

New species of *Drimia* (Hyacinthaceae: Urgineoideae) allied to *Drimia marginata* from Western and Northern Cape, South Africa

J.C. MANNING* and P. GOLDBLATT**

Keywords: *Drimia* Jacq., Hyacinthaceae, South Africa, taxonomy, Urgineoideae

ABSTRACT

Plants until now identified as *Drimia marginata* (Thunb.) Jessop on account of their leathery, oblong to elliptical leaves with thickened, cartilaginous margins and capitate inflorescences of campanulate flowers, are shown to comprise three sets of populations separable on leaf morphology, ecology and distribution. Typical *D. marginata* produces 1(2) oblong, apiculate leaves with retrorsely-scabridulous margins and occurs in fine-grained clay soils on the Hantam and Roggeveld Plateaus. Plants from Namaqualand and the Richtersveld, described here as *Drimia pulchromarginata* J.C.Manning & Goldblatt, occur in sandy or gravelly soils and produce 2–4, elliptical to suborbicular, apiculate leaves with an ornate, duplex margin: the dorsal surface bears a submarginal band of dense, velvety trichomes fringing the thickened, colliculate margin. A third series of populations from seasonally moist sandstones at higher altitude on the interior mountains of the West Coast produces 2 or 3(4) narrowly oblong, obtuse leaves with a simple, papillate or colliculate margin and are recognized as *D. ligulata* J.C.Manning & Goldblatt. A fourth taxon with a similar capitate inflorescence of campanulate flowers produces a solitary, subterete or subclavate leaf, elliptical in section. Recorded from scattered localities in the Northern and Western Cape, it is here described as *D. vermiformis* J.C.Manning & Goldblatt.

The genus *Drimia* Jacq. comprises ± 100 species of largely deciduous geophytes distinguished from other members of subfamily Urgineoideae, one of four subfamilies of the Hyacinthaceae, by their apomorphic, short-lived flowers with the tepals \pm united at the base (Manning *et al.* 2004). Each flower lasts just several hours or up to a day, and the perianth is caducous and circumscissile, abscising at the base and withering as a cap on the developing capsule. The genus includes several smaller groups of obviously related species with spurred floral bracts, some of which were previously treated as separate genera, including *Rhadamanthus* Salisb., *Schizobasis* Baker and *Tenicroa* Raf. (Jessop 1977). Among those taxa traditionally retained in the poorly defined genus *Urginea* itself, is a small assemblage of species from the winter rainfall region of the Western and Northern Cape Provinces characterized by their capitate inflorescence of campanulate flowers with spreading tepals. Florally rather uniform, the species in the group are distinguished by their foliage: *D. barkerae* J.C.Manning & Goldblatt by a rosette of oblanceolate, \pm ciliate leaves with simple margins; *D. marginata* (Thunb.) Jessop by two or three, oblong to elliptical leaves with heavily thickened margins; and *D. minor* (A.V.Duthie) Jessop by filiform or subterete leaves (Jessop 1977; Manning *et al.* 2002; Manning & Goldblatt 2003). Another taxon in this group, with a solitary, subcylindrical or clavate leaf, has been referred to *D. virens* Schltr. (Goldblatt & Manning 2000; Manning *et al.* 2002).

It is now clear that three distinct species are included within the concept of *Drimia marginata* as currently circumscribed (Jessop 1977; Goldblatt & Manning 2000).

These three entities are separable by differences in the number, shape, apex, and especially the marginal ornamentation of the leaves, as well as ecology and distribution. Typical *D. marginata* is characterized by oblong, apiculate leaves with thickened, minutely retrorsely scabridulous margins, and occurs in fine-grained clay soils on the Hantam and Roggeveld Plateaus. A second series of populations from seasonal sandstone rock flushes at moderate altitudes in the mountains of the southwestern Cape, described here as *D. ligulata* J.C.Manning & Goldblatt, produces narrowly oblong, truncate leaves with a papillate margin. A third group of populations, described here as *D. pulchromarginata* J.C.Manning & Goldblatt, occurs further north, in Namaqualand and the Richtersveld, in sandy or gravelly soils, and is characterized by its broader, elliptical to suborbicular leaves with a unique duplex margin comprising an outer rim of papillae, edged on the inner side by a dense, narrow, velvety band of minute trichomes.

