

# The native and naturalised species of *Peltocalathos* and *Ranunculus* (Ranunculaceae: Ranunculeae) in southern Africa

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## ABSTRACT

The five native and naturalised species of *Ranunculus* L. and *Peltocalathos* Tamaru (Ranunculaceae: Ranunculeae) from southern Africa are reviewed, with full descriptions and nomenclature, taxonomic history, ecological notes, and distribution data. All species are illustrated. *Peltocalathos*, a monotypic genus based on *R. baurii* MacOwan, has been overlooked in the regional literature until now. The new name *R. dregei* J.C.Manning & Goldblatt is proposed as a replacement name for the later homonym *R. meyeri* Harv., non Lowe. We conclude that the poorly known *R. capensis* Thunb. represents juvenile forms of the widespread and variable *R. multifidus* Forssk. and we synonymise the name, along with the three trivial epithets *R. pinnatus* var. *hermannii* DC., *R. pubescens* var. *glabrescens* Burt Davy and *R. pubescens* var. *harveyanus* Burt Davy, which have been overlooked in the recent literature. Based on number (mostly < 40 achenes per head) and size (mostly 1.2–1.8 mm long) of achenes, we conclude that the southern African material of the aquatic species recently re-identified as *R. rionii* Lager is more appropriately treated as *R. trichophyllus* Chaix.

## INTRODUCTION

Ranunculaceae are a large family of ± 2 150 spp. in ± 60 genera distributed worldwide, showing a diversity of floral organisations and fruit types (Tamaru 1993). Several classifications of the family have been proposed over the years, most recently by Tamaru (1995), who recognised three subfamilies and eleven tribes, based largely on chromosome base number and carpel and fruit types, including placentation. Tribe Ranunculeae DC. of subfamily Ranuculoideae Hutch. includes ± 650 spp. occurring on all continents, and is diagnosed by carpels with a solitary, unitegmic and usually ascending ovule, and petals with at least one nectary near the base (Tamaru 1993, Emadzade *et al.* 2010). Molecular phylogenetic studies suggest that the tribe is monophyletic but that parallel, adaptive and convergent evolution of morphological characters is rife, hindering the development of a morphology-based classification of the tribe. The recent generic classification of Ranunculeae derived by Emadzade *et al.* (2010) from their molecular analysis largely corroborates the narrow generic circumscriptions proposed by Tamaru (1995) [exceptions are the inclusion of *Aphanostemma* A.St.-Hil. and *Gamsoceras* Steven in *Ranunculus* but the exclusion of *Coptidium* (Prantl.) Beurl. ex Rydb. and *Ficaria* Guett. as separate genera], ultimately recognizing 18 genera in the tribe, of which *Ranunculus* L. (500–550 spp.) is by far the largest. This phylogeny also establishes that the aquatic members of *R.* sect. *Batrachium* DC. are deeply

nested in the genus in a clade that includes wetland species such as *R. repens* L., affirming that their segregation at the higher taxonomic levels of genus (Gray 1821) or subgenus (Gray 1886) is not justified.

Ranunculeae are poorly represented in sub-Saharan Africa, with only a handful of species of *Ranunculus* recorded as native, mainly from the temperate eastern highlands of the continent (Oliver 1868; Milne-Redhead & Turrill 1952; Exell & Milne-Redhead 1960). The generic diversity is higher in southern Africa, with two indigenous genera. In addition to *Ranunculus* itself, the subcontinent is home to the recently described endemic monotypic genus *Peltocalathos* Tamaru (1992), based on *R. baurii* MacOwan and separated from *Ranunculus* by its peltate leaves and longitudinally ribbed achenes lacking a sclerenchyma layer in the carpel wall, the ribs corresponding to the vascularisation of the carpel walls. In addition to the native taxa, the European *Myosurus minimus* L. is naturalised in parts of Western and Northern Cape.

The last regional revision of *Ranunculus* in southern Africa is that of Harvey (1860), in which six species were recognised. The application of three of these names is now known to have been incorrect. Current checklists for the subcontinent list seven species (including *R. baurii*, now *P. baurii*), with *R. capensis* Thunb. regarded as a doubtful species and *R. plebeius* R.Br. ex DC. as a doubtful determination (Winter 2006). The description of the monotypic *Peltocalathos* for *R. baurii* has been overlooked in all of the regional literature.

A modern review of the southern African species is clearly overdue, both to establish the taxonomic and nomenclatural status of the native species as well as the distribution and identification of all species recorded for the region. Here we review the genera *Peltocalathos* and *Ranunculus* in southern Africa, providing full descriptions and nomenclature, taxonomic history, ecological notes, and distributions for the five native and naturalised species that we recognise in the region.

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## MATERIALS AND METHODS

All relevant types were examined, as well as all herbarium material from BOL, GRA, NBG, PRE and SAM (acronyms after Holmgren *et al.* 1990), the primary collections of southern African material. All species with the exception of *Ranunculus muricatus* were also studied in the field.

## TAXONOMY

*Key to genera of Ranunculeae in southern Africa*

- 1a. Scapose annuals with linear or linear-oblong leaves; sepals with spur-like projection at base; petals long-clawed; receptacle greatly elongated and tail-like in fruit; achenes with strong dorsal ridge; ovule pendant, anatropous. . . . .  
 . . . . . *Myosurus* [not treated further here]
- 1b. Annuals or perennials with peltate or variously lobed leaves; sepals without spur-like projection; petals short-clawed; receptacle not greatly elongated in fruit; achenes with or without inconspicuous dorsal ridge; ovule ascendant:
- 2a. Leaves peltate, with finely toothed, reddish margins and hollow petioles; inflorescence a subscapose cyme; petals 11–17; achenes ellipsoid, longitudinally ribbed . . . . . *Peltocalathos*
- 2b. Leaves not peltate, coarsely toothed to pinnate; petals 5 or 6(–10); inflorescence various; achenes ellipsoid or compressed, smooth, tuberculate or transversely rugose . . . . . *Ranunculus*

***Peltocalathos Tamaru*** in Acta Phytotaxa Geobotanica 43: 139 (1992). Type species: *Peltocalathos baurii* (MacOwan) Tamaru (= *Ranunculus baurii* MacOwan).

Perennial, rhizomatous herbs, subglabrous. *Roots* fleshy, without a taproot. *Stems* erect. *Leaves* spiral, basal, petiolate, stipules adnate to base of petiole and sheathing; blades simple, peltate, finely toothed. *Flowers* usually in a scapose, paniculate cyme, rarely solitary and terminal, bisexual, actinomorphic, all parts spiral. *Sepals* 5, reflexed, caducous. *Petals* 11–17, yellow, glossy adaxially, narrowed at base into short claw, with lunate, nectar-secreting pit on adaxial surface at top of claw. *Stamens* numerous. *Carpels* free, numerous, with 1 basal ovule. *Achenes* broadly ellipsoid, longitudinally ribbed, shortly beaked, glabrous, leathery; pericarp without inner sclerenchyma layer.

1 sp., endemic to the eastern highlands of South Africa, Lesotho and Swaziland.

*Ranunculus baurii* was established as the monotypic genus *Peltocalathos* by Tamaru (1992) on the basis of its peltate leaves and longitudinally veined and ribbed achenes lacking a sclerenchymatous inner layer to the carpel wall. Phylogenetic analysis of plastid and nuclear gene sequence data of tribe Ranunculeae supports this decision, placing the species well outside of *Ranunculus* s. str. in a clade of small, mainly New World genera, where it is resolved as sister to the southern South American genus *Hamadryas* Comm. ex Juss. (Emadzade *et al.* 2010). The strong geographical isolation of the genera in this clade is presumed to have fostered the evolution of distinct autapomorphies among its members, which must be regarded as either relictual survi-

vors of ancient radiations or as lineages that have failed to diversify (Emadzade *et al.* 2010).

1. ***Peltocalathos baurii*** (MacOwan) Tamaru in Acta Phytotaxa Geobotanica 43: 139 (1992). *Ranunculus baurii* MacOwan in MacOwan & Bolus: 390 (1881); Oliv.: t. 1503 (1886b); Tölken: t. 1508 (1965). Type: South Africa, Eastern Cape, 'in graminosis subhumidus summi montis Bazija in Terra Kaffrorum (Ngangelizwe)', 4000' [1 200m], [Nov.], *R. Baur* [No. 544] (SAM, lecto!., designated here; K, isolecto. [2 sheets K000076103 & 5]—Aluka images!). [The SAM collection is chosen as lectotype as being most likely the specimen on which MacOwan based his description and in displaying insect damage (to the foliage) as reported in the protologue].

*Ranunculus cooperi* Oliv.: t. 1502 (1886a). Type: Lesotho, 'Basutoland', 1861, *T. Cooper* 928 (K, syn. [2 sheets K00076106 & 7]—Aluka images!).

Tufted, rhizomatous perennial to 600 mm; stems condensed, covered with brown fibrous remains of old leaf sheaths. *Roots* few—several, thong-like. *Leaves* radical, usually 3 or 4, peltate, glabrous or sparsely villous when young, petiole 10–450 mm long with stipules adnate and sheathing for 20–40 mm, hollow, blade orbicular, leathery, laterally folded when young, (5–)30–150(–300) mm diam., crenulate-dentate with apical tooth largest, dull dark green adaxially with irregular pale markings along veins, margins reddish and cartilaginous with callus at apex of each serration. *Flowers* (1)2–18 in a pedunculate cyme, (18–)20–30 mm diam.; peduncle 2–3 × as long as leaves, (30–)100–600 mm long, 1.5–10.0 mm diam. at base, hollow, usually with apical fringe of short, obtuse hairs at base of sepals; bracts ovate-suborbicular, cucullate, finely or irregularly toothed with reddish, cartilaginous margins, rarely lowermost leaf-like and amplexicaul. *Sepals* (4)5, reflexed, caducous, ovate to suborbicular, cucullate, 4–6 mm long, glabrous or obtusely hispidulous beneath towards base, margins irregularly toothed, yellowish or with reddish margins. *Petals* (11)12–15(–17), narrowly obovate-cuneate, 8–15 × 2.5–4.0 mm, varnished bright yellow adaxially but dull and paler beneath, narrowed into short fleshy claw in basal ± 1 mm, truncate to acute, veins branched, nectary lunate. *Stamens* ± 50 in ± 6 series, filaments ± 5 mm long, anthers ± 0.5 mm long. *Carpels* ± 50–100, glabrous. *Achenes* in subglobose head, broadly ellipsoid, 5–7 × 1.5–2.5 mm, longitudinally ribbed, shortly beaked; receptacle pubescent. *Flowering time*: (Sept.–) Oct.–Dec.(–Jan.). Figure 1.

