna, Albany Thicket (Barkly East E to Maclear, King William's Town to Komga, Jeffreys Bay to Port Alfred).

decumbens Thunb.

Annual, succulent herb, erect or decumbent branches 0.04–0.12 m long. **Leaves** sessile, linear-lanceolate to elliptic, 3–8 × 0.5–2.0 mm, acute or obtuse, glabrous, fleshy, green to reddish brown. **Inflorescence** a thyrse with many dichasia; flowers pedicellate, 4- or 5-merous. **Calyx** glabrous with denticulate margins. **Corolla** cup-shaped, scarcely fused at base, white or cream-coloured; lobes lanceolate, 1.5–3.0 mm long, acute to acuminate, spreading. **Flowering time** Sept.–Nov. Sandy or gravelly slopes, in depressions near seasonal pools; Eastern Fynbos-Renosterveld, Albany Thicket (Uitenhage to Port Elizabeth).

glomerata P.J.Bergius

Annual, succulent herb, stiff, erect branches, ± 0.15 m high, glabrous with recurved papillae. **Leaves** narrowly triangular to lanceolate, 6–10 × 1–2 mm, acute with terminal seta, glabrous with few marginal papillae, fleshy to leathery, green to brown. **Inflorescence** a flat-topped thyrse with 1–several dichasia; flowers sessile, 5-merous. **Calyx** with terminal seta. **Corolla** cup-shaped, scarcely fused at base, cream-coloured tinged red; lobes oblong-lanceolate, 1.0–1.5 mm long, obtuse, erect. **Flowering time** Aug.–Nov. Sandy soils in coastal area; Eastern Fynbos-Renosterveld, Albany Thicket (Tsitsikamma E to Port Elizabeth).

lanceolata (Eckl. & Zeyh.) Endl. ex Walp.

Moriri-oa-letlapa (SS)

Perennial, succulent herb, decumbent branches mainly from base, spreading, ± 0.15 m high, main branches and root becoming fleshy, covered with peeling bark, glabrous, old leaves remain attached to branches. **Leaves** sessile, triangular to lanceolate, 5–12 × 1.5–2.0 mm, subulate with colourless point, glabrous, fleshy to leathery, green to brown. **Inflorescence** a thyrse with many sessile dichasia in axils of leaves; flowers sessile, 5-merous. **Calyx** not awned, longer than petals. **Corolla** cup-shaped, scarcely fused at base, pale yellowish green turning brown; lobes narrowly triangular, 1 mm long, acute, erect, keeled when old. **Flowering time** Dec.–July. On rocky grassland slopes, in sheltered rock crevices on mountains; Upper Karoo, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland, Eastern Fynbos-Renosterveld (widespread, Bethulie to Kokstad S, from Middelberg to Queenstown, Willowmore and Grahamstown). Three subspecies need further research.

muscosa L.

Lizard's tail; *skoenveterbos* (A)

Perennial, succulent herb, woody branches erect or scrambling, 0.1–0.4 m high, internodes not visible between leaves, old leaves remain attached. **Leaves** sessile, triangular to ovate, 2–8 × 1–4 mm, acute or obtuse, of equal length, glabrous, fleshy, leathery, green to brown. **Inflorescence** a thyrse, many sessile dichasia in axils of leaves; flowers sessile, 5-merous. **Calyx** shorter than petals. **Corolla** cup-shaped, scarcely fused at base, pale green to brown; lobes narrowly triangular, 1–2 mm long, acute, erect, keeled. **Flowering time** Oct.–Apr. (but any time after sporadic rain). In karroid vegetation amongst shrubs, on rocky slopes; Upper Karoo, Lower Karoo, Albany Thicket, Sub-Escarpment Savanna, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (widespread, Oviston E to Bethulie S to Steynsburg and Graaff-Reinet to Komga, Willowmore to East London).

Three varieties in EC with only one endemic: *C. muscosa* L. var. *polpodacea* (Eckl. & Zeyh.) G.D.Rowley.

umbellata Thunb.

Annual, succulent herb, spreading branches 20–40 mm high, sometimes internodes not elongating, then branches only 2–6 mm high. **Leaves** sessile or shortly petiolate, rhombic to triangular, 2–4 × 2–4 mm, obtuse, constricted towards base, papillae on upper surface, glabrous, green to reddish. **Inflorescence** a thyrse with one dichasium; flowers sessile, 4-merous; pedicel elongating when fruiting. **Calyx** with papillae towards apex. **Corolla** cup-shaped, scarcely fused at base, cream-coloured tinged red; lobes ovate, 1 mm long. **Flowering time** July–Oct. Sandy soils or gravelly slopes; Upper Karoo, Albany Thicket (Middelburg and Port Elizabeth Districts).

3b Flowers 5-merous; calyx up to half as long as corolla (section Dinacrea*)*

filiformis (Eckl. & Zeyh.) D.Dietr.

Annual, succulent herb, erect wiry branches, ± 0.1 m high. **Leaves** sessile, lanceolate to elliptic, 3–7 × 2–4 mm, obtuse, glabrous, slightly fleshy, green to brown. **Inflorescence** a thyrse, one dichasium in axils of leaves; flowers sessile, 5-merous. **Calyx** shorter than petals, very fleshy. **Corolla** cup-shaped, scarcely fused at base, white; lobes oblanceolate, 2–3 mm long, acute, erect, recurved at apex. **Flowering time** Aug.–Nov. Sandy soils close to coast; Albany Thicket (Port Elizabeth District).

sebaeoides (Eckl. & Zeyh.) Toelken

Annual, succulent herb, erect, wiry branches, ± 0.08 m high. **Leaves** sessile, oblanceolate to elliptic or ovate, 5–9 × 2–4 mm, obtuse, glabrous, slightly fleshy, green. **Inflorescence** a thyrse, one dichasium in axils of leaves; flowers sessile, 5-merous. **Calyx** shorter than petals, very fleshy. **Corolla** tubular to funnel-shaped, fused at base, yellow; lobes oblanceolate, 4–5 mm long, acute to obtuse, erect, recurved at apex. **Flowering time** Sept.–Nov. Clayey soils in karroid vegetation; Albany Thicket (Grahamstown District).

1b Anthers 0.5–2.0 mm long; perennials or biennials with inflorescences not sessile
4a Plants with 2 or 3 pairs of flattened, membranous leaves; perennials with annual, soft, herbaceous branches arising from a perennial tuber covered with adventitious roots (section Petrogeton*)*

nemorosa (Eckl. & Zeyh.) Endl. ex Walp.

Perennial, soft herbaceous, erect or decumbent branches ± 0.04–0.15 m long. **Leaves** 2 or 3 pairs; lamina broadly ovate, 3–15 × 4–13 mm, rounded, cordate or cuneate, entire, somewhat fleshy, glabrous, grey-green with brown lines; petioles 3–15 mm long. **Inflorescence** a loose, terminal thyrse, without peduncle. **Corolla** star- to cup-shaped, scarcely fused at base, pale yellowish green with brown stripes; lobes smooth, 2.0–3.5 mm long, acute to acuminate, slightly keeled, apex recurved. **Flowering time** June–Aug. In shade under overhanging rocks in crevices; Albany Thicket, Eastern Fynbos-Renosterveld (Graaff-Reinet S from Willowmore to East London).

saxifraga Harv.

Perennial, branched rhizome with several tubers with adventitious roots, each tuber develops erect, unbranched stems ± 0.05–0.15 m long. **Leaves** with one pair sessile, transversely depressed obovate, 10–30 × 30–70 mm, obtuse, double crenate, glabrous, scarcely fleshy, green, purplish underneath. **Inflorescence** a terminal, umbellate thyrse; peduncle 50–150 mm long. **Corolla** star- to tubular-shaped, fused only at base, white tinged pink; lobes smooth, 3.5–7.5 mm long, bluntly acute to rounded, slightly recurved.

Flowering time Apr.–June. Dry mountain slopes on rocky soil; Eastern Fynbos-Renosterveld (Willowmore E to Port Elizabeth).

umbella Jacq.

Perennial tubers with adventitious roots, annual, soft, herbaceous, erect branches ± 0.06–0.25 m long. **Leaves** with one pair sessile, well above soil, transversely depressed obovate, 10–70 × 20–100 mm, obtuse, entire, crenate to double crenate, glabrous, yellowish green. **Inflorescence** a terminal, elongate thyrse; peduncle 5–60 mm long. **Corolla** star-shaped, scarcely fused at base, cream-coloured to yellowish green; lobes smooth, 3.0–4.5 mm long, acute to acuminate. **Flowering time** Aug., Sept. Under overhanging rocks or under shrubs on sheltered S-facing slopes; Eastern Fynbos-Renosterveld (Willowmore E to Humansdorp).

umbraticola N.E.Br.

Perennial rhizome, tubers with adventitious roots, erect, unbranched stems ± 0.05–0.11 m long. **Leaves** 3 or 4 pairs; lamina obovate or elliptic, 20–35 × 15–25 mm, obtuse, abruptly cuneate, teeth sharply pointed, glabrous, scarcely fleshy, yellowish green; petioles on lower leaves up to 10 mm long; adventitious buds in leaf axils. **Inflorescence** a terminal, loose thyrse; peduncle 20–30 mm long. **Corolla** star-shaped, scarcely fused at base, white or cream-coloured; lobes smooth, 2.5–4.0 mm long, sharply acute. **Flowering time** Jan.–Apr. Moist places under rocks; Drakensberg Grassland, Sub-Escarpment Grassland (Matatiele area).

4b Plants with > 4 pairs of leaves; branches not from a tuber covered with adventitious roots
5a Flowers star-shaped or cup-shaped or with short tube shorter than half the length of the spreading lobes
6a Petal lobes spreading at right angles, without dorsal appendages, but with a terminal hood (section Anacampseroideae*)*

arborescens (Mill.) Willd

Tree crassula; *beestebal* (A)

Perennial shrub, succulent, 1–2 m high, much branched, old leaves deciduous. **Leaves** elliptic to elliptic-oblanceolate, 20–40 × 8–15 mm, undulate, apex rounded, abruptly tapering into petiole, slightly convex on both surfaces with grey bloom, entire with purplish horny margins; petioles absent or short. **Inflorescence** a round-topped thyrse, several dichasia; peduncles 30–70 mm long. **Calyx** fleshy, grey-green tinged red, ridge towards apex. **Corolla** star-shaped, fused at base, white or cream-coloured tinged red towards apex; lobes 7–10 mm long, sharply pointed, slightly hooded and slightly ridged, spreading at right angles. **Flowering time** Dec., Jan. Lower rocky slopes in sheltered ravines; Albany Thicket (Steytlerville District, Klein Winterhoek Mountains).

Only one present and endemic to EC: *C. arborescens* (Mill.) Willd. subsp. *undulatifolia* Toelken.

cordata Thunb.

Perennial succulent, erect or decumbent, 0.3 m long, old leaves not deciduous, no adventitious roots at nodes. **Leaves** broadly ovate, 10–25 × 8–15 mm, bluntly acute to obtuse, cordate to truncate, entire, grey-green with red spots and red margins; petioles 2–8 mm long. **Inflorescence** a loose, rounded to elongated thyrse, several dichasia, vegetative adventitious buds on old inflorescence; flowers facing upwards; peduncles 30–150 mm long. **Calyx** fleshy, glabrous, grey-green tinged red. **Corolla** star-shaped, scarcely fused, cream-coloured to pale yellow, tinged pink; lobes 4–5 mm long, sharply pointed, slightly

hooded and slightly ridged, spreading at right angles. **Flowering time** Mar.–Dec. Shale, stony to rocky soil in shrubland or thicket; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket (Mpofu E to Dwesa S, from Addo to Grahamstown).

crenulata Thunb.

Perennial succulent, erect, 0.4 m high, 1–3 unbranched branches from finger-like tubers, old leaves not deciduous, no adventitious roots at nodes. **Leaves** sessile, lower leaves elliptic, upper leaves oblong, 30–60 × 10–18 mm, acute to obtuse, cymbiform, entire to crenulate, green or glaucous. **Inflorescence** a flat-topped thyrse, 1–several dichasia; flowers facing upwards; peduncles 40–80 mm long. **Calyx** fleshy, glabrous, green. **Corolla** star-shaped, scarcely fused, white to cream-coloured, rarely tinged pink; lobes 5–8 mm long, sharply acute, hooded and slightly ridged, spreading. **Flowering time** Nov.–Apr. Grassy slopes, under trees; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Kokstad SW to Elliot and Mthatha, SW to Cathcart, Butterworth and Baviaanskloof).

inandensis Schönland & Baker f.

Perennial succulent, decumbent or scrambling, sparsely branched from base, branches ± 0.4 m long, old leaves not deciduous, adventitious roots at nodes. **Leaves**: upper leaves sessile, elliptic-ovate, 20–50 × 15–30 mm, larger towards apex, obtuse and constricted towards base, dark green above, lighter below; lower leaves acuminate to cuspidate, cuneate towards base; petioles up to 15 mm long at base. **Inflorescence** a rounded thyrse, 1–several dichasia, half hidden by leaves; peduncle 10–30 mm long. **Calyx** with swollen apex. **Corolla** star-shaped, scarcely fused, cream-coloured; lobes linear-lanceolate, 3.5–5.0 mm long, acute, ridged, scarcely hooded, spreading. **Flowering time** Nov.–Jan. Shaded moist places in forests along streams; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests (Kokstad SW to Mthatha).

lactea Sol.

Perennial succulent, decumbent, 0.4 m long, sparsely branched, old leaves not deciduous, no adventitious roots at nodes. **Leaves** sessile, elliptic to oblanceolate, 30–50 × 15–25 mm, acute, cuneate, entire with horny margins, dull green with yellowish margins. **Inflorescence** a rounded to elongated thyrse, several dichasia; peduncles 40–100 mm long. **Calyx** fleshy and terete at apex, glabrous, green. **Corolla** star-shaped, fused at base, white tinged red towards apex; lobes 5–8 mm long, sharply acute, slightly hooded and slightly ridged, spreading at right angles. **Flowering time** May–Nov. Rock outcrops in full sun or shaded areas; Sub-Escarpment Savanna, Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (King William's Town E to Komga S, Steytlerville E to East London).

multicava Lem.

Skaduplakkie (A); *umadinsane* (Z)

Perennial succulent, soft, decumbent, 0.4 m long, sparsely branched, old leaves not deciduous, no adventitious roots at nodes. **Leaves** broadly elliptic to oblong-obovate, 20–50 × 15–40 mm, obtuse or emarginate, abruptly constricted into petiole, entire, green to yellowish green, recurved margins; petioles 5–20 mm long. **Inflorescence** a rounded to elongated thyrse, several dichasia, vegetative adventitious buds on old inflorescence; peduncles 30–80 mm long. **Calyx** fleshy, glabrous, ridged, green tinged red. **Corolla** star-shaped, fused at base, cream-coloured tinged red towards apex; lobes 3–4 mm long, sharply pointed, slightly hooded and slightly ridged, spreading at right angles, clos-

ing after flowering. **Flowering time** May–Aug. Rock outcrops in shaded areas; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Indigenous Forests, Albany Thicket (Maclear E to Coffee Bay, SW from Somerset East to Kentani and Grahamstown to East London).

ovata (Mill.) Druce

Kerky-bush; *kerkeibos* (A); *umxhalaguba* (X)

Perennial shrub, succulent, 1.0–2.5 m high, much branched, old leaves deciduous. **Leaves** elliptic to oblanceolate, 20–30 × 10–18 mm, pointed or mucronate, cuneate towards base, convex on both surfaces, entire with or without red horny margins, green, shiny, older leaves with silvery scales; petioles absent or short. **Inflorescence** a rounded thyrse, several dichasia; peduncles 10–30 mm long. **Calyx** fleshy, glabrous, green, distinct ridge towards apex. **Corolla** star-shaped, fused at base, white tinged pink; lobes 7–10 mm long, sharply pointed, slightly hooded and slightly ridged, spreading at right angles. **Flowering time** May–Sept. Rocky slopes or ravines in full sun; Sub-Escarpment Grassland, Lower Karoo, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Queenstown E to Lady Frere S, from Graaff-Reinet E to Butterworth and from Uitenhage to Grahamstown).

pellucida L.

Perennial, succulent herb, decumbent or prostrate branches ± 0.01–0.25 m long, old leaves not deciduous, adventitious roots at nodes, root swollen. **Leaves** sessile, cuneate to subpetiolate, constricted to base and fused in pairs, lanceolate-ovate to elliptic, 10–25 × 5–12 mm, sharply acute, glabrous, green, sometimes with brown stripes and colourless margins. **Inflorescence** 1–3 terminal dichasia appearing umbellate, fascicled or a single flower. **Calyx** sharply acute, colourless point, fleshy with membranous margins, green to colourless. **Corolla** star-shaped, scarcely fused, white tinged pink; lobes elliptic to oblanceolate, 3–5 mm long, sharply acute, without dorsal appendage.