Furthermore, examination of the syntypes of *Drimia virens*, *Schlechter 10127* and *Leipoldt s.n.*, reveals that the species falls within the current circumscription of *D. minor* (Duthie) Jessop, a species characterized by several, erect or spreading, linear or filiform leaves (Manning *et al.* 2002). In his review of the genus *Drimia*, Jessop (1977) treated *Urginea virens* as a synonym of *D. modesta* (Baker) Jessop, a species from the summer rainfall region with an elongate inflorescence but it is clearly misplaced here. *Drimia virens* is a combination based on *Urginea virens* Schltr. (1897) and as such is an earlier name for this species and we formally synonymize *D. minor* below.

The plants with a single, fleshy, subclavate leaf that were previously referred to *D. virens* by us (Goldblatt & Manning 2000; Manning *et al.* 2002) comprise a distinct species, which we describe here as *D. vermiformis* J.C.Manning & Goldblatt.

* Compton Herbarium, South African National Biodiversity Institute, Private Bag X7, 7735 Claremont, Cape Town.

** B.A. Krukoff Curator of African Botany, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166, USA.

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***Drimia vermiformis* J.C.Manning & Goldblatt,**
sp. nov.

D. virens sensu Goldblatt & Manning (2000), non *D. virens* (Schltr.) J.C.Manning & Goldblatt.

Species *Drimiae minori* similis sed folio uno, 50–80 × 2–4 mm, suberecto vel expanso, carnososo subclavato, floribus campanulatis, pallide brunneis tepalis carinis atrobrunneis, tepalis biseriatis per ± 1 mm connatis.

TYPE.—Western Cape: 3218 (Clanwilliam), Clanwilliam Dam, picnic site along N7 near wall, (–BB), 3 August 1987 (fl. in cult. 11 October 1988), *P.L. Perry 3587* (NBG, holo.).

Deciduous, bulbous herb. *Bulb* solitary, subglobose, 15–20 mm diam.; outer tunics pale brown, thinly leathery; inner tunics tightly overlapping, white or flushed pink. *Leaf* dry and withered at flowering, 1(2), spreading or suberect, leathery, dark green; blade falcate or subclavate, subterete or ellipsoid in section, 50–80 × 2–4 mm, glabrous or minutely hispidulous. *Inflorescence* nodding in bud; scape erect or flexuose at base, (20–)50–120 mm long, glabrous; raceme corymbose-capitate, 2–5 mm long, densely 5–20-flowered; bracts elliptical, ± 2 mm long, lower with spur 1–2 mm long; pedicels spreading, 5–10 mm long at anthesis. *Flowers* campanulate, 1 or 2 open at a time, pale brownish with darker keels, opening in the late afternoon and fading in the evening, apparently unscented; tepals biseriate with blades of outer series overlapping inner, penicillate at apex, fused for ± 1 mm, erect below forming a cup ± 1.5 mm deep, spreading above; blades of outer tepals ovate, ± 5.0 × 2.0 mm, inner oblong, ± 4.5 × 1.8 mm, weakly canaliculate at top of cup. *Stamens* adnate to perianth for ± 0.5 mm; filaments erect, subterete and tapering, ± 2.5 mm long; anthers erect, dorsifixed, dehiscing by longitudinal slits, ± 1 mm long, yellow with yellow pollen. *Ovary* ellipsoid, ± 2 mm long, truncate, greenish yellow; style columnar, ± 1.5 mm long, white, apically truncate with trigonous, papillate stigma. *Capsules* subglobose, 5–6 × ± 5 mm, erect on suberect, slightly curved pedicels. *Seeds* compressed, elliptical or rectangular, 2–3 mm diam., glossy black, irregularly folded, testa finely reticulate. *Flowering time*: October and November. Figure 1.

Distribution and ecology: widely distributed through the arid parts of the southwestern Cape, from Bushmanland in Northern Cape southwards onto the Roggeveld and Nuweberg Escarpments and into 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 (Figure 2). The species is certainly more common than records indicate. Plants occur 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.

Additional specimens examined

NORTHERN CAPE.—2919 (Pofadder): Pofadder, (–AB), 14 October 1954, *E. Esterhuysen 23640a* (BOL). 3120 (Williston): Roggeveld Escarpment, Middelpoos, hill behind school, (–CC), 12 September 2001 (in bud), *D. Snijman & Van der Westhuysen 1853* (NBG).