*Distribution and ecology*: a montane species endemic to the southern African Drakensberg, ranging from the Katberg in Eastern Cape through KwaZulu-Natal, Lesotho, Swaziland and Mpumalanga, with a single collection from the headwaters of the Olifants River in Limpopo (Figure 2).

*Peltocalathos baurii* is restricted to damp gullies, streambanks and the base of wet cliffs, from 1 000–3 000 m.

*Diagnosis*: a distinctive species recognised by its peltate leaves with hollow petioles and scapose inflorescence of moderately large flowers with numerous petals and caducous sepals. The leaf blades are suborbicular

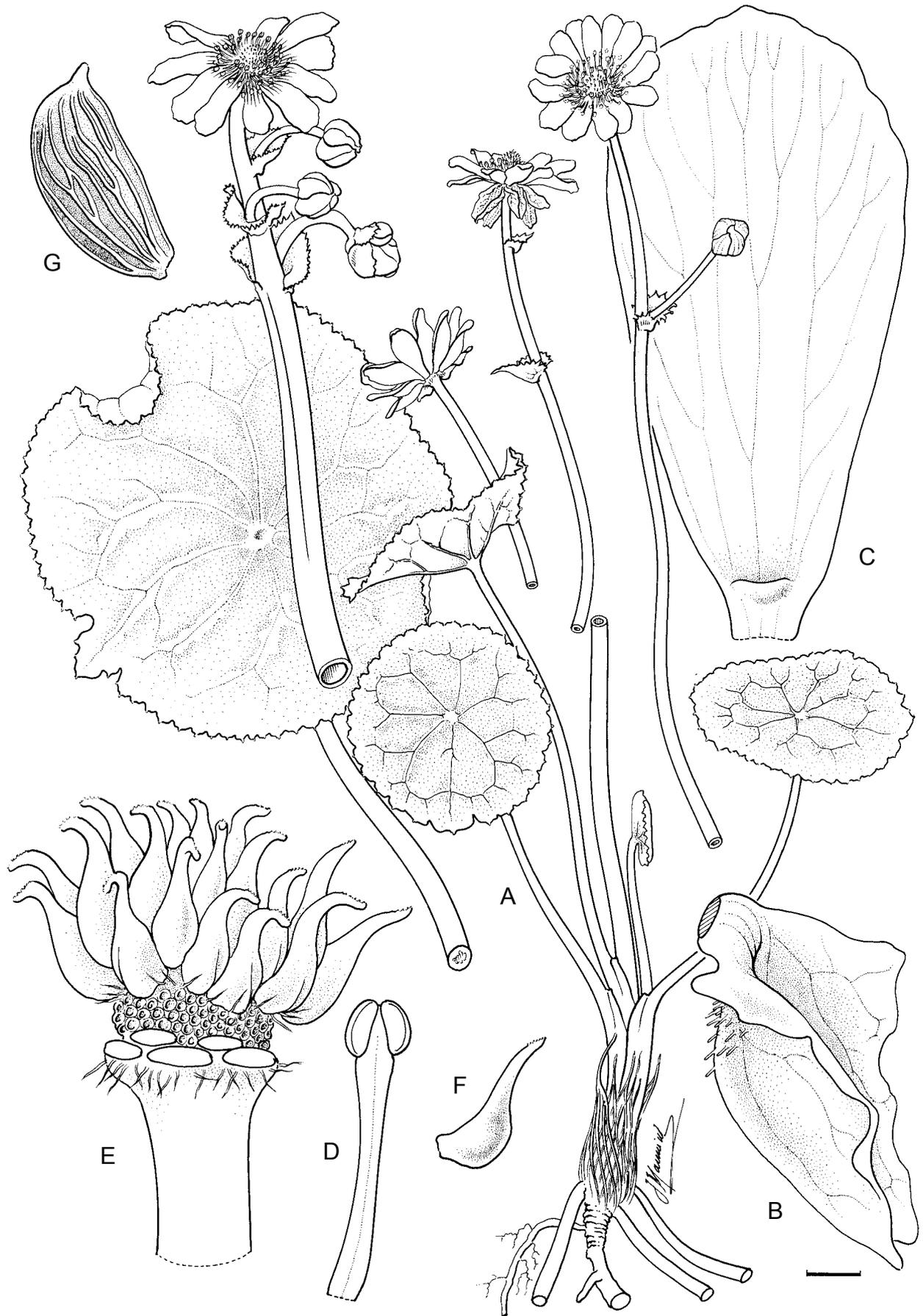


FIGURE 1.—*Peltocalathos baurii*, Naude's Nek, no voucher. A, flowering plant plus detached leaf and inflorescences; B, sepal; C, petal; D, stamen; E, pistil; F, carpel; G, achene [Dieterlen 883]. Scale bar: A, 10 mm; B–G, 1 mm. Artist: John Manning.

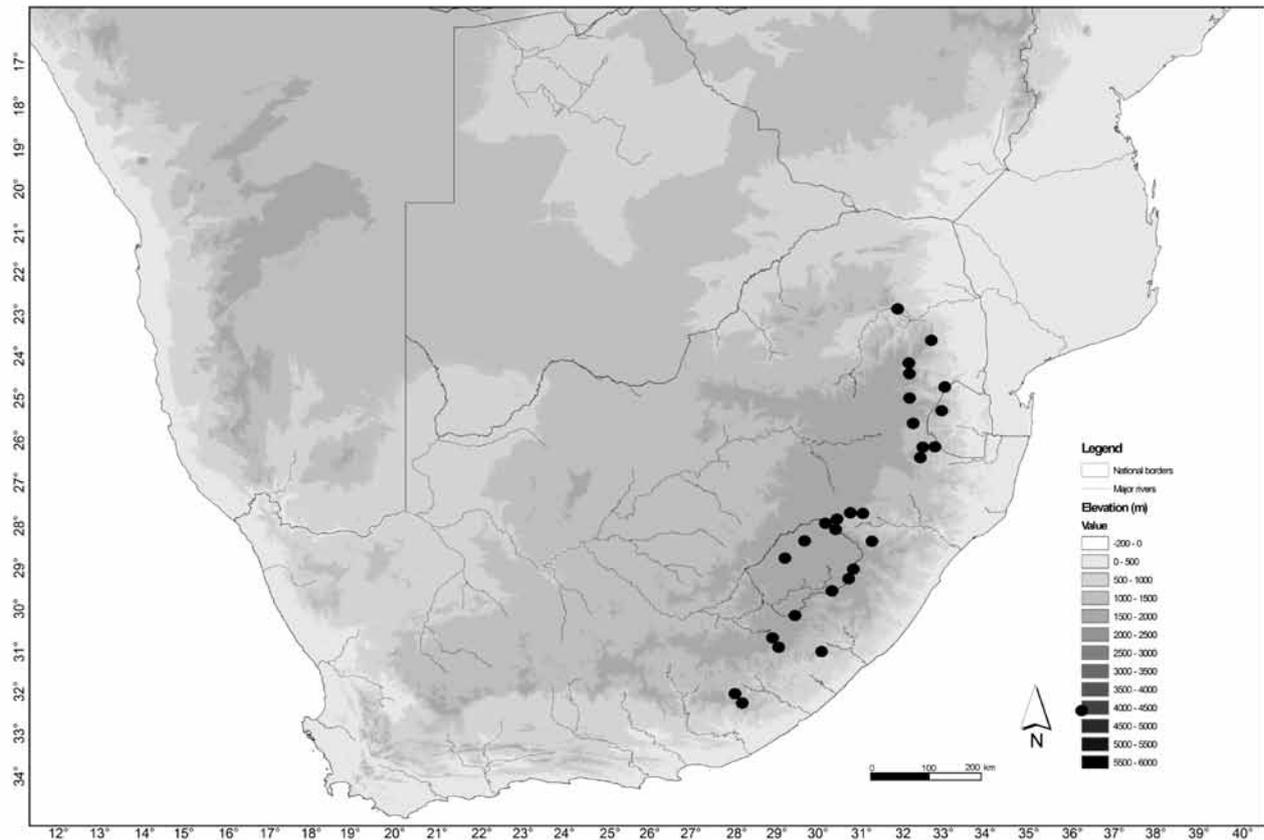


FIGURE 2.—Distribution of *Peltoalathos baurii*.

and finely toothed with attractive pale green markings along the primary veins, conspicuous against the dull, dark green upper surface.

Plants in sheltered situations tend to be much larger than those growing in shallower soils or in more exposed conditions on banks or in alpine seepages. Although the two extremes are striking, we have encountered a complete range of variants on wet banks and seepages on Naude's Nek in the southern Drakensberg, ranging from small, solitary-flowered plants with leaves less than 30 mm in diameter to well-grown individuals over 300 mm high with multiple flowers and leaves to 80 mm diam.

Plants collected early in the season at high altitudes around 3 000 m in the Drakensberg Mtns, most commonly on the summit plateau of Mt aux Sources, are exceptionally dwarfed, with solitary (rarely two) flowers on scapes 30–70 mm long and leaves either just emergent or with reduced blades 5–20 mm diam. Tölken (1965), who also remarked on this form, was uncertain how to treat it. Although these populations may represent a distinct alpine ecotype, the species as a whole exhibits such marked phenotypic plasticity that they are more likely merely extreme morphotypes, especially since early-flowering individuals from lower altitudes elsewhere may be similarly diminutive.

*History:* The species was described in 1881 by Peter MacOwan (1830–1909), principal of Shaw College in Grahamstown and expert on the regional flora,

from a collection made near Baziya, west of Umtata, by the missionary Leopold Richard Baur (1825–1889). The collection is undated but was presumably made after 1873 since it was during this year that Port Elizabeth businessman and amateur botanist Russell Hallack (1824–1903) visited Baur and encouraged him to botanise the area and send his collections to MacOwan. MacOwan associated Baur's plants with a collection from Lesotho made in 1861 by the professional plant collector Thomas Cooper (1815–1913), who had recognised that his find represented a new species. This collection (BOL, SAM) is the voucher for seeds and rhizomes that Cooper despatched to his employer, W.W. Saunders of Reigate, for cultivation, where they were successfully grown and flowered. A brief description by Kew botanist D. Oliver of the herbarium specimens pressed from these cultivated plants formed a footnote to MacOwan's description of *R. baurii*.

