

Two new species of *Romulea* (Iridaceae: Crocoideae) from the western Karoo, Northern Cape and notes on infrageneric classification and range extensions

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ABSTRACT

Two new species of *Romulea* are described from Northern Cape, raising the number of species in southern Africa to 76. *R. collina* J.C.Manning & Goldblatt is endemic to the Hantamsberg near Calvinia. It is distinguished in subgenus *Spatalanthus* by its clumped habit, yellow flowers with dark markings in the throat, and short papery bracts. A re-examination of relationships within the subgenus suggests that section *Cruciatae* is not monophyletic and it is accordingly no longer recognized as separate from section *Spatalanthus*. *R. eburnea* J.C.Manning & Goldblatt is a distinctive species of subgenus *Spatalanthus* from the Komsberg near Sutherland. It is distinguished by its golden yellow flowers with the apical third of the tepals coloured pale creamy apricot, bracts with broad, translucent margins and tips, and an unusually long perianth tube, 10–13 mm long.

The genus *Romulea* (Iridaceae: Crocoideae) comprises ± 90 species in sub-Saharan Africa, the Mediterranean and Near East. The centre of diversity of the genus lies in the winter rainfall region of southern Africa, where 73 species are currently recognized (Manning & Goldblatt 2001). The most recent revision of the sub-Saharan species divides the genus into two subgenera and six sections, based largely on characters of the corm (Manning & Goldblatt 2001). The fine structure of the corm provides essential information for accurate identification of many species, since the flower structure, with few exceptions, is conservative (Goldblatt *et al.* 2002).

Five new species of *Romulea* have been described from South Africa in the twenty years since the publication of De Vos's (1972) monograph of the genus in southern Africa (De Vos 1983; Manning & Goldblatt 2001). The subsequent discovery of an undescribed species from the summit plateau of the Hantamsberg near Calvinia in Northern Cape, described here as *Romulea collina*, and a second from the Klein Roggeveld south of Sutherland, described as *R. eburnea*, now raises the total number of species in southern Africa to seventy six. Both new species are members of subgenus *Spatalanthus*, defined by the outer corm tunics splitting below into prominent, recurved or straight teeth without fibrous tips (Manning & Goldblatt 2001). The Roggeveld Escarpment is well known for the diversity of its endemic geophyte flora (Manning *et al.* 2002) and is the centre of diversity for subgenus *Spatalanthus*. Over half of the twenty five known species of the subgenus are endemic to the Roggeveld and adjacent Bokkeveld Escarpments (Manning & Goldblatt 2001) and the description of two new species brings the total number of endemic *Romulea* species in this centre to fifteen.

The discovery of *Romulea collina* raises doubts as to the validity of the distinction between the two sections *Cruciatae* and *Spatalanthus* of subgenus *Spatalanthus*, recognized by Manning & Goldblatt (2001) in their recent account of the genus. This distinction is re-examined and we conclude that the recognition of section *Cruciatae* is no longer justified.

Romulea collina J.C.Manning & Goldblatt, sp. nov.

TYPE.—Northern Cape, 3119 (Calvinia): summit of Hantamsberg at base of radio mast, (–BD), August 2002, flowered in cult., July 2003, *IBSA* 5 (*NBG195425*, holo.).

Plantae 50–100 mm altae caespitosae, caule subterraneo ad 4-ramoso, ramis ad 10 mm supra terram productis, cormo subgloboso asymmetrico base rotundo, tunicis infra divisis cuspid acuminatis recurvatis supra fibris grossis 20–40 mm longis, foliis 7–9 laminis ad 50–100 mm longis, floribus solitariis, bracteo externo subobtus pallide papyraceo ad apicem marginibus apiceque latis translucentibus brunneo vittato 10–12 mm longo interno obtuso pallide papyraceo, floribus profunde cupuliformibus pallide flavis cupulo luteo, tubo perianthii infundibuliforme 4 mm longo parte inferiore ± 1 mm longo, tepalis lanceolatis $\pm 20 \times 7$ mm, staminibus flavis filamentis ± 6 mm longis dense pubescentibus in dimidio inferiore, antheris 2.5–3.0 mm longis apiculatis, ramis styli 1.5–2.0 mm longis, capsulis subglobosis ± 8 mm oblongo-ovoideis pedicelibus recurvatis.