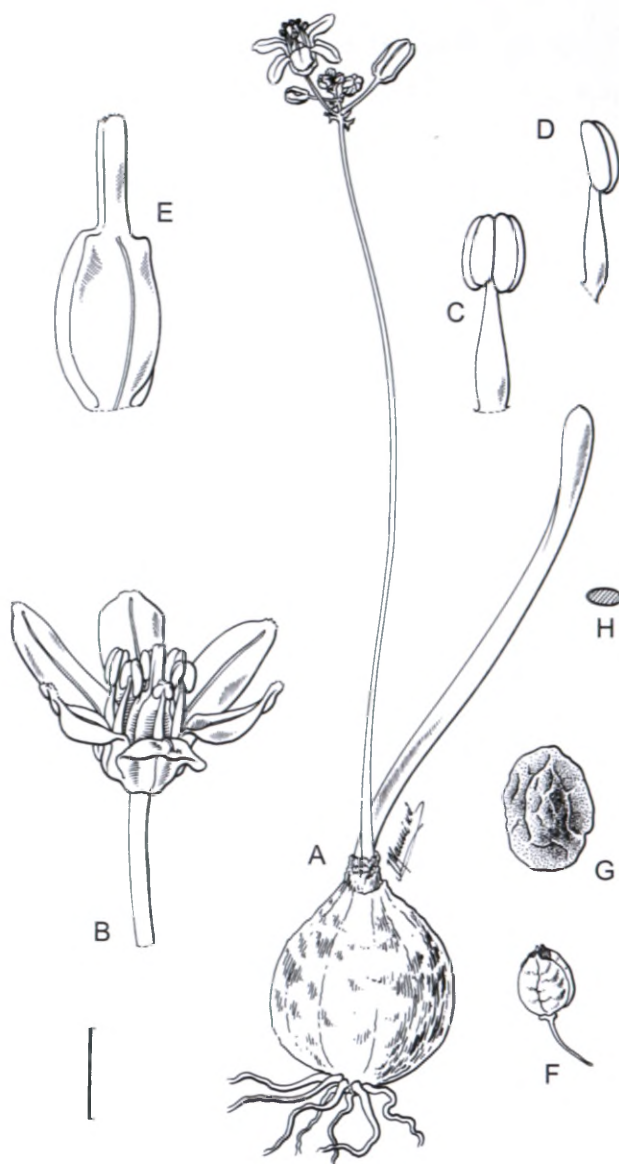


FIGURE 1.—*Drimia vermiformis*, Manning 3092. A, whole plant; B, flower. C, D, stamen: C, front view; D, side view. E, gynoecium; F, capsule; G, seed; H, c/s leaf. Scale bar: A, F, H, 10 mm; B, G, 2 mm; C–E, 1 mm. Artist: John Manning.

WESTERN CAPE.—3118 (Vanrhynsdorp): Trawal, steep slopes west of N7, (–DC), 31 August 2003 (in bud), *P.V. Bruyns 9523* (NBG); Trawal, right hand slope below N7 leading to Olifants River, (–DC), 15 April 2007, *J. Manning 3092* (NBG). 3218 (Clanwilliam): Zwart Vley, near upper waterfall east of Uitspankraal on Doring River, (–AB), 16 September 1992 (in cult.), *D. Snijman 1223* (NBG). 3222 (Beaufort West): Stolshoek, [Karoo National Park, west of Beaufort West], (–AD), 13 September 1989, *P. Bruyns 3977* (BOL). 3320 (Montagu): near Montagu, (–CC), September 1933, *M.R. Levyns 4600* (BOL); 13.5 km east of Bonnievale, (–CC), without date, *P.L. Perry s.n.* (NBG). 3321 (Ladismith): Farm Droogkraal, 30 km NW of Oudtshoorn, (–BD), 1 October 1980, *A. Bean s.n.* (NBG); road to Rooiberg Pass, SW of Radleigh, (–DA), *E.G.H. Oliver 3665* (NBG).

***Drimia virens* (Schltr.) J.C.Manning & Goldblatt** in *Strelitzia* 9: 712 (2000), *Urginea virens* Schltr.: 433 (1897). Type: [Western Cape], Cold Bokkeveld, Tweefontein, 24 January 1897, *Schlechter 10127* (BOL, lecto!., here designated; E!, GRA!, BM, K!, L, P, PRE!, S!, Z, islecto.).