With the arrival of a duplicate of Baur's collection at Kew in 1885, Oliver lost no time in having both it and Cooper's specimens lithographed for *Hooker's Icones plantarum* (Oliver 1886a, b), and in describing the latter under the name *R. cooperii*. The differences between the two were slight, 'chiefly in dimensions and number of flowers' (Oliver 1886a) and were followed by the caveat, or presentiment, that the two taxa might later have to be reduced to a single species as it was 'not improbable that connecting forms may be found'. Both names [the former sometimes misspelled as '*bauerii*'] continued to be applied to plants from KwaZulu-Natal

for some time (Wood 1907; Bews 1921), but the two were eventually united (Tölken 1965).

#### Additional specimens seen

LIMPOPO.—**2430** (Pilgrim's Rest): Olifants River, 5400' [1 650 m], (–AA), *R. Schlechter 3819* (BOL).

MPUMALANGA.—**2430** (Pilgrim's Rest): Graskop Spruit, (–DD), 16 Dec. 1937, *E. Galpin s.n.* (BOL, PRE); Graskop, marshy slopes, (–DD), 22 Nov. 1951, *L. Codd 6739* (PRE). **2530** (Lydenburg): Dullstroom, Caravan Park, (–AC), 21 Nov. 1985, *B. Clarke 1460* (PRE); Dullstroom, Farm Driehoek, (–AC), 8 Nov. 2001, *A. Hankey 1428* (PRE); Belfast, (–CA), Dec. 1909, *J. Williams s.n.* (BOL); 7 Dec. 1909, *R. Leendertz 7961* (PRE). **2531** (Komatipoort): White River, Mr Kay's Farm, (–CC), Oct. 1931, *L. Liebenberg 2815* (PRE). **2630** (Carolina): near Carolina, 5600' [1 707 m], (–AA), Dec. 1905, *H. Bolus 11678* (BOL); Ermelo, Nootgedacht, (–CB), Jan. 1928, *M. Henrici 1739* (PRE); Ermelo, Spitskop, (–CB), Nov. 1915, *R. Pott 5125* (PRE). **2730** (Vryheid): Wakkerstroom, Farm Oshoek, (–AD), 24 Nov. 1960, *N. Devenish 268* (PRE); Kwa-Mandlangampisis, Farm Groot-hoek, (–BA), 26 Nov. 1980, *L. du Toit 68* (PRE); Piet Retief, (–BB), Dec. 1911, *T. Jenkins 10972* (PRE).

FREE STATE.—**2828** (Bethlehem): gully behind Three Witches, (–DB), 20 Dec. 1983, *Dove 54* (NBG). **2829** (Harrismith): Swinburne, Rensburgskop, (–AC), 10 Dec. 1962, *M. Jacobsz 15* (PRE)

SWAZILAND.—**2631** (Mbabane): Mbabane, Forbes Reef road, 4500' [1 400m], swamp, (–AC), 6 Nov. 1958, *R. Compton 28280* (NBG, PRE); Mbabane, Kirkhill, 3500', [1 070m], (–AC), moist stream-sides, 12 Oct. 1956, *R. Compton 26067* (NBG, PRE).

KWAZULU-NATAL.—**2828** (Bethlehem): Natal National Park, (–DB), 13 Dec. 1928, *E. Galpin 10164* (PRE). **2829** (Harrismith): Van Reenen's Pass, 5–6000' [1 500–1 800 m] (–AD), 18 Dec. 1891, *J.M. Wood 955* (BOL, GRA, PRE, SAM); Van Reenen, waterfall, (–AD), 25 Nov. 1941, *E. Dillon s.n. NBG402/39* (NBG). **2929** (Underberg): Highmoor Forest Station, (–BB), stream bank, 15 Jan. 1966, *D. Killick 3628* (PRE); [Kamberg] Farm Culvers, (–BC), Dec. 1923 [?1925], *F.A. Rogers 28264* (GRA); Giant's Castle, (–CB), Nov. 1914, *R. Symons 173* (PRE); Bushman's River Pass, 9000' [2 750m], moist places on summit, (–CD), Dec. 1891, *J. Thode s.n.* (NBG); Bushman's River Valley, (–CD), 23 Oct. 1907, *J. Wylie com. J. Medley Wood 10654* (PRE).

LESOTHO.—**2828** (Bethlehem): Mamalapi, S-slopes, 9000' [2 750m], (–CD), 28 Dec. 1948, *R. Compton 21329* (NBG); Leribe, slope Mechachaneng, 5–6000' [1 500–1 800 m], (–DA), Jan. 1913, *A. Dieterlen 883* (PRE, SAM); slopes of Mt aux Sources, 7–8000' [2 100–2 400 m], (–DD), 1894, *H. Flanagan 2124* (PRE), 2125 (BOL, SAM); Mt aux Sources, 3 100 m, (–DD), Oct. 1897, *G. Mann sub Marloth 2880* (BOL); 9500' [3 000 m], 25 Oct. 1897, *A. Bolus sub Guthrie 4770* (BOL); 21 Nov. 1930, *H. Schweickerdt 689* (PRE); 10500' [3 200 m], 3 Oct. 1950, *Sidey 2013* (PRE); Sept. 1963, *Trauseld 53* (PRE); Mothae Mtns, (–DD), 8 Jan. 1958, *J. Coetzee 816* (PRE). **2927** (Maseru): Maluti Mtns, Makheke's Pass, (–DB), without date, *R. Staples 179* (PRE). **2928** (Marakabei): Little Bokong Valley, (–AA), 5 Jan. 1947, *A. Guillarmod 317* (GRA, PRE). *Imprecise locality: 'Basutoland', T. Cooper s.n.* (BOL, SAM).

EASTERN CAPE.—**3027** (Lady Grey): Witteberg, Ben Mac-Dhui, damp ground under rocks, 9200–9600' [2 800–2 900 m], (–DB), 11 Mar. 1904 (fruiting/sterile), *E.E. Galpin 6567* (BOL, GRA, PRE, SAM). **3028** (Matatiele): Ramatilislo's Beacon, moist cliffs, 2 325 m, (–BB), 12 Oct. 1976, *M. Boardman 134* (PRE). **3127** (Lady Frere): Saalboom Nek, (–BA), 15 Jan. 1959, *J. Acocks 20205* (PRE); R56 ± 17 km from Elliot to Ugie, moist slopes, (–BD), 3 Nov. 2000, *E. Nienaber 986* (PRE). **3128** (Umtata): Mjika, above Mhlahlane Forestry Station, 1 300 m, (–BC), 8 Sept. 1984, *A. Hutchings 1228* (PRE). **3226** (Fort Beaufort): under krantz, summit of Great Katberg Mtn, (–BC), Nov. 1884, *W.C. Scully 143* (SAM); top of Katberg Pass, 1 720 m, wet places at base of cliff, (–BC), *T. Dold 1246* (GRA); Amatole Mtns, Elandsberg, 5000' [1 500 m], S-facing cliffs, (–DB), 28 Oct. 1981, *P. Phillipson 432* (PRE).

**Ranunculus L.** in *Species plantarum* 1: 548 (1753). Type species: *Ranunculus acris* L. (Jarvis 2007).

*Ranunculus* sect. *Batrachium* DC.: 232 (1817). *Batrachium* (DC.) S.F.Gray: 270 (1821). *R.* subg. *Batra-*

*chium* (DC.) A.Gray: 363 (1886). Type species: *Ranunculus hederaceum* L.

Annual or perennial herbs, sometimes aquatic, glabrous or pubescent. *Roots* fibrous to fleshy, usually without a taproot. *Stems* erect or creeping, sometimes stoloniferous. *Leaves* spiral, cauline and/or basal, petiolate, stipules adnate to base of petiole and sheathing; blades simple and usually palmately lobed or pinnatisect (rarely peltate in *R. lyallii* from New Zealand), or compound, trifoliate or imparipinnate, in aquatic species often decomposed into filiform or linear segments. *Flowers* solitary and terminal or in cymes, bisexual, actinomorphic, all parts spiral. *Sepals* usually 5(3), spreading or reflexed. *Petals* [also termed honey-leaves] 5 or 6 (–10), yellow or white, often glossy adaxially, narrowed at base into short claw, with nectar-secreting pit on adaxial surface at top of claw often covered by laterally adnate scale or flap forming nectary-pocket. *Stamens* numerous, rarely 5 or less. *Carpels* free, usually numerous, with 1 basal ovule. *Achenes* smooth, tuberculate or transversely rugose, glabrous or pubescent, with or without persistent style-beak; pericarp with inner sclerenchyma layer present.

500–550 spp., cosmopolitan but mainly temperate Northern Hemisphere; 4 spp. in southern Africa, with 3 spp. native and 1 sp. naturalised. Some species are reported to be poisonous to livestock when fresh (Eichler & Walsh 2007) but Burt Davy (1926) reported that the leaves of *R. multifidus* are eaten in spring and at other times when grass is scarce.

#### Key to species

- 1a. Submerged and floating aquatic; leaf blades finely dissected into linear or hair-like segments; petals white with yellow claw; achenes transversely rugose, not beaked . . . . . *R. trichophyllum*
- 1b. Terrestrial but often growing in damp places; leaves variously simple or compound but never finely dissected; petals yellow; achenes smooth, ribbed or tuberculate/muricate, beaked:
  - 2a. Dwarf, creeping, stoloniferous perennial rooting from nodes; leaf blades cordate-reniform and crenate-dentate, mostly 5–20 mm diam.; flowers solitary, scapose; petals ligulate, acute-attenuate, ± 1 mm wide, veins unbranched. . . . . *R. dregei*
  - 2b. Erect or sprawling, tufted annuals or perennials; flowers mostly in cymes; leaf blades variously lobed or parted, 15–70 mm long; petals obovate, obtuse, 3–4 mm wide, veins branched:
    - 3a. Perennial, ± pubescent; leaves ternately pinnate or bipinnate; achenes smooth or tuberculate, 2.0–2.5 mm long, shortly beaked with beak ± 0.5 mm long . . . . . *R. multifidus*
    - 3b. Annual, ± glabrous; leaves simple or 3–5-parted; achenes muricate, 5–8 mm long, strongly beaked with blade-like beak 2–3 mm long. . . . . *R. muricatus*

#### Sect. *Ranunculus*

1. **Ranunculus muricatus L.** in *Species plantarum* 1: 555 (1753); Eichler & Walsh: 347 (2007). Type: 'Habitat in Europae australis fossis & humentibus', *LINN715.66* [LINN—digital image!, lecto., designated by Lourteig:

487 (1951)].

