

Romulea pilosa and *R. quartzicola* (Iridaceae: Crocoideae), two new species from the southern African winter rainfall region, with nomenclatural corrections including new names for *R. amoena*, *R. neglecta* and *R. rosea* var. *reflexa*

J.C. MANNING*, P. GOLDBLATT** and A.D. HARROWER***

Keywords: Iridaceae, new species, nomenclature, *Romulea* Maratti, southern Africa, taxonomy

ABSTRACT

Romulea pilosa J.C.Manning & Goldblatt and *R. quartzicola* J.C.Manning & Goldblatt are two narrow endemics from the southern African winter rainfall region. An early, fragmentary collection of *R. pilosa* from Riviersonderend lacked the diagnostic corm and was thus mistakenly associated with *R. tetragona* (sect. *Ciliatae*) as var. *flavandra* M.P.de Vos because of the highly distinctive pilose, H-shaped leaf. The rediscovery of the taxon in the wild shows it to be a previously unrecognized member of sect. *Aggregatae*, distinguished by its unusual foliage and bright orange flowers. *R. quartzicola* was grown to flowering from seeds collected from quartz patches in southern Namaqualand and proved to be a new species of sect. *Ciliatae*, distinguished by its early flowering, short, subclavate leaves with reduced sclerenchyma strands, and bright yellow flowers with short bracts. *R. neglecta* M.P.de Vos, a rare endemic from the Kamiesberg in Northern Cape, is a later homonym for the Mediterranean *R. neglecta* Jord. & Fourr., and the earliest name for this plant is shown to be *R. speciosa* (Ker Gawl.) Baker, typified by an illustration in Andrews' *The botanist's repository*. An epitype is designated to fix the application of the name. We have also examined the type illustration of *R. pudica* (Sol. ex Ker Gawl.) Baker, hitherto treated as an uncertain species, and are confident that it represents the species currently known as *R. amoena* Schltr. ex Bég., and takes priority over it as being the earlier name. The type of *R. reflexa* Eckl., a new name for the later homonym *I. reflexa* Thunb. and the basionym of *R. rosea* var. *reflexa* (Eckl.) Bég., has been mistakenly identified as an Ecklon collection but is in fact the collection that formed the basis of Thunberg's *I. reflexa*. This collection is actually a form of *R. flava* Lam., and the name *R. rosea* var. *reflexa* is thus moved to the synonymy of that species. The variety currently known under this name should now be known as *R. rosea* var. *muirii* (N.E.Br.) Goldblatt & J.C.Manning. Finally, the protologue of *R. parviflora* Eckl., until now treated under the synonymy of *R. obscura* Klatt var. *obscura*, is in fact consistent with *R. rosea* var. *australis* (Ewart) M.P.de Vos, and we therefore include the name in the synonymy of the latter.

INTRODUCTION

Romulea Maratti, one of the larger genera of Iridaceae (Goldblatt & Manning 2008), is widely distributed through eastern sub-Saharan Africa, the Mediterranean and the Near East. It is centred in the winter rainfall region of southern Africa, where 80 % of the species occur (De Vos 1972, 1983; Manning & Goldblatt 2001, 2004, 2006).

Flower structure in the genus is conservative (Goldblatt *et al.* 2002), with a few notable exceptions, and characters of the corm are essential in the primary subdivision of the genus into subgenera and sections (Manning & Goldblatt 2001, 2004). Flower colour and markings, as well as the texture and details of the membranous margins of the bracts provide the primary specific characters. Additional valuable anatomical characters include the distribution of vascular bundles in the leaf and the development of sclerenchyma caps and strands.

Five new species have been described since the last review of the genus (Manning & Goldblatt 2001,

2004, 2006), and a further two highly local endemics are described here, bringing to 83 the number of species recorded from southern Africa and raising the total number in the genus to ± 97 spp.

Romulea pilosa, a spring-flowering species endemic to stony renosterveld in the Overberg south of Riviersonderend, was collected at least as long ago as the early 1930s but the fragmentary material was misidentified until recently. It is named for the distinctive, pilose leaves. *R. quartzicola*, a recently discovered, winter-flowering species from quartz patches in the southwestern corner of the Knersvlakte, is named for its unusual habitat. We also deal with the nomenclature of *Romulea neglecta* M.P.de Vos (1983), a later homonym. The earliest legitimate name for the species is *R. speciosa* (Ker Gawl.) Baker (1877), which coincidentally has the same type as *R. neglecta*.

Collections at BOL, NBG, PRE and SAM, the main herbaria with good representation of Cape species, were consulted (herbarium acronyms after Holmgren *et al.* 1990).

* Compton Herbarium, South African National Biodiversity Institute, Private Bag X7, 7735 Claremont, Cape Town / Research Centre for Plant Growth and Development, School of Biological and Conservation Sciences, University of KwaZulu-Natal, Pietermaritzburg, Private Bag X01, Scottsville 3209, South Africa.

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

*** Kirstenbosch National Botanical Garden, South African National Biodiversity Institute, Private Bag X7, 7735 Claremont, Cape Town.

MS. received: 2011-04-14.

TAXONOMY

1. *Romulea pilosa* J.C.Manning & Goldblatt, sp. nov.

Ad sectionem *Aggregatae* M.P.de Vos pertinens et recognita caule subterraneo vel breviter aërio, foliis relative brevibus falcatis H-formibus 4–6 mm latis, margin-

bus late alatis ciliatisque, floribus salmoneis vel aurantiacis cupulo flavo, tubo perianthii infundibuliformi \pm 5 mm longo parte inferiori \pm 1 mm longo, tepalis oblanceolatis $20\text{--}30 \times 7\text{--}10$ mm, filamentis $5\text{--}6$ mm longis minute pilosis in dimidio inferiori, antheris \pm 4 mm longis.

TYPE.—Western Cape, 3420 (Bredasdorp): Farm Fonteinkloof, between Riviersonderend and Proteem, hill W of homestead, (–AA), 15 Aug. 2009, Manning 3220 (NBG, holo.; MO, iso.).