D. minor (Duthie) Jessop: 306 (1977). *Urginea minor* Duthie: 11 (1928), syn. nov. Type: [Western Cape], Stellenbosch Flats, March 1924, *Duthie s.n. STE1546* (NBG, holo!).

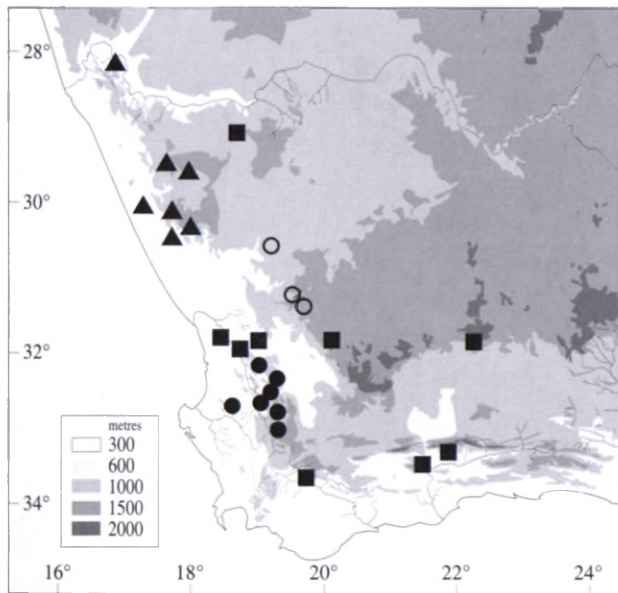


FIGURE 2.—Known distribution of *Drimia vermiformis*, ■; *D. ligulata*, ●; *D. marginata*, ○; *D. pulchromarginata*, ▲.

THE DRIMIA MARGINATA COMPLEX

***Drimia marginata* (Thunb.) Jessop** in Journal of South African Botany 43: 295 (1977). *Anthericum marginatum* Thunb.: 63 (1794). *Idothea marginata* (Thunb.) Kunth.: 346 (1843). *Urginea marginata* (Thunb.) Baker: 218 (1873). Type: [Northern Cape], Hantam, without exact date, [November 1774], Thunberg s.n. (UPS-8393, holo.—microfiche!).

Deciduous, bulbous herb. *Bulb* solitary, subglobose, 15–30 mm diam.; outer tunics pale brown, thinly leathery; inner tunics tightly overlapping, white. *Leaf* dry and withered at flowering, 1(2), spreading or prostrate, leathery, dark green, base amplexicaul; blade oblong to oblanceolate, apiculate, 30–50(–60) × 9–15 mm, glabrous or minutely hispidulous, margin adaxially thickened, cartilaginous and densely and minutely retrorsely scabridulous, ± 0.5 mm wide. *Inflorescence* erect or flexuose at base; scape (100–)150–200 mm long, glabrous; raceme capitate, 2–10 mm long, densely 10–20-flowered; bracts elliptical, 2–3 mm long, lower spurred with spur 1–2 mm long; pedicels spreading, 5–10 mm long at anthesis. *Flowers* campanulate, 1 or 2 open at a time, pale brownish with darker keels; tepals biseriate with blades of outer series overlapping inner, penicillate at apex, fused for ± 1 mm, erect below and forming a cup ± 1.5 mm deep, spreading above, blades of outer tepals ovate, ± 5.0 × 2.0 mm, inner oblong, ± 4.5 × 1.8 mm. *Stamens* adnate to perianth for ± 0.5 mm; filaments erect, subterete and tapering, ± 2.5 mm long; anthers erect, dorsifixed, introrse, dehiscing by longitudinal slits, ± 1 mm long, yellow with yellow pollen. *Ovary* ovoid, ± 2 mm long, truncate, greenish yellow; style columnar, ± 1.5 mm long, white, apically truncate with trigonous, papillate stigma. *Capsules* and *seeds* unknown. *Flowering time*: October and November.

Distribution and ecology: apparently restricted to the Hantam Plateau in Northern Cape, between Loeriesfontein and Calvinia (Figure 2), on open clay flats in renosterveld vegetation.