[? *R. sceleratus* sensu Harv.: 6 (1860), non L. (1753)]

Erect or sprawling annual, mostly 100–200(–500) mm tall, stems simple or branched in upper parts, glabrous or pilose with hairs to 2 mm long. *Roots* fibrous or narrowly thong-like. *Leaves* basal and cauline, petioles of basal leaves 50–150 mm long with stipules adnate and sheathing for 5–30 mm, glabrous or thinly pilose, blade suborbicular in outline, unlobed or 3–5-lobed to  $\pm$  midway, 15–50 mm diam., base truncate to cordate, coarsely crenate-toothed with callus at tip of each serration, usually glabrous but sometimes thinly adpressed-pilose on both surfaces, cauline leaves  $\pm$  cuneate. *Flowers* in simple or compound cymes, 10–15 mm diam. *Sepals* 5, strongly reflexed, ovate, cucullate,  $\pm$  5 mm long, pilose beneath, yellowish. *Petals* 5, obovate, 5–8  $\times$  3–4 mm, varnished bright yellow above, dull and paler beneath, narrowed into short claw in basal  $\pm$  1 mm, obtuse, veins branched, nectary pocket-like. *Stamens* 15–20 in 2 or 3 series, filaments  $\pm$  3 mm long, anthers  $\pm$  1 mm long. *Carpels* 8–20, glabrous. *Achenes* in a globose or hemispherical head, broadly obovoid or subcircular, 5–8 mm long (incl. beak), muricate with numerous acute tubercles, margin keeled and grooved, beak stout, blade-like, 2–3 mm long; receptacle pubescent. *Flowering time*: Sept.–Nov. Figure 3.

*Distribution and ecology*: native to the Mediterranean region but adventive in the southwestern Cape, where it has been recorded from the Cape Peninsula to Kleinmond and Swellendam (Figure 4), in marshy ground and riverbanks. It has been collected so far only near settlements and has not been recorded in undisturbed vegetation. The species is widely naturalised in Australia and parts of the continental United States, mainly as a weed of damp waste places and croplands but occasionally along lake and stream margins in native vegetation (DiTomaso & Healy 2007; Eichler & Walsh 2007).

*Diagnosis*: readily distinguished by the mostly subglabrous, simple or 3–5-lobed, orbicular leaves and echinate achenes, 5–8 mm long, with a stout, blade-like or hooked beak 2–3 mm long.

*Ranunculus muricatus* was not mentioned by Harvey (1860) by name [but see discussion below] and the first documented South African records are almost contemporaneous collections from the late nineteenth century, from Rondebosch on the Cape Peninsula and from Zuurbraak [Suurbraak], a mission station near Swellendam established in 1812 by the London Missionary Society. The species has been collected only sporadically since then, initially from elsewhere on and around the Peninsula but by the middle of the century from Stellenbosch and Somerset West, and most recently from Kleinmond and Caledon. It has not been recollected on the Cape Peninsula since 1942 and does not appear to be invasive.

It is possible that Harvey's (1860) reference to *Ranunculus sceleratus* L. is relevant here. In his account of the genus in southern Africa, he reported the occurrence of *R. sceleratus* in ditches near Cape Town but neglected to preserve any specimens. Native to Europe,

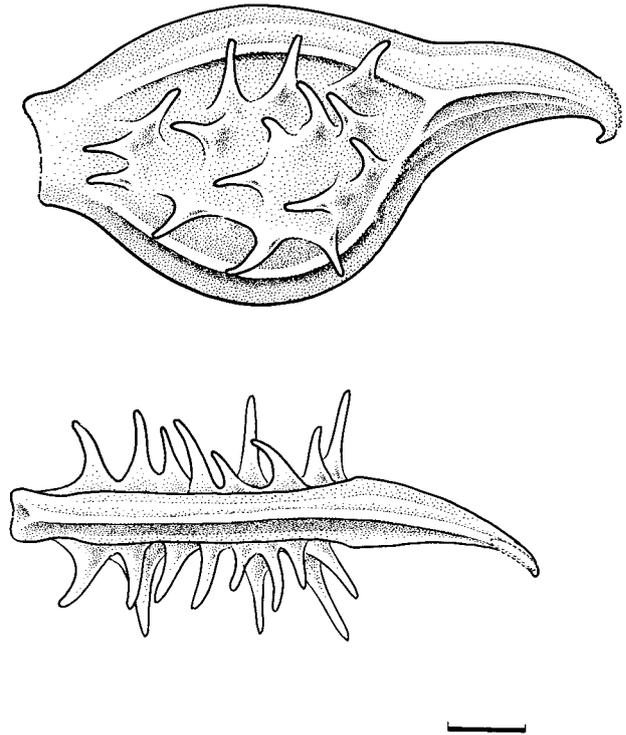


FIGURE 3.—*Ranunculus muricatus*, Camp's Bay, Saxton 135 (NBG). Achene, lateral and dorsal view. Scale bar: 1 mm. Artist: John Manning.

*R. sceleratus* is a subglabrous annual with lobed and crenate basal leaves, deflexed sepals, and elongate-conical receptacles bearing numerous small,  $\pm$  1 mm long, ovoid, faintly rugose achenes (Cook 1964). No plants of *R. sceleratus* have ever been collected in southern Africa and the identity of Harvey's plants remains unclear. A collection by Ecklon and Zeyher from the banks of the Zwartkops River listed by them under this name is in fact *R. multifidus* and although it is possible that Harvey (1860) made a similar error we consider this to be unlikely given his familiarity with that species on the Cape Peninsula. *R. sceleratus* is vegetatively much more similar to *R. muricatus* than to *R. multifidus* and if confusion occurred, it is more likely to have been between the former two species, especially without fruits.

#### Additional specimens seen

WESTERN CAPE.—**3318** (Cape Town): railway at Rondebosch, (–CD), 5 Sept. 1896, *Wolley-Dod 1604* (BOL); Rondebosch, (–CD), Sept. 1898, *H. Bolus 7991* (BOL); Rondebosch Common, (–CD), 9 Oct. 1938, *R.S. Adamson 2122* (PRE); Maitland, (–CD), Nov. 1904, *H. Bolus s.n.* (BOL); Camps Bay, (–CD), Nov. 1907, *W.T. Saxton 135* (NBG); Lion's Rump, (–CD), Nov. 1924, *R. Marloth 6305* (NBG); Klipfontein Road, 4 mi [6.4 km] E of Mowbray, (–CD), 12 Oct. 1913, *N.S. Pillans 2157* (BOL); Mowbray, (–CD), Oct. 1915, *R. Marloth 7247* (PRE); Camp Ground, (–CD), 16 Oct. 1942, *R.H. Compton 13909* (NBG); Tygerberg Nature Reserve, under trees near stream, (–DC), 2 Oct. 1975, *J.W. Loubser 3416* (NBG); Stellenbosch, Elsenburg Agricultural College, (–DD), without date, *P. le Roux s.n.* (PRE); Stellenbosch, Goedvertrouw, riverbank, (–DD), 23 Sept. 1994, *P. Nel & C. Boucher 414* (NBG, PRE); Banhoekweg, marshy ground, (–DD), 19 Sept. 1946, *D.J. Louw s.n.* (NBG). **3418** (Simonstown): Youngsfield, (–AB), 5 Nov. 1935, *R.H. Compton 5955* (NBG); Cape Flats, (–BA), 25 Oct. 1925, *R. Young 26414* (PRE); Somerset Strand, (–BB), 14 Nov. 1946, *R. Strey 737* (PRE); Somerset West, garden weed, (–BB),

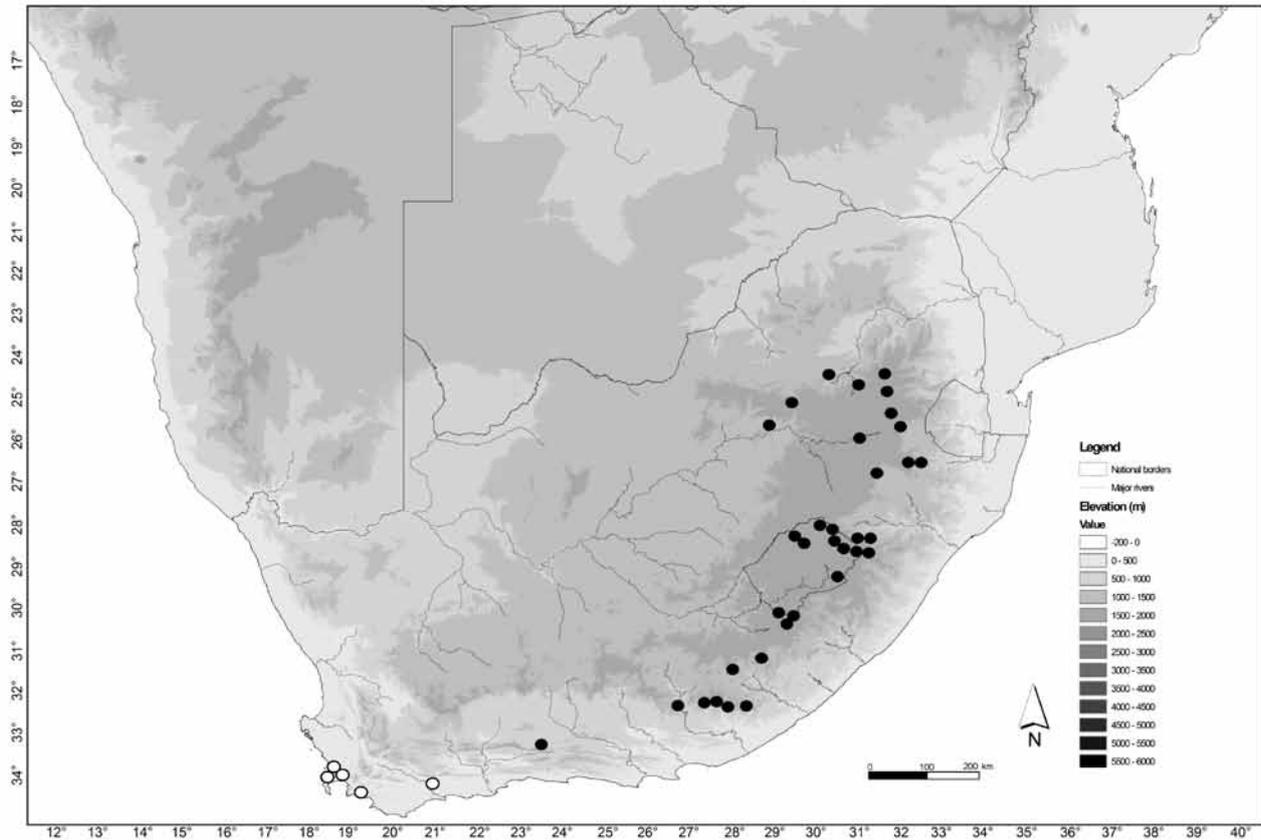


FIGURE 4.—Distribution of *Ranunculus muricatus*, ○; *R. dregei*, ●, in southern Africa.

