

Systematics of
Drimia Jacq.

(Hyacinthaceae:
Urgineoideae)

in southern Africa

John C. Manning
& Peter Goldblatt



*S*TRELITZIA 40

Systematics of
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TRELITZIA

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 Eastern Cape and KwaZulu-Natal that has become a garden favourite worldwide. It symbolises the commitment of SANBI to champion the exploration, conservation, sustainable use, appreciation and enjoyment of South Africa's exceptionally rich biodiversity for all people.

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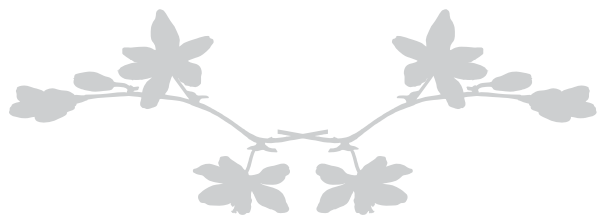
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NEW COMBINATIONS AND SPECIES IN *STRELITZIA* 40

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ABSTRACT

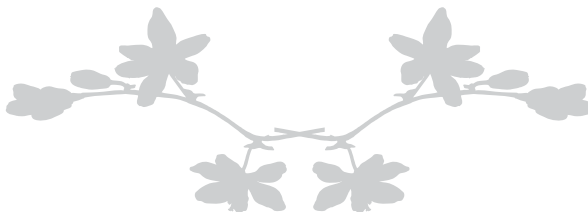
We provide a taxonomic revision of the genus *Drimia* in southern Africa, in which we recognise 70 species with 61 endemic to the region. The account includes the new combination *D. basutica* for the illegitimate *D. angustifolia* Baker (1897) plus additional combinations for names that were invalidly published. We also describe eight new species: *D. barbata*, *D. ciliolata*, *D. decipiens*, *D. jun-cifolia*, *D. khubusensis*; *D. monophylla* and *D. schizobasoides* from the Greater Cape Floristic Region, and *D. vespertina* from northern Namibia and southern Angola. Four taxa are synonymised: *Albuca reflexa* is included in *D. indica*, *D. loedolffiae* in *D. calcarata*, *D. saniensis* in *D. depressa*, and *D. macrocarpa* in *D. basutica*; and *D. ecklonii* is recognised as an earlier name for *D. ligulata*. We confirm that *Drimia nitida* is the earliest name for *Ledebouria concolor* (Baker) Jessop and provide the necessary new combination and synonymy in *Ledebouria*. We provide a detailed infrageneric classification for southern African *Drimia* in which we recognise 19 morphologically coherent sections diagnosed by a combination of traditional and novel characters. The account includes full species descriptions, notes on ecology, distribution maps and identification keys to the sections and species, and line drawings of almost half of the species.



A decorative illustration of a flowering branch with several five-petaled flowers and leaves, rendered in a light gray tone, positioned above the section header.

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INTRODUCTION

Hyacinthaceae (sensu APG 2003) are a monophyletic family of 900–1 000 species (Speta 1998; Manning et al. 2002; Buerki et al. 2012) that are segregated among the four subfamilies Oziroëoideae, Ornithogaloideae, Hyacinthoideae and Urgineoideae (Speta 1998; Pfosser & Speta 1999; Manning et al. 2004). The family is alternatively treated as Asparagaceae subfamily Scilloideae, including the tribes Oziroëae, Ornithogaleae, Hyacintheae and Urgineae (APG 2009). The phylogenetic history of the family and patterns of diversification were investigated by Buerki et al. (2012), who postulate a sub-Saharan African origin of the Old World clades at the Paleocene–Eocene boundary. This is corroborated by Ali et al. (2013), who postulate an origin of Urgineoideae in southern Africa at 48 mya.

Subfamily Urgineoideae is recognised by the characteristically spurred inflorescence bracts (usually only the lower bracts), and angled to winged seeds with a loose, brittle testa not tightly adhering to the endosperm. These two characters were first used to separate the clade as either the tribe Bowieae Hutch. (Jessop 1975) or the subtribe Caudibracteatinae [as 'Caudibracteateae'] Oberm. (Obermeyer 1980). Chemically, the subfamily is characterised by the presence of bufadienolide glycosides (Pohl et al. 2000), rendering many of the species extremely toxic. The basic chromosome number for Urgineoideae is $x = 10$, with a diploid number of $2n = 20$ and a bimodal karyotype, with low levels of polyploidy among the sub-Saharan members (Goldblatt et al. 2012).

There is still lack of consensus on the circumscription of several genera in the family, and the absence of good diagnostic characters has long been a problem in this regard (Stedje 2001). This is certainly true for the members of subfamily Urgineoideae, in which the number of accepted genera ranges from two (Manning et al. 2004 [excluding *Igidia* Speta]; Wetschnig et al. 2007) to twenty or more (Speta 1998, 2001; Martínez-Azorín et al. 2013b; Pinter et al. 2013). We follow the inclusive generic circumscriptions proposed by Manning et al. (2004), who recognise just two genera in the subfamily, viz. the monotypic *Bowiea* Harv. ex Hook., distinguished by its fleshy, highly ramified inflorescence of long-lived flowers with free tepals persisting below the capsules, and stamen filaments inserted well apart around the sessile, broad-based ovary; and *Drimia* Jacq., with a stiff or wiry inflorescence of mostly short-lived or fugacious flowers (long-lived in the Madagascan sect. *Rhodocodon* and in some eastern southern African species) with the tepals $\pm$ united below (rarely free) and abscising below the developing capsule, stamen filaments often inserted close together, and an ovoid or ellipsoid ovary $\pm$ narrowed below.

Drimia in this sense comprises $\pm$ 110 species of mainly deciduous geophytes distributed throughout Africa and extending into Eurasia and the Indian subcontinent, and includes *Aulostemon* Mart.-Azorín et al., *Litanthus* Harv., *Mucinea* M.Pinter et al., *Rhadamanthus* Salisb., *Rhodocodon* Baker, *Sagittanthera* Mart.-Azorín et al., *Schizobasis* Baker, *Thuranthos* C.H.Wright, *Tenicroa* Raf. and *Urginea* Steinh., plus additional segregates proposed by Speta (1998, 2001).

The genus *Drimia* was described for five species of southern African Hyacinthaceae with reflexed tepals or perianth lobes (Jacquin 1797). *Drimia undulata* Jacq. is the only species among the original

elements in the genus with free tepals and it is now included in the genus *Ledebouria* Roth (Hyacinthoideae). The remaining four taxa (two of which are now treated as synonyms of *D. elata* Jacq., the type of the genus), are characterised by a short perianth tube with reflexed lobes. The presence of a perianth tube led to an early association of *Drimia* with other gamophyllous genera of Hyacinthaceae such as *Hyacinthus* L. (Baker 1870). Kunth (1843), however, linked the generic name to *D. undulata* rather than to *D. elata*, thereby applying it to species now treated in *Ledebouria*, and he accordingly described the genus *Idothea* Kunth to accommodate the remaining species of *Drimia*, including the type species. *Idothea* is thus a nomenclatural synonym of *Drimia*. Allied species with $\pm$ free, spreading tepals were placed in the genus *Urginea* Steinh. (1834).

This initial distinction between species with $\pm$ free tepals and those with a perianth tube was followed by Baker (1870, 1873, 1897) in his influential treatments of the family, which then included five additional genera from southern Africa although only three of these were widely accepted, namely *Litanthus* Harv. (1844), with a solitary, cylindrical flower and sessile anthers, *Rhadamanthus* Salisb. (1866), with nodding, urn-shaped (urceolate) flowers, and *Schizobasis* Baker (1873), with a highly branched, wiry inflorescence. The two genera *Fusifilum* Raf. (1837) and *Tenicroa* Raf. (1837), in contrast, were considered by most authors to be congeneric with *Urginea*. Two additional genera were subsequently named, *Thuranthos* Wright (1916) for a nocturnal-flowering species with complex filaments, and *Urgineopsis* Compton (1930) for a small species from the Cape Peninsula, but the latter was not generally accepted as distinct from *Urginea* (e.g. Dyer 1976).

The significance and consistency of these generic distinctions was re-assessed by Jessop (1977) for his revision of the South African species of Urgineoideae. His conclusion was that the floral characters that formed the basis for the segregation of *Thuranthos*, *Urginea* and *Urgineopsis* from *Drimia* were insignificant as generic markers, and that all three genera should be included in a more widely circumscribed *Drimia*. This treatment was adopted by Stedje (1987) and Stedje & Thulin (1995) for the East African species. The molecular phylogenetic analyses of Pfosser & Speta (1999) confirmed that *Urginea* was polyphyletic in its traditional circumscription, endorsing the need for generic recircumscription in the group.

The trend towards a more inclusive circumscription of *Drimia* initiated by Jessop (1977) was, however, rejected by Speta (1998, 2001), who elected to resolve the paraphyly of *Drimia* excl. *Litanthus*, *Rhadamanthus* and *Schizobasis* that was evident in a preliminary molecular phylogenetic analysis of the family (Pfosser & Speta 1999) by circumscribing the genera of Urgineoideae ever more narrowly, rather than by the expedient of expanding the genus to include these small segregates. This approach has been continued by Martínez-Azorín et al. (2013b, 2017) and Pinter et al. (2013), leading to the further fragmentation of some of these segregates plus the description of additional genera as more taxa are included in their phylogenetic analyses. These authors currently recognise at least twenty genera in the alliance, with the inevitable need for more to come to fully resolve the paraphyly that is still evident in their analyses.

The reluctance of some authors to accept any appreciable level of floral diversity within genera of Hyacinthaceae finds expression in the emotive description of an enlarged circumscription of *Drimia* as a 'Monstergattung' (Speta 1998), but others are comfortable that such a circumscription of the genus does not justify regarding it as a 'rag bag' taxon with highly heterogeneous elements (Stedje 2001; Manning et al. 2004). A synthetic approach to the circumscription of *Drimia* is a far less radical departure from the traditional generic concepts in the subfamily than is the alternative multi-genus option. It is also nomenclaturally more stable, and, with the recognition of infrageneric taxa, is no less taxonomically informative.

The account of the southern African urGINEOIDS by Baker (1897) for the *Flora capensis* constitutes the first modern taxonomic treatment of the subfamily for the region. This was followed by taxonomic revisions of the segregate genera *Rhadamanthus* (9 spp.) by Nordenstam (1970), *Bowiea* (1 sp.), *Drimia* (including *Tenicroa*, *Thuranthos*, *Urginea* and *Urgineopsis*) (23 spp.), *Litanthus* (1 sp.) and *Schizobasis* (2 spp.) by Jessop (1977), and *Tenicroa* (4 spp.) by Obermeyer (1980, 1981). These accounts, which recognised a total of 37 species, have until now constituted the primary taxonomic revisions of the southern African species of URGINEOIDEAE, but are much outdated, not only as a result of the changes in generic circumscriptions, but also in light of significant changes in the taxonomy of the species. This includes the resurrection of several Western Cape species from synonymy by Goldblatt & Manning (2000), some nomenclatural adjustments (Martínez-Azorín & Crespo 2014; Martínez-Azorín et al. 2015), and the several new species described over the past few decades. These are mainly from the Greater Cape Floristic Region (Snijman 1985; Snijman & Manning 1999; Snijman & Harrower 2009; Manning & Goldblatt 2003, 2007; Manning & Oliver 2009; Williamson 2011; Martínez-Azorín et al. 2013a; Manning et al. 2013, 2014), but also include several new taxa from the eastern and southeastern seaboard and near-interior (Brink & Dold 2003; Edwards et al. 2005; Dold & Brink 2006; Van Jaarsveld & Van Wyk 2005, 2006; Martínez-Azorín et al. 2013b; Crouch & Martínez-Azorín 2015).

Fourteen of the southern African species are currently considered to be threatened by habitat transformation or overharvesting for medicinal or horticultural purposes (Raimondo et al. 2009), making it critical that the taxonomy of the group is adequately understood.

We provide here a preliminary account of *Drimia* in southern Africa in which we recognise 70 species, with 61 species (87%) endemic to the region. Only *D. altissima* (L.f.) Ker Gawl., *D. basutica* (E.P.Phillips) J.C.Manning & Goldblatt, *D. calcarata* (Baker) Stedje, *D. delagoensis* (Baker) Jessop, *D. elata* Jacq., *D. indica* (Roxb.) Kunth, *D. intricata* (Baker) J.C.Manning & Goldblatt, *D. uniflora* J.C.Manning & Goldblatt and *D. vespertina* J.C.Manning & Goldblatt extend beyond the subcontinent. We describe eight new species, seven from the Greater Cape Floristic region (*D. barbata* J.C.Manning & J.M.J.Deacon, *D. ciliolata* J.C.Manning & J.M.J.Deacon, *D. decipiens* J.C.Manning & Goldblatt, *D. juncifolia* J.C.Manning & J.M.J.Deacon, *D. khubusensis* P.C.van Wyk & J.C.Manning, *D. monophylla* Oberm. ex J.C.Manning & Goldblatt and *D. schizobasoides* J.C.Manning & J.M.J.Deacon) and one from northern Namibia and southern Angola (*D. vespertina* J.C.Manning & Goldblatt). We also synonymise four taxa, by including *Albuca reflexa* K.Krause & Dinter in *D. indica*, *D. loedolffiae* van Jaarsv. in *D. calcarata*, *D. macrocarpa* Stedje in *D. basutica*, and *D. saniensis* Hilliard & B.L.Burt in *D. depressa* (Baker) Jessop. Finally, we recognise *D. ecklonii* (Baker) J.C.Manning & Goldblatt as an earlier name for *D. ligulata* J.C.Manning & Goldblatt, and provide the new combination *D. basutica* for the illegitimate *D. angustifolia* Baker (1897). We follow the current broad circumscriptions for the widespread *D. altissima*, *D. calcarata*, *D. elata* and *D. physodes* (Jacq.) Jessop. This account is not complete as several more species remain to be described, some of them because the existing material is inadequate and others because the taxonomy is not fully resolved. There are certainly also additional species yet to be discovered.

Drimia s.l. is now one of the larger genera of Hyacinthaceae in southern Africa, distributed throughout the region, but mainly in the drier and seasonal parts of the subcontinent. The species are concentrated in the Greater Cape Floristic Region in the winter-rainfall southwest of the subcontinent, in the succulent karoo and fynbos biomes, where one third of the southern African species are endemic or near-endemic. The genus is also well represented in the thicket biome of Eastern Cape and the along the wetter eastern seaboard and adjacent escarpment in grassland and savanna vegetation.

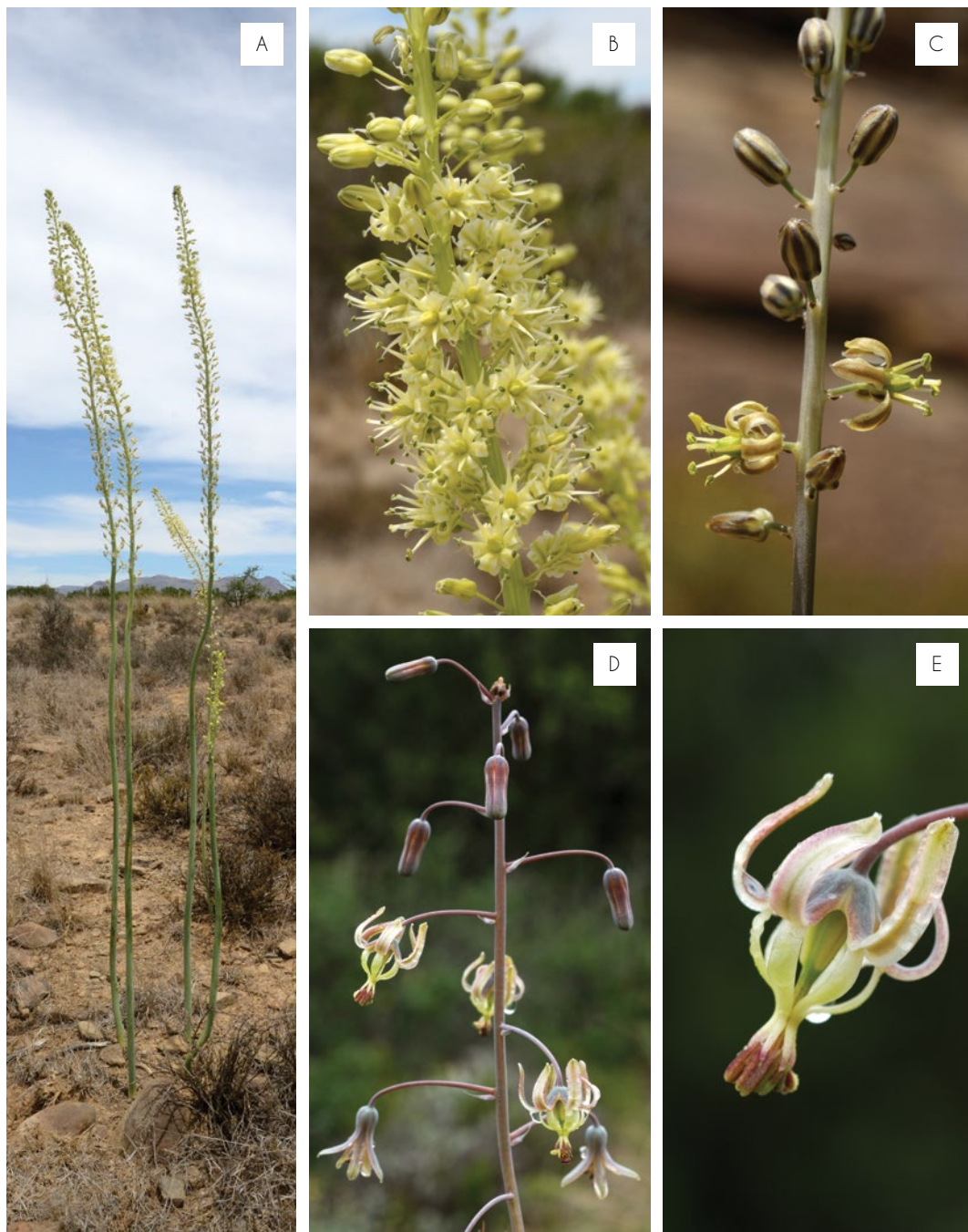


Plate 1: A & B, *Drimia altissima*, Kommandodrif, Eastern Cape; C, *D. anomala*, Nieu-Bethesda, Eastern Cape; D & E, *D. basutica*, Boschberg, Eastern Cape.

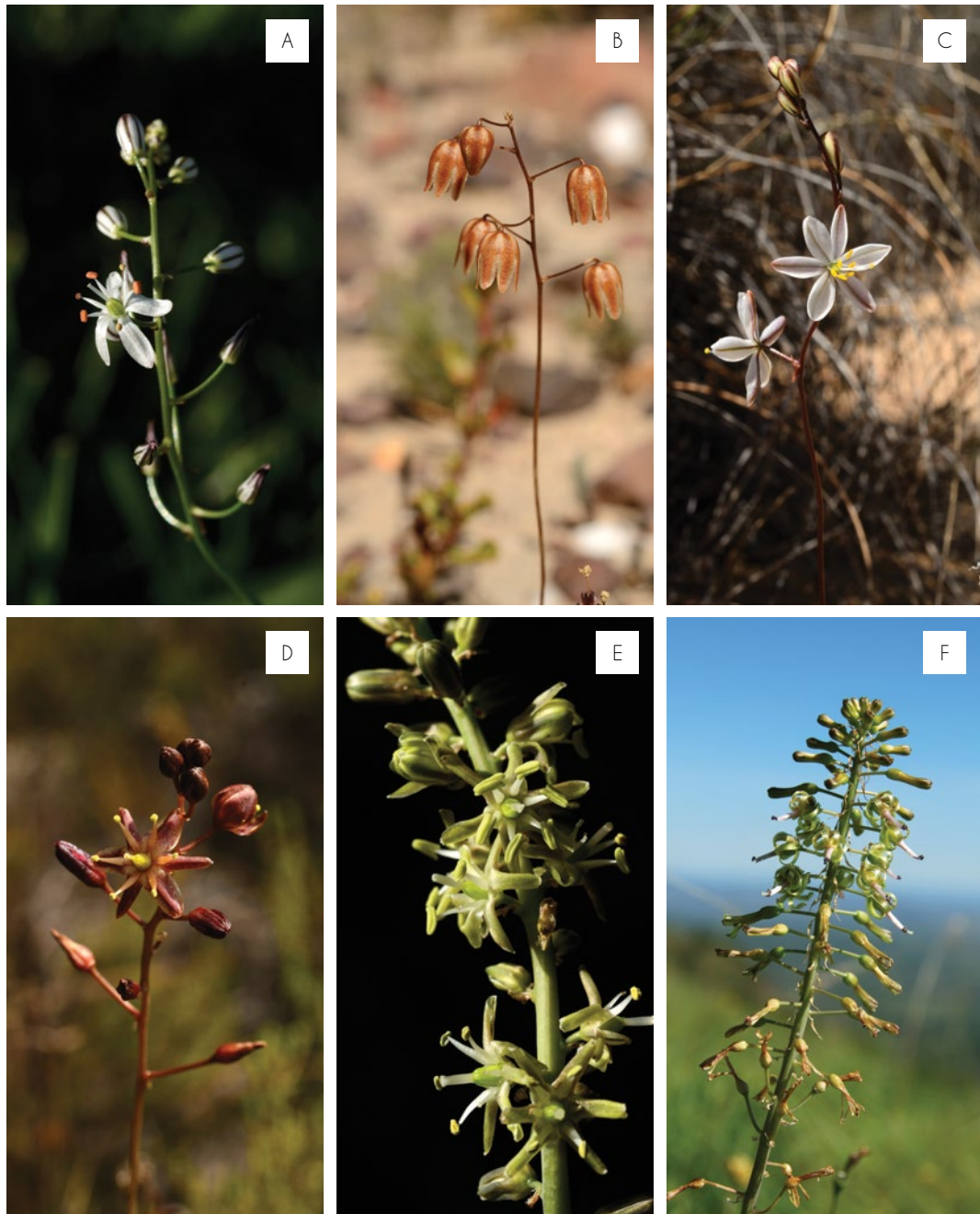


Plate 2: A, *Drimia calcarata*, Maclear, Eastern Cape; B, *D. convallarioides*, Piketberg, Western Cape; C, *D. decipiens*, Swartruggens, Western Cape; D, *D. dregei*, Elim, Western Cape; E, *D. echinostachya*, Kwelera, Eastern Cape; F, *D. elata*, Boschberg, Eastern Cape.

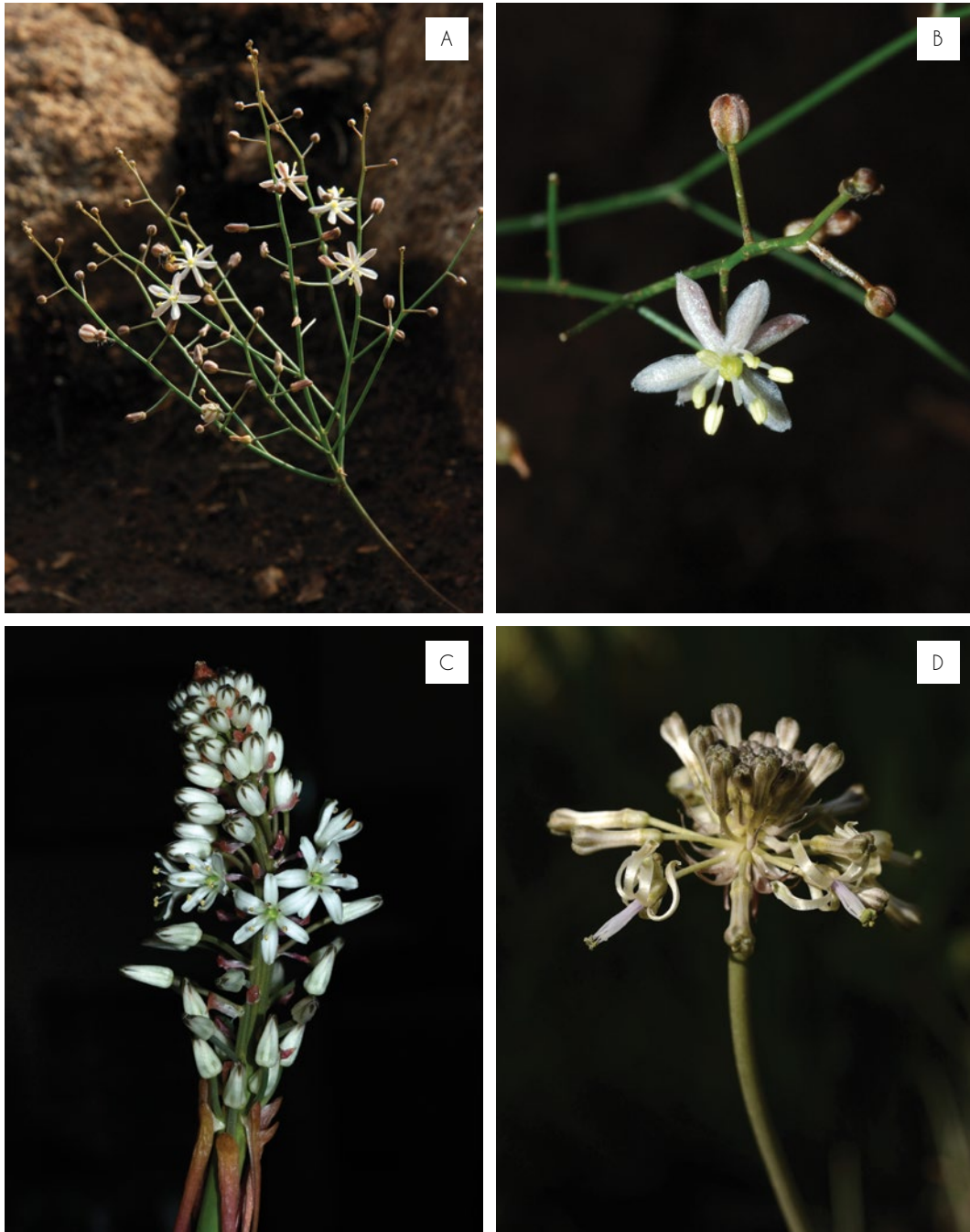


Plate 3: A & B, *Drimia intricata*, Andriesberg, Eastern Cape; C, *D. macrocentra*, Satansnek, Eastern Cape; D, *D. sphaerocephala*, Witsieshoek, Free State.

The hysteranthous nature of the leaves of many species of *Drimia* has had some unfortunate nomenclatural repercussions in that the citation by some authors of both flowering and leafing material, collected at different dates, as the holotype, is contrary to the requirements of the *International Code of Nomenclature for algae, fungi and plants* (ICN: McNeil et al. 2012: Art. 40.2) for valid publication. The names thus affected were subsequently validated by Martínez-Azorín & Crespo (2014), although we agree with the accompanying editorial comment in the publication which maintains that names for which a single dated collection was cited as the holotype in the protologue were in fact validly published even if the applicable herbarium sheet includes specimens collected at different times. The relevant names in this context are *D. montana* A.P.Dold & E.Brink, *Rhadamanthus involutus* J.C.Manning & Snijman and *Urginea saniensis* Hilliard & B.L.Burt, all of which we treat as validly published in the original publications.

We also propose an infrageneric classification for southern African *Drimia* that recognises 19 morphologically coherent sections, facilitating the curation of the species as well as providing a hypothesis for testing evolutionary relationships. The sections are diagnosed by a combination of traditional characters such as the development of cataphylls, the form of the inflorescence, the shape of the flowers and the degree of fusion of the tepals, and the attachment and mode of dehiscence of the anthers, combined with additional characters that are either novel or previously underappreciated, such as floral longevity, presence or absence of bracteoles, relative length of the filaments and style, shape of the stigma, and the size and shape (i.e. development of a peripheral wing) of the seeds. Seeds in *Drimia* are angled or $\pm$ compressed, sometimes with a well-developed peripheral wing. The testa is loose, not closely attached to the endosperm, and $\pm$ rugulose with the cell outlines $\pm$ distinct. The radial walls of the testal cells are either straight or sinuous/undulate, and the surface of the outer tangential walls $\pm$ smooth or minutely pitted or ridged (Jessop 1975).

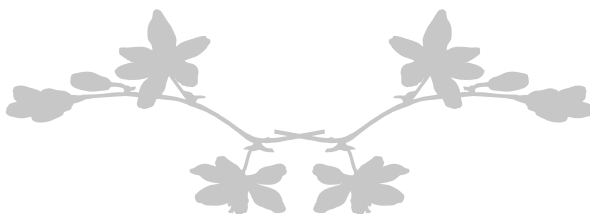
There is substantial variation in floral longevity among the species of *Drimia*. Many of the summer-rainfall taxa have relatively long-lived flowers lasting one or two days (e.g. sects *Drimia*, *Ledebouriosis*, *Macrocentrae* and *Urginavia*), whereas most of the winter-rainfall species have fugacious flowers lasting less than a day, sometimes just a few hours (e.g. sects *Capitatae*, *Drimiopsis*, *Litanthus*, *Physodia*, *Rhadamanthopsis* and *Rhadamanthus*). The tepals in members of sects *Macrocentrae* and *Urginavia*, in particular, remain separate above the ovary and persist for some time beneath the developing capsule before falling, whereas the perianth in most other sections is caducous, with the segments cohering tightly above the ovary immediately after anthesis and abscising at the base to form a dry-papery cap above the developing capsule. Flowers in sect. *Macrocentrae* and sect. *Urginavia* are also relatively longer lived than usual, lasting a day or more, although sect. *Drimia* and sect. *Sagittanthera* are also characterised by flowers that last for two days.

The presence of small bracteoles, one each on alternating sides at the base of the pedicels, is evidently plesiomorphic for the family as they are recorded in *Oziroë* Raf. (*Oziroëoideae*), which is sister to the rest of the family, as well as in tribes Hyacintheae Dumort. and Pseudoprosperae J.C.Manning & Goldblatt of subfamily Hyacinthoideae, and in *Pseudogaltonia* (Kuntze) Engl. in subfamily Ornithogaloideae. Bracteoles are, however, lacking in *Bowiea* and are also sometimes present in individual species of *Drimia* in which they are typically lacking, suggesting that their suppression is relatively easily reversible. Bracteoles, when present, are small and scale-like.

The preliminary analysis of bulb structure by Speta (1998) suggests that the bulbs of *Urgineoideae* are, with few exceptions, imbricated and comprised of separate scales, although these may be more-or-less distinctly visible from the exterior. A notable exception is *Drimia nana*, which produces a solitary

tubular cataphyll for each annual growth increment that contributes a vaginate tunic to the bulb whereas the accompanying foliage leaves contribute distinct scales.

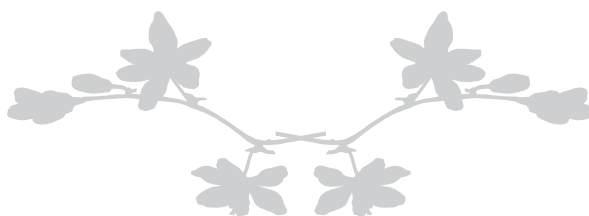
We provide complete descriptions and synonymy for all species, as well as notes on distribution and ecology, distribution maps, identification keys to the sections and species, and illustrations of half of the species.



A decorative illustration of a flowering branch with several five-petaled flowers and small leaves, rendered in a light gray tone, positioned behind the section header.

MATERIALS AND METHODS

All relevant types were examined, as well as all herbarium material from BOL, NBG, PRE and SAM (acronyms after Thiers (2015)), the primary collections of southern African species, as well as selected specimens from GRA, NH and NU. We examined online images of selected specimens on JSTOR (<https://plants.jstor.org>). Many of the species were also studied in the field and in cultivation at Kirstenbosch National Botanical Garden. Illustrations were prepared from wild-collected and cultivated plants.



SYSTEMATICS

Drimia Jacq., Collectanea Suppl.: 38 (1797). *Drimya* Lemaire in C. Orbigny, Dict. Universel Hist. Nat. 5: 131 (1844), orth. var. Type species: *Drimia elata* Jacq.

Urginea Steinh. in Ann. Sc. Nat., sér. 2, 1: 321 (1834). *Urginia* Kunth, Enum. Pl. 4: 3321 (1843), orth. var. Type: *Urginea fugax* (Moris) Stein., lecto., designated by Adamson in J. S. Afr. Bot. 8: 237 (1942) = *Drimia fugax* (Moris) Stearn

Squilla Steinh. in Ann. Sci. Nat., Bot., sér. 2, 5: 276 (1836). *Charybdis* Speta in Phytom 38: 58 (1998), nom. illeg. superfl. Type: *Squilla maritima* (L.) Steinh. = *Drimia maritima* (L.) Stearn

Ledurgia Speta in Stapfia 75: 168 (2001). Type: *Ledurgia guineensis* Speta = *Drimia guineensis* (Speta) J.C.Manning & Goldblatt

[For additional generic synonyms see individual section entries]

Deciduous or rarely evergreen geophytes. *Bulb* small or large, subterranean or less commonly epigeal, subglobose to ovoid, imbricated (rarely partly vaginated), bulb scales usually tightly packed and adherent, or loosely arranged and then sometimes stalked, flesh white or pink to reddish. *Cataphylls* one or more or evidently lacking, sometimes conspicuous and horizontally barred with thickened ribs. *Leaves* often hysteranthous, 1 to several, erect to spreading or prostrate, terete or linear to oblanceolate, rarely clavate, rarely pubescent or margins ciliate or sometimes thickened, sheathing bases sometimes persistent as a papery collar around base of scape. *Inflorescence* usually a few- to many-flowered raceme, flowers sometimes solitary or congested or corymbose to capitate, rarely branched and paniculate; scape erect or flexuous, glabrous or puberulous-scabridulous below with trichomes in longitudinal rows; bracts membranous, usually small, sometimes caducous, at least lower bracts with a short or long spur; bracteoles mostly lacking but when present solitary on alternating sides of pedicels; pedicels erect to spreading, short or long, rarely deflexed at base, usually abscising at base if not fertilised. *Flowers* usually short-lived, lasting less than a day, sometimes only a few hours, occ. lasting 2 or 3 days, white to green or brown, often with darker keel, diurnal or rarely nocturnal, scented or unscented, spreading or nodding, rotate or campanulate to urceolate; *tepals* connate at base or united into a short or moderately long tube, lobes erect, spreading, recurved or reflexed, abscising below, usually cohering above and forming a cap on the developing capsule but sometimes remaining free to expose the developing capsule. *Stamens* adnate to base of tepals and usually inserted at mouth of tube or below, weakly spreading to erect or inflexed over ovary, filaments usually free, rarely connate, linear-lanceolate to ovate, or vestigial; anthers usually medifixed but sometimes basifixed, usually dehiscing longitudinally but sometimes by apical pores or slits, sometimes shortly apiculate, usually obtuse below but rarely barbed. *Ovary* ovoid to ellipsoid, with several ovules per locule; style erect or sometimes deflexed, cylindrical or sometimes clavate; stigma trifid, sometime globose or excavated, usually papillate and sometimes capitate, rarely trilete and smooth. *Capsules* erect, ovoid to ellipsoid, sometimes 3-lobed or 3-winged, locules $\pm$ pinched in apically, dehiscing completely, but gaping only distally. *Seeds* few to several per locule, angular to flattened and elliptic to ovate with peripheral wing, black, testa loose and brittle, reticulate to rugulose or colliculate.

Species: $\pm$ 110 in Africa, Madagascar, the Mediterranean and Asia, with $\pm$ 70 species in southern Africa; most common in seasonally dry or semi-arid regions. The genus is centred in southern Africa, especially in the seasonal southwest and southeast, with a small secondary radiation in Madagascar.

Key to sections

- 1a. Inflorescence branched, at least basally but often extensively so, persisting after flowering as the primary photosynthetic organ; leaves present only in juvenile plants . . . sect. 18. *Schizobasis*
- 1b. Inflorescence unbranched, not the primary photosynthetic organ; leaves developed annually:
 - 2a. Inflorescence 1(2)-flowered with two opposed bracts terminal on scape; flower nodding, tepals connate beyond middle into a cylindrical tube longer than the lobes sect. 19. *Litanthus*
 - 2b. Inflorescence few- to many-flowered with bracts alternate; flowers various but tepals connate less than halfway:
 - 3a. Anthers dehiscing through apical pores or slits extending at most to middle:
 - 4a. Bracteoles present; anthers 5–6 mm long, laterally connate in a cone; flowers lasting two days sect. 7. *Sagittanthera*
 - 4b. Bracteoles lacking; anthers 1–3 mm long, connivent but free; flowers fugacious:
 - 5a. Flowers rotate; filaments connate in a tube $\pm$ as long as anthers; anthers linear-sagittate, 3–6 mm long, dehiscing through apical pores sect. 15. *Aulostemon*
 - 5b. Flowers campanulate or urceolate; filaments free; anthers ovate to sagittate, 1–2 mm long, dehiscing through short apical slits reaching up to middle sect. 17. *Rhadamanthus*
 - 3b. Anthers dehiscing longitudinally (rarely anthers only gaping apically but split for entire length):
 - 6a. Tepals connate in lower $\pm$ quarter with linear-spathulate lobes at least 5 mm long, strongly reflexed at anthesis; filaments slender and closely appressed to style, 4–11 mm long and at least 4 $\times$ as long as anthers, $\pm$ flexed upwards apically; mature style $\pm$ twice as long as ovary; flowers lasting 2 days thus several open at a time sect. 4. *Drimia*
 - 6b. Tepals variously connate but not as above; filaments not as above; style various; flowers lasting less than or up to 2 days:
 - 7a. Flowers nocturnal, nodding in a lax raceme; pedicels as long as or much longer than tepals; tepals connate basally and recurved or tightly rolled back at anthesis; filaments 7–20 mm long, much longer than anthers sect. 5. *Thuranthos*
 - 7b. Flowers diurnal, sometimes opening late afternoon; pedicels shorter or longer than tepals; tepals variously connate and suberect or spreading above; filaments various:
 - 8a. Bracteoles well developed, 1–5 mm long, solitary on one side of pedicel near base:
 - 9a. Plants robust, often > 1 000 mm tall; flowers spreading to weakly nodding, shallowly campanulate, 4–10 mm long, with tepals connate for up to one fifth; perianth persisting below developing capsules, tepals not cohering into a cap above; stamens suberect or spreading, anthers not connate around style; style cylindrical sect. 1. *Urginavia*
 - 9b. Plants medium-sized, up to 500(–700) mm tall; flowers pendent, narrowly campanulate, 13–15 mm long, with tepals connate between one third and one half; perianth caducous, tepals cohering above ovary and abscising at base to form a cap on developing capsule; stamens connivent, anthers connate around style; style clavate sect. 6. *Hyacinthoides*
 - 8b. Bracteoles lacking (rarely present on a few terminal flowers) or minute and scale-like (in sect. *Rhadamanthopsis*):

- 10a. Flowers pendent, urn-shaped or subglobose with tepals not spreading in upper half; anthers convergent in a cone over the ovary.sect. 16. *Rhadamanthopsis*
- 10b. Flowers spreading or weakly nodding, rotate or campanulate with tepals spreading in upper half; anthers not convergent in a cone over the ovary:
- 11a. Perianth persistent at base of developing capsule, tepals not cohering above to form a cap above developing fruit; capsules large, 10–20 mm long with heavily thickened locule marginssect. 2. *Macrocentrae*
- 11b. Perianth caducous, tepals cohering above and abscising below to form a cap on developing fruit; capsules mostly smaller:
- 12a. Leaves surrounded at base by conspicuous, papery or membranous, horizontally barred cataphylls or leaf bases; flowers rotate with tepals almost free, weakly zygomorphic with style eccentrically deflexed or inflexed; stigma globose-papillate:
- 13a. Cataphylls strongly barred with thickened transverse purple or brown ribs; leaves synanthous; bracts 2–6 mm long; anthers deflexed, sub-basifixed, 2–5 mm long.sect. 12. *Sypharissa*
- 13b. Cataphylls weakly barred; leaves hysteranthous; bracts 1.0–2.5 mm long; anthers not deflexed, 1.5–3.0 mm long:
- 14a. Style less than twice as long as ovary; pedicels shorter than perianth, 3–5 mm long; anthers medifixedsect. 11. *Juncifoliae*
- 14b. Style twice or more as long as ovary; pedicels longer than perianth, 7–10 mm long; anthers basifixed:
- 15a. Anthers intrusively basifixed, gaping only apically after dehiscence; flowers pink with green blotch at base of tepals; seeds blacksect. 13. *Orchidiformes*
- 15b. Anthers sub-basifixed, gaping fully after dehiscence; flowers white with brown keels; seeds whitish.sect. 14. *Khubusia*
- 12b. Leaves not surrounded at base by conspicuous papery or membranous cataphylls; flowers either rotate or campanulate with tepals variously connate at base, actinomorphic with style central and filaments symmetrical; anthers medifixed; stigma obtuse or truncate-papillate:
- 16a. Raceme congested and sub-corymbose, with adjacent pedicels much less than their length apart; pedicels mostly more than 4 mm long; seeds flattened and peripherally winged:
- 17a. Flowers campanulate with perianth cup-shaped below and tepals spreading above, firm-textured, usually buff or brownish with darker keel; filaments ovate to lanceolate, broadest at base; ovary greenish yellowsect. 8. *Capitatae*
- 17b. Flowers rotate with tepals spreading from base, thin-textured, white with dark keel; filaments fusiform, broadest near middle; ovary whitesect. 9. *Physodia*
- 16b. Raceme either elongated with adjacent pedicels their length or more apart, or rarely congested but then pedicels mostly less than 4 mm long, thus not subcorymbose or evidently capitate; seeds angled:
- 18a. Pedicels filiform and wiry, much longer than perianth; perianth rotate; floral buds globular, nodding before anthesis; stigma obtuse-triletesect. 10. *Sclerophyllae*
- 18b. Pedicels not wiry, usually hardly longer than perianth; perianth campanulate; floral buds obovoid, erect or spreading before anthesis; stigma truncate-papillatesect. 3. *Ledebouriopsis*

Sect. 1. **Urginavia** (*Speta*) J.C.Manning & Goldblatt, comb. et stat nov. *Urginavia Speta* in *Phyton* 8: 87 (1998). Type: *Urginavia micrantha* (A.Rich.) *Speta* = *Drimia altissima* (L.f.) Ker Gawl.

Plants large. *Bulb* scales adherent or loose, flesh white or greenish. *Leaves* several, blade narrowly lanceolate to lorate, lightly channelled above and keeled beneath towards base, hystranthous or partly synanthous. *Inflorescence* a dense, elongate raceme, 100- to 700-flowered, flowers sometimes in whorl-like clusters; scape glabrous; bracts ovate to lanceolate, lower short- or longer-spurred; bracteoles present; pedicels spreading, shorter than to much longer than tepals. *Flowers* diurnal, lasting 1 or more days, spreading, perianth persisting below developing capsules for some time, tepals not cohering above and abscising below to form a cap on top of the developing capsule; tepals shortly connate for up to $\pm$ fifth, reflexed above, elliptic-oblong, white to greenish with darker midrib, often leathery. *Stamens*: filaments suberect or spreading, subulate, 2–10 mm long, longer than anthers; anthers medifixed, elliptic, 1.5–4.0 mm long, dehiscence longitudinal. *Ovary* ovoid; style $\pm$ as long as ovary or up to twice as long, tapering or cylindrical; stigma truncate-papillate. *Capsules* ovoid to subglobose, 3-lobed, 4–10 mm long. *Seeds* elliptic, peripherally winged.

Key to species

- 1a. Inflorescence columnar with spreading, wiry pedicels (8–)10–25(–30) mm long; tepal lobes 5–8 mm long; style 2–4 mm long, $\pm$ as long as ovary. 1. *D. altissima*
- 1b. Inflorescence narrow and poker-like with short, suberect pedicels 2–6 mm long:
- 2a. Floral bracts persistent, lower with conspicuous spur up to 10 mm long; flowers smaller, tepal lobes 6–8 mm long; style $\pm$ as long as ovary, $\pm$ 3 mm long; plants from Mpumalanga. 2. *D. kniphofioides*
- 2b. Floral bracts caducous, lower with short spur up to 3 mm long; flowers larger, tepal lobes 4–6 mm long; style 1.5–2.0 times as long as ovary, 7–9 mm long; plants from western and southwestern South Africa. 3. *D. capensis*

1. ***Drimia altissima*** (L.f.) Ker Gawl. in Curtis's Bot. Mag. 27: t. 1074 [excl. illustration] (1808). *Ornithogalum altissimum* L.f., Suppl. Pl.: 199 (1782). *Urginea altissima* (L.f.) Baker in J. Linn. Soc., Bot. 13: 221 (1873). *Idothea altissima* (L.f.) Kuntze, Rev. Gen. 2: 712 (1891). *Urginavia altissima* (L.f.) *Speta* in *Phyton* 8: 87 (1998). Type: South Africa, Eastern Cape, 'Cap. Bona Spei, Zondags River', without date, *Thunberg* s.n. [UPS-THUNB [8275], lecto., designated by Stedje and Thulin in Nord. J. Bot. 15: 598 (1995)].

Ornithogalum giganteum Jacq., Hort. Schoenbr. 1: 45, t. 87 (1797). *Urginea gigantea* (Jacq.) Oyewole in Bol. Soc. Brot., sér. 2, 49: 167 (1975). Type: illustration in Jacq., Hort. Schoenbr. 1: t. 87 (1797).

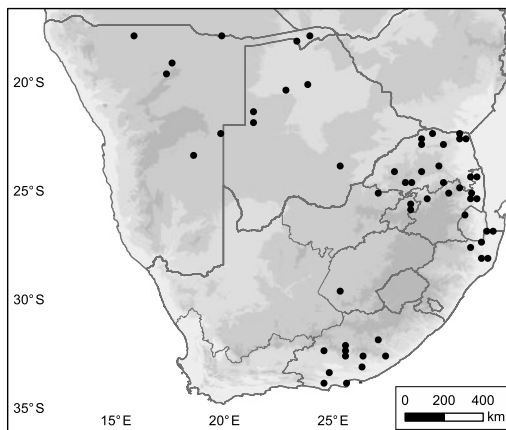
Drimia uitenhagensis Eckl. in S. Afr. Quart. Journ. 1: 364 (1830). Type: South Africa, Eastern Cape, Port Elizabeth (3325): 'on the hills of Adow [Addo], District Uitenhage', (–DA), Ecklon 17 (S [10-14097], lecto.!, designated here.).

Scilla micrantha A.Rich. in Tent. Fl. Abyss. 2: 328 (1850). *Urginea micrantha* (A.Rich.) Solms in Schweinfurth in Beitr. Fl. Aeth.: 294 (1867). *Urginavia micrantha* (A.Rich.) *Speta* in *Phyton* 8: 87 (1998). Type: Ethiopia, 'Chire', Quartin Dillon s.n. (P, holo.; K, iso.).

Urginea epigea R.A.Dyer in Flower. Pl. Afr. 26: t. 1027 (1947). *Urginavia epigea* (R.A.Dyer) *Speta* in Stapfia 75: 168 (2001). Type: South Africa, Mpumalanga, 'Transvaal, Middelburg Dist., N of Zoetvelden', Van der Merwe 2203 [PRE (inflorescence only), lecto.!, designated by Martínez-Azorín et al. in Phytotaxa 201: 169 (2015)].

Plants robust, deciduous, solitary or sometimes clumped. *Bulb* ovoid to subglobose, (50–)80–100(–150) mm diam., usually partly epigeal with rather loose, fleshy scales or subterranean with scales more tightly packed, $\pm$ imbricate, outer scales sometimes persisting and dry-papery above with transverse

abscission lines, flesh whitish to pale green. *Leaves* usually hysteranthous or sometimes partially or fully synanthous, (3)5 to 10(16), suberect, lanceolate, sometimes lightly twisted, 200–400(–500) × (15–)20–60(–70) mm, inner leaves often narrower than outer, acute to attenuate, glaucous, glabrous, plane or shallowly concave with midrib lightly raised beneath towards base, margins narrowly translucent. *Inflorescence* a moderately dense raceme (350–)500–1 000(–2 000) mm tall with rachis up to 800 mm long, 40–60 mm diam., ± 100- to 500(700)-flowered, flowers often in whorl-like clusters mostly 5–10(–20) mm apart; scape glabrous, 5–10(–20) mm diam. at base; bracts linear-lanceolate, lower 5–10(–15) mm long, sometimes caducous, spur of lowest bracts distant from base, obsolete or up to 3 mm long; pedicels ± spreading, (8–)10–25(–30) mm long, stiff and wiry; bracteoles present, scale-like or subulate, up to 2 mm long. *Flowers* spreading, weakly campanulate or almost rotate, perianth persisting below developing capsule; tepals connate up to 2 mm thus up to one fifth, lobes suberect or weakly spreading at base and spreading or reflexed above, elliptic to oblanceolate, 5–8 × 2 mm, apices penicillate, white or cream with green or brownish midrib. *Filaments* weakly spreading, linear to subulate, 4–7 mm long, white. *Anthers* medifixed, oblong to ellipsoid, 1.5–3.0 mm long, greenish with yellow pollen. *Ovary* ovoid-truncate to ellipsoid, 2–4 mm long, green; style tapering, 2–4 mm long, white; stigma obtuse-papillate. *Capsules* subglobose to obcordate and emarginate, 3-lobed, 8–15 mm diam. *Seeds* semi-orbicular, 5–8 mm long, testa colliculate. *Flowering time*: mainly September to December, sometimes as late as April, evidently in response to rainfall; flowers opening early morning and fading around midday. Plate 1A, B.



MAP 1.—Distribution of *D. altissima* in southern Africa

Distribution and ecology: one of the most widespread species in the genus, ranging from Ethiopia and Somalia through tropical Africa into northeastern Namibia, Botswana, Swaziland and South Africa, where it is recorded in the northern parts in Limpopo, Gauteng and Mpumalanga into northern KwaZulu-Natal and then further south in the southern Free State and Eastern Cape as far as Steytlerville and Hankey (Map 1); often on sandy flats but also stony flats in dry and subtropical grassland and savanna, below 1 500 m.

The whole plant is highly toxic and ingestion by livestock leads to acute or fatal poisoning, although the foliage is browsed by game (Van der Walt 2009).

Diagnosis: readily recognised by its tall stature, (350–)500–1 000(–2 000) mm tall, with an elongate, columnar raceme of campanulate flowers on long, spreading pedicels (8–)10–25(–30) mm long, these usually with a small bracteole at the base on one side, and moderately large, caducous bracts, the lower 5–10(–15) mm long. The flowers are small to moderately sized, with tepal lobes 5–8 mm long, filaments 4–7 mm long, and style 2–4 mm long and ± as long as the ovary. The subglobose or obcordate capsules are characteristic.

Additional specimens seen

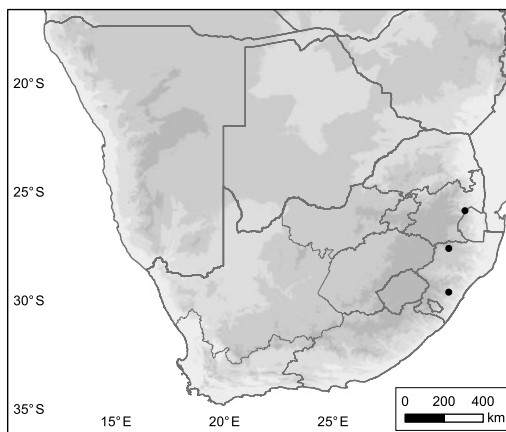
NAMIBIA. 1715 (Ondangwa): 18.8. mi [30 km] N of Ondangwa [Ondangwa] on road to Omafo, (–DD), 12 Nov. 1955, B. de Winter 3620 (PRE). **1719 (Runtu)**: 16.2 km S of Runtu, dry bush in deep white sand, (–DD), 1 Dec. 1955, B. de Winter 3786 (PRE). **1723 (Singalamwe)**: Caprivi Strip, E of Kuando [Kwando] River, (–DD),

- Oct. 1945, *H. Curson* 1072 (PRE). **1917 (Tsumeb)**: Tsumeb, (–BA), Dec. 1932 [ex hort.], *H. Herre* s.n. (BOL); 13.4 mi [21.4 km] S of Tsumeb on road to Grootfontein, (–BA), 21 Nov. 1955, *B. de Winter* 3685 (PRE); Otavi Mtns, on loose red sand, (–CB), Jan. 1937, *E. Naegelsbach* s.n. (PRE). **2219 (Sandfontein)**: Namibia, Sandfontein, (–BD), Dec. 1921, *M. Wilman* 15279 (BOL). **2318 (Leonardville)**: 60 mi [96 km] SE of Gobabis, sandveld, (–BC), Dec. 1953, *P. Basson* 93 (PRE).
- BOTSWANA. **1823 (Siamisso)**: bank of Kwande River, (–AB), 14 Nov. 1980, *P.A. Smith* 3570 (PRE). **2022 (Lake Ngami)**: 5 mi [8 km] S of Mwakwaku Pan, (–BD), Dec. 1969, *V. van der Spuy* 31 (PRE). **2023 (Kwebe Hills)**: 5.1 km W of Makalamabedi Gate on main road to Maun, sandy soil, (–BB), 1 Dec. 1978, *P.A. Smith* 2538 (PRE). **2121 (Ghanzi)**: Grootlaagte, 40 mi [64 km] NE of Ghanzi, (–AD), 24 Oct. 1969, *R.C. Brown* 6999 (PRE); along track from Tshobokwane to Ramsden, in Kalahari sand, (–CD), 15 Nov. 1978, *C. Skarpe* s.n. (PRE). **2325 (Lephepe)**: Kweneng District, Natlolakgang Ranch, Kalahari sands, (–CD), 27 Oct. 1977, *O. Hansen* 3256 (PRE).
- SWAZILAND. **2631 (Mbabane)**: Komati Bridge, (–AA), 10 Oct. 1992, *R. Glen* 190 (PRE). **2731 (Louwsburg)**: Hlatikulu Dist., 10 mi [16 km] W of Gollel, (–BD), 25 Sep. 1959, *B. Dlamini* s.n. (NBG, PRE).
- SOUTH AFRICA. LIMPOPO. **2229 (Waterpoort)**: near Dongola, (–BC), Dec. 1928, *J. Hutchinson* 2132 (PRE); 15 km N of Alldays along R521, (–CA), 3 Dec. 2010, *B. Sachse* 869 (PRE); Lebowa, Blouberg Mt, Auf der Haard farm, (–CC), 6 Dec. 1990, *L. Smook* 7399 (PRE). **2230 (Messina)**: Venda, Malongavlake between Mutale and Limpopo rivers, (–BD), 23 Oct. 1980, *E. Mugwedi* 1322 (PRE); Ngelele River S of dam, (–CC), 10 Dec. 2001, *E. van Wyk* 425 (PRE); Venda, Musunda, (–DB), 2 Oct. 1979, *M. Steynberg* 1007 (PRE). **2231 (Pafuri)**: 27 mi [43 km] NE of Punda Maria, (–CA), 2 Nov. 1948, *L. Codd & R. Dyer* 4621 (PRE). **2329 (Pietersburg)**: 3 mi [5 km] E of Boyne-Wolkberg Road, (–DD), 13 Sep. 1961, *D. van Vuuren* 1269 (PRE). **2427 (Thabazimbi)**: Waterberg Dist., 99 km SE of Ellisras on road to Vaalwater, (–BB), 19 Nov. 1981, *C. Reid* 457 (PRE). **2428 (Nylstroom)**: Warmbaths, (–CB), 5 Nov. 1908, *R. Leendertz* (PRE); Syferkraal, Naboomspruit, (–DA), 25 Nov. 1923, *E. Galpin* 665 (PRE). **2429 (Zebediela)**: Percy Fife Nature Reserve, (–AA), 3 Dec. 1969, *B. Huntley* 1907 (PRE). **2430 (Pilgrim's Rest)**: ± 45 km from Steelpoort on Steelpoort/Stofberg Road, (–CA), 13 Sep. 1992, *P. Burgoyne* 1307 (PRE). **2431 (Acornhoek)**: Ross farm, Klaserie Private Nature Reserve, mixed woodland, sandy loam, (–AD), 4 Nov. 1004, *N. Zambatis* 1049 (PRE). **2527 (Rustenburg)**: Bierkraal farm, 50 mi [80 km] N of Rustenburg, (–AA), Nov. 1934, *D. Steyn* 15708 (PRE). **2531 (Komatipoort)**: 16 mi [25.6 km] W of Skukuza, (–AB), 4 Nov. 1949, *L. Codd* 5696 (PRE); Stolznek District, granite outcrops on Mangake Range, (–AD), 26 Nov. 1987, *N. Zambatis* 1796 (PRE); halfway between Malelane and Krokodilbrug, (–BC), 25 Oct. 1951, *H. van der Schijff* 101 (PRE).
- GAUTENG. **2528 (Pretoria)**: Premier Mine, (–DA), 30 Nov. 1913, *J. Pole-Evans* 9823 (PRE); N slopes of Magaliesberg, (–DC), Dec. 1933, *C. Smith* s.n. (PRE).
- MPUMALANGA. **2430 (Pilgrim's Rest)**: Pilgrims' Rest, Calais, (–DD), 22 Nov. 1958, *Killick & Strey* 2545 (PRE). **2431 (Acornhoek)**: ± 18 mi [29 km] from Solona on Rabelais Road, (–BC), 23 Nov. 1953, *H. van der Schijff* 3292 (PRE). **2529 (Witbank)**: Loskop Dam Nature Reserve, Fonteinsonderend, (–AD), 14 Nov. 1968, *G. Theron* 1981 (PRE). **2530 (Lydenburg)**: Lydenburg, (–AB), Dec. 1930, *E. Struben* s.n. (BOL); Sekukuniland [Sekhukhuneland], Schoonoord farm, (–AB), 15 Nov. 1934, *W. Barnard* 71 (PRE).
- FREE STATE. **2925 (Jagersfontein)**: Fauresmith, Veld Reserve, (–CB), 2 Dec. 1942, *M. Henrici* 3573 (PRE).
- KWAZULU-NATAL. **2632 (Bela Vista)**: 18 mi [29 km] N of Otobotini on Ndlumu Road, (–CC), 10 Mar. 1964, *D. Edwards* 3272 (PRE); Ndumu Hill, (–CD), 11 Nov. 1968, *E. Pooley* 3 (PRE). **2731 (Louwsburg)**: Itala Nature Reserve near Louwsburg, (–CB), 19 Oct. 1982, *G. Germishuizen* 2246 (PRE). **2831 (Nkandla)**: Zululand, Hlabisa, (–BB), 28 Aug. 1937, *J. Gerstner* 2294 (BOL). **2832 (Mtubatuba)**: Hluhluwe Game Reserve, (–AA), 1 Oct. 1961, *C. Ward* 3730 (PRE).
- EASTERN CAPE. **3127 (Lady Frere)**: Glen Adelaide, (–CC), grassveld, 14 Nov. 1984, *E. Van Jaarsveld & E. Marthinus* 7922 (NBG). **3224 (Graaff-Reinet)**: near Graaff-Reinet, (–BC), Dec. 1867, *H. Bolus* 649 (BOL). **3225 (Somerset East)**: 30 miles [48 km] NW of Grahamstown on road to Cradock, (–BA), 1 Dec. 1950, *W. Barker* 7039 (NBG); Cradock, Mortimer, (–BC), Dec. 1915 [ex hort.], *Davison* s.n. (BOL); near Somerset East, (–DA), 30 Nov. 1947, *W. Barker* 5083 (NBG); road NE of Boschberg linking Glen Avon to Cookhouse, (–DA), 2 Dec. 2008, *V. Clark & J. Le Roux* 1 (NBG). **3226 (Fort Beaufort)**: Grahamstown, near Bushman's River between Port Elizabeth and Grahamstown, (–CB), 17 Jan. 1947, *F. Leighton* 2838 (BOL). **3227 (Stutterheim)**: dry grassy slopes near Komgha [Komga], (–CB), 1891, *H. Flanagan* 1188 (BOL). **3324 (Steytlerville)**: 1 km N of Springbokvlakte, (–BD), 1 Apr. 1978, *P. Perry* 595 (NBG); Droogekloof on road from Humansdorp to Andrieskraal, (–DC), Dec. 1927, *H. Fourcade* 3530 (BOL). **3325 (Port Elizabeth)**:

Redhouse near Port Elizabeth, (–DC), Jan. 1915, *F. Paterson* 2682 (BOL). **3326 (Grahamstown)**: Carlisle Bridge, (–AB), 7 Dec. 1967, *R. Bayliss* 4104 (NBG).

2. ***Drimia kniphofioides*** (Baker) J.C.Manning & Goldblatt in *Bothalia* 33: 111 (2003). *Urginea kniphofioides* Baker in *Fl. Cap.* 6: 469 (1897). Type: South Africa, Mpumalanga, Komatipoort (2531): 'Transvaal, Havelock Concession', (–CC), Sep. 1890, *Saltmarshe sub Galpin* 1055 (K, holo. —image!; BOL!, iso.).

Plants robust, deciduous. *Bulb* ovoid to subglobose, 80–150 mm diam., subterranean with scales tightly packed, $\pm$ imbricate, outer scales dry-papery, sometimes persisting in short neck with transverse abscission lines, flesh whitish. *Leaves* hysteranthous, $\pm$ 5, suberect, narrowly lanceolate, 100–400 $\times$ 8–20 mm, inner leaves often narrower than outer, acute, narrowed and clasping below, glabrous, plane or shallowly concave with midrib lightly raised beneath towards base, margins narrowly translucent. *Inflorescence* a dense, poker-like raceme 500–1 000 mm tall with rachis up to 200 mm long, up to 200-flowered, 15–20 mm diam., flowers solitary or sometimes in clusters mostly 5–10 mm apart; scape glabrous, 8–10 mm diam. at base; bracts lanceolate to linear-lanceolate, persistent, 6–10 mm long, spur of lowest bracts oblong, 8–10(–20) mm long; pedicels suberect, 2–6 mm long; bracteoles present, subulate or filiform, up to 3 mm long. *Flowers* spreading, campanulate, perianth persisting below developing capsule; tepals connate 1–2 mm thus up to one fourth, lobes suberect below but spreading or recurved above, oblong, 4–6 $\times$ 1.0–1.5 mm, apices penicillate, white with green midrib. *Filaments* suberect or weakly spreading, subulate, 4–5 mm long, white. *Anthers* medifixed, oblong, 1.5–2.0 mm long, yellow or greenish with yellow pollen. *Ovary* ovoid-truncate to ellipsoid, 2.5–3.0 mm long, green; style columnar, 2.5–3.0 mm long, $\pm$ as long as ovary, white; stigma obtuse-papillate. *Capsules* and *seeds* unknown. *Flowering time*: September to October; flowers opening early morning and withering in the afternoon.



MAP 2.—Distribution of *D. kniphofioides*

Distribution and ecology: a poorly collected species of the eastern escarpment, known from near Barberton in Mpumalanga, and from Utrecht and Pietermaritzburg in KwaZulu-Natal (Map 2); in moist grassland and forest margins around 1 000 m.

Diagnosis: a distinctive species with relatively narrow leaves, 8–20 mm wide, *Drimia kniphofioides* has a tall, dense, poker-like inflorescence up to 1 m tall, of relatively small flowers crowded on short, suberect pedicels 2–6 mm long, subtended by bracts 6–10 mm long, the lower with relatively long spurs up to 10(–20) mm long, and subulate or filiform bracteoles up to 3 mm long. The tepals are shortly connate at the base for 1–2 mm with lobes 4–6 mm long, and persistent under the developing capsule. The ovary and style are subequal in length, 2.5–3.0 mm long.

The very dense, spike-like raceme recalls that of *Drimia capensis* from the southwest, but that species has mostly broader leaves, 15–70(–100) mm wide, and much larger flowers, with lobes 8–14 mm long and a proportionally longer style 7–9 mm long and 1.5–2.0 times as long as the ovary.

Additional specimens seen

SOUTH AFRICA. MPUMALANGA. **2531 (Komatipoort)**: Twelo Forest, 3 miles [5 km] S of Barberton, (–CC), steep high mountain slope, 29 Sep. 1970, E. Buitendag 709 (NBG).

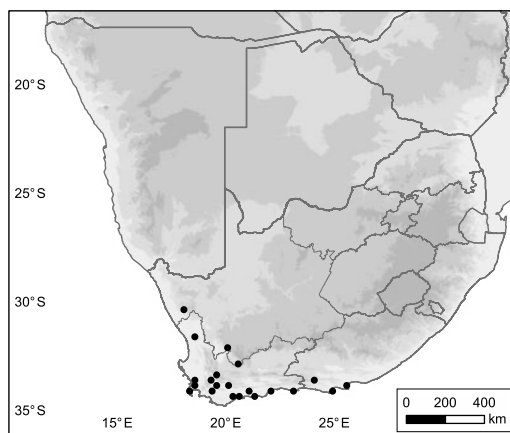
KWAZULU-NATAL. **2730 (Vryheid)**: Utrecht, (–CB), 24 Oct. 1964, N. Devenish 1178 (PRE). **2930 (Pietermaritzburg)**: World's View, (–CB), verge of forest, 980 m, 24 Sep. 1995, M. Von Vintel 15 (PRE).

3. **Drimia capensis** (Burm.f.) Wijnands, The Botany of the Commelins: 130 (1983). *Scilla capensis* Burm.f., Prod. Fl. Cap.: 10 (1768). Type: illustration in Commelin, Hort. Amst. 2: 187 t. 94 (1701), lecto., designated by Wijnands, The Botany of the Commelins: 130 (1983).

Urginea forsteri Baker in Fl. Cap. 6: 469 (1897). *Drimia forsteri* (Baker) Oberm. in Bothalia 13: 453 (1980). Type: South Africa, Western Cape, without locality or date, *Forster s.n.* [K, lecto. —image!, effectively designated by Oberm. in Bothalia 13: 453 (1980)].

Plants robust, deciduous, solitary or rarely clumped. *Bulb* ovoid to subglobose, 80–150 mm diam., subterranean with scales tightly packed, $\pm$ imbricate, outer scales dry-papery, sometimes persisting in short neck with transverse abscission lines, flesh whitish. *Leaves* hysteranthous, (4)5 to 7, suberect, lanceolate, sometimes slightly twisted, 200–500 $\times$ 15–70(–100) mm, inner leaver often narrower than outer, acute or apiculate, sometimes narrowed and clasping below, glaucous, glabrous, plane or shallowly concave with midrib lightly raised beneath towards base, margins narrowly translucent, rarely ciliate. *Inflorescence* a dense, poker-like raceme 500–1 500 mm tall with rachis up to 800 mm long, 20–40 mm diam., $\pm$ 200- to 700-flowered, flowers often in whorl-like clusters mostly 5–15(–20) mm apart, the raceme thus sometimes interrupted; scape glabrous, 8–15 mm diam. at base; bracts ovate-lanceolate, lower 3–5 mm long, caducous, spur of lowest bracts oblong, 1–3 mm long; pedicels suberect, 2–6 mm long; bracteoles present, subulate, up to 2 mm long. *Flowers* spreading, campanulate, perianth persisting below developing capsule; tepals connate for 1–2 mm thus up to one sixth, lobes suberect below, reflexed above, elliptic to oblong, 8–14 $\times$ 2.0–3.5 mm, apices penicillate, white or greenish cream with green midrib. *Filaments* suberect or weakly spreading, subulate, 8–10 mm long, white. *Anthers* medifixed, oblong, 2–4 mm long, yellow or greenish with yellow pollen. *Ovary* ovoid-truncate to ellipsoid, 4–5 mm long, green; style columnar, 7–9 mm long and $\pm$ 1.5–2.0 times as long as ovary, white; stigma obtuse-papillate. *Capsules* ovoid, 3-lobed, obtuse or emarginate, 8–14 $\times$ 7–10 mm. *Seeds* semi-orbicular, 5–8 mm long, testa colliculate. *Flowering time*: November to January, rarely as late as March; flowers opening early morning and withering in the afternoon.

Distribution and ecology: widespread but scattered through southwestern and southern South Africa, mainly at lower altitudes, recorded from the Kamiesberg and Vanrhynsdorp along the West Coast to the Cape Peninsula and eastward along the Agulhas Plain to Knysna, Port Elizabeth and the Baviaanskloof, extending inland through the Breede River Valley to De Doorns and onto the Roggeveld but absent from the Little Karoo (Map 3); shale slopes or loamy to sandy flats on a variety of substrates, especially alkaline soils



MAP 3.—Distribution of *D. capensis*

and often over limestone, but never on acidic sandstone-derived soils, in renosterveld, strandveld or limestone fynbos.

Diagnosis: the tall flowering stems of *Drimia capensis* are similar in size to those of *D. altissima*, but the pedicels in *D. capensis* are much shorter, 2–6 mm long, giving the raceme a tight, poker-like form unlike the columnar or cylindrical raceme in *D. altissima*, which has wiry pedicels (8–)10–25(–30) mm long. The floral bracts in *D. capensis* are much shorter, the lower 3–5 mm long vs 5–10(–15) mm long in *D. altissima*, but the flowers are larger in all details, the tepal lobes 8–14 mm long vs 5–8 mm long, the filaments 8–10 mm long vs 4–7 mm long, and the style 7–9 mm long and 1.5–2.0 times as long as the ovary vs 2–4 mm long and $\pm$ as long as the ovary. The distribution of the two species is complementary, with *D. altissima* occurring further east and north.

Drimia capensis may be confused with robust forms of *D. elata*, notably on the Cape Peninsula and around Port Elizabeth where they co-occur, but that species typically has longer floral bracts, up to 25 mm long, without an associated bracteole, a caducous perianth with the tepals connate at the base for 3–6(–7) mm long, thus one fourth to one half their length, smaller anthers $\pm$ 1 mm long, and a longer style, 9–13 mm long.

Although the leaves are typically glabrous, plants on the Kamiesberg have densely villous leaf margins. This deserves further investigation although similar variation in leaf vestiture is also seen in *D. elata*.

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. 3018 (Kamiesberg): Kamiesberg, Welkom farm, (–AC), Jun. 2011 [leafing], N. Helme s.n. (NBG; photo). **3220 (Sutherland):** Roggeveld, Soekop, (–AA), 17 Jun. 2005 [leafing], H. Rosch 289 (NBG); 20 miles [46 km] N of Matjiesfontein, Laingsburg, (–DC), 9 May 1969 [leafing], L. Hall 204 (NBG); Klein Roggeveld, between Kruispad and Komsberg Pass, (–DC), 14 Sep. 2004, D. Sniijman 1935 (NBG). **WESTERN CAPE. 3118 (Vanrhynsdorp):** 15 miles [24 km] N of Vanrhynsdorp, (–DA), 15 Dec. 1955, A. Loubser s.n. (NBG); Sandveld, 5 miles N of Vanrhynsdorp, (–DA), 2 Dec. 1910, H. Pearson & N. Pillans 27 (BOL); 5 km N of Vanrhynsdorp, (–DA), in deep red sand, 20 Nov. 1997, D. Sniijman 1643 (NBG); Knersvlakte, 5 km S of Varsch River, (–DA), 9 Nov. 2004, A. Le Roux 5164 (NBG). **3218 (Clanwilliam):** Saldanha Bay, (–AC), 10 Dec. 1946, F. Leighton 2363 (BOL). **3318 (Cape Town):** Malmesbury, Burgerspost farm, near Pella, (–DA), well-drained sandy soil, 17 Jan. 1980, C. Boucher & P. Shepherd 4941 (NBG); summit of Blauwberg, (–DC), 21 Jan. 1927, N. Pillans s.n. (BOL); De Grendel, W slopes of Tygerberg Hills, (–DC), coastal renosterveld, 12 Jan. 1978, C. Boucher 3516 (NBG). **3319 (Worcester):** Drooggeriviersberg 20 km SSE of Worcester, (–BC), Dec. 1998, H. Conradie 20 (NBG); Worcester, Karoo Garden, (–CB), 20 Dec. 1946, R. Compton 18965 (NBG); Worcester, veld N of Rabie Ave rail bridge, (–CB), 18 Aug. 1981 [leafing], I. Walters 2464 (NBG); Hex River Valley, (–DC), Jan. 1908, H. Bolus 13032 (BOL); De Doorns, (–DC), 5 Jun. 2002 [leafing], J. Manning 2741 (NBG). **3320 (Montagu):** Waboomsberg, (–CC), 28 Dec. 1940, R. Compton 1021 (NBG). **3418 (Simonstown):** Table Mt, Hout Bay Nek, (–AB), Feb. 1920, H. Andreae 247 (NBG); Oude Schip, (–AB), 18 Feb. 1942, R. Compton 13023 (NBG); Llandudno, (–AB), 16 Feb. 1944, F. Leighton 396 (NBG). **3419 (Caledon):** S of Caledon on road to Shaw's Pass, (–AB), 24 Jan. 1951, W. Barker 7322 (NBG). **3420 (Bredasdorp):** De Hoop, Potberg Nature Reserve, flats NE of Fransfontein, (–AD), loam over limestone, 10 Jan. 1985, A. Scott 482 (NBG); Bredasdorp, Anyskop, (–BC), without date, P. Jordaan 130 (NBG). **3421 (Riversdale):** Korente River-Heidelberg Road, (–AA), 34 Jan. 1969, M. Thompson 707 (NBG); Albertinia, Gouriqua/Ystervarkpunt, (–AD), 20 Jan. 1987, D. Willemse 2 (NBG); Still Bay, (–AD), 29 Mar. 1979, P. Bohnen 5271 (NBG). **3422 (Mossel Bay):** Mossel Bay, (–AA), 30 Jan. 1944, R. Compton 21664 (NBG). **3423 (Knysna):** hillslopes near eastern Heads, (–AA), 16 Jan. 1931, A. Duthie 1109 (NBG). **EASTERN CAPE. 3324 (Steytlerville):** top of escarpment, Baviaanskloof, (–CA), 3000 ft. [914 m], 10 Jan. 1976, R. Bayliss 7237 (NBG). **3325 (Port Elizabeth):** Port Elizabeth, (–DC), 21 Jan. 1941, F. Holland s.n. (NBG). **3424 (Humansdorp):** Seekoei Nature Reserve, sandveld, (–BB), 2 Feb. 1973, A. Montgomery 329/319 (NBG).

Sect. 2. **Macrocentrae** J.C.Manning & Goldblatt, sect. nov. Type: *Drimia macrocentra* (Baker) Jessop

Boosia Speta in Stapfia 75: 168 (2001). Type: *Boosia macrocentra* (Baker) Speta = *Drimia macrocentra* Baker

Sekanama Speta in Stapfia 75: 168 (2001). Type: *Sekanama sanguinea* (Schinz) Speta = *Drimia sanguinea* (Schinz) Jessop

Plants medium-sized to large. *Bulb* scales adherent, flesh white, greenish or red. *Leaves* one and then cylindrical or several then linear to narrowly lanceolate and lightly channelled above, hysteranthous or partly synanthous. *Inflorescence* a dense, raceme, 30- to 100-flowered, flowers sometimes in clusters; scape glabrous; bracts ovate to obovate-spathulate, lower short- or very long-spurred; bracteoles absent; pedicels spreading, shorter than to much longer than tepals. *Flowers* diurnal, lasting 1 or more days, spreading, perianth persisting below developing capsules for some time, tepals not cohering above nor forming a cap on top of the developing capsule; tepals shortly connate for up to $\pm$ quarter, reflexed above, elliptic-oblong, white to greenish with darker midrib, often leathery. *Stamens*: filaments suberect or spreading, subulate, 4–7 mm long, longer than anthers; anthers medifixed, elliptic, 1.5–2.5 mm long, dehiscence longitudinal. *Ovary* ovoid; style $\pm$ as long as ovary, tapering or cylindrical; stigma truncate-papillate. *Capsules* ovoid to ellipsoid, 9–20 mm long, with heavily thickened locule margins. *Seeds* elliptic, peripherally winged.

Key to species

- 1a. Bulbs dark red; inflorescence (60–)200–450(–600) mm tall, scape mostly shorter than rachis, often less than half as long; bracts 1–3 mm long, spur of lower bracts up to 1 mm long; leaves 3 to 8, linear to narrowly lanceolate, channelled; plants from western and northern interior South Africa. 4. *D. sanguinea*
- 1b. Bulbs white to greenish; inflorescence 300–800(–900) mm tall, scape longer than rachis; bracts 4–6 mm long, spur of lower bracts 20–35 mm long, forming a skirt below raceme in bud; leaf solitary, cylindrical, resembling scape; plants from eastern Drakensberg and coast. 5. *D. macrocentra*

4. ***Drimia sanguinea*** (Schinz) Jessop in J. S. Afr. Bot. 43: 293 (1977). *Urginea sanguinea* Schinz in Verh. Bot. Ver. Prov. Brandenburg 31: 219 (1890). *Sekanama sanguinea* (Schinz) Speta in Stapfia 75: 168 (2001). Type: Namibia, Gunib (2028): 'Osnambonde [Omambonde] in Nord-Hereroland', (–AA), Oct. 1885, Schinz 25 (Z, holo.; K—image!, iso.).

Urginea burkei Baker in Fl. Cap. 6: 469 (1897). *Sekanama burkeri* (Baker) Speta in Stapfia 75: 168 (2001). Type: South Africa, Gauteng, Rustenburg (2527): 'Magaliesberg', (–CA, CC, DB, DC), Sep [without year], Burke s.n. [K, lecto. —image!, designated by Jessop in J. S. Afr. Bot. 43: 293 (1977)].

Urginea rautanenii Baker in Bull. Herb. Boiss, sér. 2, 3: 664 (1903). Type: Namibia, Ondangua (1715): 'Am-boland, Ondonga [Ondangwa]', (–DD), Rautanen s.n. (Z, holo.).

Plants medium-sized, deciduous, solitary. *Bulb* ovoid to subglobose, (40–)50–70(–90) mm diam., scales tightly packed, outer scales dry and papery or brittle, forming a brittle, papery, lightly transversely barred neck up to 150 mm long, flesh dark red. *Leaves* usually hysteranthous, 3 to 8, erect, linear to lanceolate, 250–350(–500) $\times$ (3–)4–10(–14) mm, acute to attenuate, channelled, glabrous, leathery. *Inflorescence* a moderately dense to dense raceme, (60–)200–450(–600) mm tall with scape mostly shorter than rachis, 30- to 80-flowered, flowers sometimes in clusters mostly 2–5 mm apart but lower flowers more distant; scape glabrous, 2–8 mm diam., somewhat swollen at base; bracts caducous, ovate to obovate-spathulate, 1–3 mm long, lower with short spur $\pm$ 1 mm long; pedicels suberect or erect-spreading, (2–)4–12(–14) mm long; bracteoles absent. *Flowers* spreading, weakly

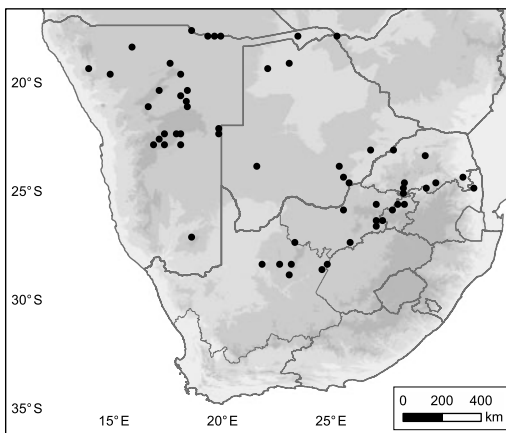
campanulate, perianth persisting below ripening capsule; tepals connate up to 2 mm thus less than one quarter, lobes suberect below and spreading or reflexed above, elliptic to oblong, $6-8 \times 2-3$ mm, apices penicillate, white with or without brown keel. *Filaments* suberect, linear-lanceolate to filiform, 5–7 mm long, white. *Anthers* medifixed, oblong, 1.5–2.5 mm long, yellowish or greenish with yellow pollen. *Ovary* ovoid-truncate, 3.5–4.5 mm long, green; style terete, 3–4 mm long, white; stigma truncate-papillate. *Capsules* ovoid to ellipsoid, (10–)12–18(–20) mm long, locule margins heavily thickened. *Seeds* elliptic to oblong, 7–12 mm long, testa minutely rugulose. *Flowering time*: (August) September to October (November).

Distribution and ecology: widespread through the drier northern and northwestern interior of South Africa extending into Botswana and southeastern, central and northern Namibia, but not yet recorded from Angola (Figueiredo & Smith 2008) (Map 4); in open savanna and dry grassland, often in red sands, but also harder soils or rocky slopes. The species has been recorded as toxic to small stock, with the local names *gifbol* [poison bulb], *slangkop* [snake's head] or *röte schlangekopf* [red snake's head].

Diagnosis: *Drimia sanguinea* is recognised by its large, distinctive dark red bulbs and an inflorescence (60–)200–450(–600) mm tall with the scape typically shorter than (sometimes less than half as long as) the inflorescence rachis, and moderate-sized, white flowers, mostly 7–10 mm long, the tepals joined at the base for less than one quarter their length. The bracts are small, 1–3 mm long and rapidly caducous, the lower with a short spur up to 1 mm long. The characteristic large capsules, 10–20 mm long with heavily thickened locule margins, are shared with *D. macrocentra*.