Very variable species, two subspecies widespread in EC:

pellucida L. subsp. **brachypetala** (Harv.) Toelken

In the eastern parts into KZN and further. **Flowering time** Dec.–Apr. Shaded moist places on rock outcrops or forest margins; Sub-Escarpment Grassland, Dry Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Kokstad SW to Queenstown and Port St. Johns, Uitenhage E to East London).

pellucida L. subsp. **marginalis** (Dryand.) Toelken

In the western parts and into WC. **Flowering time** Sept.–Dec. On rock faces of mountain slopes and summits; Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Seymour E to Komga, from Steytlerville E to East London).

pellucida L. subsp. **pellucida**

Rare in EC.

sarmentosa Harv.

Perennial succulent, scrambling or pendent from rock faces, 0.4–0.8 m long, sparsely branched from basal tubers, old leaves not deciduous, no adventitious roots at nodes. **Leaves** lower leaves elliptic, petioles 3 mm long; upper leaves sessile, ovate, 20–40 × 10–25 mm, acute or acuminate, constricted towards petiole, serrate, yellowish green tinged red along margins. **Inflorescence** a rounded to flat-topped thyrse; flowers spread-

ing at right angles; peduncle absent. **Calyx** fleshy, glabrous, green. **Corolla** star-shaped, scarcely fused, white, rarely tinged red; lobes 3–4 mm long, pointed, spreading. **Flowering time** Mar., Apr. Shaded places, rock crevices in ravines, forest margins; Indian Ocean Coastal Belt, Indigenous Forests (Mkambati SW to Willowvale).

spathulata Thunb.

Perennial succulent, prostrate or scrambling, sparsely branched from base, branches quadrangular, ± 0.2–0.4 m long, old leaves not deciduous, adventitious roots at nodes. **Leaves** ovate, 20–25 × 15–20 mm, acute or obtuse, truncate or cordate base, serrate, yellowish green tinged red along margins; petioles up to 18 mm long. **Inflorescence** a single dichasia; flowers spreading at right angles; peduncle 30–70 mm long. **Calyx** ridged, fleshy glabrous, green tinged red. **Corolla** star-shaped, scarcely fused, white tinged red; lobes linear-lanceolate, 3.0–4.5 mm long, pointed, slightly ridged, hooded, spreading. **Flowering time** Mar.–May. Shaded moist places, rock outcrops along forests margins; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Drakensberg Grassland, Albany Thicket, Indigenous Forests, Eastern Fynbos-Renosterveld (Queenstown SW to Humansdorp E to East London).

streyi Toelken

Perennial succulent, decumbent, ± 0.2–0.4 m long, old leaves not deciduous. **Leaves** sessile, elliptic, 40–65 × 25–40 mm, acute to cuspidate, angustate, margins recurved, slightly crenulate, dark green with light spots along veins above, maroon below. **Inflorescence** a rounded to elongated thyrse, several dichasia; flowers spreading at right angles; peduncles 40–80 mm long. **Calyx** fleshy, glabrous, green tinged red. **Corolla** star-shaped, fused at base for 2 mm, yellowish green with red central vein; lobes 3.0–4.5 mm long, sharply acute, hooded with dorsal ridge, spreading far apart. **Flowering time** May, June. Rock outcrops on steep slopes in forests; Indigenous Forests (Umtamvuma Nature Reserve to Port Edward and Mtentu River).

6b Petal lobes spreading, fused at base, without dorsal appendages, not hooded
7a Flowers urceolate; leaves angular-obovate, verrucose (section Deltoideae*)*

corallina Thunb.

Hasiekos (A)

Perennial, succulent herb, prostrate branches ± 0.08 m long, old leaves not deciduous, adventitious roots at nodes, root swollen. **Leaves** cuneate to subpetiolate, angular-obovate to rhombic, 3–5 × 2–3 mm, abruptly tapering into bluntly acute apex, thickest near apex, verruculose, covered with grey, flaking wax, grey-green. **Inflorescence** a terminal thyrse with one or more flowers, fascicled. **Calyx** fleshy, grey. **Corolla** urceolate to saccate, scarcely fused, cream-coloured; lobes oblong-obovate, 2.0–3.5 mm long, rounded apex, recurved at apex. **Flowering time** Aug.–Apr. Shallow, sandy soil often with limestone in full sun; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo (Venterstad SW to Willowmore and SE to Queenstown).

deltoidea Thunb.

Kata-kisu, *kata-kiso* (A)

Perennial, succulent herb, erect or spreading fleshy branches ± 0.08 m long, old leaves deciduous, root swollen. **Leaves** cuneate, joined at base, rhombic to oblanceolate, 10–15 × 4–10 mm, acute, flat above, convex below, covered with grey, flaking wax, grey-green to grey. **Inflorescence** a rounded thyrse with one to more dichasia; peduncle < 10 mm

long. **Calyx** fleshy, glabrous grey-green. **Corolla** urceolate, fused at base, cream-coloured; lobes oblong-elliptic, 3.5–5.0 mm long with ridge, rounded apex, scarcely recurved at apex. **Flowering time** Oct., Nov. In full sun on shallow, gravelly soil of shale slopes in Karoo vegetation; Rainshadow Valley Karoo (Willowmore District).

7b Flowers star-shaped or cup-shaped, scarcely fused at base; leaves elliptic, lanceolate to subulate, smooth or hairy
8a Flowers cup-shaped (section Filipedes*)*

expansa Dryand.

Perennial, succulent herb, decumbent branches, slightly woody, rooting at nodes, 0.1–0.2 m high. **Leaves** sessile, lanceolate, elliptic to broadly obovate, 6–20 × 2–4 mm, subulate to obtuse, glabrous or hairy, fleshy, green to brown. **Inflorescence** a thyrse with few-flowered cymules or solitary flowers. **Calyx** fleshy. **Corolla** cup-shaped, scarcely fused at base, white tinged red; lobes elliptic oblong, 2.5–4.0 mm long, acute or obtuse, recurved at apex. **Flowering time** Sept.–May. Well-drained rocky or sandy slopes; subsp. *expansa* widespread, subsp. *filicaulis* (Haw.) Toelken restricted to coastal areas; Sub-Escarpment Grassland, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Kokstad SW to Queenstown, Graaff-Reinet E to Fort Beaufort S, from Baviaanskloof to Grahamstown and from Port Elizabeth to Port Alfred).

papillosa Schönland & Baker f.

Perennial, succulent herb, prostrate, much branched, forming dense cushions, rooting at nodes, 0.01–0.05 m high, glabrous. **Leaves** elliptic to oblanceolate, 1.5–3.0 × 0.5–1.5 mm, obtuse, minutely papillose, fleshy, green to red; petioles absent to short. **Flowers** solitary in axils of leaves. **Calyx** minutely papillose at apex. **Corolla** cup-shaped, scarcely fused at base, white; lobes elliptic-oblong, 2–3 mm long, acute, recurved. **Flowering time** Dec.–Apr. Moist places in deep shade under rocks, mountain summits; Sub-Escarpment Grassland (Queenstown District).

tenuicaulis Schönland

Perennial, succulent herb, slender prostate branches, scrambling, forming dense carpets, ± 0.02–0.05 m high, with adventitious roots. **Leaves** elliptic, 4–10 × 2–4 mm, obtuse, glabrous, fleshy, yellowish green; petioles short. **Flowers** solitary in axils of leaves. **Calyx** fleshy. **Corolla** cup-shaped, scarcely fused at base, white; lobes elliptic, 3–4 mm long, acute, erect or slightly recurved. **Flowering time** Jan.–Apr. Moist soil in shaded areas in mountains; Sub-Escarpment Grassland (Matatiele area).

8b Flowers star-shaped (section Galpiniflora*)*

peploides Harv.

Perennial, succulent herb, several terminal rosettes on fleshy stems, 0.05–0.25 m high, fleshy roots, old leaves not deciduous. **Leaves** linear-triangular, 5–15 × 2–3 mm, acute, scarcely broadened towards base, glabrous or minutely papillose, fleshy, green tinged red. **Inflorescence** of several dichasia ending in monochasia with pedicellate flowers; peduncle indistinct or up to 40 mm long. **Calyx** fleshy, green tinged red. **Corolla** star-shaped, fused at base for 2 mm, white tinged red; lobes elliptic to obovate, 3.0–4.5 mm long, rounded apex and faintly ridged, spreading. **Flowering time** Jan.–Apr. Moist shallow soil on rocks, high altitude grassland; Drakensberg Grassland, Sub-Escarpment Grassland (Qacha's Neck SW to Queenstown District).

5b Flowers tubular with petals erect, recurved at apex only
9a Petals with a smooth ovoid or spherical dorsal appendage in terminal position; inflorescence elongate to rounded terminal thyrse with several globular part-inflorescences (dichasia) from nodes on the main axis; flowers 5-merous and sessile (section Globulea*)*

atropurpurea (Haw.) D.Dietr.

Perennial dwarf shrub, succulent, much branched, erect, slightly woody, 0.6 m high, sometimes only basal rosettes, old leaves deciduous. **Leaves** opposite, oblanceolate to obovate, 15–30 × 6–25 mm, obtuse to truncate, slightly convex on both surfaces, with hairs and papillae, margins horny, green to yellowish green with reddish margins. **Inflorescence** an elongate, terminal thyrse with several globular dichasia from 3–5 nodes; flowers sessile; peduncle 0.15–0.40 m long, glabrous to hairy. **Calyx** fleshy, green to red, with hairs, marginal cilia. **Corolla** tubular, fused 0.5–0.8 mm, cream-coloured; lobes panduriform, 3.5–4.5 mm long, beak-like, erect apex, dorsal appendage rare, furrowed on inside. **Flowering time** Oct.–Dec. Rocky slopes and outcrops; Upper Karoo, Sub-Escarpment Grassland, Lower Karoo, Albany Thicket, Rainshadow Valley Karoo, Eastern Fynbos-Renosterveld (Burgersdorp E to Maclear, SW to Willowmore, E to Port Elizabeth).

cotyledonis Thunb.

Perennial, basal rosette, succulent, little branched, erect, woody, ± 0.2 m high, 0.35–0.65 m high when in flower, old leaves not deciduous. **Leaves** opposite, oblong-oblanceolate to broadly obovate, 30–60 × 10–25 mm, obtuse to rounded, dorsiventrally flattened, both sides convex, dense hairs, marginal cilia grey-green tinged red. **Inflorescence** an elongate, terminal thyrse with several globular dichasia from 3–6 nodes; flowers sessile; peduncle 0.15–0.30 m long, hairy. **Calyx** fleshy, grey-green, hairy and marginal cilia. **Corolla** tubular, fused 0.3–0.6 mm, cream-coloured to pale yellow; lobes panduriform, 3.0–4.5 mm long, terminal spherical dorsal appendage present, apex membranous on inside. **Flowering time** Oct., Nov. Gravelly slopes, S-facing rock outcrops; Upper Karoo, Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (Middelburg SW to Willowmore, E to Grahamstown).

cultrata L.

Perennial dwarf shrub, succulent, somewhat branched, erect, woody, 0.8 m high, old leaves deciduous. **Leaves** opposite, oblanceolate to cultrate, 30–50 × 10–20 mm, obtuse to rounded, scarcely convex both sides with sharp horny margins, glabrous, green to yellowish green with reddish margins. **Inflorescence** an elongate, terminal thyrse with several globular dichasia; flowers sessile; peduncle 0.15–0.30 m long, puberulous to glabrous. **Calyx** fleshy, green, with hairs, marginal cilia. **Corolla** tubular, fused 0.6–0.8 mm, cream-coloured; lobes panduriform, 3.5–4.5 mm long, terminal ovoid dorsal appendage present, apex not membranous on inside. **Flowering time** Dec.–Feb. Sheltered valleys, rock outcrops in scrub; Drakensberg Grassland, Rainshadow Valley Karoo, Albany Thicket (Barkly East District, Fort Beaufort District, Steytlerville E to Bathurst).

[E]latibracteata Toelken

Perennial dwarf shrub, succulent, much branched, erect, lower branches decumbent, woody, 0.4 m high, old leaves deciduous. **Leaves** opposite, obovate, 10–20 × 4–7 mm, rounded, falcate turned to one side of stem, slightly convex both sides but with sharp margins, puberulous to glabrous, yellowish green, red margins. **Inflorescence** a rounded, terminal thyrse with 1–3 globular dichasia; flowers sessile; peduncle 0.15–0.25 m long, puberulous to glabrous, broad bracts on lower part. **Calyx** fleshy, swollen, green

to yellowish green, puberulous. **Corolla** tubular, fused 0.5–0.8 mm, cream-coloured; lobes oblong-lanceolate, 3.0–3.5 mm long, terminal elongate ellipsoid dorsal appendage present, apex short, swollen on inside. **Flowering time** Feb.–May. Lower slopes in dry scrub; Albany Thicket (Uitenhage E to Bathurst).

[E]**mesembryanthoides** (Haw.) D.Dietr.

Perennial dwarf shrub, succulent, erect, much branched, woody, 0.4 m high, old leaves deciduous. **Leaves** opposite, linear-triangular or linear-elliptic, 10–50 × 2–3 mm, acute, flat above, convex below, as thick as wide, densely covered with hairs, green to brown. **Inflorescence** a rounded, terminal thyrse with branches ending in globular dichasia; flowers sessile; peduncle 0.1–0.3 m long, covered with hairs. **Calyx** fleshy, green to brown, covered with hairs. **Corolla** tubular, fused 1.0–1.3 mm, white to cream-coloured; lobes elongate, panduriform, 3.5–4.5 mm long, terminal elongate ellipsoid dorsal appendage present. **Flowering time** Feb.–June. Lower slopes in dry karroid scrub or sheltered shrubby vegetation; Albany Thicket (Steytlerville E to Peddie).
Two subspecies endemic to EC: *C. mesembryanthoides* (Haw.) D.Dietr. subsp. *hispida* (Haw.) Toelken; *C. mesembryanthoides* (Haw.) D.Dietr. subsp. *mesembryanthoides*.

mollis Thunb.

Perennial dwarf shrub, succulent, erect, much branched, woody, 0.5 m high, old leaves deciduous. **Leaves** opposite, linear-elliptic, 10–20 × 2–3 mm, acute, flat above, convex below, as thick as wide, shortly velvety, grey-green to brown. **Inflorescence** a rounded, terminal thyrse with 3–many globular dichasia; flowers sessile; peduncle 0.15–0.25 m long, covered with hairs. **Calyx** fleshy, swollen, green to yellowish green, puberulous. **Corolla** tubular, fused 0.5–0.8 mm, cream-coloured; lobes oblong-lanceolate, 2.5–3.5 mm long, terminal elongate ellipsoid dorsal appendage present, conspicuous apex on inside absent. **Flowering time** Dec.–Feb. Lower slopes in dry scrub; Eastern Fynbos-Renosterveld, Albany Thicket (Willowmore E to Grahamstown).

nudicaulis L.

Skraalplakkie (A)

Perennial succulent, several basal rosettes, branched, erect, carnose to woody, 0.15–0.45 m when in flower, old leaves not deciduous. **Leaves** oblong-elliptic, 20–80 × 6–15 mm, acute to rounded, flat above, convex below, glabrous to pubescent, with or without marginal cilia, green to brown. **Inflorescence** an elongate, terminal thyrse with several dense stalked or sessile dichasia from 3–5 nodes; flowers sessile; peduncle 0.1–0.2 m long, glabrous to pubescent. **Calyx** fleshy, green to brown, hairy, marginal cilia. **Corolla** tubular, fused 0.5–0.8 mm, cream-coloured; lobes panduriform, 3.0–3.5 mm long, terminal ellipsoid dorsal appendage present, apex membranous on inside. **Flowering time** Sept.–Dec. Gravelly slopes and rock crevices; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Aliwal North E to Kokstad S, to Joubertina and East London).

pubescens Thunb.

Perennial dwarf shrub, succulent, much branched, erect, woody, 0.3 m high, old leaves deciduous. **Leaves** opposite, oblanceolate to obovate, 10–30 × 4–15 mm, obtuse to acute, slightly convex both sides but with sharp margins, tomentose, pubescent to glabrous, green to brown. **Inflorescence** an elongate, terminal thyrse with 1–4 globular dichasia; flowers sessile; peduncle 0.08–0.15 m long, puberulous to glabrous. **Calyx** fleshy, green, puberulous to glabrous, marginal cilia. **Corolla** tubular, fused 0.3–0.5 mm, cream-

coloured to pale yellow; lobes oblanceolate to panduriform, 2–3 mm long, terminal elongate ellipsoid dorsal appendage present, membranous apex on inside. **Flowering time** Sept.–Feb. Sheltered, in shade of trees, on cliffs under rock faces; Upper Karoo, Lower Karoo, Rainshadow Valley Karoo, Albany Thicket (Graaff-Reinet E to Fort Beaufort S, from Willowmore to Port Elizabeth).
Two subspecies endemic to EC: *C. pubescens* Thunb. subsp. *radicans* (Haw.) Toelken; *C. pubescens* Thunb. subsp. *rattrayi* (Schönland & Baker f.) Toelken.