Plants 50–100 mm high, growing in clumps; stem subterranean, with up to four branches reaching 10 mm above-ground, these relatively stout and flushed maroon. *Corm* subglobose, asymmetric, base rounded, tunics split into curved acuminate teeth below, drawn into coarse fibres above, these 20–40 mm long. *Cataphylls* 3, flushed maroon above ground. *Leaves* 7–9, all basal, sheaths flushed deep purple, blades two to four times as long as flowering stems, narrowly 4-grooved, 50–100 \times 1.0–1.5 mm. *Inflorescence*: up to 4 solitary flowers;

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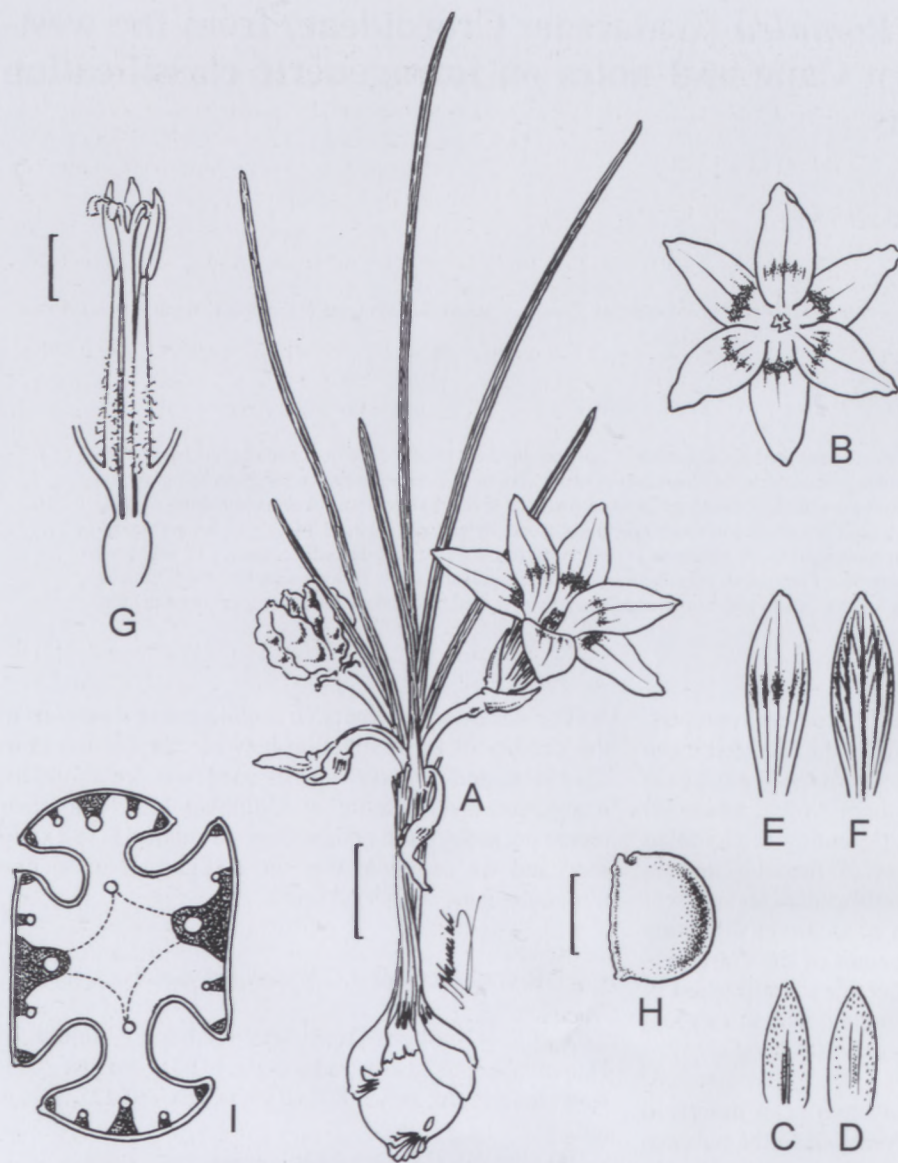


FIGURE 1.—*Romulea collina*. A, whole plant; B, flower; C, outer bract; D, inner bract; E, adaxial markings on outer tepal; F, adaxial markings on inner tepal; G, stamens and style; H, seed; I, t/s leaf. Scale bars: A–F, 10 mm; G, H, 2 mm. Artist: John Manning.