Additional specimens seen

NAMIBIA. **1718 (Kuring-Kuru)**: near Nkurunkuru, (–DA), 29 Sep. 1966, W. Giess 9484 (WIND). **1719 (Runtu)**: along Okavango at Rundu, (–CD), 9 Oct. 1985, W. Greuter 20266 (WIND); next to tarred road to Runtu, (–DC), Nov. 1995, U. Mettring s.n. (WIND); Runtu, Okavango River banks, (–DD), 30 Sep. 1949, J. Van Dam s.n. (NBG). **1723 (Singalamwe)**: Kaplyn [cutline] at Kwando, Sinmgalamwe Military Base, (–CD), 1975, P. du Preez 25 (PRE). **1815 (Namutoni)**: 38 mi [60 km] S of Ondongua on road to Okakejo, (–BD), 12 Nov. 1955, D. de Winter 3619 (PRE). **1913 (Sesfontein)**: Khwarib Schlucht, (–BD), Jan. 1980, W. Rusch s.n. (WIND). **1914 (Kamanjab)**: Kamanjab, (–DB), 28 Jan. 1972 [leafing], W. Giess 11615 (WIND). **1917 (Tsumeb)**: Tsumeb, (–BA), 12 Nov. 1934, E. Nagelsbach 17 (PRE). **1918 (Grootfontein)**: 40 miles [64 km] E of Grootfontein, (–CA), 11 Oct. 1960, D. van Vuuren 1185 (WIND). **2017 (Waterberg)**: Waterberg, (–AC), 1978, M. Müller 1041 (WIND); Waterberg plateau near Otjikorioma campsite, (–AC), 28 Sep. 1995, R. Kubirske 246 (WIND). **2018 (Gunib)**: 7 km N of Okamatapati at Ondirayakumpa, near homestead, (–AD), 12 Oct. 1994, E. Klaassen 3 (PRE, WIND); Okakara, 5 km E of intersection 3805 $\times$ 3804 on Road 3805, (–CA), 29 Sep. 1995, R. Kubirske 247 (WIND); Okakarara, 7 km N of Central Water Reservoir on Road 3805, (–CD), 27 Sep. 1995, R. Kubirske 244b (WIND). **2116 (Okahandja)**: Okahandja, (–AC), W. Giess 1989 (WIND); farm Omatako, (–BA), 25 Nov. 1971, W. Giess 11525 (WIND); 20 Jan. 1972 [fruiting], G. Woortman 64 (WIND). **2118 (Steinhausen)**: 16 km SE of Okanjatu on road to Otjinene, (–AB), 29 Sep. 1995, R. Kubirske 248 (WIND). **2216 (Otjimb-**



MAP 4.—Distribution of *D. sanguinea*

- ingwe):** farm Krumneck, (–DD), Oct. 1964, *Krainer sub W. Giess 8274* (PRE, WIND); farm Claratal on Komas Hochland, (–DD), 20 Oct. 1994, *F. Wittneben s.n.* (PRE, WIND). **2217 (Windhoek):** Neudam Agricultural College, Hans se Pos, (–AD), 17 Oct. 1994, *R. Kubirske & M. Uiras 140, 141* (WIND); farm Otjivero South, (–BD), 18 Oct. 1994, *R. Kubirske & M. Uiras 159* (PRE, WIND); Otjihundu farm, (–BD), 18 Oct. 1994, *R. Kubirske & M. Uiras 153, 157, 158* (PRE, WIND); Khomas region, farm Otjihundu, (–BD), 19 Sep. 1994, *R. Kubirske 139* (WIND); Aris, (–CA), 17 Oct. 1964, *R. Seydel 4071* (WIND); Aurus Mtns, N slope of Gross Herzog Freidrich, (–CA), 29 Apr. 2004 [leafing], *M. Wittneben 143* (WIND); Windhoek, municipal area, (–CA), 16 Nov. 1962 [fruiting], *W. Hanekom 192b* (WIND); Windhoek Botanical Garden, eastern fence on hill across from houses, (–CA), 12 Oct. 1995, *B. Strobach 2530* (WIND); farm Rietfontein, (–CD), 21 Oct. 1962, *W. Giess 5034* (WIND). **2218 (Gobabis):** Costa farm near border with Otjuhundu, Locarno and Rustig farms, (–AC), 18 Oct. 1994, *R. Kubirske & M. Uiras 154* (WIND); Asrea farm, (–AC), 17 Oct. 1994, *R. Kubirske & M. Uiras 152* (WIND); farm Scheidthof, (–CC), 17 Oct. 1994, *R. Kubirske & M. Uiras 148* (PRE, WIND). **2219 (Sandfontein):** Gobabis District, Ernst Ville farm, (–BB), 13 Nov. 1994, *B. Kruger s.n.* (PRE); Sandfontein, (–BD), Nov. 1922, *M. Wilman 15237* (BOL, NBG). **2718 (Grünau):** farm Kuchanas, (–BA), 10 May 1972 [ex hort.], *H. Wiss 2584* (WIND).
- BOTSWANA. 1725 (Livingstone):** Chobe National Park, Kasane, (–CC), dry mopane woodland, 27 Aug. 1970, *S. Mavi 1149* (PRE). **1922 (Nokoneng):** Gomare, (–AC), Oct. 1967, *F. Lambrecht 391* (PRE). **1923 (Maun):** Okavango Delta, Xuganga, Uptree Island, (–AA), 15 May 1995 [leafing], *V. Roodt 151* (PRE). **2321 (Lehututu):** 10 km NW Hukuntsi along track to Ncojari, (–DC), 23 Oct. 1977, *C. Skarpe 191* (PRE). **2325 (Lephepe):** Sehwaere, (–CD), 1 Oct. 1983, *J. Barnes 383* (PRE). **2326 (Mahalapye):** Mahalapye, (–BB), 22 Sep. 1977, *A. Camerik 197* (PRE). **2327 (Ellisras):** Seleka, (–BB), 28 May 1987 [leafing], *J. Woollard & R. Masilo 2141* (PRE). **2425 (Gaborone):** Moopololo, (–BC), 8 Oct. 1970, *H. van Rensburg 4140* (PRE); railway crossing 5 km N of Gabarone, (–DB), 12 Sep. 1977, *O. Hansen 3182* (PRE).
- SOUTH AFRICA. LIMPOPO. 2329 (Pietersburg):** Pietersburg [Polokwane] District, Dendron, (–AD), Sep. 1939, *F. van der Merwe 1962* (PRE). **2428 (Nylstroom):** Nylstroom, (–CB), 22 Sep. 1905, *F. Rogers 2484* (PRE); 15 mi [24 km] NW of Nylstroom, (–CB), 26 Sep. 1950, *L. Codd 6152* (PRE); Warmbaths, (–CD), Sep. 1908, *R. Leendertz 6018* (PRE). **2429 (Zebediela):** Lebowa, Arabie, (–CD), 29 Sep. 1981, *W. Ellery 287* (PRE); Sekukuniland [Sekhukhuneland], Avontuur farm, (–DB), 38 Sep. 1934, *W. Barnard 44a* (PRE). **2431 (Acornhoek):** Klaserie, Fife farm, (–AC), 28 Oct. 1983, *N. Zambatis 1624* (PRE).
- NORTHWEST. 2525 (Mafeking):** Mafeking between town and river along pipeline, (–DC), 29 Nov. 1933, *M. Giffen 624a* (PRE). **2527 (Rustenburg):** Rustenburg, (–CA), 8 Oct. 1910, *R. Leendertz 9670* (PRE). **2627 (Potchefstroom):** Kiel, along road to Muiskraal, (–AC), 16 Oct. 1984, *B. Ubbink 1275* (PRE); Carletonville, Abe Bailey Nature Reserve, (–AD), Apr. 1983 [leafing], *S. van Wyk 237* (PRE); Potchefstroom, (–CA), 10 Oct. 1905, *J. Burt-Davy 2426* (PRE); Potchefstroom, common on western slopes of rantjie, (–CA), 20 Sep. 1940, *A. Goossens 1672* (PRE). **2725 (Bloemhof):** Wolmaransstad, Boskuil, (–BD), Nov. 1928, *J. Sutton 63* (PRE).
- GAUTENG. 2527 (Rustenburg):** Hennops River, (–DD), Oct. 1928, *A. Leeman s.n.* (PRE). **2528 (Pretoria):** Pienaar's River, (–AB), 7 Oct. 1921, *I. Pole-Evans 216* (PRE); Pretoria, Eloffsdal, (–CA), 2 Oct. 1972, *W. Hanekom 1861* (PRE); near Wonderboom on open grassy flats, (–CA), 15 Sep. 1949, *L. Codd 5603* (PRE); Roodeplaatdam Nature Reserve, (–CB), 27 Sep. 1979, *N. van Rooyen 1947* (PRE).
- MPUMALANGA. 2431 (Acornhoek):** ± 10 km NE of Skukuza, (–DC), 9 Sep. 1982, *J. Onderstall 779* (PRE).
- NORTHERN CAPE. 2723 (Kuruman):** 3 mi [5 km] NE of Kuruman, (–AD), 30 Nov. 1957, *O. Leistner 972* (PRE). **2821 (Upington):** ± 30 km from Upington on Kalkrand farm, (–BD), 10 Oct. 1992, *P. Burgoyne 1346* (PRE). **2822 (Glen Lyon):** sandveld at Bergenaars Pad, (–BC), 23 Oct. 1936, *J. Acocks & Hafström 1375* (PRE). **2823 (Griekwastad):** along Papkuil Road 10–30 mi [16–48 km] E of Postmasburg, (–AC), 27 Oct. 1910, *J. Acocks & Hafström 1121* (PRE); Asbestos Hills near Griquatown, (–CC), without date, *R. Marloth 7686* (PRE). **2824 (Kimberley):** Kimberley, Riverton, (–BD), Nov. 1923 [fruiting], *M. Wilman 2245* (BOL); 18 mi [29 km] N of Kimberley on banks of Vaal River, (–DA), 31 Oct. 1928, *A. Mogg 12418* (PRE); Barkly West, De Kuilen, (–DA), 1922, *M. Wilman 17374* (BOL). Without precise locality. Abundant around Postmasburg and Kuruman, Oct [ex hort. Prieska], without date, *E. Bryants 961* (NBG).

5. **Drimia macrocentra** (Baker) Jessop in J. S. Afr. Bot. 43: 292 (1977). *Urginea macrocentra* Baker in Gdnrs' Chron. 1: 702 (1887). *Boosia macrocentra* (Baker) Speta in Stapfia 75: 169 (2001). Type: South Africa, Eastern Cape, 'Transkei', without date, Barber 895 (K, holo. —image!).

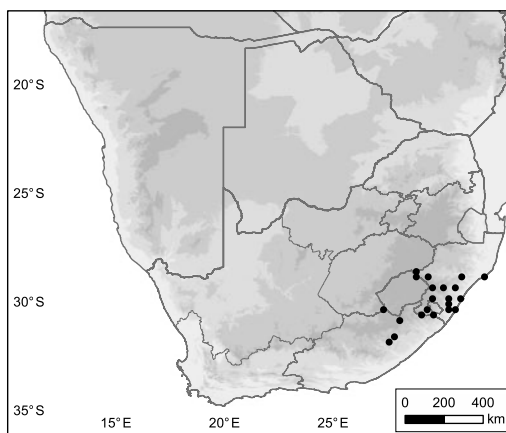
Urginea lilacina Baker in Fl. Cap. 6: 469 (1897). Type: South Africa, KwaZulu-Natal, Pietermaritzburg (2930): 'Inanda', (—DB), Sep. 1881, J. Medley Wood 642 (K, lecto. —image!, designated by Jessop in J. S. Afr. Bot. 43: 292 (1977); BM, NH—image!, SAM!, islecto.).

Urginea schlechteri Baker in Bull. Herb. Bois., sér. 2, 4: 1000 (1904). Type: South Africa, KwaZulu-Natal, Stanger (2931): 'Claremont' (—CC), 1 Aug. 1893, Schlechter 3155 [as '3158'] (BOL!, GRA, K, PRE!, Z, syn.).

Plants robust, deciduous, solitary. *Bulb* ovoid to subglobose, 15–30 mm diam., scales tightly packed, somewhat imbricate, outer scales succulent, truncate, flesh whitish to greenish. *Leaf* only produced by non-flowering plants, solitary, stiffly erect, cylindrical, 400–1 000 × 8–15 mm, firm-textured with pithy cortex, acute, glabrous. *Inflorescence* a dense, ellipsoid to cylindrical raceme, 300–800(–900) mm tall, 30- to 100-flowered, flowers often in clusters mostly 2–5 mm apart, but rachis elongating in fruit and then up to 10 mm apart; scape stiffly erect, cylindrical, glabrous, 8–15 mm diam., resembling the foliage leaf; bracts caducous, ovate to spatulate, 4–6 mm long, pinkish, lower few with long, oblong spur 20–35 mm long, forming a skirt-like collar around top of scape in bud, apex irregularly dentate or emarginate, remaining bracts with short or obsolete spur; pedicels suberect or erect-spreading, (2–)7–10(–12) mm long; bracteoles absent. *Flowers* spreading, campanulate, lightly clove-scented, perianth persisting below ripening capsule; tepals basally connate up to 0.5 mm, lobes suberect below and spreading or reflexed above, elliptic to oblong, 6–8 × 2–3 mm, apices penicillate, white or pinkish with green apical callus and with or without green keel. *Filaments* suberect, linear-lanceolate to filiform, 4–5 mm long, white. *Anthers* medifixed, oblong, ± 1 mm long, yellowish or ochre with yellow or orange pollen. *Ovary* ovoid-truncate, ± 3 mm long, green; style tapering, 2–3 mm long, white; stigma truncate-papillate. *Capsules* ovoid to ellipsoid, 9–11 mm long, locule margins heavily thickened. *Seeds* ellipsoid to arcuate, ± 5 mm long, testa minutely reticulate. *Flowering time*: September to October. Figure 1; Plate 3C.

Distribution and ecology: most common along the slopes and foothills of the Drakensberg, from Engcobo and Tsomo River in Eastern Cape through the KwaZulu-Natal midlands to Mont aux Sources, but also recorded near the coast in southern and central KwaZulu-Natal (Map 5); in moist grassland and seasonal seepages or streamsides, often on south-facing slopes, from near sea level to 1 500 m.

Diagnosis: a very distinctive species, the non-flowering plants producing a solitary, thick, cylindrical leaf up to 1 m tall, and flowering plants producing a similar-looking scape with a dense raceme of moderately large flowers. The inflorescence axis assumes the role of photosynthesis in flowering plants, which do not produce a foliage leaf. The floral bracts are caducous, falling at or shortly before anthesis and are thus largely absent at flowering, but diagnostic when the inflorescence is still in bud; the lower bracts producing extraordinarily long spurs, 20–35 mm long that hang down in a skirt-like collar around the scape below the raceme. The perianth persists below the developing capsule for some time.



MAP 5.—Distribution of *D. macrocentra*

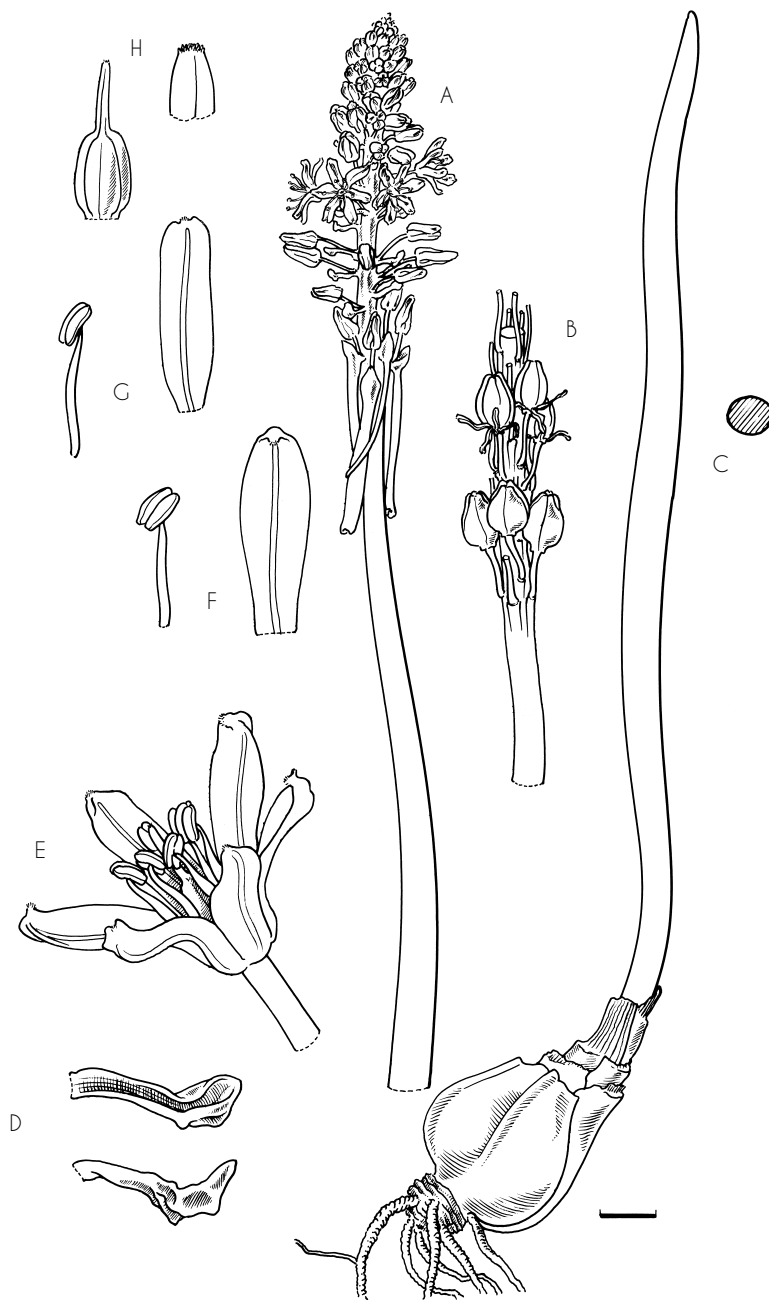


FIGURE 1.—*Drimia macrocentra*, Eastern Cape, Satansnek, Manning 3394A (NBG). A, inflorescence; B, capsules; C, leafing bulb, with leaf cross-section; D, upper floral bract, top and side views; E, flower; F, outer tepal and stamen; G, inner tepal and stamen; H, gynoecium plus enlarged detail of stigma. Scale bar: A–C, 10 mm; D–H, 2 mm. Artist: John Manning.

Additional specimens seen

SOUTH AFRICA. KWAZULU-NATAL. **2828 (Bethlehem)**: Royal Natal National Park, (–DB), Nov./Dec. 1963, *W. Trauseld* 125 (PRE); Sentinel track to Mont aux Sources, (–DD), 20 Nov. 1930, *Schweickerdt* 635 (PRE). **2829 (Harrismith)**: Cathedral Peak Forest Station, (–CD), 23 Nov. 1963, *D. Killick & Marais* 21450 (NU, PRE). **2830 (Dundee)**: Krantzkop, (–DD), Dec. 1910, *Thode s.n.* (NBG). **2831 (Nkandla)**: Empangeni, (–DD), Sep. 1923, *Mackay sub Marloth* 11659 (PRE). **2929 (Underberg)**: Mulangane Ridge above Crater's Nek, along stream-sides, (–BC), 2 Dec. 1983, *O. Hilliard & B. Burt* 17017 (NU, PRE); 30 km from Underberg on Kokstad Road, (–DC), 17 Jan. 1980, *T. Arnold* 1306 (PRE); Giant's Castle, *Tinley s.n.* (NU). **2930 (Pietermaritzburg)**: Umgeni Poort, (–AC), 3 Nov. 1964, *E. Moll* 1375 (PRE); New Hanover, Blinkwater Nature Reserve, poorly drained grassland, (–BC), 3 Oct. 1995, *T. Sikhakhane* 544 (PRE); Richmond, (–CD), Oct. 1963, *Henderson s.n.* (NBG); in swamp Claremont, (–DD), 30 Aug. 1893, *J. Medley Wood* 4941 (BOL, PRE); Merebank, (–DD), 17 Oct. 1913, *J. Medley Wood* 12520 (PRE). **3030 (Port Shepstone)**: Kenterton, (–AB), Sep. 1913, *J. Thode s.n.* (NBG); Dumisa, (–AD), *Rudatis* 438 (PRE).

EASTERN CAPE. **3027 (Lady Grey)**: Elliot District, summit of Garberg Peak, (–AD), 19 Nov. 1912, *E. Galpin* 8435 (PRE). **3028 (Maclear)**: Mt Tyndall, ± 20 km SNW [sic] of Maclear, (–CC), 1 650 m, 9 Nov. 1994, *S. Bester* 3232 (NBG, PRE). **3029 (Kokstad)**: Mt Currie, on slopes and along streams above *Faurea* belt, (–AD), 25 Nov. 1930, *A. Goossens* 357 (PRE); Matatiele, upper SW slopes of Unungi Range, (–CA), 20 Nov. 1945, *J. Acocks* 12208 (PRE); Ngeli Mt, (–DA), 19 Nov. 1986, *M. Jordaan* 827 (PRE). **3030 (Port Shepstone)**: Mgayi Hill, (–BC), 3 Oct. 1971, *C. Ward* 7231 (PRE). **3127 (Lady Frere)**: Engcobo, Satansnek, (–DB), 24 Nov. 2013, *J. Manning* 3394A (NBG); Tsomo River, (–DC), without date, *Bowker s.n.* (SAM).

Sect. 3. **Ledebouriopsis** (*Baker*) *J.C.Manning & Goldblatt*, stat. nov. *Ornithogalum* subg. *Ledebouriopsis* Baker in *J. Linn. Soc., Bot.* 13: 284 (1873). *Drimia* subg. *Ledebouriopsis* (*Baker*) Baker in *Fl. Cap.* 6: 437 (1897). Lectotype: *Drimia anomala* (*Baker*) Baker, designated here.

Urgineopsis Compton in *J. Bot.* 68: 107 (1930). Type: *Urgineopsis salteri* Compton = *Drimia salteri* (Compton) *J.C.Manning & Goldblatt*

Geschollia Speta in *Stapfia* 75: 169 (2001). Type: *Geschollia anomala* (*Baker*) Speta = *Drimia anomala* (*Baker*) Baker

Plants small. Bulb scales tightly packed, flesh white. Leaves one to several, terete or semiterete to linear and channelled above, glabrous or margins scabridulous, hysteroanthous or synanthous. Inflorescence a lax or dense raceme, up to 70-flowered; scape usually glabrous, rarely hispidulous below; bracts suborbicular to lanceolate, lower short- or longer-spurred; bracteoles absent or rarely present in some upper flowers only; pedicels suberect to spreading, shorter than to longer than tepals. Flowers diurnal, lasting up to 1 day, spreading, tepals cohering above and abscising below, forming a cap on top of the developing capsule; tepals shortly connate for up to ± quarter, spreading from base or suberect below and spreading above, elliptic-oblong, white to brownish with darker midrib, often firm-textured. Stamens: filaments suberect, subulate, 2–4 mm long, slightly longer than anthers; anthers medifixed, elliptic, 1.0–1.5 mm long, dehiscence longitudinal. Ovary ovoid; style ± as long as ovary, tapering or cylindrical; stigma truncate-papillate. Capsule ovoid to ellipsoid or rarely fusiform, 2–10 mm long. Seeds small, quadrangular to fusiform, sharply angled

Key to species

1a. Floral bracts 1.5–7.0 mm long:

2a. Plants evergreen with leaves synanthous; leaf blades concave above, the margins narrowly hyaline and smooth; bulb scales never fibrous, dark red below ground 9. *D. delagoensis*

2b. Plants deciduous with leaves hysteroanthous or emergent at flowering; leaf blades canaliculate, the margins slightly thickened and papillate; bulb scales ± fibrous, white to pink:

- 3a. Bulbs with a conspicuous collar of stiff, apical fibres 7. *D. multisetosa*
- 3b. Bulbs with at most a weak collar of fine, pale fibres. 6. *D. echinostachya*
- 1b. Floral bracts mostly up to 1 mm long:
 - 4a. Raceme congested, ellipsoid to subglobose with flowers mostly 0.5–2.0 mm apart:
 - 5a. Scape glabrous; perianth cup glabrous within; plants from extreme southwestern Western Cape ... 15. *D. salteri*
 - 5b. Scape longitudinally colliculate-scabridulous basally; perianth cup puberulous within; plants from Richtersveld 16. *D. barbata*
 - 4b. Raceme elongate, laxly cylindrical with flowers mostly more than 3 mm apart, rarely 1-flowered:
 - 6a. Bulb scales loose and stalked; scape puberulous basally. 10. *D. edwardsii*
 - 6b. Bulb scales tightly packed, not stalked; scape glabrous throughout:
 - 7a. Leaf solitary and stiffly erect, (2–)3–5 mm diam., sheathing base with wide, chestnut brown, papery margins; bulb often with a thick papery collar 8. *D. anomala*
 - 7b. Leaves 1 to 5, either solitary and erect but then less than 2 mm diam. or flexuous to drooping, sheathing bases with pale-papery margins, not forming a thick papery collar:
 - 8a. Raceme 1- to 3-flowered; plants from southern Namibia 13. *D. occultans*
 - 8b. Raceme > 3-flowered; plants from South Africa:
 - 9a. Capsules ellipsoid to fusiform (rarely ovoid), usually more than twice as long as wide, 2–3 mm diam.; plants from southwestern South Africa. 14. *D. dregei*
 - 9b. Capsules ovoid, up to twice as long as wide, 3–4 mm diam.; plants from southern and eastern South Africa:
 - 10a. Bulbs usually hypogeal, smoothly rounded; leaves up to 200 mm long; racemes 3- to 30(40)-flowered; pedicels 2–10 mm long 11. *D. calcarata*
 - 10b. Bulbs epigeal, keeled; leaves up to 500 mm long; racemes 40- to 90-flowered; pedicels 17–25 mm long. 12. *D. flagellaris*

6. ***Drimia echinostachya* (Baker) Eggli & N.R.Crouch** in *Bothalia* 42: 43 (2012). *Urginea echinostachya* Baker in *Fl. Cap.* 6: 468 (1897). Type: South Africa, KwaZulu-Natal, Pietermaritzburg (2930): 'Inanda', (–DB), J. Medley Wood 276 (K, holo. —image!; NH, iso.).

Ornithogalum cooperi Baker in *J. Linn. Soc., Bot.* 13: 284 (1873). *Drimia cooperi* (Baker) Benth. ex Baker in *Fl. Cap.* 6: 443 (1897), nom. illeg., non *D. cooperi* Baker (1868) [= *Ledebouria concolor* (Baker) Jessop]. Type: South Africa, Eastern Cape, 'ad oram orientalis', Barber s.n. (TCD, lecto., designated by Jessop in *J. S. Afr. Bot.* 43: 287 (1977); K—photo.).

Plants deciduous, solitary. *Bulb* ovoid to subglobose, 25–70 mm. diam, scales tightly packed, imbricate, outer scales firm-textured, with a weak collar of fine pale fibres where the blades have been shed or the scales damaged, flesh whitish to orange. *Leaves* emergent or partly synanthous, 2 to 4, suberect, 80–270 × 8–13 mm, sometimes twisted, weakly channelled or concave above and keeled below towards base, firm-textured, glabrous, margins lightly thickened, cartilaginous and papillate. *Inflorescence* an elongate, dense to moderately dense raceme but more lax below, 400–600 mm long, 30- to 70-flowered, flowers mostly 2–5 mm apart but lower up to 10 mm apart; scape glabrous, 2–3 mm diam.; bracts lanceolate, 2–7 mm long, lowest with spur 2–3 mm long; pedicels suberect-spreading, 2–4 mm long; bracteoles absent. *Flowers* spreading to nodding, campanulate; tepals connate 1.0–1.5 mm, thus up to ± one quarter, lobes suberect below and spreading or reflexed above, elliptic to oblong, 4.5–6.0 × 1.5–2.0 mm, apices penicillate, cream or brownish, with darker dorsal stripe. *Filaments* suberect, subulate to lanceolate, 2–4 mm long, pale. *Anthers* medifixed, oblong, 1.0–1.5 mm long, yellowish green. *Ovary* ovoid-truncate to ellipsoid, 2–3 mm long, green; style tapering, 2–3 mm long, white; stigma truncate-papillate. *Capsules and seeds* unknown. *Flowering time*: August to November, rarely December. Figure 2; Plate 2E.

Distribution and ecology: scattered through the midlands of Eastern Cape and KwaZulu-Natal and originally thought to be restricted to the escarpment foothills between Cathcart and Maclear but

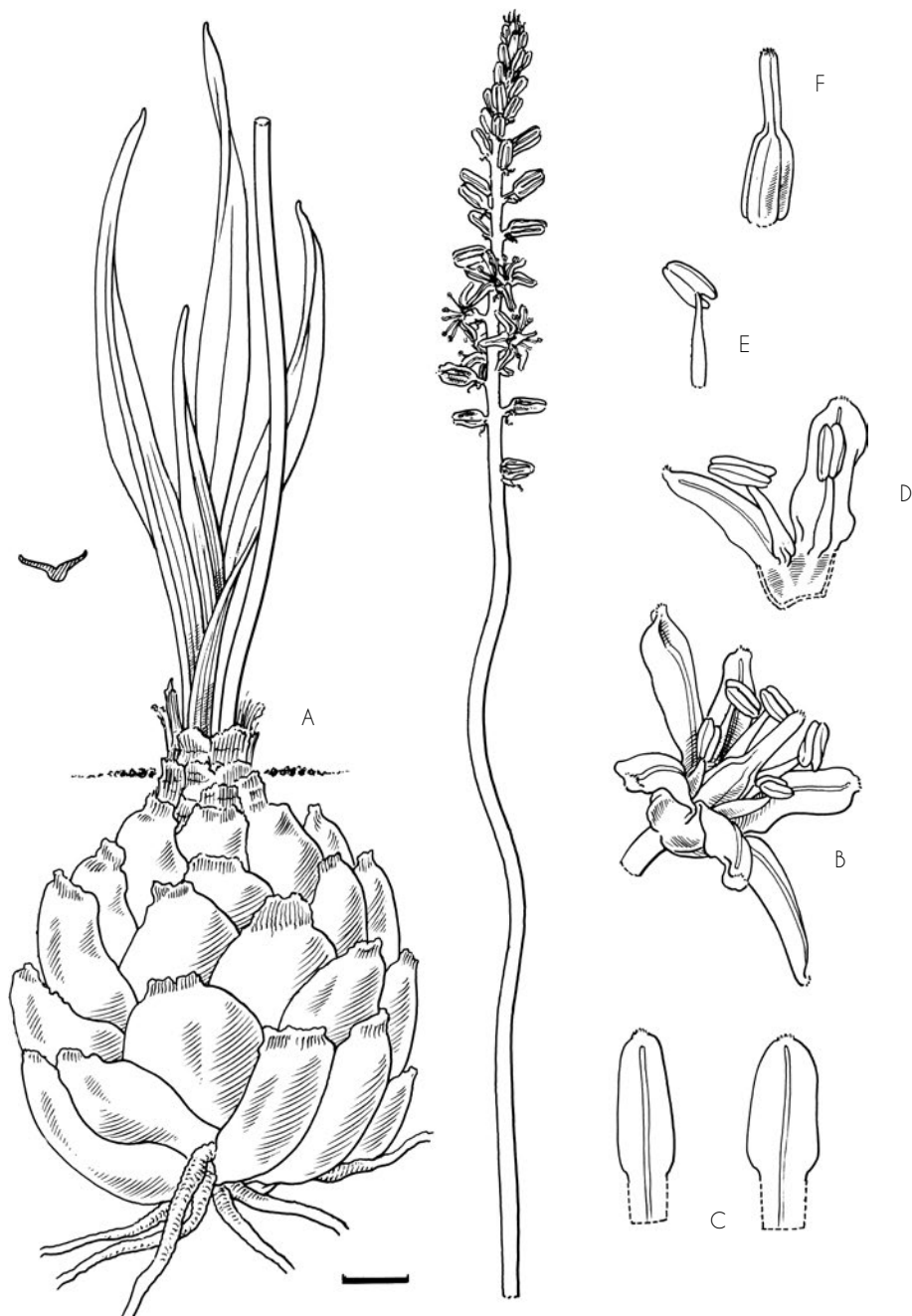


FIGURE 2.—*Drimia echinostachya*, Eastern Cape, Cathcart, Manning 3396 (NBG). A, flowering plant and emergent leaves, with leaf cross-section; B, flower; C, outer (left) and inner (right) tepals; D, tepal and stamen insertion; E, stamen; F, gynoecium. Scale bar: A, 10 mm; B–F, 2 mm. Artist: John Manning.

now also recorded from southern and central KwaZulu-Natal (Crouch et al. 2010) (Map 6); in stony grassland, from 300 to 700 m.

Diagnosis: recognised by the imbricate bulb scales decaying apically into weak, soft fibres, the narrowly lanceolate leaves that are emergent or partially synanthous at flowering, and the narrow, elongate, rather dense raceme of campanulate flowers with the tepals joined below for up to one quarter and spreading above. The similarity in inflorescence and flower structure suggests a relationship with *Drimia multisetosa* and possibly *D. anomala*, the former with two or three linear or involute leaves decaying to form a stiffly fibrous collar above the bulb, and the latter producing one or two terete or cylindrical leaves with broad papery sheath margins forming a papery collar when dry.

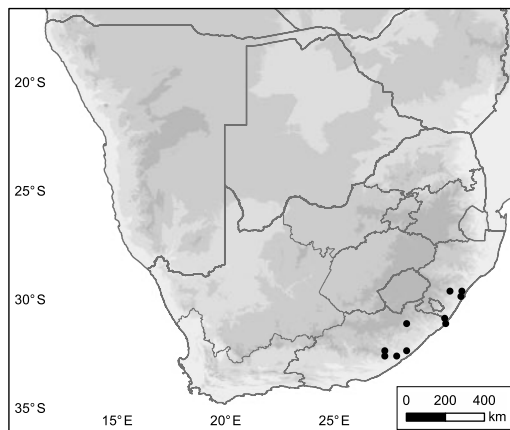
Additional specimens seen

SOUTH AFRICA. KWAZULU-NATAL. 2930 (Pietermaritzburg): Pietermaritzburg, Oribi, (–CB), 25 Oct. 1957, *W. Lawson* 584 (NH); Oribi Aerodrome, (–CB), 750 m, 17 Aug. 1965, *E. Moll* 1869 (PRE); Hesketh Conservation Area, top of Hayfields, (–CB), 12 Oct. 1008, *N. Crouch* 1179 (NH); Inanda, (–DB), Oct., *J. Medley Wood* 276 (NH); New Germany, (–DD), 17 Sep. 1998, *Y. Singh* 402 (NH). **3030 (Port Shepstone):** Umtamvuna Forestry Reserve, (–CC), 22 Sep. 1966, *R. Strey* 6967 (NH). **3130 (Port Edward):** Umtamvuna Nature Reserve, Pont Outpost, (–AA), 11 Sep. 1983, *A. Abbott* 1313 (NH); Umtamvuna Nature Reserve, Clearwater, (–AA), 14 Aug. 1985, *A. Abbott* 2704 (NH).

EASTERN CAPE. 3128 (Umtata): Maclear, Sunny Slopes farm, (–AB), 6 Nov. 1993, *S. Bester* (NH). **3227 (Stutterheim):** Cathcart, Thomas River, heights above Warburg Falls, (–AD), 24 Nov. 2012, *J. Manning* 3396 (NBG); Amatola Mountains, Dohne Peak, (–CB), Nov. 2000, *C. & R. McMaster* 2910-14 (NBG); near Komgha, (–DB), Dec. 1892, *H. Flanagan* 1302 (PRE). **3228 (Butterworth):** Kentani, hillslopes, (–AD), 3 Nov. [without year], *A. Pegler* 1395 (BOL).

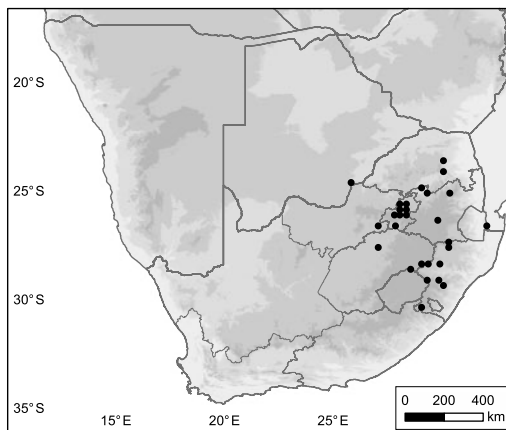
7. ***Drimia multisetosa* (Baker) Jessop** in *J. S. Afr. Bot.* 43: 299 (1977). *Urginea multisetosa* Baker in *Fl. Cap.* 6: 468 (1897). Type: South Africa, KwaZulu-Natal, Pietermaritzburg (2930): 'Natal, near Mooi River', (–AA), Oct. 1894, *J. Medley Wood* 5734 [K, lecto. —image!, designated by Jessop in *J. S. Afr. Bot.* 43: 299 (1977)].

Plants deciduous, solitary. *Bulb* ovoid to ovoid-oblong, 25–70(–80) × (15–)20–40 mm., scales tightly packed, outer scales leathery to cartilaginous, sticky and fibrous when torn, persistent leaf bases forming a ± strongly fibrous or wiry collar with transverse abscission thickenings, flesh whitish to pink. *Leaves* hysteroanthous and dry or emergent at flowering, often burned off, 2 or 3, suberect, channelled or involute, 120–400 × 2–14 mm when flattened, firm-textured and sclerotic, acute, glabrous, margins lightly thickened, cartilaginous and papillate, decaying to form a collar of wiry fibres, these usually burned off above ground. *Inflorescence* an elongate raceme, moderately dense above but more lax below, 200–500(–800) mm tall, (15)20- to 30(50)-flowered, flowers mostly 5–10 mm apart but lower up to 20 mm apart; scape glabrous, 1–2 mm diam.; bracts caducous,



MAP 6.—Distribution of *D. echinostachya*

ovate, 1.5–3.0 mm long, lowest with short oblong spur 1–3 mm long; pedicels suberect, (2–)3–6(–13) mm long; bracteoles absent. *Flowers* suberect or spreading, campanulate; tepals connate 1.00–1.75 mm, thus up to $\pm$ one quarter, lobes spreading or reflexed above, elliptic to oblong, 3.5–5.0 $\times$ 1.5–2.0 mm, apices penicillate, white, yellowish, greenish or brownish, with darker dorsal stripe. *Filaments* suberect, subulate to lanceolate, 3–4 mm long, pale. *Anthers* medifixed, oblong, 1.0–1.5 mm long, yellowish green. *Ovary* ovoid-truncate to ellipsoid, 2–3 mm long, green, style tapering, 2.0–2.5 mm long, white; stigma truncate or subcapitate, trisect-papillate. *Capsules* obovoid to subglobose, 6–10 mm long. *Seeds* ellipsoid to arcuate, 4–7 mm long, testa minutely reticulate. *Flowering time*: September to October.



MAP 7.—Distribution of *D. multisetosa*

Distribution and ecology: distributed through the near-interior of eastern South Africa, from Kokstad through the KwaZulu-Natal Midlands, Free State and Mpumalanga into Swaziland and north to Tzaneen in Limpopo and inland through Gauteng to Potchefstroom in Northwest and into southeastern Botswana (Map 7); in stony and rocky grassland or savanna.

Diagnosis: readily recognised by the characteristic collar of wiry fibres accumulating on top of the bulb, representing the persistent vascular elements in the leaf blades. The collar is usually burned off at ground level by veld fires, the result rather resembling a stiff brush, but is sometimes entirely removed. Such plants can be confused with *D. echinostachya*, but the two species are essentially allopatric and can be separated on their distribution. The raceme is moderately dense with the lower flowers rather more distant, and the floral bracts are short and caducous, 1.5–3.0 mm long, the lower with a short, oblong spur 1–3 mm long. The perianth persists at the base of the developing capsule for a while before abscising. The slender inflorescence with persistent perianth recalls that of some species of *Eriospermum*. The sclerotic leaves are mostly linear-canaliculate, but some forms have broader, lanceolate leaves.

Additional specimens seen

BOTSWANA: 2425 (Gaborone): railway crossing $\pm$ 5 km N of Gaborone, (–DB), 16 Sep. 1977, O. Hansen 3183 (PRE).

SWAZILAND: 2632 (Bela Vista): Stegi, (–CA), 16 Sep. 1964, B. Dlamini s.n. (PRE).

SOUTH AFRICA. LIMPOPO. 2330 (Tzaneen): Duiwelskloof, (–CA), 16 Sep. 1959., Scheepers 686 (PRE). **2430 (Pilgrim's Rest):** Lekgalameetse Nature reserve, Haffenden Heights, (–AA), 16 Sep. 1986, M. Stalmans 1384 (PRE).

NORTHWEST. 2627 (Potchefstroom): Potchefstroom University Grounds, (–CA), 20 Sep. 1940, Goossens 1677 (PRE).

GAUTENG. 2528 (Pretoria): Klerksoord (Rosslyn), veld opposite Princess Park College, (–CA), 6 Sep. 2003, S. Bester 4210 (PRE); National Botanic Garden, grassland N and NE of Education Building, (–CB), 17 Sep. 2004, S. Bester 5231 (PRE); near Irene, (–CC), Oct. 1929, A. Obermeyer 69 (PRE); Fairy Glen Nature Reserve, (–CD), 13 Sep. 1995, R. Williams 1219 (PRE). **2627 (Potchefstroom):** Transvaal Botanic Garden Roodepoort, open grassland next to stream above waterfall, (–BB), 24 Oct. 1983, C. Behr 598 (PRE); 3 km

NE of Walter Sisulu [National] Botanical Garden, Stallion Road, (–BB), 3 Oct. 1997, R. Reddy, K. Reddy & P. Reddy 624 (PRE); Vereeniging, (–DB), 17 Sep. 1908, J. Burt-Davy 6403 (PRE). **2628 (Johannesburg)**: Modderfontein, (–AA), Oct. 1907, A. Haagner 6822 (PRE); Naucefield, (–AA), 10 Oct. 1926, C. Moss 13662 (NBG); Johannesburg, (–AA), Oct. 1915, F. Rogers s.n. (BOL); Melville Koppies, (–AA), 20 Sep. 1960, M. MacNae 1221 (BOL, NBG); Benoni, (–AB), 9 Sep. 1934, R. Bradfield 86 (PRE).

MPUMALANGA. **2429 (Zebediela)**: Knoppiesfontein, (–CC), Sep. 1909, T. Jenkins 7233 (PRE). **2529 (Witbank)**: Groblersdal, W of golf course, (–AB), 18 Oct. 1977, A. Mauve & F. Venter 5013 (PRE). **2530 (Lydenburg)**: Witklip, (–AB), 4 Sep. 1973, J. Kluge 155 (PRE); Badplaas, (–DC), Van der Merwe 1637 (PRE). **2629 (Bethal)**: Ermelo District, 8 km from Breyten on road to Morgenster, (–BD), 28 Sep. 1977, S. Venter 2092 (PRE). FREE STATE. **2727 (Kroonstad)**: Kroonstad, (–CA), Oct. 1929, J. Pont 482 (PRE). **2828 (Bethlehem)**: Qwa Qwa National Park, Honingkloof, (–DA), 16 Oct. 1996, P. Zietsman 3554 (PRE). **2829 (Harrismith)**: Sterkfontein Dam near View Point, (–AC), rocky hill, 16 Oct. 1974, M. Jacobsz 1814 (NBG); Rensburgskop, 7 km from Swinburne, (–AD), 22 Feb. 1963, M. Jacobsz 474 (PRE).

KWAZULU-NATAL. **2730 (Vryheid)**: Utrecht District, Retirement farm, (–AD), 9 Oct. 1977, N. Devenish 1720 (PRE); Utrecht, Tweekloof, (–CB), Oct./Dec. 1923, J. Thode A301 (PRE). **2829 (Harrismith)**: ± 50 km from Newcastle on road to Ladysmith near Andrew's Motel, (–BD), 25 Sep. 1981, A. van Wyk 4989 (PRE). **2929 (Underberg)**: Giant's Castle Game Reserve, (–AB), Trauseld 999 (PRE); Mooi River, Mableston, (–BB), 23 Oct. 1918, A. Mogg 3108 (PRE). **2930 (Pietermaritzburg)**: Lion's River, (–AC), 27 Sep. 1918, A. Mogg 1301A (PRE); Tweedie, (–AC), 27 Sep. 1918, A. Mogg 1318 (PRE); Pietermaritzburg, Scottsville, (–CB), Allsopp 885 (NU). **3029 (Kokstad)**: Cedarville, Mvenyani, (–AC), Banders 21 (GRA). **3030 (Port Shepstone)**: St Michael, (–AB), Sep. 1913, J. Thode s.n. STE3473 & 3477 (NBG).

8. **Drimia anomala** (Baker) Baker in Fl. Cap. 6: 442 (1897). *Ornithogalum anomalum* Baker in Refug. Bot. 3: t. 178 (1870). *Geschollia anomala* (Baker) Speta in Stapfia 75: 169 (2001). Type: South Africa, 'sent from South Africa by Mr Thos. Cooper', illustration in Refug. Bot. 3: t. 178 (1870).

Urginea eriospermoides Baker in Gard. Chron. 2: 126 (1887). Type: South Africa, 'Cape', MacOwan s.n. (K, holotype, —image!).

[*Urginea cataphyllata* Oberm. ms.]

Plants deciduous, solitary or rarely clumped. *Bulb* subglobose to ovoid, 25–70(–100) mm diam., scales tightly packed, outer scales thinly leathery, persisting in short or long, thick papery neck or collar with transverse abscission lines, flesh whitish to pink. *Leaf* usually synanthous, solitary (rarely 2), suberect, cylindrical, 170–300 × (2)3–5(–10) mm, dark green, obtuse but withering from apex via transverse abscission plates, glabrous, sheathing base with broad, chestnut brown, papery margins. *Inflorescence* a moderately dense, elongate raceme 200–500(–600) mm tall, 15- to 80(100)-flowered, flowers sometimes in clusters, mostly 2–5 mm apart; scape glabrous, 1.5–5.0 mm diam.; bracts ovate-deltoid, 1.0–1.5 mm long, lowest with short spur 1–2(–5) mm long; pedicels spreading, (2–)3–5(–8) mm long; bracteoles absent. *Flowers* spreading, rotate or shallowly campanulate, unscented [scented fide Jesop (1977)]; tepals connate ± 1 mm, lobes either suberect below or spreading to slightly recurved from the base, elliptic to oblong, 4–5 × 1.5 mm, apices penicillate, white, yellowish or greenish to pale pink, with darker dorsal stripe, unscented. *Filaments* suberect or weakly spreading, subulate, 2.5–3.0 mm long, pale. *Anthers* medifixed, oblong, ± 1 mm long, yellowish green. *Ovary* ovoid-truncate to ellipsoid, 1.5–2.0 mm long, green; style columnar, 1.5–2.0 mm long, white; stigma truncate-papillate. *Capsules* ovoid to ellipsoid, obtuse to truncate, 4–6 mm long. *Seeds* strongly angled, 1.5–2.0 mm long, testa minutely reticulate. *Flowering time*: November to January (rarely February); flowers opening mid-afternoon and withering in the evening. Figure 3; Plate 1C.

Distribution and ecology: distributed through the drier southern parts of South Africa, from near Prince Albert and Klaarstroom in Western Cape through Eastern Cape to Butterworth (Map 8); commonly

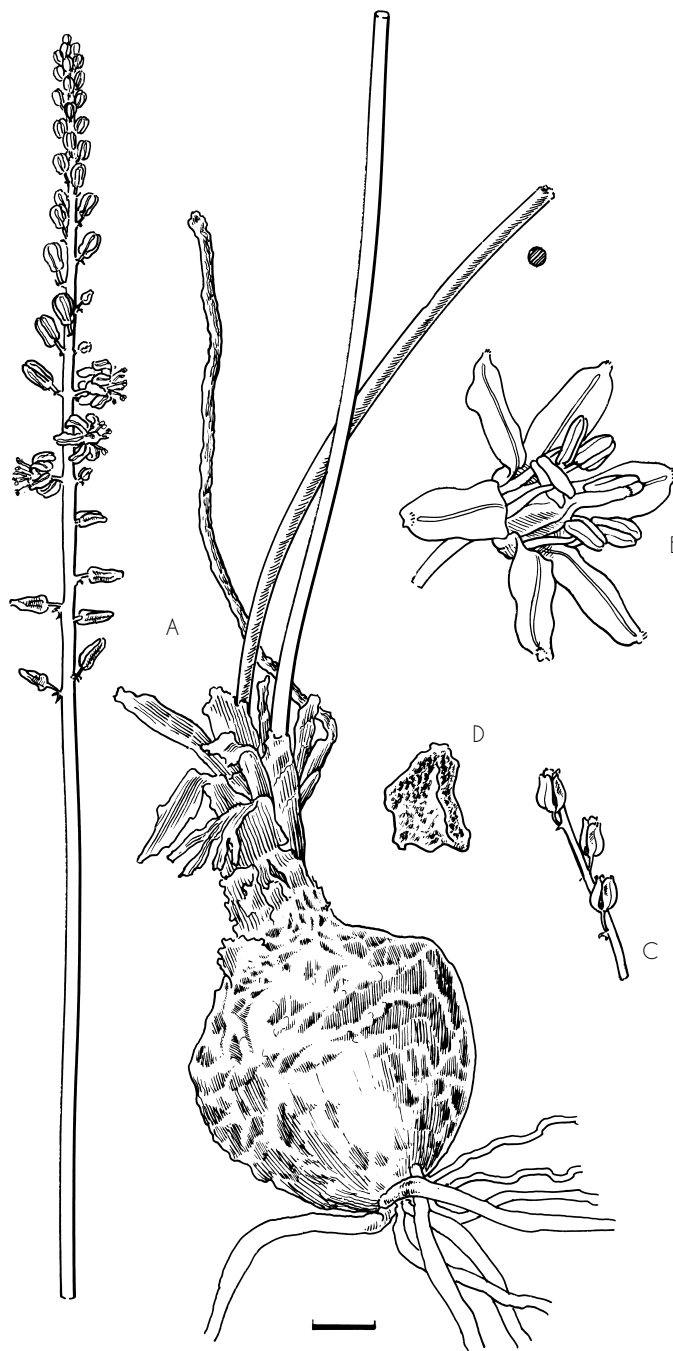
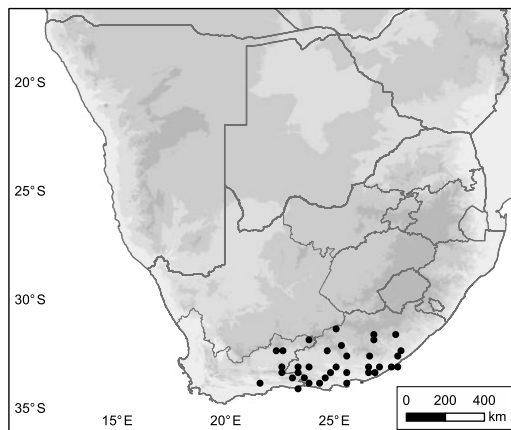


FIGURE 3.—*Drimia anomala*, Eastern Cape, Gonora, without voucher. A, flowering plant, with leaf cross-section; B, flower; C, capsules; D, seed. Scale bar: A, C, 10 mm; B, 2 mm; D, 1 mm. Artist: John Manning.

on rock ledges, often in shale. We provisionally include here a collection of two isolated inflorescences said to have been collected near Barrydale [Perry 929 (NBG)], but its occurrence this far west remains to be confirmed.

Diagnosis: distinguished by its elongate raceme of moderately small flowers, with tepals recurved from near the base, 5–6 mm long and connate for ± 1 mm, and the solitary (rarely two), cylindrical leaves usually present at flowering and mostly 3–5 mm diam. The leaf blade withers from the apex in sections separated by a distinct transverse abscission layer, thus is generally truncate and dry at the apex. The partially sheathing leaf bases have broad, papery, chestnut brown margins, and persist to form a conspicuous collar or neck of papery segments above the bulb. The bracts are small, 1.0–1.5 mm long, the lower with a short spur 1–2(–5) mm long. The capsules are remarkably small for the size of the inflorescence, 4–6 mm long, and contain small, strongly angled seeds 1.5–2.0 mm long.



MAP 8.—Distribution of *D. anomala*

Additional specimens seen

South Africa. WESTERN CAPE. **3123 (Victoria West)**: near Murraysburg, (–DD), Oct. 1879, W. Tyson 165 (SAM). **3125 (Steynsburg)**: Middelburg, Bangor farm, (–AC), Dec. 1917, H. Bolus 14107 (BOL). **3222 (Beaufort West)**: Beaufort West, Karoo National Park, (–AD), 6 Dec. 2005, A. Mudau 21 (NBG); Beaufort West, Stolshoek, (–AD/BC), 22 Nov. 1988, P. Bruyns 3423 (BOL). [Unconfirmed record]: **3320 (Montagu)**: Barrydale, (–DC), without date, P. Perry 929 (NBG). **3321 (Merweville)**: near Prince Albert, (–DC), Dec. 1904, H. Bolus 11655 (BOL). **3322 (Oudtshoorn)**: Klaarstroom, Koppieskraal, (–BA), 13 Dec. 2001, P. Bruyns 8969 (NBG); near Oudtshoorn, (–BC), Dec. 1905, H. Bolus 12403 (BOL); Meiringspoort, (–BC), rocky ledges, 5 Dec. 1985, P. Perry 3410 (NBG). EASTERN CAPE. **3126 (Queenstown)**: Andriesberg, (–DB), 6 Dec. 1896, E. Galpin 2233 (BOL); Queenstown, near Fincham's Nek, (–DD), Nov. 1896, E. Galpin 2202 (BOL). **3127 (Lady Frere)**: hills near Engcobo, (–DB), 12 Oct. 1961, E. Esterhuysen 29244 (BOL). **3224 (Graaff-Reinet)**: near Graaff-Reinet, (–BC), Dec. 1905, H. Bolus 12401 (BOL); 2 Dec. 1950, W. Barker 7096 (NBG). **3225 (Somerset East)**: Welbedacht, NW of Cradock, (–AB), 24 Dec. 1980 [fl. ex hort.], P. Bruyns 1582 (BOL, NBG); Boschberg, near Charlton Falls, (–DA), rock ledges, 11 Dec. 2008, V. Clark & J. Le Roux 491 (NBG); Somerset East, near Cookhouse, (–DA), Jan. 1902, L. Kensit s.n. (BOL). **3226 (Fort Beaufort)**: Balfour, Fort Armstrong, (–DA), 6 Jan. 1950, B. Martin 147 (NBG). **3227 (Stutterheim)**: grassy places near Kei Bridge, (–DB), Dec. 1891, H. Flanagan 1178 (BOL). **3228 (Butterworth)**: Butterworth, Hospital Hill, (–AC), 31 Dec. 1910, A. Pegler 1801 (BOL). **3323 (Willowmore)**: 20 miles [32 km] N of Willowmore, (–AB), 3 Dec. 1950, W. Barker 7127 (NBG); Georgida, (–AD), without date [ex. hort.], M. Bayer s.n. (NBG); Willowmore, Miller, (–BB), 5 Dec. 1947, W. Barker 5012 (NBG); hills near Avontuur, (–CA), Jan. 1920, H. Fourcade 2490 (BOL); Uniondale, hills from Misgund to Spitzkop, (–CA), Dec. 1928, H. Fourcade 4251B (BOL); 7 km E of Uniondale towards Baviaanskloof, (–CA), 29 Sep. 1980, P. Perry 1444 (NBG); Joubertina, Maraisdal, NE of Luiskraal homestead, (–DA), without date [ex. hort.], J. Forrester 400 (NBG); Uniondale, N foot of Tsitsikamma Mt near Joubertina, (–DD), 25 Feb. 1951, E. Esterhuysen 18343 (BOL). **3324 (Steytlerville)**: near Steytleville, (–AD), 3 Dec. 1947, R. Compton 20314 (NBG); Springbokvlakte, (–BD), 2 Dec. 1947, W. Barker 5066 (NBG); Kromme River, E of Assegaibosch, (–CD), Jan. 1931 [fl. ex hort.], H. Fourcade 3943 (BOL); Kouga Dam, (–DA), 19 Nov. 2002, E. Van Jaarsveld 17120 (NBG). **3325 (Port Elizabeth)**: Sunday's River, (–AA), Jan. 1932, Mrs Harries s.n.

(BOL); Zuurborg, Anne's Villa, (–BC), 30 Dec. 1965, R. Bayliss 3114 (NBG); Redhouse near Port Elizabeth, (–DC), Dec. 1914, F. Paterson 506 (BOL). **3326 (Grahamstown)**: S of Fort Brown, (–BA), 7 Nov. 1997, D. Snijman 1641 (NBG); Fort Brown, (–BA), 2 Feb. 2008, J. McMaster s.n. (NBG); Grahamstown, Howieson's Poort, (–BC), 18 Jan. 2002, J. Manning 2702 (NBG); Trappe's Valley, (–BD), 11 Jan. 1947, R. Compton 19121 (NBG); W of Fraser's Camp, (–BD), 30 Nov. 1950, W. Barker 7001 (NBG). **3327 (Peddie)**: Peddie, (–AA), 11 Jan. 1947, F. Leighton 2646 (BOL); East London, mouth of Chalumna River, (–BA), 24 Dec. 1901, E. Galpin 6293 (BOL); East London, Chalumna Causeway, (–BA), 29 Nov. 1950, W. Barker 6965 (NBG); East London, Buffalo Pass, (–BB), rock crevices, 28 Nov. 1945, R. Compton 17783 (NBG). **3423 (Knysna)**: Knysna, flats near Bitou River, (–AB), Mar. 1910, H. Fourcade 615 (BOL); Knysna, Plettenberg Bay, (–AB), 26 Feb. 1955, E. Esterhuysen 24210 (BOL).

9. ***Drimia delagoensis* (Baker) Jessop** in J. S. Afr. Bot. 43: 294 (1977). *Urginea delagoensis* Baker in Fl. Cap. 6: 467 (1897). *Sekanama delagoensis* (Baker) Speta in Stapfia 75: 168 (2001). Type: Mozambique, 'between Delagoa Bay and the Lebombo Mountains', 1886, H. Bolus 7627 (K, holo. —image!; BOL!, iso.).

Urginea lydenburgensis R.A.Dyer in Flower. Pl. S. Afr. 22: t. 859 (1942). Type: South Africa, Mpumalanga, 'Lydenburg District', Sep. 1937, Swart s.n. PRE23303 (PRE [2 sheets], holo.!).

Plants evergreen, solitary or clumped. *Bulb* subglobose to ovoid, (20–)40–80(–100) mm diam., scales tightly packed, imbricate, accumulating, outer scales truncate, at length dry and leathery, bulbs either subterranean, then pink or red, or partly epigeal, then exposed portion green. *Leaves* synanthous, (1)2 to 6(12), suberect or erect-spreading, subterete or linear and channelled below, tapering and subterete distally, 130–300(–450) × (1–)2–10(–15) mm, green or glaucous, acute, longitudinally ribbed when dry, margin narrowly hyaline. *Inflorescence* a moderately dense or more lax, elongate raceme 200–300(–600) mm tall, 10- to 50(60)-flowered, flowers sometimes in clusters, mostly 5–10 mm apart; scape glabrous, 1–3 mm diam.; bracts caducous or aborting, ovate to lanceolate, 2–5 mm long, lowest with short spur 2–5 mm long; pedicels suberect or spreading, 2–5(–6) mm long; bracteoles absent. *Flowers* spreading or slightly nodding, campanulate, unscented; tepals connate ± 0.5 mm, lobes erect below and spreading above, elliptic to oblong, (3–)4–5 × 1.0–1.5 mm, apices penicillate, white, yellowish or greenish to pale pink, with darker dorsal stripe. *Filaments* suberect or slightly spreading above, linear, 2.5–4.0 mm long, pale. *Anthers* medifixed, oblong, ± 1 mm long, yellowish green. *Ovary* ovoid-truncate or subglobose, 1.5–2.0 mm long, green; style terete, 1.5–2.0 mm long, white; stigma truncate-papillate. *Capsules* ellipsoid to narrowly ellipsoid, 7–10 × 3–4 mm long. *Seeds* narrowly lanceolate, 4–8 × 1–2 mm, testa striate with longitudinally elongated epidermal cells. *Flowering time*: July to September; flowers opening late morning and fading by evening. Figure 4.

Distribution and ecology: a species of the subtropical lowveld region, recorded from the coastal parts of northern KwaZulu-Natal and the Lebombo Mtns into Swaziland, southern Mozambique and Mpumalanga inland to Nelspruit (Map 9); on rock ledges and shallow pans on rock sheets.

The bulbs are toxic and caustic, and the juice is used traditionally to preserve hides [*Gerstner* 3108 (PRE)].

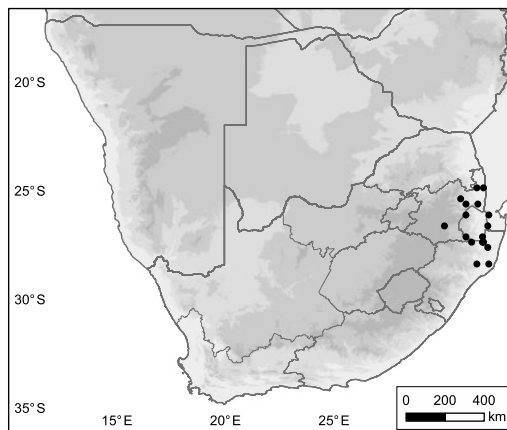
Diagnosis: one of the few evergreen species in the genus, with the leaves persisting for more than a single growing season and thus present at flowering, *Drimia delagoensis* is characterised by its dark red bulb scales except where these are exposed to the light when the bulbs are semi-epigeal. The bulbs typically divide to form small clusters or clumps, each bulb producing (1)2 to 6(12) narrow, subterete or linear-canaliculate leaves, (1–)2–10(–15) mm wide, the blades tapering and subterete distally. The raceme is narrow and elongate, with small, campanulate flowers with tepals 3–5 mm long and connate only



FIGURE 4.—*Drimia delagoensis*, ex hort., without voucher. A, flowering plant, with leaf cross-section; B, flower; C, three tepals and attached stamens; D, stamen; E, gynoeceum, side and top views; F, capsules; G, seed. Scale bar: A, F, 10 mm; B–E, 2 mm; G, 1 mm. Artist: John Manning.

at the base. The capsules are distinctive in being narrowly ellipsoid, 7–10 mm long, with narrowly lanceolate, striate seeds with longitudinally elongated testal cells. *Drimia edwardsii*, with similar flowers and capsules, bulbs with loose, pale grey, stalked scales produces a solitary terete leaf, and the scape is pubescent at the base.

Crouch & Martínez-Azorín (2015) consider *Urginea hydenburgensis* to be distinct from *D. delagoensis* and tabulate the differences between them. These are essentially vegetative: *U. hydenburgensis* has hypogeal bulbs with pinkish scales, and 1 or 2, erect-pendent leaves with a subterete blade, 3–5 mm wide with a flattened or shallowly grooved upper surface; and *D. delagoensis* has semi-epigeal bulbs with green scales, and 3 to 8, erect-spreading leaves with a linear blade, 8–15 mm wide, with a deeply channelled upper surface. They also report some chemical differences between the two taxa. Additional field work is required to confirm this distinction, especially given that the bulb scales of some collections of *D. delagoensis* are dark red, and that the distal portion of the leaves is invariably subterete, 1–3 mm wide, with a slightly flattened upper surface, thus comparable with the leaves of *U. hydenburgensis*. Until the matter has been thoroughly investigated we follow Jessop (1977) in considering the two to be conspecific.



MAP 9.—Distribution of *D. delagoensis*

Additional specimens seen

SWAZILAND. 2631 (Mbabane): Nkomati New Bridge, 200 m upstream, granite bank, (–AA), 2 Oct. 1991, K. Braun 1176 (PRE). **2632 (Bela Vista):** Lebombo Mtns S of Umbuluzi Gorge, Blue Jay Ranch, (–AA), 17 Sep. 1977, J. Culverwell 973 (PRE); 20 mi [28 km] SE of Stegi, (–CA), 16 Sep. 1964, M. Karsten s.n. (PRE); top of Mtibhlati River Valley, NE of Maphungwane, (–CA), 23 Nov. 2001, H. Steyn 340 (PRE). **2731 (Louwsburg):** Ingwavuma Poort, (–AA), 29 Aug. 1960 [ex hort.], M. Karsten s.n. (NBG, PRE); 7 miles [11 km] W of Gollel, (–BD), 25 Sep. 1959, R. Compton 29108 (NBG, PRE).

SOUTH AFRICA. MPUMALANGA. 2431 (Acornhoek): N bank of Sabie near Skukuza, (–DC), 6 Nov. 1949 [fl. ex hort. Sep. 1950], Codd 5717 (PRE); Kruger National Park near Tshokwane, (–DD), Sep. 1980, D. Hardy 5432 (PRE). **2530 (Lydenburg):** Nelspruit, Lowveld Botanic Garden, (–BD), dark soil among rocks, bulbs maroon inside, 14 Sep. 1969, E. Buitendag 93 (NBG, PRE); 27 Sep. 1969, E. Buitendag 118 (NBG). **2531 (Komatipoort):** 21 km W of Eureka Station on Barberton–Kaapmuiden Road, (–CA), 13 Aug. 1979, D. Hardy 5228 (PRE); 6 km SE of Nelspruit, granite outcrops, rock fissures and shallow depressions, (–CA), 2500' [760 m], 26 Sep. 1980, J. Onderstall 381 (NBG); Buffelspruit/Malelane, 10 km from Kaalrug to Schoemansdal, (–DA), 19 Oct. 2009, Lukhele 52 (PRE); Lebombo flats, (–DB), 22 Dec. 1932 [ex hort.], E. Galpin s.n. (BOL). **2630 (Carolina):** Ermelo, Drinkwater farm, (–CA), Sep. 1912, J. Burt-Davy 6607 (BOL). **KWAZULU-NATAL. 2731 (Louwsburg):** Ngwavuma, Pongola Poort, (–AD), 17 Nov. 1961, C. Ward 3897 (PRE); Cecil Mack Pass, next to road on rocky ledges, (–BB), 31 Aug. 1878 [fl. ex hort.], F. Venter 3759 (PRE); Jozini Dam, (–BD), 12 Jan. 1964, R. Strey 5149 (PRE); 7 Sep. 1971, R. Strey 10420 (PRE). **2732 (Ubombo):** Pongola Poort, (–BD), 7 Aug. 1962, J. Repton 5986 (PRE); 2 km from Ubombo/Jozini/Sodwana crossroad, (–CA), 5 Dec. 1983, A. van Wyk 6675 (PRE). **2831 (Nkandla):** Entonjaneni District, 9 mi [14 km] W of Biyela Store, (–BC), 10 Oct. 1946, J. Acocks 13001 (PRE). **2832 (Mtubatuba):** bushveld towards Mtubatuba on sandstone, (–AC), Nov. 1938, J. Gerstner 3108 (BOL).

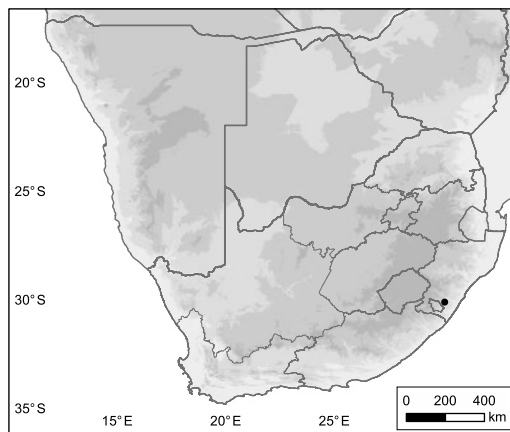
10. ***Drimia edwardsii*** N.R.Crouch & Mart.-Azorín. in *Phytotaxa* 195: 137 (2015). Type: South Africa, KwaZulu-Natal, Port Shepstone (3030): 'middle Mkhomazi River', (–AA), 21 Sep. 2011, N. Crouch 1280 (BNRH, holo.; HSMC, iso.).

Plants solitary. *Bulb* subglobose, ± 70 mm diam., scales very loose, cucullate, stalked, pale greyish. *Leaf* synanthous, solitary, erect or flexuous, subterete and shallowly channelled on upper surface, $70\text{--}360 \times 0.5\text{--}2.0$ mm, dark green, acute, longitudinally angled and denticulate along angles. *Inflorescence* a moderately lax, elongate raceme $150\text{--}320$ mm tall, 15- to 60-flowered, flowers sometimes in clusters, mostly 5–10 mm apart; scape puberulous basally, $1.5\text{--}2.0$ mm diam.; bracts caducous or aborting, ovate-naviculate, $0.7\text{--}1.0$ mm long, lowest with obsolete spur; pedicels suberect or spreading, 3–5 mm long; bracteoles absent. *Flowers* spreading or slightly nodding, campanulate, unscented; tepals connate ± 0.3 mm, lobes erect below and spreading above, elliptic to oblong, $4\text{--}6 \times 1.0\text{--}1.5$ mm, apices penicillate, pale brownish with darker keel.

Filaments suberect or slightly spreading above, subulate, ± 2.5 mm long, pale. *Anthers* medifixed, oblong, ± 1 mm long, yellowish. *Ovary* ovoid-truncate, 1.5 mm long, green; style terete, 1.5 mm long, white; stigma truncate-papillate. *Capsules* narrowly ellipsoid, $\pm 7.5 \times 3$ mm long. *Seeds* narrowly lanceolate, $\pm 5 \times 1.5$ mm. *Flowering time*: August to October; flowers opening late morning and fading by evening.

Distribution and ecology: restricted to the central Mkhomazi River Valley in southern KwaZulu-Natal (Map 10); in crevices and shallow soils on shale outcrops in woodland and thicket.

Diagnosis: a synanthous species distinguished from similar small-flowered species like *Drimia delagoensis* by the very loose, stalked, pale greyish bulb scales, solitary semiterete-channelled leaf, and puberulous base to the scape. The floral bracts are scarcely 1 mm long with an obsolete spur and the plants are evidently always solitary, with the bulbs strictly subterranean and never forming clumps.



MAP 10.—Distribution of *D. edwardsii*

11. ***Drimia calcarata*** (Baker) Stedje in Nord. J. Bot. 7: 663 (1987). *Urginea calcarata* (Baker) Hilliard & B.L.Burt in Notes Roy. Bot. Gard. Edinb. 42: 252 (1985). *Ornithogalum calcaratum* Baker in Gard. Chron. 1: 723 (1874). Type: illustration by W.H. Fitch, made from living plant sent from Eastern Cape by MacOwan (K).

Urginea modesta Baker in Bot. Jahrb. 15, Beibl. 35: 6 (1892). *Drimia modesta* (Baker) Jessop in J. S. Afr. Bot. 43: 302 (1977). Type: South Africa, Eastern Cape, 'Pondoland', Bachmann 273 (K, holo. —image!).

Urginea tenella Baker in Fl. Cap. 6: 464 (1897). Type: South Africa, KwaZulu-Natal, Harrismith (2829): 'Van Reenen', (–AD), 17 Dec. 1891, J. Medley Wood 4562 (K, holo. —image!; NH, iso.).

Urginea riparia Baker in Fl. Cap. 6: 467 (1897). Type: South Africa, KwaZulu-Natal, Pietermaritzburg (2930): 'Umzinyati Falls', (–DB), without date, J. Medley Wood 1052 (K, holo. —image!; NH, iso.).

Urginea rubella Baker in Fl. Cap. 6: 467 (1897). Type: South Africa, KwaZulu-Natal, Pietermaritzburg (2930): 'Mooi River', (–AA), 27 Oct. 1894, J. Medley Wood 5723 (K, holo. —image!; BM, BOL!, PRE!, iso.).

- Urginea natalensis* Baker in Fl. Cap. 6: 468 (1897). Type: South Africa, KwaZulu-Natal, Pietermaritzburg (2930): 'Inanda', (–DB), without date, J. Medley Wood 277 [K, lecto. —image!, designated by Jessop in J. S. Afr. Bot. 43: 303 (1977)].
- Urginea pauciflora* Baker in Bull. Herb. Boiss., sér 2, 1: 786 (1901), nom. illeg., non *U. pauciflora* Baker (1898). *Urginea umgeniensis* V.Poelln. in Ber. Deutsch. Bot. Ges. 61: 209 (1944), as nom. nov. Type: South Africa, KwaZulu-Natal, Pietermaritzburg (2930): 'Umgeni Falls', (–AC), Rehmann 7455 (Z, holo.).
- Urginea pretoriensis* Baker in Bull. Herb. Boiss., sér. 2, 1: 786 (1901). Type: South Africa, Gauteng, Pretoria (2528): 'Pretoria, Aapies [Apies] River', (–AD), Rehmann 4307 (Z, holo.).
- Drimia loedolffiae* Van Jaarsv. in Van Jaarsveld & Van Wyk in Aloe 43: 50 (2006), syn. nov. Type: South Africa, Eastern Cape, Butterworth (3228): 'near Kei River Mouth', (–CB), 6 Mar. 2003, E. van Jaarsveld & Voigt 17914 (NBG, holo.!).

Plants deciduous, solitary or sometimes colonial. *Bulb* hypogeal or sometimes partly epigeal, subglobose to ovoid, 25–55 mm diam., scales adherent or outer slightly looser, outer scales becoming thinly leathery with age, flesh whitish. *Leaf* solitary (rarely leaf from previous season persisting), hysteroanthous but sometimes synanthous in damp sites, erect or arching, flaccid, terete, 40–20 × 0.5–1.5(2.0) mm, glossy green or glaucous, subacute, glabrous, sheathing bases sometimes forming leathery neck. *Inflorescence* a moderately lax, short or elongate raceme (50–)150–200(–300) mm tall, (5)8- to 30(40)-flowered, usually persisting and remaining photosynthetic after flowering; scape erect or flexuous, rarely inclined and secund, glabrous, 1–2 mm diam.; bracts ovate-naviculate, 0.5–1.5(–2.0) mm long, lowest with spur (1–)2–5(–7) mm long; pedicels suberect or arcuate-ascending, 2–8(–10) mm long, sometimes elongating to 15 mm in fruit; bracteoles absent. *Flowers* spreading, shallowly campanulate; tepals connate 0.5–1.0 mm, lobes spreading or slightly reflexed above, elliptic, 3–5 × 1.5–2.5 mm, apices penicillate, white with green or brown keels. *Filaments* suberect, filiform to lanceolate, 2–4 mm long, white. *Anthers* medifixed, ovate, 0.5–1.0 mm long, yellow or reddish. *Ovary* ovoid, 1.5–3.0 mm long, yellowish green; style columnar, 1.5–3.0 mm long, white; stigma truncate-papillate. *Capsules* ovoid, 4–6 × 3–4 mm. *Seeds* angled, 3–4 mm long. *Flowering time*: September to December, rarely January; flowers short-lived, recorded as opening in late afternoon, but evidently persisting until the following morning. Figure 5; Plate 2A.

Distribution and ecology: widespread through temperate southern and southeastern South Africa, from Eastern Cape to Limpopo, Lesotho and Swaziland, and north into east tropical Africa (see Stedje & Thulin 1995) (Map 11); in seasonally damp grassland in seeps and rock flushes and on moist cliffs, sometimes on rocks along streams.

Diagnosis: rather lacking in diagnostic features, *Drimia calcarata* includes small plants from southeastern and eastern southern Africa and east tropical Africa with a solitary, terete leaf up to 2 mm diam. and a racemose inflorescence of small flowers on pedicels 2–8(–10) mm long, with basally connate tepals 3–5 mm long. The anthers are small, 0.5–1.0 mm long, and the style is ± as long as the ovary, 1.5–3.0 mm long. The capsules are ovoid, 4–6 mm long, with small, angled seeds. The inflorescence remains photosynthetic for some time after the seeds have been shed, and in some populations at least it appears that a leaf is not produced in years in which the plant flowers, sometimes for several consecutive years, the persistent inflorescence axis then assuming the entire photosynthetic function.

As circumscribed by Jessop (1977), *Drimia calcarata* included several taxa from the Cape Floristic Region that are now understood to be distinct species, namely *D. dregei* and *D. salteri* (sect. *Ledebouria*), *D. hesperantha* (sect. *Thuranthos*) and *D. virens* (sect. *Physodia*). Among the summer-rainfall populations, several have received recognition in the past, but current knowledge is inadequate to accept any of these as distinct although some of them may be. Further field work is required to fully understand the variation in the species.

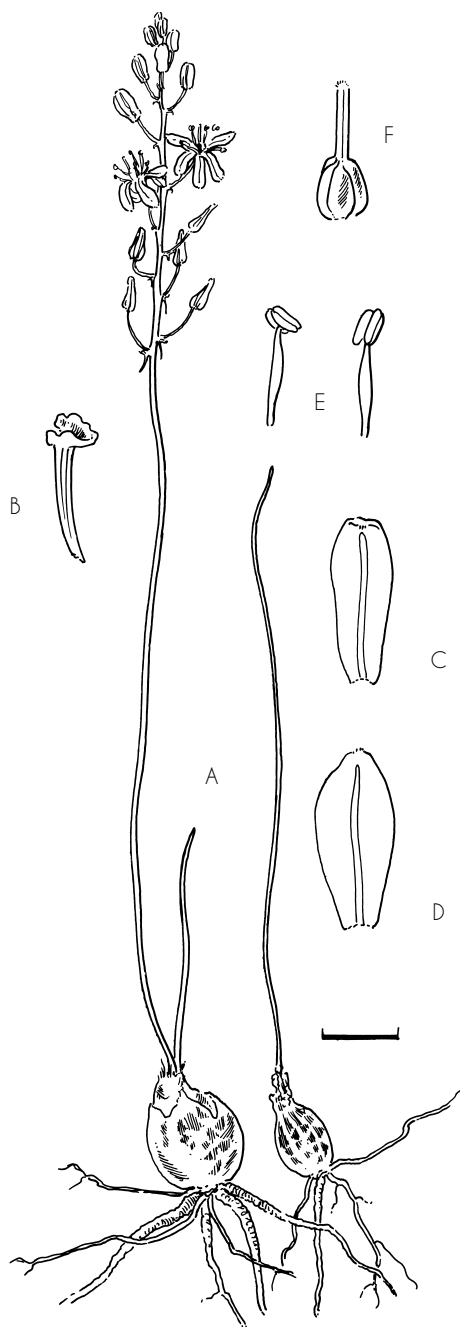


FIGURE 5.—*Drimia calcarata*, Eastern Cape, Maclear, Manning 3401 (NBG). A, flowering and leafing plants; B, lower bract; C, outer tepal; D, inner tepal; E, stamens; F, gynoecium. Scale bar: A, 10 mm; B–F, 2 mm. Artist: John Manning.

Three segregates have been described recently from cliffs and rock faces along the eastern and southeastern coastal belt, viz. *D. edwardsii*, *D. flagellaris* and *D. loedolffiae*. The first two appear to merit taxonomic recognition, but *D. loedolffiae* from the Kei Mouth in Eastern Cape was not diagnosed against *Drimia calcarata* at the time of its publication (Van Jaarsveld & Van Wyk 2006) and falls within the current circumscription of that species. We accordingly reduce it to synonymy here.

Additional specimens seen

SWAZILAND. 2631 (Mbabane): near Mbabane, (–AC), 25 Nov. 1954 [fruiting], R. Compton 24840 (NBG); Mbabane, Ukutula, (–AC), 4 Oct. 1954, R. Compton 24521 (NBG); Mbabane, Miller's Falls, (AC), 2 Nov. 1956, R. Compton 26190 (NBG, PRE). **2632 (Bela Vista):** Ngwenya Causeway, (–AA), 5 Sep. 1963, M. Karsten s.n. (NBG).

LESOTHO. 2828 (Bethlehem): Leribe, (–CC), without date, A. Dieterlen 404 (NBG), 649 (NBG, SAM). **2927 (Maseru):** Mamathes, (–BB), 29 Nov. 1953, A. Jacot-Guillarmod 1825 (PRE); Bushmen's Pass, (–BD), 1 Dec. 1978, M. Schmitz 8490 (PRE). **2929 (Underberg):** Sehlabathebe, (–CC), 4–14 Jan. 1973, R. Bayliss 5561 (PRE). **3028 (Matatiele):** 20 km N of Rama's Gate, (–BB), 15 Nov. 1976, R. Bayliss 7819 (NBG, PRE).

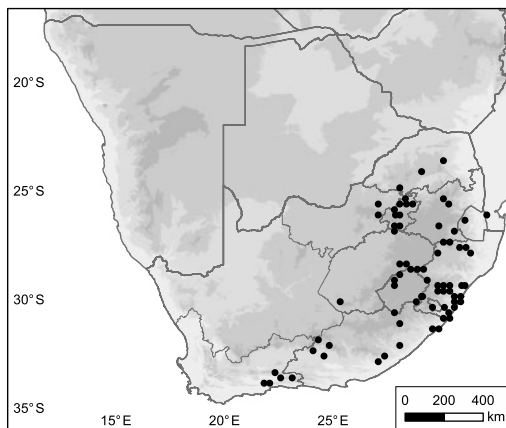
SOUTH AFRICA. LIMPOPO. 2330 (Tzaneen): Letaba, Duiwelskloof, (–CA), 18 Oct. 1950, J. Scheepers 1020 (PRE). **2428 (Nylstroom):** Warmbaths, (–CC), 29 Sep. 1908, R. Leendertz 6529 (PRE). **2429 (Zebediela):** Rust Police Post, (–AA), 27 Sep. 1908, R. Leendertz 5652 (PRE).

NORTHWEST. 2527 (Rustenburg): Rustenburg, (–CA), 6 Oct. 1910, R. Leendertz 9814 (PRE); Uitlomst farm, Slangspruit, (–DD), 20 Nov. 1970, B. Coetzee 456 (PRE). **2627 (Potchefstroom):** Ventersdorp, Goedgedacht, (–AA), 6 Nov. 1931, J. Sutton 600 (PRE).

GAUTENG. 2528 (Pretoria): shale ledges above Aapies [Apies] River, (–AD), 11 Oct. 1931, C. Smith 6031 (PRE); Meintjies Kop above Union Buildings, (–CA), 30 Sep. 1934, R. Dyer 2516 (PRE); Onderstepoort, (–CA), 29 Oct. 1912, Onderstepoort s.n. (PRE); Magaliesberg, Rietfontein, (–CA), 4 Oct. 2007, S. Bester 8119 (PRE); Pretoria, Perdepoort Ridge, (–CB), 11 Oct. 2004, S. Bester 5242 (PRE); Pienaars River Dam, (–CB), 3 Nov. 1966, J. Jessop 694 (PRE); Roodeplaatdam Nature Reserve, (–CB), 16 Nov. 1979, N. van Rooyen 219 1 (PRE); Hartebeesfontein farm near Premier Mine, (–DA), 22 Oct. 1933, R. Young s.n. (PRE). **2627 (Potchefstroom):** Witpoortjie Kloof, (–BB), 21 Nov. 1923, C. Moss 8073 (NBG); Roodepoort, Poortview, (–BB), 25 Oct. 1984, C. Behr 778 (PRE); Vereeniging, (–DB), 17 Oct. 1908, J. Burt-Davy 6404 (PRE). **2628 (Johannesburg):** Modderfontein, (–AA), Nov. 1943, A. Mclean s.n. (PRE); side of spruit below Milner Park, (–AA), 23 Oct. 1927, M. Young 1214 (PRE); Suikerbosrand Nature Reserve, (–CA), 26 Dec. 1978, N. Kroon 178 (PRE).

MPUMALANGA. 2530 (Lydenburg): Dullstroom, Verlorenvlei farm, (–AC), 17 Oct. 1980, B. Drews 87 (PRE); Belfast District, Rietvlei farm, (–CB), 11 Mar. 1981, N. Jacobsen s.n. (PRE); Waterfall Onder, Kindergoed [Nt-sinini] farm, (–CB), 20 Oct. 2008, K. Grieve 2625 (PRE). **2629 (Bethal):** Ermelo District, sandstone outcrops near pan, (–DB), 27 Sep. 1977, B. Venter s.n. (PRE). **2630 (Carolina):** Wakkerstroom, Oshoek farm, (–DC), 9 Oct. 1960, N. Devenish 145 (PRE); 2 Nov. 1962, N. Devenish 919 (PRE).

FREE STATE. 2627 (Potchefstroom): Sasolburg, Wonderwater, Elysium, (–DD), 16 Oct. 1994, N. Kroon 11413 (PRE). **2828 (Bethlehem):** Harrismith Botanic Garden, sandstone outcrop above stream, (–AC), 6 Nov. 1979, M. Jacobsz 2271 (NBG); Platberg, (–AC), seepage areas on sandstone, 21 Nov. 1979, M. Jacobsz 2600 (NBG, PRE); Swinburne, Rensburgskop, (–AD), Oct. 1964, M. Jacobsz s.n. (PRE); lower slopes of Sentinel, (–DA), wet basalt cliffs, 14 Feb. 2008 [fruiting], J. Manning 3152 (NBG); Witzieshoek, (–DB), 15 Sep. 1985, A. Paton 307 (PRE). **3025 (Colesberg):** Fauresmith, Voëlfontein, (–AB), 21 Nov. 1947, P. Kieds 362 (PRE).

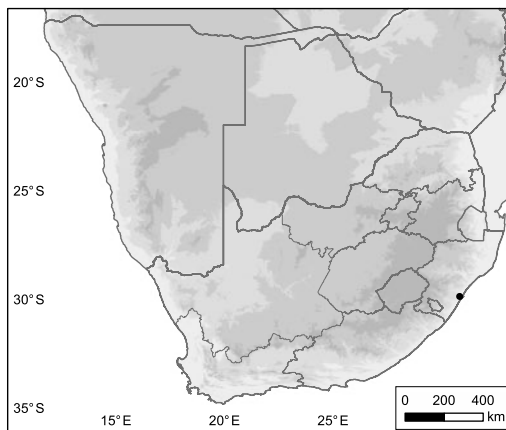


MAP 11.—Distribution of *D. calcarata* in southern Africa

- KWAZULU-NATAL. **2729 (Volksrust)**: Newcastle District, Chelmsford Park, (–DD), 14 Oct. 1989, R. Smit 1247 (PRE). **2730 (Vryheid)**: Wakkerstroom, Tweekloof, (–AC), Oct./Dec. 1923, J. Thode s.n. (PRE); Altemooi, (–AD), Nov. 1920, J. Thode s.n. (NBG); Mooihoek farm area, 15 km from Vryheid, (–DB), 19 Oct. 2008, L. Nkuna & F. Mabatha 2455 (PRE). **2731 (Louwsburg)**: Coronation, Paris farm, ± 23 km N of Coronation Colliery, (–CA), 10 Oct. 1996, N. Jacobsen 5329 (PRE); top of Ngome range between Esihlengeni to Tsikoebezane, (–CD), 27 Jul. 1944, J. Gerstner 4834 (PRE); Ngome, (–CD), 14 Dec. 1969, R. Strey 9356 (PRE). **2829 (Harrismith)**: Oliviershoek Pass, (–CA), Nov. 1908, J. Thode s.n. (NBG). **2929 (Underberg)**: Giants Castle Game Reserve, (–AB), 17 Oct. 1966, W. Trauseld 648 (PRE); Kamberg District, Game Pass, (–BD), 14 Oct. 1984, M. Stutterheim 15 (PRE); vicinity of Tarn Cave above Bushman's Nek, (–CC), 20 Nov. 1983, O. Hilliard & B. Burt 16800 (PRE); 21 Nov. 1983, O. Hilliard & B. Burt 16846 (PRE); Impendhle, Hopewell farm, (–DB), 4 Nov. 1997, N. Jacobsen 5574 (PRE). **2930 (Pietermaritzburg)**: Nottingham Road, (–AC), 1 Nov. 1928, E. Galpin 9578 (PRE); Lions River, Zwartkop Location, (–AC), 30 Sep. 1964, E. Moll 1124 (PRE); near Mt Gilboa, (–AD), 10 May 1900, J. Medley Wood 7890 (NBG); Albert Falls, (–AD), Jul. 1936, I. Verdoorn 1711 (PRE); New Hanover District, Laager Farm, Little Noodsberg, (–BD), 1984, O. Hilliard & B. Burt 14507 (PRE); Dargle, near Mountain Glen farm, (–CA), 14 Nov. 1964, E. Taat s.n. (PRE); Pietermaritzburg, (–CB), 18 Sep. 1893, R. Schlechter 3290 (PRE); Umbumbulu, (–DC), 29 Jul. 1904, J. Medley Wood 10174 (SAM); Krantzklouf, Gillies, (–DD), edge of krantz, Oct. 1911, W. Haygarth s.n. (NBG). **2931 (Stanger)**: Chakaskraal, (–AC), Sep. 1915, J. Thode s.n. (NBG). **3030 (Port Shepstone)**: Ixopo, (–AC), 23 Oct. 1962, R. Strey 4383 (PRE); Mkomazi River above near Delos Estate, (–BA), 10 Sep. 1994, C. Ward 12707 (PRE); Durban, Warner Beach, rock crevices, (–BB), 2 Aug. 1963, C. Ward 4683 (PRE); South Coast, near Botha House, (–BC), Sep. 1944, J. Smuts 2317 (PRE); Port Shepstone District, The Valleys farm, (–CB), 3 Oct. 1937, A. Mogg 13949 (PRE); Shelley Beach, (–CB), 9 Sep. 1967, R. Strey 7670 (PRE); Umtamvuna Nature Reserve, (–CC), 26 May 1982, A. Abbott 247 (PRE); Margate, (–CD), 23 Aug. 1971, H. Nicholson 1111 (PRE); tributary of Uvongo River, (–CD), 22 Aug. 1981, A. van Wyk 4489 (PRE).
- WESTERN CAPE. **3321 (Ladismith)**: Attakwaskloof, (–DD), 5 Jan. 1980, H.S. van Zyl s.n. (NBG). **3322 (Oudtshoorn)**: S foothills of Swartberg near Rust-en-Vrede, (–AD), 26 Dec. 1984, J. Vlok 883 (NBG); Robinson Pass, on rocks at summit on S side, (–CC), 5 Dec. 1951, E. Esterhuysen 19413 (BOL); Kammanassie Mtns, (–DA), 11 Jan. 2001, E.G.H. & I. Oliver 11843 (NBG).
- EASTERN CAPE. **3027 (Lady Grey)**: NE of Rhodes, Kloppeershoekspuit Valley, (–DB), 9 Dec. 1999, L. Smook 10319 (PRE). **3029 (Kokstad)**: Zuurberg, (–BC), Oct. 1883, W. Tyson 1858 (PRE, SAM). **3124 (Hanover)**: Sneeuweberg NW of Compassberg, (–CD), 6 Feb. 2007, V. Clark et al. 20 (NBG). **3128 (Umtata)**: Maclear, foot of Pot River Pass, (–AA), J. Manning 3401 (NBG). **3129 (Port St Johns)**: Lusikisiki, Fraser's Falls, (–BC), 17 Sep. 1968, M. Matthews 411/62 (NBG); 6 Apr. 2000, E. Van Jaarsveld 16371 (NBG); Magwa Estates on way to Mbotyi, (–BC), 5 Sep. 1979, G. Germishuizen 1179 (PRE); moist cliffs on edge of Mateku River Gorge (–BD), 2 Mar. 2002, K. Bunney et al. 148 (PRE). **3224 (Graaff-Reinet)**: NW of Aberdeen, (–AC), 2 Jan. 1985 [fl. ex hort.], M. Bayer 3750 (NBG); Sneeuweberg, Asante Sana Private Game Reserve, below Kouekop, (–BB), 4 Mar. 2006, R. McKenzie et al. 189 (NBG). **3225 (Somerset East)**: Boschberg Nature Reserve, summit of Boschberg near Bloukop, (–DA), 5 Dec. 2008, V. Clark et al. 294 (NBG); Boschberg, near Charlton Falls, (–DA), upriver on rock outcrops, 11 Dec. 2008, V. Clark et al. 487 (NBG). **3227 (Stutterheim)**: Amatola Mountains, Kologha Forest Reserve, (–CB), montane grassland, 1 Dec. 2000, D. Snijman 1768 (NBG); Pirie, (–CC), Jan. 1893, T. Sim 1709 (PRE). **3228 (Butterworth)**: Kentani District, Cebe, (–AA), 21 Sep. 1904, A. Pegler 1138 (PRE). **3323 (Willowmore)**: hills near Avontuur, (–CA), Jan. 1923, H. Fourcade 1490 (NBG).
12. **Drimia flagellaris** T.J. Edwards et al. in S. Afr. J. Bot. 71: 122 (2005). Type: South Africa, KwaZulu-Natal, Pietermaritzburg (2930): 'Krantzkloof, in cliff faces', (–DD), 28 Jul. 2003, N. Crouch 1023 (NU, holo. —image!; K—image!, NH, PRE, iso.).