[E]**rogersii** Schönland

Perennial dwarf shrub, succulent, much branched, erect, slightly woody, 0.3 m high, old leaves deciduous. **Leaves** opposite, oblanceolate to club-shaped, 15–20 × 4–8 mm, obtuse to bluntly acute, slightly convex above, distinctly convex below, hairy, green to yellowish green with reddish margins. **Inflorescence** an elongate, terminal thyrse with several globular dichasia; flowers sessile; peduncle 0.05–0.15 m long, hairy. **Calyx** fleshy, grey to yellowish green, with hairs, marginal cilia. **Corolla** tubular, fused 0.5–0.6 mm, pale yellow; lobes panduriform, 3–4 mm long, terminal ovoid dorsal appendage present, apex membranous on inside. **Flowering time** Jan.–Mar. Sheltered valleys, in dry scrub; Lower Karoo, Albany Thicket (Willowmore E to Port Alfred).

subaphylla (Eckl. & Zeyh.) Harv.

Louhout (A)

Perennial dwarf shrub, succulent, much branched, decumbent, wiry-woody, puberulous to tomentose, 0.8 m high, old leaves deciduous. **Leaves** opposite, right angle to stem, slightly curled upwards, linear-lanceolate, 8–15 × 2–3 mm, acute to obtuse, triangular to almost round in section, with hairs, green to reddish brown. **Inflorescence** an elongate, terminal thyrse with several globular dichasia from 2–5 nodes; flowers sessile; peduncle 0.03–0.15 m long, hairy. **Calyx** fleshy, grey-green, puberulous and marginal cilia. **Corolla** tubular, fused 0.3–0.4 mm, cream-coloured; lobes panduriform, 3.5–4.5 mm long, terminal ovoid dorsal appendage present, apex membranous on inside. **Flowering time** Oct., Nov. Gravelly, sandy slopes in karroid vegetation; Upper Karoo, Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (Aliwal North SW to Willowmore, E to Grahamstown).

9b Petals without dorsal appendage, or if present, then denticulate, pointed and not in terminal position
10a Petals narrowly oblong, smooth, > 4.5 mm *long and with terminal beak, without dorsal appendage; inflorescence sessile or almost so; leaves densely clustered at least at base (section* Columnares*)*

columnaris Thunb.

Khaki button, koesnaatjie (A)

Perennial or biennial herb, succulent, single stem, old leaves remaining on stem, ± 0.01 m long. **Leaves** transversely depressed-ovate, 5–10 × 10–25 mm, rounded with dorsal ridge, mucronate, tightly clasping and patelliform, margins membranous with cilia, grey-green to brown. **Inflorescence** a terminal, cymose capitulum or rounded thyrse, partly hidden by upper leaves; flowers sessile. **Calyx** fleshy towards apex, rounded, marginal cilia, green to brown. **Corolla** slender ampulliform, fused 2.5–3.5 mm, white tinged red; lobes narrowly elliptic-oblong, 7–13 mm long, terminal beak blunt. **Flowering time** May–Aug. Gentle slopes or depressions on quartz gravel; Rainshadow Valley Karoo (Willowmore District).

pyramidalis Thunb.

Rygbossie (A)

Perennial herb, succulent, erect, branches or unbranched, 0.03–0.25 m high. **Leaves** angular-ovate, transversely depressed-ovate, 4–12 × 4–8 mm, of equal length, acute, dorsiventrally flattened without cilia, grey-green to brown. **Inflorescence** a terminal, cymose capitulum on main and lateral branches, partly hidden by upper leaves; flowers sessile. **Calyx** fleshy and green above, membranous and yellow below, marginal cilia. **Corolla** slender ampulliform, fused 3–4 mm, white tinged red; lobes narrowly elliptic-oblong, 8–11 mm long, terminal beak blunt. **Flowering time** Aug.–Oct. Gravelly slopes, shallow soil, north aspect; Lower Karoo, Rainshadow Valley Karoo (Willowmore District).

10b Petals lanceolate, oblanceolate or panduriform, with dorsal appendage, if without, then up to 4 mm *long without beak, curved or reflexed*
11a Leaves glabrous or hairy, with marginal cilia
12a Leaves gradually shorter below inflorescence
13a Leaves terete or with flat upper surface
14a Leaves terete, subulate and up to 2.5 mm *wide*
15a Petals > 30 mm *long (section* Kalosanthes*)*

obtusa Haw.

Perennial dwarf shrub, succulent, branched, decumbent, rooting where touching ground, woody stems, ± 0.15 m high, old leaves not deciduous. **Leaves** oblong to lanceolate, 8–15 × 2–3 mm, rounded, flat above, somewhat convex below, erect, glabrous, margins ciliate, green to brown. **Inflorescence** a loose dichasium, 1–5 flowers; pedicels 2–8 mm long. **Calyx** 10–15 mm long, acute, fleshy, green to red, marginal cilia. **Corolla** tubular, fused 9–12 mm, white tinged pink; lobes narrowly spathulate, 30–40 mm long, pointed, dorsal appendage, recurved. **Flowering time** Nov.–Jan. Rock outcrops; Albany Thicket, Eastern Fynbos-Renosterveld (Joubertina E to Addo).

15b Petals 3–10 mm long
16a Petals 3–5 mm long, lobes stiff, aculeate without conspicuous dorsal appendage (section Subulares*)*

ciliata L.

Perennial dwarf shrub, succulent, decumbent, much branched, woody stems, ± 0.2 m high, old leaves not deciduous. **Leaves** oblong-elliptic, 15–30 × 5–12 mm, rounded, dorsiventrally flattened scarcely convex, marginal cilia, green to yellowish green. **Inflorescence** a long, rounded thyrse, many dichasia; many flowers; peduncle 0.15–0.25 mm. **Calyx** acute, fleshy, green to yellow, marginal cilia. **Corolla** tubular, fused 0.8–1.2 mm, cream-coloured to pale yellow; lobes elliptic to panduriform, 3.5–4.5 mm long, acuminate, indistinct dorsal appendage, erect, later recurved. **Flowering time** Nov.–Jan. Lower sandy lopes along coast; Eastern Fynbos-Renosterveld, Albany Thicket (Humansdorp E to Alexandria).

multiflora Schönland & Baker f.

Perennial dwarf shrub, succulent, branched towards apex, erect, woody stems, ± 0.8 m high, old leaves not deciduous. **Leaves** narrowly oblong, 30–60 × 3–6 mm, obtuse or rounded, dorsiventrally flattened scarcely convex, marginal cilia, grey-green to brown. **Inflorescence** a flat thyrse, many dichasia; many almost sessile flowers; peduncle indistinct. **Calyx** acute, fleshy, green to brown, marginal teeth. **Corolla** tubular, fused 1.0–1.5 mm, cream-coloured; lobes oblanceolate to panduriform, 3.5–4.5 mm long, acuminate, without dorsal appendage, scarcely recurved. **Flowering time** Dec., Jan.

Among boulders on rocky S-facing slopes; Eastern Fynbos-Renosterveld (Willowmore and Baviaanskloof).

subulata L.

Perennial dwarf shrub, succulent, fastigiate branches, erect or decumbent, woody stems, ± 0.2–1.0 m high, old leaves not deciduous, recurved hairs in 2 lines along internodes from fused basis of leaf pairs. **Leaves** subulate, linear-lanceolate, 5–20 × 1–2 mm, obtuse or rounded, dorsiventrally flattened to almost terete, marginal cilia or papillae, acute apex recurved, grey-green to brown. **Inflorescence** a rounded thyrse, several dichasia; many flowers; peduncle indistinct. **Calyx** acute, fleshy, glabrous, green to brown, rarely marginal teeth. **Corolla** tubular, fused 0.5 mm, cream-coloured tinged pink; lobes elliptic to panduriform, 3.0–4.5 mm long, acuminate, without dorsal appendage, erect to scarcely recurved. **Flowering time** Oct.–Dec. Dry rocky slopes in low fynbos or grassland; Upper Karoo, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (Hofmeyr, Seymour, Tsitsikamma E to Alexandria).

16b Petals 5–9 mm long, lobes membranous, acute with conspicuous dorsal appendage (section Curtogyne*)*

rubricaulis Eckl. & Zeyh.

Perennial dwarf shrub, succulent, much branched, erect or decumbent, woody stems, ± 0.3 m high, old leaves rarely deciduous. **Leaves** oblanceolate-cultrate, 15–25 × 5–10 mm, obtuse or rounded, flat above, convex below, glabrous with marginal cilia at apex, green with or without red margins. **Inflorescence** a rounded thyrse, several dichasia; many flowers; peduncle indistinct. **Calyx** acute, fleshy, green to red, marginal teeth. **Corolla** tubular, fused 0.8–1.0 mm, white tinged red; lobes oblong-ovate to panduriform, 4.0–5.5 mm long, acute, with subterminal dorsal appendage, recurved to reflexed. **Flowering time** Mar.–June. Rock outcrops; Albany Thicket, Eastern Fynbos-Renosterveld (Willowmore E to Alexandria).

14b Leaves lanceolate to ovate, 4–8 mm wide
17a Inflorescence flat-topped thyrse; petals 5–8 mm long (section Crassula*)*

perfoliata L.

Red crassula; *rooiplakkie* (A)

Perennial dwarf shrub, succulent, erect, little branched, 0.1–1.5 m high, stem woody covered with coarse papillae, old leaves not deciduous. **Leaves** lanceolate or oblong falcate, 40–120 × 12–35 mm, acute to obtuse, dorsiventrally compressed, concave above, convex below, or apparently laterally compressed and convex at both surfaces, covered with papillae, green to grey. **Inflorescence** a rounded thyrse, several dichasia; flowers loosely arranged; peduncle 30–100 mm long. **Calyx** fleshy, green, covered with hairs and marginal cilia. **Corolla** tubular, fused 1.0–1.5 mm, white, pink to scarlet; lobes oblong-lanceolate, 3–6 mm long, dorsal appendage recurved. **Flowering time** Oct.–Feb. Lower slopes in dry scrub, or rocks in grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Lower Karoo, Albany Thicket (Graaff-Reinet E to Komga, S to Willowmore and East London).

Three varieties endemic to EC: *C. perfoliata* L. var. *coccinea* (Sweet) G.D.Rowley, *C. perfoliata* L. var. *minor* (Haw.) G.D.Rowley, *C. perfoliata* L. var. *perfoliata*.

17b Inflorescence spike-like or rounded thyrse; petals 2–4 mm long (section Argyrophylla*)*

[E]**decidua** Schönland

Perennial herb, succulent, little branched, ± 0.06 m long, leaves deciduous before fruiting. **Leaves** obovate-cultriform, 10–25 × 6–12 mm, obtuse to rounded, dorsiventrally compressed, slightly convex both sides, covered with papillae, glabrous with age, green to grey-green. **Inflorescence** a spike-like thyrse, several dense dichasia; flowers pedicellate or almost sessile; distinct peduncle but leaves gradually shorter upwards. **Calyx** fleshy, green, covered with hairs and marginal cilia. **Corolla** tubular, fused 1 mm, white; lobes oblong-lanceolate, 2.5–3.5 mm long, acute to obtuse, dorsal appendage, slightly recurved. **Flowering time** Dec.–Mar. Amongst karroid shrubs; Upper Karoo, Dry Highveld Grassland (Cradock S to Somerset East).

lanuginosa Harv.

Perennial herb, succulent, prostrate or decumbent branches, ± 0.15 m long, rooting from nodes, old leaves not deciduous. **Leaves** obovate, elliptic, almost linear, 3–25 × 2–8 mm, acute to rounded, dorsiventrally compressed, slightly convex both sides, with hairs and cilia, green to grey-green. **Inflorescence** a flat-topped thyrse, 1–several dichasia; flowers pedicellate or almost sessile; distinct peduncle but leaves gradually shorter upwards. **Calyx** fleshy, green, covered with hairs and marginal cilia. **Corolla** tubular, fused 1 mm, white to cream-coloured; lobes oblong-obovate, 2.0–3.5 mm long, acute, dorsal appendage, recurved. **Flowering time** Jan.–Mar. In rock crevices, among boulders or under overhanging rocks; Upper Karoo, Drakensberg Grassland, Sub-Escarpment Grassland (Aliwal North E to Kokstad, S to Cradock and Cathcart).

tecta Thunb.

Perennial herb, succulent, basal rosette, much branched, ± 0.03–0.05 m high, old leaves not deciduous. **Leaves** oblong to lanceolate, 20–35 × 5–12 mm, rounded, dorsiventrally compressed, convex both sides, covered with hard papillae towards apex and cilia toward base, grey-green. **Inflorescence** a spherical thyrse, several dichasia; distinct peduncle 30–80 mm long, covered with papillae. **Calyx** fleshy, grey-green, covered with hairs and marginal cilia. **Corolla** tubular, fused 0.8 mm, white or cream-coloured; lobes oblong-lanceolate, 3–4 mm long, obtuse, indistinct dorsal appendage, scarcely recurved. **Flowering time** Apr.–June. In gravel on gentle lower slopes; Rainshadow Valley Karoo, Albany Thicket (Willowmore District, Baviaanskloof).

13b Leaves dorsiventrally flattened
18a Leaves borne in a basal rosette, vernation obvolute (section Rosulares*)*

acinaciformis Schinz

Giant crassula; *reuseplakkie* (A); *igekle* (Z)

Perennial or biennial herb, succulent, with one rosette, erect leaves spirally arranged, old ones remaining on stem, ± 1.3 m high when flowering. **Leaves** lanceolate to linear-triangular, 150–300 × 30–60 mm, acute, drying from apex, dorsiventrally flattened, canaliculate, glabrous except for few irregularly spaced cilia or teeth, green to yellowish green. **Inflorescence** a flat-topped thyrse, many dichasia, many pedicellate flowers; peduncle with leaf-like bracts, shortening upwards. **Calyx** fleshy, acute drawn into stout hair, membranous margins with few teeth, yellowish green. **Corolla** tubular, fused 0.5–0.8 mm, pale yellow; lobes oblong to obovate, 3–4 mm long, rounded, slightly hooded, recurved. **Flowering time** Mar.–June. Rocky, moist grassland slopes; Drakensberg Grassland (Maclear District).

alba Forssk.

Feko (SS); *isidwe* (Z)

Perennial or biennial herb, succulent, with one rosette, leaf pairs spirally arranged, old ones remaining on stem, ± 0.5 m high when flowering, tuberous rootstock. **Leaves** lanceolate to linear-triangular, 60–150 × 5–15 mm, acute, drying from apex, dorsiventrally flattened, folded, glabrous except for marginal cilia, dark green to yellowish green with purple marks. **Inflorescence** a flat-topped thyrse, many pedicellate flowers; peduncle with leaf-like bracts, shortening upwards. **Calyx** fleshy, acute tapering into stout hair, with marginal cilia, green. **Corolla** tubular, fused 0.2–0.5 mm, pink to white; lobes oblong to obovate, 3.0–5.5 mm long, acute, slightly hooded, erect scarcely recurved. **Flowering time** Feb.–Apr. In moist grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (from Matatiele E to Kokstad SW to Cala and Komga).

brachystachya Toelken

Perennial herb, succulent, several rosettes, leaf pairs spirally arranged, old ones remaining on stem, 0.1–0.2 m high when flowering, thick tuberous root. **Leaves** oblanceolate-oblong, 20–40 × 5–15 mm, acute, dorsiventrally flattened but convex, glabrous or with few cilia, green tinged red. **Inflorescence** a spike-like thyrse, sessile flowers; peduncle distinct with leaf-like bracts shorter than leaves. **Calyx** fleshy, acute tapering into terminal hair, glabrous with marginal cilia, green. **Corolla** tubular, fused 1 mm, white; lobes oblong-ovate, 4–5 mm long, acute, recurved. **Flowering time** Nov.–Jan. In moist shaded crevices on rock faces; Albany Thicket (Gamtoos Valley).

capitella Thunb.