Discussion: the first species in the complex to be described, *D. marginata* is still relatively poorly collected. It is distinguished by its oblong to oblanceolate, distinctly apiculate leaves with a thickened margin that is densely ornamented with minute, stiff, retrorse trichomes 0.2–0.2 mm long (Figure 3C, D). The blade may be glabrous or minutely hispidulous and typically just a single leaf is produced (rarely two).

The species appears to be restricted to fine-grained clay soils derived from shale or dolerite. No information is recorded on the time of anthesis, nor on floral fragrance.

Additional specimens examined

NORTHERN CAPE.—3019 (Loeriesfontein): 15 km from Loeriesfontein on road to Kliprand, (–CD), 13 September 2000 (in leaf), *P. Goldblatt, J. Manning & V. Savolainen* 11525 (NBG). 3119 (Calvinia): Farm uitvlug NW of Calvinia, (–BC), 6 July 2000 (fl. in cult. 5 October 2000), *J. Manning* 2270A (NBG); Hantam Mtn, Akkerdam, (–BD), 22 July 1961 (fl. in cult. 14 November 1961), *W.F. Barker* 9343 (NBG). 3120 (Williston): northern foot of Klein Tafelberg, (–CA), 22 October 1991, *P.V. Bruyns* 4293 (BOL).

***Drimia pulchromarginata* J.C.Manning & Goldblatt, sp. nov.**

Species *Drimiae marginatae* similis sed decidua vel sempervirens, tunicis bulbi interdum laxe dispositis, foliis 2–4, latioribus ellipticis ad suborbicularibus usitate 15–25 mm latis, marginibus incrassatis parte dorsali perornatis supra colliculosis infra dense scabridulis, parte ventrali simplicibus colliculosis.

TYPE.—Northern Cape: 3018 (Kamiesberg), Farm Draaiklip, (–AA), 31 October 1983 (fl. in cult.), *C.H. Stirton* 9226 (NBG, holo.!).

Evergreen or deciduous, bulbous herb. *Bulb* solitary, subglobose, 20–30 mm diam.; outer tunics pale brown, thinly leathery; inner tunics sometimes loosely arranged, white. *Leaves* green or drying at flowering, (1)2–4, prostrate or erect, leathery, dark green, sometimes purple beneath, base flat; blade elliptical to broadly elliptical or suborbicular, acute, 25–60 × (13–)15–25 mm, glabrous or minutely hispidulous adaxially, margin thickened, cartilaginous, 0.5–1.0 mm thick, colliculate, with adaxial submarginal band ± 0.5 mm wide of dense, suberect or weakly retrorse trichomes ± 0.1 mm long. *Inflorescence* erect or flexuose at base; scape (60–)150–300 mm long, glabrous; raceme capitate, 2–5(–20) mm long, densely 10–30-flowered. *Flowers* as in *D. marginata*, usually opening in late afternoon and fragrant. *Capsules* and *seeds* unknown. *Flowering time*: October and November.

Distribution and ecology: endemic to the western parts of Northern Cape, from the Richtersveld and higher-lying parts of northern and central Namaqualand as far south as Garies, rarely near the coast (Figure 2). Plants typically occur on sandy or gravelly flats among granite outcrops, sometimes on quartz patches. Anthesis has been variously recorded as in the afternoon (*Hall* 4172) or morning (*Harrover* 1521) and the floral fragrance described as either unpleasant (*Stirton* 9226) or freesia-like (*Harrover* 1521).