Plants \pm 60 mm high; stem subterranean or shortly aerial, simple or with up to 2 branches. *Corm* subglobose, asymmetric, obliquely flattened towards base with crescent-shaped basal ridge; tunics hard, smooth, dark brown, split into clusters of convergent fibrils on basal ridge and splitting along clusters into narrow vertical strips, drawn into short fibrils up to 2 mm long above. *Cataphylls* 3, membranous, flushed greenish above ground. *Foliage leaves* 2, lowermost 1 basal, blades falcate, H-shaped in section, lowermost $50\text{--}70 \times 4\text{--}6$ mm, upper shorter, lateral ribs reduced, median (apparently marginal) ribs extended laterally to form flange-like wings $1\text{--}2$ mm wide along each side of blade, densely villous along margins of wings with hairs $1\text{--}2$ mm long in two diverging rows. *Inflorescence* of solitary flowers; peduncles angled in section and villous along angles in distal part; outer bracts subobtusate, $13\text{--}15$ mm long, green with narrow, translucent membranous margins, strongly keeled along median and submarginal veins, longitudinally inflexed along submarginal veins, median keel sometimes double, keel and submarginal veins densely pubescent, inner bracts green with broad translucent white margins, \pm as long as outer, bicarinate with keels densely pubescent. *Flowers* deeply cup-shaped, cup \pm 10 mm deep, salmon-pink to dull orange but golden yellow in lower half to two thirds, yellow extending beyond cup margin onto lower third of limb, outer tepals flushed coppery on reverse, unscented, $30\text{--}40$ mm diam.; perianth tube funnel-shaped, 5 mm long with lower narrow portion \pm 1 mm long, tepals oblanceolate, $20\text{--}30 \times 7\text{--}10$ mm. *Stamens* yellow; filaments inserted at base of cup, free, $5\text{--}6$ mm long, minutely pilose in lower half; anthers parallel, 4 mm long. *Style* dividing opposite lower half of anthers, branches \pm 1.5 mm long, divided for \pm half their length. *Capsules* oblong-ellipsoid, $7\text{--}9 \times 5$ mm long, fruiting peduncles diverging, straight. *Seeds* subglobose, \pm 2 mm diam. *Flowering time*: Aug. Figure 1.

Distribution and ecology: known with certainty only from a single locality south of Riviersonderend on the Farm Fonteinkloof (Figure 2), where a small population, numbering less than fifty plants, occurs in a remnant patch of renosterveld vegetation, too stony to plough. The plants are wedged among small vertical ruffles of shale on the crest of a hill as part of a Rûens Silcrete Renosterveld community, a highly endangered vegetation type found as scattered pockets in the Overberg region (Mucina & Rutherford 2006).

Diagnosis and relationships: the oblique corm with tunics split along the basal ridge into clusters of converging fibrils place *Romulea pilosa* in sect. *Aggregatae* M.P.de Vos (1972), making it the ninth member of

this small group. Its relatively short, falcate, H-shaped leaves $4\text{--}6$ mm wide, with ciliate, winged margins, and its salmon to orange flowers with a yellow cup, make it instantly recognizable in the genus. Similar winged, ciliate leaves are known only in two other species in the genus, *R. hirsuta* Schltr. and *R. tetragona* M.P.de Vos. Although associated in sect. *Hirtae* Bég. by De Vos (1972) on the basis of their similar leaf morphology, these two species have fundamentally different corm tunic morphologies, leading Manning & Goldblatt (2001) to segregate them respectively to subgen. *Romulea* sect. *Cilatae* (M.P.de Vos) J.C.Manning & Goldblatt and subgen. *Spatalanthus* (Sweet) Baker. The discovery of a third, evidently unrelated species with similar, H-shaped and winged leaves now suggests that this unusual leaf morphology has evolved independently at least three times within the genus. The three species concerned occupy quite different geographical regions with differing ecology, and the adaptive value of this leaf type is not immediately clear.

Within sect. *Aggregatae*, *Romulea pilosa* is evidently most closely allied to *R. dichotoma* (Thunb.) Baker and *R. jugicola* M.P.de Vos, both of which typically have aerial stems, ciliate peduncles, and a solitary basal leaf with ciliate rib margins. The leaves of *R. dichotoma* in particular tend to have wider longitudinal grooves, with the marginal ribs prominently expanded and almost wing-like. Both species are found on clay soils in renosterveld communities in the southern Cape. *R. jugicola*, known only from the foothills of the Kammanassie Mtns in the Little Karoo, is distinguished by its well-exserted aerial stems, up to 30 mm tall, with a well-developed, fibrous neck around the base, and orange-yellow perianth; *R. dichotoma* is more widespread, extending from Stanford to Humansdorp, and has mostly magenta or rarely salmon-pink flowers with a yellow cup. It is most evidently separated from *R. pilosa* by its generally taller stem, up to 350 mm high, usually branched dichotomously near the top, and narrower, distinctly 4-ribbed leaves, $1\text{--}2$ mm in diameter.

The leaves of *Romulea pilosa* are anatomically consistent with sect. *Aggregatae* in their well-developed sclerenchyma girders joining the primary vascular bundles to the epidermis (Manning & Goldblatt 2001), an evidently apomorphic character state that is only intermittently developed in subgen. *Romulea*. Although girders are also developed in the secondary bundles in other members of the series, they are almost confined to the primary bundles in *R. pilosa* (occurring only rarely in one or two secondary bundles near the wing margins in some leaves). Stomata are present on the blade and 'inner' wing surfaces but are lacking on the 'outer' wing surface, i.e. those making the acute angle along the leaf margins.

Morphologically similar, H-shaped leaves have evolved repeatedly in several genera of the Cape Iridaceae. Notable examples in *Gladiolus* sect. *Homoglossum* are the *Gladiolus gracilis*–*G. caeruleus*–*G. recurvus* group in ser. *Carinatus* as well as most members of ser. *Homoglossum* and *Tristis*; and some members of *Geissorhiza* sect. *Engysiphon*. We have observed that the wings in these species curve inward over the stomatiferous grooves when the plants are water-stressed, and