Biennial or perennial herb, succulent, 1–several rosettes, leaf pairs spirally arranged, old ones remaining on stem, 0.1–0.8 m high when flowering. **Leaves** linear-lanceolate to ovate, 15–50 × 8–15 mm, acute but drying from apex, dorsiventrally compressed, grooved above central vein, glabrous to hairy with marginal cilia, green to brown, tinged red or with red spots. **Inflorescence** a spike-like thyrse, sessile dichasia and sessile flowers; peduncle short with bracts shortening upwards. **Calyx** fleshy, acute, glabrous with marginal teeth, green. **Corolla** tubular, fused 0.3–0.6 mm, white or cream-coloured tinged pink; lobes oblong, 4.5–5.5 mm long, obtuse, with rounded dorsal appendage in terminal position, fleshy petal apex spreading to centre of flower. **Flowering time** Dec.–Mar. Wide range of habitats; widespread in almost all bioregions (Albert and Aliwal North Districts S, from Middelburg to Maclear, Aberdeen to Komga and Willowmore to Grahamstown).

compacta Schönland

Perennial or annual herb, succulent, 1 or 2 rosettes, leaf pairs spirally arranged, old ones remaining on stem, ± 0.2 m high when flowering. **Leaves** ovate or obovate, 15–35 × 10–25 mm, acute or obtuse, dorsiventrally flattened, glabrous with marginal cilia, green to reddish brown. **Inflorescence** a spike-like thyrse, sessile dichasia and flowers; peduncle short with bracts shortening upwards. **Calyx** fleshy, obtuse, glabrous with marginal papillae, green. **Corolla** tubular, fused 0.2–0.5 mm, white or cream-coloured; lobes oblong-obovate, 4.5–5.5 mm long, obtuse, erect slightly recurved. **Flowering time** Nov.–Mar. Shallow soil on rocks in grassland; Upper Karoo, Drakensberg Grassland (Venterstad, E to Rhodes).

[E]cremnophila Van Jaarsv. & A.E.van Wyk

Perennial herb, succulent, up to 5 or more rosettes, recurved, appressed leaves, leaf pairs spirally arranged, old ones remaining on stem, ± 0.07 m high when flowering. **Leaves** broadly obovate, 15–35 × 10–32 mm, rounded and mucronate, glabrous with marginal cilia, glaucous-green. **Inflorescence** a round-topped thyrse, dichasia clustered; flowers many, sessile or pedicellate; peduncle distinct, 35 mm long; bracts lanceolate. **Calyx** fleshy, acute ending in bristle, glabrous, marginal cilia, green. **Corolla** tubular, scarcely fused, white tinged pink; lobes oblong-oblanceolate, 7.0–15.0 mm long, obtuse, ascending-spreading. **Flowering time** Sept.–Dec. Crevices on rock faces; Albany Thicket (Humansdorp E to Patensie).

exilis Harv.

Perennial herb, succulent, much branched, dense cushions of many rosettes with leaves loosely spirally arranged, old ones remaining on stem, ± 0.1 m high when flowering. **Leaves** oblanceolate or obovate, 6–35 × 3–10 mm, acute, glabrous except for spreading recurved cilia at margins and 1 stout, terminal hair per leaf, dorsiventrally flattened, green to brown with darker spots above. **Inflorescence** a flat-topped thyrse, 1–5 dichasia, pedicellate flowers; peduncle indistinct with spreading hairs. **Calyx** glabrous, fleshy but membranous margins and marginal cilia, stout terminal hair, green. **Corolla** tubular, fused 0.2–0.8 mm, white tinged pink; lobes oblong-obovate, 3.5–4.0 mm long, acute, recurved. **Flowering time** Feb.–Apr. Shaded rock crevices on hills; Upper Karoo, Drakensberg Grassland (Steynsburg S to Graaff-Reinet and Cradock).

Only *C. exilis* Harv. subsp. *cooperi* in EC.

flanaganii Schönland & Baker f.

Perennial herb, succulent, single rosette, recurved and appressed leaves, leaf pairs spirally arranged, old ones remaining on stem, ± 0.15 m high when flowering. **Leaves** ovate, 15–30 × 15–25 mm, obtuse and mucronate, dorsiventrally flattened but grooved along main vein, glabrous with marginal cilia, green to brownish green. **Inflorescence** a spike-like thyrse, many sessile or pedicellate flowers; peduncle distinct with short bracts. **Calyx** fleshy, obtuse, glabrous with marginal papillae, green. **Corolla** tubular, fused 0.2 mm, white or cream-coloured; lobes oblong-oblanceolate, 2.5–2.8 mm long, acute or obtuse, first erect later recurved. **Flowering time** Sept.–Nov. Dry sandstone or quartzite slopes; Albany Thicket (Willowmore, Baviaanskloof).

[E]foveata Van Jaarsv.

Perennial herb, succulent, branched, loose rosettes, erect, terete, glabrous, ± 0.18 m high when flowering. **Leaves** linear-lanceolate to triangular-lanceolate, 12–44 × 37 mm, acute, sessile, dorsiventrally flattened, convex below, concave to flat above, glabrous, sparse cilia, green becoming reddish, reddish pitted. **Inflorescence** a terminal, rounded to flat-topped thyrse, 1–several dichasia, stalked flowers; peduncle up to 0.15 m long, transition from leaves to bracts. **Calyx** acute, glabrous, fleshy, hairs at apex. **Corolla** tubular, fused 1 mm, white to pink; lobes oblong-ovate, 2 mm long, acute, spreading. **Flowering time** Feb.–Apr. Shale cliff faces; Sub-Escarpment Savanna (Butterworth District).

hemisphaerica Thunb.

Perennial herb, succulent, single rosette, recurved and appressed leaves, leaf pairs spirally arranged, old ones remaining on stem, ± 0.15 m high when flowering. **Leaves** ovate, 15–30 × 15–25 mm, obtuse and mucronate, dorsiventrally flattened but grooved along main vein, glabrous with marginal cilia, green to brownish green. **Inflorescence** a spike-

like thyrse, many sessile or pedicellate flowers; peduncle distinct with short bracts. **Calyx** fleshy, obtuse, glabrous with marginal papillae, green. **Corolla** tubular, fused 0.2 mm, white or cream-coloured; lobes oblong-oblanceolate, 2.5–2.8 mm long, acute or obtuse, first erect, later recurved. **Flowering time** Sept.–Nov. Dry sandstone or quartzite slopes; Albany Thicket (Willowmore, Baviaanskloof).

intermedia Schönland

Perennial herb, succulent, few to many rosettes with 4-ranked leaves, old ones remaining on stem, ± 0.2 m high when flowering. **Leaves** obovate to orbicular, closely appressed, 10–30 × 10–30 mm, rounded apex, mucronate, glabrous with row of marginal cilia, dorsiventrally flattened, green. **Inflorescence** a round-topped thyrse, 1–several dichasia, dense cluster of sessile flowers; peduncle 40–150 mm long. **Calyx** glabrous, fleshy, green tinged brown, marginal cilia. **Corolla** tubular, fused 0.2–0.4 mm, white tinged red; lobes obovate, 2.0–2.5 mm long, rounded, erect, scarcely recurved. **Style** reflexed. **Flowering time** Aug.–Oct. Under trees and shrubs in Fish River Valley bushveld; Sub-Escarpment Savanna, Albany Thicket (Komga SW to Port Elizabeth).

montana Thunb.

Perennial herb, succulent, cushions of many rosettes with 4-ranked leaves, old ones remaining on stem, ± 0.12 m high when flowering. **Leaves** obovate to broadly elliptic, 7–15 × 6–20 mm, tapering to apex, glabrous with row of marginal cilia, dorsiventrally flattened, green to brown, spotted. **Inflorescence** a flat-topped thyrse, 1–several dichasia, sessile flowers; peduncle 10–80 mm long. **Calyx** glabrous, fleshy, green, marginal cilia. **Corolla** tubular, fused 0.5 mm, white tinged pink; lobes oblong, 3.0–5.5 mm long, acute, recurved to reflexed. **Flowering time** Aug.–Oct. Dense mats in sheltered rock crevices; Upper Karoo, Lower Karoo, Albany Thicket (Cradock SW to Willowmore).

Only *C. montana* Thunb. subsp. *quadrangularis* in EC.

natalensis Schönland

Bohohoana (SS)

Perennial or biennial herb, succulent, with one rosette, leaf pairs spirally arranged, old ones remaining on stem, ± 0.4 m high when flowering. **Leaves** obovate, 15–60 × 5–15 mm, tapering into blunt apex, dorsiventrally flattened, drying from apex, glabrous except for marginal cilia, green tinged red. **Inflorescence** a divided, round-topped thyrse, pedicellate flowers; peduncle with leaf-like bracts, shortening upwards. **Calyx** fleshy, acute drawn into stout hair, with few marginal teeth, green. **Corolla** tubular, fused 0.4–0.5 mm, white tinged red; lobes oblong to elliptic, 2–3 mm long, rounded, slightly hooded, recurved. **Flowering time** Jan.–Apr. Rock outcrops in grassland; Drakensberg Grassland, Sub-Escarpment Grassland (Barkly East SW to Stutterheim).

obovata Haw.

Perennial herb, succulent, erect, leaf pairs spirally arranged, old ones remaining on stem, ± 0.3 m high when flowering. **Leaves** elliptic to ovate, 10–30 × 5–10 mm, acute or obtuse, dorsiventrally compressed, glabrous or with hairs and cilia, green tinged red. **Inflorescence** an elongated thyrse, sessile dichasia, many pedicellate flowers; peduncle indistinct with leaf-like bracts shortening upwards. **Calyx** fleshy, acute tapering into recurved terminal hair, glabrous, hairy or with marginal cilia, green. **Corolla** tubular, fused 0.5–1.0 mm, cream-coloured to white, tinged pink; lobes oblong, 5–7 mm long, acute, recurved. **Flowering time** Mar.–May. On moist rocky outcrops

in grassland or forest; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (from Matatiele SE to Somerset East, E to Butterworth and S from Uitenhage to Port Alfred).

orbicularis L.

Klipblom (A); *umadinsane* (Z)

Perennial herb, succulent, little branched, few rosettes with runners, ± 0.25 m high when flowering, leaf pairs spirally arranged, old ones remaining on stem. **Leaves** elliptic to oblanceolate, 15–80 × 5–20 mm, acute, glabrous with row of marginal cilia, dorsiventrally flattened, green to brownish green, tinged red along margins and apex. **Inflorescence** a terminal, elongated thyrse, many dichasia, stalked flowers; peduncle 0.05–0.20 m long. **Calyx** glabrous, fleshy, green to red, marginal cilia. **Corolla** tubular, fused 0.2–0.5 mm, white tinged pink; lobes lanceolate to linear-elliptic, 2–3 mm long, acute, slightly hooded, spreading, later recurved. **Flowering time** June–Nov. Rock outcrops in sheltered forested areas; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indigenous Forests, Indian Ocean Coastal Belt, Albany Thicket, Eastern Fynbos-Renosterveld (widespread, from Queenstown E to Kentani, S to Willowmore, and Grahamstown).

sediflora (Eckl. & Zeyh.) Endl. & Walp.

Perennial dwarf shrub, succulent, wiry decumbent branches, hardly woody, leaf pairs spirally arranged, old ones remaining on stem, 0.3–0.4 m high. **Leaves** linear, 6–15 × 1–3 mm, acute, dorsiventrally compressed, glabrous or slightly papillose, leathery, green to yellowish green. **Inflorescence** a rounded thyrse, many loosely arranged, pedicellate flowers, indistinct peduncle with leaf-like bracts, shorter upwards. **Calyx** fleshy, acute, glabrous, green. **Corolla** tubular, fused 0.6 mm, cream-coloured; lobes oblong to oblanceolate, 2.0–2.5 mm long, rounded, slightly hooded, recurved. **Flowering time** Dec.–May.

Two varieties in EC:

[E]**sediflora** (Eckl. & Zeyh.) Endl. & Walp. var. **amatolica** (Schönland) Toelken

Among grass and rocks; Drakensberg Grassland (Amatole Mts).

sediflora (Eckl. & Zeyh.) Endl. & Walp. var. **sediflora**

On shallow soil in rock crevices or rock faces; Drakensberg Grassland, Sub-Escarpment Grassland (Matatiele E to Kokstad, S to Maclear).

setulosa Harv.

Serelilienyana (SS)

Perennial herb, succulent, cushions of rosettes, leaf pairs spirally arranged, old ones remaining on stem, ± 0.15–0.25 m high when flowering. **Leaves** lanceolate to elliptic or oblong, 6–20 × 2–10 mm, acute, hairy or glabrous with marginal cilia, dorsiventrally flattened but slightly convex below, green tinged red. **Inflorescence** a round to flat-topped thyrse, 1–several dichasia, pedicellate flowers; peduncle indistinct with leaf-like bracts, shortening upwards. **Calyx** fleshy, with or without marginal cilia, green tinged red. **Corolla** tubular, fused 0.4–0.6 mm, white tinged red; lobes oblong-lanceolate, 2.5–3.5 mm long, acute or rounded, recurved. **Flowering time** Feb.–Apr. Sheltered areas between rocks; Dry Highveld Grassland, Mesic Highveld Grassland, Drakensberg Grassland, Sub-Escarpment Grassland (Aliwal North E to Kokstad, S to Grahamstown).

Two varieties in EC: *C. setulosa* var. *rubra* and *C. setulosa* var. *setulosa*; putative hybrids do occur.

[E]socialis Schönland

Perennial herb, succulent, lithophyte, cushions of many rosettes with 4-ranked leaves, old ones remaining on stem, ± 0.06 m high when flowering. **Leaves** ovate to elliptic, closely appressed, 4–7 × 4–6 mm, acuminate, glabrous with row of marginal cilia, dorsiventrally flattened, green tinged red towards margins. **Inflorescence** a rounded thyrse, 1–3 dichasia, sessile flowers; peduncle 30–60 mm long. **Calyx** glabrous, fleshy, green, marginal cilia. **Corolla** tubular, fused 0.2–0.3 mm, white; lobes oblong-obovate, 2.0–2.5 mm long, obtuse, spreading, scarcely recurved. **Style** reflexed. **Flowering time** Sept., Oct. Rock crevices on S-facing cliffs; Albany Thicket (Hogsback SW to Kommadagga and Fort Brown).

southii Schönland

Annual or perennial herb, succulent, erect, fastigiate branches woody towards base, leaf pairs spirally arranged, old ones remaining on stem, ± 0.25 m high. **Leaves** triangular, 4–10 × 2–4 mm, subulate, tapering into stout terminal hair, dorsiventrally compressed, glabrous except for marginal cilia, leathery, green to grey-green. **Inflorescence** a round-topped thyrse, 1–several dichasia half-hidden by leaves, many pedicellate flowers, indistinct peduncle with leaf-like bracts, scarcely shorter upwards. **Calyx**: lobes of different lengths, fleshy, acute tapering into stout hair, glabrous, green. **Corolla** tubular, fused 0.3–0.8 mm, cream-coloured to white; lobes oblong to oblanceolate, 2–3 mm long, rounded, slightly hooded, erect. **Flowering time** Nov.–Jan.

Two subspecies in EC:

[E]southii Schönland subsp. **southii**

Grassland slopes near coast; Albany Thicket (restricted to Alexandria E to Port Alfred).

southii Schönland subsp. **spaerocephala** Toelken

Drakensberg Grassland, Sub-Escarpment Grassland (Matatiele S to Cala).

tabularis Dinter

Perennial or annual herb, succulent, 1–several rosettes with leaf pairs spirally arranged, old ones remaining on stem, ± 0.3 m high when flowering. **Leaves** lanceolate to ovate, 10–35 × 5–15 mm, acute, glabrous except for dense row of marginal cilia, dorsiventrally flattened but slightly keeled, green to brown with darker spots above. **Inflorescence** spike-like with many sessile dichasia, sessile flowers; peduncle indistinct with leaf-like bracts. **Calyx** glabrous, fleshy but membranous margins and marginal cilia, stout terminal hair, green. **Corolla** tubular, fused 0.5 mm, white tinged pink; lobes oblong-obovate, 2.0–4.5 mm long, obtuse, reflexed. **Flowering time** Feb.–Apr. Shaded rock crevices on S-facing slopes; Upper Karoo, Mesic Highveld Grassland (Bethulie E to Lady Grey, S to Steynsburg).

vaginata Eckl. & Zeyh.

White stonecrop; *umdumbukane* (Z)

Perennial herb, succulent, with one rosette, leaf pairs spirally arranged, old ones remaining on stem, ± 0.5 m high when flowering, tuberous rootstock. **Leaves** lanceolate to linear-triangular, 5–250 × 6–20 mm, acute, drying from apex, dorsiventrally flattened, grooved above, glabrous except for stout marginal cilia, green to yellowish green. **Inflorescence** a flat-topped thyrse, many pedicellate flowers; peduncle with leaf-like bracts, shortening upwards. **Calyx** fleshy, acute drawn into stout hair, with few marginal teeth, yellowish green. **Corolla** tubular, fused 0.5–1.0 mm, yellow to white; lobes

oblong to oblanceolate, 2.5–5.0 mm long, obtuse, slightly hooded, recurved. **Flowering time** Jan.–Apr. In moist grassland; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (from Lady Grey E to Kokstad SW to Stutterheim and Komga, S to Grahamstown).