Plants evergreen. *Bulb* epigeal, angular-ovoid, 25–55 mm diam., scales loosely imbricate, often strongly keeled, outer scales truncate, green or red, becoming thinly leathery with age. *Leaves* synathous, 1 to 5, flaccid, terete, 100–800 × 2.5–7.0 mm, glossy green or glaucous, subacute, but becoming truncate through abscission plates, glabrous, sheathing base expanded, with broad, pale-papery margins. *Inflorescence* a moderately lax, elongate raceme 200–650 mm tall, 20- to 90-flowered; scape becoming

decumbent, persisting and remaining photosynthetic after fruiting, glabrous, 2.5–4.0 mm diam.; bracts ovate-naviculate, 1–2 mm long, lowest with spur 3–5 mm long; pedicels suberect, 17–25 mm long; bracteoles absent. *Flowers* spreading, shallowly campanulate; tepals connate up to 0.5 mm, lobes spreading or slightly reflexed above, elliptic, 5–8 × 2–3 mm, apices penicillate, white with green or brown keels. *Filaments* suberect, subulate, 3.0–4.5 mm long, pale. *Anthers* medifixed, ovate, ± 1 mm long, yellow. *Ovary* ovoid, 2.5–4.0 mm long, yellowish green; style columnar, 1.0–3.5 mm long, white; stigma truncate-papillate. *Capsules* ovoid, 6.0–7.5 × 3.0–3.5 mm. *Seeds* elongate to fusiform and angled, 3.0–4.5 mm long. *Flowering time*: late July to October; flowers short-lived.



MAP 12.—Distribution of *D. flagellaris*

Distribution and ecology: evidently a narrow endemic of the Krantzklouf Gorge system in southern coastal KwaZulu-Natal (Map 12); on cliffs and rock faces in both moist and drier situations. Plants from Fraser's Gorge in Eastern Cape identified as *D. flagellaris* by Van Jaarsveld & Van Wyk (2006) do not have the many-flowered racemes and long pedicels that are diagnostic for that species and are included here in *D. calcarata*.

Diagnosis: *Drimia flagellaris* is recognised by its clumped, evergreen habit with characteristically keeled bulbs, rather flaccid leaves commonly exceeding 500 mm in length, and long racemes with up to 90 flowers on pedicels 17–25 mm long. The inflorescence persists for some time, remaining green and photosynthetic after the seeds have been shed, a characteristic sometimes also found in *D. calcarata*, which is characterised by its smoothly rounded bulbs, often shorter racemes, mostly 3- to 30(40)-flowered, and shorter pedicels 1–14(–22) mm long. *Drimia flagellaris* is sympatric at Krantzklouf with a grassland form of *D. calcarata* (Edwards et al. 2005) with subterranean bulbs and deciduous leaves, but evergreen forms of *D. calcarata* with semi-epigeal bulbs are known from elsewhere. Further investigation is required to clarify the distinction between the two species.

13. ***Drimia occultans*** G. Will. in Cact. Succ. J. 84: 287 (2012). Type: Namibia, Oranjemund (2816): 'Swartkop Hill E of Oranjemund', (–CB), Feb. 1998 [fl. ex hort. Mar. 2011], G. Williamson 5829 (NBG, holo.).

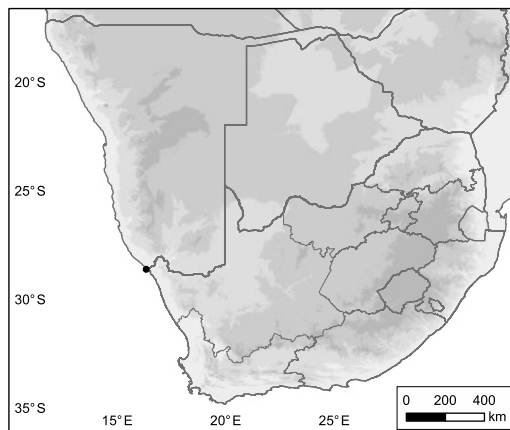
Plants deciduous. *Bulb* subglobose to ovoid, 10–12 mm diam., scales tightly packed, outer scales thinly leathery, persisting in a short neck, flesh whitish. *Leaf* hysteranthous, solitary, erect, terete, ± 42 × 0.5 mm, dark green, glabrous. *Inflorescence* a short, moderately lax raceme 30–55 mm tall, 1- to 3-flowered, flowers up to 10 mm apart; scape glabrous, 0.5–0.8 mm diam.; bracts ovate-deltoid, 0.8 mm long, with short spur 0.5 mm long; pedicels suberect, 2–5 mm long; bracteoles absent. *Flowers* spreading or slightly nodding, shallowly campanulate; tepals connate up to 0.5 mm, lobes suberect below and then spreading or slightly reflexed, elliptic, ± 6 × 1.5–2.0 mm, apices penicillate, white or pale pinkish brown with darker dorsal stripe. *Filaments* weakly spreading, filiform, 3–5 mm long, white. *Anthers* medifixed, ovate, 0.5–0.8 mm long, yellow. *Ovary* ovoid-truncate, 3-lobed, 2.0–2.5 mm long, pinkish orange; style columnar, 1.5–2.0 mm long, white; stigma truncate-papillate. *Capsules* ovoid,

4.0–4.5 mm long. *Seeds* pyramidal or angled, $\pm$ 1.0–1.3 mm long, testa colliculate. *Flowering time*: mainly January to March; flowers opening late morning and withering late afternoon.

Distribution and ecology: known only from the type collection on Swartkop Hill east of Oranjenmund along the Orange River in southern Namibia (Map 13); in sand among rocks.

Diagnosis: a poorly understood species, *Drimia occultans* is known only from the type collection comprising portions of one or possibly two cultivated plants. It is recognised essentially by its diminutive size, producing a solitary filiform leaf in winter, followed by a raceme up to 55 mm long, with up to three flowers laxly spaced up to 10 mm apart, but often with just a solitary flower.

The flowers themselves are relatively large for such small plants, with almost free tepals up to 6 mm long, and with weakly spreading stamens. The seeds are unusually small, $\pm$ 1.0–1.3 mm long. Additional material is required for a more accurate assessment of the variation in the species and its taxonomic status.



MAP 13.—Distribution of *D. occultans*

14. ***Drimia dregei* (Baker) J.C.Manning & Goldblatt** in Goldblatt & Manning in *Strelitzia* 9: 711 (2000) [non *Drimia dregeana* Kunth (1843)]. *Urginea dregei* Baker in *Fl. Cap.* 6: 467 (1897). *Fusilum dregei* (Baker) Speta in *Phyton* 8: 69 (1998). Type: South Africa, Western Cape, Worcester (3319): 'Worcester Div., Dutoitskloof', (–CC), 1840, *Drège 1501* (K, lecto. —image!, designated here; S [only the four fruiting specimens]—image!, isolecto.). [Other original material: South Africa, Western Cape, Cape Flats, *Zeyher 4251* (SAM!).]

Urginea gracilis Duthie in *Ann. Stell. Univ.* 6A (2): 10 (1928), syn. nov. Type: South Africa, Western Cape, Cape Town (3318): 'Stellenbosch flats, in low-lying, clayey area', (–DD), Mar. 1925, *A. Duthie 1446a* (NBG [as STEJ], holo.; BOL!, iso.).

Urginea exilis Adamson in *J. S. Afr. Bot.* 8: 240 (1942), syn. nov. Type: South Africa, Western Cape, Simonstown (3418): 'Cape Peninsula, De Klip', (–AD), Feb. 1940, *Salter 8312* (BOL, holo.; NBG!, SAM!, iso.).

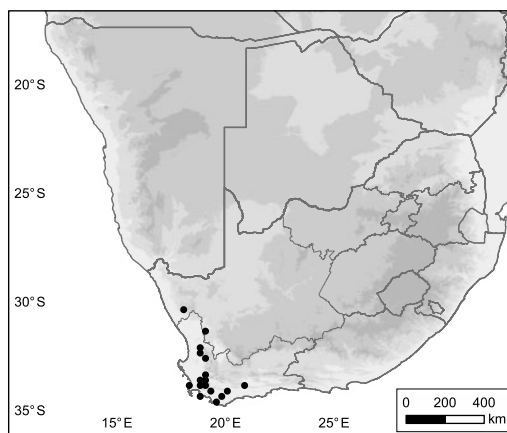
Plants deciduous. *Bulb* subglobose to ovoid, 10–20 mm diam., scales tightly packed, outer scales thinly leathery, persisting in a short or long, papery neck or collar with transverse abscission lines, flesh whitish. *Leaf* hysteranthous, solitary, erect, terete, 150–300 $\times$ 0.5–1.5 mm, dark green, subacute, glabrous, sheathing base expanded and pale-papery. *Inflorescence* a moderately dense to lax, elongate raceme 100–500(–600) mm tall, (3)5- to 30(50)-flowered, mostly 3–5 mm apart; scape erect or flexuous, glabrous, (0.5–)1.0–2.0 mm diam.; bracts ovate-naviculate, 0.5–1.0 mm long, lowest with short spur 1–2(–3) mm long; pedicels suberect, 1–3 mm long; bracteoles absent. *Flowers* spreading, shallowly campanulate, unscented; tepals connate 1.0–1.5 mm, lobes spreading or slightly reflexed above, elliptic, 3–4 $\times$ 1.5–2.0 mm, apices penicillate, white or pale pinkish brown with darker dorsal stripe. *Filaments* suberect or weakly spreading, subulate, $\pm$ 2 mm long, whitish. *Anthers* medifixed, ovate, $\pm$ 1 mm long, yellow. *Ovary* narrowly ovoid-truncate, 2.0–2.5 mm long, yellowish green; style columnar, 2.0–2.5 mm long, white; stigma truncate-papillate. *Capsules* narrowly ellipsoid to fusiform, rarely

ovoid, (4–)7–10(–12) $\times$ 2(–3) mm long. *Seeds* ellipsoid to fusiform and angled, (2–)5–6 mm long, testa striate-colliculate. *Flowering time*: mainly January to March; flowers opening mid-afternoon and withering in the evening. Figure 6; Plate 2D.

Distribution and ecology: a poorly collected species best known from the mountains and flats around Cape Town, but recorded northwards along the Cederberg to the Bokkeveld Escarpment and the Kamiesberg in Northern Cape and eastwards to the Langeberg in Western Cape (Map 14); locally common on seasonally wet or inundated flats and seeps, typically on gritty or loamy, but also sandy soils. The species has an extended flowering period, with populations often including plants already in fruit and others only in bud. The scattered distribution is probably an artefact of inadequate collecting, as the species is inconspicuous and flowers in mid-summer during the dry season, with the flowers open only in the afternoon.

Diagnosis: *Drimia dregei* is one of several small-flowered species with a racemose inflorescence that were included by Jessop (1977) under the name *Drimia modesta* (Baker) Jessop, but it is distinguished by its elongate raceme, flowers with very short pedicels, 1–3 mm long, and, critically, by its characteristically narrowly ellipsoid to fusiform capsules, (4–)7–10(–12) $\times$ 2(–3) mm, containing narrow, angled seeds. Fruiting plants with fusiform or elongate capsules are unmistakable, but this character is unfortunately not invariable and some plants, even within a single population, produce shorter, ellipsoid or even ovoid capsules, 4 $\times$ 2 mm, containing what appear to be well-formed seeds. These plants can be confused with another southwestern Cape species, *D. salteri* (Figure 7), but that species generally produces a shorter, denser raceme of mostly larger flowers with tepal lobes (3–)4–6 mm long, and ovoid to subglobose capsules, 5–7 $\times$ 3–5 mm. The two species also appear to differ in phenology, with available observations suggesting that the flowers of *D. dregei* open in the afternoon whereas those of *D. salteri* open in the morning.

Taxonomic note: it seems that Drège knowingly collected two different species of *Drimia* on Dutoitskloof under the numbers 1500 and 1501, viz. *D. convallarioides* and *D. dregei*, but the plants were muddled after pressing. Individuals of both species (four fruiting stems with the fusiform capsules of *D. dregei* and two flowering stems with the pendent, urn-shaped flowers of *D. convallarioides*) are mounted on the Stockholm sheet, which is annotated with the two numbers 1500 and 1501, but the Kew sheet includes just two plants of *D. dregei* and is labelled with the single number 1501 and annotated *Hyacinthus convallarioides*. This is the sheet that was seen and cited by Baker (1897) in the protologue of *D. dregei*. We conclude that Drège intended his number 1501 to apply to the material of *D. convallarioides*, and his 1500 to apply to the plants now known as *D. dregei*, but this is now moot, and the number 1501 has become associated with the material of *D. dregei*. Baker (1897) listed an additional two syntypes in the protologue, viz. *Ecklon* 4251 from the Cape Flats, and *Bolus* 7428 from Genadendal. The former has the narrow capsules diagnostic of *D. dregei*, but the latter is probably *D. salteri* judging by the short, dense inflorescence.



MAP 14.—Distribution of *D. dregei*

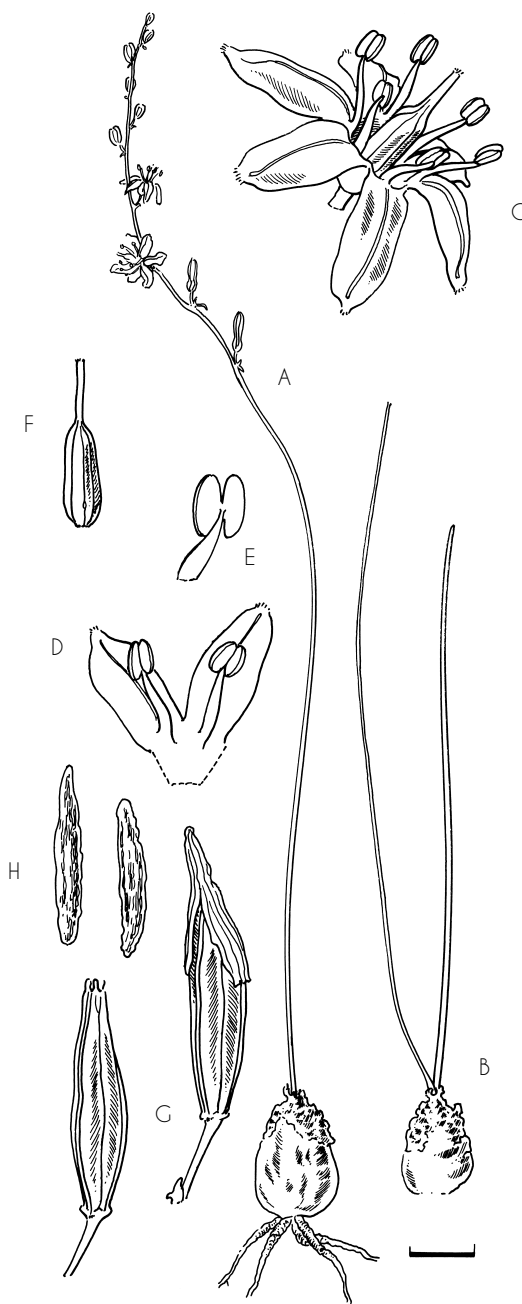


FIGURE 6.—*Drimia dregei*, Western Cape, Hermon, Goldblatt & J. Manning 11277 (NBG). A, flowering plant; B, leafing plant with solitary leaf and withered remains of old inflorescence still present; C, flower; D, two tepals and attached stamens; E, anther; F, gynoecium; G, capsules; H, seeds. Scale bar: A, B, 10 mm; C, D, F, G, 2 mm; E, H, 1 mm. Artist: John Manning.

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. **3018 (Kamiesberg)**: descending the Langkloof, (–AC), 29 Mar. 2001 [fruiting], D. Snijman 1786 (NBG). **3119 (Calvinia)**: Bokkeveld Escarpment, Oorlogskloof Nature Reserve, (–AC), 26 Mar. 2001 [fruiting], D. Snijman 1773 (NBG).

WESTERN CAPE. **3218 (Clanwilliam)**: Pakhuis, dry gravelly clay on slopes above top of pass, (–BB), 29 Dec. 1956, E. Esterhuysen 26898 (BOL); Ceres, slopes above Witelskloof, shallow stony soil, (–BD), 9 Jan. 1957, E. Esterhuysen 26953 (BOL). **3219 (Wuppertal)**: Cederberg, Middelberg Plateau, (–CA), 25 Feb. 1947 [fruiting], E. Esterhuysen 13797 (BOL). **3318 (Cape Town)**: Rondebosch Common, (–CD), Jan. 1940, R. Adamson 1080 (BOL); Cape Peninsula, Kenilworth Race Course, (–CD), Mar. 1893, H. Bolus s.n. (BOL); Feb. 1940, R. Adamson 2777 (SAM); Table Mt, shallow soil near Woodhead Reservoir wall, (–CD), 4 Feb. 1951, E. Esterhuysen 18340 (BOL); Paardeberg, Lemoenkloof, (–DB), 24 Jan. 2012, G. Nicolson & D. Roets 799 (NBG); between Bottelary and Stellenbosch, (–DD), 18 Mar. 1933, L. Bolus s.n. (BOL); Stellenbosch Flats, (–DD), 9 Apr. 1940, T. Salter 8371 (BOL); May without year [fruiting], A. Duthie s.n. (NBG); Jonkershoek, Guardian Peak, (–DD), 20 Feb. 1972, E. Esterhuysen 32824 (BOL); near Mulders Vlei, (–DD), 3 May 1940 [fruiting], T. Salter 8386 (BOL). **3319 (Worcester)**: Elandsberg farm W of Hermon, (–AC), 2 Mar. 2000 [fls and fruits], P. Goldblatt & J. Manning 11277 (NBG); Bainskloof, shallow stony soil on ridge above houses, (–CA), 7 Apr. 1956 [fruiting], E. Esterhuysen s.n. (BOL); Theewaterskloof area, (–CC), 20 Feb. 1979, M. Thompson 3850 (NBG); Berg River Hoek, (–CC), 9 Apr. 1944 [fls and fruits], W. Barker 2957 (NBG); Franschoek, Gem Peak, (–CC), 11 Feb. 1945, E. Esterhuysen 11425 (BOL); French Hoek [Franschoek] Mtns, 2 miles from foot of pass, (–CC), 11 Feb. 1945, E. Esterhuysen 11431 (BOL); E end of Franschoek Pass, (–CC), 12 Feb. 2000, P. Goldblatt & J. Manning 11258 (NBG). **3320 (Montagu)**: Heidelberg, Grootvadersbos, (–DD), 1 Jan. 1951, E. Esterhuysen 18253 (BOL). **3418 (Simonstown)**: Hangklip, (–BD), 20 Jan. 1998, C. Behr 1294 (NBG). **3419 (Caledon)**: Riviersonderend Mts, Schilpadkop area, (–AB), 2 Jan. 1953, E. Esterhuysen 21040 (BOL); Rooi Els, (–BD), 6 Feb. 1947, E. Esterhuysen 13715 (BOL); Ratel River, (–DA), 12 Mar. 1979, L. Hugo 1646 (NBG). **3420 (Bredasdorp)**: Stormsvleiport, (–AA), 17 Nov. 1985, P. Perry s.n. (NBG).

15. **Drimia salteri** (Compton) J.C.Manning & Goldblatt in Goldblatt & Manning in Strelitzia 9: 712 (2000). *Urgineopsis salteri* Compton in J. Bot. 68: 107 (1930). *Urginea salteri* (Compton) Adamson in J. S. Afr. Bot. 8: 238 (1942). Type: South Africa, Western Cape, Simonstown (3418): 'Cape Peninsula, Muizenburg on rock slabs', (–AB), Salter s.n. BOL18661 (BOL, lecto.), designated by Jessop in J. S. Afr. Bot. 43: 303 (1977); BM, K, isoleccto.).

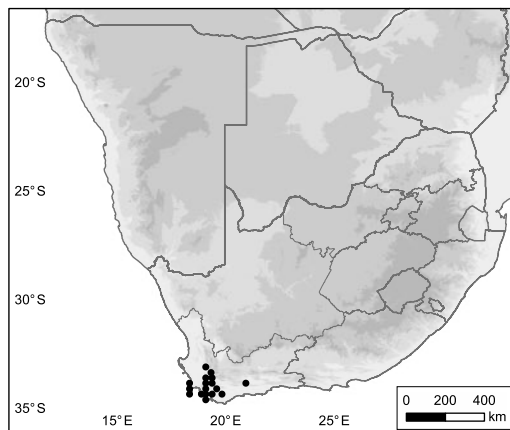
Urginea arenosa Adamson in J. S. Afr. Bot. 8: 239 (1942), syn. nov. Type: South Africa, Western Cape, Simonstown (3418): 'Cape Peninsula, Red Hill', (–AB), Salter 8321 (BOL, holo.); NBG!, K, iso.).

Urginea pedunculata Adamson in J. S. Afr. Bot. 10: 134 (1944), syn. nov. Type: South Africa, Western Cape, Simonstown (3418): 'Cape Peninsula, Kalk Bay Mountains', (–AB), Levyns sub Adamson 3483 (BOL, holo.).

Plants deciduous. *Bulb* subglobose to ovoid, (10–)15–30(–40) mm diam., scales tightly to more loosely packed, outer scales becoming brown-papery or membranous, flesh whitish. *Leaves* hysteranthous or sometimes synanthous, usually 1 (rarely 3 or more), erect or arcuate, terete and cylindric or rarely clavate, (20–)50–200 × 0.5–2.0 mm, dark green, subacute or obtuse, glabrous, sheathing base with papery margins. *Inflorescence* a dense, congested, ovoid raceme (30–)80–300(–400) mm tall, rachis 10–40 mm long even in fruit, (3)5- to 15(20)-flowered, mostly 0.5–2.0 mm apart, but rachis elongating slightly in fruit and fruiting pedicels 2–5 mm apart; scape erect or slightly flexuous, glabrous, (0.5–)1.0–2.0 mm diam.; bracts ovate to suborbicular, sometimes basally auriculate, 0.5–1.5 mm long, lowest with short spur 1–3(–5) mm long; pedicels suberect, (1.5–)2.0–4.0(–6.0) mm long; bracteoles usually absent, exceptionally some upper flowers with subulate bracteole. *Flowers* spreading, shallowly campanulate, unscented or with light spicy scent; tepals connate 1.0–1.5 mm, lobes spreading to slightly reflexed above, ovate to elliptic, (3–)4–6 × 1.5–3.0 mm, apices penicillate, pale brownish to yellowish orange with darker keel or dark maroon. *Filaments* suberect or weakly spreading, subulate, ± 2 mm long,

concolorous with perianth. *Anthers* medifixed, ovate, ± 1 mm long, yellow. *Ovary* ovoid or pyriform, ± 2 mm long, yellowish to maroon; style columnar, ± 2 mm long, paler; stigma truncate-papillate. *Capsules* ovoid, $5-7 \times 3-5$ mm. *Seeds* sharply angled, ± 2 mm long, testa reticulate. *Flowering time*: mainly November to January, rarely to March; flowers opening morning and withering in the afternoon. Figure 7.

Distribution and ecology: restricted to the coastal mountains in the southwestern corner of Western Cape, from the Witzenberg and Hex River Mtns to the Cape Peninsula and eastwards through the southern Hottentots Holland Mtns to Bredasdorp and the Langeberg (Map 15); on seasonally wet sandstone rock sheets and outcrops in shallow soils.



MAP 15.—Distribution of *D. salteri*

Diagnosis: *Drimia salteri* is one of several small-flowered species with a racemose inflorescence that were treated by Jessop (1977) as *Drimia modesta* (Baker) Jessop, but it is distinguished by its short, congested raceme, the rachis only 10–30(–40) mm long with the flowers mostly 0.5–2.0 mm apart, and the tepals (3–)4–6 mm long and often orange to brown or sometimes dark maroon in colour, the latter colour unique in the genus. Plants typically have one or two leaves, but some forms may develop more leaves. This is especially marked in populations from rock sheets in the Kogelberg that remain moist well into summer, the plants having as many as a dozen, often rather short, almost clavate leaves.

Drimia salteri is most likely to be confused with *D. dregei* (Figure 6), another species from the west and southwest of the Greater Cape Floristic Region, but that species has a longer, laxer raceme with the flowers mostly 3–5 mm apart, mostly slightly smaller flowers with tepals 3–4 mm long, and narrower, often much longer capsules, (4–)7–10(–12) $\times$ 2–3 mm long. Available observations suggest that the two species also differ in phenology, with the flowers of *D. salteri* opening in the morning and those of *D. dregei* in the afternoon.

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. 3318 (Cape Town): Cape Peninsula, Orange Kloof, (–CD), 30 Dec. 1952, T. Salter 9082 (NBG); 17 Jan. 1956, G.J. Lewis SAM69495 (SAM); Table Mt, above Kirstenbosch, (–CD), 18 Jan. 1998, P. Goldblatt & J. Manning 10851 (NBG). **3319 (Worcester)**: N Sneeuwgat Peaks, shallow soil on ledges, (–AA), 1 Jan. 1952, E. Esterhuysen 19801 (BOL); Hex River Mts, Milner Peak, (–AD), 2 Jan. 1959, E. Esterhuysen 28084 (BOL); Klein Drakenstein Mountains, 1.5 km SE of Hugenootkop, (–CA), 14 Jan. 2007, N. Helme & D. Raimondo 4515 (NBG); Waaihoek Peak, (–CB), 12 Jan. 1954, E. Esterhuysen 22618 (BOL); hills SE of Greater Brandvlei Dam, (–CB), Nov. 2014, A. le Roux & H. de Wet 1327 (NBG); Paarl, Haalhoek Sneeuwkop, (–CC), 21 Dec. 1952, E. Esterhuysen 20852 (BOL); Stettynsberg near summit, (–CD), 20 Jan. 2001, J. Manning 2313 (NBG). **3320 (Montagu)**: Heidelberg Dist., Strawberry Hill, (–DD), Dec. 1954, T. Stokoe s.n. (SAM). **3418 (Simonstown)**: Klaasjagersberg near summit, (–AB), 27 Dec. 1980, H. Taylor 10259 (NBG); Buffelsfontein farm, W of Red Hill road, (–AB), 17 Dec. 1984, D. Snijman 835 (NBG); Constantiaberg, (–AB), 18 Mar. 1943, R. Compton 14451 (NBG); 16 Dec. 1943, R. Compton 15467 (NBG); 17 Jan. 1948, R. Compton 20373 (NBG); Chapman's Peak, (–AB), 7 Dec. 1943, E. Wasserfall 763 (NBG); near Groot Kop, Simonstown, (–AB), 12 Jun. 1946 [leafing], R. Compton 18031 (NBG); Vasco da Gama Peak, (–AD), 27 Nov. 1960, M. Thomas s.n. (NBG); W of and below old



FIGURE 7.—*Drimia salteri*, Western Cape, Hangklip, without voucher. A, flowering plant; B, flower; C, stamens; D, gynoecium; E, infructescence; F, capsules; G, seed. Scale bar: A, E, 10 mm; B–D, F, 2 mm; G, 1 mm. Artist: John Manning.

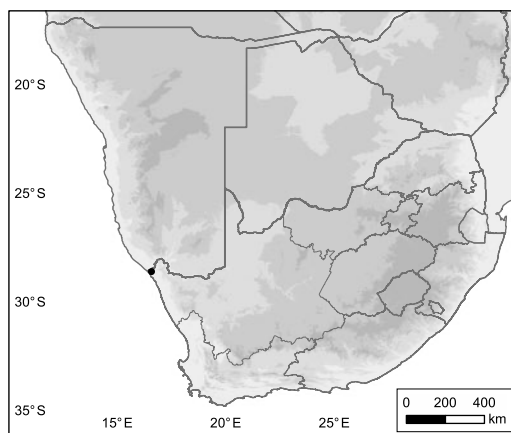
manganese mine, (–AD), 5 Dec. 1969, *C. Boucher* 958 (NBG); Grabouw, (–BD), Dec. 1950, *T. Stokoe* s.n. (SAM); Palmiet Mts above Betty's Bay, (–BD), Jan. 1947, *T. Stokoe* s.n. (SAM); behind Betty's Bay, (–BD), Jan. 1947, *E. Esterhuysen* 13768 (BOL, NBG); Betty's Bay, Disa Kloof, (–BD), 9 Dec. 1966, *J. Rourke* 687 (NBG); Hangklip, (–BD), 19 Dec. 1982, *M. Viviers* 1112 (NBG); Kogelberg Forest Reserve, (–BD), 7 Jan. 1970, *C. Boucher* 1020 (NBG); 2 Dec. 1969, *C. Boucher* 912 (NBG); Kogelberg Forest Reserve, path to Kuduberg, (–BD), 17 Dec. 1981, *J. Rourke* 1763 (NBG); Palmiet River, (–DD), 13 Nov. 1952, *E. Esterhuysen* 20733 (NBG); Elephant Rock Estate, flats W of Palmiet River Mouth, (–BD), 8 Jan. 1972, *C. Boucher* 1772 (NBG). **3419 (Caledon)**: Lebanon State Forest, Jakkalsrivier Catchment, (–AA), 31 Jan. 1979, *F. Kruger* 1803 (NBG); Palmiet River, muddy ledge above river where water collects, (–AC), 23 Nov. 1952, *E. Esterhuysen* 20733 (BOL); Kleinmond, (–AC), 28 Jan. 2005, *A. Harrower* 2529 (NBG); Hermanus, Vogelgat Nature Reserve, (–AD), 22 Dec. 1978, *I. Williams* 2681 (NBG); 27 Jan. 1980, *I. Williams* 2979 (NBG); 5 Dec. 1981, *I. Williams* 3162 (NBG); 22 Nov. 1982, *I. Williams* 3387 (NBG); 24 Nov. 2013, *G. Nicolson* s.n. (picture only) (NBG); Riviersonderend Mtns, Skilpadkop, (–BA), 2 Jan. 1953, *E. Esterhuysen* 21035 (NBG); W end of Bredasdorp Mtns, (–BD), 22 Dec. 2000, *J. Manning* 2299 (NBG); Kleinmond flats E of harbour, (–CA), 11 Jan. 1999, *C. Boucher* 6416 (NBG).

16. ***Drimia barbata*** *J.C.Manning & J.M.J.Deacon*, sp. nov. Type: South Africa, Northern Cape, Oranjemund (2816): Boegoeberg, S of Alexander Bay, (–DA), 1 Feb. 1980 [flowering bulb, ex hort.; orig. coll. 14 Sep. 1977], *M. Bayer* 1013 (NBG [2 sheets], holo.).

Plants deciduous, solitary. *Bulb* subglobose, 20–25 mm diam., scales adherent, outer scales thinly leathery, inner scales white. *Leaf* hysteranthous, solitary, suberect, terete, 10–180 × 1–3 mm, glabrous, leathery, dark green. *Inflorescence* a short, congested, ovoid or subglobose raceme, 40–60 mm long with the rachis 10–15 mm long, densely 5- to 7-flowered, mostly 1–2 mm apart; scape striate-papillate in lower half, ± 1 mm diam.; bracts ovate-orbicular, ± 1 mm long, lower with short spur 0.5 mm long; pedicels spreading, 0.5–1.0 mm long. *Flowers* diurnal, spreading, campanulate, apparently unscented; tepals 6–8 mm long, connate for 3–4 mm in a cup ± as deep as wide, densely and stiffly puberulous inside cup especially between filaments, pale brownish with darker keels, lobes spreading above, penicillate at apex, outer ovate, 3–4 × 2 mm, inner oblong, 3–4 × 2 mm. *Filaments* erect-incurved, subulate, ± 2 mm long. *Anthers* medifixed, ovoid, dehiscing by longitudinal slits, ± 1 mm long, brownish with yellow pollen. *Ovary* ovoid, ± 2 mm long, brownish yellow; style columnar-tapering, ± 2.5 mm long, white, stigma truncate-papillate stigma. *Capsules and seeds* unknown. *Flowering time*: December to February; flowers opening early morning and fading in the evening. Figure 8.

Distribution and ecology: known only from two collections near Alexander Bay in northern Namaqualand (Map 16); in rock crevices exposed to coastal fog, among dwarf succulents.

Diagnosis: a dwarf species with a solitary, terete leaf dry at flowering and a short, congested raceme of campanulate flowers unique in the genus in being stiffly and densely puberulous in the perianth cup, especially between the filaments where it is almost bearded, whence the specific epithet. The scape is longitudinally papillate-scabridulous towards the base. The foliage and inflorescence of *Drimia barbata* are strongly reminiscent of *D. salteri* of Western Cape to the south,



MAP 16.—Distribution of *D. barbata*

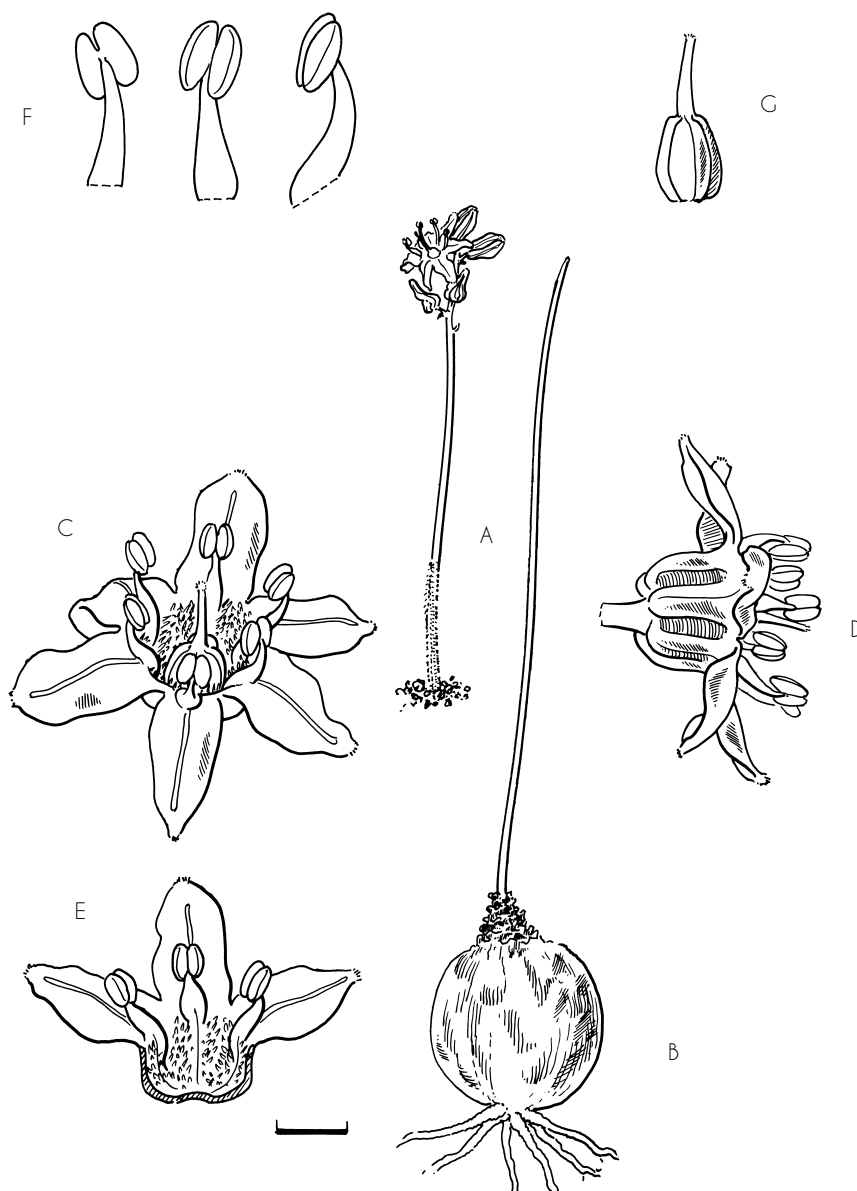


FIGURE 8.—*Drimia barbata*, Northern Cape, Alexander Bay, Deacon 722 (NBG). A, inflorescence; B, leafing plant; C, flower; D, flower side view; E, three tepals plus stamens; F, stamens; G, gynoecium. Scale bar: A, B, 10 mm; C–E, G, 2 mm; F, 1 mm. Artist: John Manning.

but that species has a smooth scape and the perianth lacks any trace of hairs in the floral cup. The flowers in both species open in the morning and fade the same evening.

Additional specimen seen

SOUTH AFRICA. NORTHERN CAPE. **2816 (Oranjemund)**: Kortdoringberg near Alexander Bay, (–DA), 24 Dec. 2015 [fl. ex hort.], Deacon 722 (NBG).

Sect. 4. **Drimia**

Strepsiphyla [sphalm.] Raf., Fl. Tellur. 3/VII: 60 (1837). Type: *Strepsiphyla villosa* (Lindl.) Raf. = *Drimia elata* Jacq.

Idothea Kunth, Enum. Pl. 4: 342 (1843). Type: *Idothea elata* (Jacq.) Kunth, lecto., designated by Stearn in Ann. Mus. Goulandris 4: 203 (1978) = *Drimia elata* Jacq.

Plants medium-sized. *Bulb* scales closely packed or loose and shortly stalked, flesh white to pale pink. *Leaves* several, blade either subterete, channelled above and keeled beneath, or lanceolate and soft-textured, usually glabrous but margins sometimes conspicuously ciliate, hystranthous or synanthous. *Inflorescence* a lax or dense raceme, sometime congested and capitate; scape glabrous; bracts lanceolate, lower short- or longer-spurred; bracteoles absent; pedicels spreading, shorter than to $\pm$ as long as tepals. *Flowers* diurnal, lasting 2 days, perianth deciduous with tepals cohering above to form a cap on developing capsule; tepals connate $\pm$ in basal quarter or third forming short tube, reflexed above, linear-spathulate, pink, yellowish or greenish with darker midrib, firm-textured. *Stamens*: filaments erect and connivent, subulate-filiform and usually flexed upwards apically, 4–11 mm long, much longer than anthers; anthers medifixed, subglobose to ovate, $\pm$ 1 mm long, dehiscence longitudinal, greyish green or purple. *Ovary* ovoid; style $\pm$ twice as long as ovary, cylindrical; stigma truncate-papillate or capitate-papillate. *Capsule* ovoid to obovoid, 3-lobed, $\pm$ 10 mm long. *Seeds* elliptic.

Key to species

- 1a. Leaves usually green at flowering, rigid, linear, 1.5–4.0 mm wide, hemiterete in section 20. *D. media*
- 1b. Leaves dry and withered at flowering, soft-textured, oblong to oblanceolate, 5–70 mm wide:
 - 2a. Inflorescence capitate or subglobose, very dense, adjacent pedicels closer to one another than long; lower bracts conspicuously spurred, the spurs forming a vertical fringe below the flowers 18. *D. sphaerocephala*
 - 2b. Inflorescence cylindrical or rarely ovoid, lax to moderately dense, lowermost pedicels always well-spaced; lower bracts never conspicuously spurred and forming a fringe:
 - 3a. Bulb scales very loosely aggregated, clavate and stalked, resembling a cluster of grapes; plants always small, raceme 100–300 mm tall 19. *D. haworthioides*
 - 3b. Bulb scales more-or-less tightly packed, never stalked; plants small to large 17. *D. elata*

17. ***Drimia elata* Jacq.**, Collectanea Suppl.: 38 (1797). *Hyacinthus elatus* (Jacq.) Poir. In Lamarck, Encycl., Suppl. 3: 120 (1813). *Idothea elata* (Jacq.) Kunth, Enum. Pl. 4: 343 (1843). Type: illustration in Jacq., Icon. Pl. Rar. 2 (15): t. 373 (1794), lecto., designated by Stedje & Thulin in Nordic J. Bot. 15: 597 (1995).

Drimia ciliaris Jacq., Collectanea Suppl.: 41 (1797). *Hyacinthus ciliaris* (Jacq.) Poir. in Lamarck, Encycl., Suppl. 3: 120 (1813). *Idothea ciliaris* (Jacq.) Kunth, Enum. Pl. 4: 343 (1843). Type: illustration in Jacq., Icon. Pl. Rar. 2 (16): t. 377 (1795).

- Drimia pusilla* Jacq., Collectanea Suppl.: 42 (1797). *Hyacinthus pusillus* (Jacq.) Poir. in Lamarck, Encycl., Suppl. 3: 120 (1813). *Idothea pusilla* (Jacq.) Kunth, Enum. Pl. 4: 344 (1843). Type: illustration in Jacq., Icon. Pl. Rar. 2 (14): t. 373 (1794), lecto., designated by Stedje & Thulin in Nordic J. Bot. 15: 597 (1995).
- Drimia purpurascens* J.Jacq., Ecl. Pl. Rar.: 48, t. 30 (1812). *Idothea purpurascens* (J.Jacq.) Kunth, Enum. Pl. 4: 342 (1843). Type: illustration in J.Jacq., Ecl. Pl. Rar.: t. 30 (1812).
- Drimia villosa* Lindl. in Edwards's Bot. Reg. 16: t. 1346 (1830). *Strepsiphyla villosa* (Lindl.) Raf., Fl. Tellur. 3: 60 (1837). *Idothea villosa* (Lindl.) Kunth, Enum. Pl. 4: 343 (1843). Type: 'Cape of Good Hope, received by Mr Tate', illustration in Edwards's Bot. Reg. 16: t. 1346 (1830).
- Drimia eckloniana* Schult.f., Syst. Veg., ed. 15 bis [Roemer & Schultes] 7(2): 1710 (1830). *Drimia humilis* Berg. ex Kunth, Enum. Pl. 4: 344 (1843), nom. illeg. superfl. Type: South Africa, 'in arenosis Prom. B. Spei.', *Ecklon s.n. Drimia* No. 89 (B, holo.). [Treated as a synonym of *D. pusilla* by Baker in Fl. Cap. 6: 441 (1897)].
- Drimia altissima* Hook.f. in Curtis's Bot. Mag. 91: t. 5522 (1865), nom. illeg., non *D. altissima* (L.f.) Ker Gawl. (1808). *Drimia alta* R.A.Dyer in Flower. Pl. S. Afr. 23: t. 890 (1943), as nom. nov. Type: South Africa, KwaZulu-Natal, 'Natal, from John Sanderson of D'Urban [Durban]', *sub W. Fitch s.n.* (K [000257364], holo. —image!).
- Drimia robusta* Baker in Refug. Bot. 3: t. 190 (1870). *Idothea robusta* (Bak.) Kuntze, Rev. Gen. 2: 712 (1891). Type: South Africa, 'Cape Colony from Cooper', *Hort Saunders 4404*, 1869, *Cooper s.n.* (K [000857417], holo. —image!).
- Drimia burchellii* Baker in Refug. Bot. 3, app. 2 (1870). *Idothea burchellii* (Bak.) Kuntze, Rev. Gen. 2: 712 (1891). Type: South Africa, Eastern Cape, 'Cape, Uitenhage Div., between Galgebosch and Melkrievier', 17 Feb. 1814, *Burchell 4769* (K [000857424], lecto. —image!, designated by Jessop in J. S. Afr. Bot. 43: 285 (1977); TCD, ?isolecto. [as *Burchell 4969*]).
- Drimia concolor* Baker in J. Linn. Soc., Bot. 11: 422 (1871). *Idothea concolor* (Bak.) Kuntze, Rev. Gen. 2: 712 (1891). Type: South Africa, 'Cap. B. Spei (e tab. ex exemplo in Hort. Kew anno 1823 cultio depicta descript)', (K, holo., not seen). [Treated as a synonym of *D. elata* by Baker in Fl. Cap. 6: 441 (1897)].
- Drimia rudatisii* Schltr. in Engl. Bot. Jahrb. 40: 89 (1907). Type: South Africa, KwaZulu-Natal, Port Shepstone (3030): 'Dumisa, feuchten schattigen Orten bei Fairfield', (—AD), 24 Aug. 1905, *Rudatis 79* (B [100167475], holo. —image!).

Plants deciduous, solitary or sometimes clumped. *Bulb* ovoid or subglobose, 30–80(–100) mm diam., scales tightly packed, arcuate-elliptic, imbricate, reddish, outer scales sometimes persisting and brown-papery above with transverse abscission lines, or leaf bases persisting as narrow brown fibrous strips. *Leaves* usually hysteranthous, (3)8 to 15, spreading to erect, linear or narrowly oblong to lanceolate, narrowed below, shallowly channelled, midrib bluntly keeled beneath, 100–300(–600) × 7–70 mm, bright green, glabrous or thinly to densely pubescent, margins plane or undulate to crisped, hairless or ciliate, cilia 0.5–2.0 mm long. *Inflorescence* a moderate to dense raceme (100–) 200–500(–1 000) mm tall, (10)20- to 100-flowered, flowers mostly 3–10 mm apart; scape glabrous, 1.0–15.0 mm diam. at base; bracts ovate-spathulate to lanceolate, 2–10(–25) mm long, spur of lowest bracts (1)–2–15(–23) mm long; pedicels ± spreading, (2)–5–10(–20) mm long. *Flowers* spreading or slightly nodding, sometimes with light lily-like or spicy fragrance; tepals connate in lower quarter or rarely up to half in cylindrical tube 3–6(–7) mm long, lobes reflexed, linear-spathulate to oblanceolate-spathulate, 9–14 × 1–3 mm, apices penicillate, silvery grey to brownish or mauve. *Filaments* erect and connivent around style, slightly upcurved apically, linear-filiform, 6–11 mm long, tapering from base, smooth or papillate-scabridulous below, whitish or often flushed reddish or purple with paler tips. *Anthers* medifixed, ellipsoid, ± 1 mm long, greyish green or purple. *Ovary* ovoid, ± 3 mm long, greenish yellow; style columnar, 9–13 mm long, white or purple distally; stigma truncate-papillate. *Capsules* oblong to obovoid, 3-lobed, 10–13 × 6 mm. *Seeds* elliptic, 4–6 × 2–3 mm. *Flowering time*: mainly autumn, February to March, in southwestern and southern winter-rainfall region and mainly spring to early summer, September to December, in eastern and northern summer-rainfall region. Figure 9; Plate 2F.

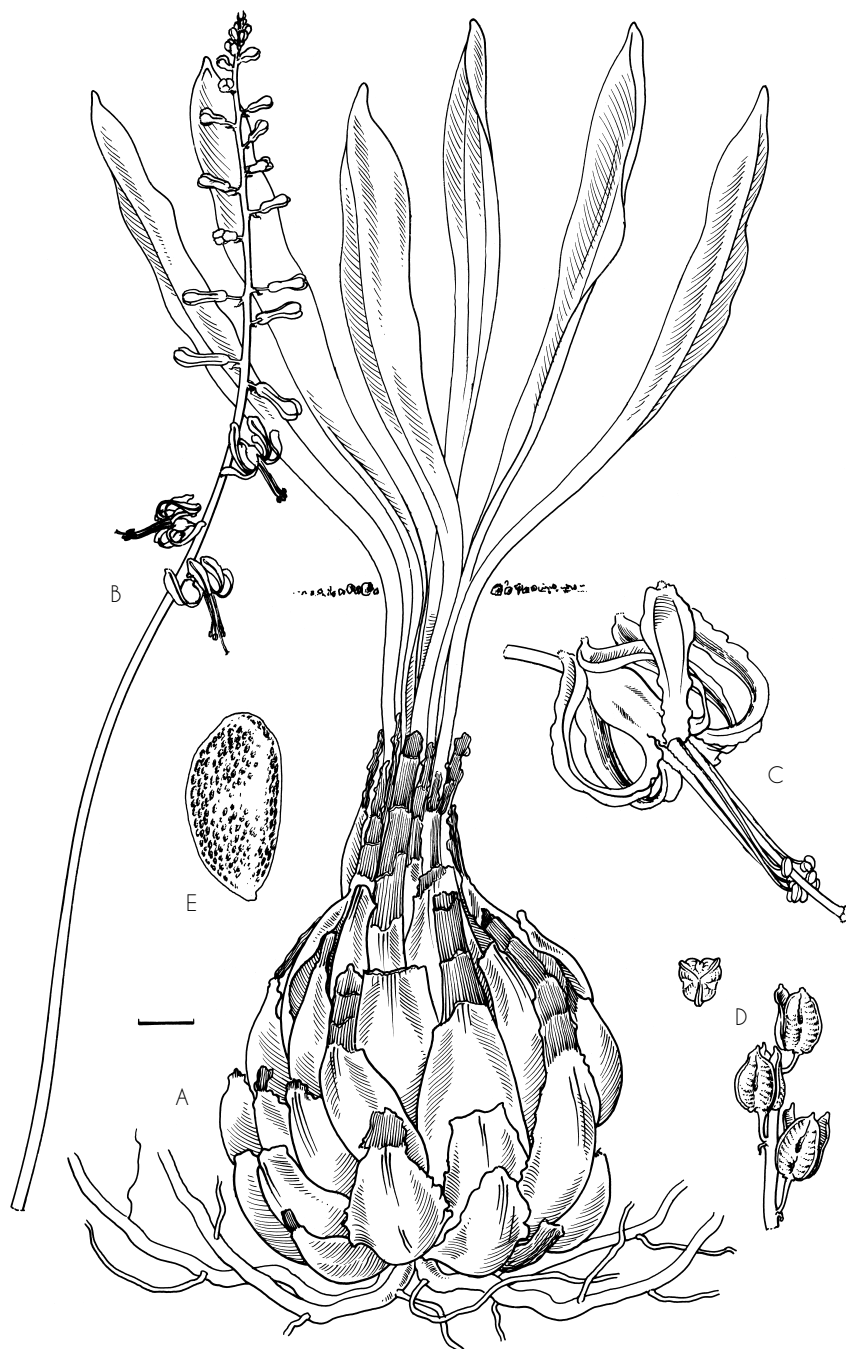


FIGURE 9.—*Drimia elata*, Western Cape, Bokbaai, without voucher. A, leafing plant; B, inflorescence; C, flower; D, capsules; E, seed. Scale bar: A, B, D, 10 mm; C, 1.5 mm; E, 1 mm. Artist: John Manning.

Distribution and ecology: widespread through southern Africa, but rare in the drier and semi-desert west and northwest and absent from the southern and central Drakensberg, extending into tropical Africa (Map 17); in a wide range of habitats, mainly grassland or open shrubland, in sandy or stony soils, from near the coast to over 1 000 m inland in the north.

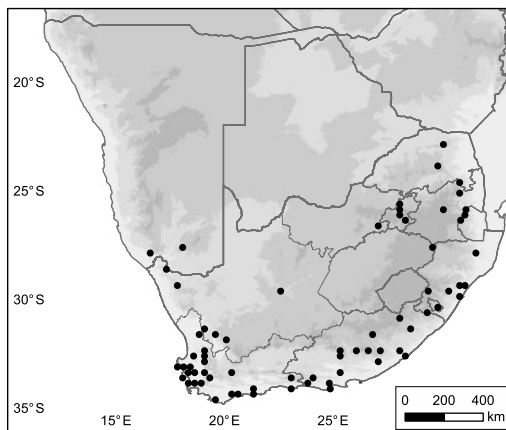
The bulb sap is caustic, causing burning and itching or irritation of the skin [Bohnen 5032 (NBG), Thode STE3392], and the species is one of several urGINEOIDS with the Afrikaans names *jeukbol* (itch-bulb) or *brandbol* (burn-bulb).

Diagnosis: *Drimia elata* is a variable species with a bulb of closely packed, usually reddish scales almost always lacking leaves at flowering time, and a cylindrical, laxly to more densely flowered raceme. Plants vary greatly in size and in their foliage, the leaves ranging from linear to lanceolate, 7–70 mm wide, either glabrous or thinly to densely pubescent, with glabrous or ciliate and sometimes tightly crisped margins. Flowers also vary in size, with the tube usually a quarter as long as the perianth, but sometimes up to half as long, and the lobes 9–14 mm long. The filaments may be smooth or puberulous-scabridulous below.

Many of these variants were described as separate species before the full extent of the variation was appreciated. Some of the more significant of these variants include *Drimia pusilla* for very small plants; *D. alta* and *D. robusta* for large forms; *D. ciliaris* and *D. villosa* for those with ciliate or pubescent leaves; *D. purpurascens* for a form with glabrous leaves with crisped margins; and *D. burchellii* for a form with very short pedicels. We, like Jessop (1977) and Stedje (1987), cannot segregate any of these variants as distinct species and adopt a similarly broad circumscription of *D. elata*.

Plants with ciliate or otherwise pubescent leaves appear to be restricted to the west and south of the subcontinent, where glabrous forms also occur; plants from the east and north of the region are invariably glabrous. We are unable to separate glabrous forms from pubescent variants at any taxonomic level. It is significant that the leaves in *D. haworthioides*, a well circumscribed species that is relatively constant in size, also vary from glabrous to conspicuously ciliate, and we conclude that leaf vestiture is variable within species in the section. Plants with short pedicels matching the type of *D. burchellii* from Uitenhage are also found inland around Somerset East. Robust plants with glabrous foliage matching *D. alta* and *D. robusta* are recorded from central KwaZulu-Natal into Swaziland and north to Magoebaskloof. Small plants with glabrous leaves matching the type of *Drimia pusilla* are recorded from the Cape Flats near Cape Town (Raitt 231, 273; Runnalls 993), but plants of the same diminutive stature are scattered into Namaqualand, with individuals from Vanrhynsdorp having either glabrous (Barker 10194) or conspicuously ciliate leaves (Hall 3594; Helme 3519).

The tightly packed bulb scales with broad bases distinguish smaller forms of *D. elata* from *D. haworthioides* and the cylindrical raceme with the lower flowers well-spaced apart separate it from *D. sphaerocephala*, which typically also flowers earlier in the season, in spring and early summer.



MAP 17.—Distribution of *D. elata* in southern Africa

Additional specimens seen

- NAMIBIA. **2716 (Witputz)**: Rosh Pinah, Scorpion Zinc Mine, (–DC), Sep. 1999, *Dauth 178* (NBG); gravel plains between Scorpion Mine and borehole 2, (–DC), 15 Sep. 2003, *Bartsch, Loots & Klaassen 1494* (NBG). **2718 (Grünau)**: farm Grabwasser, (–CA), 6 Apr. 1968 [leafing], *W. Giess 10321* (WIND).
- SWAZILAND. **2630 (Carolina)**: Mbabane Dist., Waverley Mine, (–BD), 7 Oct. 1956, *Compton 26104* (NBG). **2631 (Mbabane)**: Dalriach near Mbabane, (–AA), Jan. 1906, *Bolus 12400* (BOL); Komati Bridge, (–AA), 1 May 1959, *Dlamini s.n.* (PRE); 5 Jun. 1963, *Dlamini s.n.* (NBG).
- SOUTH AFRICA. LIMPOPO: **2230 (Messina)**: Soutpansberg, (–CC), 7 Nov. 1960 [leafing], *Strey 3508* (PRE). **2329 (Piettersburg)**: Tomazon Farm, (–DD), 1 800 m, 2 Jul. 1996, *Nienaber 22* (PRE). **2530 (Tzaneen)**: Magoebaskloof, (–CC), 24 Jun. 1946 [ex hort.], *Compton 18096* (BOL, NBG).
- NORTHWEST: **2627 (Potchefstroom)**: Potchefstroom, Tarentaal Siding, (–CA), 3 Nov. 1944, *Louw 1090* (PRE).
- GAUTENG: **2528 (Pretoria)**: Pretoria, Rietfontein, Magaliesberg N of Crot Street, (–CA), 1 385 m, 4 Oct. 2007, *Bester 8117* (NBG, PRE); Irene, (–CC), Dec. 1924 [fruiting], *Smuts s.n.* (NBG). **2628 (Johannesburg)**: Melville Koppies, (–AA), 4 Dec. 1961, *Macnae 1487* (NBG); Heidelberg, (–AD), 29 Nov. 1905, *Gilfillan 252* (PRE).
- MPUMALANGA: **2430 (Pilgrim's Rest)**: Mariepskop, (–DB), without date, *Pole-Evans 4763* (PRE). **2530 (Lydenburg)**: Sabie, (–BB), 7 Oct. 1955, *Louw 2122* (NBG). **2531 (Komatipoort)**: Barberton, (–CC), Jun. 1911, *Thornicroft 10395* (PRE).
- FREE STATE: **2729 (Volksrust)**: Memel Dist., Koolhoek, (–DA), Nov. 1907, *Thode s.n.* STE3392 (NBG).
- KWAZULU-NATAL: **2731 (Louwsburg)**: Nongoma, (–DC), Oct. 1932, *Herre s.n.* (BOL). **2929 (Underberg)**: upper tributaries S of Mkomazi River, (–CB), 3 Dec. 1982, *O. Hilliard & B. Burt 15859* (NU, PRE). **2930 (Pietermaritzburg)**: Noodsberg, (–BD), 2 Sep. 1952, *Dickson s.n.* (NBG); Pietermaritzburg, (–CB), 18 Aug. 1944, *Van der Merwe NBG57/44* (NBG); 18 Feb. 1944 [leafing], *Van der Merwe s.n.* NBG57/44 (NBG); Alexandra Park, (–CB), 17 Oct. 1939, *Fairall 140* (NBG); Old Howick Road, (–CB), 18 Aug. 1987, *H. Kennedy & J. Steed 22* (NU); Krantzklouf, (–DD), Nov. 1921, *Haygarth s.n.* (NBG); Gillits Railway Station, (–DD), 11 Sep. 1895, *Medley Wood 5789* (BOL). **2931 (Stanger)**: Chakaskraal [Shakaskraal], (–AC), Sep. 1945, *Thode s.n.* STE3390 (NBG).
- NORTHERN CAPE: **2817 (Vioolsdrif)**: Richtersveld, Klipbokberge, (–CB), Dec. 1933 [ex hort. Cape Town], *Herre s.n.* (BOL). **2917 (Springbok)**: Steinkopf, (–BD), 15 Jan. 1909, *Pearson 4720* (BOL). **2922 (Prieska)**: near Prieska, (–DA), Dec. 1933, *Fuller 194* (BOL). **3119 (Calvinia)**: Charlie se Hoek farm NE of Nieuwoudtville, (–AC), 5 Feb. 1982, *Snijman 586* (NBG); Nieuwoudtville Wildflower Reserve, (–AC), 29 Mar. 1997, *Van Rooyen, Steyn & de Villiers 391* (NBG); Oorlogskloof Nature Reserve, (–AC), 600 m, 21 Jun. 2000, *Low 5981* (NBG). **3120 (Williston)**: Middelpos Commonage, (–CC), 1 Jun. 2001 [leafing], *Manning 2344* (NBG).
- WESTERN CAPE: **3118 (Vanrhynsdorp)**: Vanrhynsdorp, Aties Farm, (–DA), 5 Jan. 1982, *Perry 977* (NBG); 5 km N of Vanrhynsdorp, W of N7 opposite existing gypsum mine, (–DA), 22 Aug. 2005 [leafing], *Helme 3519* (NBG); 3 miles [8 km] N of Vanrhynsdorp, (–DB), 6 May 1965 [fruiting; fl. ex hort. 15 Apr. 1966], *Barker 10194* (NBG); 4 miles [10 km] E of Vanrhynsdorp on Urionskraal Rd, (–DB), deep red sandveld, 12 Jun. 1970 [leafing], *Hall 3594* (NBG); 4 Feb. 1971, *Hall 3594* (NBG). **3218 (Clanwilliam)**: Piketberg, Kapteinskloof, (–DA), 10 Jun. 1970, *NBG Exp 892/70* (NBG). **3219 (Wuppertal)**: Algeria Forest Station, (–AC), 20 Sep. 1930 [leafing], *Barnes s.n.* (BOL); Clanwilliam, Warmbaths, (–CA), Jun. 1915 [leafing], *F. & L. Bolus 31785* (BOL); 8 Mar. 1946, *Leipoldt s.n.* NBG60/44 (NBG); N entrance to Elandsdorp, (–CA), 8 Aug. 1971 [fruiting and leafing], *Hardick s.n.* (NBG); Citrusdal, Theerivier, (–CC), 28 May 1973 [leafing only], *Hanekom 2087* (PRE). **3317 (Saldanha)**: near Langebaan, (–BB), Mar. 1944, *Chaplin s.n.* (NBG); Hoedjies Bay, (–BB), 23 Feb. 1956, *Hall s.n.* NBG131/53 (NBG). **3318 (Cape Town)**: Donkergat, (–AA), 19 Dec. 1965, *Hall 3324* (NBG); Hopefield, Neutboskraal, (–AB), 28 Mar. 1976, *Hugo 200a* (NBG); near Mamre, (–AD), Oct. 1931 [leafing], *Bolus s.n.* BOL31786 (BOL); road off 26th milestone to Mamre, (–AD), 3 Mar. 1970, *Axelsson 147* (NBG); Malmesbury, (–BC), 9 Feb. 2000, *Dorse 216* (NBG); Darling Flora Reserve, (–CA), Mar. 1957, *Lewis 5117* (NBG); Koeberg Rd, (–CB), Mar. 1918, *Rohland s.n.* (BOL); Raapenberg, (–CD), May 1915 [leafing], *Kensit s.n.* (BOL); Milnerton, (–CD), Feb. 1930, *Bolus 19153* (BOL); 13 Mar. 1942, *Compton 13055* (NBG); Rugby, sandy ground, (–CD), 2 Apr. 1944, *Compton 15618* (NBG); near Rosebank, (–CD), May 1876, *Bolus 3923* (BOL); Fresnaye, (–CD), 11 Mar. 1940, *Salter 8337* (BOL); Paardebeg, between Wellington and Malmesbury, (–CD), 7 Mar. 2012, *Nicolson & Roets 858* (NBG); Paarl, Dal Josephat, (–DB), 23 Mar. 1964,

Barker 8868 (NBG); Penhill, Eersterivier, (–DC), 25 Mar. 1976, Raitt 231 (NBG); 19 Sep. 1976 [leafing], Raitt 273 (NBG); Stellenbosch, (–DD), Mar. 1924, Duthie 1451 (BOL). **3319 (Worcester)**: Romans River level crossing, (–AC), 9 Mar. 1959, Barker 8869 (NBG); Farm Elandsberg W of Hermon, foot of Elandsbloof Mts, (–AC), 2 Mar. 2000, Goldblatt & Manning 11279 (NBG); Worcester Veld Reserve, (–CB), Mar. 1963, Olivier 250 (NBG). **3320 (Montagu)**: 27 km SE of Matjiesfontein, Lettaskraal farm, (–AD), 1 003 m, 21 Jun. 2003, Harrower 1624 (NBG). **3418 (Simonstown)**: Cape Peninsula, Witsands, (–AB), 10 Mar. 1940, Penfold 260 (NBG); Cape of Good Hope Nature Reserve, Duiwelsvlei, (–AB), 9 Mar. 1973, Taylor 8353 (NBG); Strand, Harmony Reserve, (–BB), 15 Mar. 2000, Runnalls 993 (NBG). **3419 (Caledon)**: Caledon Swartberg, (–AB), Jul. 1930 [leafing], Bolus s.n. (BOL); 3 miles [8 km] N of Elim, (–DA), 18 Feb. 1951, Martin 736 (NBG). **3420 (Bredasdorp)**: De Hoop Nature Reserve, struikbosveld near bungalows, (–AD), 2 Feb. 1983, Burgers 2978 (NBG); Potberg, flats SW of house, (–BC), 140 m, 27 Feb. 1985, Scott 516 (NBG). **3421 (Riversdale)**: Riversdale, (–AB), without date, Muir 3560 (NBG); Still Bay, (–AD), stony calcrete, 60 m, 15 Feb. 1979, Bohnen 5032 (NBG). **3423 (Knysna)**: Knysna Heads, (–AA), Feb. 1922, Fourcade 2024 (BOL). EASTERN CAPE: **3028 (Matatiele)**: Mt Tyndall, 20 km SNW from Maclear, (–CC), 9 Nov. 1994, Bester 3231 (NBG). **3029 (Kokstad)**: Clydesdale, (–BD), Dec. 1884, Tyson 2168 (BOL); Kokstad, (–CB), Nov. 1883, Tyson 1691 (BOL). **3126 (Queenstown)**: Andriesberg, (–DB), 6 Dec. 1896, Galpin 2230 (BOL). **3128 (Umtata)**: above Baziya Forest, (–BC), grassy slope, 29 Sep. 1985, Hutchings & Hutchings 1785 (NBG). **3225 (Somerset East)**: Bruintjieshoogte, Grootfontein farm, (–AD), 3 Dec. 2008, Clark et al. 164 (NBG); spur off Groot Bruintjieshoogte, Rietfontein farm, (–CB), 8 Dec. 2008, Clark et al. 397 (NBG). **3226 (Fort Beaufort)**: De Beerspas between Tarkastad and Bedford, (–AC), 3 Jan. 1989, Kurzweil 1305 (NBG); Grahamstown, (–BC), Dec. 1915 [ex hort.], Pienaar s.n. (BOL). **3227 (Stutterheim)**: Upland farm, ± 6 km NE of Cathcart, (–AC), 1 248 m, 7 Jan. 2012, Bester 10935 (PRE); Pirie Mt, (–CC), 9 Nov. 1901, Bolus 12400 (BOL). **3228 (Butterworth)**: near Butterworth, (–AC), 26 Nov. 1945, Compton 177706 (NBG); Kei Mouth, (–CB), Jan. 1892, Flanagan 1159 (BOL); Kei Mouth, Morgan's Bay, (–CB), grassland above lagoon, Jun. 2010, Deacon 851 (NBG). **3323 (Willowmore)**: Lauterwater, (–CA), 26 Jan. 1941, Compton 10470 (NBG); hill NW of Joubertina, (–DD), Jan. 1924, Fourcade s.n. (BOL). **3324 (Steytlerville)**: Rus en Vrede, Kouga Mts, (–CA), 17 Mar. 2000 [fruiting and leafing], Euston-Brown 9 (NBG); E of Jeffrey's Bay, old municipal tip at Papiessfontein, (–DD), 10 Mar. 2006, Prozsky 1276 (NBG). **3325 (Port Elizabeth)**: Port Elizabeth, Bridgemead, (–AD), 10 Sep. 2000 [fl ex hort. Cape Town], Cowley s.n. (NBG); Port Elizabeth, Parson's Vlei, (–AD), Mar. 1932, Laughton s.n. (BOL). **3424 (Humansdorp)**: Kabeljouw, (–BB), without date, Fourcade 3355 (BOL).

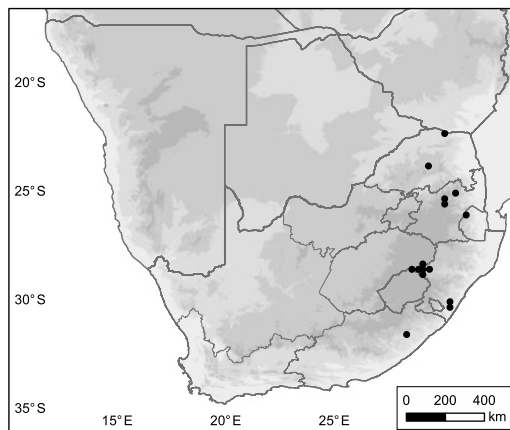
18. **Drimia sphaerocephala** Baker in Fl. Cap. 6: 441 (1897). Type: South Africa, Mpumalanga, Komatipoort (2531): 'Concession Creek near Barberton', (–CC), 7 Sep. 1890, Galpin 1020 (K [000400570], lecto. —image!, designated by Jessop in J. S. Afr. Bot. 43: 280 (1977); BOL!, SAM!, isolecto.).

Drimia neriniformis Baker in Fl. Cap. 6: 442 (1897). Type: South Africa, KwaZulu-Natal, Harrismith (2829): 'Van Reenen', (–AD), 15 Nov. 1892, Wood 4794 (K [000257350], lecto. —image!, designated by Jessop in J. S. Afr. Bot. 43: 280 (1977); E!, NH!, P, PRE, Z, isolecto.).

Drimia capitata Baker in Fl. Cap. 6: 442 (1897). Syntypes: South Africa, Eastern Cape, Umtata (3128): 'Bazeia [Baziya]', (–CB), Baur 1160 (K [000257353], syn. —image!); South Africa, 'Free State', Cooper 885 (K [000257352], syn. —image!).

Plants deciduous. *Bulb* ovoid, 20–30(–40) mm diam., scales closely packed, pale yellowish or rarely reddish. *Leaves* hysteranthous or emergent, mostly 2 to 4, erect or suberect, narrowly lanceolate, soft-textured with midrib raised beneath towards base, 100–170 × 6–10 mm, bright green, glabrous or sparsely pubescent along adaxial midrib and sometimes along abaxial edges, margins conspicuously ciliate, cilia 0.5–2.0 mm long. *Inflorescence* a congested, capitate or globose raceme, 300–450(–600) mm tall, 15- to 30-flowered, flowers mostly 0.5–1.0 mm apart; scape glabrous, 1.0–4.0 mm diam.; bracts linear-lanceolate, 3–10 mm long, spur of lowest bracts 4–10(–12) mm long; pedicels ± spreading, (2.5–) 5.0–12.0(–20.0) mm long at anthesis, but elongating to 25 mm in fruit. *Flowers* spreading or slightly

nodding, tepals (6–)8–12(–15) mm long, connate in lower fifth to quarter in a shortly cylindrical tube 2–4(–5) mm long, lobes reflexed, oblanceolate-spathulate, (6–)8–12(–15) × 1–2 mm, penicillate, silvery grey to greenish or mauve. *Filaments* erect and connivent around style, slightly upcurved apically, subulate-filiform, 4–8 mm long, smooth or papillate-scabridulous in basal half or more, whitish. *Anthers* medifixed, ellipsoid, ± 1 mm long, green or purplish. *Ovary* ovoid, ± 3 mm long, greenish yellow; style columnar, ultimately 4.5–9.0 mm long, white; stigma truncate-papillate. *Capsules* oblong or obovoid, 3-lobed, 7–10 × 4–6 mm. *Seeds* elliptic, 3–6 × 2–3 mm. *Flowering time*: November to early January. Figure 10; Plate 3D.



MAP 18.—Distribution of *D. sphaerocephala*

Distribution and ecology: restricted to the eastern escarpment, with a scattered distribution from west of Umtata in Eastern Cape and Kokstad in southern KwaZulu-Natal onto the northern Drakensberg and adjacent Lesotho and eastern Free State, Mpumalanga and Swaziland as far north as Musina and the Blouberg in Limpopo (Map 18); in montane grassland, usually on moist or marshy slopes.

Diagnosis: recognised by the capitate or globose inflorescence with the spacing between adjacent flowers much less than the length of the pedicels, the flowers remaining closely crowded and the inflorescence rounded in fruit. The bracts are typically relatively long with the lower bracts conspicuously spurred, the spurs forming a distinctive vertical collar below the flowers. The leaves are usually hysteranthous and relatively narrow, up to 10 mm wide, and conspicuously ciliate. *Drimia sphaerocephala* may be confused with occasional specimens of *D. elata* with unusually compact inflorescences, but then the lower flowers at least are rather laxly spaced and the bracts not as conspicuously spurred.

The variation in the size of the flowers and length of the pedicels led Baker (1897) to recognise three species among the limited material available to him at the time: *Drimia capitata* based on a single collection each from Baziya in Eastern Cape and the Free State, with pedicels 13–19 mm long and the inflorescence 50 mm diam.; *D. neriniformis* from one collection near Van Reenen in northern KwaZulu-Natal, with pedicels 6.0–7.5 mm long and heads 40–50 mm diam.; and *D. sphaerocephala* from near Barberton in Mpumalanga with much smaller inflorescences, the pedicels 4–5 mm long and the heads 25 mm diam. Jessop (1977), however, demonstrated a linear correlation between the two variables, with a continuous series of intermediates, and concluded that the material represented a single variable species. Modern collections confirm that populations around Harrismith in Free State typically have the largest heads ± 50 mm diam. with long pedicels 15–20 mm long, but plants with smaller heads are also recorded from there. Populations from Eastern Cape, Mpumalanga and Limpopo are consistently small-flowered, and those from Swaziland somewhat intermediate. The variation in these characters in *Drimia sphaerocephala* is matched by similar levels of variation in the other species in the group.

Additional specimens seen

SWAZILAND. **2631 (Mbabane)**: Forbes Reef, (–AA), 16 Jan. 1951, *Compton* 22405 (NBG); 4500 × [1 370 m], 24 Jan. 1956, *Compton* 25435 (NBG); 6 Nov. 1958, *Compton* 28274 (PRE); 4 Nov. 1960, *Compton* 30265 (NBG).

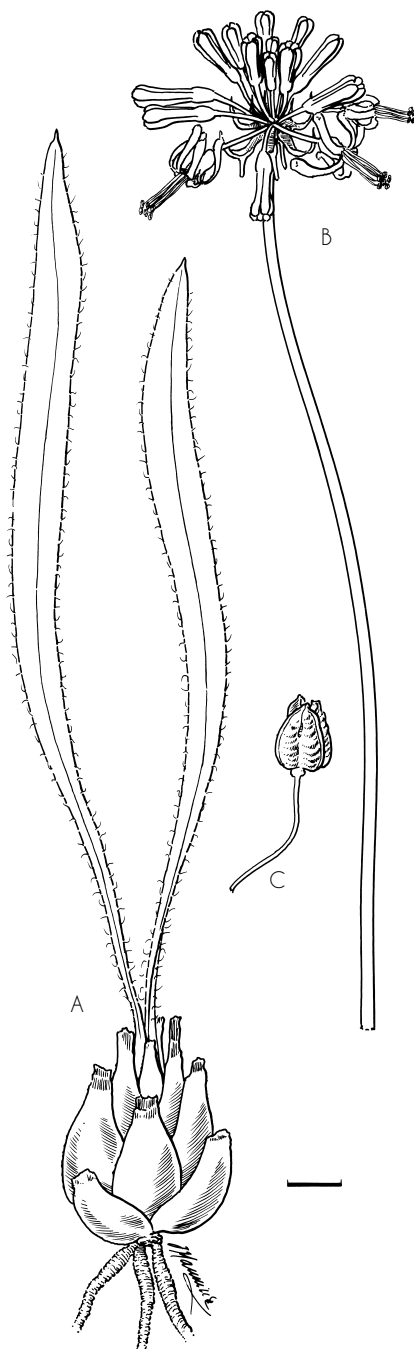


FIGURE 10.—*Drimia sphaerocephala*, KwaZulu-Natal, Witzieshoek, no voucher. A, leafing plant; B, inflorescence; C, capsule. Scale bar: 10 mm. Artist: John Manning.

SOUTH AFRICA. LIMPOPO: **2230 (Messina)**: Messina [Musina], (–AC), without date, *Moss & Rogers 1396* (BOL). **2329 (Pietersburg)**: Pietersburg [Polokwane], Blaauwberg [Blouberg], (–CD), Oct.–Dec. 1953 [fl. ex hort.], *Esterhuysen 21424* (BOL).

MPUMALANGA: **2530 (Lydenburg)**: Dullstroom, (–AC), 18 Dec. 1882, *Galpin s.n.* (BOL); Long Tom Pass, Mauchsberg, (–BA), 20 Nov. 1993, *Burgoyne 1999* (PRE); Mt Anderson W of Anderson Pass, (–CA), 25 Dec. 1932, *Smuts & Gillett 2417* (BOL).

FREE STATE: **2828 (Bethlehem)**: near Bester's Vlei, Witzieshoek, (–DA), Dec. 1893, *Bolus 8267* (BOL); Witzieshoek, road to Sentinel, (–DA), 14 Feb. 2008 [fruiting], *Manning 3151* (NBG); E slope below Sentinel, moist grassland, (–DB), 20 Dec. 1983, *Dove 53* (NBG).

KWAZULU-NATAL: **2829 (Harrismith)**: Platberg, (–AC), 2 400 m, 16 Dec. 1974, *Van der Zeyde 78* (NBG); 10 Jan. 1974, *Van der Zeyde 2727* (NBG); Van Reenen, (–CA), 15 Nov. 1892, *Medley Wood 4794* (BOL); 4 Dec. 1895, *Medley Wood 3860* (BOL); Oliviershoek Pass, (–CA), Dec. 1906, *Thode 3391* (NBG); National Park, near Bergville, (–CB), 23 Nov. 1942, *Van der Merwe 2616* (PRE); Cathedral Peak Forest Station, (–CC), 4 Dec. 1950, *Killick 1193* (BOL). **3030 (Port Shepstone)**: St Bernard's, (–AB), 22 Dec. 1952, *Barker 7977* (NBG); Alexandra, Hlokozi, (–AD), 16 Jan. 1919, *Rudatis 2393* (NBG).

19. ***Drimia haworthioides* Baker** in Gard. Chron. 1875, 3: 366 (1875). Type: South Africa, Eastern Cape, Graaff-Reinet (3224): 'near Graaff-Reinet', (–BC), Dec. 1874 [fl. ex hort. Kew], *Bolus 2040* (K [000857416], holo. —image!).

Ornithogalum haworthioides Baker in J. Bot. 16: 322 (1878). *Drimia bolusii* Baker in Fl. Cap. 6: 443 (1897), as nom. nov. [non *Drimia haworthioides* Baker (1875)]. Type: South Africa, Eastern Cape, Graaff-Reinet (3224): 'hills near Graaff-Reinet, Cave Mountain', (–BC), *Bolus 814* (?), holo.). [Note: Treated as a synonym on e-monocot.org, and matched from description.]

Plants deciduous. *Bulb* sometimes epigeal, 20–50(–70) mm diam., scales loose, imbricate, arcuate and paddle-shaped, stalked, fleshy, white to reddish. *Leaves* hysteranthous, 1 to 5(6), suberect or spreading, lorate to oblanceolate, mostly 40–140 × 5–12 mm, soft-textured with midrib raised beneath towards base, plane or undulate, bright green, glabrous or margins ciliate, cilia 0.5–1.5 mm long. *Inflorescence* a lax or moderately dense raceme 100–300 mm tall, 5- to 10(30)-flowered, flowers mostly 3–10 mm apart; scape glabrous, 1.0–1.5 mm diam.; bracts spatulate, 1–2 mm long, spur of lowest bracts 0.5–1.0 mm long; pedicels suberect-spreading, (2–)3–7 mm long. *Flowers* spreading or slightly nodding; tepals 10–15 mm long, connate in lower quarter to third in a shortly cylindrical tube 2–4 mm long, lobes reflexed, oblanceolate-spatulate, 7–9 × ± 2 mm, penicillate, greenish or brownish to mauve. *Filaments* erect and connivent around style, slightly upcurved apically, subulate-filiform, 6–8 mm long, mauve; anthers medifixed, ellipsoid, ± 1 mm long, purple. *Ovary* ovoid, ± 3 mm long, greenish yellow; style columnar, ultimately 9–10 mm long, white; stigma truncate-papillate. *Capsules* oblong, 3-lobed, ± 10 × 6 mm. *Seeds* elliptic, 4–5 × 2–3 mm. *Flowering time*: January to February. Figure 11.

Distribution and ecology: scattered through semi-arid southeastern South Africa, from near Worcester in Western Cape eastwards through the drier interior valleys of the Little and Great Karroo and the adjacent coastal districts from Riversdale to Grahamstown and Graaff-Reinet in Eastern Cape (Map 19); on stony lower slopes, sometimes in the shelter of low shrubs.

Diagnosis: a small species up to 300 mm tall in flower, distinguished by the loose cluster of fleshy, paddle-shaped bulb scales typically narrowed and stalked below, bearing a superficial resemblance to a bunch of grapes or the leaf rosette of a succulent species of *Haworthia*. *Drimia haworthioides* may be confused with small plants of *D. elata* with loose bulb scales, but in that species the bulb scales are broad-based and not evidently stalked below. Non-flowering plants also resemble *D. karooica*.



FIGURE 11.—*Drimia haworthioides*, Western Cape, Worcester, without voucher. A, leafy plant; B, inflorescence; C, flower and bract. Scale bar: A, B, 10 mm; C, 1.5 mm. Artist: John Manning.

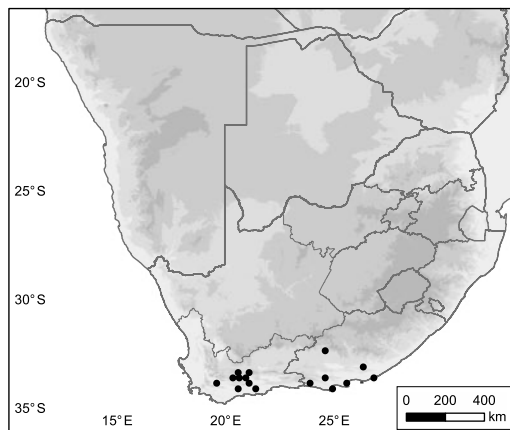
Additional specimens seen

SOUTH AFRICA. WESTERN CAPE: 3319 (Worcester):

foot of Jonas Kop, (–DC), 8 Jul. 1979 [leafing], Perry 974 (NBG). **3320 (Montagu):** Witteberg Rd about 3 miles S of Laingsburg, (–BC), 5 Feb. 1971, Wisura 1384 (NBG); 14 km E of Elands-kloof, (–BC), Jan. 1985, Bruyns s.n. (NBG); Dobbelaars-kloof, 6.5 km along turnoff to Driefontein, (–CB), 26 Aug. 1978 [fl. ex hort. 11 Jan. 1982], Perry 770 (NBG); 13 km E of Bonnievale, (–CB), 10 May 1977 [leafing], Perry 851 (NBG); Anysberg, (–DA), without date, Stokoe 8479 (BOL); Farm Zorgvliet, SW lower slopes of Touwsberg, (–DB), 5 Oct. 1993 [leafing], Snijman 1369 (NBG). **3321 (Ladismith):** 10 miles W of Ladismith, (–AC), 25 Jan. 1940, Salter s.n. NBG1193/37 (NBG); 2.5 km along Dwarsrivier turnoff from Ladismith to Laingsburg Rd, (–AC), 19 Feb. 1981, Perry 1499 (NBG); Garcia's Pass, (–CC), Dec. 1930, Bolus s.n. (BOL).

3420 (Bredasdorp): Buffeljags, E of Swellendam, (–BA), 5 Mar. 1982 [fl. ex hort. 8 Feb. 1983], Viviers 155 (NBG, PRE). **3421 (Riversdale):** 1.5 km W of Reisesbaan Siding on main road, (–AB), on laterite koppie, 24 Jan. 1980, Bohnen 7251 (NBG).

EASTERN CAPE: 3323 (Willowmore): 3 miles N of Joubertina, (–DD), 21 Aug. 1970 [leafing], Stayner s.n. (NBG). **3324 (Steytlerville):** Papiessfontein farm, E of Jeffrey's Bay, (–DA), 20 Jan. 2006, FBI131 (NBG). **3325 (Port Elizabeth):** Red House, (–DC), Jan. 1911, Paterson s.n. (BOL); Zwartkops [Swartkops] near Port Elizabeth, (–DC), Jul. 1931 [leafing], Bolus NBG 874/31 (BOL). **3326 (Grahamstown):** 6 km W of Grahamstown towards Cradock/Bedford, (–AB), 5 Jan. 1982, Perry 1638 (NBG); Kowie West, (–DB), 1916, Tyson NBG175/15 (BOL); Port Alfred, (–DB), Jan. 1907, Rogers sub Schönland 1685 (BOL). **3424 (Humansdorp):** Jeffrey's Bay, (–BB), sand dunes, Jul. 1927 [leafing], Duthie sub Fourcade 3295 (BOL).