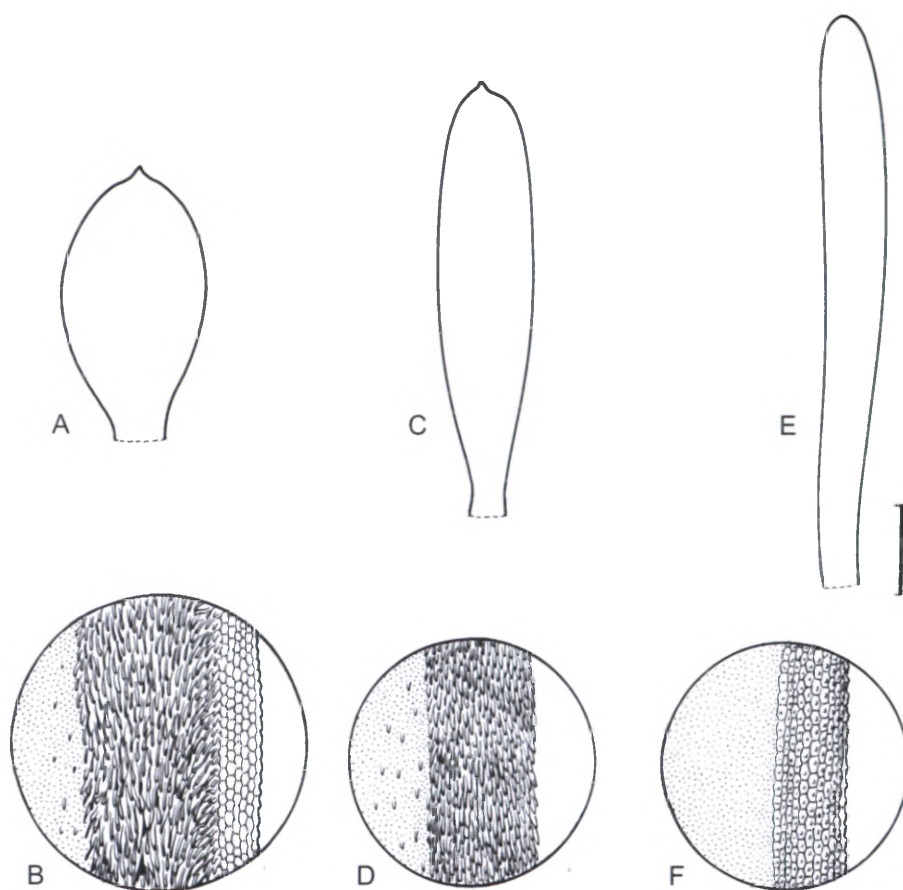


FIGURE 3.—Leaf shape and leaf margin in *Drimia marginata* complex. A, B, *Drimia pulchromarginata*, Stirton 9226; C, D, *D. marginata*, Goldblatt, Manning & Savolainen 11525; E, F, *D. ligulata*, Esterhuysen 14487. Scale bar: A, C, E, 10 mm; B, D, F, 0.5 mm. Artist: John Manning.

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 with a broader band, ± 0.5 mm wide, of closely packed, suberect or weakly retrorse trichomes ± 0.1 mm long (Figure 3A, B). This uniquely complex margin is developed only on the adaxial surface, and the margin on the ventral surface is simple and colliculate, as found in *D. ligulata*. The leaves of *D. pulchromarginata* are also characteristically broader and more elliptical than in the other species in the complex. Typically 2–4 leaves are produced, and the plants remain evergreen if conditions permit.

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

Additional specimens examined

NORTHERN CAPE.—2817 (Vioolsdrif: Richtersveld, Chubiesies, (–AB), 15 October 2006 (fl. in cult.), A. Harrower 1521 (NBG). 2917 (Springbok): Springbok, (–DB), January 1977, B. Jeppe s.n. PRE57508 (PRE). 2918 (Gamoep): Vaalkoei, 1 000 m, (–CD), 10 July 1991 [fl. 4 November 1991], P.V. Bruyns 4713 (PRE). 3017 (Hondeklipbaai): Riethuis, (–AB), 11 July 1989 [as 1898] [fl. 21 October 1991], P. Bruyns 3879 (BOL); 6 km NNE Riethuis on road to Springbok, (–AB), without date, J. Manning 1040 (NBG); Kamieskroon, (–BB), 9 November 1950, W.F. Barker s.n. NBG1181/50 (NBG); Kharkams, (–BD), 18 October 1971, H. Hall 4172 (NBG); Darter's Grave, 22 miles N of Garies, (–BD), August 1932, J. Mathews s.n. NBG1891/31 (BOL); 4 May 1963 (fl. in cult. 18 November 1963), L. Booysen 13 (NBG). Without precise locality or date: [Northern Cape], Namaqualand, 1924, Giffen s.n. NBG1051/24 (BOL).

Drimia ligulata J.C. Manning & Goldblatt, sp. nov.

Species *Drimiae marginatae* similis sed foliis 2–3(–4), angustioribus oblongis usitate 6–10, raro ad 15 mm latis, expansis vel prostratis obtusis, marginibus simplicibus papillosis, papillis truncatis vel acutis, racemo corymboso-capitato, florescentia Decembri Januarioque.