outer bracts subobtusate, pale and papery throughout with veins in centre pale green, with broad, translucent margins and tip flecked pale brown, 10–12 mm long; inner bracts obtuse, pale and papery throughout with only main veins pale green, with broad translucent margins flecked pale brown, about as long as outer. *Flowers* deeply cup-shaped, cup \pm 11 mm deep, pale canary yellow with golden yellow cup; outer tepals with dark median blotch or transverse zone in throat, reverse marked with dark maroon longitudinal streaks; inner tepals with narrow brownish maroon median line and diffuse transverse zone in throat, unscented, \pm 30 mm diam.; perianth tube funnel-shaped, 4 mm long with lower narrow portion \pm 1 mm long, tepals lanceolate, \pm 20 \times 7 mm. *Stamens* yellow; filaments inserted at base of cup, free, densely hairy in lower half, 6 mm long; anthers apiculate, parallel, 2.5–3.0 mm long. *Style* dividing opposite upper third of anthers, branches 1.5–2.0 mm long, divided for about two thirds of their length. *Capsules* subglobose, \pm 8 mm long, pushed onto soil surface or slightly underground by strongly recurved pedicels which later become erect and 10–15 mm long. *Seeds* subglobose or angled by pressure, reddish brown, 2.5–3.0 mm diam. *Flowering time*: late June to mid-July, possibly to late July. Figure 1.

Distribution and ecology

This clump-forming species is known from a single, very localized colony on the summit plateau of the Hantamsberg overlooking Calvinia on the Bokkeveld Escarpment (Figure 2). The plants grow in seasonally moist, dolerite clays in open renosterveld, invariably in small clumps that appear to originate from seeds that are shed directly at the base of the parent plant. The short peduncles curve downwards immediately after flowering but become erect when the fruits mature. They do not, however, elongate appreciably so that the mature capsules dehisce 10–15 mm above the ground at the base of the plant. Flowers open around midday and close in mid-afternoon. They are short-lived, lasting only two days. At up to 3 mm diam., the seeds of *R. collina* are among the largest recorded in the genus, where seeds are mostly 1–2 mm diam. (De Vos 1972).

Romulea collina is yet another of several species of Iridaceae that are endemic to the Hantamsberg, an isolated, flat-topped massif representing a northern outlier of the Roggeveld Escarpment. Iridaceae endemic to the slopes and summit of the Hantamsberg include *Hesperantha hantamensis* Schltr. ex Foster, *H. oligantha* (Diels) Goldblatt,

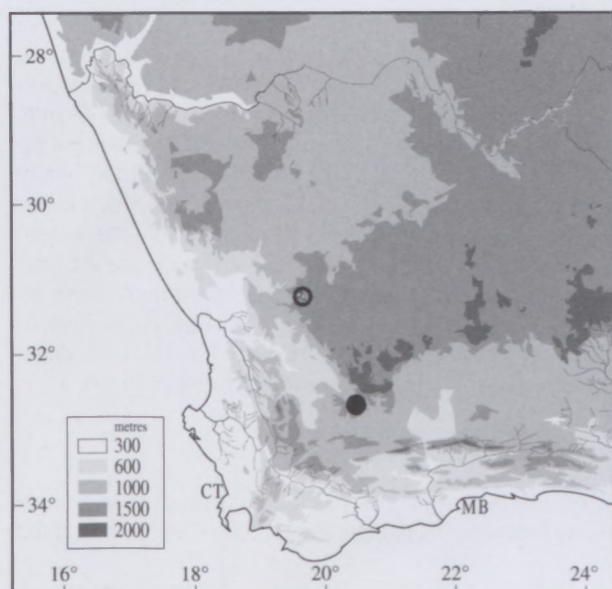


FIGURE 2.—Distribution of *Romulea collina*, ○; and *Romulea eburnea*, ●.

Moraea reflexa Goldblatt and *Romulea hantamensis* (Diels) Goldblatt, among others (Van Wyk & Smith 2001).