MAP 19.—Distribution of *D. haworthioides*

20. ***Drimia media* Jacq.**, Collectanea Suppl.: 40 (1797). *Hyacinthus medius* (Jacq.) Poir. in Lamarck, Encyc., Suppl. 3: 120 (1813). *Idothea media* (Jacq.) Kunth, Enum. Pl. 4: 342 (1843). Type: illustration in Jacq., Icon. Pl. Rar. 2 (16): t. 375 (1795).

Drimia rigidifolia Baker in J. Linn. Soc., Bot. 11: 420 (1871). *Idothea rigidifolia* (Baker) Kuntze, Rev. Gen. 2: 712 (1891). Type: South Africa, Eastern Cape, "Somerset [East]", Bowker 225 [K 000857419], lecto. —image!, designated by Jessop in J. S. Afr. Bot. 43: 285 (1977)].

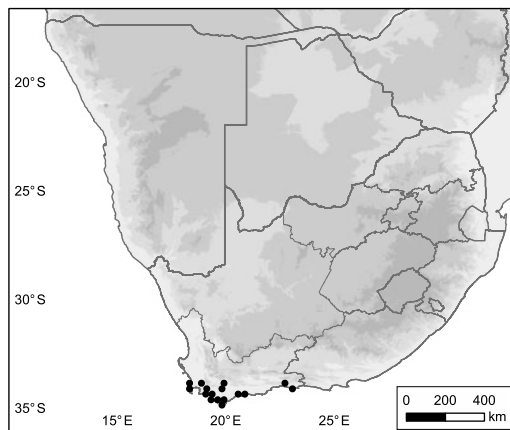
Plants semi-evergreen. *Bulb* ovoid, 30–60(–80) mm diam., scales tightly packed, imbricate, reddish. *Leaves* usually synanthous, sometimes poorly or only partly developed, but bases of older leaves shortly persistent and always evident at flowering, 3 to 10(20), erect or suberect, rigid, linear-hemiterete, 80–200(–400) × 1.5–4.0 mm, bright green, adaxial surface flat or lightly channelled above, rounded abaxially, glabrous, margins minutely papillate. *Inflorescence* a moderately dense raceme, 300–600 mm tall, (15)20- to 35-flowered, flowers mostly 3–10 mm apart; scape glabrous, 1.0–4.0 mm diam.; bracts ovate to spatulate, 2–4 mm long, spur of lowest bracts 1–2 mm long; pedicels ± spreading, 5–12 mm long. *Flowers* spreading or slightly nodding, tepals connate in lower quarter in a shortly cylindrical tube 3–4 mm long, lobes reflexed, ob lanceolate-spatulate, 9–12 × 2–3 mm, penicillate, margins plane or undulate to crisped, silvery grey to brownish or mauve. *Filaments* erect and connivent around style, slightly upcurved apically, subulate-filiform, 6–8 mm long, whitish; anthers medifixed, ellipsoid, ± 1 mm long, purple. *Ovary* ovoid, ± 3 mm long, greenish yellow; style columnar, 9–10 mm long,



FIGURE 12.—*Drimia media*, Western Cape, Cape Peninsula, without voucher. A, flowering plant with emergent foliage; B, flower; C, two tepals and attached stamens; D, anther; E, gynoecium; F, capsules; G, seeds. Scale bar: A, F, 10 mm; B, C, E, G, 1.5 mm; D, 1 mm. Artist: John Manning.

white; stigma truncate-papillate. *Capsules* oblong to obovoid, 3-lobed, 9–11 × 6 mm. *Seeds* elliptic, 4–6 × 2–3 mm. *Flowering time*: (late January) February to March (early April). Figure 12.

Distribution and ecology: a fynbos endemic restricted to the coastal mountains in the south-west of the Cape Floristic Region, from the Cape Peninsula and the Stillebosch-Hottentots Holland Mtns along the Kleinrivier Mtns to Bredasdorp and inland onto the southern slopes of the Langeberg near Robertson with an apparent small disjunction to the east on the lower slopes of the Outeniqua Mtns between George and Knysna (Map 20); on rocky sandstone and limestone slopes in low fynbos vegetation, from near sea level up to 200 m.



MAP 20.—Distribution of *D. media*

Diagnosis: resembling *Drimia elata* in flower, but readily distinguished by its foliage, the stiffly erect, linear leaves half as long as or up to as long as the scape and partially or fully developed at flowering, 1.5–4.0 mm wide and hemiterete in section, with a flattened or lightly channelled upper surface and convex underside. *Drimia media* and *D. elata* are mostly allopatric, but the two species co-occur on the Cape Peninsula and along parts of the southern coast, where they are separated ecologically by habitat and flowering time, with *Drimia elata* preferring sandy or gravelly flats and flowering in the autumn, from February to April, at which time the plants are leafless, the soft-textured blades abscising cleanly from the bulb scales without any traces evident.

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE: 3318 (Cape Town): Table Mt W of Platteklip Gorge, (–CD), Mar. 1944, *Goulinis s.n.* (BOL); Camps Bay, lower Blinkwater, (–CD), 16 Feb. 1957, *Cassidy 148* (NBG); NW of Groot Drakenstein Mts, (–DD), 26 Apr. 1953, *Esterhuysen 21348* (BOL); Jonkershoek, (–DD), 20 May 1977, *Raitt s.n.* (NBG). **3319 (Worcester)**: Robertson, Klaasvoogds, shaley S slopes of Langeberg, (–DD), 31 Jan. 1954, *Esterhuysen 22711a* (BOL). **3322 (Oudtshoorn)**: George, Kleinplaat, Duiwelskop, (–DC), 15 Feb. 1978, *Bond 1359* (NBG). **3418 (Simonstown)**: Constantiaberg, (–AB), 18 Mar. 1943, *Compton 14445* (NBG); 27 Feb. 1982, *Viviers 157* (NBG); Steenberg, (–AB), 25 Sep. 1949 [leafing], *Esterhuysen 15841* (BOL); Chapman's Peak, (–AB), 28 Mar. 1943, *Leighton 493* (BOL); Fish Hoek Mt, (–AB), 13 Mar. 1941, *Barker 1062* (NBG); Red Hill, (–AB), 10 Mar. 1940, *Adamson 2805* (BOL); *Penfold 257* (NBG). **3419 (Caledon)**: Elgin Basin, Arieskraal Farm, (–AA), 23 Feb. 1996, *Rode 640* (NBG); Hermanus Flats, (–AC), Feb. 1925, *Smuts 1079a* (NBG); Hermanus, Mossel River, (–AC), 18 Feb. 1951, *Heginbotham 189* (NBG); Hermanus, Fernkloof Nature Reserve, (–AC), 21 Mar. 1976, *Orchard 365* (NBG); Hermanus, amongst coastal scrub, (–AC), 13 Mar. 1978, *Hall 4776* (NBG); Vogelgat, (–AD), 11 Mar. 1979, *Williams 2731* (NBG); Soetanyenberg, Bergplaas farm, (–BB & DD), 26 Mar. 1982, *Fellingham 413* (NBG); 1 Feb. 1995, *Paterson-Jones 169* (NBG); Tafelberg, dry to moist N- and S-facing slopes, (–CB), 28 Mar. 1971, *Oliver 3322* (NBG); Gansbaai, Grootbos Nature Reserve, (–CB), 6 Apr. 2008, *Manning 3167A* (NBG); Hagelkraal, poort near Hagelkraal River, (–DA), limestone hill, 10 Mar. 1979, *Thompson 3919* (NBG); Klein Hagelkraal near Pearly Beach, (–DA), 10 Apr. 1979, *Raitt 365* (NBG); Koueberge, neck E of Buks-se-Berg, (–DA), 9 Mar. 1979, *Thompson 3888* (NBG); 10 km E of Baard-skeerdersbos, fynbos flats, (–DA), 14 Mar. 1977, *Thompson 3401* (NBG); Ratel River, (–DA), 12 Mar. 1979, *Thompson 3976* (NBG); Heidehof SE of Uilenkraal River mouth, (–DA), 25 Feb. 1980, *Oliver 7598* (NBG); Soetanyenberg above Rietfontein farmstead, (–DB), 19 Feb. 2006, *Turner 1498* (NBG); Bredasdorp Mountain between Boskloof and Napier, (–DB), 16 Mar. 1978, *Thompson 3794* (NBG); Hangklip Farm, Soetanyenberg,

(-DB), 6 Mar. 1996, Victor 2315 (PRE). **3420 (Bredasdorp)**: De Hoop, Potberg Nature Reserve, (-BC), 12 Feb. 1979, Burgers 1741 (NBG); The Poort near Bredasdorp, (-CA), 16 Feb. 1951, Barker 7226 (NBG). **3421 (Riversdale)**: Gouritz River Bridge, (-BD), 31 Jan. 1955, Hall 971 (NBG). **3423 (Knysna)**: hills E of Knysna Heads, (-AA), Feb. 1922, Fourcade 2042 (BOL); between Keurbooms River and Knysna, (-AA), Feb. 1926, Gillett s.n. (NBG); Zwart River road, (-AA), 26 Feb. 1944, Fourcade 6378 (NBG).

Sect. 5. **Thuranthos** (C.H.Wright) J.C.Manning & Goldblatt, comb. et stat. nov. *Thuranthos* C.H.Wright in Kew Bull. 1916: 233 (1916). Type: *Thuranthos macranthus* (Baker) C.H.Wright = *D. macrantha* (Baker) Baker

Indurgia Speta in Stapfia 75: 169 (2001). Type: *Indurgia indica* (Roxb.) Speta = *Drimia indica* (Roxb.) Kunth

Duthiea Speta in Stapfia 75: 170 (2001). Type: *Duthiea senegalensis* (Kunth) Speta = *Drimia senegalensis* (Kunth) J.C.Manning & Goldblatt

Plants small to medium-sized. *Bulb* scales adherent or loose and shortly stalked, flesh white to pale pink. *Leaves* 1 to several, blade filiform to subterete or linear and channelled above and keeled beneath, glabrous, hystranthous or synanthous. *Inflorescence* a lax raceme; scape glabrous; bracts ovate to lanceolate, sometimes caducous and absent at flowering, lower short-spurred; bracteoles absent or vestigial and then solitary at base of pedicel on alternate sides; pedicels longer than tepals at flowering, arcuate, abscising near middle or at base if unfertilised. *Flowers* nocturnal, pendent, perianth deciduous and tepals cohering above to form a cap on developing capsule; tepals almost free or connate basally, recurved, oblong-lanceolate, pink, yellowish or greenish with darker midrib, often leathery. *Stamens*: filaments erect and incurved around ovary below and erect or slightly spreading above, subulate-filiform to lanceolate or thickened and ellipsoid below and strongly constricted and filiform above, 7–20 mm long, much longer than anthers; anthers sub-basifixed, subglobose to lanceolate, dehiscence longitudinal. *Ovary* ovoid-conical; style as long as to several times longer than ovary, cylindrical to subclavate or prismatic; stigma truncate-papillate or capitate-papillate. *Capsule* ovoid to ellipsoid, sometimes large. *Seeds* angled or elliptic to suborbicular.

The section is essentially defined by nocturnal flowers with reflexed tepals and is probably not monophyletic as circumscribed here. It is likely that *Drimia basutica*, *D. indica* and *D. macrantha* are allied on the basis of their large size, caducous bracts, and thickened fruiting pedicels, often with large capsules, but there is nothing apart from the form of the perianth to link them with the other species in the section. The distinction between *Drimia indica* and *D. basutica* requires further study in the field.

Key to species

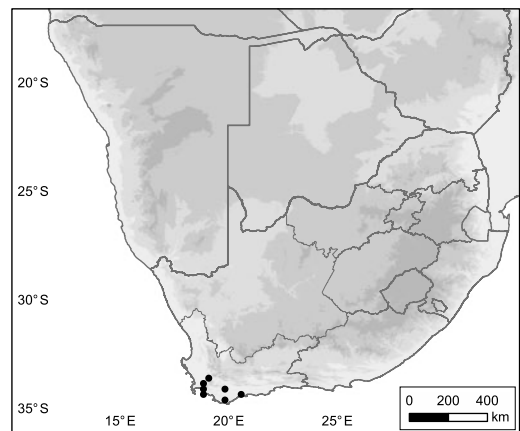
- 1a. Inflorescence to 400 mm tall; bracts persistent; pedicels 8–12 mm long, abscising $\pm$ midway if not pollinated; tepals 7–8 mm long; filaments 6–8 mm long; capsules 5–7 mm long; plants from southwestern Western Cape 21. *D. hesperantha*
- 1b. Inflorescence 150–1 300 mm tall; bracts persistent or caducous; pedicels 15–80 mm long, abscising at base if not pollinated; tepals 8–33 mm long; filaments 7–20 mm long; capsules 7–40 mm long; plants from Eastern Cape northwards:
 - 2a. Bracts persistent; filaments fusiform, constricted basally, $\pm$ 7 mm long; anthers subglobose-sagittate, $\pm$ 1 mm long at anthesis; capsules on slender, horizontally spreading pedicels, subglobose-ovoid, $\pm$ 7 mm long; leaves terete-canaliculate, 0.5–1.0 mm diam. 22. *D. vespertina*
 - 2b. Bracts caducous; filaments lanceolate, sometimes abruptly narrowed midway, but never constricted basally, 5–20 mm long; anthers oblong, 1.5–7.0 mm long; capsules on thickened, suberect pedicels, subglobose to ellipsoid, 3-lobed, 8–40 mm long; leaves linear-canaliculate, 4–18 mm wide:

- 3a. Leaf sheaths unmarked; tepals 22–33 mm long; filaments 15–20 mm long, basal 6–12 mm flattened and incurved around ovary forming a cage-like structure, sharply constricted and terete-fusiform above; style several times longer than ovary; stigma large and capitate. 25. *D. macrantha*
- 3b. Leaf sheaths plain or barred or blotched with purple towards base; tepals 9–20 mm long; filaments 7–11 mm long, simple and lanceolate or basal portion elliptical, constricted above; style as long as or slightly longer than ovary; stigma 3-angled:
- 4a. Inflorescence mostly up to 500 mm tall; pedicels 12–30 mm long; tepals 6–12 mm long; filaments 5–6 mm long. 23. *D. indica*
- 4b. Inflorescence more than 500 mm tall; pedicels 35–80 mm long; tepals 14–20 mm long; filaments 7–11 mm long. 24. *D. basutica*
21. ***Drimia hesperantha*** J.C.Manning & Goldblatt in Bothalia 33: 111 (2003), as nom. nov. pro *D. revoluta* (A.V.Duthie) J.C.Manning & Goldblatt in Goldblatt & Manning in Strelitzia 9: 712 (2000), nom. illeg., non *D. revoluta* (L.f.) Sweet (1818) [= *Ledebouria revoluta* (L.f.) Jessop]. *Urginea revoluta* A.V.Duthie in Ann. Stell. Univ. 6A(2): 9 (1928). *Thuranthos revoluta* (A.V.Duthie) Speta in Phytom: 84 (1998). Type: South Africa, Cape Town (3318): 'Stellenbosch Flats', (–DD), Mar. 1927, Duthie 1874 (NBG [as STE], holo.!, K, PRE!, iso.).

Plants deciduous, solitary. *Bulb* ovoid, $\pm$ 15–30 mm diam., scales adherent, becoming thinly leathery, flesh pink. *Leaves* hysteranthous or synanthous, 1 or 2, erect, filiform or terete, 100–200 $\times$ 0.5–1.0 mm, finely striate, dull green. *Inflorescence* a lax raceme 100–400 mm tall, 10- to 30-flowered, rachis inclined and flowers subsecund, mostly (5–)8–10 mm apart; scape erect, often slightly flexuous, 0.5–1.0 mm diam., but thickened basally, glabrous; bracts ovate, $\pm$ 1 mm long, spur to 1 mm long; bracteoles absent; pedicels arcuate or slightly deflexed at flowering, but suberect or spreading horizontally with tips erect in fruit, mostly 8–12 mm long at anthesis, abscising near middle if not pollinated and basal portion remaining curved. *Flowers* nocturnal, pendent, lightly acrid-scented; tepals connate $\pm$ 0.5 mm, recurved, linear-oblongate, 7–8 $\times$ 1.5–2.0 mm, inner sometimes wider than outer, apices penicillate, whitish or buff with brown midrib. *Filaments* erect and connivent around ovary and style, subulate-filiform, 6–8 mm long, white. *Anthers* sub-basifixed, oblong, $\pm$ 1 mm long, dehiscence longitudinal, yellow. *Ovary* ovoid, each carpel with small swollen apical lobe, pale green, 3 mm long; style narrowly clavate, 3 mm long, white; stigma subcapitate-papillate. *Capsules* subglobose, 5–7 mm long. *Seeds* angular, wrinkled, 2.0–2.5 mm long, black, testa rugulose. *Flowering time*: December to March, rarely in June after fire; flowers opening after dark at 20:00 and withering the following morning by 07:00. Figure 13.

Distribution and ecology: endemic to the coastal mountains of Western Cape, from Bainskloof to the Kogelberg eastwards to De Hoop (Map 21); on sandstone or limestone slopes in rock crevices or loamy sites, flowering mainly after fire.

Diagnosis: a slender species with a flexuous, subsecund raceme of pendent, nocturnal flowers with reflexed tepals 7–8 mm long, subulate-filiform filaments 6–8 mm long, and a narrowly clavate style 3 mm long and $\pm$ as long as the



MAP 21.—Distribution of *D. hesperantha*

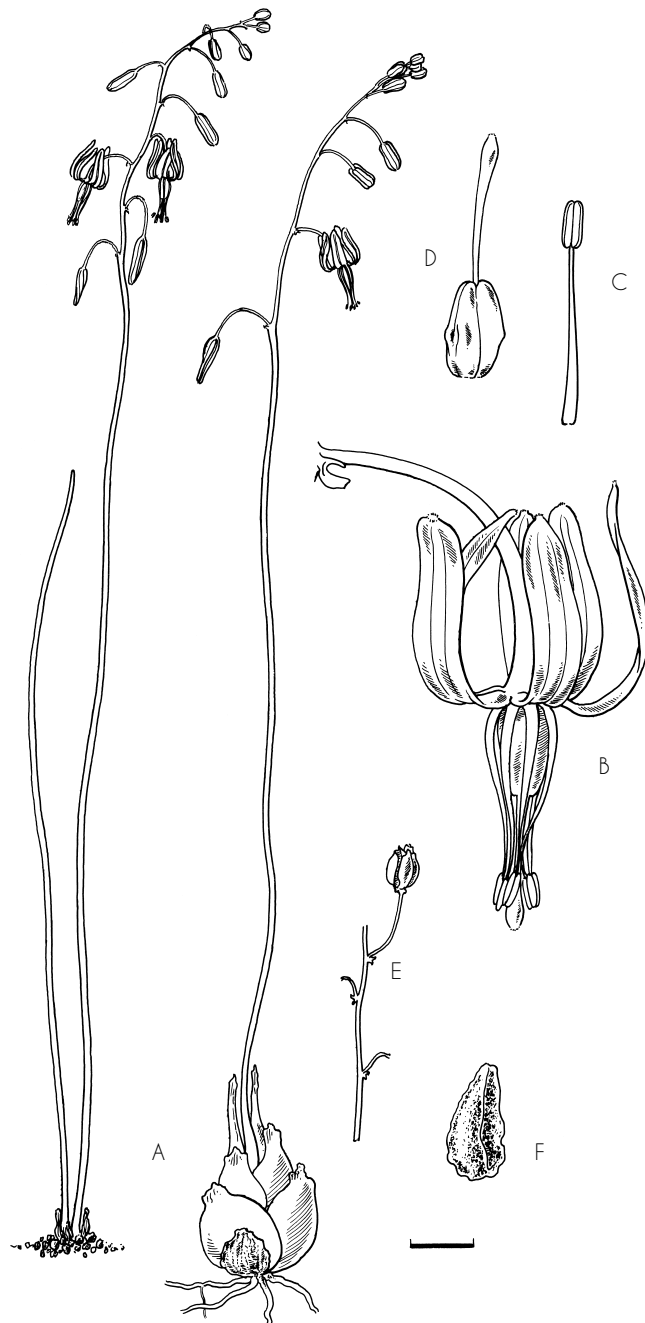


FIGURE 13.—*Drimia hesperantha*, Western Cape, Bredasdorp, Goldblatt & Manning 10857 (NBG). A, flowering plants; B, flower; C, stamen; D, gynoecium; E, portion of infructescence with capsule and partially abscised pedicels; F, seed. Scale bar: A, E, 10 mm; B–D, 2 mm; F, 1 mm. Artist: John Manning.

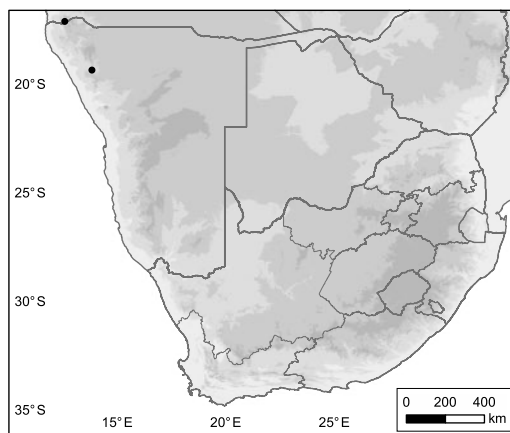
ovary. The pedicels are unique in the group and genus in abscising near the middle if the flowers are not pollinated, leaving a short, recurved basal portion 4–5 mm long attached to the scape. One or two filiform or terete leaves are produced during the winter and are often still present at flowering.

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. 3319 (Worcester): Suurvlaakte, above Du Toit's Kloof, head of pass, (–CA), 27 Feb. 1954, *E. Esterhuysen* 22771 (BOL). **3418 (Simonstown):** Somerset West, burned slope above Diepgat, (–BB), 8 Jan. 1950, *E. Esterhuysen* 16727 (BOL); Palmiet River near mouth, (–BD), Dec. 1941, *F. Leighton* BOL22719 (NBG); Fairy Glen, Palmiet River Mouth, (–BD), 25 Jan. 1947, *E. Esterhuysen* 13672 (BOL); Jan. 1972, *C. Boucher* 1776 (NBG, PRE); Kogelberg Reserve, Oudebos across Palmiet River, (–BD), 6 Jun. 2001, *J. Manning* 2303 (NBG). **3419 (Caledon):** Riviersonderend Mts, slopes near Riviersonderend village, (–BB), 20 Nov. 1955, *E. Esterhuysen* 25329 (BOL); near Elim, (–DB), 7 Dec. 1896, *H. Bolus* 450 (BOL). **3420 (Bredasdorp):** De Hoop near turnoff from Potberg road, limestone hills, (–BC), 6 Feb. 1998, *P. Goldblatt & J. Manning* 10857 (NBG).

22. ***Drimia vespertina*** *J.C.Manning & Goldblatt*, sp. nov. Type: Namibia, Sesfontein (1913): Khowarib Gorge, (–BD), 29 Apr. 1991 [flowering bulb, ex hort.; orig. coll. 8 Jan. 1990], *P. Bruyns* 4066 (NBG, holo.).

Plants deciduous. *Bulb* subglobose, 15–20 mm diam.; scales adherent, drying pale brown and becoming thinly leathery, flesh white or flushed pink. *Leaves* hysteranthous or synanthous, 3 to 7, $\pm$ erect, subterete and concave above, mostly 100–150 $\times$ 0.5–1.0 mm, glabrous, bright green. *Inflorescence* a lax raceme 150–300 mm tall, 3- to 16-flowered, flowers (7–)10–15(–20) mm apart; scape erect, 1.0–1.5 mm diam, glabrous; bracts ovate-apiculate, $\pm$ 1 mm long, lower with spur $\pm$ 1 mm long; bracteoles absent; pedicels spreading $\pm$ horizontally with tips erect, 15–25(–30) mm long at anthesis but up to 35 mm long in fruit, abscising at base if not pollinated. *Flowers* nocturnal, pendulous, unscented; tepals almost free, forming a shallow cup $\pm$ 1.5 mm deep at base, recurved, lanceolate, 8–10 $\times$ $\pm$ 2.5 mm, penicillate at apex, obscurely clawed and pouched in basal $\pm$ 1 mm, pale pink with broad green keels. *Filaments* erect and weakly sigmoid, forming open, cage-like structure around gynoecium with apices somewhat connivent, conspicuously ellipsoid-fusiform, $\pm$ 7 mm long and $\pm$ 1 mm diam. at widest point, constricted and filiform-attenuate in basal and distal 1.5 mm, pale pink. *Anthers* sub-basifixed, subglobose, $\pm$ 1.0 mm long, dehiscence longitudinal, orange with yellow pollen. *Ovary* ovoid-conical, $\pm$ 4 mm long, greenish yellow; style columnar, $\pm$ 4 mm long, white; stigma truncate, trigonous-papillate. *Capsules* subglobose-ovoid, $\pm$ 7 mm long. *Seeds* suborbicular, $\pm$ 7 mm diam., glossy black, rugulose, testa cell walls sinuous. *Flowering time*: December to April; flowers opening early evening (17:00–18:00) and withering later that night. Figure 14.



MAP 22.—Distribution of *D. vespertina* in southern Africa

Distribution and ecology: restricted to the highlying parts of Kaokoland in northwestern Namibia and adjacent southern Angola (Map 22); on dry, rocky flats.

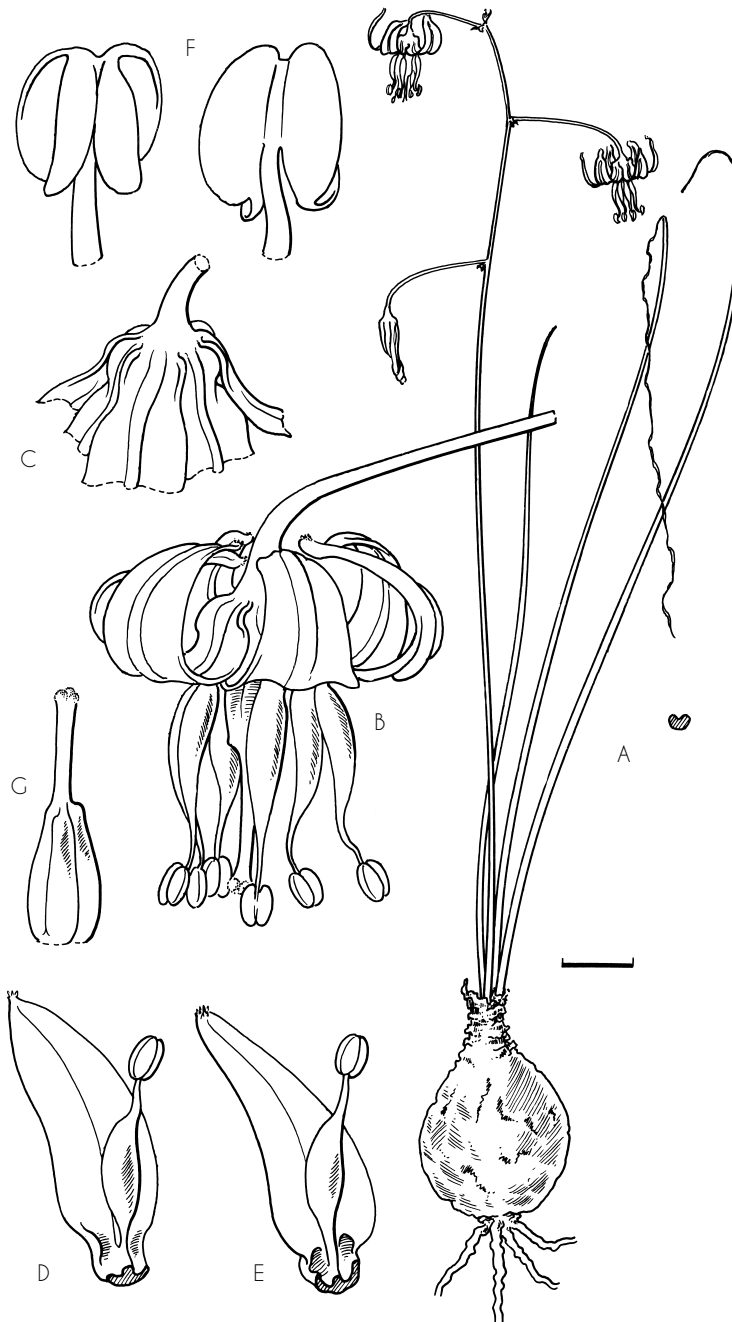


FIGURE 14.—*Drimia vespertina*, Angola, Namibe, Harrower 4101 (NBG). A, flowering plant with cross-section of leaf; B, flower; C, base of perianth; D, outer tepal and attached stamen; E, inner tepal and attached stamen; F, anthers; G, gynoecium. A, 10 mm; B–E, G, 2 mm; F, 1 mm. Artist: John Manning.

Diagnosis: very distinctive in the group in its foliage, producing 3 to 7 slender, terete-canaliculate leaves. The inflorescence is slender, up to 250 mm tall, with relatively small flowers with tepals ± 7 mm long and characteristic ellipsoid-fusiform filaments strongly constricted basally and distally. The small capsules, ± 7 mm long, are borne on slender, horizontally spreading pedicels. The small flowers may lead to confusion with *D. indica* in the absence of foliage, but that species has lanceolate filaments and larger capsules, 8–18 mm long, borne on thickened, suberect pedicels. The collection *Davies et al.* 54 (PRE) from northern Namibia was identified as *D. indica* by Jessop (1977) and cited under that name by Craven (1999) in the *Checklist of Namibian Plant Species*.

Additional specimens seen

ANGOLA. Namibe Province, ± 35 km E of Namibe on road to Leba Pass, 28 Dec. 2009 [fl. ex hort.], A. Harrower 4101 (NBG).

NAMIBIA. **1712 (Posto Velho):** Kaokoveld, Kunene Gorge about 4 km from W end, (–BA), 4 Jul. 1959 [fruiting], *Davies, Thompson & Miller* 54 (PRE).

23. ***Drimia indica* (Roxb.) Jessop** in J. S. Afr. Bot. 43: 272 (1977). *Scilla indica* Roxb., Fl. Indica 2: 147 (1824). *Urginea indica* (Roxb.) Kunth, Enum. Pl. 4: 333 (1843). *Thuranthos indicum* (Roxb.) Speta in Phytom: 84 (1998). *Indurgia indicum* (Roxb.) Speta in Stapfia 75: 170 (2001). Type: India, Coromandel, *Roxburgh s.n.* (K, holo. —image!).

Urginea zambesiaca Baker in J. Linn. Soc. Bot. 13: 223 (1873). *Thuranthos zambesiicum* (Baker) Kativu in Kativu and Drummond in Kirkia 15: 113 (1994). Type: Mozambique, 'Expedition Island', *Kirk s.n.* (K, holo. —image!).

Urginea amboensis Baker in Bull. Herb. Boissier, sér. 2, 3: 665 (1903). Type: Namibia, Ondangua (1715): 'Ondonga', (–DD), *Rautanen* 773 (Z, holo. [000102325] —image!).

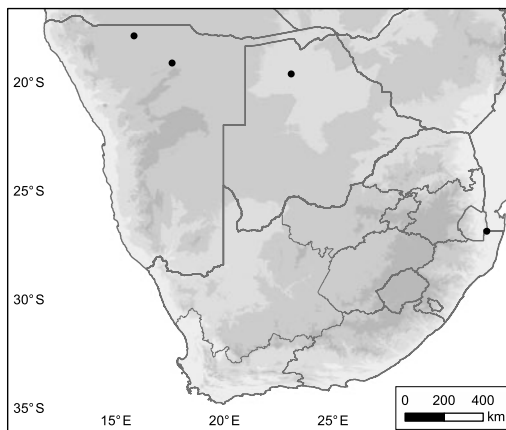
Albuca reflexa K.Krause & Dinter in Bot. Jahrb. Syst. 51(3-4): 445 (1914), syn. nov. *Ornithogalum desertorum* J.C.Manning & Goldblatt in Manning et al. in Edinburgh J. Bot. 60(3): 547 (2004), as nom. nov. [non *O. reflexum* Freyn & Sint. in Freyn (1894)]. Type: Namibia, Tsumeb (1917): 'Nord-Hereroland, bei Tsumeb', (–BA), without date, *Dinter* 2694 (SAM [2 sheets], lecto.!, designated here). (Note: No duplicates are held at WIND.)

Plants deciduous. *Bulb* ovoid to subglobose, 30–70 mm diam., scales adherent or loose and spatulate, fleshy, whitish. *Leaves* hysteranthous or synanthous, 2 to 5, erect, linear-canaliculate, up to 100–300 $\times$ 4–18 mm, dull green, usually paler below with purple bars or markings on sheaths. *Inflorescence* a lax raceme 200–500 mm tall, sometimes sub-secund, 5- to 25-flowered, flowers mostly 10–20 mm apart; scape erect or flexuous, 2–3 mm diam., glabrous; lower bracts caducous and absent at flowering, ovate, 1–2 mm long with spur to 1 mm long; bracteoles vestigial; pedicels horizontally spreading and deflexed apically, 12–30(–45) mm long, suberect or incurved in fruit, abscising at base if not pollinated. *Flowers* nocturnal, pendent, fragrant; tepals connate up to 1.5 mm, recurved, linear-oblong, 6–12 $\times$ 1.5–2.0 mm, apices penicillate, yellowish green to buff brown with darker midrib. *Filaments* inserted ± 1 mm above base of tepals, incurved over ovary below then suberect or slightly spreading above, lanceolate, 5–6 mm long, white or greenish. *Anthers* sub-basifixed, oblong, 1.5–2.0 mm long, dehiscence longitudinal, green. *Ovary* ovoid to oblong, green, 3–4 mm long; style clavate-prismatic, 4–5 mm long, white; stigma truncate and 3-angled. *Capsules* subglobose to ellipsoid, 3-lobed, 8–18 mm long. *Seeds* elliptic, 7–10 mm long, glossy black. *Flowering time*: mainly October to January; flowers opening at dusk and withering the following morning.

Distribution: ranging from the coastal parts of northern KwaZulu-Natal and northern Namibia through east and central tropical Africa to Mauretania, and India (Map 23); in woodland and seasonally flooded grassland on sandy, stony soils.

Diagnosis: recognised by the characteristically barred or mottled leaf bases and the lax inflorescence lacking bracts at flowering and with small to moderately sized, nocturnal flowers with tepals 6–12 mm long and filaments 5–6 mm long. The capsules are 8–18 mm long. *Drimia indica* is not always easily separated from *D. basutica* and more field work is required to resolve the circumscriptions of the two taxa, but we provisionally follow Jessop (1977) and Stedje (1987) in restricting *D. indica* to relatively slender and smaller-flowered plants with smaller capsules.

We have been able to examine type material of the poorly understood *Albuca reflexa* K.Krause & Dinter and find that it is in fact a member of *Drimia* sect. *Thuranthos*. The leaves are described as narrow with dark makings at the base, thus characteristic of *D. indica* and *D. basutica*, and the general size of the plant and flowers, with pedicels 30 mm long, tepals 14 × 3 mm, filaments 6 mm long and style 4.5 mm long are consistent with its inclusion in *D. indica*.



MAP 23.—Distribution of *D. indica* in southern Africa

Additional specimens seen

BOTSWANA. 1923 (Maun): Okavango Delta, Delta Camp near airstrip, (–CA), 15 Jun. 1994 [fl. ex hort.], *D. Cole* 1087 (PRE).

SOUTH AFRICA. KWAZULU-NATAL. 2632 (Bela Vista): Ndumu Game Reserve, seasonally inundated grassland, (–CC), 5 Nov. 1969, *E. Moll* 4309 (PRE); Ndumu Game Reserve, edge of Pongola floodplain, (–CC), 15 Oct. 1969, *E. Pooley* 661 (NU).

24. ***Drimia basutica* (E.P.Phillips) J.C.Manning & Goldblatt**, comb. nov. *Urginea basutica* E.P.Phillips in Ann. S. Afr. Mus. 16: 306 (1917). *Thuranthos basuticum* (Phill.) Oberm. in Bothalia 13: 139 (1980). Type: South Africa, Lesotho, Bethlehem (2828): ‘Leribe’, (–CC), Oct.–Nov. 1911, *A. Dieterlen* 854 (PRE [0048599-0], holo.!, K, SAM!, iso.). [Note: The type is clearly indicated as *Dieterlen* 854 in the protologue and not *Dieterlen* 854a as given by Jessop (1977). Although there are multiple gatherings under this number in various herbaria, some of them with different dates, the specimen indicated here is annotated ‘Type’ by Phillips and is accepted as the holotype.]

Drimia elata var. *cooperi* Baker in J. Linn. Soc., Bot., 11: 422 (1871). *Drimia angustifolia* Baker in Fl. Cap. 6: 440 (1897) [non *D. cooperi* Baker], nom. illeg., non *D. angustifolia* Kunth (1843). Type: South Africa, Eastern Cape, Fort Beaufort (3226): ‘near Tarkastadt’, (–AB), 1860, *Cooper* 387 [K, lecto. —image!], designated by Jessop in J. S. Afr. Bot. 43: 273 (1977)].

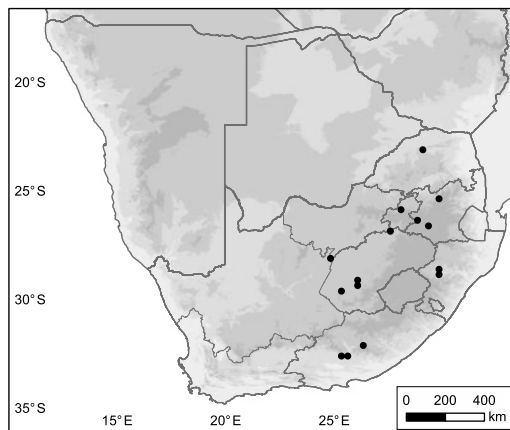
Drimia macrocarpa Stedje in Nord. J. Bot. 7: 664 (1987), syn. nov. *Thuranthos macrocarpum* (Stedje) Speta in Phytotaxa 84 (1998). *Duthiea macrocarpa* (Stedje) Speta in Stapfia 75: 170 (2001). Type: Tanzania, Mpanda Dist., Uruwira, 23 Sep. 1970, *Richards & Arasululu* 26126 (K, holo. —image!).

Ornithogalum laikipiense L.E.Newton in The Plantsman N.S. March 2003: 18 (2003), syn. nov. Type: Kenya, Laikipia Plateau, 1995, *Roberts sub Newton* 5567 (K, holo. —image!; EA, iso.).

[*Drimia zambesiaca* sensu Kativu and Drummond in Kirkia 15: 113–115 (1994), non (Roxb.) Kunth]

Plants deciduous. *Bulb* ovoid to subglobose, 50–100 mm diam., scales adherent or loose and arcuate-spathulate, fleshy, whitish. *Leaves* hysteranthous or synanthous, 2 to 4, erect, linear-canaliculate,

100–300 × 7–13 mm, dull green, sometimes with purple blotches or bars on sheaths towards base. *Inflorescence* a lax raceme 600–900 mm tall, 4- to 15-flowered, flowers mostly 10–30 mm apart; scape 2–5 mm diam., glabrous; lower bracts caducous and absent at flowering, lanceolate, 7–8 mm long; bracteoles subulate, also caducous; pedicels horizontally spreading and deflexed apically, (35–)50–60(–80) mm long, erect or ± flexuous and thickened in fruit, abscising at base if not pollinated. *Flowers* nocturnal, pendent, fragrant; tepals connate for 0.5–4.0 mm, lobes recurved, linear-oblong, 14–20 × 1.5–2.0 mm, apices penicillate, yellowish green to buff brown with darker midrib. *Filaments* inserted ± 3 mm above base of tepals, incurved over ovary below then suberect or slightly spreading above, lanceolate or lower portion somewhat expanded, 7–11 mm long, white. *Anthers* sub-basifixed, narrowly oblong, 2.5–7.0 mm long, dehiscence longitudinal, green. *Ovary* ovoid to oblong, 5–8 mm long, green; style clavate-prismatic, 7–9 mm long, white; stigma truncate and 3-angled. *Capsules* oblong to ellipsoid, 3-lobed, 25–40 mm long. *Seeds* elliptic, 9–10 mm long, glossy black, testa colliculate. *Flowering time*: mainly October to January; flowers opening at dusk and withering the following morning. Plate 1D, E.



MAP 24.—Distribution of *D. basutica*

Distribution and ecology: scattered through the temperate, well-watered eastern part of South Africa, from Somerset East in Eastern Cape, Free State and northeastern Northern Cape, Gauteng and northern KwaZulu-Natal through Mpumalanga to Limpopo, and northwards into east tropical Africa (Map 24); often in seasonally damp grassland, moist depressions or seeps and along streams, but also on rock outcrops.

Diagnosis: distinguished from *Drimia indica* by its larger size, the inflorescence more than 500 mm long with larger flowers, tepals 14–20 mm long and lanceolate filaments 7–11 mm long, borne on long spreading pedicels mostly 50–60 mm long or longer, and larger capsules 25–40 mm long on stout erect pedicels. The distinctive large capsules are shared with *Drimia macrantha*.

The South African material was not considered by Stedje (1987) when she described *Drimia macrocarpa* from East Africa. We have examined several sheets of that species and are unable to distinguish them from the southern African material of *D. basutica* and accordingly treat them as conspecific. *Ornithogalum laikipiense* was reduced to synonymy under *D. macrocarpa* by Manning (2004).

Additional specimens seen

SOUTH AFRICA. LIMPOPO. 2329 (Pietersburg): Carlisle farm, near Blaauwberg [Blouberg] Mt. (–AA), 31 Dec. 1959 [leafing], B. de Winter 7163 (PRE).

GAUTENG. 2528 (Pretoria): Six Mile Spruit on Swartkop Gold Course, (–CC), 1 Nov. 1949, L. Codd 5768 (PRE); Willow Glen, (–CC), 2 Dec. 1959 [leafing], R. Strey 3128 (PRE); May 1962 [fruiting], R. Strey 3925 (PRE). **2628 (Johannesburg)**: between Leslie and Devon, (–BD), 18 Dec. 1941 [fruiting], R. Dyer 4181 (PRE).

MPUMALANGA. 2529 (Witbank): 4 miles [6.4 km] N of Stofberg, (–BD), Mauve 4088 (PRE). **2629 (Bethal)**: De Krans, Blesbokspruit, (–CB), 7 Nov. 1993, R. Smit 2433 (PRE).

FREE STATE. 2627 (Potchefstroom): Uitkomst farm, 5–6 km WNW of Sasolburg, (–DC), 4 Nov. 1996, N. Kroon

13023 (PRE); 18 Dec. 1996 [fruiting], N. Kroon 14064 (PRE). **2925 (Jagersfontein)**: Groenvlei, Fauresmith, (–CB), Kies 332 (PRE). **2926 (Bloemfontein)**: Bloemfontein, near Eagle's Nest, in spruit bed in temporary pools, (–AA), Dec. 1916, G. Potts 1525 (BOL); O.F.S. Botanic Garden near rubbish-heap, (–AA), 17 Nov. 1976, M. Lumley s.n. (NBG); S of Bloemfontein along N1, (–AC), 14 Feb. 2008 [fruiting], J. Manning 3153 (NBG). KWAZULU-NATAL. **2829 (Harrismith)**: Colenso, Industrial area, (–DB), 8 Oct. 1986, D. Green 427 (NBG); 30 Oct. 1988, D. Green 592 (NBG); Colenso, (–DB), 24 Oct. 1888, Medley Wood 4027 (BOL); 1 km beyond Colenso on Colenso-Weenen road, (–DD), 22 Oct. 1995, R. Williams & W. Menne 1240 (NBG, PRE). NORTHERN CAPE. **2824 (Kimberley)**: Warrenton, (–BB), Nov. 1902, B. Adams s.n. BOL16205 (BOL); Jan. 1937 [fr. ex hort.], J. Acocks 1603 (PRE). EASTERN CAPE. **3225 (Somerset East)**: Klein Bruintjieshoogte, (–CB), without date [fl. ex hort.], MacOwan 1848 (SAM); Bester's Hoek, near Somerset East, MacOwan 1835 (BOL, GRA); Boschberg, Waaihoek Nature Reserve, (–DA), 9 Jan. 2010, J. Manning 3255 (NBG).

25. **Drimia macrantha** (Baker) Baker in Engl. Bot. Jahrb. 15, Beibl. 35: 7 (1892). *Ornithogalum macranthum* Baker in J. Linn. Soc., Bot. 13: 280 (1873). *Urginea macrantha* (Baker) E.P. Phillips in Ann. S. Afr. Mus. 16: 305 (1917). *Thuranthos macranthum* (Baker) C.H. Wright in Kew Bull. 1916: 233 (1916). Type: South Africa, 'Cap. B. Spei', Drège 2204 (BM, lecto., designated by Jessop in J. S. Afr. Bot. 43: 275 (1977); G. L. islecto.).

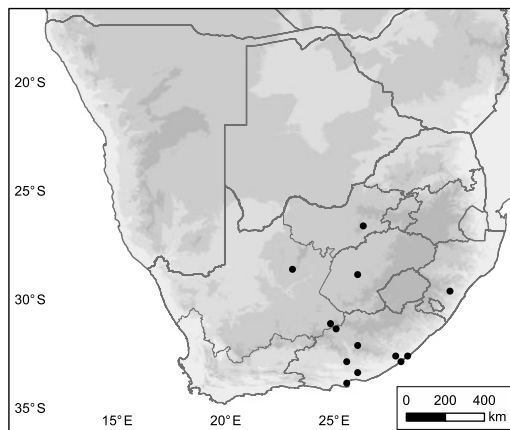
Thuranthos nocturnale R.A. Dyer in Flower. Pl. Afr. 36: t. 1439 (1964). Type: South Africa, Eastern Cape, Steynsburg (3125): 'Grootfontein', (–AC), Nov. 1956, Acocks 18650 (PRE [0046805-2], holo.!).

[Note: The protologue is explicit that 'Acocks 18650 cult. PRE2862' is the holotype, and the only mention of type material with flowers in the protologue is a reference to flowers produced in cultivation in Nov. 1956. This is the collection specified above. There are three other sheets at PRE under the same collecting number: PRE0046805-4 of a leafing bulb pressed in Jan. 1957 and mentioned in the protologue, but lacking the number PRE2862 and therefore not eligible for consideration as type material; PRE0046805-3 comprising two capsules collected in 1962–1963 and evidently the material mentioned in the protologue as 'becoming available through another collection by Mr Acocks' and therefore also not in contention as type material despite bearing the crucial number PRE2862; and finally PRE0046805-1 of two additional flowering stems also bearing the number PRE2862, but said to have been collected in Jan. 1957 and not mentioned in the protologue. There is doubt about this date, however, since it coincides with the collection of the leafing material, which has no sign of any inflorescence remnants attached. Although it might be argued that the holotype thus comprises elements gathered at different times, thereby invalidating the name (ICN Art. 8.2, 40.1 and 40.2), it seems clear that Dyer (1964) intended PRE0046805-2 as the holotype and we accept the name as validly published].

Plants deciduous, solitary or gregarious. *Bulb* ovoid to subglobose, 50–100 mm diam., scales loose, arcuate-spathulate to distinctly stalked, fleshy, pink. *Leaves* hysteranthous, 2 to 4, erect, linear-canaliculate, (130–) 400–600 × 6–10 mm, firm-textured, dull green. *Inflorescence* a lax raceme 300–1 300 mm tall, 10- to 30-flowered, flowers mostly 15–30 mm apart; scape erect, 5–10 mm diam. but thickened to 20 mm at base, glabrous; bracts caducous and absent at flowering, lanceolate, 3–7 mm long; bracteoles subulate, also caducous; pedicels arcuate to horizontally spreading and deflexed apically, (33–) 40–50 mm long, erect or suberect in fruit, abscising at base if not pollinated. *Flowers* nocturnal, pendent, fragrant; tepals almost free, recurved, linear-oblong, slightly constricted below the middle, (22–) 28–33 × 3–4 mm, apices penicillate, greyish green to brown with darker midrib. *Filaments* erect and incurved around ovary in lower portion forming a cage-like structure and erect around style or slightly spreading above, 15–20 mm long, lower portion flattened and 6–12 × 1–2 mm, green, abruptly constricted and teretefusiform in distal 4–7 mm, white. *Anthers* sub-basifixed, narrowly oblong, 3.5–5.0 mm long, dehiscence longitudinal, yellow. *Ovary* ovoid to oblong, green, 4–5 mm long; style prismatic-capitate, 14–22 mm long, white; stigma subglobose-papillate, 2 mm diam. *Capsules* oblong to ellipsoid or sometimes

quadrate, cordate below and notched above, deeply 3-lobed, 25–40 mm long. *Seeds* elliptic, 6–14 mm long, black. *Flowering time*: October to November, rarely January; flowers opening after sundown and withering before sunrise the following morning.

Distribution and ecology: scattered through the eastern and central South Africa, from near Port Elizabeth in Eastern Cape west and north to Postmansburg in Northern Cape, extending into southern Namibia and Zimbabwe (Map 25); in vleis and seasonally damp places in grassland and open scrub. Flowering appears to be stimulated by burning of the veld.



MAP 25.—Distribution of *D. macrantha*

Diagnosis: readily distinguished by the large flowers on long, spreading pedicels mostly 40–50 mm long, tepals 22–33 mm long, and the diagnostic complex filaments 15–20 mm long, with the basal 6–12 mm flattened and incurved around the ovary forming a cage-like structure, and then sharply constricted above this into a terete-fusiform upper portion suberect around the style. The large, capitate stigma is also distinctive. The bracts are caducous and absent at flowering, and the pedicels abscise at the base if not pollinated. *Drimia basutica* has smaller flowers with tepals 14–20 mm long, simple, lanceolate filaments 7–11 mm long, and a 3-angled stigma.

Additional specimens seen

Namibia. **2616 (Aus)**: Aar farm, 25 km ESE of Aus, (–CB), Nov. 1986, *H. Erni* sub *W. Giess* 16030 (M, NBG—photo).

SOUTH AFRICA. FREE STATE. **2826 (Brandfort)**: Florisbad, (–CC), 1 300 m, 16 Oct. 1985, *P.C. & L. Zietsman* 1259 (PRE).

KWAZULU-NATAL. **2930 (Pietermaritzburg)**: burned swamp near Edenvale, (–CB), 22 Oct. 1973, *C. Stirton* 340 (PRE).

NORTHERN CAPE. **2823 (Griekwastad)**: Postmasburg, near Pretorius Vlei, (–CA), *Pretorius s.n.* (PRE).

EASTERN CAPE. **3124 (Hanover)**: Wildfontein Station, (–BB), *Acocks* 16245 (PRE). **3125 (Steynsburg)**:

Grootfontein, (–AC), Jan. 1957, *Acocks* 18650 (PRE). **3225 (Somerset East)**: Klein Fish River, (–DC), 1892,

Barber s.n. (SAM). **3226 (Fort Beaufort)**: Tarka River, (–AA), *Cooper* 387 (TCD). **3227 (Stutterheim)**:

East London, upper end of Second Creek, (–DB), *Dold sub Galpin* 7962 (PRE); near Komgha, (–DB), Nov.

1889, *Flanagan* 468 (BOL, PRE, SAM). **3228 (Butterworth)**: Kentani, (–CB), Spring 1900, *A. Pegler* 79A

(PRE); 16 Nov. 1904, *A. Pegler* 79 (BOL); damp valleys between Komgha and Kei Mouth, (–CB), Oct. 1889,

H. Flanagan 468 (BOL); Komgha, near Kei Mouth, (–CB), 24 Nov. 1945, *R. Dyer* 4490 (PRE); 25 Nov. 1945,

R. Compton 17645 (NBG); between Gonubie and Kweleghe rivers, (–CC), 26 Dec. 1900, *E. Galpin* 5812

(PRE). **3325 (Port Elizabeth)**: Baakens River Valley near Walmer, (–DC), 1 Jan. 1942, *Archibald s.n.* (PRE).

3326 (Grahamstown): Alicedale, (–AC), *Cruden* 211 (GRA).

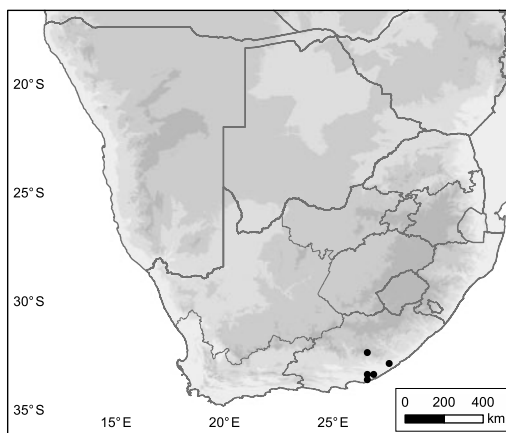
Sect. 6. **Hyacinthoides** *J.C.Manning & Goldblatt*, sect. nov. Type: *Drimia hyacinthoides* Baker

Plants medium-sized. *Bulb* scales loose and shortly stalked, flesh whitish or grey. *Leaves* several, soft-textured, narrowly oblong to elliptic, hysteranthous. *Inflorescence* a moderately dense raceme scape glabrous; bracts lanceolate, lower long-spurred; bracteoles present, well developed, linear-oblancheolate,

solitary at base of pedicel on alternate sides; pedicels $\pm$ as long as tepals at flowering. *Flowers* diurnal, narrowly campanulate, perianth deciduous and tepals cohering above to form a cap on developing capsule; tepals connate in lower third to slightly under one half, ovate to elliptic, lilac or greyish mauve with white margins, firm-textured. *Stamens*: filaments inflexed over ovary, $\pm$ as long as anthers, subulate; anthers connivent in a cone around style, sub-basifixed, lanceolate, dehiscence longitudinal. *Ovary* conical; style narrowly clavate, longer than ovary; stigma subcapitate. *Capsule* ellipsoid, 7–16 mm long. *Seeds* elliptic-oblong.

26. ***Drimia hyacinthoides*** Baker in J. Bot. 12: 6 (1874). Type: South Africa, Eastern Cape, Grahamstown (3326): shady valleys near Grahamstown, (–BC), Nov. without year, P. MacOwan 1465 (GRA, lecto. —image!, designated by Jessop in J. S. Afr. Bot. 43: 279 (1977); K—image!, NY—image!, isolecto.).

Plants deciduous, forming clumps. *Bulb* subglobose, 50–70 mm diam., scales loose, imbricate, arcuate and paddle-shaped, fleshy, white to reddish grey. *Leaves* hysteranthous, 3, suberect or spreading, narrowly oblong or elliptic, 100–120 $\times$ 14–24 mm, soft-textured with midrib raised beneath towards base, plane or slightly cucullate apically, acute or apiculate, bright green, glabrous. *Inflorescence* a moderately dense raceme 200–500(–700) mm tall, (20)30- to 40(50)-flowered, flowers mostly 2–5 mm apart; scape glabrous, 2–4 mm diam.; bracts spatulate, 3–6 mm long, lower distantly spurred, spur 3–6(–8) mm long; bracteoles linear-ob lanceolate, 4–5 mm long; pedicels suberect-cernuous, 15–17 mm long. *Flowers* pendent, narrowly campanulate, perianth firm-textured, caducous, cohering above after athesis; tepals 13–15 mm long, connate in lower third to slightly less than half in a cup-shaped tube 4–5 mm long, lobes suberect, ovate to elliptic, 6–8 $\times$ $\pm$ 3 mm, penicillate, lilac or greyish mauve with white margins. *Filaments* sigmoid-inflexed over ovary, subulate, 2.5–3.0 mm long; anthers sub-basifixed, connivent around style, lanceolate, apiculate, 2.5–3.5 mm long, yellow. *Ovary* ovoid, $\pm$ 5 mm long; style narrowly clavate, $\pm$ 7 mm long, white; stigma subcapitate. *Capsules* ellipsoid, 7–12(–16) mm long. *Seeds* flattened, irregular in outline, 6–7 $\times$ 2–4 mm. *Flowering time*: November to January.



MAP 26.—Distribution of *D. hyacinthoides*

Distribution and ecology: a local endemic of Eastern Cape between East London and Alexandria (Map 26); in grassland and open thicket, sometimes in the shelter of bushes.

Diagnosis: a very distinctive species of uncertain affinity, with a bulb of loose, paddle-shaped scales with $\pm$ three narrowly oblong to elliptic, rather soft-textured leaves 100–120 $\times$ 14–24 mm, and a moderately dense, bracteolate raceme of pendent, narrowly campanulate flowers with a perianth 13–15 mm long, the tepals connate between one third and one half to form a cup-shaped tube 4–5 mm long. The filaments are inflexed over the ovary and $\pm$ as long as the lanceolate-apiculate anthers, these connivent around the clavate style.

As noted by Jessop (1977), *Drimia hyacinthoides* includes features characteristic of several species-groups. The shape and orientation of the flowers, as well as the connivent anthers, are found in sect. *Rhadamanthus* and *Rhadamanthopsis*, but the sub-basifixed anthers, and especially the clavate style and subcapitate stigma, are characteristic of sect. *Thuranthos*, which differs in its nocturnal flowers with almost free, strongly recurved tepals. Similarly moderately large capsules are found in sects. *Drimia* and *Macrocentrae*. Not previously noted, the flowers of *D. hyacinthoides* are rather conspicuously bracteolate, with a linear-oblongate bracteole 4–5 mm long at the base of each pedicel. Well-developed bracteoles are characteristic of sects. *Urginavia*, *Macrocentrae* and *Sagittanthera*, the first two with the perianth not cohering above the capsules, thus unlike *D. hyacinthoides*, but the latter section resembling it in its bulbs with loose scales and soft-textured leaves, pendent flowers with firm-textured perianth, and anthers that are connivent and lanceolate, but with porose dehiscence.

Additional specimens seen [*Cited by Jessop (1977) but not located in the herbarium listed]

SOUTH AFRICA. EASTERN CAPE. **3226 (Fort Beaufort)**: Jolly's farm, NE corner of Grahamstown Commonage on road to Colyngham Tower, (–BC), 3 Dec. 1948, R. Dyer 5059a (PRE). **3227 (Stutterheim)**: Nahoon River, (–DC), 23 Jan. 1899, J. Wood sub *Galpin* 3152 (BOL); Slippery Drift, (–DC), 30 Dec. 1963, Smith sub *Batten* s.n. (NBG). **3326 (Grahamstown)**: near Grahamstown, (–BC), Jan. 1912, J. Burtt-Davy 12132 (BOL); grassveld near Governor's Kop near Grahamstown, (–BC), Jan. 1927, L. Britten BOL5554 (BOL); SE of Grahamstown, (–BC), 28 Jan. 1938, G. Britten BOL30628 (BOL); 7 miles [11 km] from Grahamstown on Gletwyn, (–BC), 20 Dec. 1935, R. Dyer 3306 (BOL); between Kap River and Trapp's Valley, (–BD), Dyer 3390 (PRE)*; Alexandria, top of hill near Bushman's River Pont, (–DA), 5 Jan. 1956, E. Archibald 6137 (PRE).

Sect. 7. ***Sagittanthera*** (Mart.-Azorín et al.) J.C.Manning & Goldblatt, comb. et stat. nov. *Sagittanthera* Mart.-Azorín et al. in *Phytotaxa* 98: 46 (2013b). Type: *Sagittanthera cyanelloides* (Baker) Mart.-Azorín et al. = *D. cyanelloides* (Baker) J.C.Manning & Goldblatt

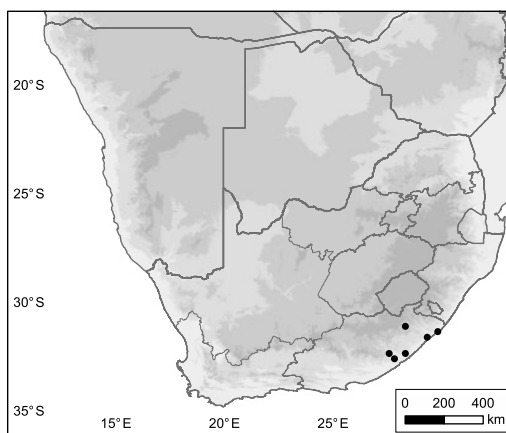
Plants medium-sized. *Bulb* partially epigeal, scales loose and shortly stalked, producing threads when torn, flesh pale pink. *Leaves* several, blade linear, channelled above and keeled beneath, glabrous, hysteroanthous. *Inflorescence* a raceme; scape glabrous; bracts lanceolate-triangular, lower long-spurred; bracteoles present, small, solitary at base of pedicel on alternate sides; pedicels ± as long as tepals. *Flowers* diurnal, rotate, perianth deciduous and tepals cohering above to form a cap on developing capsule; tepals almost free, oblong-lanceolate, white or tinged blue with darker midrib, membranous. *Filaments* erect around ovary, much shorter than anthers, free, subulate. *Anthers* connate in a cone around style, basifixed, lanceolate-sagittate, dehiscence porose. *Ovary* conical; style ± twice as long as ovary; stigma truncate-papillate. *Capsule* ovoid. *Seeds* elliptic-oblong.

The relationships of this species have long been uncertain. Included only doubtfully in the genus *Rhadamanthus* by Baker (1897) and Nordenstam (1970), it was later segregated as the type of the new genus *Sagittanthera* by Matínez-Azorín et al. (2013b), characterised by connate anthers with apical porose dehiscence. The second species of *Sagittanthera*, *D. mzimvubuensis*, differs from *D. cyanelloides* in several significant features, including the absence of bracteoles, fugacious flowers, pedicels much longer than the tepals, fusion of the staminal filaments into a collar, and anthers that are connivent but free, and is treated here in the separate section *Aulostemon*.

27. ***Drimia cyanelloides* (Baker) J.C.Manning & Goldblatt** in Goldblatt & Manning in *Strelitzia* 9: 711 (2000). *Rhadamanthus cyanelloides* Baker in *Fl. Cap.* 6: 444 (1897). *Sagittanthera cyanelloides* (Baker) Mart.-Azorín et al. in *Phytotaxa* 98: 48 (2013b). Type: South Africa, Eastern Cape, Stutterheim (3227): 'Komgha, grassy valleys near Prospect Farm', (–DB), Dec. 1895, *Flanagan* 573 (K [000257233], holo. —image!; BOL!, PRE!, iso.).

Drimia cremnophila Van Jaarsv. in Van Jaarsveld & Van Wyk in *Aloe* 42: 81 (2005). Type: South Africa, Eastern Cape, Port St. Johns (3129): 'lower Mzimvubu River, cliffs below Ludonga', (–AD), *Van Jaarsveld et al.* 97 (PRE, holo!).

Plants deciduous, gregarious. *Bulb* epigeal, subglobose, up to ± 40 mm diam., scales loose, oblong-clavate, shortly stalked, truncate or obtuse, dark purplish, flesh pale pink. *Leaves* hysteranthous, ± 3 , suberect to drooping, linear, $100\text{--}300 \times 3\text{--}8$ mm, upper surface flattened and shallowly grooved, lower surface with prominent 4-sided keel, glabrous, soft and sub-succulent. *Inflorescence* a moderately dense raceme $250\text{--}300$ mm long, 10- to 20-flowered, flowers $2\text{--}8$ mm apart; scape suberect or inclined, ± 1.5 mm diam., glabrous; bracts narrowly lanceolate, $3\text{--}5$ mm long, lower auriculate with spur to 6 mm long; bracteoles present; pedicels spreading to lightly arched, $7\text{--}10$ mm long at anthesis. *Flowers* diurnal, spreading to nodding, stellate, unscented; tepals almost free, $\pm$ spreading, elliptic-lanceolate, $7\text{--}9 \times 2$ mm, white or tinged blue, with dark purple midrib. *Filaments* erect around ovary, 1.5 mm long, flattened and squared below, swollen above, white. *Anthers* connivent in a cone around style, basifixed, narrowly lanceolate-sagittate, $5\text{--}6$ mm long, dehiscence porose, yellow. *Ovary* obconic, pale green, $3\text{--}4$ mm long; style ultimately ± 4 mm long and shortly exserted from anther cone, white, truncate-papillate. *Capsules and seeds* unknown. *Flowering time*: mainly December; flowers opening in the morning and lasting two days. Figure 15.



MAP 27.—Distribution of *D. cyanelloides*

Filaments erect around ovary, 1.5 mm long, flattened and squared below, swollen above, white. *Anthers* connivent in a cone around style, basifixed, narrowly lanceolate-sagittate, $5\text{--}6$ mm long, dehiscence porose, yellow. *Ovary* obconic, pale green, $3\text{--}4$ mm long; style ultimately ± 4 mm long and shortly exserted from anther cone, white, truncate-papillate. *Capsules and seeds* unknown. *Flowering time*: mainly December; flowers opening in the morning and lasting two days. Figure 15.

Distribution and ecology: endemic to Eastern Cape, where it is known from the lower reaches of several coastal rivers from the Kei River near Stutterheim to the Mzimvubu River south of Port St. Johns (Map 27); wedged in rock crevices on shale cliffs and rocky slopes and banks overlooking rivers, in grassland and open thicket, 400–700 m.

Diagnosis: recognised by the stellate, white flowers lasting two days, on pedicels $7\text{--}8$ mm long, with narrow anthers $5\text{--}6$ mm long, connate along the margins in a tight cone around the style and with very short filaments 1.5 mm long and rather globular above. The leaves are $3\text{--}8$ mm wide, and flattened and lightly grooved above, but strongly quadrately keeled along the midline beneath. Superficially similar but unrelated *D. mzimvubuensis* has firmer, subterete leaves $1.5\text{--}3.0$ mm diam. and minutely ciliate on the angles, longer pedicels $15\text{--}18$ mm long, and slightly longer filaments that are connate into a collar, with much shorter anthers 3 mm long. The inflorescence in *D. mzimvubuensis* is persistent and photosynthetic long after the seeds are shed, and the flowers last just a single afternoon.

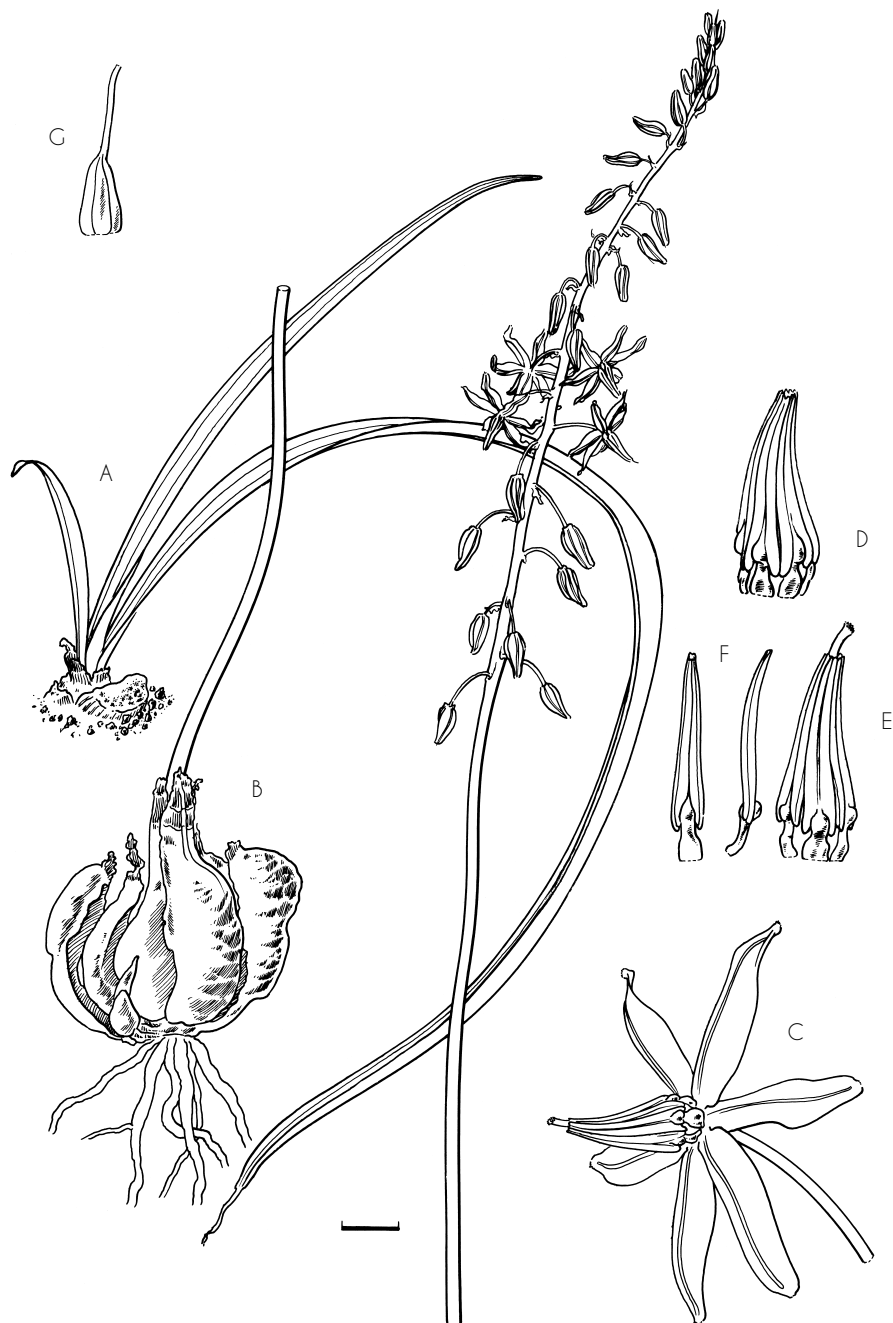


FIGURE 15.—*Drimia cyanelloides*, Eastern Cape, Kei River, Van Jaarsveld & Harrower 24767 (PRE). A, foliage; B, flowering plant; C, flower; D, androecium at anthesis; E, androecium on second day with protruding style; F, stamens; G, gynoecium. Scale bar: A, B, 10 mm; C, 1.5 mm; D–G, 1 mm. Artist: John Manning.

Additional specimens seen

SOUTH AFRICA. EASTERN CAPE. **3128 (Umtata)**: The Falls farm, 14 km NE of Maclear, (–AB), steep slope in forest scrub, 12 Nov. 1994, S. Bester 3300 (PRE). **3129 (Port St. Johns)**: Mateku waterfall, grassland on cliffs, (–BD), 11 Nov. 1970, R. Strey 10170 (PRE); confluence of Tina and Tsitsa Rivers, E of Umtata, (–CB), 699 m, Dec. 2007 [fl. ex hort.], Dold s.n (GRA). **3227 (Stutterheim)**: Boogkrans, Kei River, (–BC), 598 m, 12 Apr. 2013, Van Jaarsveld & Harrower 24767 (PRE); Klipprooiysterhoutdraai, Kei River, (–BC), 318 m, 15 Apr. 2013, Van Jaarsveld & Harrower 24794 (PRE). **3228 (Butterworth)**: Willowvale, Ngqaqini admin. Area, (–AD), steep bank along semi-permanent stream, Nov. 1983, J. van Eeden 386 (PRE).

Sect. 8. **Capitatae** J.C.Manning & Goldblatt, sect. nov. Type: *Drimia marginata* (Thunb.) Jessop

Plants small. *Bulb* scales tightly adherent or rarely loose and separate, flesh white or flushed pink. *Leaves* one to several, blade various, terete to oblong to suborbicular or subglobose, usually glabrous, rarely pubescent, margins simple or variously papillate-colliculate or scabridulous, hysteroanthous or rarely $\pm$ synanthous. *Inflorescence* a congested, corymbose-capitate raceme, nodding in young bud; scape glabrous or longitudinally puberulous; bracts lanceolate, lower short-spurred; bracteoles absent; pedicels shorter than to $\pm$ as long as tepals at flowering, spreading, mostly 4–10 mm long. *Flowers* diurnal, lasting a few hours, spreading, perianth deciduous and tepals cohering above to form a cap on developing capsule; tepals connate at base, suberect below and forming a shallow cup, but spreading above, oblong, margins often recurved, cream or pale brownish flushed brown with darker midrib, often firm-textured. *Stamens*: filaments erect, lanceolate or subulate, 2–3 mm long, longer than anthers; anthers medifixed, subglobose to ovate, $\pm$ 1 mm long, dehiscence longitudinal. *Ovary* ovoid-truncate; style $\pm$ as long as ovary, cylindrical; stigma truncate-papillate or capitate-papillate. *Capsule* ovoid to subglobose, $\pm$ 5 mm long. *Seeds* elliptic, testa finely reticulate.

Key to species

- 1a. Leaf margins thickened and cartilaginous, either papillate/colliculate or scabridulous:
 - 2a. Bulb scales loose; leaves linear-channelled, 15–32 $\times$ 2.0–2.5 mm; pedicels 2–6 mm long; plants from Eastern Cape 37. *D. chalumensis*
 - 2b. Bulb scales closely packed; leaves plane, 20–90 $\times$ 4–25 mm; pedicels 5–10 mm long; plants from Western and Northern Cape:
 - 3a. Leaf blades obtuse; margins colliculate; plants from Western Cape Fold Mtns. 31. *D. ecklonii*
 - 3b. Leaf blades acute-apiculate; margins partly or entirely scabridulous on upper surface; plants not from Western Cape Fold Mtns:
 - 4a. Leaf margins simple, densely retrorsely scabridulous along upper surface 32. *D. marginata*
 - 4b. Leaf margins duplex, narrowly colliculate along edge with submarginal band of erect or retrorse trichomes along upper surface. 33. *D. pulchromarginata*
- 1b. Leaf margins not thickened and cartilaginous, sometimes pubescent or scabridulous:
 - 5a. Leaves usually two or more, plane or channelled above, with narrow hyaline margins:
 - 6a. Leaves glabrous but minutely scabridulous along margins, at least distally 28. *D. pygmaea*
 - 6b. Leaves pubescent or scabridulous on one or both surfaces:
 - 7a. Leaves in a rosette, (15–)20–30(–70) $\times$ (3–)5–7(–9) mm, margins with long cilia and softly pubescent on one or both surfaces; tepals not fringed 29. *D. barkerae*
 - 7b. Leaves in a loose tuft, 12–26 $\times$ 1.0–1.5 mm, margins glabrous, upper surface recurved-scabridulous; inner tepals fringed 30. *D. fimbrimarginata*
 - 5b. Leaves solitary (rarely two), subterete to cylindrical, rarely flattened, but without a distinct margin:
 - 8a. Leaf clavate or almost globular, blade 6–15 mm long; inflorescence 15–30 mm tall. . . 38. *D. acarophylla*
 - 8b. Leaf subterete to flattened, blade 17–80 mm long; inflorescence 40–100 mm tall:

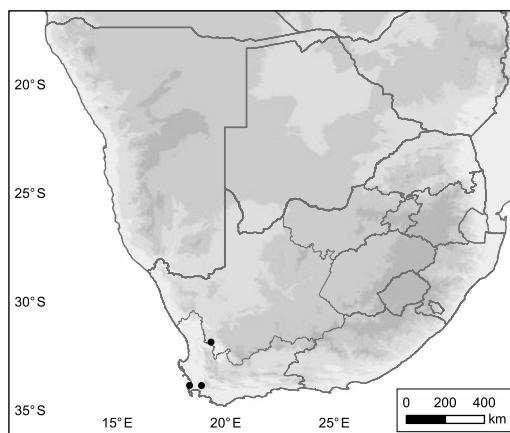
- 9a. Leaf glabrous 34. *D. vermiformis*
 9b. Leaf ciliate or pubescent:
 10a. Leaf retrorsely ciliate along margins only with hairs ± 0.5 mm long 35. *D. ciliolata*
 10b. Leaf softly retrorsely pubescent on both surfaces and along margins with hairs ± 1 mm long
 36. *D. trichophylla*

28. ***Drimia pygmaea*** (A.V.Duthie) J.C.Manning & Goldblatt, comb. nov. *Urginea pygmaea* A.V.Duthie in Ann. Univ. Stell. 6A: 10 (1928). *Fusifilum pygmaeum* (A.V.Duthie) Speta in Phytos 38: 69 (1998). Type: South Africa, Western Cape, Cape Town (3318): 'Stellenbosch Flats', (–DD), 3 Jun. 1926, Duthie s.n. STE1603a [NBG, lecto!], designated by Martínez-Azorín et al. in Phytotaxa 201: 169 (2015)].

Plants deciduous, solitary. *Bulb* subglobose, 10–15 mm diam., scales adherent, white, drying pale brown and becoming thinly leathery. *Leaves* hysteranthous, (1)2 to 4(6), spreading, linear, semiterete, lightly channelled above, subacute, 15–40 $\times$ 1–2 mm, glabrous but margin sparsely scabridulous distally or for most of length, leathery, dark green. *Inflorescence* nodding in bud, corymbose-capitate, (30–)60–150 mm long, densely 1- to 11-flowered, flowers 0.5–2.0 mm apart; scape erect or flexuous at base, longitudinally scabridulous, 0.5–1.0 mm diam. but swollen at base; bracts ovate, 1.0–1.5 mm long, lower with spur 0.5–1.5 mm long; pedicels spreading to suberect, (2–)3–7 mm long. *Flowers* diurnal, suberect or spreading, campanulate; tepals connate for 1.0–1.5 mm, erect and overlapping below forming a cup ± 1.5 mm deep, spreading above, pale brownish with darker keels, lobes elliptic to ovate, 2.5–5.0 $\times$ 1.5–2.0 mm, margins recurved. *Filaments* erect, lanceolate to subulate, 1.5–2.5 mm long, white. *Anthers* medifixed, ovoid, 0.8–1.0 mm long, dehiscence longitudinal, yellow with yellow pollen. *Ovary* ovoid-truncate, 1.5–3.0 mm long, greenish yellow; style columnar, 1–2 mm long, white; stigma truncate-papillate. *Capsules* suberect or erect on pedicels 3–7 mm long, subglobose, 4–5 mm long. *Seeds* angled or elliptical, peripherally winged, 3–4 $\times$ 2–3 mm long, glossy black, irregularly folded, testa finely reticulate. *Flowering time*: March to April around Cape Town but October on Botterkloof Pass.

Distribution and ecology: *Drimia pygmaea* is known with certainty only from the sandy flats around Cape Town and Stellenbosch in Western Cape, but we provisionally include here specimens from the Botterkloof Pass north of Clanwilliam (Map 28). These match the Peninsula plants in their foliage with spreading, narrow, channelled blades with the margins minutely scabridulous towards the apex, but differ in their slightly larger, more numerous flowers, 5 to 11 per head, produced in late spring rather than in autumn. The Botterkloof plants are known only from a single population and further investigation is required to assess their taxonomic status.

Diagnosis: recognised by the mostly two to four, spreading, linear and lightly channelled leaves with the margins scabridulous distally or along most of their length. Plants from the Cape Flats have 1 to 4 flowers per scape, but those from Botterkloof have larger heads with 5 to 11 flowers.



MAP 28.—Distribution of *D. pygmaea*

Drimia pygmaea has been confused with *D. virens* (sect. *Physodia*), but that species has suberect, slender leaves and often a short, congested raceme (rather than a subumbellate corymb) of rotate, white flowers with the tepals spreading from the base, and fusiform filaments.

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. **3119 (Calvinia)**: Botterkloof Pass, (–CD), 6 Oct. 1969, *H. Hall* 235 (NBG); 15 Oct. 1971, *H. Hall* 4171 (NBG). **3318 (Cape Town)**: Camp Ground, (–CD), 25 Apr. 1945, *T. Salter* 8932 (NBG); 26 Mar. 1946, *R. Compton* 17946 (NBG).

29. ***Drimia barkeriae*** Oberm. ex *J.C.Manning & Goldblatt* in *Bothalia* 33: 109 (2003). Type: South Africa, Western Cape, Clanwilliam (3218): '5 km southwest of Eendekuil, Draaihoek farm, open clay flats', (–DD), 13 Oct. 2001, *Manning* 2655A (NBG, holo.!, PRE!, iso.).

[*Urginea barkeri* [sphalm.] Oberm. ms: *Barker* s.n. (NBG)]

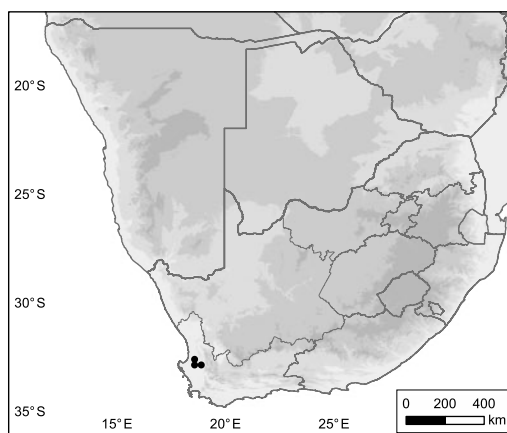
Plants deciduous, solitary. *Bulb* subglobose, 10–15 mm diam., scales adherent, white, drying pale brown and becoming papery. *Leaves* hysteroanthous, (3)5 to 7(9), prostrate to suberect, leathery, blade narrowly oblanceolate to obovate, (15–)20–30(–70) × (3–)5–7(–9) mm, contracted below into slender, channelled, petiole-like base, acute, concave, with scattered, somewhat deflexed hairs or bristles 0.2–1.5 mm long on lower or sometimes both surfaces, especially along edges, rarely ± hairless with short hairs restricted to clasping leaf base or margins, leathery, bright green. *Inflorescence* nodding in bud, corymbose-capitate, 80–160 mm long, densely 10- to 20-flowered, flowers ± 0.5 mm apart; scape flexuous, longitudinally puberulous in lower half; bracts caducous, ovate, ± 1 mm long, lower with spurs 0.5–2.0 mm long; pedicels suberect, 6–8 mm long. *Flowers* diurnal, suberect or spreading, shallowly campanulate, vanilla-scented; tepals connate for ± 1.5 mm, erect and overlapping below forming shallow cup ± 1.5 mm deep, spreading above, pale brownish with darker keels, outer lobes broadly ovate, ± 3.5 × 2.0 mm, inner ovate, ± 2.5 × 1.5 mm. *Filaments* erect, lanceolate, ± 1.5 mm long, white. *Anthers* medifixed, ovoid, ± 0.75 mm long, dehiscence longitudinal, greenish yellow with yellow pollen. *Ovary* ovoid-truncate, ± 1.8 mm long, green; style columnar, ± 1 mm long, white; stigma truncate-papillate. *Capsule* ovoid to subglobose, ± 5.0 × 4.5 mm. *Seeds* compressed, rectangular, ± 2 mm diam., shiny black, irregularly folded, finely reticulate. *Flowering time*: October and November; flowers opening in late morning and fading in the evening. Figure 16.

Distribution and biology: a narrow endemic restricted to isolated open patches on the flats surrounding the Piketberg in Western Cape (Map 29); in shallow, loamy soils fringing fine clays and quartzite pebble fields in drainage basins and washlines.

Diagnosis: distinguished from all other species in the section by the rosette of oblanceolate to obovate, ± conspicuously hairy leaves.

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. **3218 (Clanwilliam)**: Piketberg Dist., 10 km southwest of Redeling-



MAP 29.—Distribution of *D. barkeriae*



FIGURE 16.—*Drimia barkerae*, Western Cape, Eendekuil, Manning 2655A (NBG). A, flowering plant with dry foliage; B, leaf rosettes; C, flower and bract; D, stamens; E, gynoecium; F, capsule; G, seed. Scale bar: A, B, 10 mm; C, 2 mm; D, E, G, 1 mm; F, 5 mm. Artist: John Manning.

huys, loam on fringe of quartzite patch, (–DA), 1 Jul. 2002 [leafing], Manning 2745 (NBG); western foot of Piekenierskloof Pass, loamy soil on fringe of quartzite patch, (–DC), 1 Jul. 2002 [leafing], Manning 2746 (NBG); Sauer, on bank by roadside, (–DC), 28 Oct. 1943, Barker s.n. NBG 409/43 (NBG).

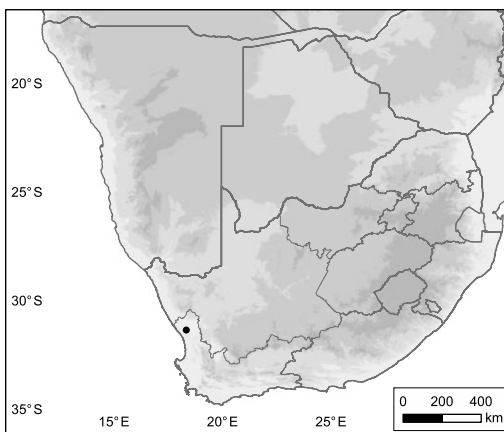
30. ***Drimia fimbrimarginata*** Snijman in Snijman & Harrower in Bothalia 39: 234 (2009). Type: South Africa, Western Cape, Vanrhynsdorp (3118): 'Knersvlakte, Moedverloor farm, ± 17 km NE of Koekenaap', (–AD), on quartzite ridges, 22 Jul. 2005, A. Harrower 2762 (NBG, holo.!, PRE, iso.).