TYPE.—Western Cape: 3218 (Clanwilliam), Piketberg Mtns, Zebra Kop, (–DB), 23 May 1948 (fl. Dec–Jan 1948 and 1949), E. Esterhuysen 14487 (BOL, holo.).

Deciduous, bulbous herb. *Bulb* solitary, subglobose, 15–30 mm diam.; outer tunics pale brown, thinly leathery; inner tunics tightly overlapping, white. *Leaves* dry and withered or emergent at flowering, 2 or 3(4), prostrate or spreading, leathery, dark green, base amplexicaul; blade oblong, obtuse, (20–)30–90 \times (4–)6–10(–15) mm, glabrous, margin thickened, cartilaginous, 0.5 mm thick, papillate or colliculate. *Inflorescence* erect or flexuose at base; scape (60–)80–200 mm long, glabrous; raceme corymboso-capitate, 2–20 mm long, densely 5–20-flowered. *Flowers* as in *D. marginata*, usually fragrant. *Capsules* spreading or suberect on pedicels 5–18 mm long, ovoid to subglobose, 6–8 \times 5–7 mm. *Seeds* elliptical to reniform, peripherally winged, 3–4(–6) \times 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.

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 Skurwe-

berg, and also on the higher parts of the Piketberg to the west (Figure 2). Plants grow in seasonally moist rock flushes or shallow rock basins on sandstone.

Discussion: the most commonly collected of the three species of the *Drimia marginata* complex, *D. ligulata* is distinguished by its generally narrower, oblong leaves, usually 6–10 (rarely up to 15) mm wide, with an obtuse apex and a simple, papillate margin (Figure 3E, F). Typically two or three leaves are produced, rarely up to four. The leaf margin is thickened on both dorsal and ventral surfaces and the papillae may be blunt or acute. Other members of the complex have broader, oblong or elliptical leaves that are distinctly apiculate and have margins that are partially or entirely ciliolate.

Drimia ligulata is geographically and ecologically distinct from other members of the complex, being confined to seasonally moist sandstone substrates at moderately high altitudes, between 500–1 500 m, in the western mountains of the Cape Fold Belt. At these altitudes the species flowers later than *D. marginata* and *D. pulchromarginata*, typically in December and January, rather than October and November.

Additional specimens examined

WESTERN CAPE.—3218 (Clanwilliam): Piketberg, (–DC), December 1950, *E. Esterhuysen* 14487 (BOL); Piketberg, S entrance to Kapteinskloof, (–DC), 22 October 1935, *N. Pillans* 8092 (BOL). 3219 (Wuppertal): Cedarberg, between Pakhuis and Heuning Vlei, (–AA), 28 December 1941, *E. Esterhuysen* 7426 (BOL); Cedarberg, Tafelberg, (–AC), 29 December 1947, *E. Esterhuysen* 14337 (BOL); Cedarberg, Wolfberg, (–AC), 3 October 1952 (fl. December 1952), *E. Esterhuysen* 20587 (BOL); Elands Kloof, (–CA), 29 September 1944 (leafing), *W.F. Barker* 3072 (NBG), 9 September 1946 (leafing), *W.F. Barker* 3822 (NBG), 24 September 1956 [fl. 18 November 1955], *T.P.*

Stokoe SAM68464 (SAM); W slopes of Cold Bokkeveld Mtns near Keerom, (–CC), 4 December 1950, *E. Esterhuysen* 17922 (BOL). 3319 (Worcester): Kliphuis Vlake on the Skurweberge, (–AA), 10 September 1989 (leafing), *D. Snijman* 1236 (NBG); Schurweberge, between Bokkeveld Tafelberg and Bokkeveld Sneeuwberg, ± 5000' [1 500 m], (–AA), 11 October 1952 (fl. December 1962), *E. Esterhuysen* 20662 (BOL); Hansiesberg, (–AB), 16 December 1944, *R.H. Compton* 16689 (NBG); top of Gydo Pass, (–AB), 7 December 1940, *E. Esterhuysen* 3952 (BOL); Mosterthoek Twins, 400' [1 370 m], (–AD), 8 January 1944, *E. Wasserfall* 810 (NBG), *E. Esterhuysen* 9892 (BOL).

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