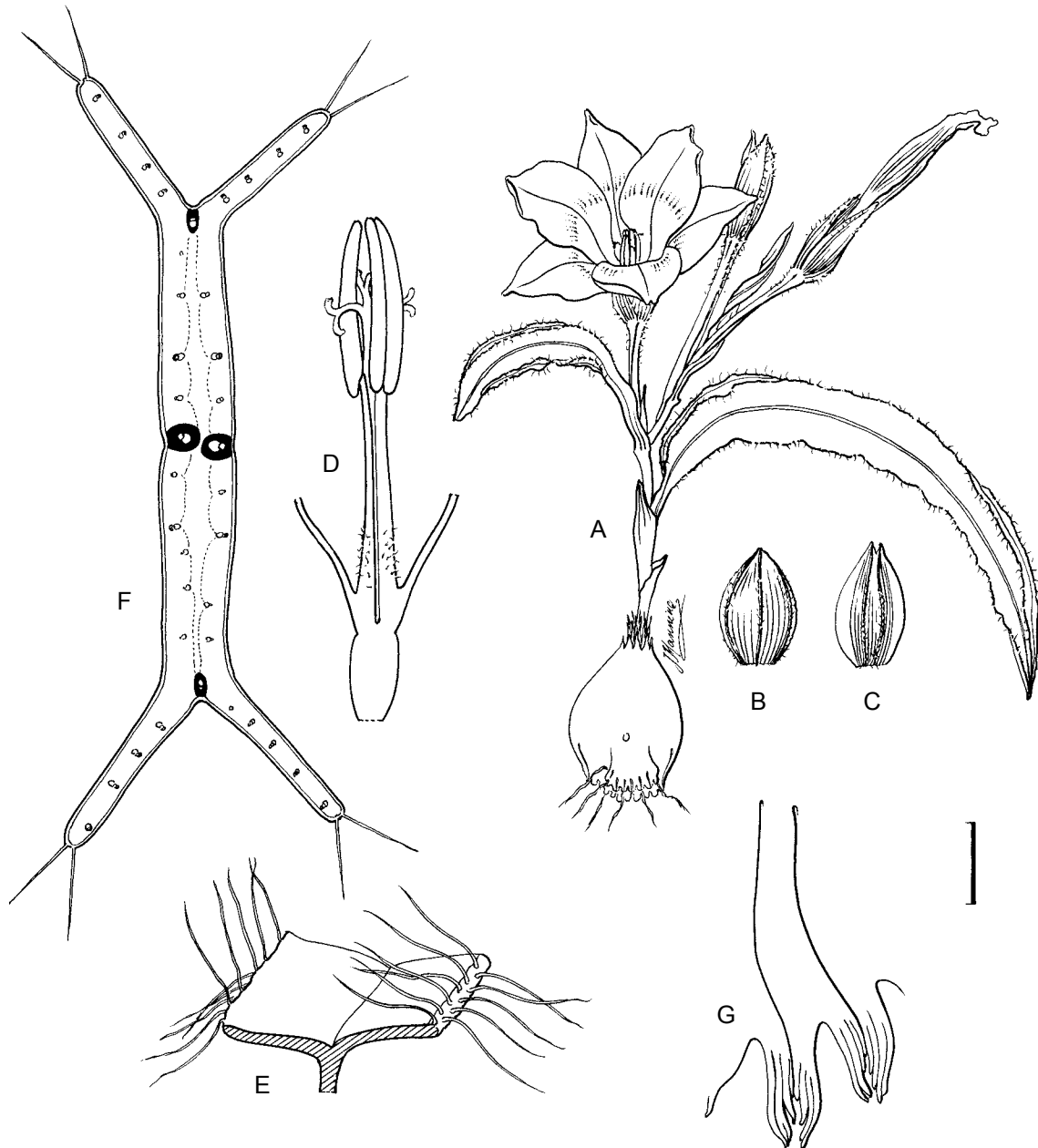


FIGURE 1.—*Romulea pilosa*, Manning 3220. A, whole plant; B, outer bract; C, inner bract; D, stamens and style; E, detail of leaf margin; F, t/s leaf; G, detail of corm fibril clusters. Scale bars: A–C, 10 mm; D, 2.5 mm; E, 1 mm; F, 0.5 mm; G, 0.2 mm. Artist: John Manning.

speculate that this mechanism facilitated the development of a relatively broader photosynthetic leaf surface while still controlling water loss.

History: described here from a population discovered in August 2009 by Napier residents and dedicated conservationists, Cameron and Rhoda McMaster, the species appears to have been first collected in 1932 or 1933 by Grace Neethling of Riviersonderend. This discovery is represented by a fragmentary specimen in the Bolus herbarium, comprising a solitary detached leaf and a single dissected flower. The plant from which these parts were picked was cultivated at Kirstenbosch but subsequently disappeared and thus no corm was preserved. The fragments are accompanied by a coloured painting of the floral parts showing the distinctive orange tepals

with their yellow cup. Although initially intending to describe the collection as a new species, De Vos (1972) subsequently treated it as *Romulea tetragona* var. *flavandra* M.P.de Vos (otherwise endemic to the southwestern Karoo), although noting the anomalous colour of the flowers of the Riviersonderend collection. With the discovery of a wild population, it is now evident that this plant is quite unrelated to *R. tetragona* and does indeed represent a distinct species. The locality where Miss Neethling found her plant is unknown, although the Neethling family owned the Farm Bon Esperance at the foot of the Riviersonderend Mtns at the time (Lewis 1947). Most of the natural vegetation below these mountains has since disappeared under cultivation and we will never know if her collection came from the present locality or from another population in the vicinity.

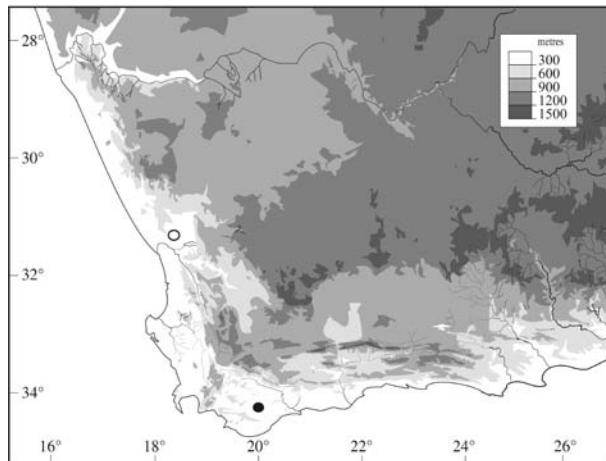


FIGURE 2.—Known distribution of *Romulea pilosa*, ○; *R. quartzicola*, ●.

Additional material seen

WESTERN CAPE.—3419 (Caledon): Rivierosonderend, (–BB), fld. [flowered] at Kirstenbosch, 24 Aug. 1933, *G. Neethling s.n. BOL24789* (BOL).

2. *Romulea quartzicola* J.C.Manning & Goldblatt, sp. nov.

Ad sectionem *Ciliatae* (M.P.de Vos) J.C.Manning & Goldblatt pertinens et recognita florentia praecoci, foliis relative brevibus obtusis subclavatis, floribus grandis canarinis, tubo perianthii profundo 7–8 mm longo, tepalis 20–22 × 6–10 mm, filamentis, 7–9 mm longis quem antheris longioribus, bracteis ovatis vel suborbicularibus 8–13 mm longis, marginibus membranaceis angustis ecoloratis vel purpureo-suffusis.