5 Nov. 1949, *R.N. Parker 4464* (BOL, NBG). **3419** (Caledon): 1 km S of Caledon, just E of rifle range, marshy area, 245 m, (–AB), 13 Oct. 2001, *N.A. Helme 2300* (NBG); Kleinmond, (–AC), without date, *M.P. de Vos 12* (NBG). **3420** (Swellendam): Zuurbraak [Suurbraak], near watermill, (–BA), 12 Oct. 1897, *E. Galpin 3738* (PRE).

2. ***Ranunculus multifidus* Forssk.** in *Flora aegyptiaco-arabica*: 102 (1775), non Pursh: 736 (1813), hom. illegit.; Milne-Redhead & Turrill: 19 (1952); Exell & Milne-Redhead: 97 (1960); Cook: 241 (2004). *R. forskoehlii* DC.: 303 (1817), nom. illegit superfl. Type: Arabia, near Taäs, *Forsskål s.n.* (C, holo., not seen).

*R. capensis* Thunb.: 94 (1800), syn. nov. Type: South Africa, precise without locality, *Thunberg UPS-THUNB 13126* (UPS-THUNB—microfiche!, holo.).

*R. pubescens* Thunb.: 94 (1800). Type: South Africa, without precise locality, *Thunberg s.n. UPS-THUNB 13186* (UPS-THUNB—microfiche!, holo.).

*R. pinnatus* Poir. in Lam.: 126 (1804). Type: ‘Les Indes’, *Sonnerat s.n.* (P-LAM, holo., not seen).

*R. pinnatus* var. *hermannii* DC.: 42 (1824), syn. nov. Type: ‘Cap. Bonae Spei’, *Hermann s.n.* (G-DC [000130084], holo.—digital image!).

*R. pubescens* var. *glabrescens* Burt Davy: 342 (1921), syn. nov. Type: South Africa, [Gauteng], ‘Vereeniging Dist., Burttholm, Uitgevallen 197’, 25 Apr. 1918, *Burt Davy 17682* (K [K000076092]—Aluka image!, holo.).

*R. pubescens* var. *harveyanus* [as ‘*harveianus*’] Burt Davy: 109 (1926), syn. nov. Type: South Africa, [Eastern Cape], ‘Graaf Reinet Div., southern slopes of the Sneeuwberg [Sneeuberg], *Burke s.n.* (PRE [PRE0418732-0]—Aluka image!, holo.).

[*R. plebeius* sensu Harv.: 6 (1860), non DC. (1817).]

[See Perrier de la Bâthie (1950) and Exell & Milne Redhead (1960) for additional synonyms from tropical Africa]

Tufted perennial, mostly 100–500 but much dwarfed in exposed situations and up to 1 000 mm in protected places, developing new shoots at base; flowering stems erect or sprawling, simple or well-branched in upper parts, densely or sparsely patent- or adpressed-hirsute or -pilose below with hairs to 2 mm long and adpressed-pubescent above, rarely glabrescent or subglabrous. *Roots* several to many, thong-like. *Leaves* basal and cauline, petioles of basal leaves 20–150(–300) mm long with stipules adnate and sheathing for 5–30(–40) mm, usually pilose, sometimes subglabrous, blade ovate in outline, ternate or ternately pinnate to bipinnatisect (rarely tripinnatisect) with 1 or 2 lateral pairs of leaflets, (20–)30–90(–130) × (15–)20–70(–100) mm, ultimate segments coarsely and irregularly toothed, with callus at tip of each serration, usually adpressed-pilose on both surfaces, rarely glabrescent, cauline leaves progressively smaller, ultimately sessile and lanceolate;

juvenile leaves suborbicular and lobed to ternate. *Flowers* in simple or compound cymes, 10–18 mm diam. *Sepals* 5, strongly reflexed, ovate, cucullate, 2.5–5.0 mm long, hispid beneath, yellowish. *Petals* 5, obovate, 4–9 × 3–7 mm, varnished bright yellow above, dull and paler beneath, narrowed into short claw in basal ± 1 mm, obtuse, veins branched, nectary pocket-like. *Stamens* ± 30 in 2 or 3 series, filaments 1–3 mm long, anthers ± 1.5 mm long. *Carpels* 30–50(–70), glabrous. *Achenes* in an ovoid head, broadly obovoid or subcircular, 2.0–2.5 mm diam., usually verrucose or tuberculate but sometimes ± smooth, margin keeled and grooved, shortly beaked, beak acute, ± 0.5–0.8 mm long; receptacle 2–5 mm long, pubescent. *Flowering time*: Aug.–Jan. Figure 5.

*Distribution and ecology*: widespread through southern and east tropical Africa to Ethiopia, Arabia and Madagascar. In southern Africa, *Ranunculus multifidus* is largely restricted to the more mesic southern and eastern parts (Figure 6), from near sea level to 3 000 m, and is largely absent from the western half of the subcontinent apart from some isolated populations in higher or locally moist situations.

Plants typically occur in moist or damp, open grassy habitats and floodplains, along streams and bogs, sometimes partially submerged, and in open patches in temperate forest; it is sometimes ruderal in gardens or along ditches and around dams. The species is self-fertile; producing numerous fruits, and has a tendency to become weedy in damp waste places, suburban gardens and parklands, especially in the southern and southwestern Cape, where it is commonly associated with human activity. Local variants are readily established.

*Diagnosis*: a widespread and variable species, especially in the degree of dissection of the leaves, which range from ternate to tripinnatisect, development and density of the vestiture on the stems and leaves, size of the flowers, and development of tubercles on the fruits, which vary from scarcely evident to almost spinulate. Plants from high altitudes and exposed or trampled situations are typically dwarfed and compact or almost prostrate and those from sheltered locations larger and more lush, but the species is always readily distinguished from other sub-Saharan species by its ± appressed pubescent, ternately pinnate or bipinnate leaves with one or two pairs of lateral leaflets, and ± tuberculate achenes. The flowers are small to moderately sized, with reflexed, hispid sepals and 5 obovate petals, 4–9 mm long.

*History*: The correct identification of the South African material of this species took some time to establish. The first collections of the species on the subcontinent were made in the late eighteenth century by Carl Thunberg (1743–1828), who described them under the names *R. capensis* Thunb. (1800) and *R. pubescens* Thunb. (1800). Subsequently Harvey (1860), in his account of the genus for *Flora capensis*, segregated the material available to him among three different names: typical plants with pinnate or bipinnate leaves, including *R. pubescens* Thunb., were treated by him, and later by Oliver (1868), under the name *R. pinnatus* Poir.; smaller plants with subsimple radical leaves were treated as *R. capensis* Thunb.; and a collection from the Sneeberg with ternate leaves and smooth achenes was referred to

the Australian species *R. plebeius* DC., a mistake that was later corrected by Exell & Milne-Redhead (1960). The priority of the name *R. multifidus* Forssk. (1775) over *R. pinnatus* Poir. (Lamareck 1804), under which name the species was better known in southern Africa, was established by Milne-Redhead & Turrill (1952).

Collections of subglabrous plants from Mpumalanga were described as var. *glabrescens* by Burt Davy (1921). The protologue clearly designates *Burt Davy 17682* (K) as the [holo] type, with *Burt Davy 17164* included among the paratypes, but this was somewhat confused when Burt Davy (1926) later identified both collections as types [syntypes]. This is incorrect. He also segregated Burke's Sneeberg collection [previously treated as *R. plebeius* by Harvey (1860)] plus some others as his new var. *harveyanus* Burt Davy (1926). Both variants fall within the range of variation of *Ranunculus multifidus* and we see no justification for upholding them. We have seen no authentic material of *R. plebeius* from southern Africa.

The identity of *Ranunculus capensis* Thunb. (1800), based on a collection of three small plants—two of them just coming into flower and the third sterile—deserves further consideration and it was treated as a doubtful species by Winter (2006). The name was associated by Harvey (1860) with two or three additional collections from the Cape Peninsula and Clanwilliam, notably *Ecklon & Zeyh. En. No. 13* (SAM) from Green Point and the latter is indeed a perfect match with Thunberg's type. After close study we conclude that the species represents a seedling variant of *R. multifidus* with juvenile, ternate leaves. This conclusion was also reached by Adamson (1950), who suggested that the taxon was a dwarf state of the variable *R. pubescens* (now *R. multifidus*). The pubescent stems and petioles, the hirsute leaf blades, the relatively small flowers with reflexed, hispid sepals, and the pubescent receptacle with small, compressed achenes with short beak are all consistent with *R. multifidus*. Additional collections from Green Point (*Ecklon s.n. SAM13992* and *Thode s.n. SAM9260*) are perfectly intermediate with more typical *R. multifidus* and we accordingly formally synonymise the name here.