Plants deciduous, solitary. *Bulb* half-epigeal, subglobose, 20–22 mm diam., scales adherent, imbricate, fleshy. *Leaves* hysteranthous or partly synanthous, ± 8 , in a loose tuft, at first spreading but later suberect, blade shortly linear to narrowly lanceolate, 12–26 $\times$ 1.0–1.5 mm, narrowed below, upper surface flat, longitudinally recurved-scabridulous with pale sheen, undersurface slightly convex and smooth, acute, leathery, margins minutely thickened and translucent. *Inflorescence* corymbose-capitate, up to 60 mm long, densely 6- or 7-flowered, flowers ± 0.5 mm apart; scape flexuous, 0.5 mm diam., sparsely scabridulous; bracts deltoid, ± 1 mm long, lower with spur ± 1 mm long; pedicels curved upwards, 5–8 mm long. *Flowers* diurnal, suberect, campanulate, unscented; tepals connate for ± 1.5 mm at base, suberect below forming a

cup ± 1.5 mm deep, spreading above, white to pale beige with darker keels, dimorphic, outer lobes oblong, $\pm 5 \times 1.5$ mm, penicillate or apically fringed, inner elliptic, $\pm 5.5 \times 2$ mm, conspicuously fimbriate with hairs ± 1 mm long except basally, margins recurved. *Filaments* erect, subulate, ± 4 mm long, white. *Anthers* medifixed, ovoid, ± 1 mm long, dehiscence longitudinal, yellow with yellow pollen. *Ovary* ovoid, ± 2.5 mm long, green; style columnar, ± 2.5 mm long, white; stigma truncate-papillate. *Capsules and seeds* unknown. *Flowering time*: late November to early December; flowers opening in the late afternoon and fading in the early evening.

Distribution and ecology: known only from the type locality in the western Knersvlakte on the farm Moedverloor NE of Koekenaap in Western Cape (Map 30); on north-facing slopes of a quartz ridge among quartz pebbles.

Diagnosis: readily recognised by the distinctive foliage and flowers, the half-epigeal bulbs with imbricate, truncate scales, the inner with small, linear to narrowly lanceolate blades 12–26 $\times$ 1.0–1.5 mm, the upper surface minutely longitudinally scabridulous and the undersurface smooth but glaucous distally; and the shallowly campanulate flowers with dimorphic tepals, the inner broader than the outer and conspicuously fringed except at the base. The relationships of *Drimia fimbrimarginata* are not clear. It was diagnosed against *D. barkerae* in the protologue (Snijman & Harrower 2009), but is anomalous in the section in its relatively longer filaments, ± 4 mm long and style longer than the ovary.



MAP 30.—Distribution of *D. fimbrimarginata*

31. ***Drimia ecklonii* (Baker) J.C.Manning & Goldblatt**, comb. nov. *Urginea ecklonii* [as '*eckloni*'] Baker in Bot. Jahrb. Syst. 15, Beibl. 35: 6 (1893). Type: South Africa, Western Cape, Clanwilliam (3218): 'Olifantsrivier', (–BD), Sep. [1829 or 1830], *Ecklon & Zeyher Asphod.* 128 (†B, holo., SAM, lecto!), designated by Tang & Weiglin in Feddes Repert. 112: 503 (2001). Epitype: South Africa, Western Cape, Wuppertal (3219): Cedarberg [Cederberg], Wolfberg, (–AC), 3 Oct. 1952 (fl. ex hort Dec. 1952), *E. Esterhuysen 20587* (BOL, epi., designated here).

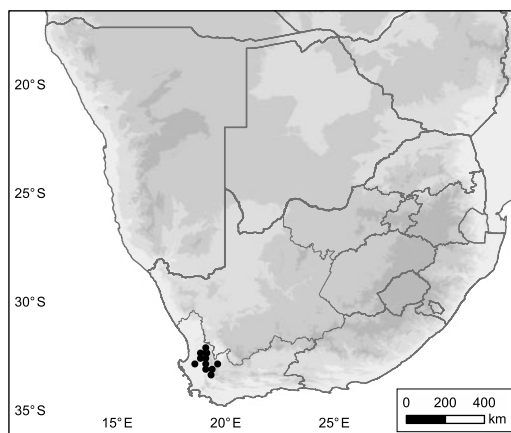
[Note: The type material of *Urginea ecklonii* Baker from the Olifants River Valley has the inflorescence and campanulate flowers of *Drimia marginata* and its allies, but lacks foliage necessary for a firm identification. On the basis of the floral characters and location, Tang & Weiglin (2001) applied the name to the taxon subsequently described as *Drimia ligulata* (Manning & Goldblatt 2007). It is likely, although not certain, that this application is correct, but we adopt it for consistency and designate an epitype to fix its application.]

Drimia ligulata J.C.Manning & Goldblatt in Martínez-Azorín & Crespo in Taxon 63: 1330 (2014) [J.C.Manning & Goldblatt in Bothalia 37: 186 (2007), nom. inval.], syn. nov. Type: South Africa, Western Cape: Clanwilliam (3218): 'Piketberg, Zebra Kop', (–DB), 23 May 1948, *E. Esterhuysen 14487* (BOL, [bulb with three leaves on lower left-hand corner of sheet], holo.!).

Plants deciduous, solitary. *Bulb* subglobose, 15–30 mm diam., scales adherent, white, drying pale brown and becoming thinly leathery. *Leaves* hysteroanthous or emergent at flowering, 2 or 3(4), prostrate or spreading, blade oblong, obtuse, (20–)30–90 × (4–)6–10(–15) mm, glabrous, margin thickened, cartilaginous, 0.5 mm thick, papillate or colliculate, leathery, dark green. *Inflorescence* nodding in bud, corymbose-capitate, (60–)80–200 mm long, densely 5- to 30-flowered, flowers ± 0.5 mm apart; scape erect or flexuous at base, glabrous, 0.5–1.0 mm diam., but swollen to 4 mm diam. at base; bracts ovate-lanceolate, ± 2 mm long, lower with spur 1–2 mm long; pedicels spreading, 5–10 mm long. *Flowers* diurnal, spreading, campanulate, usually scented; tepals connate for ± 1 mm, erect and overlapping below, forming a cup ± 1.5 mm deep, spreading above, pale brownish with darker keels, outer lobes ovate, ± 5 × 2 mm, inner oblong, ± 4.5 × 1.8 mm. *Filaments* erect, lanceolate, ± 2.5 mm long, white. *Anthers* medifixed, ovoid, ± 1 mm long, dehiscence longitudinal, yellow with yellow pollen. *Ovary* ovoid-truncate, ± 2 mm long, greenish yellow; style columnar, ± 1.5–2.5 mm long, white, truncate-papillate. *Capsules* spreading or suberect on pedicels 5–18 mm long, ovoid to subglobose, 6–8 × 5–7 mm. *Seeds* elliptical to reniform, peripherally winged, 3–4(–6) × 1.8–2.5 mm long, glossy black, irregularly folded, testa finely reticulate. *Flowering time*: December and January, rarely as early as October at lower altitudes. Figure 17A.

Distribution and ecology: recorded from most of the western mountain chains of the Cape Fold Belt of Western Cape, from the northern Cedarberg southwards through the Cold Bokkeveld Mountains and the Skurweberg, and also on the higher parts of the Piketberg to the west (Map 31); on seasonally moist rock flushes or shallow rock basins on sandstone at moderately high altitudes, between 500 and 1 500 m.

Diagnosis: the most commonly collected of the three species of the *Drimia marginata* complex, *D. ecklonii* is distinguished by its generally narrower, oblong leaves, usually 6–10 (rarely up to



MAP 31.—Distribution of *D. ecklonii*

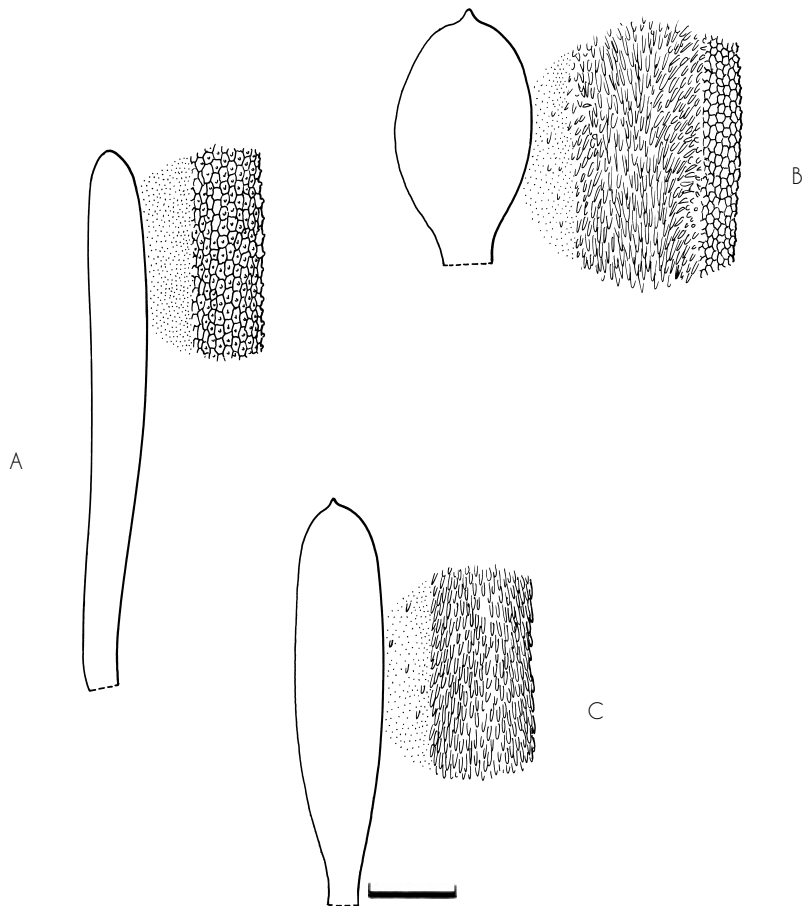


FIGURE 17.—Leaf shape and detail of margin in species of the *Drimia marginata* complex. A, *D. ecklonii*, Western Cape, Piketberg, Esterhuysen 14487 (BOL); B, *D. marginata*, Northern Cape, Loeriesfontein, Goldblatt, Manning & Savolainen 11525 (NBG); C, *D. pulchromarginata*, Northern Cape, Kamiesberg, Stirton 9226 (NBG). Scale bar: leaf outline, 10 mm; margin detail, 0.5 mm. Artist: John Manning.

15) mm wide, with an obtuse apex and a simple, papillate margin. The leaf margin is thickened on both dorsal and ventral surfaces and the papillae may be blunt or acute. Plants produce mostly two or three leaves, rarely up to four. Other members of the complex have broader, oblong or elliptical leaves that are distinctly apiculate and have margins that are partially or entirely ciliate.

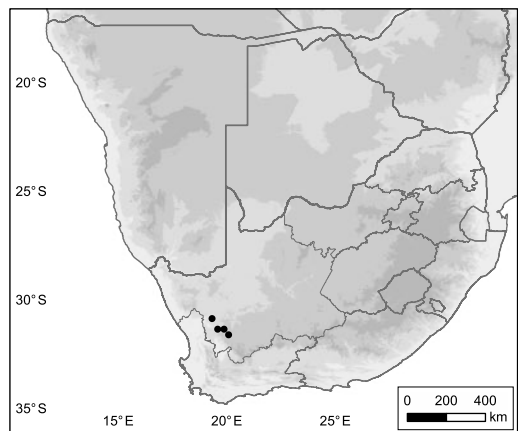
Drimia ecklonii is geographically and ecologically distinct from other members of the complex and flowers later than *D. marginata* and *D. pulchromarginata*, typically in December and January, rather than October and November.

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. **3218 (Clanwilliam)**: Piketberg, S entrance to Kapteinskloof, (–DC), 22 Oct. 1935, *N. Pillans* 8092 (BOL). **3219 (Wuppertal)**: Cederberg Mtns, between Pakhuis and Heuning Vlei, (–AA), 28 Dec. 1941, *E. Esterhuysen* 7426 (BOL); Cederberg, Tafelberg, (–AC), 29 Dec. 1947, *E. Esterhuysen* 14337 (BOL); Elands-kloof, (–CA), 29 Sep. 1944 [leafing] *W.F. Barker* 3072 (NBG); 9 Sep. 1946 (leafing), *W.F. Barker* 3822 (NBG), 24 Sep. 1956 [fl. ex hort. 18 Nov. 1955], *T.P. Stokoe s.n.* SAM68464 (SAM); W slopes of Cold Bokkeveld Mtns near Keerom, (–CC), 4 Dec. 1950, *E. Esterhuysen* 17922 (BOL); Swarttruggens, Knolfontein, (–DC), 24 Nov. 2011, *I. Jardine* 1755 (NBG). **3319 (Worcester)**: Kliphuisvlakte on the Skurweberge, (–AA), 10 Sep. 1989 [leafing], *D. Snijman* 1236 (NBG); Schurweberg, between Bokkeveld Tafelberg and Bokkeveld Sneeuwberg, ± 5000 ft [1 500 m], (–AA), 11 Oct. 1952 (fl. ex hort. Dec. 1962), *E. Esterhuysen* 20662 (BOL); Hansiesberg, (–AB), 16 Dec. 1944, *R.H. Compton* 16689 (NBG); top of Gydo Pass, (–AB), 7 Dec. 1940, *E. Esterhuysen* 3952 (BOL); Mosterthoek Twins, 400ft [1 370 m], (–AD), 8 Jan. 1944, *E. Wasserfall* 810 (NBG); 8 Jan. 1944, *E. Esterhuysen* 9892 (BOL).

32. ***Drimia marginata*** (Thunb.) Jessop in J. S. Afr. Bot. 43: 295 (1977). *Anthericum marginatum* Thunb., Prod. Pl. Cap. : 63 (1794). *Idothea marginata* (Thunb.) Kunth., Enum. Pl.: 346 (1843). *Urginea marginata* (Thunb.) Baker in J. Linn. Soc., Bot.: 218 (1873). Type: South Africa, Northern Cape, Calvinia (3119): ‘Hantam’, (–BD), without exact date, [Nov. 1774], *Thunberg s.n.* (UPS-THUNB [8393], holo.–microfiche!).

Plants deciduous, solitary. *Bulb* subglobose, 15–30 mm diam., scales adherent, white, drying pale brown and becoming thinly leathery. *Leaf* hysteroanthous, 1(2), spreading or prostrate, blade oblong to oblanceolate, apiculate, 30–50(–60) $\times$ 9–15 mm, glabrous or minutely hispidulous, leathery, dark green, margin thickened on upper surface only, cartilaginous and densely and minutely retrorsely scabridulous, ± 0.5 mm wide. *Inflorescence* capitate, (100–)150–200 mm long, densely 10- to 20-flowered, flowers ± 0.5 mm apart; scape straight or flexuous below, glabrous, 0.5–1.0 mm diam., but swollen at base; bracts ovate-lanceolate, 2–3 mm long, lower with spur 1–2 mm long; pedicels spreading, 5–10 mm long. *Flowers* diurnal, spreading, campanulate, usually scented; tepals connate for ± 1 mm, erect and overlapping below forming a cup ± 1.5 mm deep, spreading above, pale brownish with darker keels, outer lobes ovate, $\pm 5 \times 2$ mm, inner oblong, $\pm 4.5 \times 1.8$ mm. *Filaments* erect, lanceolate, ± 2.5 mm long, white. *Anthers* medifixed, ovoid, ± 1 mm long, dehiscence longitudinal, yellow



MAP 32.—Distribution of *D. marginata*

with yellow pollen. *Ovary* ovoid-truncate, ± 2 mm long, greenish yellow; style columnar, ± 1.5 mm long, white; stigma truncate-papillate. *Capsules and seeds* unknown. *Flowering time*: December and January, rarely as early as October at lower altitudes. Figure 17B.

Distribution and ecology: evidently endemic to the Hantam Plateau in Northern Cape, where it has been recorded around Loeriesfontein and Calvinia (Map 32); on open clay flats in renosterveld vegetation. The collection Manning 2270A was cited in error as from near Matjiesfontein by Manning & Goldblatt (2007).

Diagnosis: endemic to the Hantam Plateau and still poorly collected, *Drimia marginata* is distinguished by its solitary (rarely two), oblong to oblanceolate, distinctly apiculate leaf with a thickened margin densely ornamented on the upper side with minute, stiff, retrorse trichomes 0.1–0.2 mm long. The blade itself may be glabrous or minutely hispidulous. *Drimia ecklonii* from sandstone slopes in the Cape Fold Mountains has obtuse leaves with papillate/colliculate margins (Figure 17A), and *D. pulchromarginata* from Namaqualand has generally broader leaves with unique duplex margins on the upper surface (Figure 17C).

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. **3019 (Loeriesfontein)**: 15 km from Loeriesfontein on road to Kliprand, (–CD), 13 Sep. 2000 [leafing], P. Goldblatt et al. 11525 (NBG). **3119 (Calvinia)**: Uitvlug farm NW of Calvinia, (–BC), 6 Jul. 2000 [fl. ex hort. 5 Oct. 2000], J. Manning 2270A (NBG); Hantam Mtn, Akkerendam, (–BD), 22 Jul. 1961 [fl. ex hort 14 Nov. 1961], W.F. Barker 9343 (NBG). **3120 (Williston)**: northern foot of Klein Tafelberg, (–CA), 22 Oct. 1991, P.V. Bruyns 4293 (BOL).

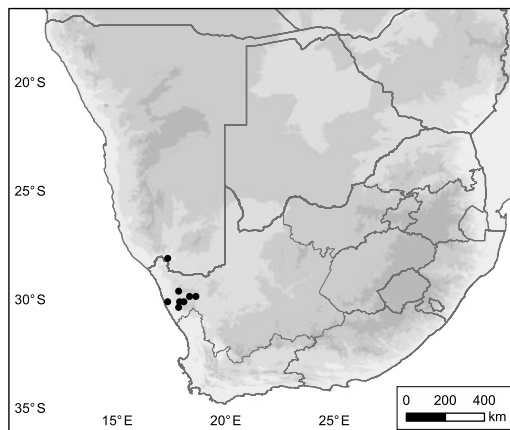
33. ***Drimia pulchromarginata*** J.C.Manning & Goldblatt in Bothalia 37: 185 (2007). Type: South Africa, Northern Cape, Kamiesberg (3018): 'Draaiklip farm', (–AA), 31 Oct. 1983 (ex hort.), C.H. Stirton 9226 (NBG, holo!).

Plants evergreen or deciduous, solitary. *Bulb* subglobose, 20–30 mm diam., scales closely or sometimes loosely adherent, white, drying pale brown and becoming thinly leathery. *Leaves* synanthous or hysteranthous, (1)2 to 4, prostrate or erect, elliptical to suborbicular, 25–60 $\times$ (13–)15–25 mm, acute, leathery, base plane, dark green, sometimes purple beneath, glabrous or minutely hispidulous adaxially, margin thickened, cartilaginous, 0.5–1.0 mm thick, colliculate, upper surface with adaxial submarginal band ± 0.5 mm wide of dense, suberect or weakly retrorse trichomes ± 0.1 mm long. *Inflorescence* corymbose-capitate, (60–)150–300 mm long, densely 10- to 30-flowered, flowers ± 0.5 mm apart; scape straight or flexuous below, glabrous, 0.5–2.0 mm diam.; bracts ovate-lanceolate, 2–3 mm long, lower with spur 1–2 mm long; pedicels spreading, 5–10 mm long, abscising near middle and subsequently near base if not pollinated. *Flowers* diurnal, spreading, campanulate, usually scented (described as unpleasant or freesia-like); tepals connate for ± 1 mm, erect and overlapping below forming a cup ± 1.5 mm deep, spreading above, pale brownish with darker keels, outer lobes ovate, $\pm 5 \times 2$ mm, inner oblong, $\pm 4.5 \times 1.8$ mm. *Filaments* erect, lanceolate, ± 2.5 mm long, white. *Anthers* medifixed, ovoid, ± 1 mm long, dehiscence longitudinal, yellow with yellow pollen. *Ovary* ovoid-truncate, ± 2 mm long, greenish yellow; style columnar, ± 1.5 mm long, white; stigma truncate-papillate. *Capsules and seeds* unknown. *Flowering time*: October and November; flowers variously recorded as opening in the morning or the afternoon. Figure 17C.

Distribution and ecology: endemic to western Northern Cape, from the Richtersveld and higher-lying parts of northern and central Namaqualand as far south as Garies, rarely near the coast (Map 33); on

sandy or gravelly flats among granite outcrops or sometimes on quartz patches.

Discussion: the northernmost member of the *Drimia marginata* complex, *D. pulchromarginata* is distinguished by its elliptical to suborbicular, apiculate leaves, mostly 15–25 mm wide, with a highly ornamented, duplex margin comprising a narrow, colliculate rim edged internally on the upper surface with a broader band, ± 0.5 mm wide, of closely packed, suberect or weakly retrorse trichomes ± 0.1 mm long. This uniquely complex margin is developed only on the upper surface, and the margin on the undersurface is simple and colliculate, as found in *D. ecklonii*. Typically two to four leaves are produced, and the plants remain evergreen if conditions permit.



MAP 33.—Distribution of *D. pulchromarginata*

The development of dense trichomes along the upper edge of the leaf margins in *Drimia marginata* and *D. pulchromarginata* is evidently a derived character, suggesting that the two taxa are allopatric sister species.

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. 2817 (Violsdrif): Richtersveld, Chubiesies, (–AB), 15 Oct. 2006 [fl. ex hort.], A. Harrower 1521 (NBG). **2917 (Springbok):** Springbok, (–DB), Jan. 1977, B. Jeppe s.n. (PRE). **2918 (Gamoep):** Vaalkoei, 1 000 m, (–CD), 10 Jul. 1991 [fl. ex hort. 4 Nov. 1991], P.V. Bruyns 4713 (PRE); Wildeperdehoek Pass, (–DC), 17 Aug. 2005, H. Steyn 731 (PRE). **3017 (Hondeklipbaai):** Riethuis, (–AB), 11 Jul. 1989 [as '1898'] [fl. ex hort. 21 Oct. 1991], P. Bruyns 3879 (BOL); 6 km NNE of Riethuis on road to Springbok, (–AB), without date, J. Manning 1040 (NBG); Kamieskroon, (–BB), 9 Nov. 1950, W.F. Barker s.n. NBG1181/50 (NBG); Kharkams, (–BD), 18 Oct. 1971, H. Hall 4172 (NBG); Darter's Grave, 22 miles N of Garies, (–BD), Aug. 1932, J. Mathews s.n. NBG1891/31 (BOL); 4 May 1963 [fl. ex hort. 18 Nov. 1963], L. Booysen 13 (NBG). Without precise locality or date: [Northern Cape], Namaqualand, 1924, Giffen s.n. NBG 1051/24 (BOL).

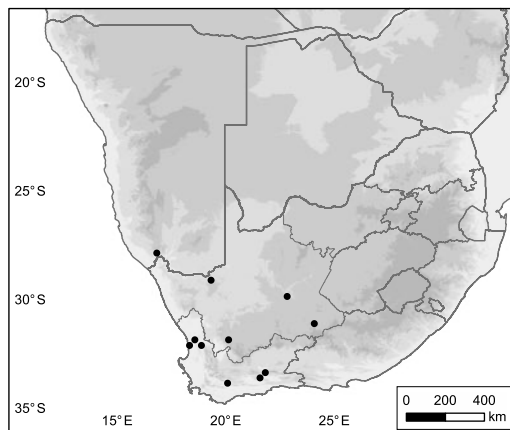
34. ***Drimia vermiformis*** J.C.Manning & Goldblatt in Martínez-Azorín & Crespo in Taxon 63: 1330 (2014) [J.C.Manning & Goldblatt in Bothalia 37: 184 (2007), nom. inval.]. Type: South Africa, Western Cape, Clanwilliam (3218): 'Clanwilliam Dam, picnic site along N7 near wall', (–BB), 3 Aug. 1987, P.L. Perry 3587 (NBG [leaf only], holo.!).

Plants deciduous, solitary. *Bulb* subglobose, 15–20 mm diam., scales adherent, white or flushed pink, drying pale brown and becoming thinly leathery. *Leaf* hysteranthous, solitary (rarely two), spreading or suberect, cylindric or rarely falcate, subterete or flattened and elliptic in section, 50–80 $\times$ 2–5 mm, obtuse or rarely subacute, glabrous or minutely hispidulous, leathery, dark green flushed purple at base. *Inflorescence* nodding in bud, corymbose-capitate, (20–)50–120 mm long, densely 5- to 20-flowered, flowers ± 0.5 mm apart; scape erect or flexuous at base, 0.5–1.0 mm diam., but swollen basally, usually glabrous or sometimes longitudinally puberulous in lower half; bracts ovate-lanceolate, ± 2 mm long, lower with spur 1–2 mm long; pedicels spreading, 5–10 mm long, abscising near middle and subsequently near base if not pollinated. *Flowers* diurnal, spreading, campanulate, unscented; tepals



FIGURE 18.—*Drimia vermiciformis*, Western Cape, Trawal, Manning 3092 (NBG). A, leafing bulb, with leaf cross-section; B, inflorescence; C, flower; D, stamens; E, gynoecium; F, capsule; G, seed. Scale bar: A, B, F, 10 mm; C, 2 mm; D, E, G, 1 mm. Artist: John Manning.

fused for ± 1 mm at base, erect and overlapping, below forming a cup ± 1.5 mm deep, spreading above, pale brownish with darker keels, outer lobes ovate, $\pm 5 \times 2$ mm, inner oblong, $\pm 4.5 \times 1.8$ mm, weakly canaliculate at top of cup, margins recurved. *Filaments* erect, lanceolate, ± 2.5 mm long, white. *Anthers* medifixed, ovoid, ± 1 mm long, dehiscence longitudinal, yellow with yellow pollen. *Ovary* ellipsoid-truncate, ± 2 mm long, greenish yellow; style columnar, ± 1.5 mm long, white; stigma truncate-papillate. *Capsules* subglobose, $5-6 \times \pm 5$ mm. *Seeds* compressed, elliptical or rectangular, 2–3 mm diam., glossy black, irregularly folded, testa finely reticulate. *Flowering time*: October and November; flowers opening in the late afternoon and fading in the evening. Figure 18.



MAP 34.—Distribution of *D. vermiformis*

Distribution and ecology: scattered through arid southwestern southern Africa, but poorly collected, from southern and southwestern Namibia into Bushmanland and Gordonias in Northern Cape, southwards through the Roggeveld and Nuweveld Escarpments to Western Cape, extending westwards through the arid Doring River Basin into the lower Olifants River valley around Clanwilliam, and into the Little Karoo as far east as Oudtshoorn (Map 34); on exposed, mostly shale flats and lower slopes in fine-grained clay or loam. Populations in the Little Karoo around Calitzdorp have been recorded from quartz patches.

Diagnosis: distinctive in the section in its solitary (rarely two), cylindrical or falcate, firmly fleshy leaf, $50-80 \times 2-5$ mm, terete or slightly flattened and elliptical in section, and usually spreading or prostrate. Plants typically have a solitary leaf, but populations in the Little Karoo may have two leaves per bulb.

Additional specimens seen

NAMIBIA. 2716 (Karass): koppie E of mine at Rosh Pinah, on Namuskluft, (–DD), 29 Sep. 2004, *Mannheimer et al.* 2661 (NB). **2818 (Warmbad)**: Warmbad Dist, Witsand, 950 m, (–DB), 19 Jul. 2005, *P. Bruyns* 10093 (NBG).

SOUTH AFRICA. NORTHERN CAPE. 2919 (Pofadder): Pofadder, (–AB), 14 Oct. 1954, *E. Esterhuysen* 23640a (BOL). **2922 (Prieska)**: Griquaastad Dist., Rudesheim, 1 400 m, (–DD), 15 Apr. 2003, *P. Bruyns* 9415 (NBG). **3120 (Williston)**: Roggeveld Escarpment, Middelpoort, hill behind school, (–CC), 12 Sep. 2001 [in bud], *D. Snijman & Van der Westhuysen* 1853 (NBG). **3124 (Hanover)**: Richmond, Messfontein Farm, (–AA), 13 Apr. 2016 [leafing], *Ebrahim & Marais* CR16633 (NBG).

WESTERN CAPE. 3118 (Vanrhynsdorp): Trawal, steep slopes west of N7, (–DC), 31 Aug. 2003 (in bud), *P.V. Bruyns* 9523 (NBG); Trawal, right hand slope below N7 leading to Olifants River, (–DC), 15 Apr. 2007, *J. Manning* 3092 (NBG). **3218 (Clanwilliam)**: Zwart Vley [Swartvlei], near upper waterfall E of Uitspankraal on Doringrivier, (–AB), 16 Sep. 1992 [ex hort.], *D. Snijman* 1223 (NBG). **3222 (Beaufort West)**: Stolshoek, [Karoo National Park, W of Beaufort West], (–AD), 13 Sep. 1989, *P. Bruyns* 3977 (BOL). **3320 (Montagu)**: near Montagu, (–CC), Sep. 1933, *M.R. Levyns* 4600 (BOL); 13.5 km E of Bonnievale, (–CC), without date, *P.L. Perry s.n.* (NBG). **3321 (Ladismith)**: Cango Caves, (–BD), Nov. 1928, *J. Gillett* 1961 (BOL); Farm Droogkraal, 30 km NW of Oudtshoorn, (–BD), 1 Oct. 1980, *A. Bean s.n.* (NBG); road to Rooiberg Pass, SW of Radleigh, (–DA), *E.G.H. Oliver* 3665 (NBG); Besemkop, NE of Calitzdorp, (–DA), 29 Sep. 2006, *P. Burgoyne & M. Warrington* 10677 (PRE).

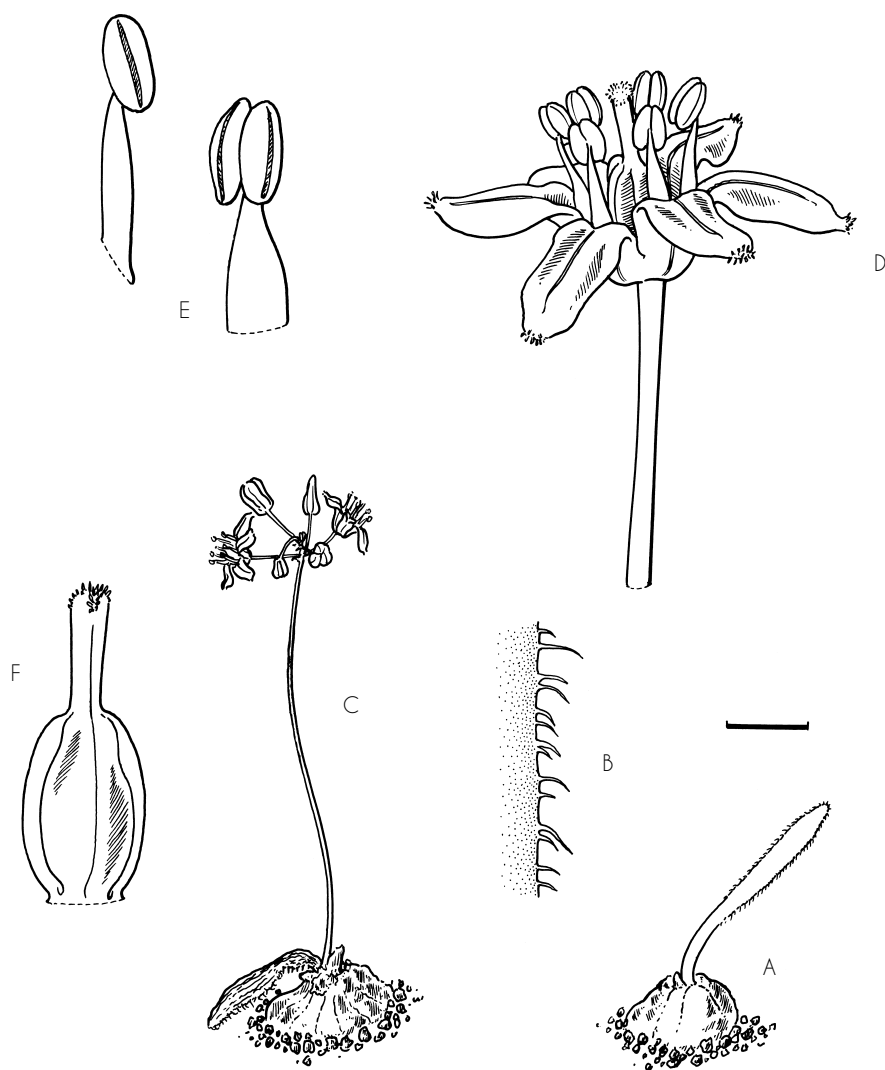
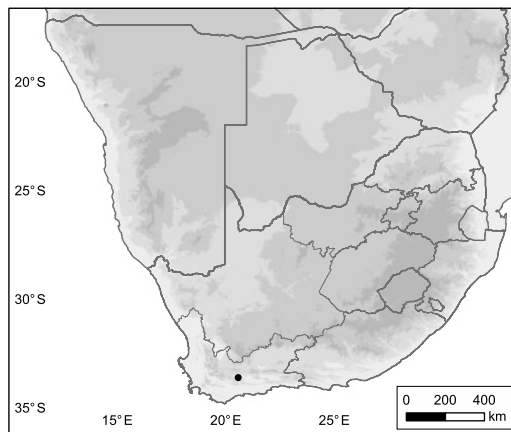


FIGURE 19.— *Drimia ciliolata*, Western Cape, Anysberg, Deacon 4411 (NBG). A, leafing bulb; B, detail of leaf margin; C, flowering bulb; D, flower; E, stamens; F, gynoecium. Scale bar: A, C, 10 mm; B, D–F, 2 mm. Artist: John Manning.

35. ***Drimia ciliolata*** J.C.Manning & J.M.J.Deacon, sp. nov. Type: South Africa, Western Cape, Montagu (3320): Anysberg, (–DA), quartz patches S of Anysberg, 20 Aug. 2016 [leafing bulb; orig. coll. 11 Oct. 2015], J. Deacon 4411 (NBG, holo.).

Plants deciduous, solitary. *Bulb* ovoid to subglobose, 10–15 mm diam., scales adherent, white but green when exposed, drying pale brown and becoming membranous. *Leaf* hysteranthous, solitary, suberect or spreading, narrowly oblanceolate, $\pm 25 \times 3$ mm, subacute, margins retrorsely ciliate with hairs ± 0.2 – 0.5 mm long, blade narrowed and glabrous basally, bright green. *Inflorescence* nodding in bud, corymbose-capitate, 40–70 mm long, densely 7- to 10-flowered, flowers ± 0.5 mm apart; scape erect, 0.5 mm diam., glabrous; bracts ovate-lanceolate, ± 2 mm long, lower with spur 0.5–1.0 mm long; pedicels suberect to spreading, 5–7 mm long. *Flowers* diurnal, spreading, weakly campanulate, unscented; tepals fused for 1.0–1.5 mm at base, suberect and overlapping below forming a cup ± 1.5 mm deep, spreading above, pale brownish with darker keels, penicillate, outer lobes lanceolate, $\pm 4 \times 1$ mm, inner ovate, $\pm 4 \times 1.5$ mm, weakly canaliculate at top of cup, margins recurved. *Filaments* erect, lanceolate, ± 2 mm long, white. *Anthers* medifixed, ovoid, ± 1 mm long, dehiscence longitudinal, yellow with yellow pollen. *Ovary* ellipsoid-truncate, ± 2 mm long, yellowish green; style columnar, ± 2 mm long, white; stigma truncate-papillate. *Capsules and seeds* unknown. *Flowering time*: October and November; flowers opening in the late afternoon and fading in the evening. Figure 19.



MAP 35.—Distribution of *D. ciliolata*

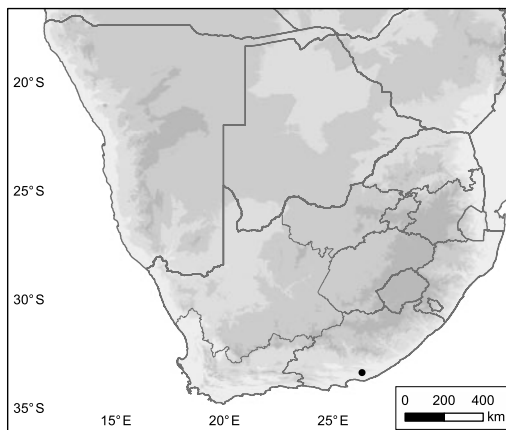
Distribution and ecology: known only from the type collection from quartz patches south of Anysberg in the western Little Karoo of Western Cape (Map 35).

Diagnosis: typical of the section in its flowers, *Drimia ciliolata* is distinguished by its solitary, spreading leaf with a narrowly oblanceolate blade $\pm 25 \times 3$ mm with retrorsely ciliate margins, the hairs 0.2–0.5 mm long. *Drimia trichophylla* from near Grahamstown in Eastern Cape has similar foliage, but the leaf is covered on both surfaces as well as along the margins with softer, longer hairs ± 1 mm long.

36. ***Drimia trichophylla*** Mart.-Azorín et al. in Syst. Bot.: 944 (2016). Type: South Africa, Eastern Cape, Grahamstown (3326): ‘Cradock Road, ± 6 km from Grahamstown’, (–AD), 13 Nov. 1979, C. Vosa & E. Brink s.n. (GRA, holo.).

Plants deciduous, solitary. *Bulb* ovoid to subglobose, 8–15 mm diam., scales adherent, forming short neck, white, drying pale brown and becoming membranous. *Leaf* hysteranthous or withering at flowering, solitary, prostrate, narrowly lanceolate-oblong, flattened and elliptic in section or somewhat channelled, 17–55 $\times$ 1.5–2.0 mm, obtuse or subacute, with scattered retrorse white hairs ± 1 mm long on both surfaces and on margins, dark green flushed purple at base. *Inflorescence* nodding in bud, corymbose-capitate, (40–)60–100 mm long, densely 3- to 20-flowered, flowers ± 0.5 mm apart; scape erect, 0.5–1.0 mm diam., glabrous; bracts ovate-lanceolate, ± 2 mm long, lower with spur 1–2 mm long; pedicels suberect to

spreading, 5–9 mm long. *Flowers* diurnal, spreading, weakly campanulate, unscented; tepals fused for 1.0–1.5 mm at base, suberect and overlapping below forming a cup ± 1.5 mm deep, spreading above, pale brownish or greenish with darker keels, outer lobes lanceolate, $\pm 4 \times 1$ mm, inner ovate, $\pm 4 \times 1.5$ mm, weakly canaliculate at top of cup, margins recurved. *Filaments* erect, lanceolate, ± 2 mm long, colliculate basally, white. *Anthers* medifixed, ovoid, ± 1.0 mm long, dehiscence longitudinal, yellow with yellow pollen. *Ovary* ellipsoid-truncate, ± 1 mm long, greenish; style columnar, ± 1 mm long, white; stigma truncate-papillate. *Capsules* subglobose, 4.0–4.5 mm long. *Seeds* irregularly compressed, 1–2 mm diam., glossy black. *Flowering time*: October and November; flowers opening in the afternoon and fading in the evening.



MAP 36.—Distribution of *D. trichophylla*

Distribution and ecology: known from a single locality north of Grahamstown in Eastern Cape (Map 36); in open places.

Diagnosis: distinguished in the section by its solitary, narrow leaf with scattered, deflexed hairs ± 1 mm long, on both surfaces and along the margins.

Additional specimens cited

SOUTH AFRICA. EASTERN CAPE. **3326 (Grahamstown)**: Cradock Road, 6–7 miles [10–11 km] from Grahamstown, (–AD), Nov. 1929, R. Dyer 2194 (GRA); Table Hill farm, ± 8 km from Grahamstown on Cradock road, (–AD), 21 Oct. 2011 [fl. ex hort.], M. Martínez-Azorín & A. Martínez-Soler 613 (GRA).

37. ***Drimia chalumnensis*** A.P.Dold & E.Brink in S. Afr. J. Bot. 70: 631 (2004). Type: South Africa, Eastern Cape, Peddie (3327): 'Cornfields farm, near the Chalumna River, 5 km NW of Kayser's Beach, 35 km SW of East London', (–BA), 25 Oct. 2002, Dold 4619 (GRA, holo. —image!).

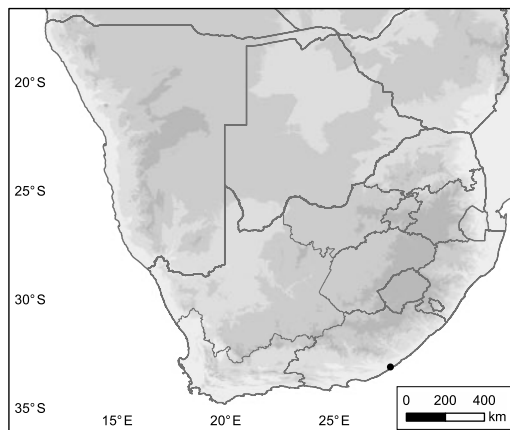
[*Urginea patersoniae* Schönland ms.: Drège 2122, Cruden 300 (PRE)]

Plants deciduous, gregarious, forming colonies. *Bulb* subglobose, 15–25 mm diam., scales loose and separate, contracted or petiolate below; truncate above, fleshy, white. *Leaves* hysteranthous or synanthous, 2 to 6(8), rosulate, subterranean portion clasping scape, spreading, linear-lanceolate, channelled above, subacute, (15–)20–30(–50) $\times$ 2.0–2.5 mm, margin thickened and cartilaginous, colliculate, stiffly leathery, glaucous. *Inflorescence* congested, subcapitate-racemose, 10–15 mm long, densely 15- to 30-flowered, flowers ± 0.5 mm apart; scape erect, glabrous, 40–110 mm long, ± 1 –2 mm diam.; bracts ovate, 1–2 mm long, lower saccate or with short spur to 2 mm long; pedicels spreading to suberect, (2–)3–6 mm long. *Flowers* diurnal, suberect, shallowly campanulate; tepals connate below for 0.8 mm, suberect and overlapping below forming a cup ± 1 mm deep, spreading above, pale brownish with darker keels, lobes ovate, 3.0–3.5 $\times$ 1.5–2.0 mm, margins recurved. *Filaments* erect, lanceolate, finely papillate, 1.8–2.0 mm long, contiguous at base, white. *Anthers* medifixed, globose, 0.6 mm long, dehiscence longitudinal, yellow with yellow pollen. *Ovary* ovoid, 1.0–1.4 mm long, pale green; style columnar, ± 1 mm long, white;

stigma truncate-papillate. *Capsules* subglobose, 4–5 mm long. *Seeds* angled and lightly winged, 1.5–2.0 mm long, glossy black, irregularly folded, testa finely reticulate. *Flowering time*: October to November; flowers opening at 08:00 and closing at 17:00.

Distribution and ecology: the species was described from two populations near Chalumna in Eastern Cape, but we include additional collections from near Port Elizabeth (Map 37); in shallow soils on calcareous sandstone sheets and open flats.

Diagnosis: recognised by the loosely aggregated bulb scales that are narrowed or stalked below, and the linear, stiffly spreading leaves up to 2.5 mm wide that are channelled above with thickened, colliculate-cartilaginous margins.



MAP 37.—Distribution of *D. chalumnensis*

When described (Dold & Brink 2004), *Drimia chalumnensis* was known only from two populations near Chalumna, both comprising diminutive plants with peduncles up to 40 mm long and short pedicels to 4 mm long. We provisionally include in the species two earlier collections from near Port Elizabeth that match the Chalumna plants in vegetative features, notably the loose bulb scales and spreading, linear-channelled leaves with thickened, colliculate margins, and that differ essentially only in their taller inflorescences, 60–110 mm long with slightly longer pedicels 4–6 mm long. They bear the manuscript name *Urginea patersoniae* Schönland. Further field work is necessary to assess the circumscription of the species and the status of the Port Elizabeth populations.

Two other collections, *Zeyher 4223* (SAM) from Zwartkopsrivier [Swartkopsrivier] near Port Elizabeth and *Van Jaarsveld 1119* (NBG) from Normandale south of Bedford, are of plants with tightly packed bulb scales, a subumbellate inflorescence 20–90 mm tall, and a synanthous, solitary, arcuate or spreading, linear-oblong leaf with thickened, colliculate margins that are sometimes curved or rolled under. They probably represent an undescribed species, but the material is inadequate for a formal description and additional material is required to resolve the matter.

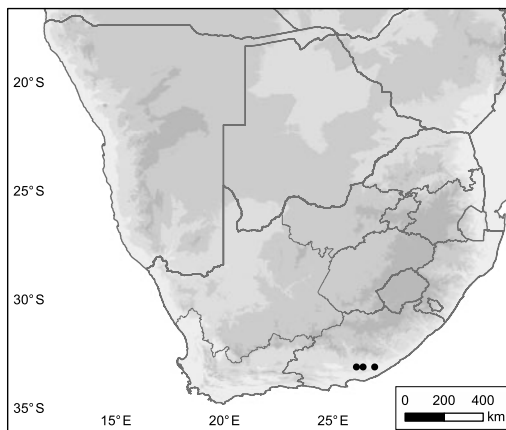
Additional specimens seen

SOUTH AFRICA. EASTERN CAPE. **3325 (Port Elizabeth)**: Uitenhage Dist., Aloes [Railway Siding], (–DC), 7 Nov. 1912, I.L. Drège 2122 (PRE). **3326 (Grahamstown)**: Alicedale, (–AC), sandy flats in village land, Oct.–Nov. 1918, F. Cruden 300 (PRE).

38. ***Drimia acarophylla*** E.Brink & A.P.Dold in S. Afr. J. Bot. 69: 396 (2003). Type: South Africa, Eastern Cape, Grahamstown (3326): ‘Commitees Drift, Tyefu Location’, (–BB), 22 Aug. 1991, Brink 799 (GRA, holo. —image!; BOL!, iso.).

Plants dwarf, deciduous, aggregated in small colonies. *Bulb* subglobose, 14–25 mm diam., scales adherent, white or flushed pink, drying pale brown and becoming thinly leathery. *Leaf* hysteranthous or synanthous, solitary (rarely two), spreading or recumbent, clavate, ellipsoid or slightly channelled in section, (6–)10–12(–15) × 1–5 mm, abruptly contracted at ground level into slender petiole-like subterranean

portion, obtuse or retuse, glabrous, leathery, dull greyish green. *Inflorescence* corymbose-capitate, (15–)20–30 mm long, densely 6- to 19-flowered, flowers ± 0.5 mm apart; scape erect, 0.5–1.0 mm diam., but swollen basally, glabrous; bracts deltoid, 1–2 mm long, lower saccate or with spur up to 0.3 mm long; pedicels spreading, (1–)5–6(–9) mm long. *Flowers* diurnal, spreading, shallowly campanulate, unscented; tepals connate for 0.4 mm at base, suberect and overlapping below forming a cup ± 1 mm deep, spreading above, white or pinkish with brown keels, outer lobes ovate, 4–5 $\times$ 2 mm, inner elliptic, 4.0–4.5 $\times$ 1.0–1.5 mm, margins recurved. *Filaments* suberect, lanceolate, ± 2 mm long, white. *Anthers* medifixed, ovoid, ± 1.5 mm long, dehiscence longitudinal, greenish with yellow pollen. *Ovary* ovoid, ± 2 mm long, pale yellow; style columnar, ± 2 mm long, white; stigma truncate-papillate. *Capsules* subglobose, 4.5–6.5 $\times$ 3–6 mm. *Seeds* compressed, ellipsoid or rectangular, 2.0–2.5 mm diam., glossy black, irregularly folded, testa finely reticulate. *Flowering time*: July to September; flowers opening mid-morning $\pm 10:00$ and withering in the late afternoon $\pm 17:00$.



MAP 38.—Distribution of *D. acarophylla*

Distribution and ecology: restricted to the Great Fish River Valley north and east of Grahamstown (Map 38); confined to bare patches of exposed, loose, pencil shale fragments, forming small clonies isolated on raised shale humps.

Diagnosis: readily distinguished in the section by its diminutive size, and solitary (rarely two) clavate or almost globular leaf strongly contracted into a petiole-like subterranean base, the blade (6–)10–12(–14) $\times$ 1–4 mm.

Additional specimens cited

SOUTH AFRICA. EASTERN CAPE. **3326 (Grahamstown)**: Riebeeck East, Swartwaterspoort, (–AA), 22 Sep. 2002, *Dold 4451* (GRA); Fort Beaufort, Coniston farm, (–AB), 27 Oct. 1991, *Dold 312* (GRA); Lynton farm, Piggott Bridge, Fish River, (–AB), 25 Sep. 2002, *Dold 4452* (GRA); Fort Brown, Kwandwe Game Park, Krantz Drift, (–AB), 19 Sep. 2002, *Dold 4453* (GRA); Fort Brown, Krantz Drift, (–AB), 2 Aug. 1982, *Skead s.n.* (GRA); Fort Brown, Tempe farm, (–BA), 25 Sep. 2001, *Dold 4451* (GRA); Committees, Glen Boyd farm, (–BB), 27 Jul. 1979, *Brink 683* (GRA); Committees Drift, Qamnyana, (–BB), 25 Aug. 2002, *Dold 4448* (GRA).

Sect. 9. **Physodia** (Salisb.) J.C.Manning & Goldblatt, comb. nov. *Physodia* Salisb., Gen. Pl.: 37 (1866). *Urginea* sect. *Physodia* (Salisb.) Baker in J. Linn. Soc., Bot. 13: 216 (1873). Type: *Physodia pusilla* (Jacq.) U.Müll.-Doblies, lecto., designated by Deb and Dasgupta in J. Econ. Tax. Bot. 3: 823 (1982) = *Drimia physodes* (Jacq.) Jessop

Fusifilum Raf., Fl. Tellur. 2: 27 (1837). Type: *Fusifilum physodes* (Jacq.) Speta, lecto., designated by Deb and Dasgupta in J. Econ. Tax. Bot. 3: 823 (1982) = *Drimia physodes* (Jacq.) Jessop

Plants small. *Bulb* scales tightly adherent, flesh white or pink. *Leaves* few to several, blade various, terete or linear to lorate, glabrous, margins narrowly membranous, hysteranthous or rarely $\pm$ synanthous.

Inflorescence a congested, short or corymbose-capitate raceme; scape longitudinally puberulous or glabrous; bracts ovate to spatulate, lower short-spurred; bracteoles absent; pedicels longer than tepals at flowering, spreading, mostly 5–30 mm long. *Flowers* diurnal in late afternoon, lasting a few hours, spreading, rotate, perianth deciduous and tepals cohering above to form a cap on developing capsule; tepals connate at base, spreading, elliptic, white with darker midrib. *Stamens*: filaments suberect, fusiform, 2–4 mm long, longer than anthers, papillate below swelling; anthers medifixed, subglobose to ovate, 0.5–1.0 mm long, dehiscence longitudinal, yellow or brownish. *Ovary* ovoid-truncate, white; style slightly shorter than to $\pm$ as long as ovary, cylindrical; stigma truncate-papillate or capitate-papillate. *Capsule* ovoid to subglobose, 4–10 mm long. *Seeds* elliptic, testa finely reticulate.

Key to species

- 1a. Inflorescence globose-capitate, all pedicels $\pm$ 0.5 mm apart and rachis not elongating in fruit; scape glabrous; lower bracts 1.5–4.0 mm long with a spur 1–6 mm long; plants from mesic grasslands along eastern escarpment. 39. *D. depressa*
- 1b. Inflorescence subcapitate-racemose or congested-racemose, lower pedicels often distant and rachis somewhat elongating in fruit; scape usually longitudinally puberulous; lower bracts 0.5–2.0 mm long with reduced spur up to 1.5 mm long; plants from drier habitats along western and southern coast and interior:
 - 2a. Leaves subterete-filiform, 0.5–1.0 mm wide; pedicels arcuate-suberect in fruit 42. *D. virens*
 - 2b. Leaves linear to lanceolate, 1–25 mm wide; pedicels spreading-reflexed with tips abruptly erect in fruit:
 - 3a. Pedicels (3.0–)5.0–6.5 mm long; ovary white with yellow shoulders edged with purple speckles; base of bulb and roots bulbiferous 40. *D. montana*
 - 3b. Pedicels (8–)15–20(–30) mm long; ovary uniformly white; plants not bulbiferous 41. *D. physodes*

41. ***Drimia depressa* (Baker) Jessop** in J. S. Afr. Bot. 43: 297 (1977). *Urginea depressa* Baker in Bull. Herb. Boiss., sér. 2, 4: 1000 (1904). *Fusifilum depressum* (Baker) U.Müll.-Doblies et al. in Feddes Repert. 112: 480 (2001). Type: South Africa, Gauteng, Johannesburg (2628): 'Transvaal, Modderfontein', (–CB), 9 Oct. 1898, Conrath 687 (Z, lecto., designated by Jessop in J. S. Afr. Bot. 43: 297 (1977); K [000857414], isolec. —image!).

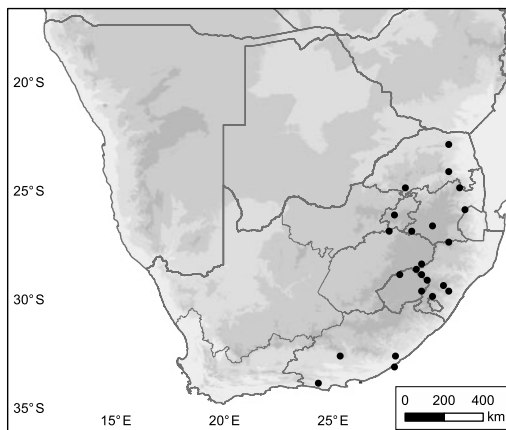
Ornithogalum capitatum Hook.f. in Curtis's Bot. Mag. 89: t. 5388 (1863) [non *Drimia capitata* Baker (1897)]. *Urginea capitata* (Hook.f.) Baker in Fl. Cap. 6: 465 (1897). *Physodia capitata* (Hook.f.) U.Müll.-Doblies et al. in Müller-Doblies and Müller-Doblies in Feddes Repert. 107: 520 (1996). *Fusifilum capitatum* (Hook.) Speta in Phytotax 38: 69 (1998). Type: South Africa, Eastern Cape, 'British Kaffraria', 1860, Cooper 208 (K [000365544], holo. —image!).

Urginea saniensis Hilliard & B.L.Burtt in Notes Roy. Bot. Gard. Edinb. 42: 253 (1985), syn. nov. *Drimia saniensis* (Hilliard & B.L.Burtt) J.C.Manning & Goldblatt in Bothalia 33: 111 (2003). Type: South Africa, KwaZulu-Natal, Underburg (2929): 'top of Sani Pass', (–CA), 6 Nov. 1973, Hilliard & Burtt 7102 (E, holo. —image!; NU, iso. —image!).

Plants deciduous, solitary or colonial. *Bulb* ovoid or subglobose, (10–)25–40(–50) mm diam., scales adherent, white or pinkish, drying greyish brown and becoming papery or thinly leathery. *Leaves* usually hysteranthous, 5 to 8, erect, linear to narrowly lanceolate, (80–)100–240(–260) $\times$ (4–)10–26 mm, subacute, with narrowly hyaline margin, glabrous, dark green, bases sometimes $\pm$ accumulating and papery. *Inflorescence* congested and subcapitate, (50–)70–200(–350) mm tall, 10- to 20(50)-flowered, flowers mostly 0.5 mm apart; scape 1–4 mm diam., glabrous; bracts ovate-cucullate to spatulate, 1.5–4.0 mm long, lower with spur 1–6 mm long; pedicels spreading to arcuate, 4–15(–20) mm long. *Flowers* diurnal, suberect and globose in bud, rotate; tepals connate at base for 0.5–0.8 mm, spreading, lobes elliptic, 4–8 $\times$ 1.5–3.0 mm, apices penicillate, white with dark midrib. *Filaments* suberect

to spreading, ellipsoid-fusiform, contracted at base, 3–4 mm long, papillate at base, white. Anthers medifixed, ovoid, 0.5–1.2 mm long, dehiscence longitudinal, yellow or brownish. Ovary ovoid, 2–3 mm long, white; style 1.5–2.5 mm long, white; stigma truncate-papillate. Capsules ovoid, 5–8 mm long. Seeds elliptic, unequally circumferentially winged, 4–5 mm long, glossy black, testa minutely rugulose. Flowering time: (August) September to December; flowers opening late afternoon and withering later that evening.

Distribution and ecology: widespread through the eastern parts of southern Africa, extending from Kareedouw in Eastern Cape along the coast to southern KwaZulu-Natal and through the Midlands and Drakensberg into Lesotho and eastern Free State north to Limpopo and Swaziland, and inland to Gauteng (Map 39); in stony grassland, from near sea level to above 2 000 m, flowering in spring and early summer, often earlier in burned veld.



MAP 39.—Distribution of *D. depressa*

Diagnosis: distinguished in the section by the globose-subcapitate raceme not elongating in fruit and with the pedicels remaining $\pm$ 0.5 mm apart, the scape always glabrous, and the relatively larger bracts, 1–4 mm long, the lower with a spur 1–6 mm long. The more mesic habitat, in the grasslands of the eastern part of the subcontinent, is also characteristic. That said, it is not always easy to separate *Drimia depressa* from plants of *D. physodes* in early flower before the rachis extends, but the latter is essentially a species of the drier interior and western parts of the country, usually with a puberulous scape, and the lower bracts smaller, 1–2 mm long, with a reduced spur up to 2 mm long.

Drimia saniensis from the summit plateau of the Drakensberg at Sani Pass was distinguished from *D. depressa* by its fewer flowers (1 to 4, rarely up to 7) and narrower leaves (20–60 $\times$ 1.0–1.5 mm) (Hilliard & Burt 1985), but this variation falls within the lower limits accepted in *D. depressa* and we therefore consider it to represent a dwarf alpine form of this species.

Additional specimens seen

LESOTHO. **2828 (Bethlehem):** Leribe, (–CC), 'spring', A. Dieterlen 363 (SAM).

SOUTH AFRICA. LIMPOPO. **2230 (Messina):** Venda, Rambuda, near Lutheni V village, (–CD), 6 Nov. 1998, N. Jacobsen 5761 (PRE). **2428 (Nylstroom):** 8 mi [13 km] NE of Nylstroom, (–CD), 7 Oct. 1954, L. Codd 8836 (PRE); between Warmbaths and Nylstroom, (–CD), 2 Oct. 1938, Hafström & Acocks 339 (PRE).

MPUMALANGA. **2430 (Pilgrim's Rest):** The Downs, Paris farm, Mashelu, (–AB), 17 Oct. 1981, F. Center 7145 (PRE); Fèeland just outside Graskop, (–DD), 28 Sep. 1979, J. Kluge 1962 (PRE). **2531 (Komatipoort):** Sadelback Mt, (–CC), Sep. 1890, E. Galpin 987 (PRE, SAM). **2629 (Bethal):** Bethal, (–DA), 8 Nov. 1966, A. Mauve 4494 (PRE).

NORTHWEST. **2627 (Potchefstroom):** Potchefstroom, Witkop, (–DC), 3 Oct. 1944, W. Louw 1049 (PRE).

GAUTENG. **2627 (Potchefstroom):** Krugersdorp, (–BB), Apr. 1956, J. Acocks 18728 (PRE); Roodepoort, Transvaal Botanic Garden, (–BB), 28 Sep. 1983, C. Behr 560 (PRE). **2628 (Johannesburg):** Witpoortjie, (–DC), grassveld and koppies, 24 Dec. 1922, C. Moss 8066 (NBG).

FREE STATE. **2828 (Bethlehem):** Witzieshoek, (–DB), 15 Aug. 1985, A. Paton 290 (PRE). **2829 (Harrismith):** Manyenyeza Mt on Rensburgskop farm, (–AC), below sandstone cliffs, 2 000 m, 24 Nov. 1977, M. Jacobsz 516 (NBG).

KWAZULU-NATAL. **2730 (Vryheid)**: Altemooi, (–AD), stony grassy places, Nov. 1920, *Thode s.n.* STE3479 (NBG). **2829 (Harrismith)**: Cathedral Peak area, (–CC), Jul. 1946, *E. Esterhuysen* 12918 (BOL); Bergville, Molweni area, (–CC), Jul. 1959 [ex hort.], *E. Esterhuysen* 28305 (BOL). **2929 (Underberg)**: Cathkin Peak, (–AB), Sep. 1912, *W. West s.n.* (SAM); Lotheni, above Jacob's Ladder, (–BC), 15 Dec. 2005 [past flowering], *J. Buring s.n.* (NBG); Estcourt District, No. 1 Location, (–DC), 25 Oct. 1935, *J. Pentz* 51 (PRE). **2930 (Pietermaritzburg)**: Mt Gilboa, (–AC), 24 Sep. 1906, *J. Medley Wood* 10040 (BOL); Pietermaritzburg, Oribi Aerodrome, (–CB), 17 Aug. 1965, *E. Moll* 1877 (PRE).

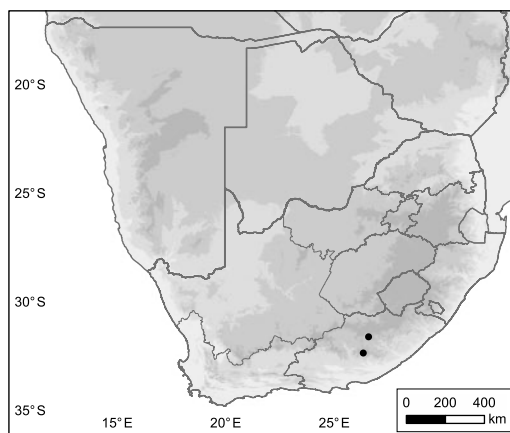
EASTERN CAPE. **3225 (Somerset East)**: Bruintjieshoogte, (–CB), without date or collector, SAM23188 (SAM). **3227 (Stutterheim)**: Komgha, (–DB), Aug. 1892, *H. Flanagan* 1723 (BOL, SAM). **3324 (Steytler-ville)**: between Kareedouw and Assegai, (–CD), without date, *J. Jeppe sub H. Fourcade* 4992 (BOL). **3327 (Pедdie)**: East London, Buffalo Pass, (–BB), 7 Jan. 1945, *W. Barker* 3537 (NBG); Gonubie, (–BB), without date, *H. Bokelmann* 3 (NBG).

40. ***Drimia montana*** A.P.Dold & E.Brink in Martínez-Azorín & Crespo in Taxon 63: 1130 (2014) [A.P.Dold & E.Brink in Bothalia 35: 64 (2006), nom. inval.]. *Fusifilum montanum* (A.P.Dold & E.Brink) A.P.Dold et al. in Phytotaxa 201: 168 (2015). Type: South Africa, Eastern Cape, Fort Beaufort (3226): 'Groot Winterberg, The Hoek farm', (–AD), 1 Jan. 2004, *Dold* 4633 (GRA, holo. —image!).

[?*Fusifilum stoloniferum* U.Müll.-Doblies et al. in Feddes Repert 112: 484 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

Plants deciduous, aggregated in small colonies. *Bulb* subglobose, 10–15 mm diam., roots (?stolons) terminating in a solitary large bulbil, scales adherent, reddish purple, drying greyish brown and becoming papery, loosely flaking, forming a short collar. *Leaves* hysteranthous, (2)3 to 6, erect, linear, upper surface $\pm$ concave, 15–50 $\times$ 1.0–1.5 mm, acute, glabrous, glossy green. *Inflorescence* congested, subcapitate-racemose, (45–)50–60(–80) mm long, densely 6- to 15-flowered, flowers 1–3 mm apart; scape 0.7–0.8 mm diam., longitudinally puberulous; bracts ovate-concave, 0.5–0.8 mm long, lower saccate with fold-like spur up to 0.8 mm long; pedicels spreading-suberect, (3.0–)5.0–6.5 mm long. *Flowers* diurnal, spreading, rotate; tepals fused for 0.8 mm at base, spreading or reflexed, white with broad maroon keel, lobes elliptic, 6.0–6.5 $\times$ 2.0–2.5 mm. *Filaments* suberect or slightly spreading above, fusiform, 3.2–3.6 mm long, white. *Anthers* medifixed, ovoid, $\pm$ 1 mm long, dehiscence longitudinal, yellowish green with yellow pollen. *Ovary* ovoid-truncate, $\pm$ 2 mm long, white with yellow shoulders flanked by purple speckling; style columnar, 1.5–2.5 mm long, white; stigma truncate-papillate. *Capsules* erect on apically flexed pedicels, obovoid, 8–10 $\times$ 6–8 mm. *Seeds* compressed, ovate, 5–8 $\times$ 4–5 mm, glossy black, testa finely reticulate. *Flowering time*: December to January; flowers opening mid-afternoon $\pm$ 14:30 and fading that evening $\pm$ 19:00.

Distribution and ecology: a montane species known from the summit of the Andriesberg and the Groot Winterberg in Eastern Cape (Map 40); forming large mats among lichens and mosses on rock slabs at $\pm$ 2 000 m.



MAP 40.—Distribution of *D. montana*

Diagnosis: resembling small forms of *Drimia physodes* in its subcapitate-racemose inflorescence, longitudinally puberulous scape and minute bracts, but distinguished by its shorter pedicels, (3.0–)5.0–6.5 mm long, and pigmented ovary, white with yellow shoulders edged with purple speckles. The development of a terminal bulbil on the roots [sic.] (?stolons) is evidently diagnostic for the species. The bulbil forms at the end of the new growth after the parent bulb breaks dormancy, but is readily detached. A collection of plants from the Nuweveld Escarpment with narrow leaves, which formed the basis for the invalidly published name '*Fusifilum stoloniferum* U.Müll.-Doblies et al.' (2001), is described as producing bulblets [sic.] at the end of stolons and may belong here, but we have not seen any material of this taxon.

Additional specimen cited

SOUTH AFRICA. EASTERN CAPE. **3126 (Queenstown):** summit of Andriesberg, Carnarvon Estate, Black Eagle Nature Reserve, (–DA), 15 Dec. 2002, Dold & Cocks 4700 (GRA).

41. ***Drimia physodes*** (Jacq.) Jessop in J. S. Afr. Bot. 43: 300 (1977). *Anthericum physodes* Jacq., Icon. Pl. Rar. 2 (16): 18, t. 1046 (1795). *Phalangium physodes* (Jacq.) Pers., Syn. Pl. 1: 369 (1805). *Albucca physodes* (Jacq.) Ker Gawl. in Curtis's Bot. Mag. 26: t. 1046 (1807). *Caesia physodes* (Jacq.) Spreng., Syst. Veg. 2: 88 (1825). *Idothea physodes* (Jacq.) Kunth, Enum. Pl. 4: 345 (1843). *Urginea physodes* (Jacq.) Baker in J. Linn. Soc., Bot. 13: 217 (1873). *Physodia physodes* (Jacq.) U.Müll.-Doblies et al. in Feddes Repert. 107: 519 (1996). *Fusifilum physodes* (Jacq.) Speta in Phytion 38: 69 (1998). Type: illustration in Jacq., Icon. Pl. Rar. 2 (16): t. 1046 (1795).

Anthericum pusillum Jacq., Icon. Pl. Rar. 2 (16): 18, t. 417 (1795). *Phalangium pusillum* (Jacq.) Pers., Syn. Pl. 1: 369 (1805). *Caesia pusilla* (Jacq.) Spreng., Syst. Veg. 2: 88 (1825). *Idothea drimioides* Kunth, Enum. Pl. 4: 345 (1843), as nom. nov., non *I. pusilla* (Jacq.) Kunth [= *D. elata* Jacq.]. *Urginea pusilla* (Jacq.) Baker in J. Linn. Soc., Bot. 13: 217 (1873). *Physodia pusilla* (Jacq.) U.Müll.-Doblies et al. in Feddes Repert. 107: 520 (1996). *Fusifilum pusillum* (Jacq.) Speta in Phytion 38: 70 (1998). Type: illustration in Jacq., Icon. Pl. Rar. 2 (16): t. 417 (1795).

[*Fusifilum bruce-bayeri* U.Müll.-Doblies et al. in Feddes Repert 112: 479 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

[*Fusifilum crenulatum* U.Müll.-Doblies et al. in Feddes Repert 112: 483 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

[*Fusifilum glaucum* U.Müll.-Doblies et al. in Feddes Repert 112: 481 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

[*Fusifilum hei* U.Müll.-Doblies et al. in Feddes Repert 112: 480 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

[*Fusifilum magicum* U.Müll.-Doblies et al. in Feddes Repert 112: 491 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

[*Fusifilum oliverorum* U.Müll.-Doblies et al. in Feddes Repert 112: 487 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

[*Fusifilum papillosum* U.Müll.-Doblies et al. in Feddes Repert 112: 487 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

[*Fusifilum spirale* U.Müll.-Doblies et al. in Feddes Repert 112: 483 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

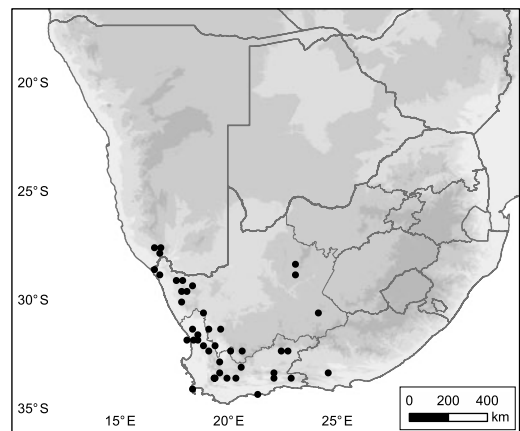
Plants deciduous, solitary or clumped. *Bulb* ovoid or subglobose, (20–)30–70(–100) mm diam., scales closely adherent, white or pink, drying papery and pale greyish brown or membranous and pinkish, sometimes accumulating as a short collar or neck. *Leaves* hysteranthous, (2)4 to 8, erect, mostly linear-lanceolate to lanceolate or oblanceolate, rarely linear or lorate, often twisted, 30–150(–200) ×

(2–)5–25(–37) mm, sometimes lightly folded and obscurely keeled below, inner leaves usually smaller and narrower than outer, acute or acuminate to subobtusate, bases sometimes cohering to form a short pseudostem, margins narrowly hyaline, sometimes crenulate, glabrous, dark green or glaucous, sometimes flushed red below, firm-textured. *Inflorescence* congested and subcapitate-racemose at flowering, but rachis elongating in fruit (up to 100 mm or more long) and ultimately cylindrical, 30–150(–250) mm tall, mostly 10- to 100-flowered, flowers mostly 0.5–1.0 mm apart at anthesis, but lower flowers up to 5(–10) mm apart in fruit; scape 0.8–2.0 mm diam., sparsely to densely scabridulous basally or throughout, or glabrescent (sometimes evidently glabrous), lower pedicels also rarely sparsely scabridulous; bracts ovate-cucullate to spatulate, 0.5–2.0 mm long, lower with spur to 1.5 mm long; pedicels spreading to suberect at anthesis, but often deflexed after flowering if not pollinated, (8–)15–20(–30) mm long, filiform and wiry, but thickening slightly in fruit. *Flowers* diurnal, rotate, unscented; tepals connate at base for 0.5–1.0 mm, spreading, minutely papillate-puberulous at base, lobes elliptic, 3–5 × 1.5–2.0 mm, apices penicillate, white with brown midrib. *Filaments* suberect to spreading, fusiform, (1.5–)2.0–3.0 mm long, papillate below bulge, white. *Anthers* medifixed, ovoid, 0.5–1.0 mm long, dehiscence longitudinal, yellow or brownish. *Ovary* ovoid-truncate, 1.5–2.5 mm long; style 1.3–2.0 mm long, white; stigma truncate-papillate. *Capsules* ovoid, 5–10 × 4–8 mm, 3-lobed. *Seeds* elliptic, circumferentially winged, 4–8 mm long, glossy black, testa minutely reticulate. *Flowering time*: late spring and summer, mainly November to March; flowers opening in the afternoon (16:30–17:30) and withering that evening (19:30). Figure 20.

Distribution and ecology: scattered through southwestern southern Africa, from southern Namibia through the western part of Northern Cape south to Worcester in Western Cape, with isolated populations on the southern Cape Peninsula and on the southern coast at Still Bay, and inland to Kimberley and the southern Free State (Map 41); on stony or gravelly flats, especially abundant on calcareous soils.

Diagnosis: A species of the semi-arid southwest, plants of *Drimia physodes* are often aggregated in clumps, and produce a congested, sometimes capitate raceme of flowers with pedicels (8–)15–20(–30) mm long, these often deflexed after flowering if not pollinated. The lower flowers are often some millimetres distant from one another, but the upper flowers are always closely aggregated, forming a characteristic pagoda-like raceme at the start of flowering. The rachis usually elongates during flowering and in floriferous individuals may reach 100 mm or more in length. The scape is scabridulous-puberulous below, although sometimes only sparsely and microscopically so. The leaves vary from linear to lorate, (2–)5–25(–37) mm wide, and are either flat or lightly concave above, with the bases sometimes cohering to form a short pseudostem.

As accepted here, *Drimia physodes* is a widespread and vegetatively variable species, the leaves varying greatly in number, shape and size. Many of these variants were treated as separate species by Müller-Doblies et al. (2001), but much more field work is required to resolve these patterns.



MAP 41.—Distribution of *D. physodes*



FIGURE 20.—*Drimia physodes*, Western Cape, Vermaaklikheid, without voucher. A, foliage; B, flowering plant; C, flower; D, two tepals; E, stamens; F, gynoecium. Scale bar: A, B, 10 mm; C–F, 2 mm. Artist: John Manning.

Drimia physodes may be difficult to separate from *D. depressa* where the ranges of the two species converge, but *D. depressa*, from the wetter eastern part of southern Africa, has a glabrous scape, a persistently congested raceme with the flowers remaining tightly clustered, and the lower flowers often with slightly longer bracts, 1–4 mm long with a longer spur up to 6 mm long. *Drimia montana* from the mountains around Queenstown in Eastern Cape is a generally smaller plant with shorter pedicels, (3.0–)5.0–6.5 mm long, and forms bulbils at the base of the parent bulb and at the tips of the roots.

Additional specimens seen

NAMIBIA. 2716 (Witputz): 5 km SE of Witputs [Witputz], (–DA/DB), 21 Aug. 1983 [fl. ex hort. 3 Apr. 1984], *N. van Berkel* 518 (NBG); Rosh Pinah, Namaskluft farm, (–DD), Nov. 2002 [fl. ex hort. Apr. 2003], *S. Carr* 49 (NBG); N of Rosh Pinah, (–DD), Mar. 2008 [leafing ex hort.; fl. ex hort. Dec. 2007], *G. Nicolosn s.n.* (NBG).

SOUTH AFRICA. NORTHERN CAPE. 2816 (Oranjemund): Grootderm, (–DA), Jun. 1986 [leafing ex hort.], *G. Williamson* 3371 (NBG); Swartwater, near the Orange River, (–DD), 19 Feb. 1953, *H. Hall* 617 (NBG). **2823 (Griekwa-stad):** Griquatown/Postmansburg, c. 50 miles [80 km] NW of Olifantshoek, (–AC), 9 Dec. 1960, *O. Leistner* 2071 (BOL); Hay Div., Griquatown, (–CC), Jan. 1921, *H. Steyn s.n.* (BOL). **2917 (Springbok):** ± 34 km N of Steinkopf towards Umduas, (–BA), 25 Oct. 1987, *G. Williamson* 3813 (NBG); Eenriet, 6 miles [9.6 km] N of Steinkopf, (–BB), 19 Oct. 1971, *H. Hall* 4180 (NBG); Bushmanland, seven miles from Jakkalswater, (–BB), 23 Feb. 1934, *H. Herre s.n.* (BOL); Concordia Valley, (–DB), Mar. 1923, *Cook s.n.* (BOL). **2918 (Gamoep):** Naipse-Berg, (–AD), 11 Nov. 1987, *E. van Jaarsveld* 9477 (NBG); 400 m E of Kweekfontein turnoff, (–CA), 21 Nov. 1981, *N. van Berkel* 466 (NBG). **3017 (Hondeklipbaai):** Grootvlei, (–BB), 15 Aug. 1979 [leafing; fl. ex hort. 18 Feb. 1980], *E. van Jaarsveld* 4276A (NBG). **3018 (Kamiesberg):** Langberg farm NW of Loeriesfontein, (–DB), 8 Jan. 1986 [leaves ex hort. 30 Apr. 1986], *D. Snijsman* 1005 (NBG). **3024 (De Aar):** near De Aar, (–CA), Nov. 1912, *G. Ridley s.n.* SAM4410 (SAM). **3119 (Calvinia):** Top of Vanrhyn's Pass, (–AC), 22 Feb. 1979, *D. Snijsman* 100 (NBG); Nieuwoudtville, Oorlogskloof Nature Reserve, (–AC), 20 Dec. 2000, *W. Pretorius* 679 (NBG); Bokkeveld Escarpment, Glenlyon farm, (–AC), 13 Mar. 2000, *P. Goldblatt & I. Nänni* 11307 (NBG); 15 km E of Calvinia, (–BC), 2 Mar. 1983 [leaves ex hort. 20 Aug. 1983], *D. Snijsman* 661 (NBG). **3220 (Sutherland):** Uitkyk farm, along upper reaches of Malansgatrivier, (–AD), 13 Dec. 1982, *D. Snijsman* 536 (NBG); Voëlfontein farm, (–BC), 10 May 1969 [leafing], *H. Hall* 221 (NBG).

WESTERN CAPE. 3118 (Vanrhynsdorp): Marble Mine, Moedverloor, Hol River, (–AD), 15 Feb. 1971, *H. Hall* 3478 (NBG); Hol River, Vredendal, (–CB), 31 Jan. 1969, *H. Hall* 3331 (NBG); Strandfontein, Vredendal, (–CC), 28 Jan. 1970, *H. Hall* 3493 (NBG); Sout River Bridge, (–DA), 18 Nov. 1969 [leafing ex hort. 3 May 1972], *H. Hall* 3476 (NBG); Heerenlogement, Torenberg, NE slopes, (–DC), 25 Jul. 1963 [leafing; fl. ex hort. 26 Feb. 1964], *W. Barker* 9884 (NBG); Heerenlogementberg, rocky plateau, (–DC), 9 Feb. 1978, *M. Thompson* 3658 (NBG). **3218 (Clanwilliam):** Clanwilliam, (–BB), Jan. [without year], *Zeyher* 4247 (SAM); 1897 [without month], *Leipoldt* 417 (SAM); Pakhuis Pass, (–BB), 3 May 1972 [leafing], *W. Wisura* 275 (NBG). **3219 (Wuppertal):** Diamond Drift, Bidouw River between Pakhuis and Wupperthal, (–AB), 20 Aug. 1939 [leafing], *C. Leipoldt* 3066 (BOL); Matjiesrivier, (–AC), 16 Apr. 1943, *W. Barker* 22 (NBG); Keerom, S of Citrusdal, (–CA), 4 Dec. 1950, *E. Esterhuysen* 17939a (BOL); Ceres, Blinkberg Pass, (–CB), 15 Sep. 1951, *G. Hoehn s.n.* (BOL); Swartruggens, Knolfontein, (–DC), 25 Jan. 2006, *I. Jardine & C. Jardine* 305 (NBG); 18 Dec. 2015, *I. Jardine* 2265 (NBG). **3222 (Beaufort West):** top of Nuweveld Mountains W of Radio Mast, (–AD), 29 Aug. 1984 [leafing], *M. Bayer* 4321 (NBG); Karoo National Park, Klipspringer Pass, (–AD), 6 Dec. 2005, *A. Mudau* 25 (PRE); Karoo National Park, (–BC), 3 Dec. 1985 [fl. ex hort.], *M. Bayer* 3938 (NBG). **3319 (Worcester):** near Karooport, (–BC), Aug. 1952 [fl. ex hort. Nov. 1952], *T. Stokoe s.n.* (SAM); Worcester, Karoo Garden Veld, (–CB), 22 Mar. 1977, *M. Bayer* 406 (NBG); Worcester, opposite Veld Reserve, (–CB), 26 Aug. 1982 [leafing; fl. ex hort. 1 Mar. 1983], *P. Perry* 1902 (NBG); Worcester West, Aitona farm, (–CB), 1991, *J. Forrester s.n.* (NBG); Hex River Valley, near De Doorns, (–CD), Jan. 1908 [fruiting; leafing ex hort. Apr.–Jul. 1908], *H. Bolus* 13033 (BOL); Rooihoogete Pass between Karoo and Matroosberg, (–DB), 11 Feb. 1985, *P. Perry* 3211 (NBG). **3320 (Montagu):** 5 km N of Matjiesfontein towards Whitehill Station, (–BA), 2 Jun. 1979 [leafing], *P. Perry* 962 (NBG); 5 km S of Bloutoring, (–CB), 9 May 1983 [leafing], *Malan s.n.* (NBG). **3322 (Oudtshoorn):** Swartberg Pass, (–AC), Dec. 1942, *T. Stokoe s.n.* (SAM); 18 km from Oudtshoorn on Lategansvlei road, (–CA), Mar. 1983 [fl. ex hort.], *P. Perry* 1522 (NBG); Uniondale, S foot of Kamanassie Mts, Laudina, (–DB), 8 Mar. 1951, *E. Esterhuysen* 18370 (BOL). **3418 (Simonstown):** Cape

Peninsula, Grootkop, (–AB), 27 Jun. 1942 [leafing], R. Compton 14001 (NBG). **3421 (Riversdale)**: Still Bay, head of kloof N of rifle range, (–AD), 17 Jan. 1979, P. Bohnen 5003 (NBG); western plateau of Pauline Bohnen Reserve, (–AD), 6 Jan. 2001, U. de Villiers & A. Pienaar 606 (NBG).

EASTERN CAPE. **3324 (Graaff-Reinet)**: Richmond Dist., Sneeuwberg, above Schanskraal, summer without year, (–BC), C. Watermeyer s.n. (BOL).

42. **Drimia virens** (Schltr.) J.C.Manning & Goldblatt in Goldblatt & Manning in Strelitzia 9: 712 (2000). *Urginea virens* Schltr. in J. Bot. 35: 433 (1897). Type: South Africa, Western Cape, 'Cold Bokkeveld, Tweefontein', 24 Jan. 1897, Schlechter 10127 (BOL, lecto.!, designated by Manning & Goldblatt in Bothalia 37: 184 (2007); E!, GRA!, BM, K!, L, P, PRE!, S!, Z, isolecto.).

Urginea minor A.V.Duthie in Ann. Stell. Univ. 6, A(2): 11 (1928). *Drimia minor* (Duthie) Jessop in J. S. Afr. Bot. 43: 306 (1977). *Physodia minor* (A.V.Duthie) U.Müll.-Doblies et al. in Feddes Repert. 107: 520 (1996).

Fusifilum minus [as 'minor'] (A.V.Duthie) Speta in Phytotaxa 38: 69 (1998). Type: South Africa, Western Cape, Cape Town (3318): 'Stellenbosch Flats', (–DD), Mar. 1924, Duthie s.n. STE1546 (NBG, holo.!).

[*Fusifilum emdeorum* J.Tang & Weiglin in Feddes Repert. 112: 505 (2001), name not validly published, type not deposited (ICN Art. 40.7)]

[*Urginea purcellii* Oberm. ms: Purcell s.n. (SAM)]

Plants deciduous, solitary. *Bulb* ovoid, 10–20 mm diam., scales adherent, white, drying pale greyish brown and papery. *Leaves* hysteranthous, (1)2 to 8(12), erect, subterete or shallowly canaliculate, sometimes weakly flexuous or arcuate, 20–80 × 0.5–1.0 mm, subacute, glabrous or rarely scabrid distally on margins and adaxial surface, becoming finely striate on drying, dark green, firm-textured, bases sometimes ± accumulating as a short papery collar. *Inflorescence* congested and subcapitate-racemose at flowering, but rachis elongating in fruit and ultimately shortly cylindrical, 30–150(–250) mm tall, (1)2- to 15-flowered, flowers mostly 0.5–1.0 mm apart at anthesis, but lower flowers up to 10 mm apart in fruit; scape 0.2–1.0 mm diam., thinly to more densely scabridulous in lower part or glabrous; bracts ovate-triangular, 0.5–2.0 mm long, lower with spur to 1.5 mm long; pedicels spreading to suberect, 4–15 mm long, filiform and wiry. *Flowers* rotate, diurnal, nodding and globular in bud; tepals connate at base for 0.5–1.0 mm, spreading, minutely papillate-puberulous at base, lobes elliptic, 3–5 × 1.5–2.0 mm, apices penicillate, white with dark midrib. *Filaments* suberect to spreading, fusiform or rarely more widely expanded medially, 2–3 mm long, papillate below bulge, white. *Anthers* medifixed, ovoid, 0.5–0.8 mm long, dehiscence longitudinal, yellow or brownish. *Ovary* ovoid-truncate, 1.5–2.5 mm long; style 1.3–2.0 mm long, white; stigma truncate-papillate. *Capsules* ovoid, 4–7 × 4–6 mm. *Seeds* elliptic, circumferentially winged, 3.0–5.5 mm long, glossy black, testa minutely reticulate. *Flowering time*: November to March; flowers opening in the afternoon (17:00–18:00) and withering at 20:00.

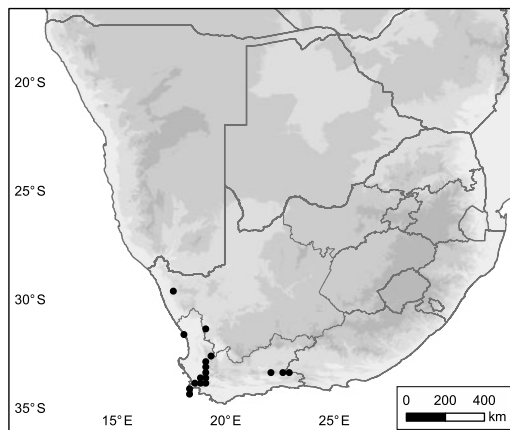
Distribution and ecology: as currently circumscribed *Drimia virens* occurs widely through the western and southwestern mountains of South Africa, from near Springbok in Northern Cape to the Cape Peninsula, and along the southern foothills of the Swartberg in Western Cape (Map 42); on shallow gravelly or sandy soils, often on rock sheets, from near sea level to 1 800 m.