18b Leaves dorsiventrally flattened and evenly spaced with internodes visible, vernation opposite
19a Petals > 30 mm long (section Kalosanthes*)*

obtusa Haw. (see 15a above)

19b Petals 3–10 mm long
20a Petals 3–5 mm long, lobes stiff, aculeate without conspicuous dorsal appendage (section Subulares*)*

ciliata L. (see 16a above)
multiflora Schönland & Baker f. (see 16a above)
subulata L. (see 16a above)

20b Petals 5–9 mm long, lobes membranous, acute with conspicuous dorsal appendage (section Curtogyne*)*

rubricaulis Eckl. & Zeyh. (see 16b above)

12b Leaves abruptly shorter below inflorescence, at least one pair much shorter than bracts below inflorescence
21a Leaves borne in a dense basal rosette, recurved, hydathodes in a dense row along margins, vernation obvolute (section Rosulares*)*

acinaciformis Schinz (see 18a above)
alba Forssk. var. **alba** (see 18a above)
brachystachya Toelken (see 18a above)
capitella Thunb. (see 18a above)
compacta Schönland (see 18a above)
[E]**cremnophila** Van Jaarsv. & A.E.van Wyk (see 18a above)
exilis Harv. (see 18a above)
flanaganii Schönland & Baker f. (see 18a above)
[E]**foveata** Van Jaarsv. (see 18a above)
hemisphaerica Thunb. (see 18a above)
intermedia Schönland (see 18a above)
montana Thunb. (see 18a above)
natalensis Schönland (see 18a above)
obovata Haw. (see 18a above)
orbicularis L. (see 18a above)
sediflora (Eckl. & Zeyh.) Endl. & Walp. (see 18a above)
setulosa Harv. (see 18a above)
[E]**socialis** Schönland (see 18a above)
southii Schönland (see 18a above)
tabularis Dinter (see 18a above)
vaginata Eckl. & Zeyh. (see 18a above)

21b Leaves evenly spaced with internodes visible, hydathodes scattered, vernation opposite
22a Leaves hairy or papillose, if glabrous, then sepals hairy
23a Inflorescence a flat-topped thyrse; petals 5–8 mm long (section Crassula*)*

perfoliata L. (see 17a above)

23b Inflorescence spike-like or rounded thyrse; petals 2–4 mm long (section Argyrophylla*)*

[E]decidua Schönland (see 17b above)

lanuginosa Harv. (see 17b above)

tecta Thunb. (see 17b above)

22b Leaves and sepals glabrous (section Perfilatae*)*

perforata Thunb.

Concertina plant; *sosatiesbossie* (A)

Perennial dwarf shrub or scrambler, succulent, rarely much branched, old leaves not deciduous, ± 0.6 m long. **Leaves** ovate, 8–20 × 3–15 mm, acute or obtuse, constricted towards base, fused to opposite leaf, slightly convex on both surfaces, glabrous to ciliate, glaucous or green, margins yellow to red, horny. **Inflorescence** an elongate thyrse, sessile flowers; peduncle indistinct, gradual change from leaves to bracts. **Calyx** fleshy, acute, glabrous ridges, brown to red. **Corolla** tubular, scarcely fused, cream-coloured to pale yellow; lobes elliptic-oblong, 2.0–2.5 mm long, acute or obtuse, spreading to recurved later. **Flowering time** Nov.–Apr. Under dry scrub, in rock crevices or among boulders; Sub-Escarpment Savanna, Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (from Graaff-Reinet E to Kei Mouth, S to Willowmore and East London).

Endemic to EC: *C. perforata* Thunb subsp. *kougaensis* Van Jaarsv. & A.E.van Wyk.

rupestris Thunb.

Concertina plant; *sosatiesbossie* (A)

Perennial dwarf shrub, succulent, much branched, old leaves deciduous, ± 0.5 m long. **Leaves** ovate to lanceolate, 5–10 × 5–10 mm, obtuse, flat to concave above, convex below, bases fused into disc, glabrous, glaucous to reddish brown to purple in parts, margins yellow to red, horny. **Inflorescence** a rounded thyrse, sessile flowers; peduncle 20 mm long, partly hidden by upper leaves. **Calyx** fleshy, pointed, glabrous ridges, glaucous-green tinged red. **Corolla** tubular, fused 0.4–0.6 mm, white tinged pink; lobes elliptic-oblong, 2.0–2.5 mm long, obtuse, spreading to recurved later. **Flowering time** June–Oct. Under rock outcrops, lower mountain slopes, karroid vegetation; Lower Karoo, Rainshadow Valley Karoo, Albany Thicket, Eastern Fynbos-Renosterveld (from Graaff-Reinet S to Willowmore, E to Grahamstown).

11b Leaves glabrous or hairy or papillose, without marginal cilia (or just a few at base)
24a Leaves hairy or papillose
25a Leaves subulate or linear, up to 3 mm wide
26a Petals > 30 mm long (section Kalosanthes*)*

obtusa Haw. (see 15a above)

26b Petals 3–10 mm long
27a Petals 3–5 mm long, lobes stiff, aculeate without conspicuous dorsal appendage (section Subulares*)*

ciliata L. (see 16a above)

multiflora Schönland & Baker f. (see 16a above)
subulata L. (see 16a above)

27b Petals 5–9 mm long, lobes membranous, acute with conspicuous dorsal appendage (section Curtogyne*)*

rubricaulis Eckl. & Zeyh. (see 16b above)

25b Leaves lanceolate, elliptic to obovate or falcate, > 3 mm wide
28a Inflorescence a flat-topped thyrse; petals 5–8 mm long (section Crassula*)*

perfoliata L. (see 17a above)

28b Inflorescence a spike-like or rounded thyrse; petals 2–4 mm long (section Argyrophylla*)*

[E]decidua Schönland (see 17b above)
lanuginosa Harv. (see 17b above)
tecta Thunb. (see 17b above)

24b Leaves glabrous or irregularly warted
29a Petals with denticulate dorsal appendage
30a Stems with recurved appressed hairs when young
31a Petals > 30 mm long (section Kalosanthes*)*

obtusa Haw. (see 15a above)

31b Petals 3–10 mm long
32a Petals 3–5 mm long, lobes stiff, aculeate without conspicuous dorsal appendage (section Subulares*)*

ciliata L. (see 16a above)
multiflora Schönland & Baker f. (see 16a above)
subulata L. (see 16a above)

32b Petals 5–9 mm long, lobes membranous, acute with conspicuous dorsal appendage (section Curtogyne*)*

rubricaulis Eckl. & Zeyh. (see 16b above)

30b Stems glabrous
33a Sepals hairy

34a Inflorescence a flat-topped thyrse; petals 5–8 mm long (section Crassula*)*

perfoliata L. (see 17a above)

34b Inflorescence a spike-like or rounded thyrse; petals 2–4 mm long (section Argyrophylla*)*

[E]decidua Schönland (see 17b above)
lanuginosa Harv. (see 17b above)
tecta Thunb. (see 17b above)

33b Sepals glabrous (section Perfilatae*)*

perforata Thunb. (see 22b above)
rupestris Thunb. (see 22b above)

29b Petals without dorsal appendage; perennials with carnose, brittle, slightly woody branches covered with fine papillae (section Acutifolia*)*

biplanata Haw.
Perennial dwarf shrub, succulent, much branched, erect to decumbent, carnose to woody stems up to 50 mm in diam., ± 0.15–0.3 m high, papillae on internodes, rarely peel-

ing or flaking bark on older branches, old leaves deciduous. **Leaves** sessile, lanceolate, 8–15 × 1–2 mm, subulate, dorsiventrally flattened to terete, dark green, thick bloom. **Inflorescence** a flat-topped dichasium, few to many pedicellate, densely clustered flowers; peduncle 50–150 mm long. **Calyx** pointed, fleshy, green. **Corolla** tubular, scarcely fused, white or cream-coloured; lobes oblong-elliptic, 4–5 mm long, acute, dorsal ridge, recurved. **Flowering time** Feb.–Apr. Shallow soil on rocky lower slopes; Eastern Fynbos-Renosterveld (Willowmore E to Uitenhage).

dependens Bolus

Perennial dwarf shrub, succulent, branched, decumbent, thin and wiry, ± 0.2 m high, papillae on young branches, rarely peeling bark on older branches, old leaves not deciduous. **Leaves** sessile, linear-lanceolate, 5–15 × 1–2 mm, acute, dorsiventrally flattened, glabrous, green to brown. **Inflorescence** an almost sessile, flat-topped dichasium, few to many flowers. **Calyx**: lobes of unequal length, ridged, fleshy glabrous, green tinged red. **Corolla** tubular, scarcely fused, white or cream-coloured; lobes lanceolate-oblong, 4–5 mm long, acute, dorsal ridge, recurved. **Flowering time** Dec.–Mar. Shallow soil on rock outcrops; Drakensberg Grassland, Sub-Escarpment Grassland, Dry Highveld Grassland, Eastern Fynbos-Renosterveld (Lady Grey E to Kokstad, SW from Middelburg to Port Edward, S from Engcobo E to Stutterheim and Willowmore).

ericoides Haw.

Karkai (A)

Perennial dwarf shrub, succulent, branched, erect, fastigiate, 0.15–0.40 m high, glabrous, few spreading hairs below inflorescence, flaking bark on older branches, old leaves deciduous. **Leaves** sessile, lanceolate to ovate, 3–7 × 1–3 mm, acute, dorsiventrally flattened, glabrous, green, hydathodes in 2 rows along margins. **Inflorescence** a sessile, rounded, terminal thyrse, 1–several dichasia, half hidden by leaves, shortly pedicellate flowers. **Calyx** ridged to keeled toward apex, fleshy papillose, green. **Corolla** tubular, scarcely fused, white or cream-coloured; lobes elliptic-oblong, 3–5 mm long, acute, folded, dorsal ridge, erect or slightly spreading. **Flowering time** Jan.–May. Forest margin, grassland, scrub, renosterbos, coastal scrub; Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Tsitsa SW to Somerset East to Kentani S from Joubertina to Grahamstown).

[E]**planifolia** Schönland

Perennial dwarf shrub, succulent, branched, erect to decumbent, carnose stems, ± 0.3 m high, flaking bark on older branches, old leaves deciduous. **Leaves** sessile, elliptic to lanceolate, 20–35 × 4–10 mm, acute, dorsiventrally flattened to slightly convex on both surfaces, glabrous, dark green. **Inflorescence** a round-topped thyrse, irregularly branched, many pedicellate flowers; peduncle 30–60 mm long. **Calyx** acute, somewhat ridged, fleshy, green. **Corolla** tubular, scarcely fused, white or cream-coloured; lobes oblong, 1.0–1.5 mm long, rounded, dorsal ridge, slightly recurved. **Flowering time** July, Aug. Shallow soil on rocky outcrops; Sub-Escarpment Savanna (Mthatha to Kentani).

sarcocaulis Eckl. & Zeyh.

Serelilenyane (SS); *umadinsane* (Z)

Perennial dwarf shrub, succulent, much branched, spreading to decumbent, carnose stem up to 50 mm in diam., ± 0.2–0.6 m high, papillae on young branches, peeling bark on older branches, old leaves deciduous. **Leaves** sessile, linear-lanceolate,

10–30 × 1–8 mm, acute, dorsiventrally flattened, glabrous with few papillae along margins, dark green. **Inflorescence** an almost sessile, dense thyrse with 1–several dichasia, few to many flowers. **Calyx** ridged, fleshy, glabrous, green. **Corolla** tubular, scarcely fused, white or cream-coloured; lobes oblong to oblanceolate, 3–5 mm long, acute, dorsal ridge, recurved. **Flowering time** Jan.–June. Shallow soil on rocky mountain slopes; Drakensberg Grassland, Sub-Escarpment Grassland, Upper Karoo, Lower Karoo (Bethulie E to Kokstad S, from Middelburg to Ngangelizwe S, from Graaff-Reinet to Hogsback).

tetragona L.

Karkai (A)

Perennial dwarf shrub, succulent, much branched, erect to decumbent, carnose to woody stems up to 50 mm in diam., ± 0.8–1.0 m high, smooth, rarely peeling or flaking bark on older branches, old leaves deciduous. **Leaves** sessile, lanceolate, 8–50 × 1–4 mm, acute, dorsiventrally flattened to terete, green, grey bloom. **Inflorescence** a flat-topped dichasium, few to many pedicellate flowers; peduncle 10–150 mm long. **Calyx** acute, fleshy, green tinged reddish brown. **Corolla** tubular, scarcely fused, cream-coloured; lobes elliptic to oblanceolate, 1–2 mm long, acute, dorsal ridge, recurved. **Flowering time** Jan.–Mar. Depressions in low karroid vegetation, in scrub of dry river valleys; Upper Karoo, Lower Karoo, Sub-Escarpment Grassland, Albany Thicket, Eastern Fynbos-Renosterveld (widespread from Aliwal North SW to Willowmore and SE to Port Elizabeth).

KALANCHOE Adans.

Species ± 200, tropical Africa, Madagascar, S and SE Asia and N Australia; 13 in sthn Afr., restricted to the summer rainfall areas.

1a Leaves sessile
2a Inflorescence a rounded or flat-topped thyrse

paniculata Harv.

Hasie-oor (A); *sehlakwahlakwane* (SS); *indabulaluvalo* (Z)

Succulent shrublet, rosettes developing a single, erect stem, up to ± 1.2 m high. **Leaves** sessile at base, higher up almost petiolate, ovate, oblong flattened, 100–160 × 60–100 mm, obtuse or rounded, entire, folded lengthwise. **Inflorescence** a flat-topped thyrse with many, loose dichasia ending in monochasia. **Corolla** yellowish green; tube quadrangular-cylindrical, 11–13 mm long; lobes deep yellow. **Flowering time** Mar.–July. On rocky hills; Dry Highveld Grassland (Venterstad to Aliwal North, Somerset East to Bedford).

2b Inflorescence an elongate thyrse

thyrsiflora Harv.

White lady; *meelplakkie* (A); *serilile* (SS); *utywala bentaka* (X); *utshwala benyoni* (Z)

Succulent shrublet, rosettes developing a single, erect stem, up to ± 1.5 m high. **Leaves** sessile obovate to oblanceolate-oblong, flattened, 80–120 × 30–70 mm, clasping, glabrous, grey-green with red margins. **Inflorescence** a slender, elongate thyrse with many tight dichasia ending in monochasia; flowers sweet scented. **Corolla** grey-green covered with thick bloom; tube quadrangular-cylindrical, 12–16 mm long; lobes deep yellow. **Flowering time** May–Sept. On rocky hills; Drakensberg Grassland, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Queenstown E to Engcobo, S to Stutterheim and Butterworth).

1b Leaves petiolate

crenata (Andrews) Haw.

Plakkie (A); *uMahogwe*, *ibohlololo elimpofu* (Z)

Sparse, succulent shrublet, 1–several erect, terete stems, up to ± 1.5 m high. **Leaves** petiolate, ovate to oblong, clasping, 40–110 × 30–90 mm, glabrous to hairy, obtuse, cuneate to cordate, crenate, ± folded lengthwise, yellowish green. **Inflorescence** a rounded thyrse with many dichasia ending in monochasia. **Corolla** yellow or orange; tube elongate-ampullaceous, 10–12 mm long; lobes orange. **Flowering time** Aug.–Oct. In shade of moist bushveld or forest margins; Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket, Indigenous Forests (Port St Johns S to Butterworth, Uitenhage E to Bathurst).

rotundifolia (Haw.) Haw.

Nentakalanchoe; *nentabos* (A); *mfayisele yasehlatini* (X); *umadinsane* (Z)

Sparse, succulent shrublet, 1–several, erect, terete stems, up to ± 1.2 m high. **Leaves** petiolate, not clasping, elliptic to oblong, 30–50 × 8–25 mm, acute to rounded, entire or lobed, flat to slightly concave above, blue-green, often with bloom. **Inflorescence** a sparse, rounded thyrse with several small dichasia. **Corolla** orange to deep red; tube elongate-ampullaceous, 6–10 mm long. **Flowering time** Mar.–Aug. In shade or half shade under trees; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Indian Ocean Coastal Belt, Albany Thicket (Queenstown E to Port St Johns S, from Graaff-Reinet to Fort Beaufort and Butterworth, and from Steytlerville to Uitenhage).

TYLECODON Toelken

Species 41, endemic to sthn Afr., N, NC, WC, EC with concentration of species in the NC.