TYPE.—Western Cape, 3118 (Vanrhynsdorp): Knersvlakte, Farm Moedverloor, ± 15 km NE of Lutzville, (–AD), 21 June 2010, *A.D. Harrower & J.C.Manning 4395* (NBG, holo.; MO, iso.).

Plants 50–80 mm high; stem aerial, up to 35 mm long, simple or with 1 branch. *Corm* subglobose, ± 10 mm diam., asymmetric, obliquely flattened towards base with crescent-shaped basal ridge; tunics hard, smooth, dark brown, split into numerous fine parallel fibrils on basal ridge and into narrow teeth up to 5 mm long above. *Cataphylls* 3, membranous, flushed greenish above ground. *Foliage leaves* (1)2, all basal, blades mostly ± as long as flowering stem, cylindrical-subclavate, obtuse, narrowly 4-grooved, 30–80 × (1.0–) 1.5–2.5 mm; cauline leaf present only when lateral inflorescence developed, inserted midway or two thirds up stem, much shorter than basal leaves, entirely sheathing or with blade up to 30 mm long. *Inflorescence* of solitary flowers; outer bracts broadly elliptical-suborbicular, concave, obtuse, green with narrow, translucent (sometimes purplish tinted) membranous margins, 8–13 mm long, inner bracts similar but with broader membranous margins, ± as long as outer, notched apically. *Flowers* deeply cup-shaped, 25–30 mm diam., cup 12–15 mm deep, bright chrome-yellow (rarely peach-coloured), with 3–5 inconspicuous dark veins at base of cup, rarely flushed copper or pale green on reverse, weakly clove-scented; perianth tube funnel-shaped, 7–8 mm long

with lower narrow portion ± 1 mm long, tepals oblan-ceolate, 20–22 × 6–10 mm. *Stamens* yellow; filaments inserted at base of cup, lower 2–4 mm included within perianth tube, free, pubescent in lower two thirds, especially towards base, 7–9 mm long; anthers parallel, 4–5 mm long, thecae well separated by broad connective 0.50–0.75 mm wide. *Style* dividing opposite upper half of anthers, branches ± 3 mm long, divided for entire length into six filiform branchlets. *Capsules and seeds* unknown. *Flowering time*: mid-June to July. Figure 3.

Distribution and ecology: known so far from several small populations on the Farm Moedverloor, northeast of Lutzville in the extreme southwestern Knersvlakte (Figure 2). Plants are restricted to the drainage basin of the Moedverloor River, where they are localized on southern or southwest-trending slopes, typically just below the crest of the quartzite outcrops that fringe the eastern edge of the basin, but occasionally on the lower slopes. The species is relatively common where it occurs but populations never extend over a large area. Plants grow among quartz pebbles only in relatively dense stands of Knersvlakte Dwarf Vygieveld (Mucina & Rutherford 2006), a dwarf succulent shrubland dominated by various small Aizoaceae in the genera *Argyroderma*, *Cheiridopsis*, *Conophytum* and *Monilaria*. This highly specific ecology appears to be determined largely by the cooler aspect and by the associated higher precipitation. The rocky crests on which the species mostly occurs face the ocean, and the localized presence of lichens on the summit rocks suggests that coastal fogs, which are a feature of the region in the autumn and winter, play an important role in providing additional moisture to these sites, as attested also by the relatively dense associated succulent shrublets compared with adjacent slopes with a more northerly aspect. The Moedverloor basin has exposed an extensive and rather localized area of these quartzite slopes, the Moedverloorberg to the north being granitic and the hills to the south primarily loamy sand. A localized distribution and low population size is a characteristic of other quartz-loving species in the region (Snijman & Harrower 2009). Local changes in soil chemistry, depth, particle size, aspect, insolation and available moisture appear to be responsible for this very patchy ecology (Schmiedel & Jürgens 1999).

Other locally endemic geophytes from the southwestern Knersvlakte include *Bulbine dactylopsoides* and *B. haworthioides* (Asphodelaceae), *Lachenalia patula*, *Ornithogalum naviculum*, and the recently described *Drimia fimbri-marginata* (all Hyacinthaceae) (Snijman & Harrower 2009).

The flowers open between 13:00–14:00 in the afternoon and close in the evening near sunset. They remain closed in cold and overcast weather.

Diagnosis and relationships: the corm with a fimbriate basal ridge places *Romulea quartzicola* in sect. *Ciliatae* (M.P.de Vos) J.C.Manning & Goldblatt of subgen. *Romulea*, where it is distinguished by its early flowering, relatively short, obtuse, subclavate leaves, large, deeply funnel-shaped, canary-yellow flowers with tepals 20–22 × 6–10 mm and perianth tube 7–8 mm long, and the relatively long filaments, 7–9 mm long, much longer than the anthers. The bracts are ovate or suborbicular,