Diagnosis: distinguished in the section by the slender, semiterete leaves 0.5–1.0 mm diam. and usually shallowly channelled above, and the subcapitate-racemose inflorescence; the taxon is still poorly understood and more field work is required.

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. **2917 (Springbok)**: Nababeep, Skaap River, (–DA), among quartz and gravel, 16 Nov. 2001, Bruyns 8914A (NBG). **3119 (Calvinia)**: Nieuwoudtville, Glen Lyon, (–AC), karroid flats, 3 Mar. 1983, P. Perry 2005 (NBG).

WESTERN CAPE. **3118 (Vanrhynsdorp)**: Vredendal, Strandfontein, (–CC), shallow pockets on coastal cliffs, 5 Apr. 1980 [fl. ex hort. Oct.–Nov. 1980], *H. Hall* 4926 (NBG); 5 Oct. 1985, *H. Hall* 5288 (NBG). **3219 (Wuppertal)**: Clanwilliam, Welbedacht, (–CB), 14 Apr. 1952 [fruiting], *E. Esterhuysen* 20068 (BOL); Clanwilliam, Kromme River, (–CB), 1 Apr. 1956 [fruiting], *E. Esterhuysen* 25491 (BOL); turnoff to Rosendal farm on Grootrivier road, S of Blinkberg Pass, (–CB), 15 May 1987 [fl. ex hort. 1 Feb. 1988], *P. Perry* 3575 (NBG); rocky ledges below summit of Olifants River Dome, (–CC), Jan. 1950/51, *E. Esterhuysen* 15271 (BOL). **3318 (Cape Town)**: Wellington, Seven Sisters Mt., (–DB), 14 Jan. 1951 [fruiting 17 Jan. 1952], *E. Esterhuysen* 18320 (BOL); Ndabeni, (–DC), 4 Nov. 1941, *T. Salter* 8699 (BOL); 5 Dec. 1941, *R. Adamson* (SAM); 29 Jan. 1941, *T. Salter* 8599 (NBG); Stellenbosch, Banhoek (–DD), 13 Jan. 1952 [fruiting], *E. Esterhuysen* 19915 (BOL). **3319 (Worcester)**: Tulbagh, Sneeu gat, (–AA), Jan.–Feb. 1950, *E. Esterhuysen* 16886 (BOL); Tulbagh, Great Winterhoek, (–AA), 14 Feb. 1934, *R. Compton* 4660 (BOL); Tulbagh, Little Winterhoek, (–AA), 21 Feb. 1947, *E. Esterhuysen* 31816 (BOL); open kloof at head of Tulbagh Valley, (–AC), 15 Mar. 1951, *E. Esterhuysen* 16890 (BOL); Hex River Mts, slopes below Shale Peaks, (–AC), 3 Jan. 1955, *E. Esterhuysen* 24048 (BOL); Dutoits's Kloof, near Khama Caves, (–CA), 29 Jan. 1970 [fl. ex hort. 7 Mar. 1971], *P. Bruyns* s.n. (NBG); Haalhoek Sneeu kop, (–CA), 26 Dec. 1943, *E. Esterhuysen* 9678 (BOL); Tierkloof, below Wemmershoek Tafelberg, (–CC), 5 Nov. 1950, *E. Esterhuysen* 17699a (BOL). **3321 (Ladismith)**: Seweweekspoort not far from turnoff, (–AD), 24 Oct. 1980, *Mauve, Reid & Wikner* 120 (NBG, PRE). **3322 (Oudtshoorn)**: Swartberg, summit ridge south of Witberg, (–AC), 4 Jan. 1975, *M. Thompson* 2230 (NBG); Swartberg Pass, N side of Platberg, (–AC), rock hollow, 3 Jan. 1975, *E. Oliver* 5572 (NBG); Swartberg, Blesberg, foothill ridge W of Rooielskloof, (–BC), sandy open area between rocks, moist, 1 820 m, 7 Jan. 2001, *E. & I. Oliver* 11802 (NBG); Swartberg above Kliphuisvlei, (–BD), rock crevices, 1 800 m, 1 Jan. 1975, *E. Oliver* 5523 (NBG). **3418 (Simonstown)**: Bergvliet farm, (–AB), 9 Apr. 1917 [fruiting], *W. Purcell* s.n. (SAM); camp under fir on Ladies Mile, (–AB), 11, 15 and 20 Mar. 1919, *W. Purcell* s.n. (SAM); De Klip, (–AD), 2 Feb. 1940, *R. Adamson* 2798 (SAM); 29 Feb. 1940, *T. Salter* 8313 (BOL, NBG, SAM); 6 Mar. 1940, *R. Adamson* 2799 (PRE); Schuster's Kraal, (–BA), 9 Mar. 1941, *W. Barker* s.n. (NBG).



MAP 42.—Distribution of *D. vires*

Sect. 10. **Sclerophyllae** *J.C.Manning & Goldblatt*, sect. nov. Type: *Drimia sclerophylla* *J.C.Manning & Goldblatt*

Plants small. *Bulb* hypogeal or partially epigeal, scales adherent, flesh white. *Leaves* several, erect or prostrate, blade terete or plane to cucullate, glabrous or margins thickened and papillate or scabrid-ciliate, firm-textured, hysteroanthous. *Inflorescence* a raceme; scape puberulous-scabridulous; bracts ovate-triangular, lower short-spurred; bracteoles lacking; pedicels wiry, longer than tepals at flowering. *Flowers* diurnal in afternoon only, rotate, buds nodding and globular, perianth deciduous and tepals cohering above to form a cap on developing capsule; tepals $\pm$ connate at base, oblong-ovate, white with darker midrib, membranous. *Stamens*: filaments weakly spreading, $\pm$ as long as anthers, subulate; anthers medifixed, oblong, dehiscence longitudinal. *Ovary* conical; style $\pm$ as long as ovary; stigma truncate, trilete, smooth. *Capsule* ovoid. *Seeds* angled.

Key to species

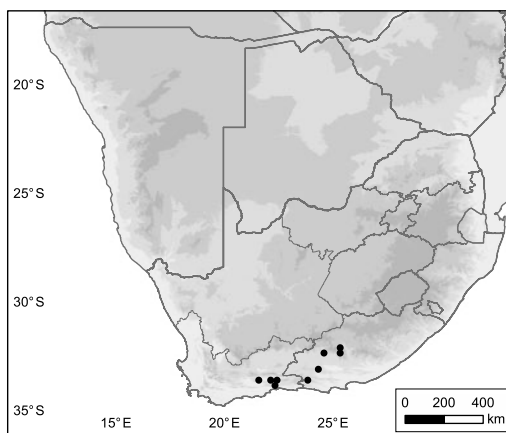
- 1a. Leaves stiffly erect, terete, 100–200 × 1–2 mm; inflorescence 120–300 mm tall and 20- to 60-flowered 43. *D. sclerophylla*
- 1b. Leaves spreading or suberect and rosulate, elliptic to obovate, mostly 15–30 × 7–20 mm; inflorescence 100–200(–350) mm tall and 10- to 40-flowered:
 - 2a. Leaf blades plane, margins shortly bristly-ciliate or papillate; flowers spreading or slightly nodding at anthesis. 44. *D. ciliata*
 - 2b. Leaf blades concave and cucullate, margins hyaline and erose; flowers erect at anthesis . . . 45. *D. cochlearis*

43. ***Drimia sclerophylla*** J.C.Manning & Goldblatt in Goldblatt & Manning in *Strelitzia* 9: 712 (2000), as nom. nov. pro *Urginea rigidifolia* Baker in *J. Bot.* 16: 323 (1878) [non *Drimia rigidifolia* Baker (1871) = *D. media* Jacq.]. Type: South Africa, Eastern Cape, Graaff-Reinet (3224): 'Karoo, near Graaff-Reinet', (–BC), 1873, *Bolus* 783 (K [000257339], holo. —image!).

Plants deciduous, solitary or gregarious. *Bulb* ovoid, ± 20–30 mm diam., scales adherent, white, becoming membranous. *Leaves* hysteranthous, (2)3(5), erect, terete, 100–200 × 1–2 mm, ± acute, glabrous and finely striate becoming grooved on drying and sometimes twisted, dull green, stiff and wiry, bases ± accumulating as a papery, lightly barred neck. *Inflorescence* a moderately dense raceme 120–300 mm tall, 20- to 60-flowered, flowers mostly 2–5 mm apart; scape (0.5–)1.0–2.0 mm diam., thinly to more densely puberulous-scabridulous in lower part, sometimes glabrescent; bracts ovate-triangular, 1.0–2.5 mm long, spur to 1.5 mm long; pedicels spreading, (6–)10–15 mm long at anthesis, filiform and wiry. *Flowers* rotate, slightly nodding, diurnal, sweetly scented, nodding and globular in bud; tepals connate at base for up to 1 mm, inner spreading-incurved and outer reflexed, lobes elliptic to ovate, 4–6 × 2–3 mm, inner sometimes wider than outer, apices penicillate or ciliate, white with dark midrib. *Filaments* suberect or spreading, 1.5–2.0 mm long, subulate, white. *Anthers* medifixed, oblong, 2 mm long, dehiscence longitudinal, yellow. *Ovary* ovoid, 1.5–2.0 mm long, pale green; style 1.5–2.0 mm long, white; stigma trilete, smooth. *Capsules* ovoid, 5–8 × 4–6 mm. *Seeds* angular, wrinkled, 2.0–2.5 mm long, glossy black, testa reticulate. *Flowering time*: December to January; flowers opening at 16:00 and withering at 20:00.

Distribution and ecology: restricted to the drier southeastern interior of South Africa, from Ladismith in Western Cape through the Little Karoo and the Langkoof into the Great Karoo as far east as Graaff-Reinet and Cradock in Eastern Cape (Map 43); on stony shale and dolerite slopes.

Diagnosis: distinguished from *Drimia ciliata* and *D. cochlearis* in flower by its mostly longer, more floriferous raceme with slightly longer anthers 2 mm long, and by its stiffly erect, wiry leaves, 1–2 mm diam. and terete in section, striate when fresh, but becoming finely grooved when dry. *Drimia sclerophylla* and *D. cochlearis* are sympatric and flower contemporaneously at Zebra near Oudtshoorn.



MAP 43.—Distribution of *D. sclerophylla*

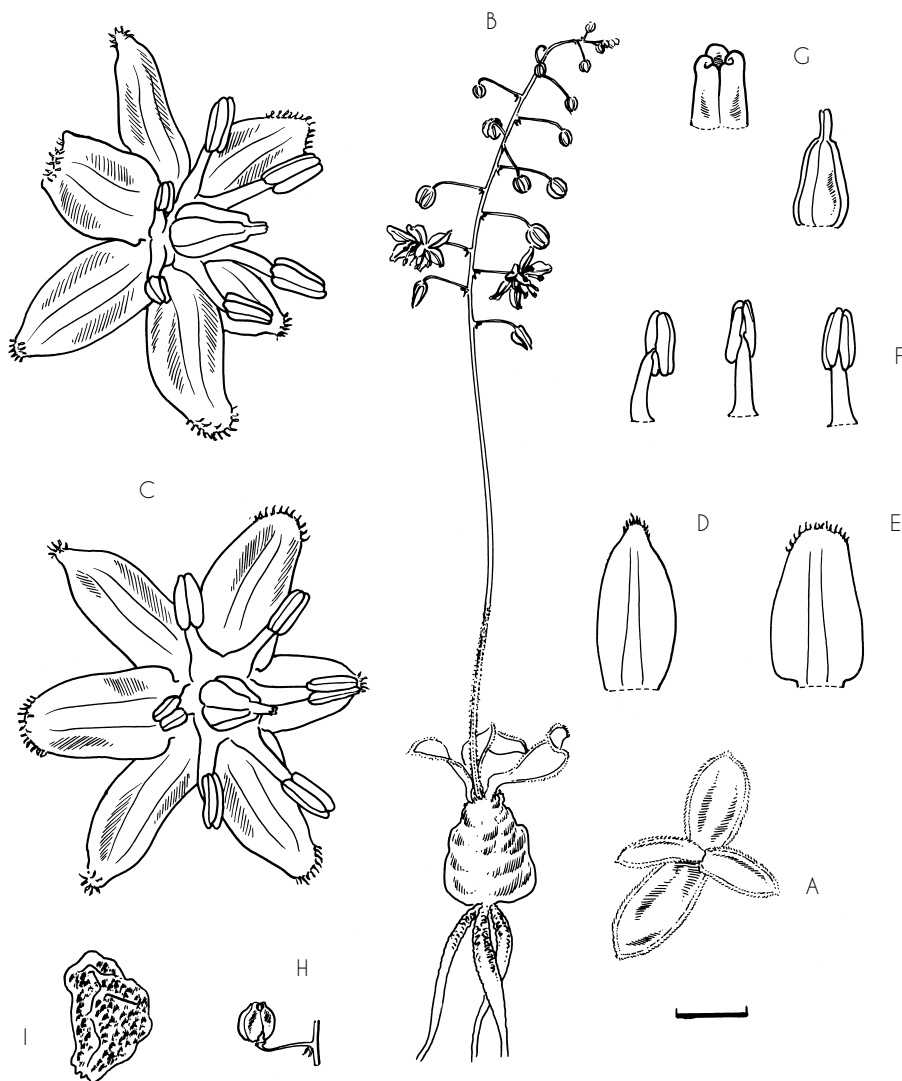


FIGURE 21.—*Drimia ciliata*, Western Cape, Bredasdorp, Goldblatt & Manning 10860 (NBG). A, leaf rosette; B, flowering plant; C, flowers; D, outer tepal; E, inner tepal; F, stamens; G, gynoecium with style not fully elongated, and detail of stigma; H, capsule; I, seed. Scale bar: A, B, H, 10 mm; C–G, I, 2 mm; G (detail), 1 mm. Artist: John Manning.

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. **3321 (Ladismith)**: Radleigh, (–DA), 9 Aug. 1949 [leafing], *Barker s.n.* (NBG); Huis River Pass, (–DA), 7 Dec. 1981 [leafing ex hort. 13 Jul. 1982], *Perry 1600* (NBG). **3322 (Oudtshoorn)**: hills W of Oudtshoorn, (–CA), 3 Dec. 1951, *E. Esterhuysen 19496a* (BOL); Zebra, (–CB), 3 Dec. 1951 [fl. ex hort.], *E. Esterhuysen 19496a* (BOL); Moeras River, (–CC), 6 Dec. 1951, *Barker 7732* (NBG); Perdepoort along George–Kammanassie Road, (–CD), 7 Dec. 1981 [flowering ex hort.; leaves ex hort. 13 Jul. 1982], *Perry 1506* (NBG, PRE). EASTERN CAPE. **3224 (Graaff-Reinet)**: Naudesberg Pass, (–BC), 10 Dec. 1979, *Bruyns 1765* (NBG). **3225 (Somerset East)**: Welbedacht, WNW of Cradock, (–AB), 18 Dec. 1980 [flowering ex hort.], *Bruyns 1582A* (NBG); Mountain Zebra National Park, foot of Rondekop, (–AB), 12 Dec. 2005, *A. Mudau s.n.* (PRE); Mountain Zebra National Park, next to Doringhoek Dam, (–AD), 12 Dec. 2005, *A. Mudau 121* (PRE). **3323 (Willowmore)**: Baviaanskloof Mega Reserve, (–DB), 19 Aug. 2009 [leafing], *Deacon 297* (NBG); NE of Wagenbooms River at Joubertina, (–DD), Jan. 1928, *Fourcade 3569* (NBG). **3324 (Steytlerville)**: Teasdale, (–AB), Oct. 1985, *Hoffman 1088* (NBG).

44. ***Drimia ciliata* (L.f.) J.C.Manning & Goldblatt** in *Bothalia* 33: 111 (2003). *Ornithogalum ciliatum* L.f., Suppl. Pl.: 199 (1782). *Urginea ciliata* (L.f.) Baker in *J. Linn. Soc., Bot.* 13: 218 (1873). Type: South Africa, ‘Caput bonae Spei’, *Thunberg s.n.* (UPS-THUNB [8281], holo.-microfiche!).

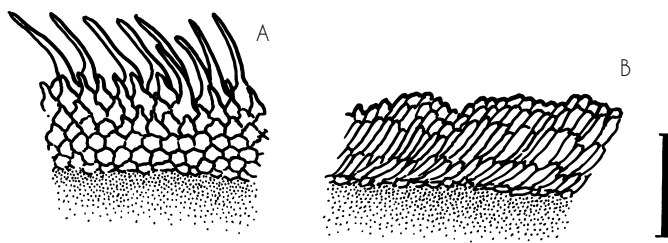
Urginea muirii N.E.Br. in *Gard. Chron.*, sér. 3, 93: 334 (1933), syn. nov. Type: South Africa, near Riversdale, 1933, *Muir 4846* (K, holo. —image!).

[*Urginea crudenii* Schönl. ms: *Cruden 355* (GRA, PRE)]

[*Urginea rosulata* Oberm. ms: *NBG158/57* (NBG)]

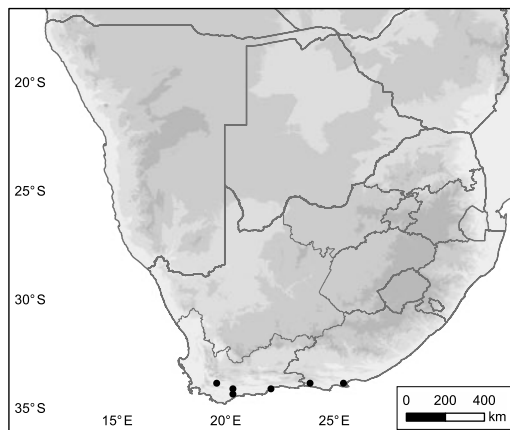
Plants deciduous, solitary or gregarious. *Bulb* subglobose, ± 20 –25 mm diam., scales adherent, white, becoming membranous. *Leaves* hysteranthous, (4)6 to 8, rosulate, prostrate, elliptic to obovate, progressively smaller, mostly 15 – 30×7 – 20 mm, acute, glabrous, margins thickened and hyaline, papillate with peripheral papillae elongated and usually $\pm$ recurved scabrid-ciliate, dark glossy green, firm-leathery. *Inflorescence* a moderately lax or sometimes contracted raceme 100–200(–350) mm tall, 10- to 20-flowered, flowers mostly 5–10 mm apart; scape straight or rarely somewhat sprawling, 0.5–1.5 mm diam., densely puberulous-scabridulous in lower part; bracts ovate-triangular, 1.0–1.5 mm long, spur to 0.5 mm long; pedicels spreading, (5–)10–20(–25) mm long at anthesis, filiform and wiry. *Flowers* diurnal, spreading to slightly nodding, rotate, faintly and sweetly honeysuckle-scented, nodding and globose in bud; tepals connate at base for up to 0.5 mm, spreading-incurved or outer reflexed, elliptic to ovate, 5 – 6×2 – 3 mm, inner sometimes wider than outer, apices penicillate or ciliate, white with dark midrib. *Filaments* suberect to weakly spreading, subulate, 2–3 mm long, sometimes almost connate at base, white. *Anthers* medifixed, oblong, 1 mm long, dehiscence longitudinal, yellow. *Ovary* ovoid, ± 2 mm long, pale green; style 2 mm long, white; stigma trilete, smooth. *Capsules* ovoid, 3 – 7×3 – 5 mm. *Seeds* angular, wrinkled, 2.0–2.5 mm long, glossy black, testa reticulate. *Flowering time*: January to February; flowers opening at 16:00 and withering at 20:00. Figure 21, 22A.

FIGURE 22.—Detail of leaf margins. A, *Drimia ciliata*, Western Cape, Mossel Bay, *Helme s.n.* (NBG), with papillate-ciliate margin; B, *D. cochlearis*, Western Cape, Anysberg, *Oliver 9750* (NBG), with palisade-like margin. Scale bar: 0.5 mm. Artist: John Manning.



Distribution and ecology: largely restricted to the southern coastal plain, from Bredasdorp and Eilandia in the Breede River Valley in Western Cape to Port Elizabeth, and also recorded near Joubertina in the Langkloof in Eastern Cape (Map 44); on limestone, sandstone and quartzite outcrops in shallow soils between rocks.

Diagnosis: distinguished from allied species with similar inflorescence and flowers by the rosulate, prostrate foliage, the leaf blades elliptic to obovate and plane with thickened, $\pm$ recurved scabrid-ciliate margins, and the slightly nodding flowers. The leaf margins comprise several series of hyaline papillae, with the outer series $\pm$ elongated into short, bristle-like cilia or rarely merely longer papillae. The erroneous description of these cilia as black by Baker (1873) was corrected by Dold & Momberg (2000).



MAP 44.—Distribution of *D. ciliata*

Drimia cochlearis, from slightly more inland in the Little Karoo and the Langkloof to Baviaanskloof, has similar short leaves but the blades are $\pm$ concave with the marginal papillae radially flattened and palisade-like, forming an erose, undulating edge (Figure 22B), and the flowers are erect at anthesis.

Additional specimens seen

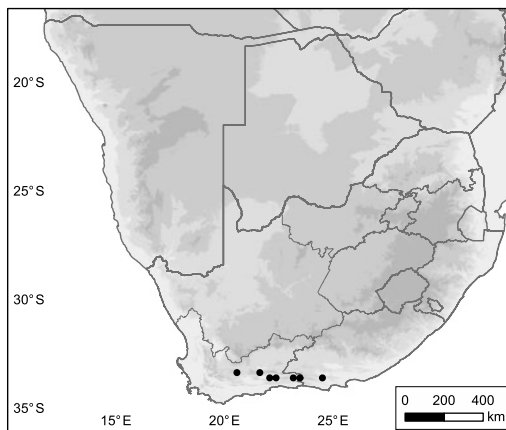
SOUTH AFRICA. WESTERN CAPE. 3319 (Worcester): $\pm$ 1 km along Eilandia Road, (–DC), 12 Jan. 1981 [fl. ex hort.], Perry 1202 (NBG). **3420 (Bredasdorp):** 6 km SW of Swellendam, (–AB), 9 May 1978 [leafing], Perry 720 (NBG); De Hoop Provincial Farm, (–AD), 31 Dec. 1957 [leafing 17 Jun. 1958], without collector NBG158/57 (NBG); De Hoop Nature Reserve, near camp, (–AD), Oct. 1980 [fl. ex hort. 5 Dec. 1981], Mauve, Reid & Wikner 39 (PRE); Driefontein farm near De Hoop, (–AD), 6 Feb. 1998, Goldblatt & Manning 10860 (NBG). **3422 (Mossel Bay):** 10 km W of Mossel Bay, (–AA), 7 Feb. 2000, Helme s.n. (NBG). **EASTERN CAPE. 3323 (Willowmore):** rocky hill N of Joubertina, (–DD), Jan. 1924, H. Fourcade 2930 (BOL); rocky hill NE of Wagenbooms River at Joubertina, (–DD), Jan. 1928 [fl. ex hort.], H. Fourcade 3569 (BOL). **3325 (Port Elizabeth):** Baakens River Valley, (–CD), Jan. 1922, F. Cruden 355 (GRA, PRE); Port Elizabeth, (–CD), 29 Sep. 1964 [flowering ex hort. 8 Jan. 1969], Batten s.n. (NBG); The Valleys, road towards Greenbushes, (–CD), 2 Jul. 1969 [flowering ex hort. 16 Feb. 1972], Wisura 168 (NBG).

45. ***Drimia cochlearis* Mart.-Azorín et al.** in Martínez-Azorín & Crespo in *Taxon* 63: 1329 (2014) [Mart.-Azorín et al. in *Syst. Bot.* 38: 334 (2013), nom. inval.]. Type: South Africa, Western Cape, Ladismith (3321): ‘11 km SW of Calitzdorp, Gamkaberg Nature Reserve, 408 m’, (–BC), 29 Sep. 2011, Mart.-Azorín et al. 941 (GRA [bulb with leaves], holo. —image!).

[*Urginea patens* Oberm. ms (BOL, PRE)]

Plants deciduous, usually gregarious. *Bulb* subglobose, $\pm$ 20–25 mm diam., scales adherent, white, becoming membranous. *Leaves* $\pm$ hysteroanthous, 4 to 9, rosulate, spreading or suberect, oblong to obovate, concave with cucullate apex, progressively smaller, mostly 19–40 $\times$ 7–10 mm, acute, glabrous, margins hyaline and erose, papillate, the papillae radially elongated and flattened on underside, dark glossy green, firm-leathery. *Inflorescence* a moderately lax raceme 100–250 mm tall, 10- to 40-flowered,

flowers mostly 5–10 mm apart; scape 0.5–1.5 mm diam., densely puberulous-scabridulous in lower part; bracts ovate-triangular, ± 1 mm long, spur to 0.5 mm long; pedicels spreading, 10–20 mm long, filiform and wiry. *Flowers* diurnal, erect, rotate, faintly and sweetly scented, nodding and globose in bud; tepals connate at base for up to 0.5 mm, inner spreading-incurved and outer reflexed, lobes elliptic to ovate, $4\text{--}6 \times 1.5\text{--}2.5$ mm, inner sometimes wider than outer, apices penicillate or ciliate, white with dark midrib. *Filaments* weakly spreading, 2.0–2.5 mm long, subulate, white. *Anthers* medifixed, oblong, 1 mm long, dehiscence longitudinal, yellow. *Ovary* ovoid, white striped green, ± 1.5 mm long; style 2 mm long, white; stigma trilete, smooth. *Capsules* ovoid, $\pm 5 \times 4$ mm. *Seeds* angular, wrinkled, 2–3 mm long, glossy black or dark brown, testa reticulate. *Flowering time*: late September to early January; flowers opening at 16:00 and withering at 20:00. Figure 22B.



MAP 45.—Distribution of *D. cochlearis*

Distribution and ecology: endemic to the Little Karoo and Langkloof, from the Anysberg in Western Cape to the Baviaanskloof Mtns in Eastern Cape (Map 45); on dry stony slopes in shallow soils on sandstone, from 250–720 m.

Diagnosis: distinguished from allied species with similar inflorescence and flowers by the rosulate, foliage, the leaf blades oblong to obovate and rather concave with a cucullate apex and hyaline, erose margins, and the flowers erect at anthesis. The leaf margins comprise several series of papillae, these elongated and flattened on the undersurface of the blade. *Drimia ciliata*, mainly from the coastal plain to the south, has similar short leaves but the blades are flat with the outermost series of marginal papillae elongated into short, bristle-like cilia, and the flowers are spreading or slightly nodding at anthesis. *Drimia cochlearis* and linear-leaved *D. sclerophylla* are sympatric and flower contemporaneously at Zebra near Oudtshoorn.

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. 3320 (Montagu): valley on N side of Anysberg E of Vrede, (–BC), 720 m, 23 Sep. 1990 [flowering ex hort. Dec. 1990], *Oliver 9750* (NBG). **3322 (Oudtshoorn)**: Wynandsrivier, (–CA), 15 Mar. 1993, [fl. ex hort.], *E. van Jaarsveld 10855* (PRE); 18 km S of Oudtshoorn, (–CB), 3 Dec. 1985, *Vlok 869* (NBG); Zebra, (–CB), 3 Dec. 1951 [fl. ex hort.], *E. Esterhuysen 19496* (BOL). **EASTERN CAPE. 3323 (Willowmore)**: sandstone ridge above Uniondale Poort, (–CA), Sep. 1951 *E. Esterhuysen 16779* (BOL, PRE); Uniondale Pass, (–CA), Oct. 1980, *Mauve, Reid & Wikner 153* (PRE); a few km off Uniondale-Avontuur road towards De Hoop Farm, (–CB), 30 Sep. 1980, *Perry 1448* (NBG); Uniondale, De Hoop Farm, (–CB), 13 Dec. 1981 [leafing ex hort. 7 Jul. 1982], *Snijman 372* (NBG). **3324 (Steytlerville)**: Baviaanskloof Mtns, Enkeldoorn, (–CB), 28 Sep. 1980 [leafing ex hort. 13 Jul. 1983], *Perry 1431* (NBG); along track from Enkeldoorn to Wilgerivier on N side of Baviaanskloof Mtns, (–CB), 13 Dec. 1981 [flowering ex hort.], *Snijman 375* (NBG); Appieskloof, N of Baviaanskloof River, (–CB), 258 m, 20 Dec. 2011, *Euston-Brown 1704* (NBG).

Sect. 11. **Juncifoliae** J.C.Manning & Goldblatt, sect. nov. Type: *Drimia juncifolia* J.C.Manning & J.M.J.Deacon

Plants small. *Bulb* subterranean, scales imbricate, flesh white or pale pink. *Cataphylls* involute, surrounding foliage as papery or membranous sheath with overlapping margins, lightly or more heavily transversely barred. *Leaves* either solitary and filiform-terete or many and linear-hemiterete with scabridulous margins, leathery, $\pm$ hysternanthous. *Inflorescence* a raceme; scape glabrous; bracts ovate, lowermost conspicuously auriculate, short-spurred; bracteoles lacking; pedicels shorter than tepals at flowering. *Flowers* diurnal, rotate, perianth deciduous and tepals cohering above to form a cap on developing capsule; tepals almost free, elliptic, white with dark midrib. *Stamens*: filaments suberect to weakly spreading, $\pm$ 1.5 times as long as anthers, filiform-tapering; anthers medifixed, oblong, dehiscence longitudinal. *Ovary* ovoid to ellipsoid; style weakly declinate, $\pm$ as long as or longer than ovary; stigma globose-papillate. *Capsule* ovoid. *Seeds* elliptic or ovate, peripherally winged, testa smooth (obscurely scalariform-colliculate).

Key to species

- 1a. Leaves many (9 to 13), hemiterete with scabridulous margins; raceme densely 10- to 20-flowered; tepals pale yellow with dark keel, $\pm$ 5 mm long46. *D. juncifolia*
- 1b. Leaf solitary, filiform-terete; raceme moderately laxly 2- to 8-flowered; tepals pure white with dark keel, 8–9 mm long.47. *D. decipiens*

46. ***Drimia juncifolia*** J.C.Manning & J.M.J.Deacon, sp. nov. Type: South Africa, Western Cape, Cape Town (3318): 'Paarl, Brier's Louw Nature Reserve', (–DD), 23 Nov. 2013, J. Deacon 3078 (NBG, hol.).

Plants deciduous, solitary. *Bulb* depressed-globose, 30–40 mm diam., scales adherent, imbricate with hard, dry base of blades persisting. *Cataphylls* 2, membranous with overlapping margins, pale with thickened horizontal bars. *Leaves* hysternanthous, dry remains still present at flowering, 9 to 13, suberect, straight or arcuate, but slightly helically twisted when dry, stiff and leathery, linear, hemiterete, 60–100 $\times$ 1.0–1.5 mm, acute, margins scabridulous, dark green, entire blade or only basal portion persisting and sclerotic. *Inflorescence* a moderately dense, cylindrical raceme 200–300 mm long with rachis 20–40 mm long, densely 10- to 20-flowered, flowers mostly 2–5 mm apart, but lowest sometimes more distant; scape sometimes weakly flexuous, $\pm$ 1 mm diam., glabrous; bracts transversely ovate, auriculate, apiculate, lower 2.0–2.5 mm long with spur 3–4 mm long; pedicels suberect, 3–5 mm long. *Flowers* diurnal, spreading, rotate, strongly rose-scented; tepals connate at base up to 0.5 mm, spreading or slightly reflexed, slightly cucullate, outer ovate, $\pm$ 5 $\times$ 2 mm, inner ovate-oblong, $\pm$ 5 $\times$ 3 mm, pale lemon yellow with green or brownish keels. *Filaments* suberect, subterete and tapering, $\pm$ 3 mm long. *Anthers* medifixed, oblong, 1.5–2.0 mm long, dehiscing longitudinally, yellow with yellow pollen. *Ovary* ellipsoid-truncate, $\pm$ 2 mm long, greenish yellow; style slightly deflexed, $\pm$ 2 mm long, columnar, white; stigma globose-papillate. *Capsules* ovoid-ellipsoid, 6–9 $\times$ 3–6 mm. *Seeds* compressed, elliptical and peripherally winged or irregularly folded, 2–3 mm diam., glossy black, testa almost smooth (obscurely scalariform-colliculate). *Flowering time*: October and November; flowers opening in the morning and fading in the afternoon. Figure 23.

Distribution and ecology: known only from the type population near Paarl in Western Cape (Map 46); on an ironstone outcrop in loamy pockets in renosterveld.

Diagnosis: recognised by the rather compact raceme of rotate, fragrant flowers with a weakly deflexed style, and the distinctive foliage. Leafing plants have distinctive, horizontally barred, membranous

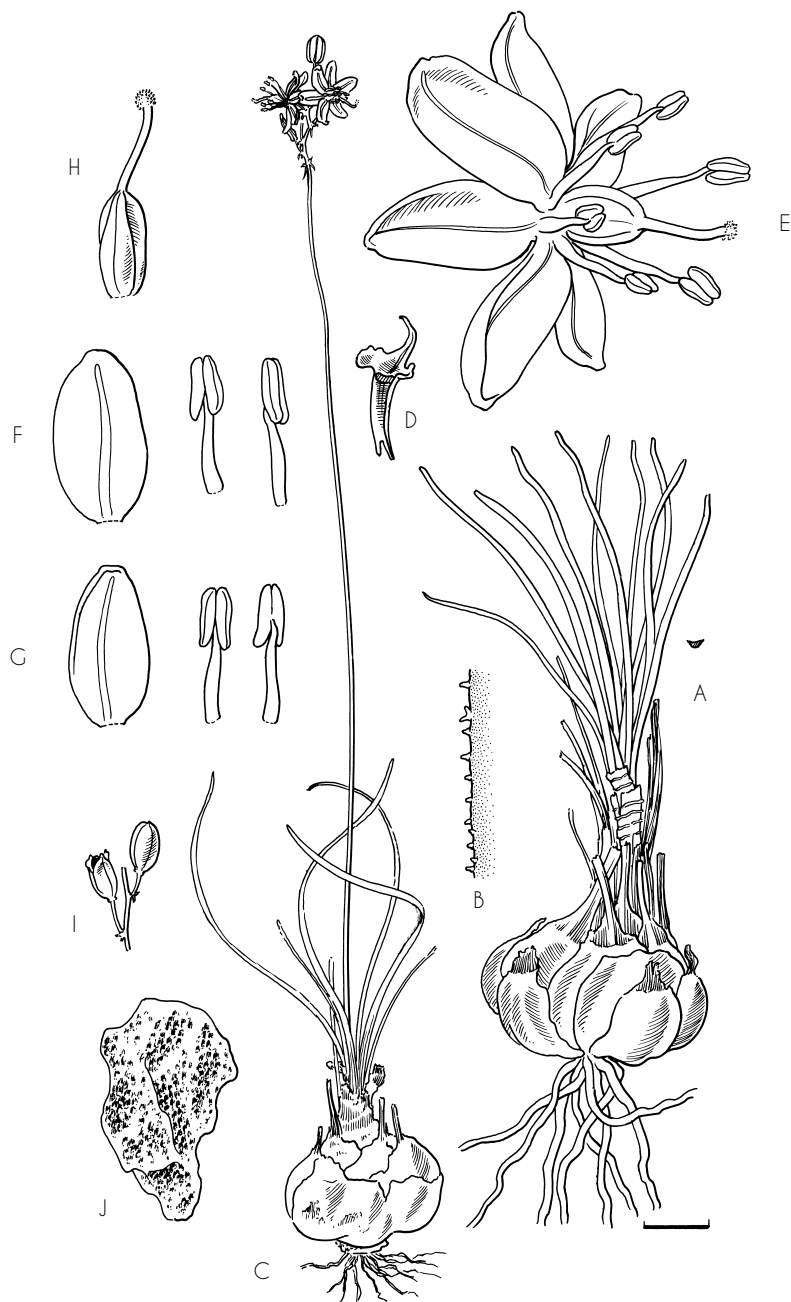
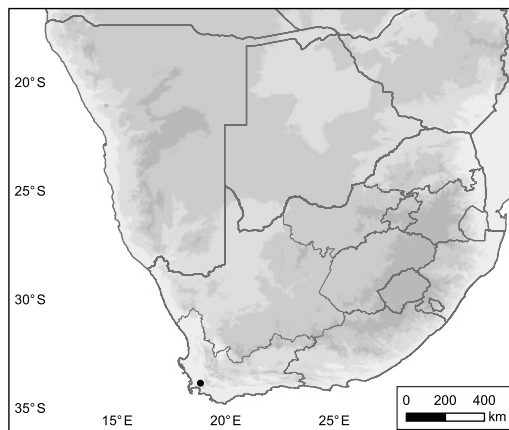


FIGURE 23.—*Drimia juncifolia*, Western Cape, Paarl, Deacon 3078 (NBG). A, leafing bulb with persistent remains of old leaves attached, plus leaf cross-section; B, leaf margin detail; C, flowering plant with dry foliage; D, bract; E, flower; F, outer tepal and stamens; G, inner tepal and stamens; H, gynoecium; I, capsules; J, seed. Scale bar: A, C, I, 10 mm; D–H, 2 mm; J, 1 mm. Artist: John Manning.

cataphylls surrounding the base of the tuft of very stiff, linear-hemiterete leaves with scabridulous margins, the dry, wiry leaves persisting partially or entirely into the flowering period.

The relationships of *Drimia juncifolia* are not clear. The barred cataphylls and slightly deflexed style with globose-papillate stigma are characteristic of sect. *Sypharissa*, but the stamens are unspecialised, with medifixed anthers, unlike the longer, basifixed anthers of sect. *Sypharissa*, and the style is only as long as the ovary. The species is anomalous in sect. *Ledebouriopsis* in its rotate flowers and flattened seeds, and we therefore place it in a separate, monospecific section pending further information.



MAP 46.—Distribution of *D. juncifolia*

Additional specimen seen

SOUTH AFRICA. WESTERN CAPE. **3318 (Cape Town)**: Paarl, Brier's Louw Nature Reserve, (–DD), 16 Aug. 2014 [leafing], J. Manning 3452 (NBG).

47. ***Drimia decipiens*** J.C.Manning & Goldblatt, sp. nov. Type: South Africa, Western Cape, Wuppertal (3219): Swarttruggens, near turnoff to Kaggas Kamma at summit of Skitterykloof, (–DC), 27 Nov. 2017, J.Manning 3637 (NBG, holo.).

Plants deciduous, solitary. *Bulb* suglobose, 15–20 mm diam., scales adherent, $\pm$ imbricate, white, drying membranous and pale brown. *Cataphyll* solitary, involute, translucent-membranous, lightly barred. *Leaf* usually hysteranthous, rarely synanthous, solitary, erect, terete-filiform, 100–150 $\times$ 1.0–1.5 mm, glabrous. *Inflorescence* a moderately lax raceme 100–300 mm long with rachis 20–50 mm long, (2)4- to 8-flowered, flowers 3–6 mm apart; scape erect or weakly flexuous, reddish green, $\pm$ 1 mm diam., glabrous; bracts ovate-cucullate, auriculate, 1.0–2.5 mm long, lowermost with spur to 3.5 mm long; pedicels spreading, 4–7 mm long. *Flowers* diurnal, spreading, rotate, unscented; tepals connate at base up to 0.5 mm, spreading, outer elliptic, 8–9 $\times$ 3–4 mm, inner ovate, 8–9 $\times$ 4–5 mm, white with dark keel. *Filaments* suberect around ovary, subulate-filiform and tapering, 4–5 mm long, white. *Anthers* sub-basifixed, oblong, $\pm$ 2 mm long, dehiscence longitudinal, yellow. *Ovary* ovoid, 2.5–3.0 mm long, pale green; style weakly deflexed. 4–5 mm long, white; stigma globose-papillate. *Capsules* ovoid, 7–9 $\times$ 3–4 mm, flushed purple along sutures when fresh. *Seeds* angular, wrinkled, 1.5–2.0 mm long, dull black. *Flowering time*: late November to early December; flowers opening in the early morning and lasting until late afternoon. Figure 24; Plate 2C.

Distribution and ecology: restricted to the summit plateau of the Swarttruggens in Western Cape (Map 47); on loamy flats in open, arid fynbos dominated by low restios and small shrubs.

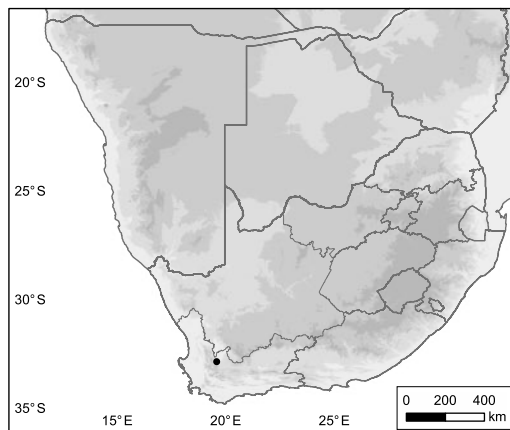
Diagnosis: recognised by the rather lax raceme of rotate, moderately sized flowers with a weakly deflexed style longer than the ovary and with a globose-papillate stigma. The solitary terete leaf is usually withered at flowering, rarely still present. In flower, the species is confusingly similar to smaller forms of *Drimia exuviata*, whence the derivation of the epithet. Both species share rotate flowers opening in the early morning and lasting a full day, with a weakly deflexed style longer than the ovary and a globose-papillate stigma, but *D. exuviata* is readily distinguished by the conspicuous, strongly horizontally



FIGURE 24.—*Drimia decipiens*, Western Cape, Swartruggens, Manning 3637 (NBG). A, flowering bulbs, one with leaf still attached; B, lower flower bract; C, flower; D, outer (right) and inner (left) tepals; E, stamens with anterior, posterior and side aspects; F, gynoecium; G, infructescence; H, capsule; I, seeds. Scale bar: A, G, 10 mm; B–F, H, 3 mm; I, 1 mm. Artist: John Manning.

barred, papery cataphyll, whereas that in *D. decipiens* is membranous with only traces of barring. The unscented flowers of *D. decipiens* are also slightly smaller, with tepals 8–9 mm long and anthers $\pm$ 2 mm long with complete longitudinal dehiscence whereas the sweetly fragrant flowers of *D. exuviata* have tepals 10–14 mm long and anthers 2–4 mm long with porose-longitudinal dehiscence. The two species are sympatric on the Swartruggens, but *D. exuviata* flowers slightly earlier in the season, and is in fruit as *D. decipiens* comes into bloom.

The relationships of *Drimia decipiens* are not entirely clear and it is morphologically somewhat intermediate between *Drimia juncifolia* and sect. *Sypharissa*, differing from the former in its moderately lax raceme of larger flowers with a proportionally slightly longer style, but lacking the strongly barred cataphylls and basifixed anthers with porose-longitudinal dehiscence that are diagnostic for sect. *Sypharissa*. Vegetatively, *D. decipiens* is quite unlike *D. juncifolia*, which produces a tuft of wiry leaves with scabridulous margins. In its solitary, erect, filiform-terete leaf, *D. decipiens* is readily confused with another fynbos species, *D. dregei* (sect. *Ledebouria*), but that species has small, campanulate flowers that open in the afternoon, with ovate anthers $\pm$ 1 mm long and a short, columnar-truncate style $\pm$ as long as the ovary.



MAP 47.—Distribution of *D. decipiens*

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. **3219 (Wuppertal)**: 60 km NE of Ceres, Knolfontein, Swartruggens, (–DC), 8 Dec. 2009, I. & C. Jardine 1263 (NBG); 4 Dec. 2012, I. Jardine 1983 (NBG); 12 Dec. 2017 [fruiting], I. Jardine 2772 (NBG).

Sect. 12. **Sypharissa** (Salisb.) J.C.Manning & Goldblatt, comb. nov. *Sypharissa* Salisb., Gen. Pl.: 37 (1866). *Urginea* sect. *Sypharissa* (Salisb.) Baker in J. Linn. Soc., Bot. 13: 216 (1873). Type species: *Sypharissa exuviata* (Jacq.) Salisb. ex Oberm. = *Drimia exuviata* (Jacq.) Jessop, lecto., designated by Oberm. in Bothalia 13: 111 (1980).

Tenicroa Raf., Fl. Tellur. 3: 52 (1837). Type species: *Tenicroa fragrans* (Jacq.) Raf. = *Drimia fragrans* (Jacq.) J.C.Manning & Goldblatt

Pilasia Raf., Fl. Tellur. 3: 53 (1837). Type species: *Pilasia filifolia* (Jacq.) Raf. = *Drimia filifolia* (Jacq.) J.C.Manning & Goldblatt

Plants small to medium. *Bulb* subterranean, scales imbricate, flesh white or pale pink. *Cataphyll* involute, surrounding leaves as a conspicuous papery or fibrous sheath with overlapping margins, strongly barred with thickened transverse purple or brown ribs. *Leaves* 1 to many, blade filiform to subterete, glabrous, synanthous. *Inflorescence* a raceme; scape glabrous, bracts ovate to lanceolate-acuminate, lowermost conspicuously auriculate and long-spurred; bracteoles lacking; pedicels shorter than tepals at flowering. *Flowers* diurnal, rotate, fragrant, perianth deciduous and cohering above to form a cap on developing capsule; tepals almost free, elliptic, white with dark midrib, membranous. *Stamens*: filaments erect or $\pm$ connivent around ovary, $\pm$ 1.5 times as long as anthers, filiform-tapering, weakly

sigmoid-deflexed distally; anthers $\pm$ deflexed, basifixed, linear, dehiscence longitudinal or porose-longitudinal and gaping only apically. Ovary ovoid; style declinate, longer than (up to twice as long as) ovary; stigma globose-papillate. Capsule ellipsoid, relatively large. Seeds elliptic or ovate, testa reticulate with sinuate anticlinal cell walls.

Key to species

- 1a. Leaves numerous (30 to 100), 0.25–0.50 mm diam., up to 100 mm long and much shorter than inflorescence. 50. *D. multifolia*
- 1b. Leaves one to many (1 to 25), 1.0–1.5 mm diam., mostly more than 100 mm long, $\pm$ as long as or shorter than inflorescence:
 - 2a. Leaves many, (6)15 to 25, $\pm$ half as long as inflorescence; raceme elongated 49. *D. fragrans*
 - 2b. Leaves few, 1 to 10, $\pm$ as long as inflorescence or slightly longer; raceme often congested . . . 48. *D. exuviata*

48. ***Drimia exuviata* (Jacq.) Jessop** in J. S. Afr. Bot. 43 : 276 (1977). *Anthericum exuviatum* Jacq., Icon. Pl. Rar. 2 (13): 18, t. 415 (1794). *Phalangium exuviatum* (Jacq.) Poir. in Lamarck, Encycl. 5: 243 (1804). *Albuca exuviata* (Jacq.) Ker Gawl. in Curtis's Bot. Mag. 22: t. 871 (1805). *Urginea exuviata* (Jacq.) Steinh. in Annls. Sc. Nat., sér. 2, 2: 330 (1834). *Ornithogalum exuviatum* (Jacq.) Kunth, Enum. Pl. 4: 369 (1843). *Sypharissa exuviata* (Jacq.) Salisb. ex Oberm. in Bothalia 13: 113 (1980). *Tenicroa exuviata* (Jacq.) Speta in Linzer Biol. Beitr. 12: 195 (1980). Type: illustration in Jacq., Icon. Pl. Rar. 2: t. 415 (1794).

Anthericum filifolium Jacq., Icon. Pl. Rar. 2 (15): 18, t. 414 (1794). *Phalangium filifolium* (Jacq.) Poir. in Lamarck, Encycl. 5: 242 (1804). *Albuca filifolia* (Jacq.) Ker Gawl. in Bot. Reg. 7: 557 (1821). *Urginea filifolia* (Jacq.) Steinh. in Annls. Sc. Nat., sér. 2, 2: 329 (1834). *Pilasia filifolia* (Jacq.) Raf., Fl. Tellur. 3: 53 (1837). *Ornithogalum filifolium* (Jacq.) Kunth., Enum. Pl. 4: 369 (1843). *Sypharissa filifolia* (Jacq.) Salisb. ex Oberm. in Bothalia 13: 113 (1980). *Tenicroa filifolia* (Jacq.) Oberm. in J. S. Afr. Bot. 47: 577 (1981). *Drimia filifolia* (Jacq.) J.C.Manning & Goldblatt in Goldblatt and Manning in Strelitzia 9: 711 (2000). Type: illustration in Jacq., Icon. Pl. Rar. 2 (15): t. 414 (1794).

Anthericum spiratum Thunb., Prodr.: 62 (1794). Syntypes: South Africa, 'Cap. B. spei', Thunberg s.n. (UPS-THUNB [8413 & 8414]-microfiche!, syn.).

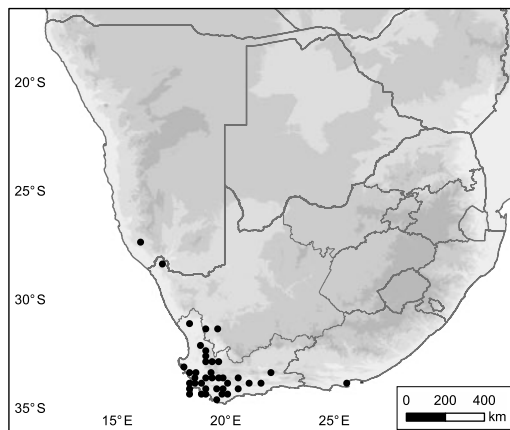
Urginea unifolia A.V.Duthie in Ann. Univ. Stell. 6A: 8 (1928). Type: South Africa, Western Cape, Cape Town (3318): 'Stellenbosch Flats', (–DD), Oct. 1927, Duthie s.n. STE1891 (NBG, holo.!; BOL!, iso.).

Urginea duthieae Adamson in J. S. Afr. Bot. 8: 239 (1942). [*Urginea ecklonii* sensu Duthie in Ann. Univ. Stell. 6A: 6 (1928), non *U. ecklonii* Baker (1892)]. Type: South Africa, Western Cape, Cape Town (3318): 'Stellenbosch Flats', (–DD), 17 Oct. 1925, Duthie s.n. STE1790 (NBG, holo.!; K, iso.).

Urginea flexuosa Adamson in J. S. Afr. Bot. 8: 240 (1942). Type: South Africa, Western Cape, Simonstown (3418): 'Cape Peninsula, Smitswinkel Bay', (–AD), 3 Jan. 1941, Adamson 3099 (BOL, holo.!; SAM!, iso.).

Plants deciduous, sometimes gregarious. Bulb ovoid or scales distichous, $\pm$ 15–60 mm diam., scales adherent or outer scales sometimes loose, $\pm$ imbricate, flesh whitish. Cataphyll a membranous or papery sheath, often decaying into fine or coarse fibres, 10–150 mm long, pale with dark, sometimes woody horizontal bars. Leaves synanthous, 1 to 10, suberect, straight or loosely flexuous, filiform to semiterete, 150–500(–900) $\times$ (0.5–)1.0–4.0 mm, glabrous, bases sometimes persisting as barred, papery sheaths. Inflorescence a moderately dense to congested raceme 150–500(–900) mm tall, $\pm$ as long as the leaves, 5- to 50-flowered, flowers 2–6 mm apart; scape 1–5 mm diam., glabrous; bracts ovate to lanceolate, 4–10 mm long, auriculate, lowermost with spur to 15 mm long; pedicels spreading, 3–10 mm long at anthesis, elongating to 15 mm in fruit. Flowers diurnal, spreading, rotate, fragrant; tepals connate up to 0.5 mm, spreading, elliptic or inner obovate, 10–14 $\times$ 3–8 mm, inner sometimes

wider than outer, white or flushed pink with dark midrib. *Filaments* erect around ovary, 4–6 mm long, subulate to filiform, white. *Anthers* basifixed, linear, 2–4 mm long, dehiscence porose-longitudinal (theca splitting entirely, but only gaping apically), yellow. *Ovary* ellipsoid, $\pm$ 4 mm long, pale green; style deflexed, ultimately 6–8 mm long, white; stigma penicillate. *Capsules* ovoid to obovoid, 10–20(–25) $\times$ 5–10 mm. *Seeds* elliptic, 2–6(–10) mm diam., black. *Flowering time*: September to December, rarely into early January; flowers opening mid-morning and lasting the rest of the day. Figure 25.



MAP 48.—Distribution of *D. exuviata*

Distribution and ecology: widespread through the coastal and near-interior mountains of the Greater Cape Floristic Region, from the Bokkeveld Mtns of Northern Cape southwards to the Cape Peninsula in Western Cape and eastwards to Port Elizabeth in Eastern Cape, with scattered records to the northwest from Karas in southern Namibia and the Richtersveld and Nuwerus in Northern Cape (Map 48); on sandy or gravelly flats and rock outcrops, often in moist situations or seepages, from near sea level to above 1 000 m.

Diagnosis: a variable species, recognised by the one to several filiform to semiterete leaves 1–4 mm in diam. and $\pm$ as long as the inflorescence and the often rather congested raceme. As circumscribed here, plant size and leaf number vary greatly. Several of these variants on the Cape Peninsula were recognised as species by Adamson (1942), but have not been maintained since. The type illustration of *Drimia exuviata* (Jacquin, 1794: t. 415) depicts a robust plant with five thick leaves and a well-developed papery collar around the leaf bases, becoming fibrous at the base. *Drimia filifolia* (Jacquin, 1794: t. 414), in contrast, is typified by a delicate plant with three filiform leaves. Obermeyer (1980) referred coarser plants with 4 or 5 thicker leaves 2–4 mm wide to *D. exuviata* and more delicate forms with one to several narrower leaves to *D. filifolia*, but this distinction is not readily applied, and her identification of some specimens was uncertain and of others rather arbitrary. Here we adopt a broader circumscription of the species to include both extremes. Forms with more numerous leaves are also sometimes difficult to separate from *Drimia fragrans*, defined by an inflorescence well exserted above the leaves and a more elongate raceme. All three species were combined under *D. exuviata* by Jessop (1977) and their taxonomy remains to be fully resolved.

Additional specimens seen

NAMIBIA. **2716 (Witputz)**: Karas, (–AC), 797 m, 12 Aug. 2001, C. Mannheimer 1607 (WIND).

SOUTH AFRICA. NORTHERN CAPE. **2817 (Vioolsdrift)**: Richtersveld, Kambroekop, (–AC), 13 Sep. 1929, H. Herre s.n. (NBG). **3118 (Vanrhynsdorp)**: Nuwerus, (–AB), 16 Sep. 1963, W. Barker 9927 (NBG). **3119 (Calvinia)**: Nieuwoudtville, Klipkoppies, (–AC), 5 Nov. 1962 [fruiting], W. Barker 9763 (NBG); top of Vanrhyn's Pass, (–AC), 6 Nov. 1962, L. Booysen 9792 (NBG).

WESTERN CAPE. **3119 (Calvinia)**: Gifberg, (–BC), 2 Sep. 1948, R. Compton 20784 (NBG). **3218 (Clanwilliam)**: near Clanwilliam, (–BB), 25 Nov. 1946, C. Leipoldt NBG278/45 (NBG). **3219 (Wuppertal)**: Ez-elbank, (–AC), Oct. 1929, J. Thode s.n. (SAM); near Citrusdal, (–AC), 1 Sep. 1945, F. Leighton 1622 (BOL);

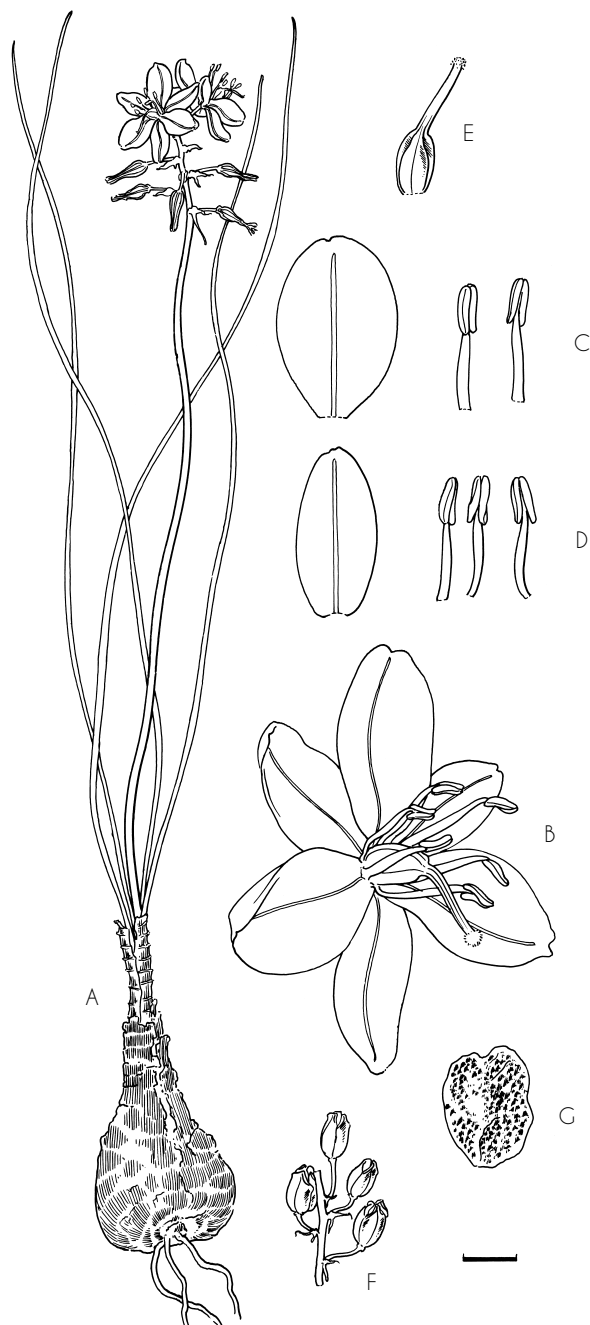


FIGURE 25.—*Drimia exuviata*, Western Cape, Tulbagh, without voucher. A, flowering plant; B, flower; C, outer tepal and stamens; D, inner tepal and stamens; E, gynoecium; F, capsules; G, seed. Scale bar: A, F, 10 mm; B–E, 1.5 mm; G, 1 mm. Artist: John Manning.

Middelberg Plateau, (–AC), 14 Dec. 1941, *R. Compton* 12730 (NBG); Cederberg, Middelberg, (–AC), Dec. 1967, *O. Kerfoot* 6163 (NBG); Cederberg Forest Reserve, near Driehoek, (–AC), 28 Oct. 1977, *I. Emdon* 202 (NBG); Clanwilliam, Modderfontein, (–CA), 6 Sep. 1933, *R. Compton* 4288 (NBG); Citrusdal, (–CA), 1 Sep. 1951, *W. Barker* 7395 (NBG); Porterville, bottom of Dasklip Pass, (–CC), 7 Oct. 1981, *Mauve & Hugo* 14 (NBG); Saron, De Hoek, (–CD), 11 Sep. 1949, *W. Barker* 5831 (NBG); Groenfontein, Zeekoegat, (–DC), 900' [300 m], 4 Nov. 2001, *M. Stobie* 8b; Swarttruggens, Knolfontein, (–DC), 29 Sep. 2006, *I. Jardine & C. Jardine* 492 (NBG); 2 Nov. 2010, *I. Jardine* 1446 (NBG); 24 Oct. 2011, *I. Jardine* 1708 (NBG). **3318 (Cape Town)**: hills N of Saldanha Bay, (–AA), 6 Sep. 1928, *J. Hutchinson* 301 (BOL); Saldanha Bay, Donkerkat, (–AA), 3 Oct. 1968, *H. Hall* 3130 (NBG); Kreeftbaai, S arm of Saldanha, (–AA), 9 Sep. 1966, *J. Rourke* 587 (NBG); Langebaan, (–AA), Sep. 1932, *G. Lewis* s.n. (BOL); 2 ½ miles [5 km] NW of Darling, (–AD), 15 Oct. 1959, *J. Acocks* 20701 (PRE); Darling Flora Reserve, (–AD), 4 Oct. 1956, *W. Barker* 8652 (NBG); 18 Sep. 1967, *W. Barker* 10507 (NBG); near Groenekloof, (–BC), Oct. 1898, *H. Bolus* 4354 (BOL); Mamre hills, (–BC), 22 Sep. 1943, *R. Compton* 14950 (NBG); Malmesbury Commonage, (–BC), 14 Sep. 1953, *G. Lewis* 3621 (SAM); Malmesbury, Klipfontein, (–BC), 16 Sep. 1982, *L. van Zyl* 3239 (NBG); Cape Peninsula, Camp's Bay, (–CD), without date, *Zeyher* 134 (SAM); 12 Sep. 1956, *J. Cassidy* 27 (NBG); N of Klipheuwel, (–DA), 16 Sep. 1982, *L. van Zyl* 3189 (NBG); Riebeeck Kasteel, Viswater, (–DB), Oct. 1927, *E. Markotter* (NBG); Wellington, (–DB), 13 Sep. 1941, *R. Compton* 11625 (NBG); Paardeberg, between Wellington and Malmesbury, (–DB), 312 m, 12 Sep. 2011, *G. Nicolson & D. Roets* 432 (NBG); Tygerberg Nature Reserve, (–DC), 24 Sep. 195, *Loubser* 3079 (NBG); Bellevue Farm, Bottelary Road W of Koelenhof, (–DD), 30 Sep. 1975, *M. Thompson* 2926 (NBG); Bottelaryberg, Koopmanskop farm, (–DD), 1200' [400 m], 20 Sep. 1988, *J. Beyers* 105 (NBG); Jonkershoek, Twin Peaks, 4500' [1 400 m], (–DD), 31 Dec. 1967, *O. Kerfoot* 6245 (NBG); Jonkershoek State Forest, (–DD), 13 Oct. 1975, *E. Kruger* 38 (NBG). **3319 (Worcester)**: Ceres, Hansiesberg, (–AB), 17 Dec. 1944, *R. Compton* 16719 (NBG); Prince Alfred's Hamlet, (–AD), 6 Oct. 1941, *R. Compton* 11975 (NBG); Michells Pass, (–AD), 16 Nov. 1952, *E. Esterhuysen* 20723 (BOL); Matroosberg, near Lakenvlei, (–BC), Nov. 1917, *E. Phillips* 11892 (SAM); Bain's Kloof, (–CA), 17 Jan. 1945, *R. Compton* 16915 (NBG); Rawsonville, Wagenboom farm, (–CB), 21 Sep. 1976, *I. Walters* 1534 (NBG); Worcester, Reier's Rus farm, (–CB), 4 Oct. 1980, *I. Walters* 2297 (NBG); Nuy, Kanetvlei farm, (–DA), 18 Sep. 1980, *I. Walters* 2247 (NBG); 3 km along Worcester–Robertson road, silt flats, (–DA), 5 Oct. 1991, *J. Manning* 1025 (NBG). **3320 (Montagu)**: Montagu, Donkerkloof, (–CC), 26 Sep. 1946, *R. Compton* 18492 (NBG); *G. Lewis* 2151 (SAM); lower slopes of Naudesberg, (–DA), 22 Nov. 1959, *W. Barker* 9114 (NBG). **3321 (Ladismith)**: Riversdale, Garcia's Pass, (–CC), Oct. 1904, *H. Bolus* 31808 (BOL); Bergfontein, lower S slopes of Witelsvoorberg, (–DC), 30 Oct. 1990, *D. McDonald* 1971 (NBG). **3322 (Oudtshoorn)**: near the summit of the Swartberg Pass, (–AC), Dec. 1951, *T. Stokoe* 64498 (SAM). **3418 (Simonstown)**: Cape Peninsula, Arend's Kop, (–AB), 2 Jan. 1941, *R. Compton* 10310 (NBG); Raapenberg, (–AB), Dec. 1883, *H. Bolus* s.n. (BOL); Kenilworth Race Course, (–AB), 18 Feb. 1941, *T. Salter* 8607 (BOL); Bergvliet farm (–AB), 28 Dec. 1917, *W. Purcell* 91 (NBG); Constantiaberg, (–AB), 17 Dec. 1939, *R. Compton* 8264 (NBG); Silvermine, (–AB), 27 Dec. 1942, *R. Compton* 14276 (NBG); Llandudno, (–AB), 18 Sep. 1943, *R. Compton* 14814 (NBG); Noordhoek, (–AB), 7 Jan. 1945, *R. Compton* 16902 (NBG); Muizenburg, (–AB), *F. Guthrie* 353 (NBG); Smith's Farm, (–AD), 16 Jan. 1936, *R. Compton* 6045 (NBG); Kommetjie Hills, (–AD), 20 Sep. 1949, *M. Steyn* 647 (NBG); Cirkel's Vlei, (–AD), 15 Jan. 1946, *R. Compton* 17922 (NBG); Faure, Ollemans Vlei, (–BB), 24 Sep. 1950, *M. Johns* s.n. (NBG); Elgin, Somersfontein farm, (–BD), 245 m, 16 Nov. 1971, *C. Boucher* 1718 (NBG); Kogelberg State Forest, 1 km NE of Oudebos, (–BD), 60 m, 10 Oct. 1991, *Vlok et al.* 16 (NBG). **3419 (Cal-edon)**: hill near Grabouw, (–AA), Oct. 1924, *Andreae* 1084 (NBG); Caledon, Lekkerwater, (–AB), 9 Nov. 1941, *W. Barker* 1886 (NBG); Hermanus, (–AC), 30 Oct. 1928, *M. Gillett* 3 (BOL); Drayton Siding, (–BA), 16 Oct. 1984, *P. Perry* 3221 (NBG); upper N slope of Galgeberg, (–BA), 14 Dec. 1981, *E. van Jaarsveld & A. Bean* 6465 (NBG); Riviersonderend, (–BB), without date, *Zeyher* 4248 (SAM); Fairfield farm, ± 12 km NW of Napier, (–BD), 180 m, 11 Nov. 1994, *J. Kemper* 743 (NBG); near Elim, (–DA), Dec. 1896, *H. Bolus* s.n. (BOL). **3420 (Bredasdorp)**: hill above Cape Agulhas, (–AC), 9 Nov. 2011, *P. Goldblatt & C. Porter* 13735 (MO, NBG); Bredasdorp, Bontebok Park, (–BA), 8 Oct. 1950, *B. Martin* 584 (NBG); Swellendam, Bushman's River, (–DA), 24 Sep. 1941, *R. Compton* 11913 (NBG).

EASTERN CAPE. **3325 (Port Elizabeth)**: sandhills near Zwartkop River (–DC), Sep without year, *Zeyher* 1056 (SAM).

49. **Drimia fragrans** (Jacq.) J.C.Manning & Goldblatt in Goldblatt & Manning in Strelitzia 9: 711 (2000). *Anthericum fragrans* Jacq., Hort. Schoenbr. 1: t. 86 (1797). *Phalangium fragrans* (Jacq.) Poir. in Lamarck, Encycl. 5: 247 (1804). *Albuca fugax* Ker Gawl. in Bot. Reg. 4: t. 311 (1818), as nom nov. [non *Albuca fragrans* Jacq.]. *Urginea fragrans* (Jacq.) Steinh. in Annls. Sc. Nat., sér. 2, 2: 328 (1834). *Tenicroa fragrans* (Jacq.) Raf., Fl. Tellur. 3: 52 (1837). *Ornithogalum fragrans* (Jacq.) Kunth., Enum. Pl. 4: 366 (1843). *Sypharissa fragrans* (Jacq.) Salisb. ex Oberm. in Bothalia 13: 113 (1980). Type: illustration in Jacq., Hort. Schoenbr. 1: t. 86 (1797).

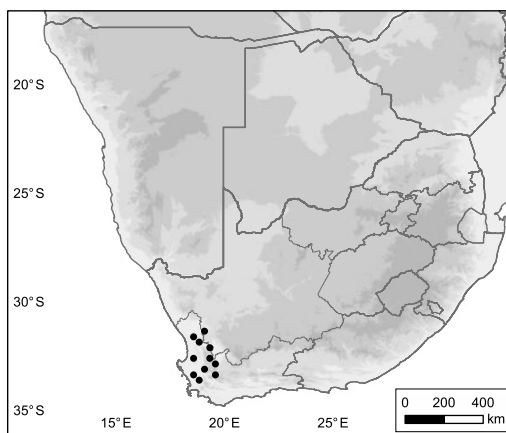
Plants deciduous, usually gregarious. *Bulb* subglobose, $\pm$ 30–60 mm diam., scales $\pm$ imbricate, flesh whitish to orange. *Cataphyll* a papery sheath up to 150 mm long, upper part white heavily barred with purple and fluted. *Leaves* synanthous, (6)15 to 25, suberect, straight or loosely coiled, terete, 150–300 $\times$ 1–2 mm, glabrous. *Inflorescence* a moderately dense raceme 300–450 mm tall, $\pm$ twice as long as leaves, up to 40-flowered, flowers 5–10 mm apart; scape 2–4 mm diam., glabrous; bracts ovate-attenuate, 3–6 mm long, auriculate, lowermost with spur to 10 mm long; pedicels spreading, 4–12 mm long at anthesis. *Flowers* diurnal, spreading, rotate, fragrant; tepals connate up to 0.5 mm, spreading, elliptic or inner obovate, 10–12 $\times$ 3–6 mm, inner sometimes wider than outer, white or flushed pink with dark midrib. *Filaments* erect around ovary, subulate, 4–5 mm long, white. *Anthers* sub-basifixed, linear, 3–5 mm long, dehiscence porose-longitudinal (thecae splitting entirely, but only gaping apically), yellow. *Ovary* ellipsoid, $\pm$ 4 mm long, pale green; style deflexed, ultimately $\pm$ 6 mm long, white; stigma penicillate. *Capsules* ovoid to obovoid, 16–20 $\times$ 7–10 mm. *Seeds* elliptic, 8 mm diam., black. *Flowering time*: September to November; flowers opening mid-morning and lasting the rest of the day.

Distribution and ecology: restricted to the Atlantic coast and near-interior, from the Bokkeveld Mtns of Northern Cape through the Cederberg to Darling and Wellington in Western Cape (Map 49); forming small clumps on seasonally moist sandy flats in fynbos, from 250 to 900 m.

Diagnosis: a relatively robust species recognised in sect. *Sypharissa* by its gregarious habit and cluster of several to many leaves 1–2 mm diam. and up to 300 mm long and much shorter than ($\pm$ half as long as) the inflorescence. The papery collar around the base of the leaves is often very conspicuous, and the raceme is always elongated, never congested as in *Drimia exuviata*.

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. **3119 (Calvinia)**: near Nieuwoudtville Waterfall, (–AC), 26 Oct. 1983, *D. Snijman* 649 (NBG); Nieuwoudtville, Annex Kranskloof 794, (–AC), 733 m, 26 Oct. 2000, *W. Pretorius* 621 (NBG). WESTERN CAPE. **3118 (Vanrhynsdorp)**: summit of Gifberg, (–DA), 16 Nov. 1970, *H. Hall* 3906 (NBG); Nardouwsberg, N of Witbakenkop, (–DD), 1300' [400 m], 3 Sep. 1984 [leafing only], *E. Oliver* 8582 (NBG). **3218 (Clanwilliam)**: Witwater, near Piketberg, (–DA), Oct. 1895, *H. Bolus* 8624 (BOL); Piketberg, Het Kruis, (–DA), 29 Sep. 1943, *W. Barker* 2597 (NBG). **3219 (Wuppertal)**: Biedouw, Welbedacht, (–AB), 22 Sep. 1952, *A. Middlemost* 1742 (NBG), *Lewis* 2529 (SAM); Cederberg, Gonnafontein, (–CB), 900 m, 18 Nov. 2000, *U. Pond*



MAP 49.—Distribution of *D. fragrans*

237 (NBG); Swartruggens, Knolfontein, (–DC), 1 221 m, 22 Oct. 2009, *I. Jardine & C. Jardine* 1221 (NBG); 16 Oct. 2011, *I. Jardine* 1705 (NBG); Groenfontein, Zeekoegat, (–DC), 900' [300 m], 2 Nov. 2001, *M. Stobie* 8a (NBG). **3318 (Cape Town)**: Malmesbury, (–BC), 15 Oct. 1959, *J. Acocks* 20701 (PRE); Paardeberg, Kwepersfontein, (–DB), 265 m, 14 Sep. 2011, *G. Nicolson & D. Roets* 469 (NBG). **3319 (Worcester)**: Saron, (–AA), 3 Oct. 1947, *Herre s.n.* STE26768 (NBG); Karooport, in sand near rocks, (–BC), 21 Oct. 1945, *E. Esterhuysen* 12154 (BOL).

50. ***Drimia multifolia*** (*G.J.Lewis*) Jessop in *J. S. Afr. Bot.* 43: 278 (1977). *Urginea multifolia* G.J.Lewis in *Ann. S. Afr. Mus.* 40: 9 (1952). *Sypharissa multifolia* (G.J.Lewis) Oberm. in *Bothalia* 13: 114 (1980). *Tenicroa multifolia* (G.J.Lewis) Oberm. in *J. S. Afr. Bot.* 47: 577 (1981). Type: South Africa, Northern Cape, Springbok (2917): '27 miles [42 km] S of Springbok', (–DD), 27 Jul. 1950, *Lewis* 2302 (SAM, holo.!, NBG!, iso.).

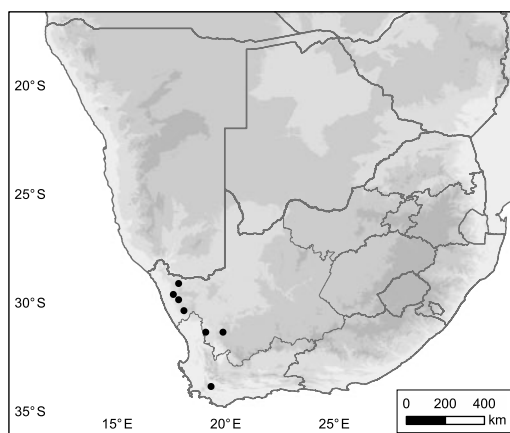
Plants deciduous, often gregarious. *Bulb* subglobose, ± 45 mm diam., scales $\pm$ imbricate, flesh whitish. *Cataphyll* a membranous sheath 5–30 mm long, pale with fine horizontal bars. *Leaves* ± 30 to 50, suberect, often loosely twisted or sometimes coiled, filiform, $30\text{--}100 \times 0.25\text{--}0.50$ mm, glabrous. *Inflorescence* a moderately dense raceme 30–300 mm tall, held well above leaves, 5- to 15-flowered, flowers 2–6 mm apart; scape 1.0–1.5 mm diam., glabrous; bracts ovate-triangular, 2–4 mm long, auriculate, lowermost with spur to 4 mm long; pedicels spreading, 6–11 mm long at anthesis. *Flowers* diurnal, spreading, rotate, fragrant; tepals connate up to 0.5 mm, spreading, elliptic, $10\text{--}12 \times 3\text{--}5$ mm, white with dark midrib. *Filaments* erect around ovary, 4–5 mm long, filiform, white. *Anthers* linear, $\pm 2.0\text{--}2.5$ mm long, sub-basifixed, dehiscence porose-longitudinal (thecae splitting entirely, but only gaping apically), yellow. *Ovary* ellipsoid, pale green, ± 4 mm long; style deflexed, ultimately ± 6 mm long, white, stigma penicillate. *Capsules and seeds* unknown. *Flowering time*: September to October; flowers opening midday and lasting the rest of the day.

Distribution and ecology: mostly restricted to higher elevations of western Northern Cape, from Steinkopf to the Kamiesberg and the Bokkeveld Plateau between Calvinia and Nieuwoudtville, but also recorded near Worcester in Western Cape although this isolated record is based on a cultivated plant and requires confirmation (Map 50); on dry, stony flats in open vegetation.

Diagnosis: a distinctive species separated from other species of the section by the tuft of 30 to 50, filiform leaves $0.25\text{--}0.50$ mm in diam. and up to 100 mm long, often loosely twisted or sometimes coiled near the tips, with the inflorescence extending well above them. Non-flowering plants resemble *Drimia nana*, but in that species the cataphyll is tubular and not obviously barred and the leaf scales are basally connate.

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. **2917 (Springbok)**: N of Steinkopf, (–BB), 800 m, Sep. 1995 [non-flowering], *G. & F. Williamson* 5698 (NBG); Platjiesfontein, (–DA), Sep. 1995 [non-flowering], *G. & F. Williamson* 5712 (NBG). **3018 (Kamiesberg)**: Witwater farm, near campsite between



MAP 50.—Distribution of *D. multifolia*

Bloudraai and Witwater, (–AC), 3500' [1 000 m], 12 Oct. 1981, A. le Roux & M. Ramsey 676 (NBG). **3119 (Calvinia)**: between Oorlogskloof and Papkuilsfontein, (–AC), 24 Sep. 1939, C. Leipoldt s.n. (BOL); Hantamsberg, Vanrhynshoek farm, (–BD), 1 410 m, 10 Oct. 1983, M. Thomas 44 (NBG).

WESTERN CAPE. **3319 (Worcester)**: Moordkuil, 3 km N of Lemoenpoort, (–CD), 18 Aug. 1990 [flowering ex hort. 6 Sep. 1991], P. Perry 3765 (NBG).

Sect. 13. **Orchidiformes** J.C.Manning & Goldblatt, sect. nov. Type species: *Drimia nana* (Snijman) J.C.Manning & Goldblatt

Mucinaea M.Pinter et al. in *Phyton* 53: 296 (2013), syn. nov. Type species: *Mucinaea nana* (Snijman) M.Pinter et al. = *Drimia nana* (Snijman) J.C.Manning & Goldblatt

Plants small. *Bulb* subterranean, partially imbricated and partially tunicated, scales adherent, flesh pale pink. *Cataphyll* tubular, vaginate below, forming a short membranous sheath above, lightly barred. *Leaves* numerous, concrescent basally, blade filiform, glabrous, hysteranthous. *Inflorescence* a raceme; scape glabrous; bracts ovate-triangular, short-spurred; bracteoles lacking; pedicels $\pm$ as long as tepals at flowering. *Flowers* diurnal, rotate, perianth deciduous, cohering above to form a cap on developing capsule; tepals free, elliptic, deep pink with green basal blotch, membranous. *Stamens*: filaments connivent around ovary, $\pm$ twice as long as anthers, flattened below, but filiform and deflexed distally; anthers deflexed, intrusive-basifixed, linear, dehiscence porose-longitudinal (thecae splitting longitudinally, but only gaping apically). *Ovary* ovoid; style declinate or flexed to one side or upwards, $\pm$ twice as long as ovary; stigma penicillate. *Capsule* ovoid. *Seeds* ellipsoid, testa reticulate with straight, slightly raised anticlinal walls.

51. ***Drimia nana*** (Snijman) J.C.Manning & Goldblatt in *Bothalia* 33: 111 (2003). *Tenicroa nana* Snijman in *S. Afr. J. Bot.* 51: 284 (1985). *Mucinaea nana* (Snijman) M.Pinter et al. in *Phyton* 53: 296 (2013). Type: South Africa, Northern Cape, 3018 (Kamiesberg): 'Kamiesberg, slopes of Rooiberg', (–AC), 26 Nov. 1980 [flowering ex hort.], D. Snijman 292 (NBG, holo.!, K, PRE!, iso.).

Plants deciduous, gregarious. *Bulb* subglobose, $\pm$ 25 mm diam., scales adherent, flesh pale pink. *Cataphyll* membranous, tubular and vaginate below, with a pale or brownish cylindrical neck 12–50 mm long, sometimes obscurely barred. *Leaves* hysteranthous, $\pm$ 20, suberect to spreading, filiform, 50–100 $\times$ 0.25 mm, glabrous. *Inflorescence* a moderately dense raceme 30–200 mm tall, 6- to 20-flowered, flowers 2–8 mm apart; scape $\pm$ 1 mm diam., glabrous; bracts ovate-triangular, 1.0–1.5 mm long, spur to 0.2 mm long; pedicels spreading, 7–10 mm long at anthesis, elongating to 15 mm in fruit. *Flowers* diurnal, spreading or slightly nodding, rotate, unscented; tepals free, $\pm$ reflexed, elliptic, 6–11 $\times$ 2.0–3.5 mm, pink with green blotch at base surrounded by white. *Filaments* connivent around ovary, 3.5–4.0 mm long, flattened and semiterete below, but filiform and deflexed distally, white with a pink band around middle. *Anthers* intrusive-basifixed, linear, $\pm$ 2 mm long, dehiscence porose-longitudinal (theca splitting entirely, but only gaping apically), yellow. *Ovary* ovoid, pale green, $\pm$ 1.5 mm long; style deflexed or rarely flexed upwards, ultimately $\pm$ 4 mm long, white; stigma penicillate. *Capsules* ovoid, 4–7 $\times$ 3–4 mm. *Seeds* ellipsoid, wrinkled, dark golden-brown, testa reticulate. *Flowering time*: November to January; flowers opening in the morning and lasting one day. Figure 26.

Distribution and ecology: locally endemic along the higher ground in central and northern Namaqualand in Northern Cape, recorded from the Spektakelberg west of Springbok, the Kourkammaberg and the Kamiesberg (Map 51); in seasonally moist sandy patches on granite rock sheets in sheltered situations.

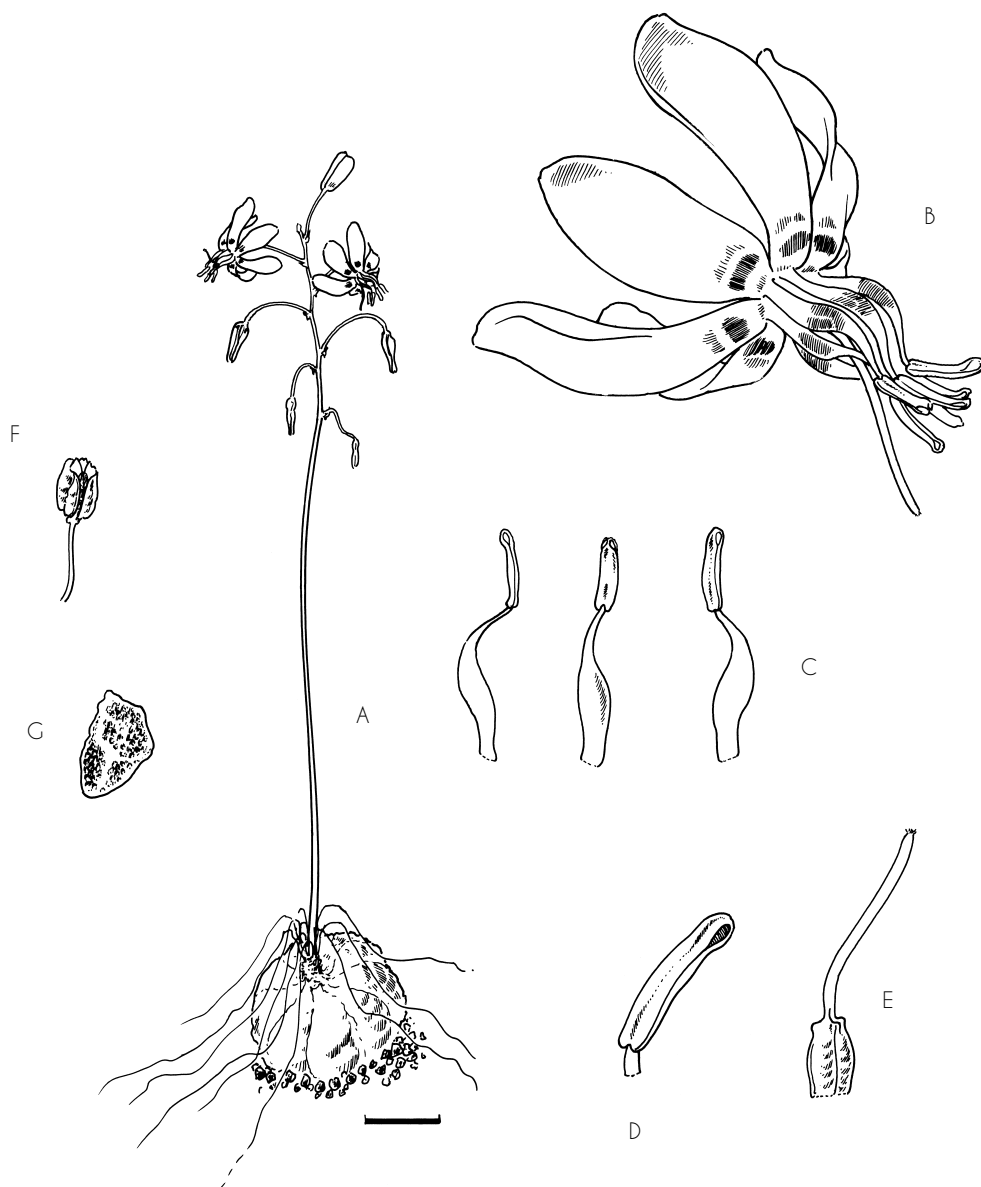
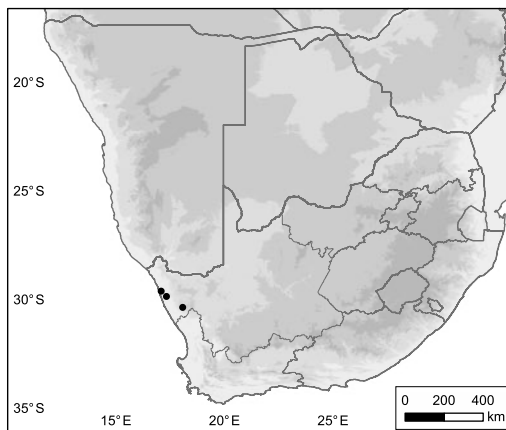


FIGURE 26.—*Drimia nana*, Northern Cape, Kamiesberg, without voucher. A, flowering bulb; B, flower; C, stamens; D, anther; E, gynoeceum showing two ovary forms; F, capsule; G, seed. Scale bar: A, F, 10 mm; B, C, E, 2 mm; D, G, 1 mm. Artist: John Manning.