Diagnosis and relationships

Romulea collina is readily distinguished by its clumped habit, rounded corm with the outer tunics splitting into acuminate teeth, yellow flowers with dark markings in the throat, and short bracts, 10–12 mm long, that are entirely pale and papery at flowering. The corm with tunics splitting into acuminate teeth at the base are a defining characteristic of *Romulea* subgenus *Spatalanthus* but within the subgenus, the relationships of *R. collina* are more difficult to define. The rounded corm with curved basal teeth is characteristic of section *Spatalanthus* but in other respects, particularly the relatively short, more or less entirely membranous bracts and the long filaments, the species closely resembles *R. membranacea* M.P. de Vos, another species from the Roggeveld Escarpment.

Conservation status: Vulnerable (B1 + 2c, D).

Apart from the difference in the corm shape, *R. collina* is separated from *R. membranacea* by the longitudinal dark streaks on the outside of the outer tepals and by the pronounced dark blotches on the inside. Despite their different corm morphology, the overwhelming similarity between the two species in other particulars makes it difficult to accept that they are not immediately related. *R. membranacea* is currently placed in section *Cruciatae*, which is defined by a corm pointed at base and with straight basal teeth (Manning & Goldblatt 2001) but the relationships of this species have always been problematic. De Vos (1972) placed it in her subsection *Atrandrae* on the basis of the broad membranous margins of the bracts but pointed out that it was anomalous here in its pointed corm and lack of marginal veins in the leaves. Manning & Goldblatt (2001), placing greater emphasis on corm structure, preferred to ally it with the other species with straight basal teeth, which it matches in leaf anatomy. The chromosome number $2n = \pm 24$ is, however, inconsistent with this alliance and accords better with section *Atrandrae*. The discovery of the new species *R. col-*

lina, with the rounded corm of section *Spatalanthus* but the leaf anatomy and bract morphology of *R. membranacea*, suggests that the earlier placement by De Vos (1972) of *R. membranacea* in subsection *Atrandrae* (= series *Atrandrae* of Manning & Goldblatt 2001) is preferable. Within series *Atrandrae*, *R. collina* and *R. membranacea* are probably most closely related to *R. diversiformis* M.P. de Vos, with which they share yellow flowers, fruiting peduncles that are curved at maturity rather than coiled, and leaves that lack marginal veins along the furrows.

The reassessment of the relationships of *R. collina* and *R. membranacea* implies that the pointed corm with straight basal teeth has arisen more than once within the genus. If this interpretation is correct then the heterogeneity evident within the section assumes a new significance. Section *Cruciatae* is currently divided into two series. Series *Cruciatae*, with the removal of *R. membranacea*, contains three species, two of which are clearly sister taxa [*R. cruciata* (Jacq.) Baker and *R. eximia* M.P. de Vos] that share the unusual chromosome number $2n = 18$. On the basis of their cytology, *R. cruciata* and *R. eximia* are better allied with *R. rosea* (L.) Eckl. (section *Spatalanthus*, series *Roseae*), the only other species in the genus with $2n = 18$. The third species in this series, the poorly known *R. vlokii* M.P. de Vos has bracts that more closely resemble those found in series *Atrandrae* of section *Spatalanthus*, which is where De Vos (1983) placed it. Series *Tubiformes* contains a single highly derived species, *R. hantamensis* (Diels) Goldblatt, with a chromosome number $2n = 30$, which is unique within subgenus *Spatalanthus* and its relationships remain unclear. If the pointed corm is interpreted as a convergent character state, then it is likely to have evolved three times in section *Cruciatae* and a fourth time in *R. membranacea*. Section *Cruciatae* as currently construed is probably not monophyletic and it seems more appropriate that the species within it be removed to section *Spatalanthus*. Accordingly, we no longer recognize section *Cruciatae*, and subgenus *Spatalanthus* should no longer be subdivided into sections.

***Romulea eburnea* J.C. Manning & Goldblatt, sp. nov.**

TYPE.—Northern Cape, 3220 (Sutherland): 28 km along Komsberg Pass road from southern end, foot of Smoushoogte, alluvial wash along Meintjiesplaasrivier, (–DC), 28 August 2003, J. Manning 2886 (NBG, holo.; MO, iso.).