1a Leaves without basal abscission layer (remains of old leaves on stem)

ventricosus (Burm.f.) Toelken

Nenta; *klipnenta* (A)

Shrublet, with branched, subterranean, tuberous base, stems erect, 5–10 mm in diam., 0.05–0.30 m high. **Leaves** flattened, linear to oblanceolate, 30–60 × 3–20 mm, withering but not abscising, dry when flowering. **Inflorescence** a thyrse, with 1–3 monochasia each with 1–3 flowers; peduncle 0.15–0.3 m long, brown-hairy. **Corolla** yellowish green with purple veins; tube cylindrical, 16–19 mm long, bulging in middle, glabrous. **Flowering time** Nov., Dec. On rocky soils on granite, shale and sandstone, in shade of karoo shrubs; Lower Karoo, Albany Thicket, Rainshadow Valley Karoo (Graaff-Reinet S to Jansenville and Somerset East, from west of Willowmore to Grahamstown District).

1b Leaves with basal abscission layer (no remains of old leaves on stem)
2a Stems with decurrent leaf basis and/or phyllopodia

cacalioides (L.f.) Toelken

Nenta bush; *nentabos*, *karkey* (A)

Shrub with branched, erect stems, 0.5 m in diam., 0.3–1.0 m high, covered with phyllopodia. **Leaves** on tip of branches, linear, 30–70 × 2–4 mm, terete, glabrous. **Inflorescence** a thyrse with 1–7 monochasia arising almost at same point, each with 1–3 flowers; peduncle 0.3–0.45 m long. **Corolla**: tube cylindrical, slightly widened at mouth, sulphur-yellow, 17–25 mm long, glandular-pubescent, hairy filaments. **Flowering time** Jan., Feb. On rocky hillsides with karoo shrubs; Rainshadow Valley Karoo (Willowmore District).

wallichii (Harv.) Toelken

Wallich cotyledon; *kandelaarbos*, *karkeibos* (A)

Shrub with branched, erect stems, 0.5 m in diam., 0.3–0.8 m high, covered with elongated phyllopodia. **Leaves** on tip of branches, linear, 40–150 × 2–6 mm, terete, glabrous. **Inflorescence** a thyrse with 3–5 straight monochasia, each with 5–12 glandular-pubescent flowers; peduncle 0.35–0.6 m long. **Corolla**: tube cylindrical, yellow, slightly widened at mouth, 10–12 mm long, glandular-pubescent, not hairy filaments. **Flowering time** Jan., Feb. Sandy or gravelly slopes with karoo shrubs; Rainshadow Valley Karoo (Willowmore District).

2a Stems smooth without decurrent leaf basis and/or phyllopodia

paniculatus (L.f.) Toelken

Butter bush; *botterboom* (A)

Shrub with thick, branched, erect stems, 0.6 m in diam., 0.5–2.5 m high, covered with yellow, peeling bark. **Leaves** on tip of branches, obovate, 60–120 × 30–100 mm, cuneate, obtuse, glandular-pubescent to glabrous. **Inflorescence** a thyrse with 3–6 straight monochasia, each with 4–10 glabrous flowers; peduncle 0.08–0.15 m long. **Corolla**: tube cylindrical, yellow-orange to red, slightly widened at mouth, 12–16 mm long, glandular-puberulous to glabrous. **Flowering time** Oct.–Jan. Gravelly granite, shale and quartz slopes; Lower Karoo, Rainshadow Valley Karoo (Graaff-Reinet and Willowmore Districts).

reticulatus (L.f.) Toelken

Oukoe (A)

Perennial shrub with thick, erect, little-branched stems, 0.3 m in diam., 0.3–0.4 m high, covered with yellow-brown peeling bark. **Leaves** on tip of branches, linear, oblanceolate, 15–40 × 3–10 mm, cuneate, obtuse, terete, glandular-pubescent to glabrous. **Inflorescence** a persistent thyrse with 1–3 monochasia, each with 2–6 glandular-pubescent, erect flowers; peduncle 0.05–0.10 m long. **Corolla**: tube cylindrical to urn-shaped, yellowish green sometimes with brown-purple where petals are fused, 6–8 mm long, with fine hairs on lobes. **Flowering time** Oct.–Jan. Gravelly granite, shale and quartz slopes; Lower Karoo, Rainshadow Valley Karoo (Graaff-Reinet and Willowmore Districts).

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CUCURBITACEAE

(Order Cucurbitales)

Compiled by W.G. Welman

1a Tendrils apically 2-fid; styles 3, free.....**Gerrardanthus**
1b Tendrils simple or proximally 2–4-fid, spine-like or absent; style 1:
2a Receptacle tube relatively long in both male and female flowers; fruit round, ribbed or trigonous:
3a Style long, linear; stigma 3-lobed, dilated; fruit fleshy, few-seeded.....**Trochomeria**
3b Style thick, fleshy; stigma 3-lobed, fleshy; fruit fleshy, many-seeded.....**Peponium**
2b Receptacle tube short, at least in female flowers, or small and campanulate:
4a Fruit ± glabrous or muricate or with distinct protuberances or with soft spines:
5a Ripe fruit orange or scarlet; seeds much compressed, marginate, usually appearing as if corroded, especially along margins.....**Momordica**
5b Ripe fruit not orange or scarlet; if so, seeds not compressed and marginate, but suborbicular, ovate-oblong or obovate.....**Cucumis**
4b Fruit not bearing warts, spines or other protuberances, but sometimes hairy:
6a Outer layer of large fruit (> 60 mm in diam.), hard and almost bony; seeds narrowly triangular, notched or emarginate on one side, or subrectangular, truncate or bidentate at one or both ends.....**Lagenaria**
6b Outer layer of fruit soft, usually easily squashed or, if harder, either fruit up to 20 mm in diam. or ellipsoid-fusiform, rarely > 100 mm long; seeds ovate or elliptic to subglobose, not subrectangular and not notched on one or both ends:
7a Seeds not much compressed, not marginate.....**Kedrostis**
7b Seeds distinctly compressed, often marginate:
8a Fruit small, globose, smooth or finely foveolate, glabrous, < 35 mm long; seeds marginate .....**Zehneria**
8b Fruit larger, mostly > 35 mm long, glabrous or hairy, never foveolate:
9a Fruit globose, > 50 mm in diam., often much larger.....**Citrullus**
9b Fruit not globose or, if so, fruit up to 50 mm in diam.....**Coccinia**

CITRULLUS Eckl. & Zeyh.

Species 4, Africa to Asia; 3 in sthn Afr., widespread, rare in KZN, WC, EC.

lanatus (Thunb.) Matsum. & Nakai

Wild watermelon; *wilde-waatlemoen* (A); *tsamma* (Khoisan); *umxoxosi* (X)

Monoecious, annual herb. **Stems** prostrate, scandent, up to 3 m long, ± hairy, glabrescent. **Tendrils** 2- or 3-fid. **Leaves** up to 200 × 190 mm, outline ovate to cordate, deeply palmately 3–5-lobed; lobes elliptic, ± pinnately lobulate, subentire, central largest,

hairy to scabrid-punctate; petioles 20–185 mm long, hairy. **Flowers** yellow, solitary. **Male flowers** on hairy 12–45 mm long pedicels; receptacle tube 2.5–5.0 mm long, pale green; lobes 2.5–5.0 mm long, lanceolate; petals 7–19 mm long, obovate. **Female flowers** on 3–45 mm long pedicels; receptacle tube 1.5–2.0 mm long; lobes 2.5–5.5 mm long. **Flowering time** mainly Jan., Feb. **Fruit** 15–200 mm in diam., subglobose, ± green mottled darker green, stalk 20–50 mm long. **Seeds** ovate-elliptic, 9–11 mm long, ± smooth, dark or pale, often mottled. Sandy riverbanks, grassland, bushland, disturbed areas, also cultivated; Sub-Escarpment Grassland, Upper Karoo (Middelburg, Cala).

COCCINIA Wight & Arn.

Species ± 30, Old World, all but 1 confined to Africa; 7 in sthn Afr., widespread.

1a Tendrils bifid; plant glabrous

palmata (Sond.) Cogn.

Bospampoentjie (A)

Dioecious, perennial herb, glabrous. **Stems** slender, branched, climbing, up to 9 m long. **Leaves** 40–120 mm long and wide, outline suborbicular to ovate-oblong, dark green above, paler below, ± smooth both sides, deeply palmately 5-sect; lobes ovate to oblong-lanceolate, ± acute, central lobe largest; margins ± denticulate to callose-toothed, basal sinus subrotund to narrow; petioles 10–60 mm long. **Male flowers** 1- to racemosely 8-flowered; peduncles 20–100 mm long; pedicels 8–25 mm long; receptacle tube 3–6 mm long; lobes 3–4 mm long; corolla 10–20 mm long, pale yellow, petals acute. **Female flowers**: peduncle up to 60 mm long. **Flowering time** Jan.–Apr. **Fruit** oblong-fusiform to narrowly ellipsoid, acute, red when ripe, up to 80 × 35 mm. **Seeds** dirty white, finely rugulose, 6.5–8.0 mm long. Forests, forest edges, streambanks; Indigenous Forests, Sub-Escarpment Grassland, Sub-Escarpment Savanna (Kentani to Engcobo, Mount Ayliff, Port St Johns).

1b Tendrils simple or some bifid, but if so, plant distinctly pubescent
2a Whole plant (except corolla) glabrous or nearly so

quinqueloba (Thunb.) Cogn.

Bobbejaankomkommer (A); *ithangazana* (X)

Dioecious, perennial herb, ± glabrous. **Stems** slender, branched, climbing, up to 10 m long. **Leaves** glaucous above, paler below, outline suborbicular, deeply palmately 3–5-sect, up to 120 × 100 mm; lobes oblong, entire or callose-toothed, mucronate, central lobe longest, basal sinus very narrow, up to 25 mm deep; petioles 10–30 mm long. **Flowers** mostly solitary. **Male flowers** with 20–40 mm long pedicels; receptacle glabrous, 4–5 mm long; lobes ± triangular, 2 mm long; corolla ± 20 mm long, ± pubescent. **Female flowers** with 10–20 mm long pedicels. **Flowering time** Nov.–Apr. **Fruit** ellipsoid, bright red when ripe, apex acute, base ± rounded, up to 60 × 40 mm. **Seeds** obovate, smooth, 6–7 mm long. Forest, forest edges, scrub, bush, dune and river bush; Albany Thicket, Sub-Escarpment Savanna, Indigenous Forests, Eastern Fynbos-Renosterveld (common, Queenstown and Kentani to Humansdorp).

2b Plant ± densely hairy on stems, petioles, leaves and/or calyx
3a Stems persistently hairy with soft curved or curly hairs; leaves without glands, not scabrid with raised pustules

hirtella Cogn.

Perennial herb, annual stems from a fusiform rootstock. **Stems** several to many, climbing or prostrate, up to 3 m long. **Leaves** dark green, ± paler below, outline ± cordate,

palmately lobed or 5–7-sect to middle, up to 100 × 90 mm, basal sinus shallow; lobes ± ovate, contracted basally, denticulate to serrate-dentate or pinnately lobulate; middle lobe longest; petioles 10–45 mm long. **Tendrils** simple or bifid. **Flowers** mostly solitary. **Male flowers**: pedicels slender, up to 150 mm long; receptacle broadly cup-shaped, 4–5 mm long; lobes lanceolate-subulate, 4–7 mm long, hairy; corolla apricot-yellow to pale buff-green, hairy veins outside, 19–23 mm long; petals ± acute. **Female flowers**: pedicels up to 40 mm long. **Flowering time** Sept.–Mar. **Fruit**: base ± rounded, firstly with longitudinal green, grey-white and yellow bands, when ripe bright orange-red, ± glabrous, up to 80 × 40 mm; pedicels glabrescent. **Seeds** ± smooth, up to 7 × 4 mm. Streambanks, grass, forest edges, disturbed places; Drakensberg Grassland, Mesic Highveld Grassland (rare, Lady Grey, Herschel, Barkly East to Xalanga).

3b Stems often glabrescent, becoming white-punctate, or if retaining the pubescence, hairs stiff; leaves often with glands on blade near base beneath and/or scabrid with small raised pustules on upper surface or on both sides

rehmannii Cogn.

Dioecious, perennial herb, large tuberous rootstock. **Stems** annual or perennial, slender, prostrate or climbing, up to 5 m long. **Leaves** up to 80 × 130 mm, outline broadly ovate, cordate, scabrid-punctate above, pentagonal to deeply palmately 3–5-lobed; lobes ± ovate, entire to deeply lobulate, central largest; petioles 5–60 mm long. **Tendrils** simple. **Male flowers** solitary, in sessile few-flowered clusters or in 2–20-flowered racemes; peduncles 8–30 mm long, with co-axillary, solitary flower; pedicels 5–45 mm long; receptacle tube 3–6 mm long, broadly campanulate, hairy; lobes lanceolate, 2–8 mm long; corolla cream-coloured to pale yellow, green-veined, lobes 10–30 mm long, obovate. **Female flowers** solitary; pedicels 2–15 mm long; receptacle tube 2.0–3.5 mm long, ± cylindrical; lobes 2–5 mm long, ± lanceolate. **Flowering time** Oct.–Apr. **Fruit** ± ellipsoid, 15–75 mm long, smooth, red; pedicel 4–20 mm long. **Seeds** 4.5–7.0 mm long, ± oblong, flattened, margins 2-grooved. Savanna, bushland, coastal dunes; Indian Ocean Coastal Belt, Indigenous Forests (Port St. Johns to East London).

CUCUMIS L.

Species 52, mainly Africa, also Asia, Australia, a few widely cultivated; 16 in sthn Afr., widespread, rare in WC.

1a Fruit red or brown when ripe, smooth and glabrous or sometimes hairy, up to 40 mm long; ovary and young fruit hairy

hirsutus Sond.

Suurkomkommertjie (A)

Dioecious, hairy, perennial herb, rootstock woody. **Stems** procumbent, up to 2 m long. **Leaves** up to 210 × 105 mm, outline ± ovate, entire or 3–5-palmately lobed, base subcordate to obtuse, apex acute to obtuse, margins serrate, lobes oblong to triangular, central lobe longest; petioles up to 55 mm long. **Tendrils** simple. **Male flowers** ± racemose, 2–11-flowered; peduncle up to 450 mm long; pedicels up to 85 mm long; receptacle campanulate, up to 9 mm long; lobes linear, up to 6 mm long; corolla campanulate, hairy outside, glabrous inside; tube 6–10 mm long; lobes ± triangular, up to 9 mm long. **Female flowers** 1–3, glabrous inside; pedicels up to 70 mm long; receptacle ovoid, up to 13.5 mm long; lobes ± triangular, up to 6 mm long; corolla tube up to 11 mm long;

lobes ± elliptic, up to 14.5 mm long. **Flowering time** Nov.–Jan. **Fruit** ± globose, dark green lengthwise stripes first; pedicels up to 95 mm long. **Seeds** ovate, up to 80 mm long. Grassy slopes; Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna (rare, Mount Ayliff, Lusikisiki to Kentani).

1b Fruit not red when ripe, with soft spines, tubercles or protuberances; ovary with soft spines or tubercles
2a Segments of ± completely palmatisect leaf 5–7, linear, many times longer than wide, usually entire and up to 4 mm wide

heptadactylus Naudin

Wildekomkommertjie (A)

Dioecious, perennial herb. **Stems** prostrate, up to 1.5 m long, shortly hirsute to glabrate. **Leaves** 5–8-palmately lobed, base truncate, margins entire, up to 150 × 60 mm, roughly hairy above, on veins below; central lobe longest; petioles 4–20 mm long. **Tendrils** simple. **Male flowers** sessile, in 3–15-flowered racemes; pedicels 2–16 mm long, roughly hairy; receptacle tube campanulate, 4.5–6.5 mm long, ± hairy; lobes triangular, 1.5–2.0 mm long, glabrate; corolla funnel-shaped, glabrous; tube 0.5–1.0 mm long; lobes ovate, 2–3 mm long, glabrous outside, hairy inside. **Female flowers** solitary, pedicel 1.5–11.0 mm long, ± hairy; receptacle ovoid, 4 mm long, aculeate; lobes triangular, 1.5–2.0 mm long, glabrate; corolla glabrous; tube minute; lobes ovate, 1.0–1.5 mm long. **Flowering time** Dec.–Mar. **Fruit** ellipsoid to ovoid, up to 50 × 40 mm, dark green and yellow longitudinal stripes, aculeate, aculei 2.5–3.5 mm long; pedicel up to 20 mm long. **Seeds** elliptic, 5.5 mm long. Flats, slopes, karoo; Dry Highveld Grassland, Sub-Escarpment Grassland, Upper Karoo (rare, Middelburg, Venterstad, Sterkstroom).