Diagnosis: unmistakable in flower, with a raceme of rotate, pink flowers with $\pm$ reflexed tepals, each tepal with a green blotch at the base. The filaments are connivent and somewhat flattened in the basal half, but filiform and deflexed distally, and $\pm$ twice as long as the linear, intrusive-basifixed anthers. Dehiscence is porose-longitudinal, with the thecae splitting from the apex to the base, but only gaping distally to form a short apical slit. The style is flexed downwards or sometimes upwards, and a little more than twice as long as the ovary. The numerous, filiform leaves are surrounded by a membranous, tubular cataphyll that contributes a solitary vaginate tunic to the bulb, surrounding the several foliar scales that are developed during each annual growth increment (Speta 1998).



MAP 51.—Distribution of *D. nana*

Drimia nana closely resembles *D. multifolia* in foliage, but the latter has a strongly barred, involute cataphyll with overlapping margins, and different flowers with larger, spreading white tepals connate basally.

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. **2917 (Springbok):** Ezelsfontein, $\pm$ 14 miles W of Springbok on Spektakel Road, (–CA), 10 Nov. 1962, *Nordenstam 1881* (NBG); Kourkammaberg, SE slopes, (–CD), 24 Apr. 2001 [leafing], 15 Nov. 2001 [fl. ex hort.], *Snijman 1804* (NBG). **3018 (Kamiesberg):** Damsland farm at foot of Rooiberg, W slopes of Rusbospoort, (–AC), 3 Jun. 1980 [leaves ex hort.; fl. ex hort 21 Jan. 1981], *Hall 4931* (NBG).

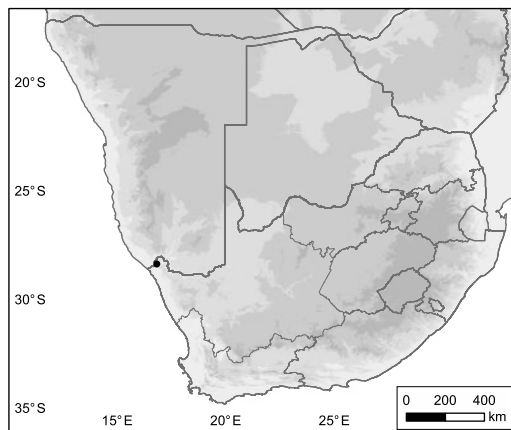
Sect. 14. **Khubusia** J.C.Manning & Goldblatt, sect. nov. Type species: *Drimia khubusensis* P.C.van Wyk & J.C.Manning

Plants small. *Bulb* subterranean, scales adherent, flesh white. *Leaves* several, blade linear-canaliculate, glabrous, hystranthous, bases persisting as a lightly barred, papery sheath. *Inflorescence* a short, ovoid raceme; scape glabrous; bracts ovate, short-spurred; bracteoles lacking; pedicels $\pm$ as long as tepals at flowering. *Flowers* diurnal, nodding, rotate, perianth deciduous, cohering above to form a cap on developing capsule; tepals reflexed, free, elliptic, white with dark keel, membranous. *Stamens:* filaments suberect below spreading distally, slightly longer than anthers, filiform; anthers basifixed, oblong, dehiscence longitudinal. *Ovary* ovoid; style erect, $\pm$ twice as long as ovary; stigma truncate-papillate. *Capsule* ovoid, segments reflexing at dehiscence to expose seeds. *Seeds* ellipsoid, cream-coloured to pale greyish.

52. ***Drimia khubusensis*** P.C.van Wyk & J.C.Manning, sp. nov. Type: South Africa, Northern Cape, Oranjemund (2816): Richtersveld, Khubus [Kuboes], 15 m directly west of first and oldest graveyard, (–BD), 6 Oct. 2014, P.C.V. van Wyk 500 (NBG, holo.).

Plants deciduous, solitary. *Bulb* subglobose to pyriform $\pm$ 30 mm diam., with a subterranean neck 30–50 mm long, scales adherent, $\pm$ imbricate, whitish, drying papery or thinly leathery and pale

greyish. *Leaves* hysteranthous, 5 to 10, suberect or spreading, linear-canaliculate or semiterete distally, 70–150 × 0.5–1.0 mm, glabrous, margins smooth, sheathing bases persisting as lightly barred, papery sheaths. *Inflorescence* a dense, ovoid raceme 400–100 mm tall, 10- to 20-flowered, flowers 1–2 mm apart; scape pale glaucous, ± 1 mm diam., glabrous; bracts ovate-cucullate, 1–2 mm long, lowermost with spur to 1 mm long; pedicels spreading or weakly arching, decurved apically, 7–10 mm long. *Flowers* diurnal, nodding, rotate, unscented; tepals ± free, reflexed, elliptic, 7–8 × 2.0–2.5 mm, white with dark midrib. *Filaments* suberect around ovary spreading distally, 4–5 mm long, filiform, white. *Anthers* basifixed, oblong, 2–3 mm long, dehiscence longitudinal, yellow. *Ovary* ovoid, 2.0–2.5 mm long, pale green; style erect, 4–5 mm long, white; stigma truncate-papillate. *Capsules* ovoid, 6–10 × 5–6 mm, rugulose, segments reflexing at dehiscence to expose seeds. *Seeds* elliptic to discoid, broadly peripherally winged, 4–5 mm diam., cream-coloured to pale greyish. *Flowering time*: October; flowers opening in the morning and lasting until late afternoon. Figure 27.



MAP 52.—Distribution of *D. khubusensis*

Distribution and ecology: a local endemic of the Richtersveld in Northern Cape, known only from the surroundings of the town Khubus (also Kuboes) (Map 52); growing in well-drained loamy quartzite soils in alluvial deposits on flats and gentle slopes.

The bulbs are cooked and eaten as part of the traditional diet, and the species is known locally as *knoffelbol* (garlic bulb).

Diagnosis: a species of uncertain affinity, recognised by the short, compact inflorescence of nodding, rotate white flowers with reflexed tepals 7–8 mm long, distally spreading stamens with basifixed anthers, and the relatively long style, ± twice as long as the ovary. The linear-canaliculate leaves are withered at flowering and are surrounded at the base by the papery, sheathing remains of the previous seasons' foliage.

Drimia khubusensis has unique capsules and seeds. The capsules are rather dark in colour, sometimes almost black, and the segments reflex from the base at dehiscence to expose the seeds completely, whereas other species of *Drimia* typically have brown capsules with segments that recurve only distally so that the seeds remain largely enclosed within the locules. Most striking, however, are the creamy-white or pale greyish seeds, these discoid with well-developed peripheral wings (Figure 27M). All other species of *Drimia* have black or dark brown seeds. The significance of the unique colouration of the seeds in *D. khubusensis* is unknown.

The nodding flowers lasting a full day and with reflexed tepals, oblong anthers, and long style recall those of pink-flowered *D. nana*, but that species has filiform leaves ± 0.25 mm diam., unique stamens with fusiform filaments and intrusively basifixed anthers, and a strongly flexed style.

Additional specimen seen

SOUTH AFRICA. NORTHERN CAPE. **2816 (Oranjemund)**: Richtersveld, Khubus [Kuboes], (–BD), 23 Oct. 2016 [fruiting], P.C.V. van Wyk 1026 (NBG).



FIGURE 27.—*Drimia khusensis*, Northern Cape, Khusus, Van Wyk 500 (NBG). A, flowering plant (black line indicates ground level); B, dissected bulb; C, portion of horizontally barred leaf sheath; D, foliage; E, inflorescence; F, front view of flower; G, side view of flower; H, ovary; I, style and stigma; J, stamen; K, capsule; L, flower bud; M, seed. Photographer: P.V. van Wyk.

- Sect. 15. **Aulostemon** (Mart.-Azorín et al.) J.C.Manning & Goldblatt, comb. et stat. nov. *Aulostemon* Mart.-Azorín et al. in *Phytotaxa* 321: 288 (2017). Type: *Aulostemon mzimvubuensis* (van Jaarsv.) Mart.-Azorín et al. = *D. mzimvubuensis cyanelloides* (Van Jaarsv.) J.C.Manning & Goldblatt

Plants medium-sized. *Bulb* partially epigeal, scales loose and shortly stalked, flesh pale pink. *Leaves* several, blade linear, hemiterete, minutely ciliolate on angles, hysteranthous. *Inflorescence* a raceme, persistent and photosynthetic; scape glabrous; bracts lanceolate-triangular, lower long-spurred; bracteoles lacking; pedicels longer than tepals. *Flowers* diurnal, fugacious, lasting one afternoon, rotate, perianth deciduous and tepals cohering above to form a cap on developing capsule; tepals almost free, oblong-lanceolate, white with darker midrib and green blotch at base, membranous. *Filaments* erect around ovary, $\pm$ as long as anthers, connate in a collar, oblong-subulate. *Anthers* connivent in a cone around style, basifixed, lanceolate-sagittate, dehiscence porose. *Ovary* conical; style $\pm$ twice as long as ovary; stigma truncate-papillate. *Capsule* ovoid. *Seeds* elliptic-oblong.

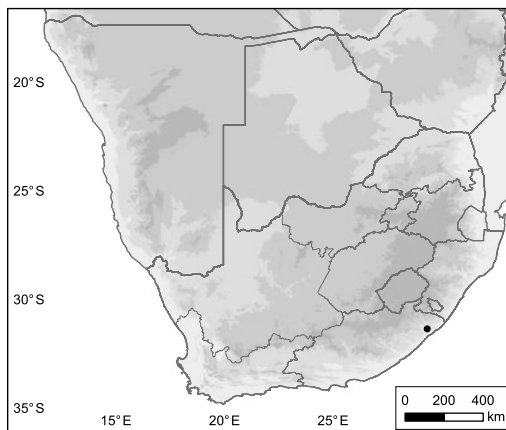
Drimia mzimvubuensis was included with *Drimia cyanelloides* in the genus *Sagittanthera* by Martínez-Azorín et al. (2013), characterised by connate anthers, but differs from it in several significant features, including the absence of bracteoles, fugacious flowers, pedicels much longer than the tepals, fusion of the staminal filaments into a collar, and anthers that are connivent but free. Preliminary molecular results reported by Martínez-Azorín et al. (2017) also suggest that the two species are not close allies.

53. **Drimia mzimvubuensis** van Jaarsv. in Van Jaarsveld & Van Wyk in *Aloe* 42: 83 (2005). *Sagittanthera mzimvubuensis* (van Jaarsv.) Mart.-Azorín et al. in *Phytotaxa* 98: 51 (2013). *Aulostemon mzimvubuensis* (van Jaarsv.) Mart.-Azorín et al. in *Phytotaxa* 321: 288 (2017). Type: South Africa, Eastern Cape, Port St. Johns (3129): 'lower Mzimvubu River, cliffs near Lutengela [Lutungele]', (–AD), van Jaarsveld et al. 58 (PRE, holo.).

Plants deciduous, gregarious. *Bulb* epigeal, subglobose, up to $\pm$ 50 mm diam., scales loose, clavate, shortly stalked, obtuse, dark purplish, flesh pale pink. *Leaves* hysteranthous, 1 to 4, suberect to drooping, hemiterete, 40–50 $\times$ 1.5–3.0 mm, upper surface shallowly channelled, lower surface 12- to 14-grooved, minutely ciliolate along angles, leathery. *Inflorescence* a moderately dense raceme 340–380 mm long, 20- to 50-flowered, persistent and remaining photosynthetic in fruit, flowers 2–8 mm apart; scape inclined-decumbent, $\pm$ 3 mm diam., glabrous; bracts narrowly lanceolate, (3–)5–8 mm long, lower with spur to 10 mm long; bracteoles lacking; pedicels arched, 14–20 mm long. *Flowers* diurnal, opening in the afternoon and fading in the evening, slightly nodding, rotate, unscented; tepals almost free, $\pm$ spreading, elliptic-lanceolate, 9–11 $\times$ 2.5–3.5 mm, white with green midrib and green blotch basally forming a ring around filament collar. *Filaments* erect around ovary, 3.5 mm long, connate for most of their length into a staminal collar 2.5 mm high, free parts subulate, $\pm$ 1 mm long, white. *Anthers* connivent in a cone around style, basifixed, lanceolate-sagittate, 3 mm long, dehiscence porose, yellow. *Ovary* obconic, pale green, $\pm$ 3 mm long; style $\pm$ 4.5 mm long, exerted from anther cone, white. *Capsules* ovoid, 7–10 mm long. *Seeds* oblong, 5–7 mm long. *Flowering time*: mainly late November to December; flowers opening midday and lasting one afternoon.

Distribution and ecology: known only from the type locality near Lutungele Village along the lower Mzimvubu River south of Port St Johns in Eastern Cape (Map 53); on south-facing shale cliffs in open thicket, with the bulbs wedged in rock crevices.

Diagnosis: recognised by the stellate, fugacious white flowers on long pedicels 15–18 mm long, with anthers 3 mm long and connivent in a tight cone around the style, and the filaments 3.5 mm long and connate for most of their length into a staminal collar 2.5 mm long. The leaves are 1.5–3.0 mm wide, semiterete and shallowly channelled above and lightly grooved beneath. The inflorescence is persistent and photosynthetic long after the seeds are dispersed. Superficially similar *Drimia cyanelloides* has softer, linear, keeled leaves 3–8 mm wide, shorter pedicels 7–8 mm long, and slightly shorter filaments free to the base with much longer anthers 5–6 mm long. The inflorescence in *D. cyanelloides* is not persistent after the seeds are shed and the flowers last two days.



MAP 53.—Distribution of *D. mzimvubuensis*

Sect. 16. **Rhadamanthopsis** (Oberm.) J.C.Manning & Goldblatt, comb. et stat. nov. *Rhadamanthus* subg. *Rhadamanthopsis* Oberm. in *Bothalia* 13: 137 (1980). *Rhadamanthus* subg. *Drimioides* Oberm. in *Bothalia* 14: 78 (1982), nom. illeg. superfl. *Rhadamanthopsis* (Oberm.) Speta in *Phyton* 38: 74 (1998). Type: *Rhadamanthopsis namibensis* Oberm. = *Drimia namibensis* (Oberm.) J.C.Manning & Goldblatt

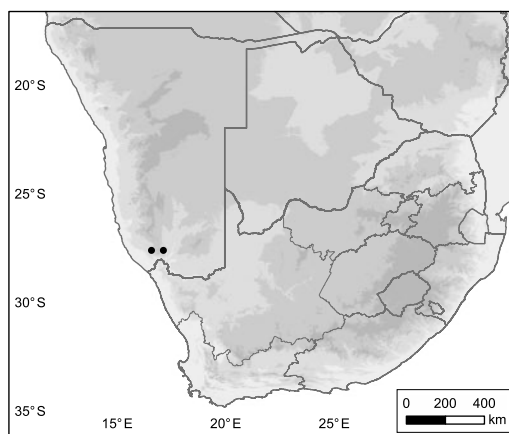
Plants small. *Bulb* subterranean, scales adherent or loose and spatulate, flesh pale pink. *Leaves* hysteranthous, narrowly lanceolate-canaliculate and leathery or plane and ovate to oblanceolate and membranous, glabrous. *Inflorescence* a raceme; scape glabrous or longitudinally puberulous; bracts ovate-triangular, short-spurred; bracteoles usually present, but minute and scale-like; pedicels $\pm$ as long as tepals at flowering. *Flowers* diurnal, nodding, campanulate, perianth deciduous, cohering above to form a cap on developing capsule; tepals connate at base, elliptic, white or greenish with dark midrib. *Stamens*: filaments curved over ovary, shorter or longer than anthers; anthers convergent over the ovary, medifixed, oblong, thecae acute or obtuse apically, dehiscence longitudinal. *Ovary* ovoid; style $\pm$ as long as ovary; stigma trilete, smooth. *Capsule* ovoid. *Seeds* ellipsoid-obovoid, testa reticulate with straight, slightly raised anticlinal walls.

Key to species

- 1a. Inflorescence up to 700 mm long, with 50 to 70 flowers; anthers 2 mm long, thecae apiculate; bulb scales closely adhering; leaves arcuate, canaliculate, leathery, bases persisting as papery collar; plants from southern Namibia 54. *D. namibensis*
- 1b. Inflorescence up to 300 mm long, with up to 30 flowers; anthers 1 mm long, thecae apically obtuse; bulb scales adhering or loose; leaves plane, membranous; plants from South Africa:
 - 2a. Bulb scales adhering, broadened basally; leaves 3 to 6; scape longitudinally scabridulous towards base 55. *D. karoocica*
 - 2b. Bulb scales loose and separating, narrowed basally or shortly stalked; leaf solitary; scape glabrous 56. *D. monophylla*

54. **Drimia namibensis** (Oberm.) J.C.Manning & Goldblatt, comb. nov. [J.C.Manning & Goldblatt in Goldblatt & Manning in *Strelitzia* 9: 712 (2000), nom. inval.]. *Rhadamanthus namibensis* Oberm. in *Taxon* 63: 1331 (2014) [Oberm. in *Bothalia* 13: 137 (1980), nom. inval.]. Type: Namibia, Witputz (2716): 'Witputz-Suid 1 km SE of Police Station', (–DA), Giess 13781 (PRE [PRE0488688-1: inflorescence in two pieces], holo.!; K, M, WIND, iso.).

Plants deciduous, solitary or clump-forming. *Bulb* subglobose, ± 50 mm diam., scales adherent, white to pale mauve, becoming thinly leathery. *Leaves* hysteranthous, 2 to 4, suberect and recurved, narrowly lanceolate, 150–240 $\times$ 15–25 mm, canaliculate, acute, glabrous, glaucous, leathery, bases persistent in a finely transversely barred neck. *Inflorescence* a dense raceme up to 700 mm tall, 50- to 70-flowered, flowers mostly 2–5 mm apart, sometimes clustered and raceme interrupted; scape 2–3 mm diam., evidently glabrous; bracts spatulate, 3–4 mm long, spur to 0.5 mm long; bracteole present, minute and scale-like; pedicels spreading, 7–8 mm long at anthesis, elongating to 12 mm in fruit. *Flowers* diurnal, weakly nodding, urceolate; tepals connate for 2–3 mm, lobes erect and apically recurved, elliptic to obovate, 5–6 $\times$ 3–4 mm, apices penicillate, pale mauve with dark base. *Filaments* erect, curved over ovary, 1.5 mm long, subulate, white. *Anthers* convergent, medifixed, oblong, ± 2 mm long, bifid apically and thecae apiculate, dehiscence longitudinal. *Ovary* ovoid or subglobose, ± 2 mm long, pale green; style columnar, 3 mm long, white; stigma trilobate, smooth. *Capsules* ellipsoid, 5–7 $\times$ 4–5 mm. *Seeds* obovoid, 4–5 mm long, glossy black. *Flowering time*: October and November; flowers open at 16:00 and wither at 20:00.



MAP 54.—Distribution of *D. namibensis*

Distribution and ecology: known only from the Huib Hoch Plateau near Witputz in southern Namibia (Map 54); in rock crevices in full sun.

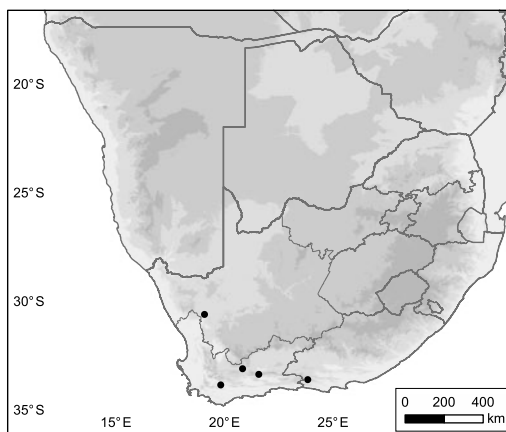
Diagnosis: recognised by the relatively robust inflorescence to 700 mm long bearing 50 to 70 flowers, these often clustered and the raceme thus somewhat interrupted. The flowers are campanulate and pale mauve, with longitudinally dehiscent anthers included in the perianth and characteristically bifid apically with minutely apiculate thecae. The firm-textured, narrowly lanceolate leaves are falcate and canaliculate, with the bases persisting as a papery, horizontally barred collar.

Additional specimens seen

NAMIBIA. 2716 (Witputz): Witputs, 2 miles [3.2 km] N of Police Station, (–DA), 12 Sep. 1958, *B. de Winter* 6304 (PRE); Witputs near Aus, (–DA), Nov. 1960 [fruiting], *B. de Winter* 6304 (PRE); Huib Hoch Plateau, W side just E of Witputz [Witputs], (–DA), 1 100m, 30 Jun. 1989 [leafing only], *E.G.H. Oliver* 9167 (NBG). **2717 (Chamaites)**: Aus Plateau, S of Uitsig farm, (–CA), May 1978 [fl. ex hort. 17 Oct. 1979], *W. Wendt* 58 (PRE).

55. ***Drimia karooica*** (Oberm.) J.C.Manning & Goldblatt, comb. nov. [J.C.Manning and Goldblatt in Goldblatt & Manning in *Strelitzia* 9: 712 (2000), nom. inval.]. *Rhadamanthus karooicus* Oberm. in Martínez-Azorín & Crespo in *Taxon* 63: 1331 (2014) [Oberm. in *Bothalia* 13: 137 (1980), nom. inval.]. Type: South Africa, Western Cape, Montagu (3320): 'Laingsburg, Keurfontein farm', (–BB), Dec. 1974 [flowering ex hort.], J. van Zanten s.n. (PRE [PRE0240643-1: plant with inflorescence], holo.).

Plants deciduous, clump-forming. *Bulb* subglobose, 25–30 mm diam., truncate, partly exposed, scales imbricate, fleshy, greenish. *Leaves* hysteranthous, 3 to 6, suberect or more usually spreading to prostrate, ovate or oblong to narrowly oblanceolate, 40–50 × 4–9 mm, acute, glabrous, membranous or soft-textured, dark green, paler beneath. *Inflorescence* a moderately dense raceme up to 300 mm tall, (5)10- to 30-flowered, flowers mostly 3–8 mm apart; scape 1.0–1.5 mm diam., longitudinally scabridulous towards base; bracts ovate-triangular, 1–2 mm long, spur to 0.5 mm long; bracteole usually present, minute and scale-like; pedicels spreading, 3–8 mm long at anthesis, suberect in fruit. *Flowers* campanulate or urceolate, diurnal, pendent; tepals connate for 1.0–1.5 mm, lobes erect, elliptic, 5–6 × 2 mm, apices penicillate, white or greenish with dark midrib. *Filaments* erect, connivent around ovary, 3 mm long, subulate, white. *Anthers* convergent, medifixed, oblong, ± 1 mm long, dehiscence longitudinal, green to yellow. *Ovary* ovoid, ± 2 mm long, pale green; style columnar, 2 mm long, white; stigma trilete, smooth. *Capsules* ovoid, 5–7 × 5 mm. *Seeds* ellipsoid, 4 mm long, black, testa colliculate. *Flowering time*: (December) January to February. Figure 28.



MAP 55.—Distribution of *D. karooica*

Distribution and ecology: a poorly known species from the drier southwestern near-interior of South Africa, with scattered records from Loeriesfontein in Northern Cape, Robertson and Laingsburg in Western Cape, and the Baviaanskloof in Eastern Cape (Map 55); on stony flats in karroid scrub.

Diagnosis: recognised by the partly epigeal bulb with imbricate scales, often tinged greenish, producing 3 to 6 ovate to narrowly oblanceolate, membranous leaves, and a moderately dense spike of nodding, campanulate to urceolate flowers with stamens included within the perianth and longitudinally dehiscent anthers. The scape is longitudinally scabridulous towards the base.

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE: **3019 (Loeriesfontein)**: Taaibosfontein, (–CA), 6 May 1983 [leafing], 19 Feb. 1987 [fl. ex hort.], P.L. Perry 1975 (NBG).

WESTERN CAPE. **3319 (Worcester)**: along R60 from Robertson to Worcester, (–DD), 20 Sep. 2010, J. Deacon & E. van Jaarsveld 1191 (NBG). **3321 (Ladismith)**: Huis River, (–BC), 10 Jul. 1987 [leafing], 18 Jan. 1988 [fl. ex hort.], M.B. Bayer 3659 (NBG).

EASTERN CAPE. **3323 (Willowmore)**: Baviaanskloof, near Studtis along road to Kleinpoort, (–DB), 19 Aug. 2009 [leafing], J. Deacon 291 (NBG).

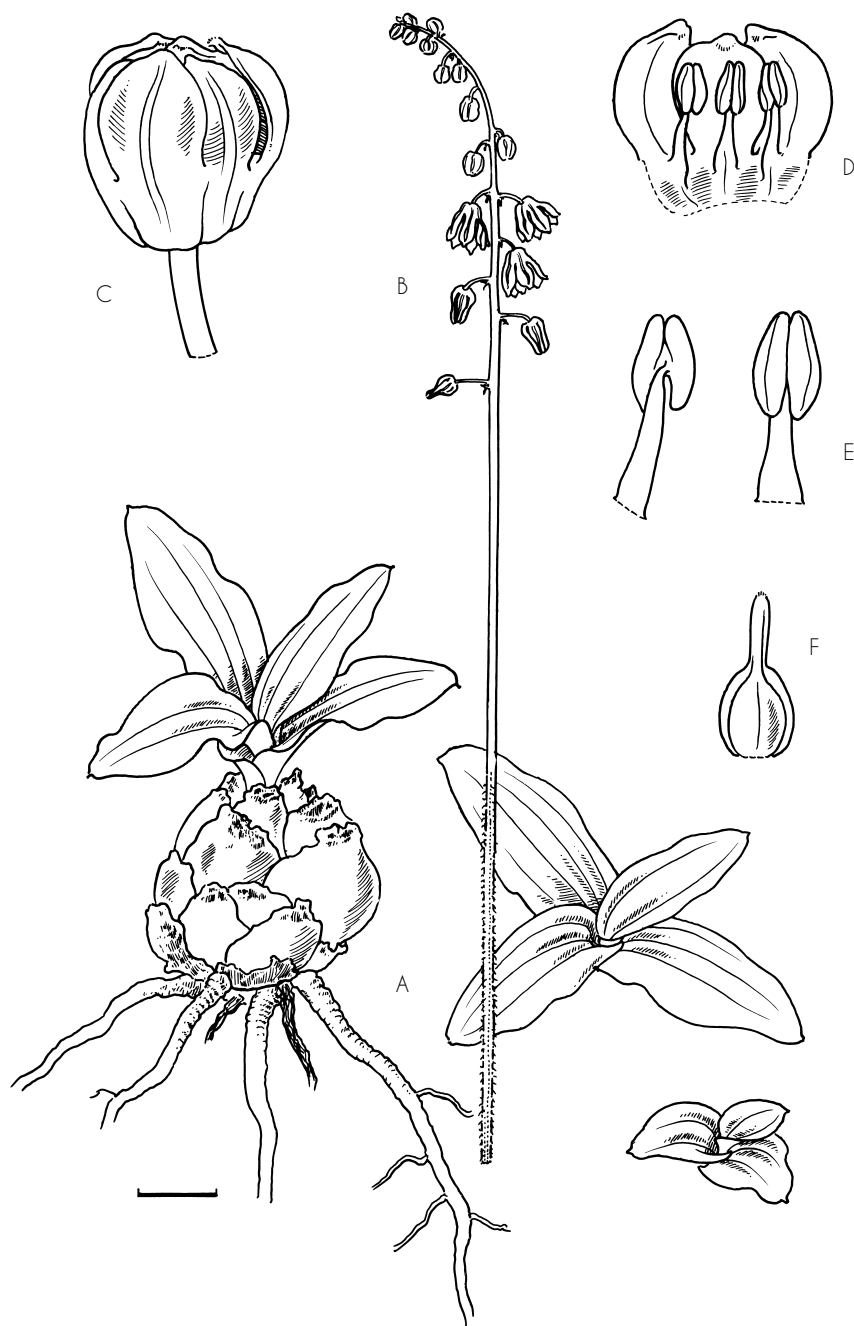
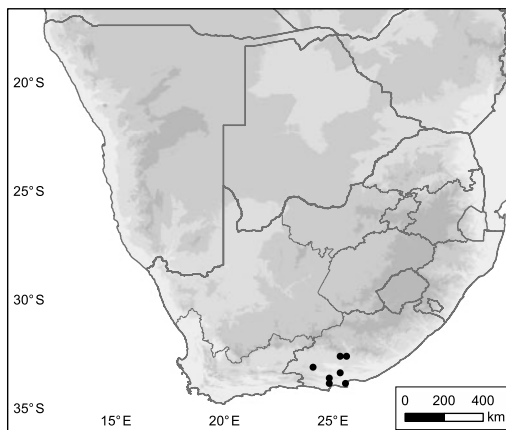


FIGURE 28.—*Drimia karooica*, Eastern Cape, Baviaanskloof, Deacon 291 (NBG). A, leafing bulb with two additional leaf rosettes; B, inflorescence; C, flower; D, three tepals and attached stamens; E, stamens; F, gynoecium. Scale bar: A, B, 10 mm; C, D, F, 2 mm; E, 1 mm. Artist: John Manning.

56. ***Drimia monophylla*** Oberm. ex J.C.Manning & Goldblatt, sp. nov. Type: South Africa, Eastern Cape, Somerset East, (3225): 'Stone Fountain farm', (–DA), 19 Apr. 1963 [leafing bulbs], R. Bayliss 1345 (NBG, holo.).

Plants deciduous. *Bulb* 20–40 mm diam., scales loose, arcuate and paddle-shaped, narrowed basally or shortly stalked, fleshy, whitish. *Leaf* hysteranthous, solitary (rarely two), spreading or prostrate, oblong to lanceolate, 40–50 × 5–8 mm, with two impressed longitudinal furrows, acute, glabrous, membranous or soft-textured, dark green, paler beneath. *Inflorescence* a moderately dense raceme up to 300 mm tall, 10- to 30(40)-flowered, flowers mostly 4–7 mm apart; scape erect, 1–2 mm diam., glabrous; bracts ovate-triangular, 1–2 mm long, spur to 3 mm long; bracteole usually present, minute and scale-like; pedicels suberect, 2–4 mm long at anthesis, elongating to 8 mm in fruit. *Flowers* campanulate or urceolate, diurnal, pendent; tepals connate for 1.0–1.5 mm, lobes erect, elliptic, 4 × 2 mm, apices penicillate, white or pale yellowish with dark midrib. *Filaments* erect, connivent around ovary, 2 mm long, subulate, white. *Anthers* convergent, oblong, ± 1 mm long, medifixed, dehiscence longitudinal, green to yellow. *Ovary* ovoid, ± 2 mm long, pale green; style columnar, 2 mm long, white; stigma trilete, smooth. *Capsules* ovoid, 5 × 3 mm. *Seeds* unknown. *Flowering time*: December; flowers opening at 16:00.



MAP 56.—Distribution of *D. monophylla*

Distribution and ecology: endemic to the southeastern Great Karoo in Eastern Cape, from Steytleville to Port Elizabeth and Somerset East (Map 56); on stony soil in thicket.

Diagnosis: easily distinguished in the section by the loose, paddle-shaped bulb scales that separate and readily break off from the baseplate, and the solitary (rarely two), membranous leaf with two longitudinal impressions. The campanulate flowers are pendent with small, longitudinally dehiscent anthers connivent around the ovary and included within the perianth. When not in flower the species can easily be mistaken for *Drimia haworthioides* (sect. *Drimia*), with similar bulbs with loose scales and soft-textured foliage, but mostly several leaves, often ciliate on the margins, and very different flowers.

Additional specimens seen

SOUTH AFRICA. EASTERN CAPE. **3225 (Somerset East)**: 28 km NW of Somerset East, along Klein Fish River, (–CB), 5 Dec. 1981, L. Smook 3932 (PRE); Sunday's River near Addo, (–DA), 9 Dec. 2013, N. Jacobsen 6742 (PRE). **3324 (Steytleville)**: Steytleville–Jansenville, Campher's Poort, (–AA), 4 Dec. 1947, W. Barker 5008 (NBG); Swartkopsrivierhoogte, (–DB), Dec, Zeyher 4252 (SAM); Hankey, on road to Bosch's farm, (–DD), rootstock as that of *D. haworthioides*, Aug. 1939 [fl. ex hort.], H. Fourcade 5387 (BOL). **3325 (Port Elizabeth)**: Kaboega [Kabouga], (–AD), 6 Jan. 1974, R. Bayliss 6327 (PRE); Break Nek, (–AD), 12 Feb. 1986, B. & M. van Wyk 1858 (PRE); Redhouse, (–DC), Dec. 1914, T. Paterson 2664a (GRA—image!).

Sect. 17. **Rhadamanthus** (Salisb.) J.C.Manning & Goldblatt, comb. et stat. nov. *Rhadamanthus* Salisb., Gen. Pl.: 37 (1866). Type: *Rhadamanthus convallarioides* (L.f.) Baker = *Drimia convallarioides* (L.f.) J.C.Manning & Goldblatt

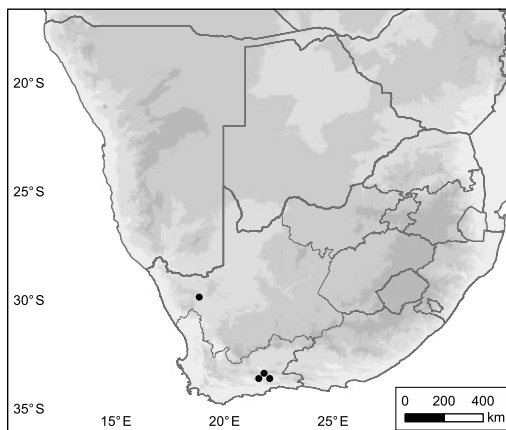
Plants small. *Bulb* subterranean, scales adherent or loose and spatulate, flesh pale pink. *Leaves* hysteranthous, usually filiform to terete and leathery, rarely plane and ovate to oblanceolate, glabrous to velutinous above. *Inflorescence* a raceme; scape longitudinally puberulous or glabrous; bracts ovate-triangular, short-spurred; bracteoles lacking; pedicels $\pm$ as long as or longer than tepals at flowering. *Flowers* diurnal, nodding, campanulate, perianth deciduous, cohering above to form a cap on developing capsule; tepals connate to halfway, elliptic, white or pinkish brown with dark midrib. *Stamens*: filaments curved over ovary, shorter or longer than anthers, rarely scabridulous; anthers convergent over ovary or rarely erect, medifixed or sub-basifixed, ovate-sagittate, thecae acute apically, obtuse to apiculate or caudate basally, rarely barbellate, dehiscing through apical slit to halfway. *Ovary* ovoid; style obsolete to $\pm$ as long as ovary; stigma trilete or rarely concave, smooth. *Capsule* ovoid. *Seeds* ellipsoid-obovoid, testa reticulate with straight, slightly raised anticlinal walls.

Key to species

- 1a Scape glabrous, sheathed at base by 1 or 2 well-developed, prominently cross-barred membranous collars formed by inner leaf bases; flowers rotate; anthers erect; leaf solitary, terete 65. *D. fasciata*
- 1b Scape longitudinally puberulous towards base, not sheathed basally by a well-developed or prominently cross-barred collar; flowers $\pm$ campanulate or urceolate; anthers convergent over ovary in a cone; leaves various:
 - 2a Anther thecae rounded basally:
 - 3a Filaments shorter than the anthers, 0.3–0.5 mm long, oblong:
 - 4a. Tepals monomorphic, plane or shallowly concave 63. *D. albiflora*
 - 4b Tepals dimorphic, outer concave and apically reflexed with dark green basal blotch, inner suberect and involute 64. *D. involuta*
 - 3b Filaments $\pm$ as long as the anthers or longer, 1–2 mm long, subterete:
 - 5a Leaves several, filiform or terete, glabrous; plants from central Namaqualand to Little Karoo 62. *D. convallarioides*
 - 5b Leaf solitary, elliptic to ovate, velutinous on upper surface; plants from southern Namibia 61. *D. oliverorum*
 - 2b Anther thecae basally apiculate, caudate or barbellate:
 - 6a Anther thecae deeply sagittate and barbellate basally; filaments papillate-puberulous; style well developed, $\pm$ 1 mm long; leaves two, prostrate, ovate to elliptic and velutinous on upper surface 60. *D. platyphylla*
 - 6b Anther thecae weakly sagittate and apiculate or caudate basally; filaments smooth; style very short, up to 0.5 mm long; leaves several, filiform, glabrous:
 - 7a Bulb scales tightly adherent; scape puberulous throughout; anthers basally caudate; style not produced 57. *D. uranthera*
 - 7b Bulb scales loose or separate; scape glabrous; anthers basally apiculate; style produced:
 - 8a Bulb scales stalked; raceme curved to the north, secund; pedicels very short, 1–2 mm long 59. *D. secunda*
 - 8b Bulb scales sessile; raceme suberect, cylindrical; pedicels 4–10 mm long 57. *D. arenicola*
57. **Drimia uranthera** (R.A.Dyer) J.C.Manning & Goldblatt in Goldblatt & Manning in Strelitzia 9: 712 (2000). *Rhadamanthus urantherus* R.A.Dyer in Hooker's Icon. Pl., sér. 5, 33: t. 3247 (1934). Type: South Africa, Western Cape, Oudtshoorn (3322): '1 mile [1.6 km] E of Oudtshoorn', (–CA),

29 Mar. 1933 [leafing 11 Oct. 1933 ex hort.], *Barker s.n. K933/32* [K (000257230 bulb with two inflorescences in centre of sheet), lecto.!, designated by Martínez-Azorín et al. in *Phytotaxa* 201: 169 (2015)].

Plants deciduous. *Bulb* subglobose-ovoid, 15–30 mm diam., scales adherent, drying pale brown and thinly leathery, usually forming a short wrinkled neck. *Leaves* hysteranthous, 2 to 8, erect, subterete, (20–)40–60 × 0.5 mm, glabrous, dark green, sheathing bases sometimes forming a pale, membranous, lightly transversely barred collar. *Inflorescence* a moderately lax raceme 120–200 mm tall, 10- to 25-flowered, flowers mostly 3–8 mm apart; scape longitudinally scabridulous throughout, sometimes densely so, rarely glabrate, 0.5–1.5 mm diam.; bracts ovate-deltoid, 1–2 mm long, spur 0.5–1.5 mm long; pedicels suberect to spreading, 3–12 mm long, minutely scabrid-puberulous or glabrate. *Flowers* pendent, campanulate to urn-shaped, unscented; tepals connate basally for up to 1 mm, lobes ovate-oblong, 3.5–4.0 × 2.0–2.5 mm, apices penicillate, creamy pink with darker midrib. *Filaments* incurved, 1 mm long, subulate. *Anthers* connivent, arching inward over ovary, sub-basifixed, ovate-sagittate, 1.5–1.8 mm long, thecae acute, base of thecae with short incurved spur, dehiscing by short longitudinal slits from apex to halfway. *Ovary* ovoid-pyriform, 2.0–2.5 mm long, papillate-puberulous; style obsolete; stigma trilete, smooth. *Capsule* broadly ovoid-subglobose, ± 5 mm long. *Seeds* unknown. *Flowering time*: March to April.



MAP 57.—Distribution of *D. uranthera*

Distribution and ecology: best known from the Little Karoo in Western Cape, between Calitzdorp and Oudtshoorn, but with a single record far to the northwest in Bushmanland in Northern Cape (Map 57); in alluvial conglomerate and red sands in succulent karroid shrubland.

Diagnosis: distinguished in the section by the anthers with each theca bearing a short, incurved spur at the base, and the obsolete style. Although well beyond the original known range of the species, the Bushmanland collection matches it in the filiform leaves and in the critical floral features of basally spurred anthers and obsolete style, and there seems no doubt about its identity. Should its occurrence in Bushmanland be confirmed then additional records can be expected from the intervening area. *Drimia uranthera* is sympatric with *D. convallarioides* at Oudtshoorn, but the basally spurred anthers and obsolete style serve to separate it.

Additional material seen

SOUTH AFRICA. NORTHERN CAPE. **2918 (Pofadder)**: Farm Driehoek, 47 km E of Gamoep on road to Kalkstasie, (–DD), 26 Aug. 1988 [?ex hort.], *M. Crosby* 746 (PRE).

WESTERN CAPE. **3321 (Ladismith)**: Buffeljagsfontein farm, Warmbad to Oudtshoorn, (–BD), 20 Feb. 1980, *P. Perry* 1503 (NBG); Calitzdorp, (–DA), 2 Mar. 1982 [leafing ex hort. 13 Jul. 1982], *P. Bruyns* 2264 (NBG). **3322 (Oudtshoorn)**: Oudtshoorn, (–CA), Apr. 1933, *W. Barker* 126b (BOL); 18 km from Oudtshoorn towards Lategaansvlei, (–CA), 3 Mar. 1982 [leafing ex hort. 13 Jul. 1982], *P. Perry* 1457 (NBG).

58. **Drimia arenicola** (B.Nord.) J.C.Manning & Goldblatt in Goldblatt & Manning in Strelitzia 9: 711 (2000). *Rhadamanthus arenicola* B.Nord. in Bot. Not. 123: 166 (1970). Type: South Africa, Northern Cape, Hondeklipbaai (3017): '0.5 miles [0.8 km] S of Wallekraal', (–BC), Oct. 1924, Pillans s.n. (BOL, holo.).

Plants deciduous. *Bulb* subglobose, 25–50 mm diam., scales loose, ovoid-lanceolate, each often tapering into a slender, obscurely cross-banded sheath, 10–30 × 5–15 mm, flesh pale pink, becoming membranous or papery. *Leaves* hysteranthous, 3 to 5, erect, filiform-terete, 50–130 × 0.5–1.0 mm, glabrous. *Inflorescence* a moderately dense or lax raceme up to 180 mm tall, 8- to 25-flowered, flowers mostly 3–8 mm apart; scape 1–2 mm diam., glabrous; bracts ovate-deltoid, 1–2 mm long, spur 1–2 mm long; pedicels suberect to spreading, 4–10 mm long. *Flowers* pendent, campanulate or urn-shaped, unscented; tepals connate basally for 1.5 mm, lobes ovate-oblong, 3.0–3.5 × 1.5–2.0 mm, apices penicillate, creamy pink to reddish brown with darker midrib. *Filaments* 1 mm long, linear-subulate.

Anthers connivent, arching inward over ovary, sub-basifixed, ovate-sagittate, 1.0–1.2 mm long, thecae acute apically and apiculate basally, dehiscing by short longitudinal slits from apex to halfway. *Ovary* ovoid, 2.0–2.5 mm long, papillate; style obsolete or shortly columnar, to 0.5 mm long; stigma crateriform with lobed margin, smooth. *Capsule* broadly ovoid-subglobose, 4–5 mm long. *Seeds* oblong, ± 4 mm long, wrinkled. *Flowering time*: (September) October to November.

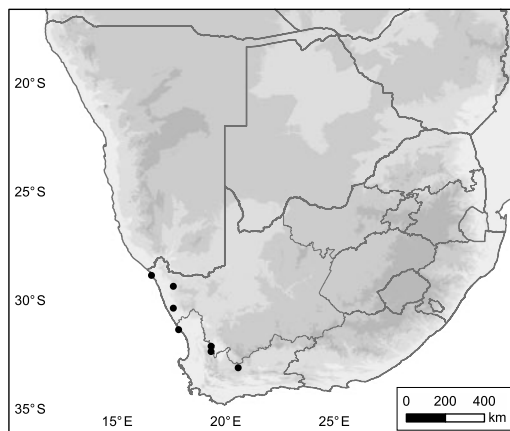
Distribution and ecology: recorded from north of Steinkopf in Northern Cape through western Namaqualand and the eastern Cederberg to Matjiesfontein in Western Cape (Map 58); in semi-arid areas on stony and sandy flats and rock pavement.

Diagnosis: a poorly collected but distinctive species with loose, pale pink bulb scales, glabrous scape, and urceolate flowers with the tepals connate ± halfway, basally acuminate anther thecae, and short style. *Drimia secunda* has similar loose bulb scales, but these are obviously stalked, and the raceme is secund with very short pedicels, 1–2 mm long.

Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. **2816 (Oranjemund)**: sandy depression N of Witbank, (–DC), Oct. 1926, Pillans 5562 (BOL). **2917 (Springbok)**: 15 km N of Steinkopf, (–BC), 25 Jun. 1996 [leafing], G. & F. Williamson 5712 (NBG).

WESTERN CAPE: **3117 (Lepelfontein)**: 59–64 km S of Lutzville to Brand-se-Baai, (–BD), 15 Sep. 2008, P. Goldblatt & L. Porter 13122A (NBG). **3219 (Wuppertal)**: Langkuil farm, Doringbos, (–AB), 16 Oct. 1986 [fl. ex hort.], W. Metelkamp 574 (NBG); 11 km N of Ramkraal, Zuurfontein farm, (–AD), 15 Sep. 2002, A. Low 7862 (NBG). **3320 (Montagu)**: Matjiesfontein, (–BA), Oct. 1921, Foley 121 (PRE).

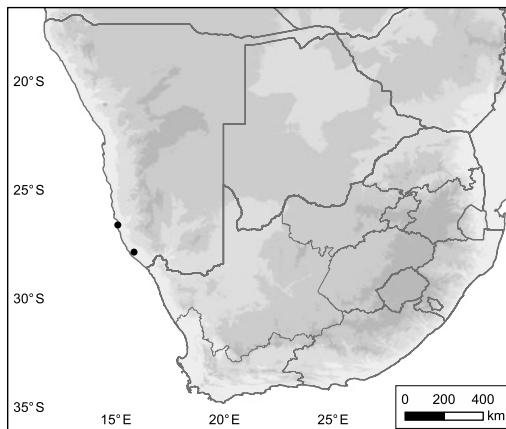


MAP 58.—Distribution of *D. arenicola*

59. **Drimia secunda** (B.Nord.) J.C.Manning & Goldblatt in Goldblatt & Manning in *Strelitzia* 9: 712 (2000). *Rhadamanthus secundus* B.Nord. in *Bot. Not.* 123: 168 (1970). Type: Namibia, Lüderitz (2615): 'Lüderitz-Süd, Kovisberge', (–CA), 30 Sep. 1959, Giess 2350 (M, holo.; WIND, iso.).

[*Ophioasylon peculiar* Dinter ms.: Dinter 6492 (SAM)]

Plants deciduous, gregarious and clump-forming. *Bulb* subglobose, 50–80 mm diam., scales separate and imbricate forming a lax rosette, clavate or ellipsoid-fusiform, stalked, 15–40 × 10–20 mm, very fleshy, pale pink, inner scales forming a papery, obscurely cross-banded sheathing collar. *Leaves* hysteranthous, ± 6 to 30 or more, suberect or flexuous, linear-subterete, 50–80 × 1.0–1.5 mm, fleshy, glabrous. *Inflorescence* a moderately dense, secund, spike-like raceme up to 150 mm tall, 10- to 25-flowered; scape erect, but rachis flexed outwards, ± 1.5 mm diam., glabrous; bracts ovate, 1–2 mm long (lower often larger), spur 0.5 mm long; pedicels spreading or arcuate, 1–2 mm long. *Flowers* pendent, campanulate or urn-shaped, unscented; tepals connate basally for 1.5–2.0 mm, lobes ovate-oblong, 1.5–2.0 × 1.5–2.0 mm, apices penicillate, brownish with darker midrib. *Filaments* 1.0–1.5 mm long, linear-subulate. *Antthers* connivent, arching inward over ovary, sub-basifixed, ovate-sagittate, 1.0–1.5 mm long, thecae acute apically and apiculate basally, dehiscing by short longitudinal slits from apex to halfway. *Ovary* subglobose, 2.0–2.5 mm long; style obsolete or shortly columnar, to 0.5 mm long; stigma crateriform with lobed margin, smooth. *Capsules and seeds* unknown. *Flowering time*: September.



MAP 59.—Distribution of *D. secunda*

Distribution and ecology: known from just two coastal inselbergs, the Kowisberg and the Buchuberg, near Lüderitz in southern Namibia (Map 59).

Diagnosis: a poorly known species occurring as clumps of 10 to 30, relatively large bulbs with separate, stalked bulb scales forming a loose rosette. At flowering the glabrous scape is flexed outwards at the base of the spike-like raceme, which faces north. The very short pedicels, 1–2 mm long, are diagnostic.

Additional specimen seen

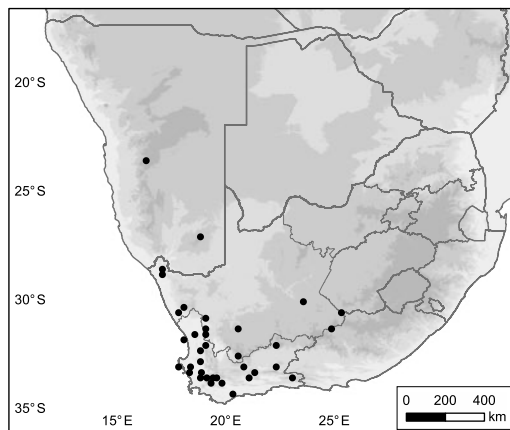
NAMIBIA. **2615 (Lüderitz)**: Lüderitzbucht, (–CA), 21 Oct. 1937, W. Otzen s.n. (BOL); Kovis [Kowis] Mts, near Lüderitzbucht, (–CA), without date, F. Eberlanz s.n. (BOL). **2715 (Bogenfels)**: W side of Buchuberg, (–DD), Jul. 1929 [leafing], Dinter 6492 (BOL, SAM).

60. **Drimia platyphylla** (B.Nord.) J.C.Manning & Goldblatt, comb. nov. [J.C.Manning & Goldblatt in Goldblatt & Manning in *Strelitzia* 9: 712 (2000), nom. inval.]. *Rhadamanthus platyphyllus* B.Nord. in Martínez-Azorín & Crespo in *Taxon* 63: 1332 (2014) [B.Nord. in *Bot. Not.* 123: 172 (1970), nom. inval.]. Type: South Africa, Western Cape, Clanwilliam (3218): 'below Cederberg Tafelberg', 3500–4000' [1 060–1 200 m], (–BB), 16 Dec. 1950 [leafing ex hort. Apr. 1951], E. Esterhuysen 18135 (BOL [140333, bulb with two leaves at bottom left corner of sheet], holo.!).

Plants deciduous. *Bulb* subglobose-ovoid, 20–45 mm diam., scales adherent, drying pale brown and becoming thinly leathery, usually forming a wrinkled collar. *Leaves* hysteranthous, (1)2, subopposite,

prostrate, leathery or sub-succulent, elliptic to broadly ovate, 10–40 × 6–25 mm, usually with a pair of depressed longitudinal furrows, upper surface densely velutinous, dark green or with paler longitudinal bands. *Inflorescence* a moderately dense raceme up to 300 mm tall, cylindrical or congested, 5- to 20-flowered, flowers mostly 1–8 mm apart; scape 0.5–1.5 mm diam., longitudinally scabridulous throughout, sometimes densely so; bracts ovate-deltoid to lanceolate, 1.0–2.5 mm long, spur 0.5–1.5(–2.0) mm long; pedicels suberect to spreading, 3–10 mm long, minutely scabrid-papillate or glabrate. *Flowers* pendent, urn-shaped to subglobose, unscented; tepals connate basally for 1–2 mm, lobes ovate-oblong, 3.5–6.0 × 1.5–2.5 mm, apices penicillate, creamy pink to reddish brown with darker midrib.

Filaments incurved, 1.0–1.5 mm long, subterete, papillate-puberulous. *Anthers* connivent, arching inward over ovary, sub-basifixed, ovate-sagittate with thecae diverging basally, 1.0–1.8 mm long, thecae acute apically and barbellate basally with spine-like or papilliform excrescences, dehiscing by short longitudinal slits from apex to middle. *Ovary* ovoid, 1.8–2.0 mm long; style columnar, ± 1 mm long; stigma trilete, smooth. *Capsule* broadly ovoid-subglobose, 3-lobed, 4.5–7.0 mm long. *Seeds* compressed, unequally elliptic to reniform, 3–4 mm long, folded and wrinkled, testa finely reticulate with raised walls. *Flowering time*: (October) November to January; flowers opening in the late afternoon and withering in the early evening.



MAP 60.—Distribution of *D. platyphylla*

Distribution and ecology: recorded from central and southern Namibia through southwestern South Africa, from the Richtersveld in Northern Cape south and east to Willowmore in Eastern Cape, and inland through the Upper Karoo to Kimberley and the southern Free State (Map 60); in shallow soil on rock ledges and cliffs, in rock outcrops and crevices, and in rock pans and shallow basins, often partially shaded.

Diagnosis: distinctive in leaf, producing two (rarely just one), prostrate leaves with a broadly ovate to elliptic blade that is densely velutinous on the upper surface and with impressed longitudinal furrows, as well as in its flowers, which are unique in the section and genus in their scabrid filaments and anthers with the thecae diverging below and barbellate or spinulose in the lower half or basally. The scape is scabridulous throughout, with even the pedicels ± scabridulous.

Additional specimens seen

NAMIBIA. **2316 (Nauchas)**: Rehoboth Dist., Areb, (–CB), 1929, *Wettstein 244* (PRE). **2718 (Grünau)**: farm Koche-na, (–BB), 11 May 1972 [leafing; fl. ex hort. 22 Oct. 1974], *W. Giess & M. Müller 11865* (PRE, WIND); 3 Aug. 1976 [leafing], *W. Giess 14463* (WIND).

SOUTH AFRICA. FREE STATE. **3025 (Colesberg)**: Gariep Dam, (–CB), 9 Sep. 2002 [leafing], *W. Cowley s.n.* (NBG).

NORTHERN CAPE. **2817 (Vioolsdrif)**: Richtersveld, Dolomite Peaks, (–CA), 10 Aug. 1979 [leafing; fl. ex hort.], *P. Perry 1140* (NBG); Karachabpoort, (–CC), 9 Mar. 1979 [fl. ex hort. 16 Feb. 1983, leafing ex hort. May 1983], *P. Perry 912* (NBG). **3017 (Hondeklipbaai)**: 16 miles [25.6 km] SW of Garies, (–DB), 19 Aug. 1970 [fl. ex hort. Jan. 1972; leafing ex hort. 1 Jun. 1972], *H. Hall 3764* (NBG). **3018 (Kamiesberg)**: SW side of Studer's Pass, (–AC), 10 Jun. 1980 [leafing; fl. ex hort. 11 Dec. 1980], *D. Snijman 285* (NBG). **3019 (Loeriesfontein)**: 23 km NW of Loeriesfontein, (–CC), *P. Perry s.n.* (NBG). **3023 (Britstown)**: 52 km N of Britstown on N12 to Kimberley, (–BA), 16 Apr. 2000 [leafing], *J. Manning 2239* (NBG). **3119 (Calvinia)**: Nieuwoudtville Wildflower re-

serve, (–AC), 10 May 1983 [leafing], P. Perry & D. Snijman 2073 (NBG); Lokenberg farm, SE of Nieuwoudtville, (–CA), 9 Jan. 1986 [fruiting; leafing ex hort. 30 Mar. 1986], D. Snijman 1015 (NBG). **3120 (Williston)**: 32 km E of Moutonsdrift towards Williston, (–BC), 27 Nov. 1985 [ex hort.], P. Perry 3380 (NBG). **3220 (Sutherland)**: Klein Roggeveld, (–DA), 28 Nov. 1939, P. Bond 149 (NBG).

WESTERN CAPE. **3118 (Vanrhynsdorp)**: Strandfontein, Vredendal, (–CC), crevices on coastal cliffs, 12 Nov. 1969 [leafing ex hort. 17 May 1970], H. Hall 3473 (NBG); 22 Nov. 1970, H. Hall 3907 (NBG); Aties Farm, SW of Vanrhynsdorp, (–DA), 18 Dec. 1981 [fl. ex hort; leafing ex hort. 13 Jul. 1982], P. Perry 1177 (NBG); Vuurborg farm, 24 km E of Vanrhynsdorp, (–DA), 20 Apr. 1971, H. Hall 3941 (NBG). **3218 (Clanwilliam)**: Clanwilliam, Elandsloof, (–BD), 9 Dec. 1940, E. Esterhuysen 3985 (BOL); Piketberg Mt, on top, (–DD), 8 Sep. 1965 [leafing; fl. ex hort. 11 Jan. 1966], W. Barker 10308 (NBG). **3219 (Wuppertal)**: foot of Pakhuis Pass, (–AA), 21 May 1980 [leafing], P. Perry 1322 (NBG). **3222 (Beaufort West)**: Nuweveldberge (Beaufort West-Loxton region), Farm Grootvlei, (–AB), 8 Mar. 2008 [fruiting], V. Clark & R. Cerros 472 (NBG). **3317 (Saldanha)**: Hoedjieskop (Baviaanskop), (–BB), 30 Aug. 1980, D. Snijman s.n. (NBG). **3318 (Cape Town)**: Langebaan, Donkergat, (–AB), 27 Jun. 1968 [leafing; fl. ex hort. 9 Jan. 1969], H. Hall 3201 (NBG); Klipberg, N of Darling, (–AD), 3 Mar. 1984 [fl. ex hort. 19 Dec. 1984; leafing ex hort. 15 May 1985], P. Perry 3087 (NBG); Riebeeck Kasteel, (–BD), 22 Apr. 1986 [leafing], J. Rourke 1853 (NBG); Paarl Rocks, (–DB), 13 Jul. 1982 [leafing and fruiting], P. Perry s.n. (NBG). **3319 (Worcester)**: ridge at N end of Dutoitskloof Peak, (–CA), Jan. 1952, E. Esterhuysen 18924 (BOL); Worcester, Blaauwkoop near Keeromsberg, (–CA), 16 Dec. 1951, E. Esterhuysen 19627 (BOL); Worcester, Fairy Glen Kloof at foot of Audensberg, (–CB), 1 Jan. 1950, E. Esterhuysen 16675 (BOL); Stettynskloof, (–CD), 19 Aug. 1961 [leaves], W. Barker 9462 (NBG); Hex River Valley, Kanetvlei farm, (–DA), 16 Jul. 1978, P. Perry 876 (NBG); Robertson, Klaasvoogds, (–DD), Jan. 1955 [leafing Jun. 1955], E. Esterhuysen 22686 (BOL). **3320 (Montagu)**: Laingsburg, Baviaans, (–BB), 17 Jul. 1944 [leafing], R. Compton 15734 (NBG). **3321 (Ladismith)**: Seweweekspoort, 10 km in poort from S entrance, (–AD), 5 Oct. 1979 [fl. ex hort. Dec. 1979–Jan. 1980], H. Hall 4808 (NBG); 12 miles [19.2] km S of Ladismith on road to Oktoberkraal, (–CA), 4 Jun. 1968 [leafing], H. Hall 3187 (NBG); NE slopes of Touwsberg, (–CA), 7 Oct. 1993 [leafing], D. Snijman 1399 (NBG). **3322 (Oudtshoorn)**: Tierberg, (–AB), 5 Dec. 1987, P. Bruyns 2885 (NBG). **3420 (Bredasdorp)**: De Hoop Farm, (–AD), 18 Dec. 1981 [ex hort; leafing ex hort. 13 Jul. 1982], P. Perry 1481 (NBG).

EASTERN CAPE. **3124 (Hanover)**: Middelberg, The Glen, (–BD), 4 Nov. 2016 [leafing], Marais et al. 16716 (NBG). **3323 (Willowmore)**: ± 6 km beyond Uniondale turnoff to Baviaanskloof, (–CA), 29 Sep. 1980, 18 Dec. 1981 [ex hort.; leafing ex hort. 13 Jul. 1982], P. Perry 1436 (NBG).

61. **Drimia oliverorum** J.C.Manning in Manning & Oliver in Bothalia 39: 225 (2009). Type: South Africa, Namibia, Witputz (2716): 'Huib Hoch Plateau, Zebrasfontein', (–DB), 1 200 m, 29 Jun. 1989 [leaf only], E.G.H. Oliver & I.M. Oliver 9164 (NBG, holo.!).

[*Rhadamanthus unifolius* ms.: Seely 2033 (WIND)]

Plants deciduous. *Bulb* subglobose, ± 15 mm diam., scales adherent, drying pale brown and becoming thinly leathery. *Leaf* hysteranthous, solitary, prostrate, leathery or sub-succulent, blade elliptic to ovate, 15–20 × 7–10 mm, with two solitary or paired, impressed longitudinal grooves, apically notched or toothed, upper surface densely velutinous, dark green. *Inflorescence* a moderately dense raceme up to 100 mm tall, few-flowered; scape longitudinally papillate-puberulous basally; bracts ovate, 1.5–2.0 mm long, spur 0.5–1.0 mm long; pedicels spreading, 5–7 mm long. *Flowers* slightly nodding, shallowly campanulate, unscented; tepals connate basally for ± 1 mm, lobes obovate, ± 5.0 × 2.5 mm, apices penicillate, pinkish white with darker midrib. *Filaments* incurved, 1 mm long, subterete. *Anthers* connivent, arching inward over ovary, sub-basifixed, ellipsoid, 1.8 mm long, thecae acute apically, dehiscing by longitudinal slits from apex to halfway. *Ovary* ovoid, 1.8 mm long; style columnar, 1.8 mm long; stigma trilete, smooth. *Capsules and seeds* unknown. *Flowering time*: not recorded, probably October–November. Figure 29.

Distribution and ecology: restricted to southern Namibia, where it has been recorded from the Huib Hoch Plateau and near Ai-Ais (Map 61); on stony flats and on gravelly patches on a quartzite ridge.

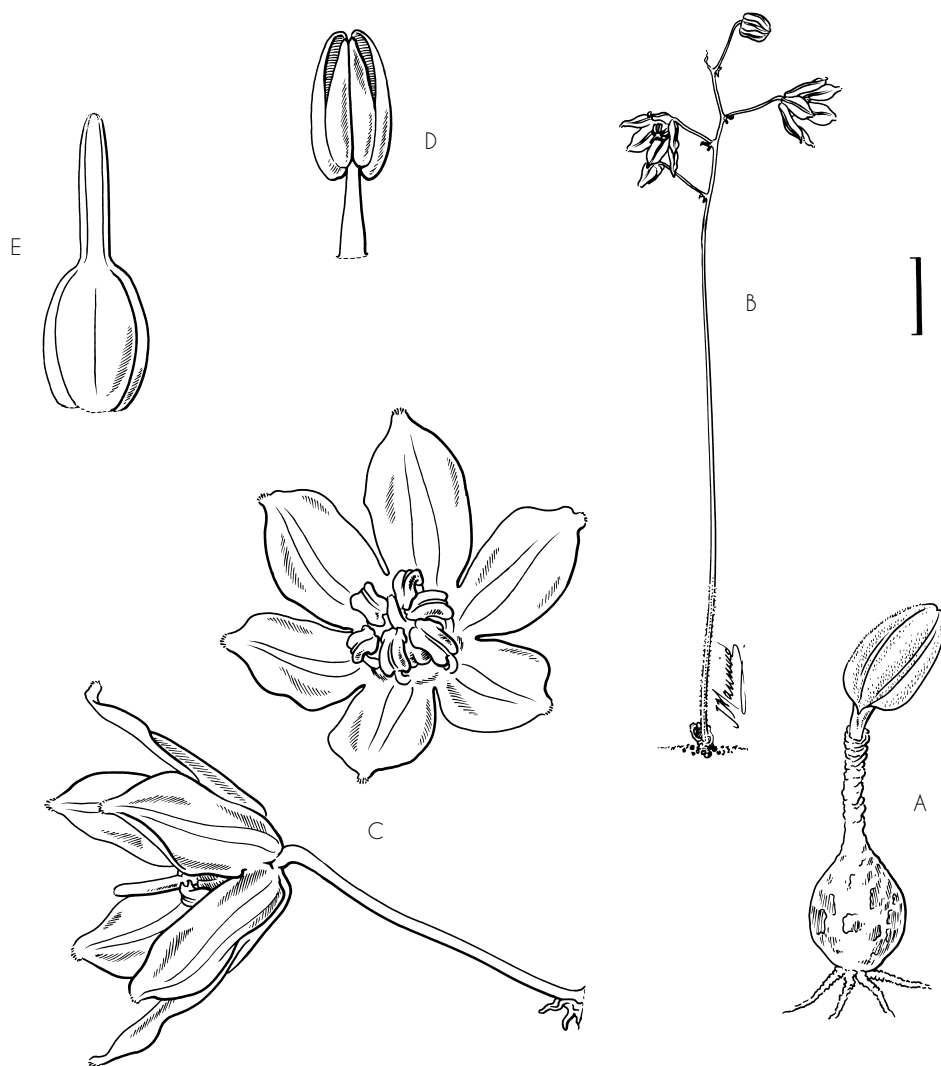
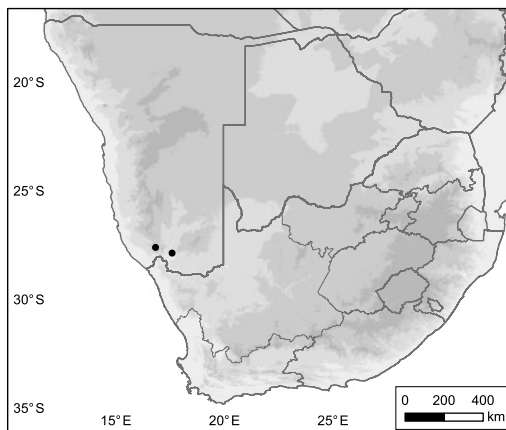


FIGURE 29.—*Drimia oliverorum*, Namibia, Witputz, Oliver 9164 (NBG). A, leafing bulb; B, inflorescence; C, flowers; D, stamen; E, gynoecium. Scale bar: A, B, 10 mm; C, 2 mm; D, E, 1 mm. Artist: John Manning.

Diagnosis: resembling *Drimia platyphylla* in its ovate-elliptical leaf with the upper surface velutinous and with two to four longitudinal grooves, but distinguished by the glabrous filaments and ellipsoid anthers with the bases of the thecae smoothly rounded. *Drimia platyphylla*, which is widespread through the western half of South Africa and has also been recorded from central and southern Namibia, differs from *D. oliverorum* in its usually paired leaves, distinctly pendent, urn-shaped flowers with papillate-puberulous filaments and sagittate anthers with basally diverging thecae barbellate at the base, and in the very short style, markedly shorter than the ovary.



MAP 61.—Distribution of *D. oliverorum*

Additional specimens seen

NAMIBIA. 2616 (Aus): farm Aar, (–DA), 2 Nov. 1982, *Lauranos & Pehlman* 20748 (WIND). **2717 (Chamaites):** road junction to Ai-Ais, 11 km from Ai-Ais, (–DC), quartzite ridge with gravel and stones, 27 Jun. 1974, *Nordenstam & Lundgren* 180 (NBG, S).

62. ***Drimia convallarioides* (L.f.) J.C.Manning & Goldblatt** in Goldblatt & Manning in *Strelitzia* 9: 711 (2000). *Hyacinthus convallarioides* L.f., Suppl. Pl.: 204 (1782). *Rhadamanthus convallarioides* (L.f.) Baker in J. Linn. Soc., Bot. 11: 434 (1871). Type: South Africa, Sutherland (3220): 'karroo below Roggeveld', (–CA), *Thunberg s.n.* UPS-THUNB8519 [UPS-THUNB, lecto., designated by Nordenstam in Bot. Not. 123: 159 (1970)].

Rhadamanthus montanus B.Nord. in Martínez-Azorín & Crespo in *Taxon* 63: 1331 (2014) [B.Nord. in Bot. Not. 123: 162 (1970), nom. inval.]. Type: South Africa, Western Cape, Cape Town (3318): 'Jonkershoek Twins', (–DD), 12 Feb. 1945 [bulb with withered leaves and two inflorescences], *E. Esterhuysen* 11456 (BOL, holo.!, K, NBG!, iso.).

Plants deciduous, solitary. *Bulb* subglobose or ovoid, 15–30 mm diam., scales adherent, becoming papery and greyish. *Leaves* $\pm$ 4 to 20, erect or arcuate, filiform to hemiterete and flat or slightly concave above, 40–150 $\times$ 1.0–2.5 mm, striate or ribbed when dry, glabrous or rarely minutely scabridulous along veins, firm-textured, bases sheathing, translucent with obscure horizontal bars. *Inflorescence* a moderately dense to fairly lax, subsecund raceme, 80–250 mm tall, 5- to 50-flowered, flowers mostly 5–10 mm apart; scape straight or weakly flexuous, sometimes flexed outward at base of raceme, 1.0–2.5 mm diam., longitudinally scabrid-puberulous in basal half or higher; bracts ovate-deltoid, 1–2 mm long, spur to 1 mm long; pedicels suberect to spreading, 3–15(–18) mm long. *Flowers* diurnal, campanulate to broadly campanulate, pendent; tepals connate for 1–3 mm, lobes elliptic-oblong, 5–10 $\times$ 1.5–3.0 mm, apices penicillate, whitish to pinkish brown with darker midrib. *Filaments* curved inwards over ovary, 1–2 mm long, linear, white. *Anthers* convergent, sub-basifixed, elliptic, 1–2 mm long, thecae acute apically, obtuse basally, dehiscence through apical slits reaching just below middle of thecae, orange or yellow. *Ovary* ovoid-conical, $\pm$ 2–4 mm long, sometimes papillate, pale green; style columnar-clavate, 1.0–2.5 mm long, white; stigma trilete, smooth. *Capsules* ovoid to subglobose, 3-angled, 4–7 mm long. *Seeds* oblong or lunate, wrinkled, 2–4 mm long. *Flowering time*: October to January. Plate 2B.

Distribution and ecology: largely restricted to the Cape Floristic Region, from the Bokkeveld Mtns of Northern Cape through Vanrhynsdorp, the Cederberg and Cold Bokkeveld Mtns to the Hottentots Holland Mtns and inland to the Klein Roggeveld and Swartberg in Western Cape, with a single collection from the Kamiesberg in Namaqualand (Map 62); mostly in fynbos, rarely succulent karoo, in shallow soil on stony slopes and especially rock ledges or sheets, often in seasonally wet places.

Diagnosis: very variable in number and size of flowers, *Drimia convallarioides* is largely a fynbos species, with $\pm$ pendent, campanulate flowers with linear-subulate filaments 1–2 mm long and as long as or longer than the anthers, which are basally obtuse. It is sympatric with *D. uranthera* at Oudtshoorn, but that species is readily recognised by its basally spurred anthers and obsolete style.

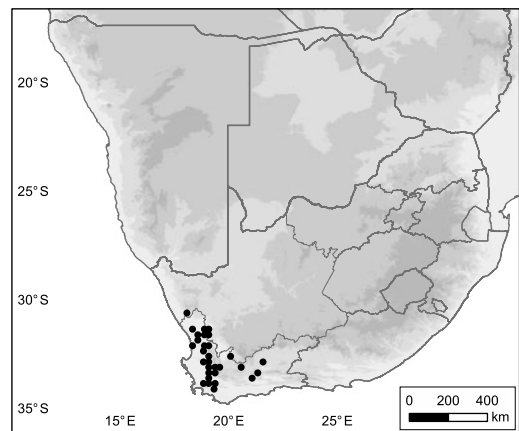
Additional specimens seen

SOUTH AFRICA. NORTHERN CAPE. 3018 (Kamiesberg): near Garies, (–CA), Nov. 1939, *E. Esterhuysen* 2610 (BOL).

3119 (Calvinia): top of Vanrhyn's Pass, (–AC), 30 Nov. 1993, *J. Manning* 2095 (NBG); Lokenberg, (–CA), 9 Dec. 1946, *F. Leighton* 2359 (BOL).

WESTERN CAPE. 3118 (Vanrhynsdorp): Hol River, 17 miles [27 km] N of Vredendal, (–AD), 7 Nov. 1970 [leaves ex hort. 7 Jul. 1971], *H. Hall* 3895 (NBG); E of Vanrhynsdorp on hills towards Vanrhyns Pass E of Grootdrif, (–BD), 17 Nov. 2001, *D. Snijman* 1868 (NBG); 5 km S of Vanrhynsdorp, (–DA), without date, *J. Lauranos* 20830 (NBG); pans on top of Gifberg, (–DB), 9 Jan. 1986 [ex hort.], *P. Perry* s.n. (NBG); Klawer, (–DC), Oct. 1944, *C. Leipoldt* s.n. (BOL); Klawer, (–DC), 5 Dec. 1945 [ex hort.], *C. Leipoldt* s.n. (NBG). **3218 (Clanwilliam):** Cederberg, Wolfberg, (–AB), 26 Dec. 1953, *E. Esterhuysen* 22474 (BOL); Pakhuis Pass, (–BB), 1 Dec. 1934, *T. Salter* 5025 (BOL); rock basins on summit of Pakhuis, (–BB), 29 Dec. 1948, *E. Esterhuysen* 14953 (BOL); Pakhuis Pass, near Leipoldt's grave, (–BB), 1 Aug. 1968 [leafing], *H. Hall* 3222 (NBG); Clanwilliam, Rondegat, (–BD), Oct. 1938, *L. Bolus* s.n. BH30630 (BOL); Clanwilliam, Nooitgedacht farm, (–BD), 13 Dec. 1993, *D. Gildenhuys* 929 (NBG); 15.6 km from Algeria to Clanwilliam, (–BD), 11 Dec. 1981, *P. Perry* 1317 (NBG); Elandskloof, (–BD), 14 Dec. 1935, *M. Levyns* 5109 (BOL); Piketberg, plateau at Bugler's Post, (–DD), shallow soil on rock surface, 15 Dec. 1979, *E. Esterhuysen* 35311 (BOL); Piketberg, SE of Levant Hill, (–DD), 1 Feb. 1982, *H. Linder* 3162 (BOL). **3219 (Wuppertal):** Boontjieskloof farm E of Pakhuis, (–AA), 2 Dec. 1985 [fl. ex hort.], *P. Perry* 3447 (NBG); Heuningvlei, (–AA), 29 Dec. 1941, *E. Esterhuysen* s.n. (NBG); Elandskloof, Cold Bokkeveld Mtns, (–CA), Jan. 1952, *E. Esterhuysen* 18449 (BOL); Elandskloof, 20 km SE of Citrusdal, (–CA), 16 & 17 Jan. 1986, *M. Bayer* s.n. (NBG); Middelburg Pass, (–CA), 23 Dec. 2000, *J. Manning* 2301 (NBG); Porterville, Grootfontein, next to Ratelrivier, (–CC), 12 Dec. 1982, *L. van Zyl* 3417 (NBG). **3220 (Sutherland):** Koedoesberg, (–CA), 28 Oct. 1950, *H. Hall* 284 (NBG).

3221 (Merweville): Prince Albert, (–DC), Jan. 1923 [fl. ex hort.], *Neethling* s.n. (BOL). **3318 (Cape Town):** Jonkershoek, Langrivier, (–DD), Feb. 1966, *O. Kerfoot* 5675 (NBG); Jonkershoek Twins, (–DD), 12 Feb. 1945, *E. Esterhuysen* 11456 (NBG); Stellenbosch, Guardian Peak, (–DD), 13 Jan. 1955, *E. Esterhuysen* 24132 (BOL); Banhoek, (–DD), 11 Jan. 1941, *R. Compton* 10346 (NBG). **3319 (Worcester):** Twenty Four Rivers Kloof, (–AA), 6 Dec. 1950, *E. Esterhuysen* 17948 (BOL); Op-de-Berg, (–AB), 12 Jan. 2001, *J. Manning* 2305 (NBG); Witzenberg, (–AC), 4 Jan. 1984, *M. Hoffman* 317 (NBG); Tulbagh, near Montpellier farm, (–AC), 26 Sep. 1984 [leafing; fl. ex hort. Mar. 1985], *Leach & Perry*



MAP 62.—Distribution of *D. convallarioides*

17215A (NBG); Ceres, Visgat, upper Olifants River Valley, (–AD), 26 Dec. 1946, *F. Leighton* 13391 (BOL); Agter Witzenberg, Visgat, (–AD), 30 Dec. 1962, *H. Taylor* 4552 (NBG); Michell's Pass, (–AD), 16 Nov. 1952, *E. Esterhuysen* 20724 (BOL); Waaiohoek Mts, lower part of Jan du Toit's Kloof, (–AD), 19 Jan. 1949, *E. Esterhuysen* 15065 (BOL); 7.5 km towards Calvinia from Karooport, (–BA), 24 Oct. 2004, *D. Snijman* 1976 (NBG); Bainskloof, (–CA), 11 Jan. 1940, *H. Henry s.n.* (NBG); Bainskloof, N side of Sebastianskloof, (–CA), 31 Jan. 1951, *E. Esterhuysen s.n.* (NBG); Bainskloof Mts, Bailey's Peak, (–CA), 21 Feb. 1954, *E. Esterhuysen* 22738 (BOL); Dutoitskloof, (–CA), 16 Dec. 1944, *R. Adamson* 3576 (BOL); Elandskloof off Dutoitskloof, (–CA), 28 Dec. 1952, *E. Esterhuysen* 20983 (BOL); Drakenstein Mts, Devil's Tooth, (–CC), 12 Dec. 1943, *E. Esterhuysen* 9518 (BOL); Stettynsberg, NW end of Klein Tafelberg, (–CD), 10 Jan. 1985, *E. Oliver* 8653 (NBG); Stettynsberg, (–CD), 16 Dec. 1944, *E. Esterhuysen* 11445 (BOL); Stettyn, (–CD), 2 Jan. 2009 [ex hort.], *A. Harrower* 3522 (NBG). **3320 (Montagu)**: Laingsburg, Whitehill, (–BA), 10 Nov. 1935, *R. Compton s.n.* (BOL); Whitehill, (–BA), 21 Nov. 1944, *R. Compton* 16387 (NBG). **3321 (Ladismith)**: Seven Weeks Poort, (–AD), 19 Dec. 1939, *J. Lewis s.n.* (NBG). **3322 (Oudtshoorn)**: Oudtshoorn, (–CA), Apr. 1933, *W. Barker* 126a (BOL). **3419 (Simonstown)**: Nuweberg, (–AB), 10 May 1966 [leafing; fl. ex hort. 15 Dec. 1966], *W. Barker* 10376 (NBG).

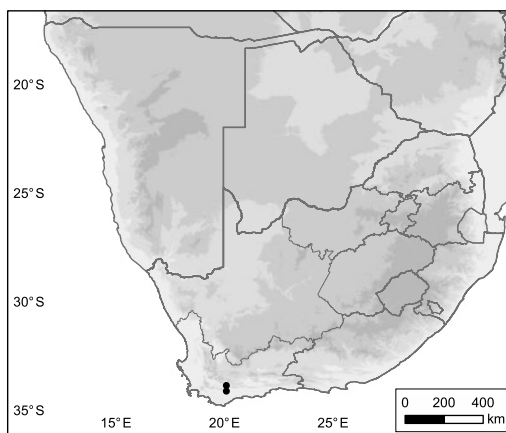
63. ***Drimia albiflora* (B.Nord.) J.C.Manning & Goldblatt** in Goldblatt & Manning in *Strelitzia* 9: 711 (2000). *Rhadamanthus albiflorus* B.Nord. in *Botaniska Notiser* 123: 177 (1970). Type: South Africa, Western Cape, Bredasdorp (3420): 'Hesquaspoort', (–AA), 20 Dec. 1962, *Acocks* 23242 (PRE, holo.!).

[*Rhadamanthus montaguense* [sphalm.] Oberm. ms: *H. Bolus* 2797 (NBG)]

Plants deciduous, solitary. *Bulb* subglobose to pyriform, 15–25 mm diam., scales adherent, becoming papery and greyish. *Leaves* $\pm$ 4, suberect or arcuate, terete, 30–50 $\times$ 1.0–1.5 mm, striate, glabrous firm-textured, sheathing bases translucent with obscure horizontal bars. *Inflorescence* a moderately dense to fairly lax raceme up to 250 mm tall, 6- to 15-flowered, flowers mostly 3–8 mm apart; scape straight or weakly flexuous, 0.5–1.0 mm diam., longitudinally scabrid-puberulous in basal half or higher; bracts ovate-deltoid, auriculate-denticulate, 1–2 mm long, spur to 1 mm long; pedicels suberect to spreading, 3–9 mm long at anthesis. *Flowers* diurnal, broadly campanulate to subrotate, weakly nodding; tepals connate for 1.0–1.5 mm, lobes elliptic-oblong, 4–5 $\times$ 1.5–2.5 mm, apices penicillate, whitish with darker midrib. *Filaments* curved inwards over ovary, 0.3–0.5 mm long, oblong, white. *Anthers* convergent, sub-basifixed, elliptic, 2.5 mm long, thecae acute apically, dehiscence through apical slits reaching just below middle of thecae. *Ovary* ovoid, $\pm$ 2 mm long, pale green; style columnar, 1.8 mm long, white; stigma trilobate, smooth. *Capsules and seeds* unknown. *Flowering time*: December.

Distribution and ecology: a poorly understood species known from two localities, one near Montagu and the other near Bonnievale in Western Cape (Map 63); in 'marginal fynbos on northern slopes'.

Diagnosis: similar to *Drimia convallarioides*, but separated by very short filaments, 0.3–0.5 mm vs 1–2 mm long.



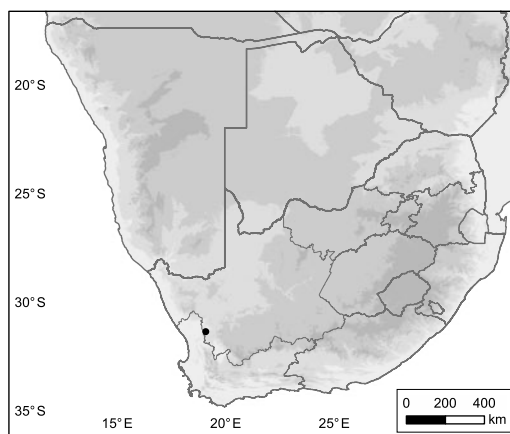
MAP 63.—Distribution of *D. albiflora*

Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. **3320 (Montagu)**: Montagu Baths, (–CC), Dec. 1892, *H. Bolus* 2797 (NBG); 1893–1894 [fl. ex hort. Jan. 1901], *H. Bolus* 7567 (BOL, PRE).

64. ***Drimia involuta*** (*J.C.Manning & Snijman*) *J.C.Manning & Goldblatt* in *Goldblatt & Manning* in *Strelitzia* 9: 712 (2000). *Rhadamanthus involutus* *J.C.Manning & Snijman* in *Snijman & Manning* in *Novon* 9: 113 (1999). Type: South Africa, Northern Cape, Calvinia (3119): 'Arendskraal farm, W of Nieuwoudtville', (–AC), 20 Dec. 1995, *D. Snijman & J. Manning* 1525 (NBG, holo.!, K!, MO!, PRE!, iso.).

Plants deciduous, solitary or rarely clumped. *Bulb* subglobose to ovoid, 20–30 mm diam., scales adherent, becoming papery and greyish, bases membranous and sheathing, translucent with obscure horizontal bars. *Leaves* hysteranthous, 3 to 6, erect or straggling, filiform, 100–200 × 0.5 mm. *Inflorescence* a moderately dense raceme up to 200 mm tall, 16- to 20-flowered, flowers mostly 3–5 mm apart; scape 0.5–1.0 mm diam., longitudinally scabrid-puberulous in basal half; bracts ovate-deltoid, auriculate-denticulate, 1–2 mm long, spur to 1 mm long; pedicels spreading, 3–4 mm long. *Flowers* diurnal, spreading, broadly campanulate; tepals connate for 1 mm, white with dark basal blotch, dimorphic, outer lobes suberect, ovate, concave with apex recurved, 4 × 2.5 mm, apices penicillate, inner erect-incurved, tightly involute, glabrous. *Filaments* curved inwards around ovary, 0.5 mm long, oblong, white. *Anthers* convergent, sub-basifixed, elliptic, 1.5 mm long, thecae acute apically, obtuse basally, dehiscence through apical slits reaching below middle of thecae, orange. *Ovary* ovoid, ± 1.5 mm long, pale green; style erect, terete, 1.5 mm long, white; stigma trilete, smooth. *Capsules* ovoid, 3 mm long. *Seeds* elliptic, glossy black, 2 mm long, testa finely reticulate with raised walls. *Flowering time*: November to December. Figure 30.



MAP 64.—Distribution of *D. involuta*

Distribution and ecology: known only from the Bokkeveld Escarpment in Northern Cape (Map 64); in pockets of humic soil on exposed sandstone pavement.

Diagnosis: recognised by its unique flowers with markedly dimorphic perianth whorls, the outer tepals erect-concave with recurved apices and the inner tepals erect-incurved and tubular with the margins closely involute. Both whorls of tepals are white with a dark olive green blotch at the base. The short, spreading pedicels are also distinctive.

Additional specimen seen

SOUTH AFRICA. NORTHERN CAPE. **3119 (Calvinia)**: top of Vanrhyn's Pass, (–AC), 30 Nov. 1993, *J. Manning* 2098 (NBG).