Plantae 100–150 mm altae, caule subterraneo 2-ramoso, ramis ad 30 mm supra terram productis, cormo subgloboso asymmetrico base rotundo, tunicis infra divisus cuspis acuminatis recurvatis supra fibris grossis ± 2 mm longis, foliis 2–4 laminis ad 150–200 mm longis, floribus solitariis, bracteo externo marginibus translucetibus apice membranaceo brunneo vittato 18–22 mm longo interno bifido, floribus profunde cupuliformibus pallide cremeo-armeniaceis supra luteis infra ± 30 mm diam., tubo perianthii infundibuliforme, 10–13 mm longo parte inferiore 6–8 mm longo, tepalis lanceolatis, 23–27 \times 7–9 mm, staminibus flavis filamentis 6–7 mm longis ad basem pubescentibus, antheris ± 8 mm longis, ramis styli 3 mm longis, capsulis oblongo-ovoideis 10–11 \times 5.5–6.0 mm pedicelibus recurvatis spiralis ubi siccus.

Plants 100–150 mm high; stem subterranean, with up to two branches reaching 30 mm above ground, these relatively stout and flushed maroon. *Corm* subglobose, asymmetric, base rounded, tunics split into curved acuminate teeth below, drawn into coarse fibres above, these up to 2 mm long. *Cataphylls* 3, flushed maroon above ground. *Leaves* 2–4, sheathing portion pale with adhering sand grains, blades of two longest leaves up to six times as long as flowering stems, narrowly four-grooved, 150–200 mm long, when more than two leaves present, then uppermost one or two with blades less than half as long, 10–100 × 1 mm. *Inflorescence*: up to 2 solitary flowers; outer bracts pale reddish brown with broad, translucent margins and broad, membranous tip flecked with pale brown, 18–22 mm long; inner bracts bifid, pale reddish brown with broad, translucent margins and broad, membranous tip flecked with pale brown, about as long as outer or slightly longer. *Flowers* deeply cup-shaped, cup ± 12 mm deep, pale creamy apricot with lower two thirds of tepals and

cup deep yellow; outer tepals with reverse flushed dull olive in centre in lower half, unscented, ± 30 mm diam.; perianth tube funnel-shaped, 10–13 mm long with lower narrow portion 6–8 mm long, tepals lanceolate, 23–27 × 7–9 mm. *Stamens* yellow; filaments inserted at base of cup, free, pubescent at base, 6–7 mm long; anthers suberect or lightly incurved, ± 8 mm long. *Style* dividing opposite tips of anthers, branches 3 mm long, divided for about half their length. *Capsules* oblong-ovoid, 10–11 × 5.5–6.0 mm, pushed onto soil surface or slightly underground by strongly recurved pedicels which later coil up when dry. *Seeds* subglobose or angled by pressure, reddish brown, 1.8–2.0 mm diam. *Flowering time*: late August to early September. Figure 3.

Distribution and ecology

This distinctively coloured species is known from a single colony below Smoushoogte Pass south of Sutherland at the