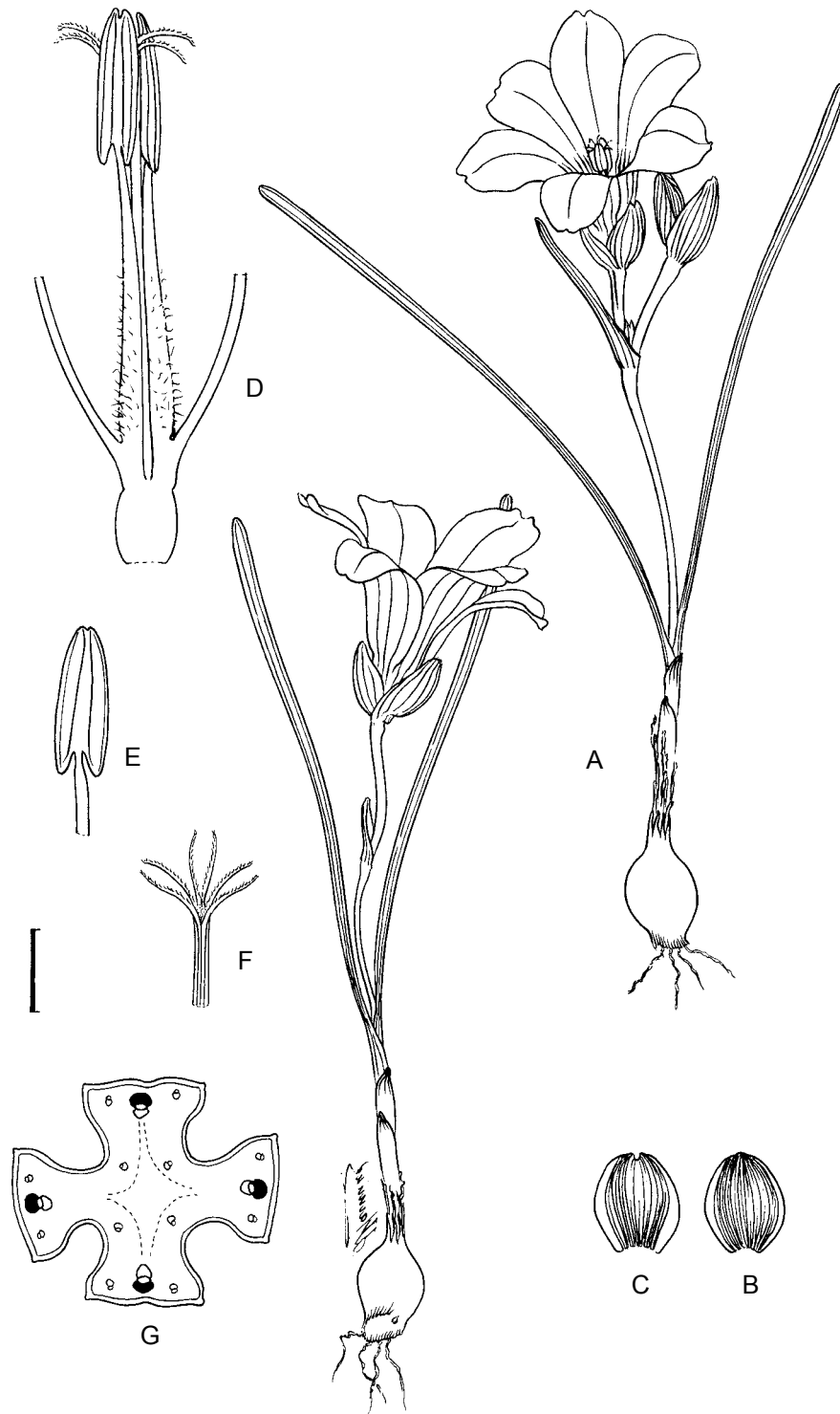


FIGURE 3.—*Romulea quartzicola*, Harrower 2756. A, whole plants; B, outer bract; C, inner bract; D, stamens and style; E, anther, outer face; F, details of style branches; G, t/s leaf. Scale bars: A–C, 10 mm; D, E, 2.5 mm; F, 0.5 mm. Artist: John Manning.

8–13 mm long, and both the inner and outer bracts have narrow, colourless or purple-flushed membranous borders. The leaves of *R. quartzicola* are morphologically distinctive in broadening appreciably in the distal half, thus somewhat clavate in appearance, but they are anatomically simple in lacking vascular girders as well as rib marginal bundles or strands. All four primary bundles have incomplete sclerenchyma sheaths restricted to phloem caps, and even these are absent in the secondary bundles. This is a relatively uncommon condition, as most species in the section have complete sclerenchyma bundle sheaths around the lateral primary bundles (De Vos 1972; Manning & Goldblatt 2001). The leaves of

R. quartzicola are thus among the least sclerified in the entire genus, matched in this regard, as far as is known, only by *R. namaquensis* M.P.de Vos.

The combination of yellow flowers and green bracts without the conspicuous, brown-streaked membranous margins that characterize the *Romulea pearsonii* group of species, places *R. quartzicola* in a small group of sect. *Ciliatae* that comprises *R. citrina* Baker, *R. elliptica* M.P.de Vos, *R. lutea* J.C.Manning & Goldblatt, *R. montana* Bég. and *R. sulphurea* Bég. Among this group it is readily distinguished from all except *R. sulphurea* by the relatively long filaments, \pm twice as long as the

anthers. The rarely collected *R. sulphurea*, which was represented only by the type (collected in 1897) until we relocated it in 1999 (Manning & Goldblatt 2001), is still known only from the Pakhuis Pass in the northern Cedarberg, where it forms dense populations on seasonally wet sandstone pavement, flowering in early spring, in July and August. It is distinguished from *R. quartzicola* not only by its ecology and distribution but by its filiform leaves, ± 0.5 mm diam., smaller, sweetly scented flowers with elliptical tepals 12–20 mm long, mostly smaller bracts, 7–10 mm long, the inner with broad, brown-speckled membranous margins, and by the shorter anthers, 2.5–3.0 mm long.

Perianth colour is an important character in *Romulea* to the extent that species are either pink- or yellow-flowered but never both. Plain yellow flowers without dark blotches on the inner surface are uncommon in *Romulea* and restricted to a handful of species of sect. *Ciliatae*, only one of which, *R. lutea* J.C.Manning & Goldblatt, has been recorded from southern Namaqualand. This species, a recent discovery from sandy washes west of Koekenaap (Manning & Goldblatt 2008), has plain, golden yellow flowers superficially similar to those of *R. quartzicola* but it differs not only in its later flowering, August to September, but in its narrower leaves, ± 1 mm in diameter, with only the lowermost leaf basal, shorter perianth tube, ± 3 mm deep, and shorter filaments, 4 mm long and \pm as long as the anthers. The two species differ also in leaf anatomy. In *R. lutea* the lateral primary bundles have complete sclerenchyma sheaths and the secondary bundles have well-developed phloem caps extending to the epidermis as girders. Both of these conditions are lacking in *R. quartzicola*.

History: the species was originally collected as a single fruit in July 2005. Seed was germinated in April 2006 in the nursery at Kirstenbosch Botanical Garden, and four plants were grown to maturity. These flowered for the first time on 6 June 2009, when it became clear that they represented an undescribed species. Type material was collected the following year.

Additional material seen

WESTERN CAPE.—3118 (Vanrhynsdorp): Knersvlakte, Farm Moedverloor, ± 15 km NE of Lutzville, (–AD), 15 May 2010 [flowered in cultivation, plants originally collected 22 July 2005], *A.D. Harrower 2756* (NBG); 21 June 2010, *A.D. Harrower & J.C. Manning 4397* (NBG), *4399* (NBG).