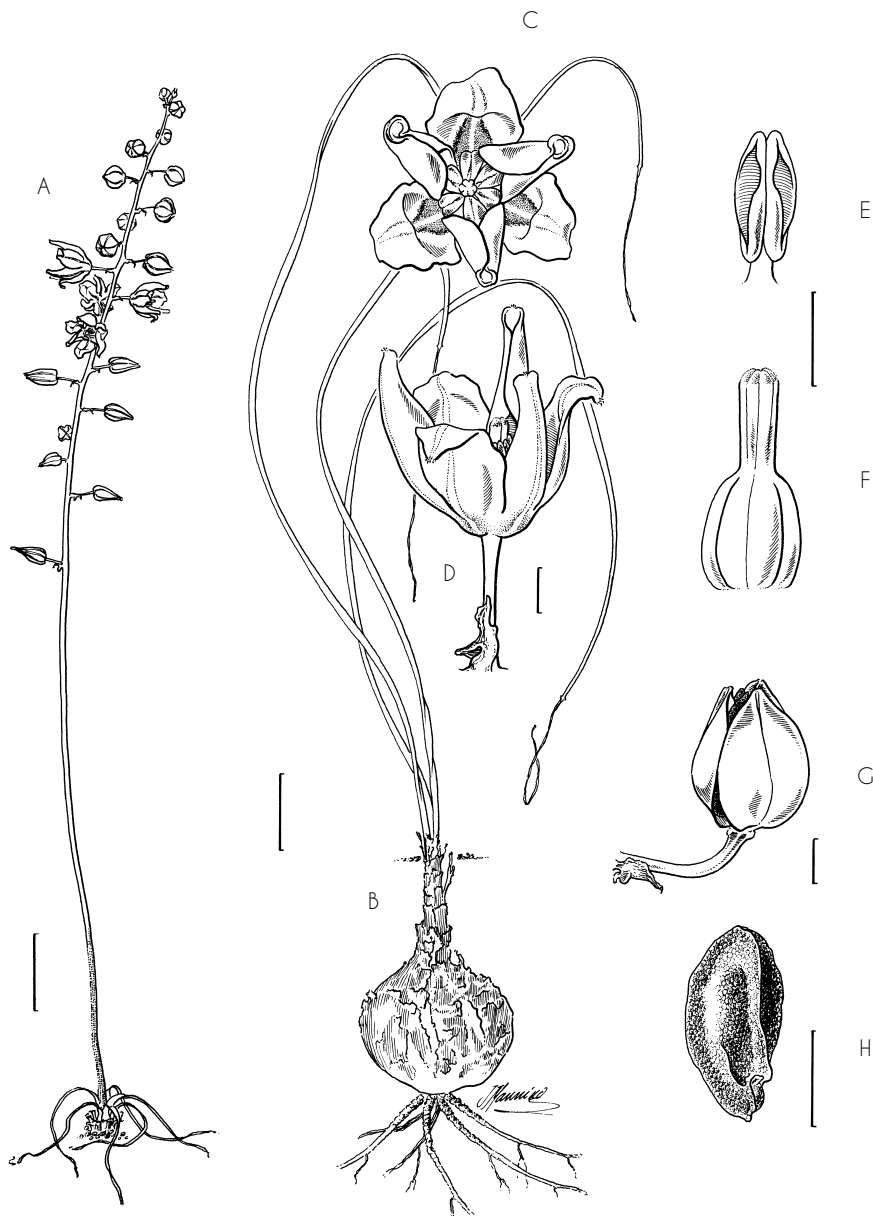
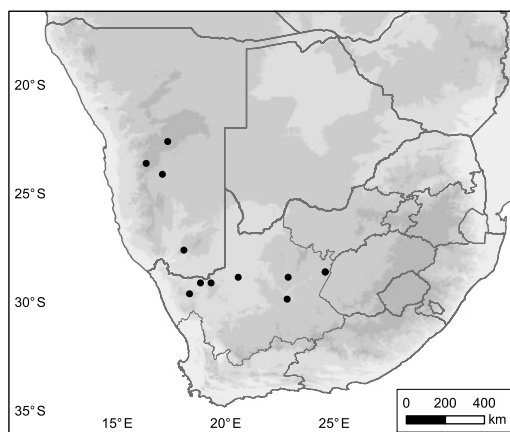


FIGURE 30.—*Drimia involuta*, Northern Cape, Nieuwoudtville, Snijman & Manning 1525 (NBG). A, inflorescence; B, leafy plant; C, flower front view; D, flower side view with bract; E, stamen; F, gynoecium; G, capsule; H, seed. Scale bar: A, B, 10 mm; C, D, G, 2 mm; E, F, H, 1 mm. Artist: John Manning.

65. **Drimia fasciata** (B.Nord) J.C.Manning & Goldblatt in Goldblatt & Manning in Strelitzia 9: 711 (2000). *Rhadamanthus fasciatus* B.Nord. in Bot. Not. 123: 174 (1970). Type: South Africa, Northern Cape, Kimberley (2824): 'Nooitgedacht, 10 mi [16 km] SE of Barkly West', (–DA), 15 Oct. 1960, Leistner 1963 (PRE, holo.!, LD, iso.).

Plants deciduous, solitary. *Bulb* subglobose to pyriform, 20–30 mm diam., scales adherent, becoming papery and greyish, forming a distinct collar. *Leaf* hysteranthous, solitary, erect, filiform or terete, up to 200 × 0.5–1.0 mm, glabrous, leathery, basal sheaths of inner 1 or 2 leaves rolled and sheathing base of scape as membranous collar 10–50(–80) mm long, white or silvery with dark, thickened horizontal bars. *Inflorescence* a moderately dense raceme up to 250 mm tall, 10- to 30-flowered, flowers mostly 2–5 mm apart; scape 0.25–1.00 mm diam., glabrous; bracts ovate-deltoid, auriculate-denticulate, 1.0–1.5 mm long, spur to 0.5 mm long; pedicels suberect to spreading, 6–8(10) mm long at anthesis. *Flowers* diurnal, ± spreading or weakly nodding, rotate; tepals connate for 1.0–1.5 mm, outer lobes spreading, inner suberect, elliptic-oblong, 3.5–5.5 × 1.5–2.5 mm, apices penicillate or ciliate, whitish to pale yellow or brownish pink, with darker midrib. *Filaments* suberect around ovary, 1.0–1.7 mm long, subulate, white. *Anthers* erect, sub-basifixed, lanceolate, 2.0–2.5 mm long, thecae acute apically, obtuse basally, dehiscence through apical slits reaching just below middle of thecae. *Ovary* ovoid, ± 2 mm long, pale green; style columnar, 1.5 mm long, white; stigma trilete, smooth. *Capsules and seeds* unknown. *Flowering time*: Mainly October and November.



MAP 65.—Distribution of *D. fasciata*

Distribution and ecology: distributed through the highlands of central and southern Namibia from Windhoek to Keetmanshoop and the western interior of South Africa along the drainage basin of the Orange River through Bushmanland and Griqualand West to Barkly West in Northern Cape (Map 65); in rock crevices or rocky flats.

Diagnosis: distinctive in its conspicuous, horizontally barred membranous sheaths enclosing the base of the glabrous scape, and producing a solitary, terete leaf. The flowers are ± rotate, with tepals connate at the base, and erect stamens with anthers dehiscing through apical slits reaching just below the middle of the thecae. The prominent, barred cataphylls recall those in sect. *Sypharissa*.

Additional specimens seen [* not seen but cited by Nordenstam (1970)]

NAMIBIA. **2217 (Windhoek)**: Windhoek, Binsenheim, (–CB), Aug. 1956, Volk 11078 (M)*; Gr.-Aud, (–CB), 7 Nov. 1965 [fl. in cult Sep. 1974], W. Giess 9041A (PRE). **2316 (Nauchas)**: Damas, (–CA), Nov. 1939, Volk 788 (M)*. **2417 (Maltahohe)**: Bläskrantz (–AA), Nov. 1939, Volk 922 (M)*. **2718 (Grünau)**: Klein Karas, (–CA), Nov. 1923, Dinter 5071 (B)*.

SOUTH AFRICA. NORTHERN CAPE. **2820 (Kakamas)**: Kakamas, (–DC), Nov. 1930, Fuller 26 (PRE). **2822 (Glen Lyon)**: top of Langebergen at Bergenaars Pad, (–DD), Oct. 1936, Acocks sub Hafström 1098 (BOL, PRE). **2824 (Kimberley)**: Nooitgedacht, 10 miles [16 km] SE of Barkly West, (–DA), Oct. 1960, Leistner 1983

(PRE). **2918 (Gamoep)**: Bushmanland, Gamsberg, (–BB), 12 Nov. 1987, *E. van Jaarsveld* 9508 (NBG); 6 km S of Bakenskop, (–CB), 1 020 m, 21 Nov. 1981, *N. van Berkel* 465 (NBG). **2919 (Pofadder)**: Gannapoort, 22 miles [35 km] SE of Pofadder, (–AB), Oct. 1961 [flowering ex hort.], *Leistner* 2400 (PRE). **2922 (Prieska)**: Prieska, (–DD), 1–10 Oct. 1931, *Bryant* 846 (PRE).

Sect. 18. **Schizobasis** (Baker) J.C.Manning & Goldblatt, comb. et stat. nov. *Schizobasis* Baker in J. Bot. 11: 105 (1873). Type: *Schizobasis macowanii* Baker = *D. intricata* (Baker) J.C.Manning & Goldblatt.

Plants small. *Bulb* scales adherent, flesh white to pale pink. *Leaves* 1 or 2, sometimes present only in seedling stage, filiform or terete, glabrous. *Inflorescence* variously branched, sometimes paniculate, persisting and photosynthetic; scape longitudinally scabridulous; bracts ovate, minutely spurred; bracteoles absent; pedicels longer than tepals at flowering. *Flowers* diurnal, campanulate to urceolate or rotate, pendent, perianth deciduous, cohering above to form a cap on developing capsule; tepals connate basally, lobes elliptic to ovate, white or pinkish with darker midrib. *Filaments* erect and usually connivent around ovary, longer than anthers, subulate. *Anthers* connivent around style, medifixed, elliptic or $\pm$ sagittate, connective apiculate, dehiscence longitudinal. *Ovary* ovoid; style erect, $\pm$ as long as ovary; stigma obtuse, minutely 3-lobed. *Capsule* ovoid to prismatic. *Seeds* angled.

Key to species

- 1a. Inflorescence almost a simple raceme, the lowest 1 or 2 nodes with a short spreading branch resembling a pedicel bearing 1 or 2 accessory flowers; plants from Richtersveld. 66. *D. schizobasoides*
- 1b. Inflorescence obviously paniculate and weakly to extensively branched with lowest nodes subopposite or $\pm$ ternate and bearing multi-flowered branches; plants widespread but evidently not from Richtersveld:
 - 2a. Flowering pedicels suberect or spreading, geniculate in fruit; anther connective minute, $\pm$ 0.1 mm long. 67. *D. intricata*
 - 2b. Flowering pedicels deflexed from base, sigmoid in fruit; anther connective conspicuous, $\pm$ 0.3 mm long. 68. *D. sigmoidea*
66. **Drimia schizobasoides** J.C.Manning & J.M.J.Deacon, sp. nov. Type: South Africa, Northern Cape, Springbok (2917): 'Karrachabpoort', (–AC), 23 Dec. 2015 [ex hort], *Deacon* 3915 (NBG, holotype!).

Plants deciduous. *Bulb* solitary, subglobose, 10–20 mm diam., scales adherent, white or greenish when exposed. *Leaves* present only on non-flowering plants, 1 or 2, filiform, 20–40 mm long. *Inflorescence* up to 100 mm high, up to 15-flowered, racemose with lowermost two nodes developing short spreading branches resembling pedicels bearing 1 or 2 accessory flowers; scape wiry, longitudinally striate-scabridulous in basal part; bracts lanceolate, lowermost 1–2 mm long with spur 0.5 mm long; pedicels ascending-sigmoid, $\pm$ 10 mm long, sharply recurved apically in fruit. *Flowers* diurnal, pendent, urceolate or campanulate, unscented; tepals connate in basal 1 mm, lobes suberect or slightly spreading, elliptic to obovate, 3.0×1.5 mm, penicillate, white with green keels. *Filaments* sigmoid and apically inflexed, connivent around style, filiform, $\pm$ 2 mm long, white; anthers connivent around style, medifixed, $\pm$ 1 mm long with connective extended apically into conspicuous membranous flap $\pm$ 0.25 mm long, longitudinally dehiscent, green with cream pollen. *Ovary* oblong with conspicuous shoulders, $\pm$ 1.5 mm long, greenish with yellow blotch on shoulders; style columnar, $\pm$ 1.5 mm long, white; stigma obtuse, minutely 3-lobed. *Capsules and seeds* unknown. *Flowering time*: December;

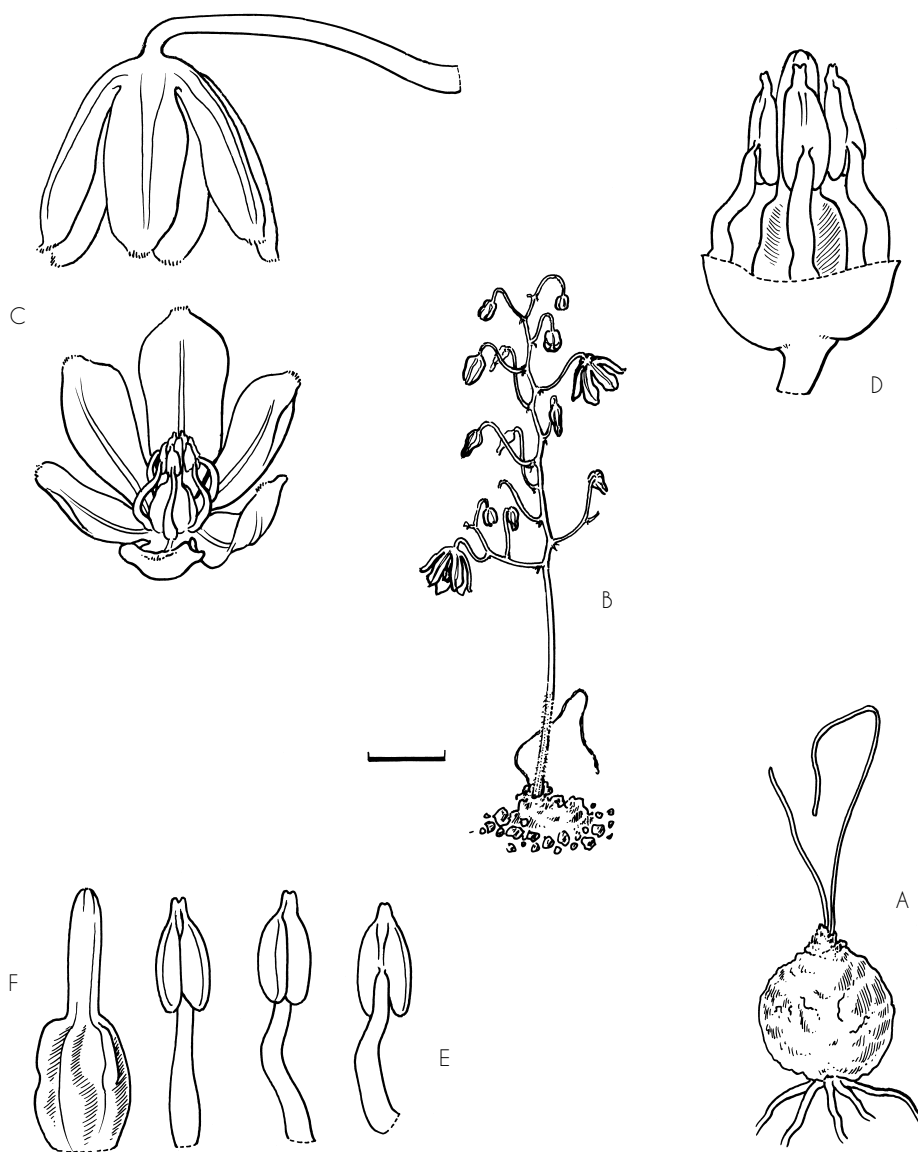
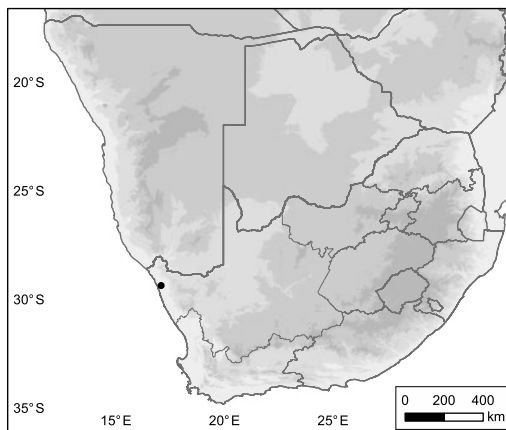


FIGURE 31.—*Drimia schizobasoides*, Northern Cape, Karrachabpoort, Deacon 3915 (NBG). A, leafing plant; B, inflorescence; C, flowers; D, insertion of stamens; E, stamens; F, gynoecium. Scale bar: A, B, 10 mm; C, 2 mm; D–F, 1 mm. Artist: John Manning.

flowers opening mid-afternoon and withering in the evening, Figure 31.

Distribution and ecology: known from two locations east of Port Nolloth at the southeastern edge of the Richtersveld (Map 66); forming colonies in seasonally damp places on south-facing cliffs.

Diagnosis: *Drimia schizobasoides* is distinguished from the other two members of sect. *Schizobasis* by its short, scarcely branched inflorescence, mostly a simple raceme with the lowest one or two nodes producing short, spreading branches that resemble few-flowered pedicels bearing two or three flowers. The nodes on the inflorescence are strictly alternate whereas the lower nodes are subopposite or ternate in the other two species.



MAP 66.—Distribution of *D. schizobasoides*

The inflorescence has evidently not entirely taken over the role of photosynthesis, and non-flowering plants produce one or two filiform leaves. In the other two species in the section, production of leaves is suppressed in mature plants, which rely on the persistent inflorescence axis for photosynthesis. The ovary in *D. schizobasoides* has a conspicuous yellowish green blotch on the shoulders of the septa immediately above the nectar pores, and similar pale blotches are also characteristic of *D. sigmoidea*, but have not been recorded in *D. intricata*.

Additional specimen seen

SOUTH AFRICA. NORTHERN CAPE. **2917 (Springbok):** Vyftienmyl-se-Berg, E of Port Nolloth (–AC), Deacon s.n. (sight record only).

67. ***Drimia intricata* (Baker) J.C.Manning & Goldblatt** in Goldblatt & Manning in *Strelitzia* 9: 712 (2000). *Anthericum intricatum* Baker in *J. Bot.* 10: 140 (1872). *Schizobasis intricata* (Baker) Baker in *J. Bot.* 12: 368 (1874). Type: South Africa, 'Cape', Zeyher 4284 (K [000257121], lecto. —image!, designated by Manning et al. in *S. Afr. J. Bot.* 94: 264 (2014); SAM [0022792-0]!, islecto.).

Schizobasis macowanii [as 'macowani'] Baker in *J. Bot.* 11: 105 (1873). Type: South Africa, Eastern Cape, Somerset East (3225): 'inter frutices pr. fl. Klein Visch Rivier prope Somerset East', (–DA), MacOwan 1847 (K [000257123], lecto. —image!, designated by Manning et al. in *S. Afr. J. Bot.* 94: 264 (2014); BOL!, SAM [0022788-0], islecto.).

Asparagus cuscutoides Burch. ex Baker in *J. Linn. Soc., Bot.* 14: 606 (1875). *Schizobasis cuscutoides* (Burch. ex Baker) Benth. & Hook.f., *Gen. Pl.* 3: 786 (1883). *Drimia cuscutoides* (Burch. ex Baker) J.C.Manning & Goldblatt in Goldblatt & Manning in *Strelitzia* 9: 711 (2000). Type: South Africa, [Northern Cape], 'Caput Bonae Spei, in saxosis aridis ad ripas fluminis Gariep', 1 Mar. 1813, Burchell 2673 (K [000257125], holo. —image!, L, P, iso.).

Schizobasis angolensis Baker in *Trans. Linn. Soc. London, Bot.* 1(5): 255 (1878). Type: Angola, 'Pungo Andongo, ad rupes ipsius Praesidii', Aug. 1857, Welwitsch 3867 (LISU [222125], holo. —image!).

Schizobasis schlechteri Baker in *Bull. Herb. Boissier Sér. II, 1*: 783 (1901). Type: South Africa, Eastern Cape, Umtata (3128): 'Südwest-Afrika (Natal) [sic.], regio orientalis prope Umtata', (–DB), Schlechter 6327 (Z, lecto., designated by Manning et al. in *S. Afr. J. Bot.* 94: 264 (2014); BOL!, PRE!, islecto.).

Schizobasis dinteri Krause in Bot. Jahrb. Syst. 48: 355 (1912). Type: Namibia, Mariental (2417): 'Gross Namaland, bei Marienthal [Mariental] in der Kuschüste unterhalb des Staudammes', (–DB), *Dinter* 2005 (SAM [0073821-0], lecto., designated by Manning et al. in S. Afr. J. Bot. 94: 264 (2014); SAM [0004463-0], isolecto!).

Schizobasis gracilis R.E.Fr. in Fries & Rosen, Wiss. Ergebn. Schwed. Rhodesia-Kongo-Exped. 1911–1912, 1: 227 (1916). Type: Zambia, 'Nordost-Rhodesia, Kalungwisi-river, in Felsenritzen in Trockenwald', Oct. 1911, R. Fries 1157 (UPS [V-041106], holo. —image!).

Schizobasis buchubergensis Dinter in Repert. Spec. Nov. Regni Veg. 30: 80 (1932). Type: Namibia, Bogenfels (2715): 'Buchuberge', (–DD), *Dinter* 6493 (?B, holo., not located).

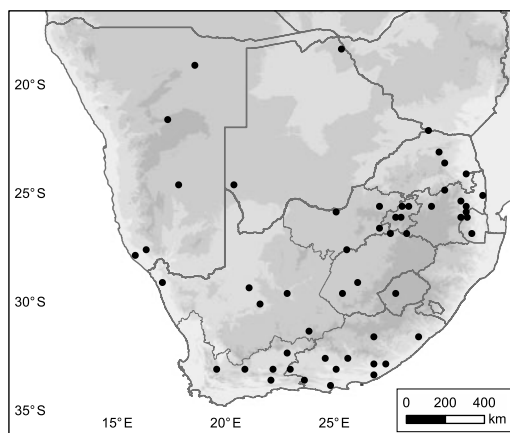
[*Asparagus micranthus* Thunb. ms.: *Thunberg s.n.* (UPS-THUNB)]

[*Adenotheca aphylla* Welw. ms.: *Welwitsch* 3867 (LISU) [222125]—image!]

Plants deciduous. *Bulb* subglobose, 10–50 mm diam., scales adherent, flesh white, yellowish or pinkish to greenish. *Leaves* present only at seedling stage, one or two, filiform, up to 40 × 0.3 mm. *Inflorescence* weakly to extensively branched, mostly 100–200 mm long, branches suberect or ± divaricate, straight or flexuose, lowest branches subopposite or ± ternate, flowers mostly 5–10 mm apart; scape deflexed at base, sprawling or flexuose to distinctly twining, wiry, longitudinally scabridulous in basal part or throughout; bracts lanceolate, lowermost 1–3 mm long with spur 1–2 mm long; pedicels suberect to spreading or slightly reflexed, straight or apically deflexed at anthesis, but apically erect in fruit, (5–)10–20(–30) mm long. *Flowers* pendent or nodding, campanulate to urceolate or ± rotate, unscented; tepals connate for 0.5–1.0 mm, lobes spreading or apically recurved, elliptic to obovate, 2.5–3.0 × 1.0–1.5 mm, penicillate, white to pale pinkish with brown or green keels. *Filaments* suberect or apically inflexed, connivent around style, filiform, ± 2 mm long, white; anthers spreading or connivent around style, dorsifixed, basally sagittate, ± 1 mm long, ± apiculate with connective extended in acute or notched, membranous tip ± 0.1 mm long, longitudinally dehiscent. *Ovary* subglobose, ± 1 mm long, greenish yellow; style columnar, ± 1.5 mm long, slightly longer than ovary, extending shortly beyond anthers, white; stigma obtuse, minutely 3-lobed. *Capsules* subglobose to narrowly ellipsoid, sometimes angled, 3–5 × 2–5 mm, erect or spreading on suberect or spreading pedicels. *Seeds* ellipsoid, 1.5–2.0 × 1.0–1.5 mm, glossy black, testa scalariform-colliculate. *Flowering time*: November to March; flowers opening in the afternoon and withering in the evening. Figure 32; Plate 3A, B.

Distribution and ecology: widespread through the drier parts of southern Africa with summer or aseasonal rainfall, recorded in South Africa from the Ceres Karoo through interior Western and Northern Cape into Namibia along the western escarpment to Angola and into northern Botswana in the west, and from the Little Karoo near Calitzdorp through Eastern Cape and Free State to Limpopo and Swaziland (Map 67); also in Mozambique, Zimbabwe, Zambia and Tanzania to Ethiopia in the east; in a wide range of rocky habitats in seasonally dry areas.

Diagnosis: a widespread and variable species diagnosed in sect. *Schizobasis* by the mostly paniculately branched inflorescence with suberect to spreading pedicels, and the very small apical appendages on the anther connectives. Plants



MAP 67.—Distribution of *D. intricata*

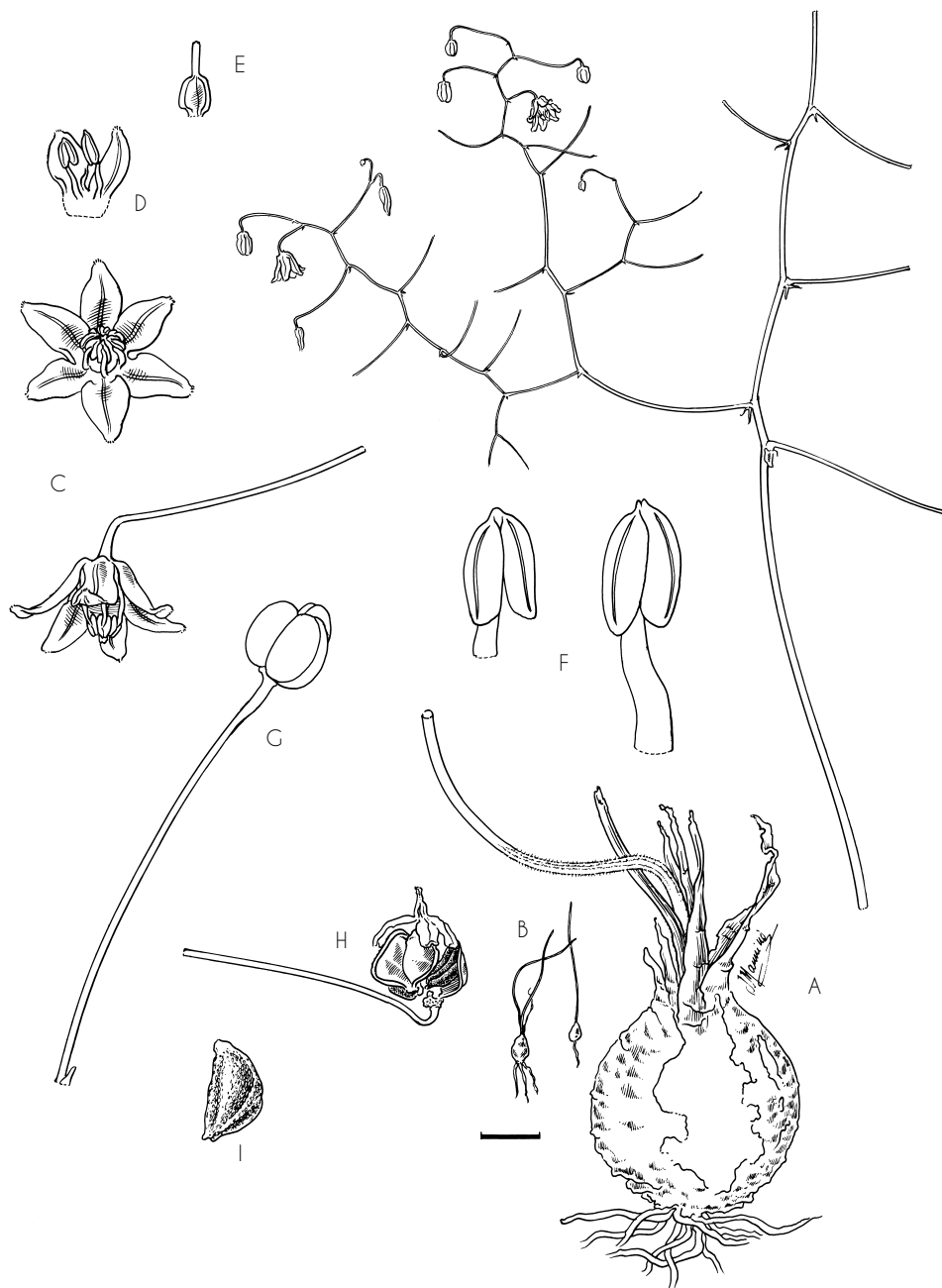


FIGURE 32.—*Drimia intricata*, Eastern Cape, Lake Mentz, Van der Walt sub J. Deacon 3133 (NBG). A, flowering plant; B, seedlings showing foliage; C, flowers, side and front views; D, two tepals with attached stamens; E, gynoecium; F, stamen showing acute and bifid anther apices; G, capsule before dehiscence; H, dehiscing capsule with withered perianth still adhering; I, seed. Scale bar: A, B, 10 mm; C–E, G, H, 2 mm; F, I, 1 mm. Artist: John Manning.

are shorter and compact in open and exposed places but become sprawling or even twining in closed or moist situations.

Additional specimens examined

NAMIBIA. **1918 (Grootfontein)**: 84 km from Rundu, Taranaki Farm, open shrubland, (–BA), 5 Mar. 1995, *P. Burgoyne* 3215 (PRE). **2117** (Otjonsondu): Okongavaberg, quartz outcrop, (–CB), 26 Feb. 1914 [sterile], *Dinter* 3386 (SAM). **2716** (Witputz): Aurus flats, Rooiberg, (–CB), 10 Oct. 1978, *D. Hardy* 5046 (PRE).

BOTSWANA. **1825 (Panda-ma-Tenga)**: 70 km S of Kazungula, Mopani woodland, (–AD), 11 Dec. 1991, *S. Venter, N. Hahn & R. Archer* 152 (PRE).

SWAZILAND. **2631 (Mbabane)**: Komati Bridge, riverside sand, (–AA), 7 Sep. 1961, *R. Compton* 30691 (NBG); Komati Bridge, closed woodland over sandstone, 650 m, (–AA), 10 Oct. 1992, *R. Glen* 176 (PRE); Hlatikulu, Sibowe River, rocks, (–CD), 13 Jan. 1960, *B. Dlamini s.n.* (NBG, PRE).

SOUTH AFRICA. LIMPOPO. **2229 (Waterpoort)**: Messina District, Greefswaldt, (–AB), 8 Jan. 1974, *G. Theron* 2781 (PRE). **2329 (Pietersburg)**: ± 15 km N of Louis Trichardt at Clouds End farm, (–BB), 19 Nov. 1993, *P. Burgoyne* 1946 (PRE). **2330 (Tzaneen)**: Modjadji's Reserve near Duiwelskloof, (–CA), 27 May 1938 [sterile], *J. Krige* 200 (PRE). **2431 (Acornhoek)**: Klaserie Nature Reserve, Zeekoegat farm, gravel flats, (–AA), 28 Oct. 1983, *N. Zambatis* 1623 (NBG).

NORTHWEST. **2525 (Mafikeng)**: Phitsane Hills, ironstone, (–CC), 12 Feb. 1982 [fruiting], *A. Gubb* 239/93 (PRE). **2527 (Rustenburg)**: Rustenburg Nature Reserve, cracks on cliff faces, (–CA), 8 Oct. 1970, *N. Jacobsen* 1039 (PRE); Tierkloof on Baviaanskrans farm, crevices on rock faces, (–CA), 2 Oct. 1976, *F. Venter* 1098 (PRE). **2627 (Potchefstroom)**: Potchefstroom, Ontdekkerspark, crevices in cliffs, (–CA), 15 Oct. 1973, *F. Venter* 166 (PRE). **2725 (Bloemhof)**: Bloemhof Dam, Sandveld Nature Reserve, (–DA), Mar. 1983, *W. Ferguson* 190 (PRE).

GAUTENG. **2528 (Pretoria)**: Magaliesberg, Apies River, (–CA), 4 Nov. 1893, *R. Schlechter* 3624 (SAM); Wonderboom, (–CA), 29 Sep. 1912, *A. Theiler* 12360 (PRE); Riviera, hilltop behind Louis Botha Home, (–CA), 11 Nov. 1925, *C. Smith* 828 (PRE); Bryanston, below Govt. House and Old Fort, rock crevices, (–CA), 14 Nov. 1926, *C. Smith* 3343 (PRE); Pretoria, National Botanic garden, grassland, 1 362 m, (–CB), 9 Dec. 2003, *S. Bester* 4486 (PRE); Derdepoort Bridge, (–CB), 11 Oct. 2004, *S. Bester* 5241 (PRE). **2627 (Potchefstroom)**: Roodepoort, Poortview, stony grassland, (–BB), 25 Jan. 1984, *C. Behr* 777 (PRE); 5–6 km WNW of Sasolburg, Uitkomst Farm, wedged between rocks on koppie, 1 430 m, (–DC), 31 Oct. 1996, *N. Kroon* 12080 (PRE). **2628 (Johannesburg)**: Johannesburg, Zoo Koppies, (–AA), 8 Dec. 1930, *C. Moss* 19052 (NBG). Heidelberg, Vaaldam, Brittsville, closed shrubland, 1 518 m, (–CD), 17 Oct. 1990, *S. Venter* 13490 (PRE).

MPUMALANGA. **2430 (Pilgrim's Rest)**: between Burgersfort and Penge, stony ground in dry bushveld, 850 m, (–CB), 6 Aug. 1983 [in bud], *J. Kluge* 2567 (PRE); Steelpoort Park Farm, ± 38 km from Steelpoort, norite outcrop, (–CC), 13 Sep. 1992, *P. Burgoyne* 1301 (PRE). **2529 (Witbank)**: Middelberg, hill NW of town, (–CB), 26 Oct. 2010, *S. Bester* 10329 (PRE). **2530 (Lydenburg)**: Lowveld Botanic Garden, granite crevices beside Crocodile River in semi-shade, 640 m, (–BD), 20 Jan. 1981, *J. Kluge* 2359 (NBG); Nelspruit, granite koppie opposite Crocodile Inn west of town, (–BD), 1 Nov. 2002, *J. Manning* 2802 (NBG). **2531 (Komatipoort)**: Kruger National Park, Sabie poort, (–BB), 20 Mar. 1953 [sterile], *H. van der Schijff* 2481 (PRE); Noordkaap, rocky slope, (–CA), 17 Aug. 1946, *J. Acocks* 12873 (PRE); Barberton, (–CC), Sep./Oct. 1889, *G. Thorncroft* 525 (SAM); NE of Barberton on road to Kaapmuiden, rocky hillside, (–CC), 17 Aug. 1946, *L. Codd* 1632 (PRE). **2630 (Carolina)**: Songimvelo Game Reserve between Hoogenoeg and Lochiel, grassland, (–BB), 11 Dec. 1992, *M. Jordaan* 2531 (PRE).

FREE STATE. **2925 (Jagersfontein)**: Fauresmith, Vaalberg, (–CB), Jan. 1928, *C. Smith* 5482 (PRE). **2926 (Bloemfontein)**: Bloemfontein, (–AA), Mar. 1907, *G. Pots* 472 (BOL); Bloemfontein Botanic Garden, (–AA), 14 Jan. 1969, *D. Müller* 436 (NBG, PRE).

NORTHERN CAPE. **2917 (Springbok)**: Vyftienmyl-se-berg, Gemsbok Vlei, (–AA), 14 May 2010, *J. Deacon & E. van Jaarsveld* 681 (NBG); Spektakel Pass, shale slopes, (–DB), 15 May 2003, *J. Manning* 2922 (NBG). **2921 (Kenhardt)**: Kenhardt, on hills, (–AC), Jan. 1929, *H. van Niekerk s.n.* (NBG). **2922 (Prieska)**: Prieska, rocky hillside, (–DB), 1933, *E. Bryant* STE18283 (NBG). **3021 (Vanwyksvlei)**: Groot Strondberg, among

dolerite boulders, (–BA), 7 Jan. 1989, P. Bruyns 3453 (NBG). **3123 (Victoria West)**: Richmond Townlands, among stones on north-facing dolerite slopes, 1 500 m, (–BD), 20 Jan. 1988, P. Bruyns 3012 (NBG). WESTERN CAPE. **3222 (Beaufort West)**: 30 km NE of Beaufort West, Elandsfontein Farm, (–BD), Mar. 2003, S. Todd s.n. (NBG). **3319 (Worcester)**: Ceres Karoo, Fonteinskop, flats, (–BA), 5 Aug. 2006 [sterile], J. Manning 3038 (NBG). **3320 (Montagu)**: ± 20 km NE of Laingsburg along Moordenaar's Karoo road, along seasonal watercourse, (–BB), 16 Mar. 1980, D. Snijman 203 (NBG). **3321 (Ladismith)**: Gamka Mountain Reserve, (–BC), May 1976, A. Boshoff 319 (NBG); Gamka Poort, cliffs, (–BC), 28 Dec. 1987, P. Bruyns 2919 (NBG). **3322 (Oudtshoorn)**: Prince Albert, (–AA), Dec. 1895, R. Marloth 2291 (NBG); 3 km E of Prince Albert, at side of bushes, tillite slope, 700 m, (–AA), 18 Apr. 1987, P. Bruyns 2603 (NBG); Matjiesfontein, (–BB), Oct. 1920 [sterile], Thoday & Delf 61 (NBG); near Oudtshoorn, (–CA), Dec. 1905, H. Bolus 12376 (BOL). EASTERN CAPE. **3126 (Queenstown)**: Sterkstroom, Andriesberg, Carnarvon Estate, dolerite dome, (–DB), 11 Jan. 2010, J. Manning 3264 (NBG). **3224 (Graaff-Reinet)**: Graaff-Reinet District, Kendrew Estate, stony flats, (–DA), 27 Mar. 2003 [sterile], D. Snijman 1909 (NBG). **3226 (Fort Beaufort)**: Alice, granite koppie under loose stones, (–DD), 5 Jan. 1943, W. Barker 2324 (NBG). **3227 (Stutterheim)**: King William's Town, rocky ground, (–CD), Jan. 1893, Sim s.n. (SAM). **3323 (Willowmore)**: Langkloof, Kleinrivier tributary to Kouga River, on cliffs, 550 m, (–DA), 9 May 2006, E. Brown 724 (NBG). **3324 (Steytlerville)**: Fingerpol farm, NW of Hankey, (–DD), 17 Apr. 2008 [sterile], D. Snijman 2222 (NBG). **3325 (Port Elizabeth)**: between Janseville and Kirkwood, Lake Mentz, (–AA), 27 Dec. 2013 [ex hort.], D. van der Walt sub J. Deacon 3133 (NBG). **3326 (Grahamstown)**: Howieson's Poort, (–BD), 1899, H. Bolus 9136 (BOL).

68. **Drimia sigmoidea** J.C.Manning & J.M.J.Deacon in Manning et al. in S. Afr. J. Bot. 94: 267 (2014). *Schizobasis sigmoidea* (J.C.Manning & J.M.J.Deacon) Mart.-Azorín et al. in Phytotaxa 201: 168 (2015). Type: South Africa, Western Cape, Montagu (3320): 'Ashton, Wolwendrift, cliff face in large kloof', (–CC), 23 Sep. 2013, J.M.J. Deacon et al. 2820 (NBG, holo.!, MO, iso.!).

[*Schizobasis bruce-bayeri* U. & D.Müll.-Doblies ms.: Marloth 11997 (NBG)]

Plants deciduous. *Bulb* subglobose, 10–40 mm diam., scales adherent, flesh pinkish to greenish. *Leaves* not seen. *Inflorescence* weakly or moderately branched, mostly 100–200 mm long, persisting and photosynthetic, branches suberect, straight, lowest branches subopposite or ± ternate, flowers mostly 5–10 mm apart; scape straight or deflexed at base, wiry, longitudinally scabridulous in basal part; bracts lanceolate, lowermost ± 2 mm long with spur ± 1 mm long; pedicels deflexed from base, 8–15 mm long, sharply recurved apically in fruit. *Flowers* subsecund to pendent, urn-shaped to campanulate, unscented; tepals connate in basal 0.5–1.0 mm, lobes suberect or slightly spreading, elliptic to obovate, 2.5–3.0 × 1.0–1.5 mm, penicillate, white to pale pinkish with brown or green keels. *Filaments* sigmoid and apically inflexed, connivent around style, filiform, ± 2 mm long, white; anthers connivent around style, medifixed, basally sagittate, ± 1 mm long, apiculate with connective extended apically into conspicuous, membranous flap ± 0.3 mm long, longitudinally dehiscent. *Ovary* oblong with conspicuous shoulders, ± 1.5 mm long, greenish with yellow blotch on shoulders; style columnar, ± 1.5 mm long, white; stigma obtuse, minutely 3-lobed. *Capsules* ovoid, sometimes angled, ± 3 × 2 mm, erect on pendent pedicels abruptly upcurved apically. *Seeds* ellipsoid 1.5–2.0 × 1.0–1.5 mm, glossy black, testa scalariform-colliculate. *Flowering time*: November to March; flowers opening mid-afternoon and withering in the evening. Figure 33.

Distribution and ecology: endemic to the Breede River Valley in Western Cape, from Worcester to Bonnievale (Map 68); on stony shale or sandstone slopes and cliffs.

Diagnosis: distinguished from *Drimia intricata* by the pedicels deflexed strongly from the base, thus essentially pendent and subsecund. The tips of the pedicels recurve strongly soon after flowering so that the ripening ovary and fruit are erect on a sharply sigmoid pedicel. The apical appendage on the

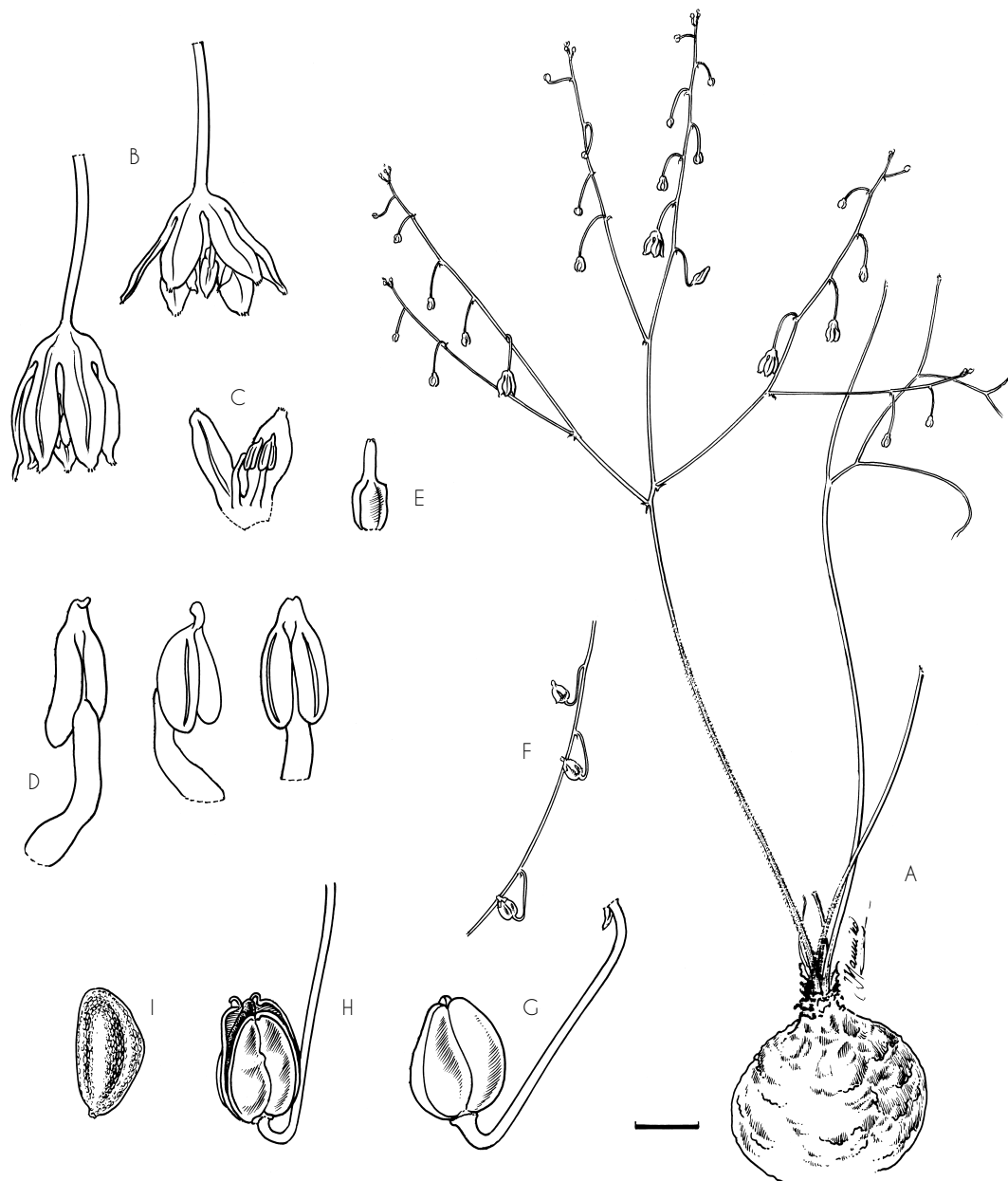


FIGURE 33.—*Drimia sigmoidea*, Western Cape, Ashton, J. Deacon *et al.* 2820 (NBG). A, flowering plant; B, flowers; C, two tepals and attached stamens; D, stamens; E, gynoeceum; F, capsules; G, capsule before dehiscence; H, dehiscing capsule; I, seed. Scale bar: A, F, 10 mm; B, C, E, G, H, 2 mm; D, I, 1 mm. Artist: John Manning.

connective is larger than in *D. intricata*. Plants are consistently relatively poorly branched, with the branches ascending at an acute angle.

The two species are allopatric and ecologically separated, with *Drimia sigmoidea* restricted to the winter-rainfall region at the western end of the Little Karoo, and *D. intricata* widespread through the aseasonal and summer-rainfall parts of the continent, from the central Little Karoo northward and eastward, but absent from the moister temperate montane grasslands and subtropical coast.

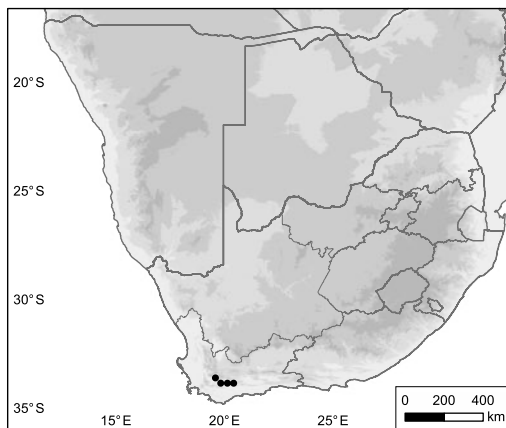
Additional specimens seen

SOUTH AFRICA. WESTERN CAPE. **3319 (Worcester):**

Worcester, kloof between Audenberg and Keer-

omsberg, (–DA), Manning sight record; Robertson, (–DD), 12 Feb. 1953, *H. Hall* NBG789/52 (NBG). **3320**

(Montagu): Montagu, Kogman's Kloof, (–CD), 5 May 1940 [fruiting], *F. Thorns* sub *R. Compton* 8782 (NBG); Klaasvoogds, shale hillside at foot of Langeberg, (–CD), 31 Jan. 1954, *E. Esterhuysen* 2271 (BOL); 18 Apr. 1954 [fruiting], *E. Esterhuysen* 22857 (BOL); Bonnievale, shale hill, (–CD), 28 Apr. 1925 [fruiting], *R. Marloth* 11997 (NBG).



MAP 68.—Distribution of *D. sigmoidea*

Sect. 19. **Litanthus** (Harv.) J.C.Manning & Goldblatt, comb. et stat. nov. *Litanthus* Harv. in London J. Bot. 3: 314 (1844). Type: *Litanthus pusillus* Harv. = *Drimia uniflora* J.C.Manning & Goldblatt

Plants minute. *Bulb* scales adherent, flesh white to pale pink. *Leaves* 1 to 5, blade erect, filiform or terete, glabrous, hysteranthous or synanthous. *Inflorescence* 1-flowered; scape longitudinally scabridulous; bracts terminal, subopposite, ovate, minutely spurred; bracteoles absent; pedicels shorter than tepals at flowering. *Flowers* diurnal, cylindrical, pendent, perianth deciduous, cohering above to form a cap on developing capsule; tepals connate for half their length or more into a tube, lobes ovate-lanceolate, white or pinkish with darker midrib. *Filaments* inserted in upper half of tube, erect, much shorter than anthers, subulate. *Anthers* connivent in a cylinder around style, medifixed, sagittate, connective apiculate, dehiscence longitudinal. *Ovary* ovoid; style erect, $\pm$ as long as ovary or longer; stigma subclavate, truncate-concave with crenellate-toothed margin, smooth. *Capsule* ovoid to prismatic. *Seeds* angled.

Key to species

- 1a. Leaves (1)2 to 5, thread-like; flowers 4–6 mm long, tepal lobes ovate, $\pm$ 1 mm long; pedicels $\pm$ 1 mm long at anthesis, hardly elongating in fruit and up to 2 mm long; capsules ovoid, $\pm$ 3 mm long, unicoloured greenish or brown 69. *D. uniflora*
- 1b. Leaf solitary, terete; flowers 6–7 mm long, tepal lobes lanceolate, $\pm$ 2 mm long; pedicels 1.0–2.5 mm long at anthesis, elongating markedly in fruit and 5–8 mm long; capsules cylindrical-prismatic, 4–6 mm long, longitudinally banded in green and white 70. *D. stenocarpa*

69. ***Drimia uniflora*** J.C.Manning & Goldblatt in Goldblatt & Manning in Strelitzia 9: 712 (2000), as nom. nov. pro. *Litanthus pusillus* Harv. in London J. Bot. 3: 315, t. 9 (1844) [non *D. pusilla* Jacq. (1797)]. Type: South Africa, Eastern Cape, Port Elizabeth (3325): 'shady places in the woods by the Zwartkop's River, Uitenhage', (–DC), [Dec. 1829], Zeyher s.n. (TCD, lecto., designated by Jessop: 308 (1977); S—image!, SAM!, isolecto.).

Plants deciduous, solitary or gregarious. *Bulb* subglobose, 4–10 mm diam., scales adherent, white or flushed pink, becoming thinly leathery. *Leaves* synanthous or hysteranthous, (1)2 or 3(5), erect, filiform-terete, 20–30 mm long, $\pm$ 0.25–0.80 mm diam., glabrous. *Inflorescence* 1(2)-flowered, 20–30 mm long; scape minutely longitudinally scabridulous in basal half or $\pm$ throughout; bracts 2, but only 1 usually subtending a flower, subopposite, ovate, $\pm$ 1 mm long, spur 0.5 mm long; pedicel decurved at anthesis and $\pm$ 1 mm long, erect and 1–2 mm long in fruit. *Flower* cylindrical, nodding, white to pale pinkish with brown or green keels, unscented; tepals 4–6 mm long, connate in a cylindrical tube 3–4 mm long, lobes erect or slightly spreading, ovate, $\pm$ 1 $\times$ 1 mm, penicillate. *Stamens* adnate to perianth for $\pm$ 2 mm, thus inserted $\pm$ at upper third of tube; filaments linear, 0.5 mm long; anthers erect in a cylinder around style, dorsifixed, sagittate, 1 mm long with connective extended apically into notched, membranous flap, dehiscence longitudinal. *Ovary* ovoid, 1.5–2.0 mm long, greenish yellow; style columnar, 2.0–2.5 mm long, slightly to distinctly longer than ovary, shortly exerted beyond anthers, white; stigma subclavate-truncate, excavated with minutely 6-toothed margin, smooth. *Capsules* ovoid or subglobose, $\pm$ 3 $\times$ 2 mm, greyish to brown. *Seeds* angular, $\pm$ 1 $\times$ 0.5–1.0 mm, glossy black, testa rugulose. *Flowering time*: November to March; flowers opening in the morning and lasting one day. Figure 34.

Distribution and ecology: widespread through the drier, aseasonal and summer-rainfall parts of southern Africa, from the Gamsberg in Bushmanland and the Little Karoo through the eastern half of the subcontinent into southern Zimbabwe, but evidently absent from the more arid central region (Map 69); typically in rock crevices or rocky cliffs, in seasonally damp and sheltered situations, sometimes in mats with moss or other dwarf succulents.

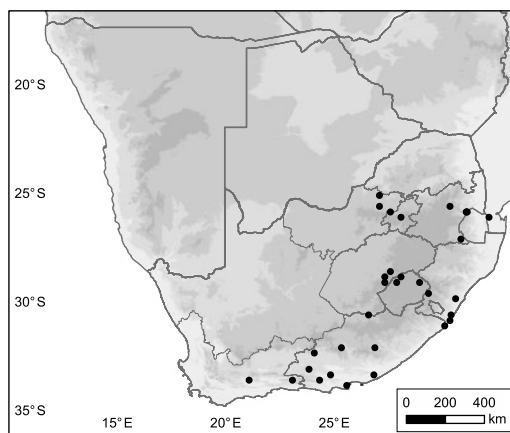
Diagnosis: distinguished from *Drimia stenocarpa* by the small, globose bulbs and slightly smaller flowers, 4–6 mm long with ovate tepal lobes $\pm$ 1 mm long, and the ovoid or subglobose, unicoloured capsules $\pm$ 3 mm long. The pedicels, 0.5–1.0 mm long in flower, elongate hardly at all in fruit, reaching at most 2 mm long. Bulbs produce up to five thread-like leaves, only rarely just one.

Additional specimens seen

SWAZILAND. **2531 (Komatipoort)**: Havelock Concession, rocky ridge above Komassan River, (–CC), Sep. 1890, *Salmarsh* 1042 (PRE, SAM). **2632 (Bela Vista)**: Ndzindza, Mlawula Nature Reserve, (–AA), 15 Sep. 1987, *Braun* 530 (PRE).

LESOTHO. **2927 (Maseru)**: Mamathes Distr., (–BB), 15 Apr. 1949, *Jacot-Guillarmod* 882 (PRE). **2828 (Bethlehem)**: Leribe, holes in rocks, (–CC), without date, *Dieterlen* 855 (PRE). Without precise locality: Basutoland, *Dieterlen* 855 (SAM).

SOUTH AFRICA. NORTHWEST. **2527 (Rustenburg)**: Pilaanesberg, near Police Station on Genl. Smut's



MAP 69.— Distribution of *D. uniflora* in southern Africa

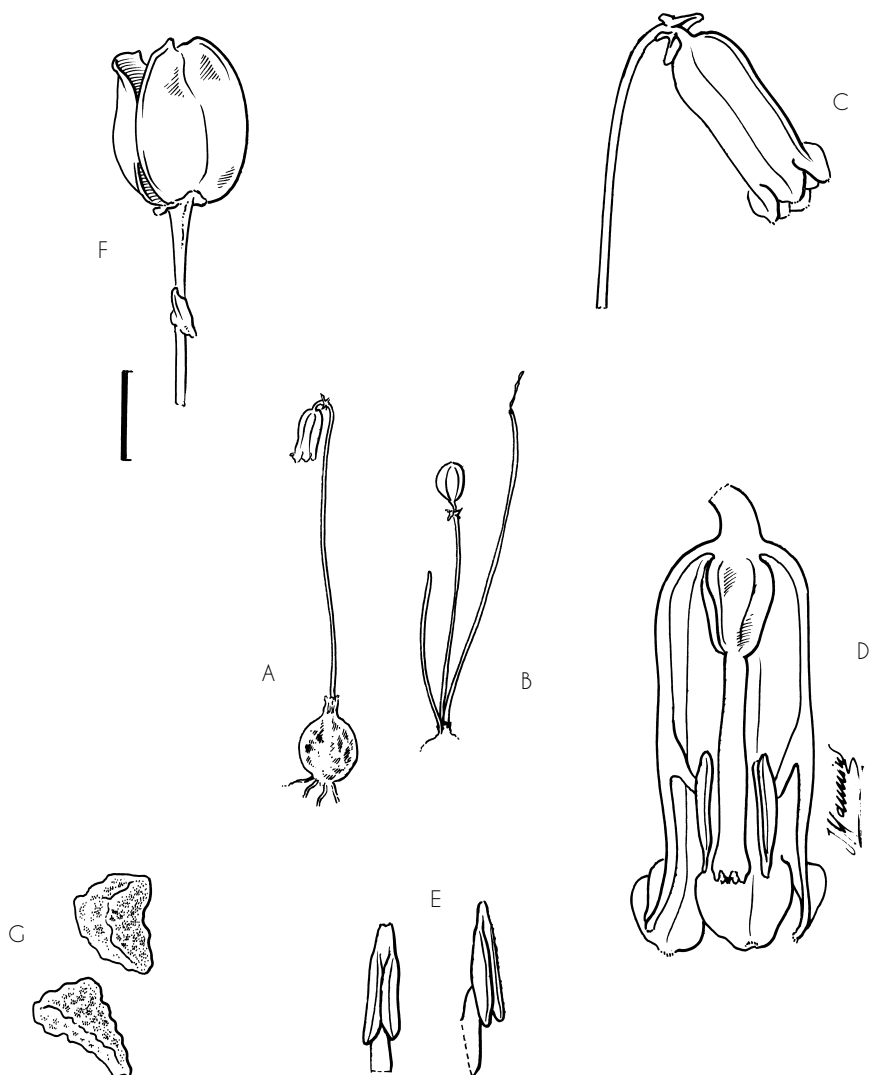


FIGURE 34.—*Drimia uniflora*, Eastern Cape, Commandodrif, without voucher. A, flowering plant; B, fruiting plant with foliage; C, flower; D, half flower; E, stamens; F, capsule; G, seeds. Scale bar: A, B, 10 mm; C, F, 2 mm; D, E, G, 1 mm. Artist: John Manning.

- Farm, (–AA), 20 Oct. 1970, *Venter* 1134 (PRE); Rustenburg, next to waterfall, (–CA), 1 Feb. 1978, *Smook* 1039 (PRE).
- GAUTENG. **2527 (Rustenburg)**: Krugersdorp Dist., Jack Scott Private Nature Reserve, (–DC), 6 Feb. 1961, *Wells* 2485 (PRE). **2628 (Johannesburg)**: Sandton, NE of Frankenwald, crevices in flat rock faces, (–AA), 18 Aug. 1951, *Gilliland* PRE62138 (PRE).
- MPUMALANGA. **2530 (Lydenburg)**: Carolina, Waterval Boven, (–CB), 26 Sep. 1932 m, *Van der Merwe* PRE32061 (PRE). **2531 (Komatipoort)**: 4 mi [6.4 km] from Barberton to Havelock Mine, N slopes of Saddleback Hill, (–CC), 17 Oct. 1940, *Codd* PRE36138 (PRE). **2730 (Vryheid)**: Piet Retief, Hlangapies, (–BB), Dec without year, *Van der Merwe* 1102 (PRE).
- FREE STATE. **2827 (Senekal)**: Clocolan, Mequatlingsnek, (–CD), without date, *Stam* PRE32063 (PRE); Senekal Dist., Groot Doornkop, (–DA), 7 Dec. 1931, *Goossens* 932 (PRE). **2927 (Maseru)**: 18 mi [29 km], from Hobhouse on Ladybrand road, (–AB), 29 Jan. 1945, *Acocks* 11186 (PRE).
- KWAZULU-NATAL. **2929 (Underberg)**: Cobham Forest Reserve, Ndlovini, Troutbeck, (–CB), 8 Nov. 1980, *Hilliard & Burt* 13362 (PRE). **2930 (Pietermaritzburg)**: Monteseel, (–DC), 19 Sep. 1982, *Reid* 639 (PRE); Drummond, Alverston Ridge, cliff near radio masts, (–DC), 14 Nov. 2001, *Manning* 2658 (NBG). **3030 (Port Shepstone)**: Aurora Farm, Gibraltar, (–CB), 20 Jul. 1977, *Strey* PRE58055 (PRE); Uvongo Nature Reserve, (–CD), 24 Dec. 1970, *Strey* 10340 (PRE). **3130 (Port Edward)**: ± 8 km NW of main road N of Port Edward, (–AA), 26 Nov. 2000, *Burgoyne* 9771 (PRE).
- NORTHERN CAPE. **2918 (Gamoep)**: Aggenys, Gamsberg, (–BB), 15 Feb. 2001, *Desmet* 3071 (NBG).
- WESTERN CAPE. **3321 (Ladismith)**: 12 mi [19 km] south of Ladismith, rock cracks, (–CA), 13 Jan. 1969, *H. Hall* 3185 (NBG); western Rooiberg, Keurboschfontein 193, waterfall 1.5 km NW of farmhouse, 520 m, (–CB), 6 Dec. 2000, *Helme* 1920 (NBG).
- EASTERN CAPE. **3026 (Aliwal North)**: Elandshoek, (–DA), Jan [without year], *Bolus* 10542 (PRE). **3224 (Graaff-Reinet)**: Kamdebooiberg, in crevices in rocks, ± 1 570 m, (–AC), 16 Jan. 1988, *Bruyns* 2980 (NBG). **3225 (Somerset East)**: Mountain Zebra National Park, (–AB), 12 Dec. 2000, *Bester* 6291 (PRE). **3226 (Fort Beaufort)**: Oxton Manor, near Whittlesea, mountain top under krantz, (–BB), 25 Dec. 1910, *Galpin* 8386 (PRE). **3323 (Willowmore)**: NW of Willowmore on road to Klipplaat, (–BB), 11 Dec. 2000 [fl. ex hort.], *Williamson s.n.* (NBG); Uniondale, (–CA), 15–16 Mar. 1953 [fl. ex hort.], *E. Esterhuysen* NBG134/50A (NBG). **3324 (Steytlerville)**: Wolwefontein Dist., Blaauwbosch Nature Reserve, (–BD), 11 Nov. 2000, *Bredenkamp* 3243 (PRE); Baviaanskloof, Drinkwaterskloof, (–CB), 20 Dec. 2001, *Euston-Brown* 1700 (PRE). **3325 (Port Elizabeth)**: Redhouse, Otoru, (–DC), Dec without year, *Paterson* 2083 (PRE). **3326 (Grahamstown)**: Driver's Bush, arid savanna, TMS rocks, (–BD), 12 Nov. 1986, *Van Jaarsveld* 9083 (NBG).
70. ***Drimia stenocarpa*** J.C.Manning & J.M.J.Deacon in Manning et al. in *S. Afr. J. Bot.* 90: 99 (2014). *Litanthus stenocarpus* (J.C.Manning & J.M.J.Deacon) Mart.-Azorín et al. in *Phytotaxa* 201: 168 (2015). Type: South Africa, Western Cape, Vanrhynsdorp (3118): 'Papendorp, 25 mi [40 km] from Vredendal', (–CA), 17 Mar. 1971, *Hall* 3921 (NBG, holo.; PRE!, iso.).

Plants deciduous, solitary. *Bulb* ovoid to pyriform, 8–12 mm diam., scales adherent, white or flushed pink, becoming thinly leathery, forming wrinkled collar. *Leaf* hysteranthous, solitary, erect, filiform-terete, 30–60(–140) mm long, 0.3–1.0 mm diam., glabrous. *Inflorescence* 1-flowered, 20–50 mm long; scape minutely longitudinally scabridulous throughout, sometimes more than one produced successively; bracts 2, but only 1 subtending a flower, subopposite, terminal, ovate, ± 1 mm long, spur 0.5 mm long; pedicel decurved at anthesis and 1.0–2.5 mm long, erect and elongating to 5–8 mm long in fruit. *Flower* cylindrical, pendent, pale pinkish with darker keels, unscented; tepals 6–7 mm long, in a cylindric tube 4–5 mm long, lobes erect or slightly spreading, lanceolate, ± 2 × 1 mm, penicillate. *Stamens* adnate to perianth for ± 3 mm, inserted ± at upper quarter of tube; filaments linear, 0.50–0.75 mm long; anthers erect in a cylinder around style, dorsifixed, sagittate, 1.0–1.5 mm long with connective extended apically into small, acute, membranous flap, dehiscence longitudinal. *Ovary* cylindrical, 2–3 mm long, greenish yellow; style columnar, 2.0–3.5 mm long, slightly shorter

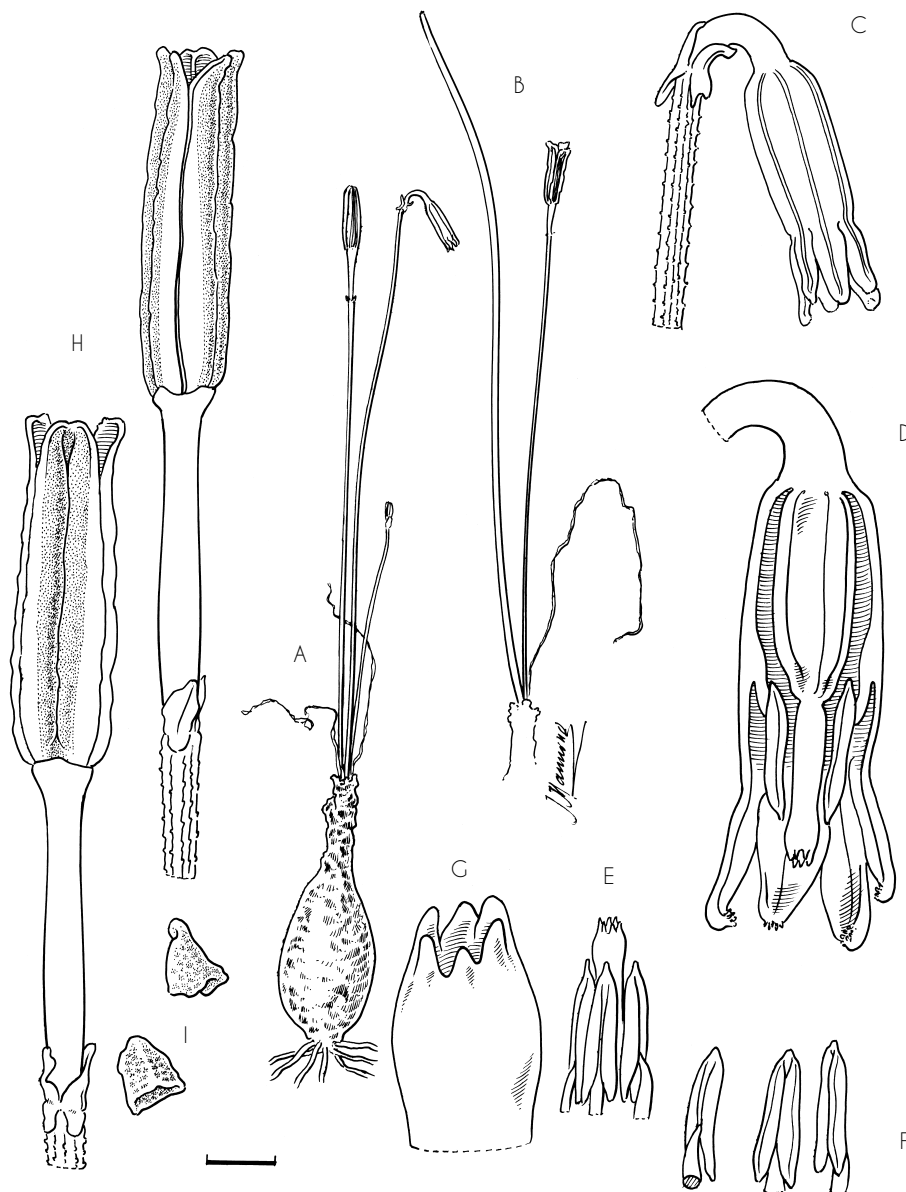
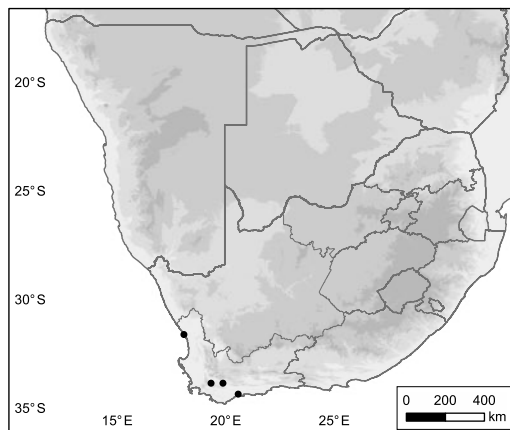


FIGURE 35.—*Drimia stenocarpa*, Western Cape, Robertson, Deacon s.n. (NBG). A, flowering plant; B, fruiting plant with foliage; C, flower; D, half flower; E, androecium and style; F, anthers; G, stigma; H, capsules; I, seeds. Scale bar: A, B, 10 mm; C, H, 2.5 mm; D, E, F, I, 1 mm; G, 0.5 mm. Artist: John Manning.

than to slightly longer than ovary, exerted shortly beyond anthers, white; stigma subclavate-truncate, excavated with minutely 6-toothed margin, smooth. *Capsules* oblong-prismatic, $4\text{--}6 \times \pm 2$ mm, strongly bicoloured, dark greyish green with broad whitish longitudinal band along carpel sutures. *Seeds* angular, $\pm 1 \times 0.5\text{--}1.0$ mm, glossy black, testa rugulose. *Flowering time*: December to March; flowers opening in the morning and lasting one day. Figure 35.

Distribution and ecology: endemic to the winter-rainfall region of Western Cape, known from Papendorp at the mouth of the Olifants River, and from near Robertson to Malgas along the lower Breede River (Map 70); in exposed sites, either on open flats in loamy soils or in rock crevices in shale, typically among various dwarf succulent species.



MAP 70.— Distribution of *D. stenocarpa*

Diagnosis: distinguished from *Drimia uniflora* by the larger, $\pm$ pear-shaped bulb with a well-developed, wrinkled collar, the slightly larger flowers, 6–7 mm long with lanceolate tepal lobes ± 2 mm long, and by the distinctive capsules, cylindrical-prismatic, 4–6 mm long, and strikingly bicoloured, coloured dull greyish green with broad, whitish longitudinal bands along the carpel sutures. The pedicels elongate significantly in fruit, reaching 5–8 mm long. Plants appear to consistently produce a solitary leaf. Successive inflorescences may be produced if conditions are favourable.

Additional specimens seen

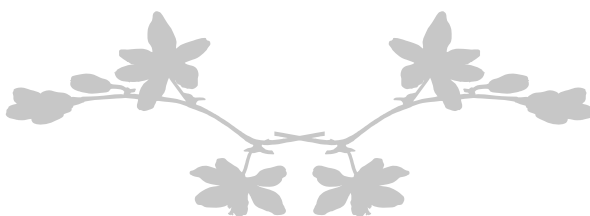
SOUTH AFRICA. WESTERN CAPE. 3118 (Vanrhynsdorp): Papendorp, (–CA), 12 Dec. 1971, Hall 4191 (NBG); Papendorp, mouth of Olifants River, in small, shallow declivities on outcrops of sandstone-quartzite conglomerate, (–CA), 26 Mar. 1973, Hall 4246 (PRE). **3319 (Worcester)**: hills SW of Greater Brandvlei Dam, S of Worcester, (–CD), Feb. 2015, A. le Roux & H. de Wet 1370 (NBG); 3 km E of Robertson, (–DD), 19 Jul. 1977 [leafing], Perry 279 (NBG). **3420 (Bredasdorp)**: eastern banks of Breede River near Malgas, (–BC), 4 Dec. 2004, Louw s.n. (NBG—photo only).

Sect. 20. **Rhodocodon** (Baker) J.C.Manning & Goldblatt, comb. et stat. nov. *Rhodocodon* Baker in J. Linn. Soc., Bot. 18: 280 (1881). Type: *Rhodocodon madagascariensis* Baker = *Drimia mascarenensis* (Baker) J.C.Manning & Goldblatt

Plants small to medium-sized, deciduous or evergreen. *Bulb* subterranean or epigeal, scales adherent or loose. *Leaves* hysteranthous or synanthous, linear and firm-textured or elliptic to oblanceolate and soft-textured, glabrous. *Inflorescence* a raceme, dense or lax; scape glabrous; bracts ovate-triangular, short-spurred; bracteoles usually lacking, rarely present; pedicels very short to longer than tepals at flowering. *Flowers* diurnal, pendent campanulate to urn-shaped, perianth usually persistent below dehiscent capsule, rarely abscising below but tepals not cohering above to form a cap on developing capsule; tepals connate more than halfway, lobes erect or reflexed, elliptic, white or greenish to pinkish brown or reddish, lasting for 3 to 7 days. *Filaments* inserted in lower half of perianth tube, curved

over ovary, shorter than to $\pm$ as long as anthers. *Anthers* convergent over ovary, medifixed, oblong to sagittate, sometimes apiculate, dehiscent longitudinally. *Ovary* subglobose to cylindrical; style shorter than to longer than ovary; stigma trilete or punctate, smooth. *Capsule* ovoid. *Seeds* ellipsoid, compressed or rarely fusiform.

This section of 13 species, originally treated as the genus *Rhodocodon*, is endemic to Madagascar and was included in *Rhadamanthus* by Speta (1998) on account of their similar pendent nodding, urn-shaped flowers with the tepals connate for more than halfway. It differs from that genus in several important characters, however, namely its long-lived flowers that last for several days and the persistent perianth that remains attached below the capsules until after dehiscence (Knirsch et al. 2015). Molecular data (Wetschnig et al. 2007; Ali et al. 2013) confirm that it is embedded within *Drimia*, but not immediately allied to *Rhadamanthus* and we therefore recognise a separate section for it for the sake of completeness. The species were recently monographed by Knirsch et al. (2015).



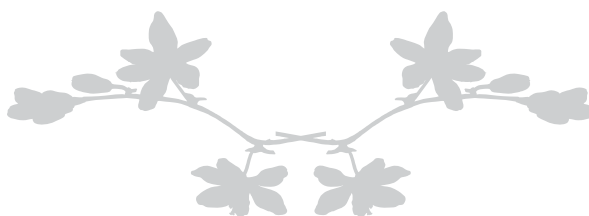
A decorative illustration of a flowering branch with several five-petaled flowers and leaves, rendered in a light gray, sketchy style, positioned above the section header.

UNCERTAIN SPECIES

Drimia pauciflora Baker in Engl. Bot. Jahrb. 15, Beibl. 35: 6–7 (1892). Type: South Africa. 'C. B. Spei', *Ecklon and Zeyher Asphod.* 102 (not located, not at S). The description suggests that this taxon may be a member of sect. *Thuranthos*, probably either *D. basutica* or *D. macrantha*. If the former then it is the earliest available name for the taxon.

Drimia pusilla var. **setosa** Baker in J. Linn. Soc., Bot., 11: 422 (1871). Type: South Africa, 'Cap. B. Spei.', *Ecklon & Zeyher Asphod.* 28 (not located, not at S). This taxon was distinguished by Baker (1871) from typical *Drimia pusilla* by the scape densely set with whitish bristles. This character is unknown in this group of species (sect. *Drimia*) although longitudinal rows of papillae or short bristles are present on the scapes in species in other sections.

Drimia viridiflora Eckl. ex Kuntze in Linnaea 20: 10 (1847). [*Drimia viridiflora* Eckl. in Topogr. Verz. Pflanzensamml. Ecklon: 2 (1827), *nom. nud.*]. *Scilla viridiflora* (Kuntze) Baker in J. Linn. Soc., Bot. 13: 255 (1873). Type: South Africa, 'Cape', *Gueinzus s.n.* (not located). This species, said to have linear-subulate leaves, very short pedicels and greenish flowers, is probably a species of *Ledebouria*.



EXCLUDED SPECIES

- Drimia acuminata* Lodd., Bot. Cab.: t. 1041 (1825). Type: illustration in Lodd., Bot. Cab.: t. 1041 (1825) = **Ledebouria revoluta** (L.f.) Jessop
- Drimia angustifolia* Kunth, Enum. Pl. 4: 340 (1843). Type: South Africa, Struisfontein, near Steelkloof, Drège 8618b [P, lecto., designated by Jessop in J. S. Afr. Bot. 43: 315 (1977)] = **Ledebouria undulata** (Jacq.) Jessop
- Drimia apertiflora* Baker in Saund. Ref. Bot. 1: t. 19 (1870). Type: illustration in Saund. Ref. Bot. 1: t. 19 (1868) = **Ledebouria apertiflora** (Baker) Jessop
- Drimia brevifolia* Baker in F.T.A. 7: 527 (1898). Type: 'Somalia/Ethiopia border', near the River Daua, at Dolo, Riva 1251 (B, holo.; FT, iso.) = **Ledebouria revoluta** (L.f.) Jessop
- Drimia chlorantha* Baker in Fl. Cap. 6: 443 (1897) [non *Urginea chlorantha* Welw. ex Baker (1878)]. Type: South Africa, Mpumalanga, 'Sheba Battery, Avoca', 16 Dec. 1890, Galpin 1191 (K, NH, PRE!, syn.) = **Albuca abyssinica** Jacq.
- Drimia cooperi* Baker in Saund. Ref. Bot. 1: t. 18 (1868). Type: South Africa, 'Cap. B. Spei', without date, Cooper s.n. (K, holo.) = **Ledebouria nitida** (Eckl.) J.C.Manning & Goldblatt
- Drimia dregeana* Kunth, Enum. Pl. 4: 340 (1843). Type: South Africa, 'Cape', Drège 1616c (type not located) = **Ledebouria nitida** (Eckl.) J.C.Manning & Goldblatt
- Drimia ensifolia* Eckl. in S. Afr. Quart. J. 1: 364 (1830). Type: South Africa, 'Uitenhage District', Zwartkops [Swartkops] River, without date, Zeyher 10 [K, lecto., designated by S.Venter in *Herbertia* 62: 109 (2008)] = **Ledebouria ensifolia** (Eckl.) S.Venter & T.J.Edwards
- Drimia gawleri* Schrad., Blumenb.: 30 (1827). Type: illustration in Curtis's Bot. Mag. 33: t. 1380, sub *Drimia lanceaefolia* (1811) = **Ledebouria ovalifolia** (Schrad.) Jessop
- [*Drimia humilis* Berg. ex Eckl. in Topogr. Verz. Pflanzensamml. Ecklon: 2 (1827), *nom. nud.*]
- Drimia lanceaefolia* var. *longipedunculata* Schrad., Blumenb.: 30 (1827). *Drimia longipedunculata* Sweet, Hort. Brit., ed. 2: 529 (1830). Type: illustration in Pl. Rar. Hort. Acad., Monac. 2: fol. 100, t. 100 (1819) = **Ledebouria revoluta** (L.f.) Jessop
- Drimia lanceaefolia* var. *maculata* Tratt. in Archiv der Gawschunde 2: 132, t. 168 (1814). Type: illustration in Tratt. in Archiv der Gawschunde 2: t. 168 (1814) = **Ledebouria revoluta** (L.f.) Jessop
- Drimia lanceolata* Schrad., Blumenb.: 28 (1827). Type: illustration in Andr. Bot. Rep. 5: t. 299, sub *Lachenalia reflexa* Andr. (1803) = **Ledebouria ovalifolia** (Schrad.) Jessop
- Drimia longipedunculata* Sweet, Hort. Brit., ed. 2: 529 (1830). Type: illustration in Pl. Rar. Hort. Acad., Monac. 2: fol. 100, t. 100 (1819) = **Ledebouria revoluta** (L.f.) Jessop

Drimia ludwigii Miq. in Bull. Scien. Phys. Neerl. 1839: 39–40 (1839). Type: South Africa, 'Cap. B. Spei', without date, *Ecklon & Zeyher 1064* (U, holo.; GRA, PRE, iso.) = **Ledebrouia ensifolia** (Eckl.) S.Venter & T.J.Edwards

Drimia nitida Eckl. in S. Afr. Quart. J. 1: 364 (1830). Type: South Africa, 'Uitenhage District, In eine Klüft an Schattige Stellen bei den Holzungen won Ado [Addo]', Dec. 1829, *Ecklon Asphod. 145* (S [S10-14103], holo. —image!) = **Ledebouria nitida** (Eckl.) J.C.Manning & Goldblatt. Jessop (1970) suspected that *Drimia nitida* was conspecific with *Ledebouria concolor*, but was unable to confirm this by examining the type. He subsequently located the type specimen after the publication of his monograph on the genus *Ledebouria* and annotated it as conspecific with *L. concolor* (Baker) Jessop. *Drimia nitida* is thus an earlier name for *L. concolor* but this has not been formalised, and we do so here:

Ledebouria nitida (Eckl.) J.C.Manning & Goldblatt, comb. nov. *Drimia nitida* Eckl. in S. Afr. Quart. J. 1: 364 (1830). Type: South Africa, 'Uitenhage District, In eine Klüft an Schattige Stellen bei den Holzungen won Ado [Addo]', Dec. 1829, *Ecklon Asphod. 145* (S [S10-14103], holo. —image!)

Ledebouria concolor (Baker) Jessop in J. S. Afr. Bot. 36: 254 (1970) [non *L. cooperi* (Hook.f.) Jessop]. *Drimia cooperi* Baker in Saund. Ref. Bot. 1: t. 18 (1868). *Scilla concolor* Baker in Saund. Ref. Bot. 3, Appen.: 13 (1870), as nom. nov., non. *S. cooperi* Hook. f. (1866)]. Type: South Africa, Cap. B. Spei', *Cooper s.n.* (K, holo.!)

Drimia ovalifolia Schrad., Blumenb.: 28 (1827). Type: illustration in Lodd. Bot. Cab. 3: t. 278, sub *Drimia lanceaefolia* (1818) = **Ledebouria ovalifolia** (Schrad.) Jessop

Drimia revoluta (L.f.) Sweet, Hort. Suburb. Lond.: 72 (1818). *D. revoluta* (L.f.) Kunth, Enum. Pl. 4: 341 (1843), nom. superfl. = **Ledebouria revoluta** (L.f.) Jessop

Drimia undulata Jacq., Collectanea Suppl.: 41 (1797). Type: illustration in Jacq., Icon. Pl. Rar. 2 (15): t. 376 (1794) = **Ledebouria undulata** (Jacq.) Jessop

Schizobasis flagelliformis (Baker) Baker in J. Linn. Soc., Bot. 15: 161 (1876) = **Eriospermum flagelliforme** (Baker) J.C.Manning

Urginea acinicipolia Schinz. in Beiträge zur Kenntn. Fl. S.W.A. in Verh. Bot. Vereins Prov. Brandenburg 31: 220 (1890). Type: Namibia, 'Oshando in SE Ondonga', *Schinz 24* (Z, lecto., designated by Jessop in J. S. Afr. Bot. 43: 316 (1977); K, isolecto.) = **Albuca angolensis** Welw.

Urginea dimorphantha Baker in Bull. Herb. Boiss., sér. 2, 3: 663 (1903). Type: Namibia, 'Ovamboland, Ondonga', *Rautanen 772* (Z, holo. [PRE, photo!]) = **Albuca comosa** (Welw. ex Baker) J.C.Manning & Goldblatt

Urginea lorata Baker in Bull. Herb. Boiss., sér. 2, 3: 664 (1903). Type: Namibia, 'Ovamboland, Ondonga', *Rautanen s.n.* (Z, holo. [PRE, photo!]) = **Dipcadi glaucum** (Ker Gawl.) Baker

Urginea nematodes (Schult. & Schult.f.) Baker in J. Linn. Soc., Bot. 13: 218 (1873). *Anthericum nematodes* Schult. & Schult.f., Syst. Veg. 7: 472 (1829), as a nom. nov. pro *A. filifolium*. Thunb., Prodr. 1: 62 ([Oct.] 1794), nom. illeg., non *A. filifolium* Jacq. (1794) [= *Drimia filifolia* (Jacq.) J.C.Manning & Goldblatt]. *Ornithogalum thunbergii* Kunth, Enum. Pl. 4: 369 (1843), as nom. nov. pro *A. filifolium* Thunb. (1794), nom. illeg., non *O. filifolium* (Jacq.) Kunth (1843) = **Ornithogalum thunbergianulum** U.Müll.-Doblies & D.Müll.-Doblies



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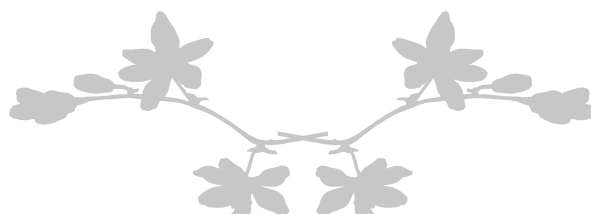
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We provide a taxonomic revision of the genus *Drimia* in southern Africa, in which we recognise 70 species with 61 endemic to the region. The account includes the new combination *D. basutica* for the illegitimate *D. angustifolia* Baker (1897) plus additional combinations for names that were

invalidly published. We also describe eight new species: *D. barbata*, *D. ciliolata*, *D. decipiens*, *D. juncifolia*, *D. khubusensis*; *D. monophylla* and *D. schizobasoides* from the Greater Cape Floristic Region, and *D. vespertina* from northern Namibia and southern Angola. Four taxa are synonymised: *Albuca reflexa* is included in *D. indica*, *D. loedolffiae* in *D. calcarata*, *D. saniensis* in *D. depressa*, and *D. macrocarpa* in *D. basutica*; and *D. ecklonii* is recognised as an earlier name for *D. ligulata*. We confirm that *Drimia nitida* is the earliest name for *Ledebouria concolor* (Baker) Jessop and provide the necessary new combination and synonymy in *Ledebouria*. We provide a detailed infrageneric classification for southern African *Drimia* in which we recognise 19 morphologically coherent sections diagnosed by a combination of traditional and novel characters. The account includes full species descriptions, notes on ecology, distribution maps and identification keys to the sections and species, and line drawings of almost half of the species.

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