The relationship between *Ranunculus multifidus* and *R. pinnatus* has proven remarkably troublesome to resolve. Following Harvey (1860), the South African material was treated under the name *R. pinnatus* (e.g. *Wood 1909*, *Bews 1921*) until Burt Davy (1921) queried the conspecificity of *R. pubescens* with *R. pinnatus*. Although evidently of the opinion that the two were probably the same, the type locality of *R. pinnatus*, given by Poir. (1804) as 'Les Indes', was problematical to him and he therefore elected to treat the southern African material under the name *R. pubescens* until this could be resolved. Certainly, both Milne-Redhead & Turrill (1952) and Exell & Milne-Redhead (1960) considered that the tropical African material was not conspecific with *R. pinnatus* Poir., although without explicit justification, and this opinion is still followed by some authors (Teketay & Edwards 2000). Perrier de la Bâthie (1950), in his account of the genus in Madagascar, however, treated the two as conspecific under the name *R. pinnatus* Poir. This remains the current situation until formally reversed.

*Additional specimens seen*

NAMIBIA.—**1820** (Tarikora): swampy area below Tamso Camp in Omuramba Khaudum, (–DA), 16 Feb. 1956, *B. de Winter & W. Marais* 4687 (PRE). **1917** (Tsumeb): Otavi, (–CB), 30 Nov. 1908, *Dinter* 909 (SAM); Otavifontein, (–CB), 3 Feb. 1960, *Giess & Smook* 10620 (PRE). **1918** (Grootfontein): Grootfontein, (–CA), without date, *Schoenfelder* 293 (PRE); Grootfontein, (–CA), 3 Mar. 1960, *R. Seydel*

**2066** (NBG), **2017** (Waterberg): Waterberg Plateau, (–CA), Dec. 1935, *J. Boss s.n.* (PRE); Gross Waterberg, (–CA), 12 Nov. 1947, *R.J. Rodin* 2590 (BOL, PRE); Okosongomingo, (–CA), 4 Feb. 1911, *Dinter* 1766 (SAM). Uncertain locality: Okasewa, alluvium along Nossob, 24 Jan. 1913, *Dinter* 2739 (SAM).

BOTSWANA.—**2525** (Mafeking): Kanye, Majana village along banks of Kolobeng River, (–BA), 16 Nov. 1948, *Hillary & Robertson* 572 (PRE).

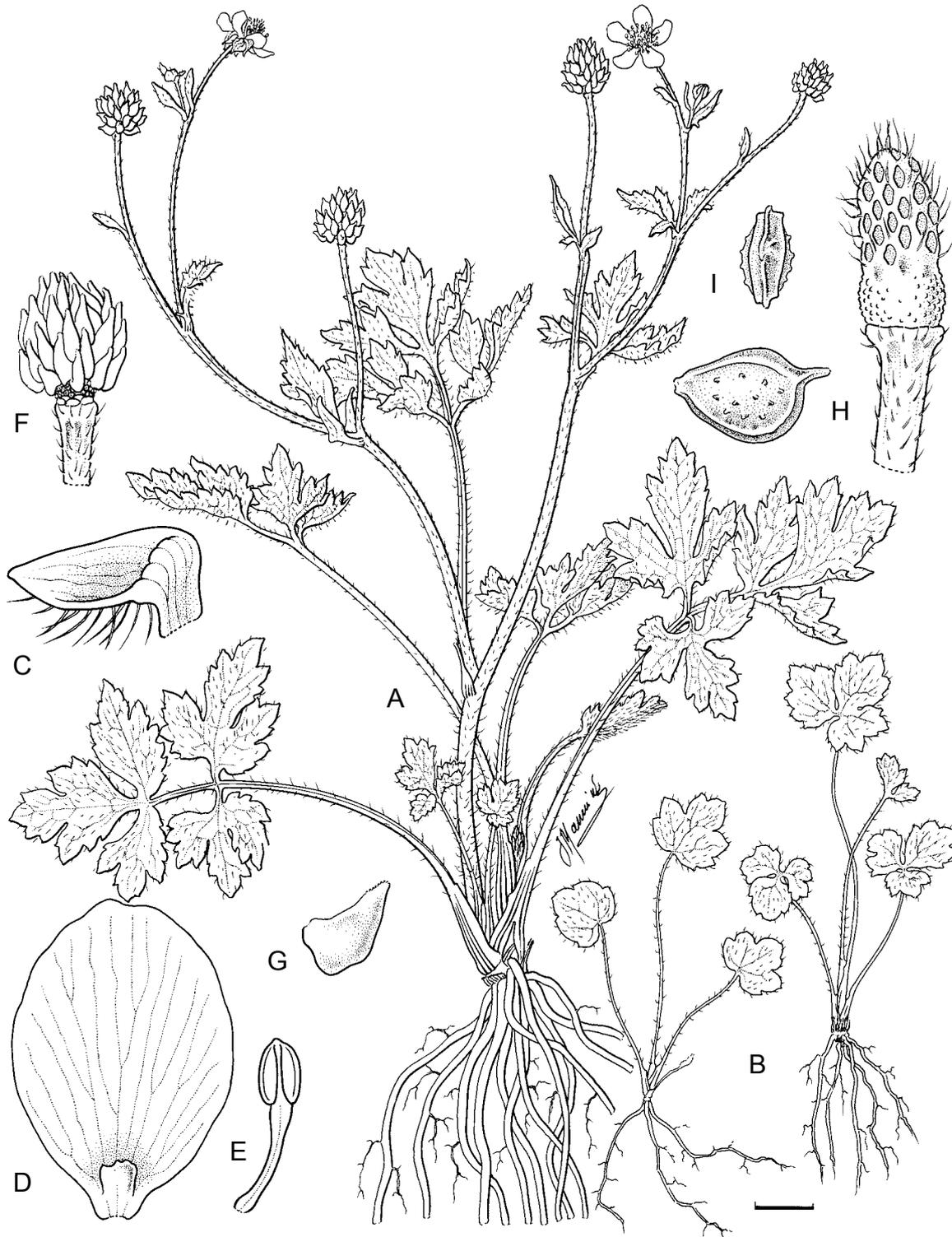


FIGURE 5.—*Ranunculus multifidus*, Cape Town, *Manning* 3405 (NBG). A, flowering plant; B, seedlings; C, sepal; D, petal; E, stamen; F, pistil; G, carpel; H, receptacle; I, achene, lateral and frontal view. Scale bar: A, B, 10 mm; C–E, G–I, 1 mm; F, 2 mm. Artist: John Manning.

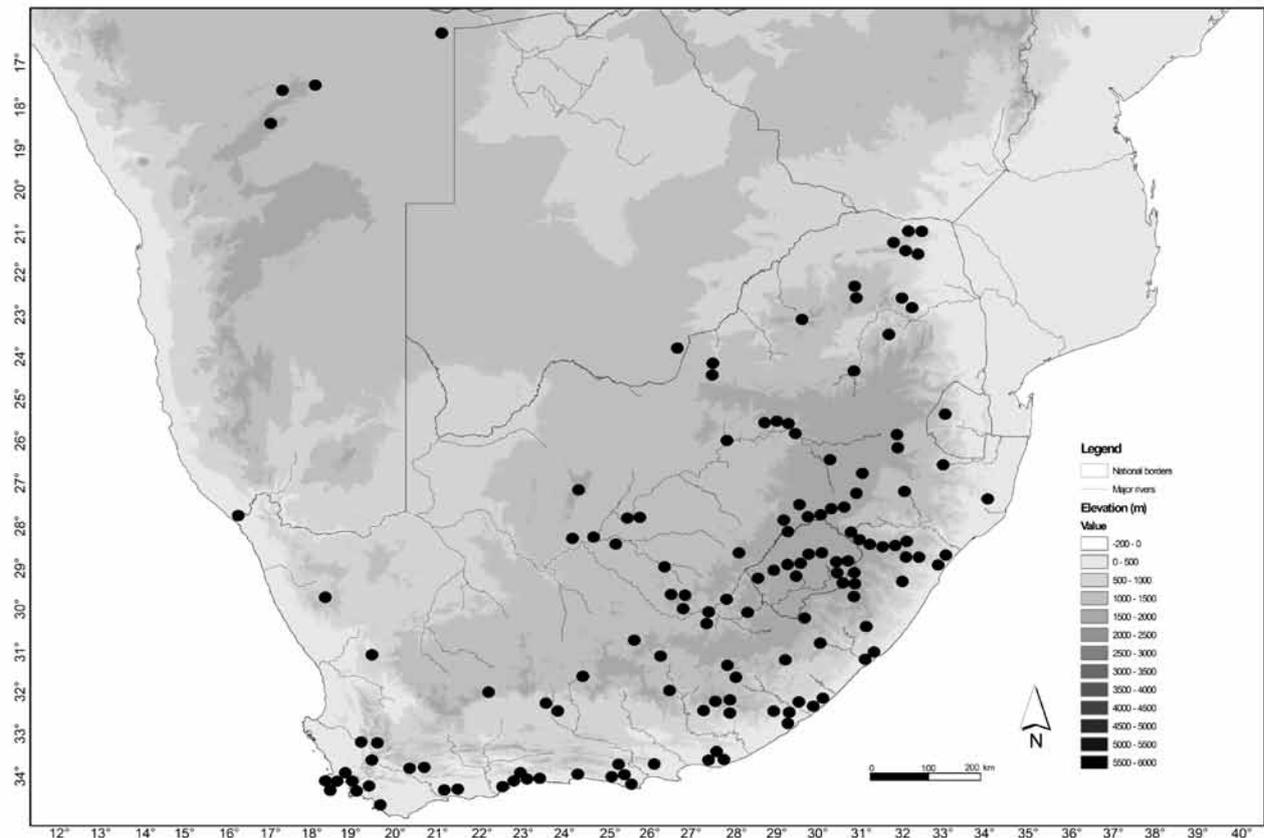


FIGURE 6.—Distribution of *Ranunculus multifidus* in southern Africa.