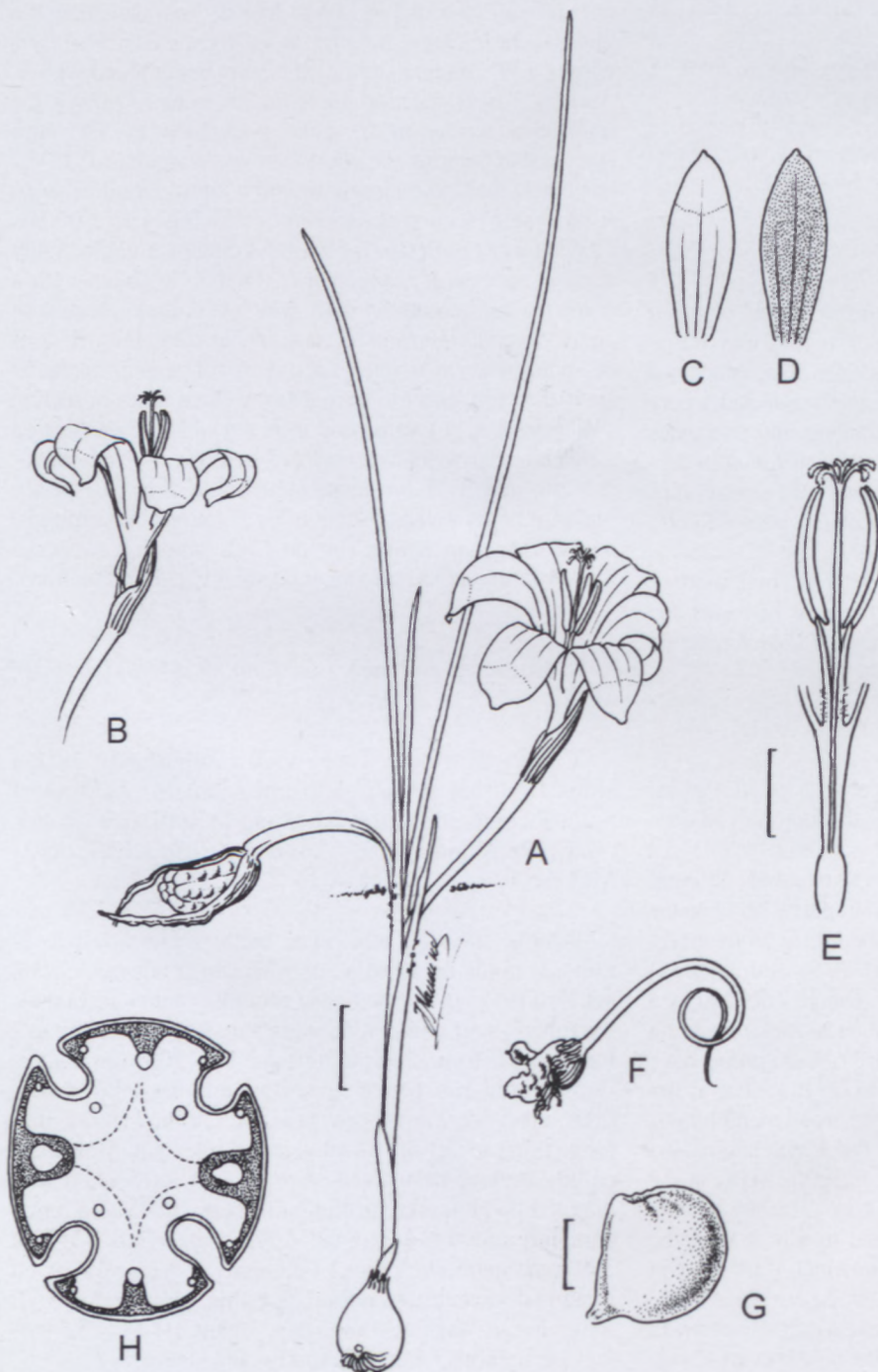


FIGURE 3.—*Romulea eburnea*. A, whole plant; B, flower, side view; C, adaxial markings on outer tepal; D, adaxial markings on inner tepal; E, stamens and style; F, dry capsule; G, seed; H, t/s leaf. Scale bars: A–D, F, 10 mm; E, 5 mm; G, 1 mm. Artist: John Manning.

foot of the Klein Roggeveldberge (Figure 2). *Romulea eburnea* grows in an alluvial wash along the Meintjiesplaasrivier in seasonally moist, deep sandy loam. The vegetation is open scrub dominated by *Asparagus capensis*, *Chrysocoma ciliata*, *Eriocephalus eximius*, and *Dimorphotheca cuneata*, and quite distinct from the adjacent renossterveld (*Elytopappus rhinocerotis*) community that occupies fine-grained clays derived from shale.

R. eburnea was first noticed almost a decade ago by local bulb enthusiasts who reported the occurrence of a pale-flowered species on the Komsberg but in the absence of specimens it was impossible to verify its identity. The possibility that it represented an outlying population of *R. membranacea* was suggested by Manning & Goldblatt (2001) but it is now clear that the plants represent a distinct species. It is another of several species in series *Atrandrae* that are endemic or near-endemic to the Roggeveld Escarpment around Sutherland, including *R. hallii* M.P.de Vos, *R. komsbergensis* M.P.de Vos and *R. multifida* M.P.de Vos.