NAME CHANGES AND NOMENCLATURAL CORRECTIONS

1. The protologue of *Trichonema pudica* (Ker Gawler 1810), the basionym for *Romulea pudica* (Ker Gawl.) Baker (1877), includes a painting of a pink-flowered species of *Romulea* with dark longitudinal streaks in a pale cup. This plant was brought from the Cape by a Miss Symonds and given to Messrs Whitley and Borne of Brompton, London, in whose greenhouse it was raised. They later provided the flowering specimen to the artist who executed the painting reproduced in *Curtis's Botanical Magazine*. Depicting a plant with two basal leaves and a symmetrical, bell-shaped corm with a neatly scalloped basal rim, this illustration clearly represents the species currently known under the name *R. amoena*, a

narrow endemic of the Bokkeveld Mtns south of Nieuwoudtville in Northern Cape. Ker Gawler (1810) cited one specimen in the protologue, *Ixia pudica* Sol. *ms* in Herb. Banks (now the herbarium of the British Museum of Natural History). The plant so annotated by Solander was collected by Oldenburg and has no date, precise locality or number. De Vos (1972, 1983) identified it as *R. flava* Lam. and we agree with her determination after having examined a digital image of the specimen.

Ker Gawler first listed the name *Ixia pudica* when he described the genus *Trichonema* (Ker Gawler 1802), including it among one of several species that he believed correctly belonged in his new genus. He later (Ker Gawler 1804, 1809) listed '*Trichonema pudica* Gawl.' as one of several species of *Trichonema* but it was only in 1810 that the validating protologue was published (Ker Gawler 1810). De Vos (1983) cited the painting as the type ('iconotype') of *T. pudica* and we endorse her action. The painting, showing a plant with red perianth, pale, darkly striped cup, and two basal leaves, differs sharply from the alternative choice of type, the Oldenburg specimen, which has a single basal leaf and apparently had a white perianth with a plain yellow cup. Significantly, the trivial name, rose-flowered trichonema, that accompanies the protologue, provides a direct and clear reference to the painting. Only the painting, therefore, accords with the words and title of the protologue and we formally designate it the lectotype. Although De Vos (1983) was not able to associate the painting (and thus the name) with any wild species, we are confident that it is a good representation of *R. amoena* (Béguinot 1907), the only known species of this genus with a dark pink to red perianth with pale, streaked cup, two basal leaves, and a bell-shaped corm scalloped along the basal rim. We accordingly reduce *R. amoena* to synonymy under *R. pudica*, a combination provided by Baker (1877). Daniel Solander evidently provided the inspiration for the name of the species but the specimen bearing his annotation is not the type.

***Romulea pudica* (Sol. ex Ker Gawl.) Baker** in *Journal of the Linnean Society, Botany* 16: 89 (1877). *Trichonema pudicum* Sol. ex Ker Gawl: t. 1244 (1810) [*T. pudicum* Sol. ex Ker Gawl.: 223 (1804) et sub t. 1225 (1809), nom. nud.], *Ixia pudica* (Sol. ex Ker Gawl.) Roem. & Schult.: 377 (1817). *Geissorhiza pudica* (Sol. ex Ker Gawl.) Klatt: 655 (1866). *Bulbocodium pudicum* (Sol. ex Ker Gawl.) Kuntze: 700 (1891). *Romulea rosea* var. *pudica* (Sol. ex Ker Gawl.) Baker: 42 (1896). Lectotype here designated: South Africa, without precise locality, illustration in Ker Gawl. in *Curtis's Botanical Magazine* 31: t. 1244 (1810). [The syntype, without precise locality, *Oldenland s.n.* annotated *Ixia pudica* by Solander (BM) = *R. flava* Lam. is in serious conflict with the protologue.]

Romulea amoena Schltr. ex Bég.: 334 (1907), syn. nov. Type: South Africa, [Northern Cape], Bokkeveld Mtns, Papelfontein [Papkuijsfontein], *Schlechter 10896* (G, holo.; BM, BOL, GRA, K, MO, PRE, S, Z, iso.).

2. The phrase '*Blumen rosenroth klein*' (flowers rose-red, small) constitutes the entire diagnosis for C.F.Ecklon's *Romulea parviflora*, which he collected on the Cape Peninsula near Green Point. The species, typified by a specimen in the Stockholm Herbarium so annotated by Ecklon (Nordenstam 1972), was determined as

R. obscura Klatt by De Vos (1972). Nordenstam (1972) felt that this diagnosis was sufficient to validate Ecklon's species, and that, as the earlier name it should thus replace *R. obscura*. De Vos (1973) disagreed, regarded Ecklon's species as inadequately diagnosed and therefore invalidly published, and accordingly listed the name in synonymy both under *R. obscura* var. *obscura* and under *R. rosea* var. *australis* Ewert (De Vos 1972). Later, in the *Flora of southern Africa* (De Vos 1983) she cited it solely as a synonym of *R. obscura* var. *obscura*. This species usually has yellow to apricot, occasionally pale pink flowers (De Vos 1972), whereas *R. rosea*, including its varieties, has pale to deep pink or red flowers. We are of the opinion that the species is therefore better assigned to *R. rosea* on the basis of flower colour. The small flower size indicates that it should be assigned to synonymy under *R. rosea* var. *australis*.

***Romulea rosea* var. *australis* (Ewart) M.P.de Vos** in *Journal of South African Botany*, Supplement 9: 254 (1972). *Romulea cruciata* var. *australis* Ewart: 43 (1907). Type: Australia, Victoria, near Melbourne, Tovey s.n. [MEL, lecto., designated by De Vos: 252 (1972); BOL, iso.].

Romulea parviflora Eckl.: 19 (1827). *Trichonema parviflorum* (Eckl.) Steud.: 702 (1841), syn. nov. Type: South Africa, [Western Cape], Cape Peninsula, Green Point, Sept. 19–24, Ecklon s.n. (S, holo.).

3. First described as *Ixia reflexa* by Thunberg (1811), the epithet was transferred to *Romulea* by Ecklon (1827), who explicitly cited Thunberg's species as the basionym. *Ixia reflexa* of Thunberg is, however, a homonym for a species of that name described by Andrews (1797) [now, incidentally, *Ixia scillaris* L.]. Ecklon's use of the name is to be treated nomenclaturally as a new name dating from 1827 (McNeil *et al.* 2006: Art. 58.1) but it remains typified by the type of Thunberg's homonym. The taxon is conspecific with *R. flava* var. *flava* (De Vos 1972; 1983). Béguinot (1908), and later De Vos, however, mistakenly regarded Ecklon's name as typified by his (Ecklon's) own collections bearing that name, which are a form of *R. rosea*, and accordingly treated them as var. *reflexa* of that species. Based on the actual type, however, *R. rosea* var. *reflexa* is a nomenclatural synonym of *R. flava*. The variety var. *reflexa* sensu Béguinot, a local endemic of the Riversdale District, then requires a new name and its only synonym, at species rank, is *R. muirii*, which is available for the taxon. We accordingly provide the combination below.