LIMPOPO.—**2229** (Waterpoort): N of Fogwells, (–DD), 23 Dec. 1935, *Smuts & Gillett 3162* (PRE). **2230** (Messina): Venda, Smokey Irrigation Scheme, Nzhelele (Dzanani), (–CB), *E. Netsgingane 632* (PRE); Schikunda-Milema, along Mutail River, (–DA), 7 Oct. 1981, *A. Van Wyk & G. Theron 4963* (PRE). **2329** (Polokwane): Pietersburg [Polokwane], (–CD), Feb. 1904, *H. Bolus 11035* (BOL). **2330** (Tzaneen): 5 km from Elim on road to Bandolierskop, (–AA), 6 Nov. 1985, *G. Germishuizen 2446* (PRE); Zoutpansberg, Tshakoma, (–AB), Nov. 1931, *A. Obermeyer 993* (PRE); Woodbush, (–CC), without date, *T. Jenkins 10450* (PRE). Woodbush, Pypkop, (–CC), 29 Dec. 1944, *A. Mogg 17449* (PRE). **2428** (Nylstroom): Naboomspruit, Mosdene, Nylsvlei, (–DA), 29 Oct. 1919, *E. Galpin 465* (PRE). **2429** (Zebediela): Potgietersrust, (–AA), 2 Nov. 1908, *R. Lendertz 6207* (PRE); Sekukuniland, Motoka, Farm Ironstone, (–DD), 9 Jan. 1939, *Mogg & Barnard 808* (PRE); Farm Schoonraad, along water furrows and vleis, (–DD), without date, *W. Barnard 14* (PRE).

NORTH-WEST.—**2526** (Zeerust): Zeerust, (–CA), Jan. 1912, *R. Pott 4186* (PRE); Marico Dist., Wonderfontein, (–CC), 18 Nov. 1907, *J. Burt-Davy 7239* (PRE). **2527** (Rustenburg): Beestkraal, (–AD), Dec. 1908, *T. Jenkins 6946* (PRE); Rustenburg, (–CA), Dec. 1918, *F. Rogers 22354* (PRE); Rustenburg Kloof, (–CA), 27 Dec. 1949, *M. Steyn 879* (NBG). **2625** (Delareyville): Mafeking Dist., Setlagoli, (–AC), 13 Nov. 1911, *J. Burt-Davy 11047* (PRE). **2626** (Klerksdorp): Klerksdorp, (–DC), Feb. 1918, *L. Kretschmar s.n.* (PRE). **2627** (Potchefstroom): Potchefstroom, (–CA), 21 Mar. 1910, *R. Leendertz 7993* (PRE); abandoned park near Mooivallei suburb, (–CA), 31 Oct. 2011, *D.M. Komape, L.I. Mabe & S.J. Siebert KMS125* (NBG); Klipdrift E of Potchefstroom, (–CB), 4 Jan. 1935, *J. Theron 1115* (PRE); Vereeniging, (–CB), 20 Feb. 1917, *J. Burt Davy 17164* (BOL). **2724** (Taung): Taung, Kaap Plateau, 1 200 m, riverine, (–DA), 16 Dec. 1977, *Peeters, Gericke & Burelli 448* (PRE). **2725** (Bloemhof): Wolmaransstad, Boskuil, (–BD), 9 July 1929, *J. Sutton 173* (PRE); Bultfontein, Oppermandrif Dam, 1 220 m, (–CB), 14 Dec. 1974, *T. O'Connor 88* (PRE); Christiana, (–CC), 22 Dec. 1911, *J. Burt-Davy s.n.* (PRE).

GAUTENG.—**2527** (Rustenburg): Hennops River, (–DD), 10 Nov. 1951, *L. Prosser 1628* (PRE). **2528** (Pretoria): Koedoespoort, (–CA), 19 Oct. 1905, *R. Leendertz 646* (BOL, PRE); Groenkloof Val-

ley, (–CA), 1 Nov. 1917, *I. Pole-Evans 167* (PRE); Fountains Valley, (–CA), 22 Oct. 1928, *I. Verdoorn 514* (PRE); Muckleneuk, (–CA), 10 Oct. 1930, *A. Goossens 27* (PRE); Colbyn Nature Reserve, (–CA), 14 Nov. 2000, *J. Meyer 3084* (PRE); Pretoria, Silverton, Moreleta River, (–CB), 6 Nov. 1980, *A. Balsinhas 3494* (PRE). **2627** (Potchefstroom): Roodepoort, Botanic Garden, (–BB), 19 Nov. 1982, *C.M. Behr 149* (NBG); Vereeniging, Leeuwkuil Pasture Research Station, (–DB), 5 Nov. 1935, *R. Story 44* (PRE). **2628** (Johannesburg): near Kempton, (–AA), Nov. 1926, *C. Smith 3505* (PRE); Crown Mines, (–AA), 14 Nov. 1961, *A. Lucas 35242* (PRE). Without exact locality: Johannesburg, Dec. 1908, *R. Leendertz 6856* (PRE).

MPUMALANGA.—**2430** (Pilgrims Rest): Shiluvane, (–AB), without date, *H. Junod 25202* (PRE); Mount Sheba, damp forest floor along streamlet, 6400' [1 900 m], (–DC), 29 Nov. 1980, *J.P. Kluge 2319* (NBG, PRE). **2431** (Acornhoek): near river at Skukuza, (–DC), Nov. 1833, *E. Cholmondeley s.n.* (PRE). **2529** (Witbank): Middelburg, Doornkop, (–CB), 23 Oct. 1968, *C. du plessis 819* (PRE). **2530** (Lydenburg): Spekboom River, 4 mi [6.4 km] N of Lydenburg, stream bank, (–AB), 19 Nov. 1933, *R. Young 464* (PRE); Dullstroom, (–AC), 27 Nov. 1980, *B. Drews 175* (PRE); 16 Nov. 1984, *H. Cameron 390* (PRE); Schoemann's Kloof, (–AD), 14 Nov. 1933, *R. Young 319* (PRE); Mt Anderson, W of Anderson Pass, (–BA), 25 Dec. 1932, *Smuts & Gillett 2447* (PRE); Schagen, (–BD), Dec. 1934, *L. Liebenberg 3279* (PRE); Rosehaugh, (–BD), 10 Jan. 1938, *A. Mogg 13670* (PRE); Witklip, in vlei, (–BD), 3 Jan. 1974, *J. Kluge 405* (PRE); 15.5 mi [25 km] N of Belfast, (–CA), 16 Dec. 1956, *L. Prosser 2035* (PRE). **2531** (Komatiport): Barberton, Plaston, (–AC), Nov. 1931, *W. Holt 123* (PRE); Moodies, (–CC), Sept./Oct. 1889, *E. Galpin 587* (PRE); Barberton, (–CC), Nov. 1909, *A. Williams 10446* (PRE). **2629** (Bethal): Bethal, (–AD), Dec. 1910, *R. Pott s.n.* (BOL); Ermelo, (–DB), 18 Dec. 1949, *M. Steyn 848* (NBG). **2630** (Carolina): Ermelo, (–CD), 2 Nov. 1926, *M. Henrici 111* (PRE). **2729** (Volksrust): Volksrust, (–BD), Jan. 1911, *T. Jenkins 10687* (PRE). **2730** (Vryheid): Utrecht, (–AB), Dec. 1915, *A. Wahl 15387* (PRE); Wakkerstroom, (–AB), 20 Nov. 1926, *Watt & Brandwijk 1617* (PRE).

FREE STATE.—**2627** (Potchefstroom): Sasolburg, 1 463 m, (–DD), 14 Oct. 1977, *N. Kroon 43* (PRE). **2727** (Kroonstad): Hillbrow,

(-BD), 21 Jan. 1931, *A. Goossens 492* (PRE); Kroonstad, (-CA), without date, *D. Chennells 81* (BOL); Kroonstad, near Vals River and Bloemspuit, (-CA), Oct.-Nov. 1927, *J. Pont 201* (PRE). **2728** (Frankfort): Farm Rietspruit, 29 km from Frankfort on road to Vrede, (-BC), 28 Jan. 1983, *E. Retief 1095* (PRE). **2828** (Bethlehem): Bethlehem, (-AB), 3 Dec. 1919, *E. Phillips 3080* (GRA, PRE); Fouriesburg, (-CA), 8 Jan. 1918, *G. Potts 3245* (PRE); Golden Gate National Park, Oshoek, (-DA), 10 Dec. 1988, *Gertenbach & Groenewald 8838* (PRE); Witzieshoek, (-DB), Oct. 1909, *J. Thode s.n.* (PRE). **2829** (Harrismith): Harrismith Botanic Garden, 1 880 m, (-AC), 30 Oct. 1970, *A. van der Zeyde 459* (NBG); small dam E of garden estate, (-AC), 2 Dec. 1974, *A. van der Laarse s.n.* (NBG); Van Reenen's Pass, (-AD), 13 Dec. 1931, *M. van Wyk 107* (PRE); Swinburne, (-AD), Nov. 1961, *M. Jacobsz 20* (PRE). **2925** (Jagersfontein): Fauresmith, (-CB), 25 Nov. 1931, *I. Verdoorn 910* (PRE). **2926** (Bloemfontein): Winter valley, N of Bloemfontein, (-AA), 8 Oct. 1968, *D. Muller 339* (PRE). **2927** (Maseru): Thaba Nchu, 1 650 m, (-AA), 12 Dec. 1977, *Peeters, Gericke & Burelli 319* (PRE). **3025** (Colesberg): Phillipolis Road Station, (-AB), 5 Jan. 1928, *C. Smith 5219* (PRE); Trompsberg, Rietpoort Noord, (-BA), 30 Oct. 1943, *P. Kies 269* (PRE); Colesberg, (-DA), 13 Dec. 1971, *Anderson 210* (PRE). **3026** (Aliwal North): Haasfontein Farm, 40 km W of Smithfield, (-AC), 24 Jan. 1990, *T. Saaiman 555* (PRE); Cliftonvale Farm ± 12 km SE of Bethulie, 1 280 m, (-CA), 18 Dec. 1983, *H. Burrows 2219* (PRE); Bergplaas Farm ± 12 km SE of Bethulie, 1 280 m, damp places near stream, (-CA), 21 Apr. 1984, *H. Burrows 2401* (PRE). **3027** (Lady Grey): Zastron, (-AC), Apr. 1926, *J. Maree 62* (PRE).

SWAZILAND.—**2631** (Mbabane): Mbabane, Poliniane River, (-AC), 11 Oct. 1963, *B. Dlamini s.n.* (PRE).