2b Segments of leaf not linear, mostly > 4 mm wide, often coarsely dentate to lobulate
3a Fruit clearly variegated at least when young, with longitudinal usually darker bands, or if unclearly variegated when mature, globose, up to 30 mm in diam.
4a Spines on fruit laterally compressed, large, dense; fruit narrowly ellipsoid to oblong, usually > 40 mm long; bands on fruit brownish to dirty purple on a paler, dull pale yellow or green-white background; corolla usually > 10 mm long

africanus L.f.

Wild cucumber; *wilde-agurkie* (A); *ithangazana lethafa* (X)

Monoecious, mostly scabrous, perennial herb, rootstock woody. **Stems** procumbent, up to 2 m long. **Leaves** outline broadly ovate, base cordate, up to 115 × 75 mm, palmately 5-lobed; margins serrate; lobes ± elliptic, central lobe longest; petioles up to 85 mm long. **Tendrils** simple. **Flowers** bright yellow. **Male flowers** sessile, in 5–10-flowered racemes; pedicels 3–13 mm long; receptacle tube funnel-shaped, 3.5–6.5 mm long; lobes triangular, 1–3 mm long; corolla funnel-shaped, glabrous inside; tube 1.5–3.0 mm long; lobes ± ovate, 2.0–5.5 mm long. **Female flowers** solitary, pedicel 12–34 mm long; receptacle tube 9–19 mm long, aculeate to hispidulous outside, glabrous inside; lobes linear, 1.5–4.0 mm long; corolla ± glabrous inside; tube 1–3 mm long; lobes elliptic, 5–8 mm long. **Flowering time** Dec.–Mar. **Fruit** 30–80 mm long, aculei 1–7 mm long; non-bitter, edible. **Seeds** elliptic, 4–5 mm long. Grassland, karoo; Albany Thicket, Lower Karoo (very rare, Graaff-Reinet).

4b Spines on fruit terete or very small; fruit ellipsoid or subglobose, up to 40 mm long; corolla usually up to 10 mm long

5a Mature fruit striped lengthwise in shades of orange with 10–20 aculei on darker and 2–10 on lighter stripes of young fruit; aculei 1.5–4.0 mm long

myriocarpus Naudin subsp. **myriocarpus**

Wildekomkommertjie (A)

Monoecious, annual herb, roughly and shortly hairy, rootstock woody. **Stems** prostrate, up to 2.5 m long. **Leaves** with pubescence of 3 different types in distinct zones; outline broadly ovate, base cordate, apex ± acute, up to 160 × 130 mm, 5-palmately lobed, margins serrate; central lobe largest; petioles up to 135 mm long. **Tendrils** simple. **Male flowers** 1–6, sessile; pedicels 5–12 mm long; receptacle ± campanulate, up to 5 mm long; lobes ± linear, up to 3.5 mm long; corolla funnel-shaped, ± hairy outside, ± glabrous inside; tube up to 2.5 mm long; lobes elliptic, up to 6 mm long. **Female flowers** solitary; pedicel up to 60 mm long; receptacle ovoid, up to 6.5 mm long, aculeate outside, ± hairy inside; lobes ± linear, up to 4.5 mm long; corolla ± hairy inside and outside; tube up to 1 mm long; lobes ± elliptic, up to 7 mm long. **Flowering time** Dec.–Mar. **Fruit** ± globose, 15–50 mm long, green with light green lengthwise bands, ripening dirty orange to rusty brown bands; pedicel up to 60 mm long. **Seeds** elliptic, up to 6.5 mm long. Rocky slopes; Sub-Escarpment Grassland, Albany Thicket (rare, Kokstad, Queenstown, Sterkstroom, Paterson).

5b Mature fruit pale yellow without lengthwise stripes or rarely with faint traces, with 1–10 aculei on darker stripes and absent on lighter stripes of young fruit; aculei up to 3 mm long

myriocarpus Naudin subsp. **leptodermis** (Schweick.) C.Jeffrey & P.Halliday

Wildekomkommertjie (A)

Similar too subsp. *myriocarpus* except fruit and **Flowering time** Nov.–Mar. Grassland, karoo, disturbed places, weedy; Sub-Escarpment Grassland, Upper Karoo Albany Thicket, Sub-Escarpment Savanna (Lady Grey to Mount Ayliff, southwards from Graaff-Reinet to King William's Town).

3b Fruit not variegated, up to 50 mm long, with usually dense subulate spines up to 13 mm long

zeyheri Sond.

Monoecious, perennial herb, roughly hairy to scabrid, rootstock woody. **Stems** prostrate, up to 2 m long. **Leaves** up to 65 × 55 mm, outline ovate, base cordate, apex acute, 5-palmately lobed; margins serrate, central lobe largest, pinnatifid; petioles 15–40 mm long. **Tendrils** simple. **Male flowers** mostly solitary; pedicel up to 28 mm long; receptacle campanulate, 3–5 mm long; lobes oblong, up to 4 mm long; corolla funnel-shaped, ± hairy inside and outside; tube up to 1 mm long; lobes elliptic or obovate, up to 7 mm long. **Female flowers** solitary; pedicel up to 15 mm long; receptacle ellipsoid, up to 13 mm long, aculeate outside, ± hairy inside; lobes ± linear, up to 3.5 mm long; corolla ± hairy inside and outside; tube up to 2 mm long; lobes up to 5 mm long. **Flowering time** Nov.–Apr. **Fruit** ellipsoid, 40–50 mm long, light and dark green lengthwise stripes, ripening mono-coloured yellow; toxic; pedicel up to 40 mm long. **Seeds** elliptic, up to 6.5 mm long. Stony soil, grassland, karoo; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Upper Karoo, Albany Thicket (Mount Ayliff S to Middelburg and Alexandria).

GERRARDANTHUS Harv. ex Hook.f.

Species 5, Africa; 2 in sthn Afr., S, KZN, EC.

macrorhizus Harv. ex Hook.f.

Dioecious, perennial climber, flattened tuberous rootstock, up to 1 m in diam. **Stems** up to ± 10 m long, becoming woody. **Leaves** subsucculent, glabrous, outline ovate, cordate, 2–8 × 2–8 mm, unlobed or palmately 3–7-lobed; lobes triangular, central largest; petioles 10–40 mm long. **Tendrils** apically 2-fid. **Male flowers** 2–7 in ± sessile, axillary fascicles; pedicels 5–30 mm long; receptacle tube 0.5–1.0 mm long; lobes ovate, 2–3 mm long; petals 4–7 mm long, brownish, unequal. **Female flowers** 1 or 2, axillary; pedicels 10–20 mm long. **Flowering time** mainly Dec. **Fruit** an obconic-cylindric, trigonous capsule, 43–65 × 14–22 mm, dry, brownish, smooth, glabrous, dehiscent by an apical triradiate slit. **Seeds** compressed, linear-oblong, verrucose, broad, apical membranous wing, 30–55 mm long. Valleys, ravines, riverbanks, forests, bush, sandy soil among rocks; Indigenous Forests, Sub-Escarpment Savanna (Port St Johns to East London).

KEDROSTIS Medik.

Species ± 25, Old World tropics, mostly Africa; 9 in sthn Afr., widespread.

1a Tendrils simple
2a Flowers appearing before the leaves

capensis (Sond.) A.Meeuse

Monoecious, perennial herb, foetid, tuberous rootstock up to 100 mm thick, vegetative parts with short, white, curved hairs. **Stems** annual, slender, firstly short, suberect, later mostly prostrate, up to 0.5 m long. **Leaves** secund, firm, grey-green, outline ovate to oblong, first-formed undivided to palmately lacerated, base truncate-hastate to cordate, up to 40 × 30 mm, later deeply palmatifid, up to 70 × 50 mm; lobes 5–7, linear to oblong, entire or toothed, central ones longest; petioles 4–15 mm long. **Tendrils** reduced or absent. **Male flowers** racemose or fascicled, up to 20; peduncle up to 60 mm long; pedicels up to 30 mm long; receptacle 3–6 mm long, shortly hairy; lobes ± triangular, 1–3 mm long, hairy; petals ± yellow, ± ovate, 3–8 mm long, densely papillose. **Female flowers** solitary; pedicels up to 10 mm long. **Flowering time** Aug.–Feb. **Fruit** subglobose to oblong, ± rostrate, later glabrous, up to 30 mm × 15 mm. **Seeds** up to 10, ± globose, 5–6 mm in diam. Under shrubs on flats or slopes; Upper Karoo, Albany Thicket, Sub-Escarpment Grassland, Drakensberg Grassland, Dry Highveld Grassland (Middelburg, Queenstown to Steytlerville, Fort Beaufort).

2b Flowers appearing when leaves are present
3a Plant dioecious
4a Leaves broadly ovate to reniform-cordate, entire or angular to shallowly lobed; lobes broad, obtuse

nana (Lam.) Cogn. var. nana

Ystervarkpatats (A)

Dioecious, perennial herb, foetid, ± glabrous to hairy, tuberous roots thick. **Stems** slender, much branched, up to 1.5 m long, mostly climbing. **Leaves** ± fleshy, outline ± cordate, angular or lobed, deep green above, paler below, drying grey-green, up to 70 × 70 mm, basal sinus ± rounded, apex and lobes ± obtuse, margins ± subentire; petioles 10–40 mm long. **Male flowers** racemose, up to 20-flowered; peduncle 20–100 mm long; pedicels 3–16 mm long, filiform; receptacle ± subcylindric, 2–4 mm

long; lobes ± triangular, 1–2 mm long; petals light yellow, oblong to triangular, densely hairy outside, 4–9 mm long. **Female flowers** solitary; filiform peduncle up to 8 mm long in fruit. **Flowering time** mostly Feb. **Fruit** ovoid to rostrate, 15–20 mm long, orange to red, smooth, glabrous, few-seeded. **Seeds** ± globose, smooth, 6–7 mm long. Riverbanks, dune bushes, among shrubs, waste areas; Albany Thicket, Sub-Escarpment Savanna, Indigenous Forests, Eastern Fynbos-Renosterveld (Fort Beaufort and Willowvale to Humansdorp).

4b Leaves deeply palmatilobed to palmatisect; lobes usually acute, often dentate, lobulate or dissected, or lobes narrow, ligulate, rounded
5a Leaves usually smooth above; lobes usually ± rhomboid or cuneate, often coarsely and acutely dentate

nana (Lam.) Cogn. var. **zeyheri** (Schrad.) A.Meeuse

Similar to var. *nana* except leaves and **Flowering time** Nov.–Apr. Riverbanks, stony soil in scrub, shrub, forest, waste areas; Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (Queenstown to Kentani S, to Steytlerville and Port Elizabeth).

5b Leaves usually scabrid on upper or on both surfaces with white pustules; lobes variable, usually ± ligulate

nana (Lam.) Cogn. var. **schlechteri** (Cogn.) A.Meeuse

Similar to var. *nana* except leaves and **Flowering time** mainly Mar. Mixed scrub, sandy loam, slopes; Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld, Albany Thicket (King William's Town to Willowmore and Port Elizabeth).

3b Plant monoecious
6a Male and female flowers borne in the same axils, minute

africana (L.) Cogn.

Basterdawidjieswortel (A); *uthuvana* (X)

Perennial herb, foetid, rootstock tuberous. **Stems** annual, slender, mostly climbing, ± glabrous, much branched, up to 6 m long. **Leaves** glabrous and smooth to scabrid-puncticulate, outline orbicular to triangular, deeply pinnately dissected to palmately lobed, 20–100 mm in diam.; lobes filiform to cuneiform, up to 12 mm wide, entire, margins flat or ± recurved; petioles slender, 1–12 mm long. **Tendrils** simple. **Flowers** ± white to yellow-green. **Male flowers** in few–12-flowered racemes; peduncle 20–80 mm long; pedicels capillary, 2–5 mm long; receptacle 0.5–1.5 mm long; lobes ± linear, 1–2 mm long; petals finely papillose, 1–2 mm long. **Female flowers** solitary; peduncles up to 6 mm. **Flowering time** Oct.–Dec. **Fruit** subglobose, pointed, 8–15 mm in diam., red when ripe, glabrous, few-seeded. **Seeds** ± ovoid, granulated, 4.5–6.0 mm long. Scrub, shrubs, moist stony slopes, wooded grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld (± common, Queenstown E to Mthatha S, to Graaff-Reinet, Uitenhage and East London).

6b Male and female flowers borne in different axils

capensis (Sond.) A.Meeuse (see 2a above)

1b Tendrils bifid

hirtella (Naudin) Cogn.

Monoecious, perennial herb, rootstock tuberous up to 200 mm long. **Stems** prostrate or climbing, up to 2 m long, ± hairy. **Leaves** densely and finely hairy, more on veins below,

later ± scabrid, outline ovate to pentagonal, cordate, up to 75–110 mm long, ± sinuate-denticulate, unlobed to deeply palmately 3–7-lobed; lobes ± triangular to ± lanceolate, central largest; petioles 18–60 mm long, hairy. **Male flowers** ± 5–11 in pedunculate, axillary racemes; peduncles 8–55 mm long; pedicels 1–8 mm long; receptacle tube 2–3 mm long; lobes ± lanceolate, 4–9 mm long; petals 3.5–5.0 mm long, ± yellow. **Female flowers** solitary, axillary; pedicel 1–4 mm long; receptacle tube 1.5–2.5 mm long; lobes ± lanceolate, 4.0–4.5 mm long; petals 6–8 mm long. **Flowering time** Oct.–Feb. **Fruit** cylindric-fusiform, base rounded, rostrate, up to 65 × 23 mm, green spotted, pale green or white, ripening red, splitting lengthwise; pedicel 2–12 mm long, stout. **Seeds** subglobose, ± 5 mm long, smooth, bordered. Under shrubs and trees; Sub-Escarpment Savanna, Albany Thicket (Komga, Kentani).

LAGENARIA Ser.

Species ± 6, mostly tropical Africa; 2 in sthn Afr., widespread, except N, FS, L, NC.

sphaerica (Sond.) Naudin

Wildekalbas (A)

Dioecious, perennial herb. **Stems** annual, prostrate or climbing, up to 10 m long. **Leaves** outline broadly ovate, cordate, up to 190 × 215 mm, dark green and ± scabrid above, paler and finely, shortly hairy below; palmately 5-lobed; lobes shallow to deep, ovate to elliptic, coarsely sinuate-dentate, often lobulate, central lobe largest; glands prominent, patent; petioles 10–120 mm long. **Flowers** white with green veins, fragrant. **Male flowers** racemose; peduncle 10–200 mm long; pedicels 3–50 mm long; receptacle tube 9–17 mm long, obconic below, expanded above; lobes 3–6 mm long, ± lanceolate, glandular; petals 25–55 mm long, obovate. **Female flowers**: peduncles 15–85 mm long. **Flowering time** Dec.–Aug. **Fruit** subglobose, 70–110 × 60–100 mm, smooth, deep green with paler spots and patches; stalk 25–100 mm long, stout. **Seeds** oblong, 8.5–11.5 mm long, base subtruncate, emarginate, apex ± narrowed, faces with 2, flat, submarginal ridges. Forests, forest margins, dunes, streamsides; Indigenous Forests, Albany Thicket (Port St Johns along coast to Humansdorp).

MOMORDICA L.

Species ± 40, Old World, mostly tropical Africa; 9 in sthn Afr., widespread, except L, WC.

Leaves undivided to faintly lobed or angular, ovate-cordate or narrowly cordate to cordate-triangular, margins minutely to rather coarsely denticulate or crenate-dentate

foetida Schumach.

Gifappel (A)

Dioecious, perennial herb, foetid, rootstock tuberous. **Stems** ± glabrous to pubescent, green-flecked, prostrate or climbing, up to 5 m long. **Leaves** green-flecked, up to 190 × 180 mm, decurrent on petiole; petioles up to 170 mm long. **Tendrils** simple or bifid. **Male flowers** subumbellate, 1–8; peduncle 20–230 mm long; bract 3–30 mm long, ± oblanceolate, subtending flower; pedicels 2–70 mm long; receptacle tube 3–8 mm long; lobes 5–10 mm long, ± ovate, dark green to black; petals obovate, 17–35 mm long, yellow to orange, deeper orange to black at base. **Female flowers** solitary; peduncle 65 mm long; bract 3–20 mm long; pedicel up to 185 mm long; receptacle tube 2.0–2.5 mm long; lobes 2–11 mm long, ± triangular; petals 15–37 mm long. **Flowering**

time Dec.–Mar. **Fruit** ellipsoid, up to 75 × 50 mm, softly spiny, orange, dehiscent into 3 valves; stalk 50–200 mm long. **Seeds** ± oblong, flattened, 7–12 mm long, ± warted, margins grooved, in red pulp. Forest, woodland, grassland, riverbanks; Indigenous Forests, Sub-Escarpment Savanna, Albany Thicket (Butterworth, Komga, Kentani).