***Romulea rosea* var. *muirii* (N.E.Br.) J.C.Manning & Goldblatt**, comb. et stat. nov. *Romulea muirii* N.E.Br.: 467 (1932). Type: South Africa, [Western Cape], Riversdale, Muir 4848 (K, holo.).

R. rosea var. *reflexa* sensu Béguinot (1908) et De Vos (1972), non (Eckl.) Béguinot (1908) [= *R. flava* (Lam.) M.P.de Vos].

***Romulea flava* (Lam.) M.P.de Vos** in *Journal of South African Botany*, Supplement 9: 98 (1972). *Ixia flava* Lam.: 109 (1791). Type: without precise locality or collector [P: Herb. Lamarck, lecto., designated by M.P. de Vos: 99 (1972)].

R. rosea var. *reflexa* (Eckl.) Béguinot: 158 (1908). *R. reflexa* Eckl.: 18 (1827), as nom. nov. pro *Ixia reflexa* Thunb.: 55 (1811), hom. illegit., non *I. reflexa* Andr. (1797), syn. nov. Type: South Africa, without pre-

cise locality, Thunberg s.n. UPS-THUNB984 [UPS-THUNB, lecto., designated by De Vos: 27 (1983)].

4. In her *Flora of southern Africa* account of *Romulea*, De Vos (1983) recognized *Ixia neglecta* Schult. (1822) as an earlier name for what was until then *R. oliveri* M.P.de Vos, a narrow endemic of the Kamiesberg in Namaqualand, Northern Cape. While true, the combination that she proposed in *Romulea* is technically a new name because she deliberately excluded the type of both *I. neglecta* and its synonym *Trichonema speciosum* Ker Gawl. Her new name is, however, a homonym for the Mediterranean *R. neglecta* Jord. & Fourr. (1868). *Ixia neglecta* of Schultes (1822) was itself a new name in *Ixia* for *Trichonema speciosum* (Ker Gawler 1804)—not the later account of the species in 1812 cited by De Vos—because *I. speciosa* Andrews bars its transfer to *Ixia*. The type of *T. speciosum* (and of *I. neglecta* Schult.) is a plate in Andrews (1801) titled *Ixia bulbocodium* var. *flore speciosissimo*, a polynomial. Ker Gawler's *Trichonema speciosa* is based solely on the Andrews illustration and not, as De Vos and others believed, on the illustration in *Curtis's Botanical Magazine*: t. 1476 (Ker Gawler 1812), which is the type that De Vos cited for *R. neglecta*. This plate is, nevertheless, evidently the same species (and probably the same plant or its descendants) as was illustrated by Andrews. Baker (1877) provided the combination *R. speciosa*, citing *Ixia bulbocodium* var. *speciosa* Andrews (in error for the polynomial listed above), and Ker Gawler's *Trichonema speciosa*. In addition, Baker listed in synonymy *R. tabularis* Eckl., at the time a manuscript name on specimens distributed by Ecklon, later *R. tabularis* Eckl. ex Béguinot in 1907. Baker also correctly listed in synonymy, *Ixia neglecta* Schult.

The type of *Trichonema speciosa* and *Ixia neglecta* is a painting of a red-flowered *Romulea*, the dark tepal cup pale at the base and the reverse of the outer tepals boldly striped with pale and dark longitudinal lines. The poorly rendered corm seems consistent with *R. neglecta* but the plant is illustrated with one basal and one sub-basal leaf. The bracts are consistent with *R. neglecta* as understood by De Vos, the inner with membranous, darkly streaked margins. Andrews's plant was provided in 1801 by George Hibbert, Member of Parliament and patron of botany, who we suspect received corms from James Niven. Hibbert had commissioned Niven in 1798 to collect plants for him at the then Cape Colony and Niven is known to have visited the Kamiesberg in 1799, where he collected specimens of the endemic *Moraea longiflora* Ker Gawl., which was illustrated in *Curtis's Botanical Magazine*: t. 712 (Ker Gawler 1804; Goldblatt 1986: 104). Thus this early illustration of a then remote Namaqualand endemic is not unprecedented.

The presence of two, rather than a single basal leaf, is not consistent with *Romulea neglecta*, which usually has a single basal leaf, but the anomaly may be the result of its cultivation in England or of a misrepresentation by the artist. The plant illustrated later in *Curtis's Botanical Magazine* however, also from stock derived from Hibbert's introduction, has a single basal leaf. Because of this inconsistency, we designate an epitype for *R. speciosa*, the name that must now be applied to the species. As the type collection of *R. oliveri* still represents the

only actual specimen of *R. speciosa* that is known, we designate this collection as the epitype.

***Romulea speciosa* (Ker Gawl.) Baker** in Journal of the Linnean Society, Botany 16: 89 (1877). *Trichonema speciosum* Ker Gawl.: 223 (1804). *Ixia neglecta* Schult.: 279 (1822), nom. nov. pro *Trichonema speciosum* Ker Gawl. [non *Ixia speciosa* Andrews (1801)]. *Bulbocodium speciosum* (Ker Gawl.) Kuntze: 700 (1891). Type. South Africa, without precise locality, possibly collected by J. Niven, illustration in Andrews (1801), The botanist's repository 3: t. 170 '*Ixia bulbocodium* var. *flore speciosissimo*' (1801). Epitype: South Africa, [Northern Cape], Kamiesberg, Farm Welkom, 14 Sept. 1970, *Oliver 3169* (NBG, epi.!, PRE, iso.).

R. oliveri M.P.de Vos: 116 (1972). Type: South Africa, [Northern Cape], Kamiesberg, Farm Welkom, 14 Sept. 1970, *Oliver 3169* (NBG, hol.!, PRE, iso.).

R. neglecta M.P.de Vos: 29 (1983), hom. illegit., non *R. neglecta* Jord. & Fourr. (1868). Type: South Africa, without precise locality, possibly collected by J. Niven, illustration in Curtis's Botanical Magazine 14: t. 1476 '*Ixia speciosa*' (Ker Gawler 1812).

ACKNOWLEDGEMENTS

We thank Roy Gereau, Missouri Botanical Garden, and Kanchi Gandhi, Harvard University, for invaluable assistance with nomenclatural questions and Mary Stiffler, research librarian, Missouri Botanical Garden, for cheerfully providing references not available electronically. Type material was collected under a permit from CapeNature.