Diagnosis and relationships

The rounded corms with tunics fragmenting into curved teeth, place *Romulea eburnea* firmly in subgenus *Spatalanthus*. It is immediately recognized by its largely golden yellow flowers with the apical third of the tepals coloured pale creamy apricot, bracts with broad, translucent margins and tips, and the unusually long perianth tube. This is funnel-shaped and 10–13 mm long with the lower narrow portion 6–8 mm long. In most other species of *Romulea* with a similar-shaped perianth, the tube is 4–6(–10) mm long with the lower narrow portion no more than 2 mm long. Within subgenus *Spatalanthus*, the presence of vascular bundles along the margins of each of the ribs in the leaves, the broad membranous margins and tips to the bracts, and fruiting peduncles that coil when dry, are all consistent with series *Atrandrae*. Within series *Atrandrae*, *R. eburnea* is possibly most closely allied to *R. diversiformis*, with which it shares yellow flowers lacking dark markings in the throat and a long style that divides at or beyond the tips of the anthers. In an extraordinary coincidence, both *R. diversiformis*, described just over fifty years ago (De Vos 1952), and *R. eburnea* share the same type locality and we have in the past collected *R. diversiformis* in flower in late September within a few dozen metres of the *R. eburnea* population, then long past flowering, without being aware of its existence. *R. diversiformis* was until recently thought to be restricted to the Klein Roggeveld area but is now known to occur also on the Hantamsberg near Calvinia, a considerable distance away at the northern end of the Roggeveld Escarpment (Manning & Goldblatt 2001). *R. diversiformis* is distinguished from *R. eburnea* by its greater number of leaves, 6 or more versus 2–4, uniformly golden yellow flowers with short perianth tube, 4–6 mm long versus 10–13 mm long and fruiting peduncles that do not coil up when dry. The two species differ also in leaf anatomy, *R. diversiformis* lacking rib marginal veins but possessing secondary veins in the ribs. *R. diversiformis* grows in fine-grained, clay soils that are seasonally waterlogged or actually shallowly inundated, whereas *R. eburnea* is known only from seasonally moist, sandy soils.

Conservation status: Vulnerable (B1 + 2c, D).

Adjustments to distribution records of two Namaqualand species

Romulea maculata Manning & Goldblatt in *Adansonia* 23: 81 (2001).

This species was based on a single collection made on the summit of the Flaminkberg just southeast of Nuwerus in southern Namaqualand. The recent discovery of a second collection antedating the type by almost twenty years, substantially increases the known range of the species. This collection matches the type in all respects, including the large white flowers, bracts with broad, brown-spotted membranous margins and the white-spotted cataphyll and there is no doubt that it represents this species. *Romulea maculata* is now known from near Nuwerus in the south of Namaqualand to Komaggas in the north and may be expected to occur through most of the higher ground of Namaqualand. The species is restricted to seasonally moist, sandy loam on granitic slopes.

Additional material examined

NORTHERN CAPE.—2917 (Springbok): Farm Drierivier, (–DC), 17-08-1980, Van der Westhuizen 109/80 (NBG).

Romulea multisulcata M.P.de Vos in *Journal of South African Botany*, Suppl. 9: 139 (1972).

This species was described from seasonal pools on the Bokkeveld Mountains near Nieuwoudtville in Northern Cape (De Vos 1972) but later collections from the foot of the Gifberg-Matsikamma massif nearby (Manning & Goldblatt 2001), clearly represent a second set of populations differing from the type only in their white rather than yellow flowers. However, populations from Hondeklip Bay in central Namaqualand that were also assigned to this species on the basis of a single herbarium collection (Manning & Goldblatt 2001) prove, on examination of living plants, to lack the characteristic multisulcate leaves of *R. multisulcata* and accord more closely with *R. tabularis* Eckl. ex Bég. This species of waterlogged coastal flats is widely distributed along the west coast of South Africa from Cape Agulhas in the south to northern Namaqualand. The Hondeklip Bay populations thus fall within its recorded range. *Romulea multisulcata* thus remains endemic to southern Namaqualand, where it is restricted to a few scattered seasonal pools near Vanrhynsdorp and Nieuwoudtville.

Range extensions for *Romulea tabularis*

NORTHERN CAPE.—3017 (Hondeklipbaai): Koinaas, Skulpfontein, (–AB), 24-08-1999, Desmet 222 (NBG); Farm Strandfontein, 15 km S of Wallekraal, (–DA), 25-08-1996, De Villiers s.n. (NBG177635); Groen River mouth, slopes above estuary ± 1 km from ocean, (–DC), 25-8-2002, Goldblatt & Porter 12116 (MO, NBG).

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