Leaves ± lobed to palmatifid

balsamina L.

Laloentjie (A)

Monoecious, perennial herb. **Stems** slender, prostrate or climbing, up to 5 m long. **Leaves** foetid, up to 90 × 120 mm, outline broadly ovate to suborbicular, deeply cordate, deeply palmately 5–7-lobed; lobes sinuate-dentate or 3–5-lobulate; petioles up to 60 mm long. **Tendrils** simple. **Flowers** solitary. **Male flowers**: peduncle up to 105 mm long; bract ± suborbicular, up to 18 mm long, sessile, pallid with dark green veins and tip; pedicel 2–5 mm long; receptacle tube 2.0–4.5 mm long; lobes 4–9 mm long, ± ovate, blackish or green; petals obovate-oblong, 10–20 mm long, pale yellow to white, green-veined, dark at base. **Female flowers**: peduncle 2–5 mm long; bract 1.5–5.0 mm long, green; pedicel up to 27 mm long; receptacle tube 0.5–1.0 mm long; lobes narrow, 1–5 mm long; petals up to 13 mm long. **Flowering time** Dec.–July. **Fruit** ovoid, rostrate, up to 62 × 28 mm, tuberculate, orange or red, dehiscent into 3 valves; stalk up to 20 mm long. **Seeds** ovate, flattened, 8.5–11.0 mm long, edges elevated, sculptured, margins grooved, in red pulp. Dune bush, sandy soil; Indigenous Forests, Indian Ocean Coastal Belt, Sub-Escarpment Savanna (Lusikisiki to Kentani).

PEPONIUM Engl.

Species ± 20, Africa, Madagascar, Aldabra and Seychelles; 4 in sthn Afr., LIM, NW, G, FS, KZN, NC, EC.

Male flowers usually solitary on 40–180 mm long pedicels; lobes of leaves not constricted basally; pubescence of stems, petioles, pedicels and lobes usually of long, ± crinkly and articulate hairs

mackenii (Naudin) Engl.

Monoecious, perennial herb. **Stems** climbing, up to > 10 m long, stout, hairs fawn. **Leaves** up to 130 × 160 mm, outline ± pentagonal, palmatilobed to ± middle, upper 3 lobes large, triangular, ± acute, central largest, 2 lowest lobes smaller, oblique, sometimes bilobed, basal sinus broad, shallow, upper surface glabrescent to hairy to scabrid, lower surface densely hairy, margins finely crenate-dentate; petioles stout, 30–80 mm long. **Tendrils** bifid. **Flowers** white to yellow. **Male flowers**: bracteoles obovate, ± 10 mm long; receptacle ± campanulate, ± glabrous, 16–18 mm long; lobes 5–6 mm long; petals papillose, 30–35 mm long. **Female flowers**: pedicels 10–20 mm long. **Flowering time** Dec.–Mar. **Fruit** fleshy, ovoid-oblong, base ± narrowed, rounded, apex ± conical, green mottled white, ripening glabrous, smooth, red, up to 90 × 40 mm. **Seeds** many, obovate, 9–10 mm long, margined, brown to dull black. Forests, forest edges; Indian Ocean Coastal Belt, Indigenous Forests, Sub-Escarpment Savanna (rare, Port St Johns).

Male flowers usually racemose on short individual pedicels; lobes of leaves usually constricted basally; pubescence on stems usually of short hairs, sometimes on young parts forming a short tomentum

caledonicum (Sond.) Engl.

Monoecious, perennial herb. **Stems** climbing, prostrate, up to 10 m long, stout, glabrescent, furrowed. **Leaves** firm, up to 120 × 120 mm, outline cordate-orbicular, basal

sinus shallow, rounded, 5-partite to ± middle, ± glabrous above, finely hairy to glabrescent below; lobes close to ± overlapping, oblong to suborbicular, ± obtuse, also with extra lobule, margins coarsely crenate-dentate; petioles 20–30 mm long, glabrescent. **Tendrils** bifid. **Male flowers**: raceme up to 250 mm long, up to 12-flowered; peduncle up to 120 mm long, densely hairy; pedicels erect, hairy, up to 20 mm long; bracteoles 3–7 mm long, often stalked; receptacle obconical, hairy, 16–18 mm long; lobes subulate, 7–8 mm long; petals 24–30 mm long, hairy. **Female flowers** subsessile. **Flowering time** Nov.–Jan. **Fruit** fleshy, oblong-fusiform to subcylindric, up to 100 × 35 mm, green, ripening red, glabrous, smooth; pedicels stout, up to 10 mm long. **Seeds** many, obovate, margined, 7–8 mm long, black. Rocky outcrops, mountainsides; Upper Karoo, Sub-Escarpment Grassland (Middelburg to Queenstown S, from Graaff-Reinet to Cradock).

TROCHOMERIA Hook.f.

Species ± 8, Africa; 4 in sthn Afr., widespread, except FS, L, WC.

Male flowers with a short funnel-shaped to widely campanulate receptacle not much longer than wide, 3–4 mm long; petals 4–5 mm long; leaves sagittate, entire

sagittata (Harv. ex Sond.) Cogn.

Dioecious, perennial herb, tuber subglobose, up to ± 70 mm in diam. **Stems** several, prostrate or climbing, unbranched, glabrous, up to 0.5 m long. **Leaves** firm, herbaceous, 40–70 × 10–40 mm, triangular with a subsagittate base to narrowly sagittate with long basal lobes, margins entire, finely scabrid-setulose, lobes acute, glabrous to scabrid to hairy; petioles 10–20 mm long. **Tendrils** filiform. **Male flowers** fasciculate, 1–3; peduncles nodding, 10–40 mm long; receptacle ± funnel-shaped, 3–5 mm long; lobes ovate-triangular, up to 0.5 mm long; petals white to greenish white, ± fleshy, triangular-ovate, 4–6 mm long, densely and finely papillose. **Female flowers** solitary. **Flowering time** Oct., Nov. **Fruit** ovoid, 16–21 × 11–14 mm, glabrous; peduncle up to 40 mm long. **Seeds** 3 or 4, subglobose-ellipsoid, smooth, 5–6 mm long. Grassland; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Mount Currie to Mqanduli and Mthatha).

Male flowers with a subcylindric elongate receptacle, distinctly longer to several times longer than wide; receptacle and petals usually much > 4 mm long; leaves palmately lobed to ± middle, lobes usually > 10 mm wide

hookeri Harv.

Dioecious, perennial herb, rootstock tuberous. **Stems** annual, slender, hairy, climbing or prostrate, up to 2 m long. **Leaves** up to 90 × 105 mm, outline broadly ovate to ovate-triangular, cordate, ± scabrid, unlobed to deeply palmately 3–5-lobed; lobes obovate to lanceolate, coarsely sinuate-dentate or lobulate, central lobe largest; petioles 6–40 mm long, densely hairy. **Tendrils** simple. **Stipuloid bracts** broadly reniform to circular, 5–25 mm long, ciliate-laciniate. **Male flowers** in ± sessile, 2–5-flowered clusters; pedicels 7–45 mm long, pubescent; receptacle tube 10–21 mm long, ± pilose; lobes 1.5–2.5 mm long, recurved; petals 10–25 mm long, ± greenish yellow, recurved. **Female flowers**: pedicels 10 mm long. **Flowering time** Nov., Dec. **Fruit** ovoid-ellipsoid, red, up to 40 × 30 mm, stalk ± 17 mm long. **Seeds** ± subglobose, smooth, white, 10–12 mm in diam. Grass, shrubs, forests; Sub-Escarpment Grassland, Sub-Escarpment Savanna (Mqanduli, Mthatha to King William's Town).

ZEHNERIA Endl.

Species ± 30, Africa to East Indies and Australia; 3 in sthn Afr., widespread, rare in NC.

scabra (L.f.) Sond. subsp. scabra

Dawidjieswortel (A); *itanga* (X)

Dioecious, perennial herb. **Stems** prostrate or climbing, ± glabrous to densely hairy, up to 3 m long. **Leaves** outline ovate, base cordate, up to 110 × 110 mm, deep green, scabrid-punctate above, paler below, veins hairy; margins sinuate-denticulate, unlobed or palmately 3–5-lobed, central largest; petioles 7–70 mm long, glabrous to densely hairy. **Flowers** in sessile or pedunculate axillary clusters; white, turning ± yellow. **Male flowers** 3–60, dense, with a solitary, long-pedicellate flower; peduncles 9–70 mm long; pedicels 1.5–10.0 mm long; receptacle tube 2.0–5.5 mm long, pale green; lobes up to 1.5 mm long, dentiform; petals 1.5–3.5 mm long. **Female flowers** 1–10; peduncles up to 27 mm long; pedicels 4–20 mm long. **Flowering time** Sept.–June. **Fruit** bright red, glabrous, globose or ellipsoid, 8–13 mm in diam.; pedicels 2–68 mm long. **Seeds** ovate, 2.0–5.5 mm long, smooth, ± flat. Forests, forest edges, along streams, dune bush; Dry Highveld Grassland, Sub-Escarpment Savanna, Albany Thicket, Eastern Fynbos-Renosterveld, Indigenous Forests (Aliwal North E to Bizana S, to Humansdorp).

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CUNONIACEAE

(Order Oxalidales)

Compiled by C.L. Bredenkamp

Stipules united into a large spoon-like structure; inflorescences dense, spike-like racemes; petals longer than sepals; ovules many per locule ..... **Cunonia**
Stipules small, free; inflorescences long-pedunculate, axillary panicles; petals shorter than sepals; ovules 2 per locule ..... **Platylophus**

CUNONIA L.

Species ± 17, discontinuous distribution with 16 in New Caledonia and 1 in sthn Afr., KZN, WC, EC.

capensis L.

Red-alder; *rooi-els* (A); *umqwashube* (X); *umaphethu* (Z)

Tree or shrub, 2.5–30.0 m high. **Leaves** petiolate, imparipinnate; leaflets 2- or 3-jugate, lanceolate, obtuse or shortly acuminate, with serrate margins; stipules large, oblong, united into a spoon-shaped structure around leaf buds. **Inflorescence** a dense, spike-like raceme. **Calyx** 5-lobed, with short, open tube. **Petals** 5, oblong, imbricate. **Stamens** 10, inserted with petals; filaments filiform, much longer than petals. **Ovary** with many ovules, axile, pendulous in 2 rows; styles 2, terete. **Flowering time** all year. **Fruit** a 2-horned, 2-locular, coriaceous capsule, opening by 2 valves. **Seeds** ± ovoid, with nar-

row, membranous wing. Inland and coastal forests and ravines; Indigenous Forests, Eastern Fynbos-Renosterveld, Sub-Escarpment Savanna (King William's Town SW through Baviaanskloof to Diepwalle Forest at Knysna, E to Humansdorp and Grahamstown).

PLATYLOPHUS D.Don

Monotypic, forests of South WC to Uitenhage in EC.

trifoliatus (L.f.) D.Don

White alder; *witels* (A)

Small to large tree, 3–30 m high. **Leaves** petiolate, trifoliolate; leaflets lanceolate, coriaceous, with toothed margins; stipules small, deciduous. **Inflorescences** long-pedunculate, many-flowered, axillary panicles. **Calyx** 4- or 5-lobed. **Petals** 4 or 5, 3-fid or -toothed, shorter than sepals. **Stamens** 8 or 10, inserted on rim of disc. **Ovary** with 2 collateral ovules below apex of each locule; styles 2, subulate. **Flowering time** Dec.–Feb. **Fruit** a turgid capsule, compressed above, with persistent styles. **Seeds** curved. Coastal forests, streambanks; Indigenous Forests (Kareedouw Pass E to Storms River Forest Reserve and Humansdorp).

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CURTISIACEAE

(Order Cornales)

Compiled by C.L. Bredenkamp

The genus *Curtisia* Aiton was traditionally placed in the family Cornaceae. Detailed studies of the fruit and seed structure of *Curtisia* provided new evidence in support of a close relationship between the families Curtisiaceae and Cornaceae (Yembaturova 2009).

[E]CURTISIA Aiton

Monotypic, confined to southern parts of Africa, LIM, M, S, KZN, WC, EC.

dentata (Burm.f.) C.A.Sm.

Assegai; *assegaai* (A); *modulatšhwene* (NS); *umgxina* (X); *umagunda* (Z)

Small tree or shrub, 2–20 m high, young growth densely greyish or brownish tomentose. **Leaves** opposite, leathery, simple, coarsely toothed, prominently veined on lower surface, shiny dark green above; stipules absent. **Flowers** bisexual, regular, arranged in panicles. **Calyx**: lobes 4, triangular-ovate, persistent; tube ± qaudrate, twice as long as lobes. **Petals** 4, free, valvate. **Stamens** 4, alternating with petals and ± as long; anthers 2-thecous, dehiscing laterally. **Disc** tumid (swollen), qaudrate, pubescent. **Ovary** inferior, 4-locular; 1 pendulous ovule in each locule; style 1, shorter than stamens; stigma 4-lobed. **Flowering time** Dec.–May. **Fruit** a small, ± globose drupe, crowned by calyx lobes, reticulately veined. **Seeds** 1 per locule. Forests, mountain slopes, watercourses, alt. 0–2 300 m; Sub-Escarpment Grassland, Indigenous Forests, Albany Thicket, Sub-Escarpment Savanna, Eastern Fynbos-Renosterveld (Maclear E to Ngeli Mts, SW through Fort Beaufort and Baviaanskloof to Humansdorp, E to Grahamstown and Kentani).

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CYTINACEAE

(Order Malvales)

Compiled by S. Smithies

CYTINUS L.

Species ± 11, Mediterranean region, Africa, Madagascar; 3 in sthn Afr., LIM, M, S, NC, WC, EC.

sanguineus (Thunb.) Fourc.

Perennial herb, root holoparasite, dioecious; aerial parts orange or bright red (darker red). **Stems** up to 0.26 m high, fleshy. **Leaves** scale-like. **Flowers** 1–5; perianth funnel-shaped with ± 6 lacinulate lobes, glabrous or sparsely hairy outside, with glandular papillae inside; ± 6 nectar pockets at base. **Male flowers** with central staminal column; anthers with small horn-like processes above. **Female flowers** with inferior ovary, columnar style and globose stigma. **Flowering time** (July–)Aug.(–Nov.). On various hosts like *Passerina* L., sandy loam on Witteberg quartzite, under grass and *Passerina*; river valley with *Erica-Passerina* community; Upper Karoo, Eastern Fynbos-Renosterveld, Albany Thicket (Middelburg, Kentani, Port Elizabeth and Alexandria).

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End of Volume 1

DICHAPETALACEAE

(Order Malpighiales)

Compiled by C.L. Bredenkamp

TAPURA Aubl.

Species 21, tropical America and Africa; 1 in sthn Afr., KZN and northern parts of EC.

fischeri Engl.

Leafberry-tree; *blaarbessieboom* (A); *umpengende* (Z)

Tree or shrub, 1.5–20.0 m high. **Leaves** elliptic to ovate, 40–100 × 20–50 mm, with minute, caducous stipules. **Inflorescence** a subumbel. **Flowers** up to 3.5 mm long, irregular, in small, axillary, shortly pedunculate glomerules; peduncle adnate to petiole. **Calyx** with 5 unequal lobes. **Petals** 5, adnate at base to stamens to form an unequal, 5-lobed tube; 3 lobes entire, 2 bifid. **Stamens** 2 or 3 fertile, 2 sterile. **Ovary** sessile, 2- or 3-locular; style filiform, shortly 2- or 3-fid at apex. **Fruit** drupaceous, 1–3-seeded. **Seeds** with or without distinct endosperm. In forest; Indigenous Forests (Ntsubane Forest).

BRETELER, F.J. 1986. The African Dichapetalaceae IX. A taxonomic revision. *Agricultural University Wageningen papers* 86-3: 1–74.
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A Flora of the Eastern Cape Province is a comprehensive book, the first to describe the vascular plants occurring in the Eastern Cape Province. From an evolutionary perspective, this flora evolved during the formation of the Karoo Supergroup and reached a phase of maturity in the latter half of the Cretaceous. Geology and soils, together with climate, form the basis for the existence of plants and animals, a symbiosis that can rightfully be described as a symphony. The introduction to the *Flora* leads the reader through the 12 bioregions and the lustre thereof is reflected in the twelve accompanying photographic plates. A broad perspective of the bioregions in the Eastern Cape is provided by Prof. Richard Cowling in the chapter *Vegetation of the Eastern Cape: navigating a transition zone*. This *Flora* contains descriptions of all families (226), genera (1 440) and species (6 611) occurring in the Eastern Cape Province, compiled by 77 contributors, of whom many are specialists on specific taxa.



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