REFERENCES

- ANDREWS, H. 1797. *Ixia reflexa*. Reflex flowered ixia. *The botanist's repository*, vol. 1. Bensley [for author], London.
- ANDREWS, H. 1801. *Ixia bulbocodium* var. *flore speciosissimo*. *The botanist's repository*, vol. 3. Bensley [for author], London.
- BAKER, J.G. 1877 [as 1878]. Systema Iridacearum. *Journal of the Linnean Society, Botany* 16: 61–180.
- BAKER, J.G. 1896. Iridaceae. In W.T. Thiselton-Dyer, *Flora capensis* 6: 7–71. Reeve, Ashford.
- BÉGUINOT, A. 1907. Diagnoses Romulearum novarum vel minus cognitarum (Schluss). *Botanische Jahrbücher für Systematik* 38: 323–339.
- BÉGUINOT, A. 1908. Revisione delle *Romulea* dell'erbario Delessert (Ginevra). *Annuaire du Conservatoire et du Jardin Botaniques de Genève* 11–12: 144–163.
- BROWN, N.E. 1932. *Romulea rosea*. *The Gardeners Chronicle*, ser. 3, 92: 467.
- DE VOS, M.P. 1972. The genus *Romulea* in South Africa. *Journal of South African Botany*, Suppl. vol. 6. National Botanic Gardens of South Africa, Kirstenbosch.
- DE VOS, M.P. 1973. Note on *Romulea parviflora* Ecklon. *Journal of South African Botany* 39: 111.
- DE VOS, M.P. 1983. *Romulea*. In O.A. Leistner, *Flora of southern Africa* 7, 2, fascicle 2: 10–73. Botanical Research Institute, Pretoria.
- ECKLON, C.F. 1827. *Topographisches Verzeichniss der Pflanzensammlung von C.F. Ecklon*. Reiseverein, Esslingen.
- EWART, A.J. 1907. Contribution to the flora of Australia. *Proceedings of the Royal Society of Victoria* 19: 43.
- GOLDBLATT, P. 1986. The moraeas of southern Africa. *Annals of Kirstenbosch Botanical Garden* 14. National Botanic Gardens, Cape Town in association with the Missouri Botanical Garden, St. Louis.
- GOLDBLATT, P., BERNHARDT, P. & MANNING, J.C. 2002. Floral biology of *Romulea* (Iridaceae: Crocoideae): a progression from a generalist to a specialist pollination system. *Adansonia* 24: 243–262.
- GOLDBLATT, P. & MANNING, J.C. 2008. *The iris family: natural history and classification*. Timber Press, Oregon.
- HOLMGREN, P.K., HOLMGREN, N.H. & BARNETT, L.C. 1990. *Index herbariorum. Part 1: the herbaria of the World*. New York Botanical Garden, New York.
- JORDAN, C.T.A. & FOURREAU, J.P. 1868. *Breviarum plantarum novarum*. Savy, Paris.
- KER GAWLER, J. 1802. *Trichonema cruciatum*. Channel-leaved trichonema. *Curtis's Botanical Magazine* 16: t. 575.
- KER GAWLER, J. 1804 [as 1805]. Ensatorum ordo. *König & Sims Annals of Botany* 1: 219–247.
- KER GAWLER, J. 1809. *Trichonema roseum*. Rose-coloured trichonema. *Curtis's Botanical Magazine* 30: t. 1225.
- KER GAWLER, J. 1810. *Trichonema pudicum*. Blush-coloured trichonema. *Curtis's Botanical Magazine* 31: t. 1244.
- KER GAWLER, J. 1812. *Trichonema speciosa*. Crimson trichonema. *Curtis's Botanical Magazine* 14: t. 1476.
- KLATT, F.W. 1866. Revisio Iridacearum. *Linnaea* 34: 537–689.
- KUNTZE, O. 1891. *Revisio generum plantarum*, vol. 2. Felix, Leipzig.
- LAMARCK, J.B.A.P.M. 1791. *Tableau encyclopédique et méthodique botanique*, vol. 1. Pancoucke, Paris.
- LEWIS, J.G. 1947. *Gladiolus stokoei*. *The Flowering Plants of Africa* 26: t. 1004.
- MANNING, J.C. & GOLDBLATT, P. 2001. A synoptic review of *Romulea* (Iridaceae: Crocoideae) in sub-Saharan Africa, the Arabian Peninsula and Socotra including new species, biological notes, and a new infrageneric classification. *Adansonia*, sér. 3, 23: 59–108.
- MANNING, J.C. & GOLDBLATT, P. 2004. Two new species of *Romulea* (Iridaceae: Crocoideae) from the western Karoo, Northern Cape and notes on infrageneric classification and range extensions. *Bothalia* 34: 17–22.
- MANNING, J.C. & GOLDBLATT, P. 2006. New species of Iridaceae from the Hantam-Roggeveld centre of endemism, and the Bokkeveld, Northern Cape, South Africa. *Bothalia* 36: 139–145.
- MANNING, J.C. & GOLDBLATT, P. 2008. *Romulea lutea* and *R. tubulosa* (Iridaceae: Crocoideae), two new species from Namaqualand, South Africa. *Bothalia* 38: 78–82.
- MCNEILL, J., BARRIE, F.R., BURDET, H.M., DEMOULIN, V., HAWKSWORTH, D.L., MARHOLD, K., NICOLSON, D.H., PRADO, J., SILVA, P.C., SKOG, J.E., WIERSMA, J.H. & TURLAND, N.J. (eds). 2006. International Code of Botanical Nomenclature (Vienna Code) adopted by the seventeenth International Botanical Congress, Vienna, Austria, July 2005. *Regnum Vegetabile* 146. Gantner, Liechtenstein.
- MUCINA, L. & RUTHERFORD, M.C. 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.
- NORDENSTAM, B. 1972. Types of Ecklon's 'Topographisches Verzeichniss' in the Swedish Museum of Natural History in Stockholm. *Journal of South African Botany* 38: 277–298.
- ROEMER, J.J. & SCHULTES, J.A. 1817. *Systema vegetabilium*, vol. 1. Cotta, Stuttgart.
- SCHMIEDEL, U. & JÜRGENS, N. 1999. Community structure on unusual habitat islands: quartz-fields in the Succulent Karoo, South Africa. *Plant Ecology* 142: 57–69.
- SCHULTES, J.A. 1822. *Mantissa systematis vegetabilium*, vol. 1. Cotta, Stuttgart.
- SNIJMAN, D.A. & HARROWER, A.D. 2009. A new species of *Drimia* (Urgineoideae) from the Knersvlakte, Western Cape, South Africa. *Bothalia* 39: 233–237.
- STEUDEL, E.T. 1841. *Nomenclator botanicus*, edn 2. Cotta, Stuttgart.
- THUNBERG, C.P. 1811. *Flora capensis*. Edman, Uppsala.