KWAZULU-NATAL.—**2731** (Ubombo): Mkuzi, 150' [46 m], (-CA), 4 Sept. 1932, *E. Galpin 13329* (PRE). **2828** (Bethlehem): Tugela Valley, Natal National Park, (-DB), 26 Aug. 1950, *B.E. Martin 467* (NBG). **2829** (Harrismith): Fort Mistake, (-BB), 25 Oct. 1977, *H. Nicolson 1793* (PRE). **2830** (Dundee): Dundee, (-AB), 21 Mar. 1926, *D. Gordon Truscott 52* (PRE). **2832** (Mtubatuba): Hluhluwe Game Reserve, (-AA), 31 Oct. 1961, *P. Hitchins 117* (PRE). **2929** (Underburg): Bergville, (-AB), 16 Dec. 1928, *E. Galpin 10791* (PRE); 20 Oct. 1950, *D. Killick 1052* (PRE); Tabamhlope, (-BA), 9 Dec. 1937, *O. West 481* (PRE); Estcourt, 5000' [1 500 m], (-BB), 26 Nov. 1937, *O. West 445* (BOL, GRA); Biggarsberg, (-BD), 12 Oct. 1990, *W. Vos 141* (PRE); top of Sani Pass, 9500' [2 900 m], (-CB), 6 Nov. 1973, *O. Hilliard & B. Burt 7105* (PRE); Underburg, (-CD), Mar. 1938, *A. McClean 737* (PRE); Giant's Castle, (-DD), Nov. 1914, *R. Symons 157* (PRE). **2930** (Pietemarienburg): Mooi River, (-AA), 1 Nov. 1918, *A. Mogg 3195* (PRE); Pietemarienburg, Town Hill, (-CA), 20 Oct. 1952, *R.H. Compton 23725* (NBG); Taylor's Halt, (-CB), 19 Oct. 1939, *A.R. Fairall 54* (PRE). **2931** (Stanger): Umhloti, (-CA), 14 Mar. 1927, *C. Musil 80* (PRE); Durban, (-CC), Aug. 1883, *J. Medley Wood 36* (BOL, PRE). **3030** (Port Shepstone): Ixopo, (-AA), 7 Oct. 1918, *A. Mogg 2319* (PRE).

LESOTHO.—**2828** (Bethlehem): Leribe, (-CC), without date, *A. Dieterlen 141* (PRE). **2927** (Maseru): Mafeteng, (-CD), 9 Aug. 1926, *Watt & Brandwijk 1226* (PRE); Morija, 5500' [1 700 m], (-DA), April 1919, *M. Page s.n.* (BOL). **2928** (Marakabei): Mamalapi, (-AC), 27 Dec. 1948, *A. Jacot Guillarmod 648* (GRA, PRE); Ntibokho Valey, (-AD), 2 Jan. 1947, *A. Jacot Guillarmod 301* (PRE); Senqunyane River near Marakabei, (-CA), 24 Nov. 1997, *C. Boucher 6199* (PRE); Cheche's Pass, 2 500 m, common in bog, (-CB), 30 Nov. 1977, *D. Killick 4243* (PRE); Sehlabathebe, (-CC), *Jacot Guillarmod, Gelliffe & Mzamane 212* (GRA, PRE). **2929** (Underburg): Mokhotlong, (-AC), Jan. 1953, *L. Liebenberg 5753* (PRE); Sani Valley, 2 740 m, abundant in sponges, (-CB), 14 Jan. 1977, *D. Killick 4112* (PRE).

NORTHERN CAPE.—**2816** (Oranjemund): S bank of Orange River 1.5 km from coast, (-CB), 12 Sept. 1984, *O'Callaghan & Van Wyk 51* (NBG, PRE). **2823** (Griekwastad): Danielskuil, (-BA), 24 Mar. 1939, *G.J. Lewis 434* (SAM); Griquatown Commonage, 4100' [1 250 m], (-CC), moist calcareous ground around spring, 22 Jan. 1960, *O. Leistner 1623* (BOL); banks of Riet River near Blaauwkrantz, (-DD), 10 Oct. 1935, *A. Hafström 887* (PRE). **2824** (Kimberley): Barkly West, Holpan, (-DA), 7 May 1936, *J. Acocks 373* (PRE); Kimberley, along Vaal River, (-DB), Dec. 1885, *R. Marloth 820* (PRE); Riverton, (-DB), Oct. 1918, *J. Moran 19230* (PRE). **2924** (Hopetown): Modder River, (-BA), 4 Aug. 1908, *H.H.W. Pearson 1655* (NBG, SAM); Modder River at Ritchie, (-BA), 13 Feb. 1926, *C. Smith 2353* (PRE). **3018** (Kamiesberg): Kamiesberg, stream bank ± 10 km N of Leliefontein, (-AC), 4 Nov. 1982, *P. Goldblatt 6681* (MO, NBG), *Rourke 1789* (NBG). **3024** (De Aar): Colesberg, Doornkloof Nature Reserve,

(-BD), 10 Nov. 1982, *A. Hahndiek 83* (GRA). **3025** (Colesberg): near Colesberg, (-CA), Nov. 1939, *C. Thorne s.n. SAM54456* (SAM). **3026** (Aliwal North): Burgersdorp, (-CD), 1892, *H. Flanagan 1539* (PRE). **3119** (Calvinia): Oorlogskloof Nature Reserve, 578 m, (-AC), 8 Oct. 2000, *W.A.J. Pretorius 609* (NBG). **3124** (Hanover): Vlakplaats [Vlakplaas], (-BA), Oct. 1914, *H. Bolus 13766* (BOL). **3125** (Steynsburg): Middelburg Dist., Grootfontein Farm, (-AC), 20 Feb. 1947, *G. Theron 177* (PRE).

WESTERN CAPE.—**3123** (Victoria West): Murraysburg, (-DC), Sept. 1879, *W. Tyson 90* (SAM); July 1954, *D.M. van Heerden s.n.* (NBG). **3221** (Merweville): Nuweveldberg, ± 60 km S of Fraserburg, Bok se Plaas, seepages, 1 620 m, (-BA), 26 Feb. 1986, *Moffett & Steensma 3983* (NBG). **3222** (Beaufort West): foot of Nuweveld Mtns, along stream, 1 000m, (-BD), 15 Feb. 1978, *Gibbs Russell, Robinson, Herman & Downing 238* (PRE). **3318** (Cape Town): Green Point flats, (-CD), Aug. 1887, *J. Thode s.n. SAM9260* (SAM); Devil's Peak, E Buttress, (-CD), 5 Jan. 1978, *B. Durand 344* (NBG); Devil's Peak, (-CD), 26 Sept. 2004, *F. Forest, P. Goldblatt, L. Porter & I. Nänni 600* (NBG); above Camp's Bay, (-CD), 28 Oct. 1943, *R. Adamson 3537* (BOL); Orange Kloof, (-CD), 24 Oct. 2000, *C.N. Cupido 91* (NBG); Fisantekraal, Mosselbank River floodplain, 69 m, (-DA), 29 Oct. 2008, *C. Boucher 7567* (NBG); field by Maitland, (-DC), 2 Oct. 1897, *Wolley Dod 3163* (BOL); Jonkershoek, Biesiesvlei, 1100' [340 m], (-DD), 10 Sept. 1945, *H.B. Rycroft 908* (NBG); Assegai-bosch, by damme, (-DD), Oct. 1969, *C. van der Merwe 1241* (PRE). **3319** (Worcester): Tulbagh, Grootwinterhoek, Sneeuat Valley, (-AA), Nov. 1916, *E.P. Phillips 1699* (SAM); Ceres, Baviansberg, 5000' [1 500 m], (-BA), 2 Jan. 1942, *R.H. Compton 12861* (NBG); Botha, below dam near Groenrivier, (-CB), 26 Jan. 1982, *I.B. Walters 2526* (NBG); Franschoek, (-CD), 30 Oct. 1913, *E.P. Phillips 8266* (SAM). **3320** (Montagu): Montagu-Barrydale Rd, (-CC), Sept. 1923, *M. Levyns 530* (BOL); Tradouw Pass, river bank at old farm, (-DC), 28 Jan. 1969, *J. Marsh 1124* (NBG). **3322** (Oudshoorn): Wildernesse, (-DC), 3 Nov. 1929, *A. Mogg 11623* (PRE); Knysna Dist., Karatora Village, (-DD), Dec. 1922, *J. Keet 1164* (PRE). **3418** (Simonstown): Raapenberg Vlei, (-AB), 10 Nov. 1897, *A. Wolley Dod 3612* (BOL); Raapenberg, (-AB), 1898, *Guthrie 423* (BOL); Mowbray, garden weed, (-AB), 20 Dec. 2012, *J. Manning 3405* (NBG); stream between Retreat and Muizenburg vlei, (-AB), 14 Nov. 1897, *Wolley Dod 3689* (BOL); Table Mt slopes N of Kirstenbosch, (-AB), 12 Sept. 1928, *J.B. Gillett 396* (NBG); Rondebosch, (-AB), Nov. 1885, *H. Bolus 7020* (BOL); Rondebosch, University grounds, (-AB), 12 Oct. 1931, *M. Levyns 3452* (BOL); Constantia, (-AB), 3 Nov. 2011, *Ramjukadh C-LR103* (NBG); Constantiaberg, shade of forest, (-AB), 8 Mar. 1940, *R.H. Compton 8560* (BOL); Buffels Bay, damp places, (-AD), 23 Aug. 1943, *R.H. Compton 14668* (NBG, PRE); Somerset West, (-DA), 20 Nov. 1947, *R.N. Parker s.n.* (BOL). **3419** (Caledon): Kleinmond, bank of vlei, (-AC), 15 Oct. 1949, *M.P. de Vos 1492* (NBG); Oudebos, Riviersonderend, (-BA), Dec. 1928, *C. Thorne s.n. SAM45749* (SAM); Gansbaai, Baviansfontein, (-CA), Aug. 1940, *T.P. Stokoe 7603* (BOL). **3420** (Bredasdorp): Heidelberg, Grootvadersbosch, ground layer in moist or wet forest, (-BB), 6 Dec. 1953, *B. Maguire 1037a* (NBG); Bredasdorp, Nachtwacht, (-CA), Nov. 1926, *C. Smith 3048* (PRE). **3421** (Riversdale): 8 mi [13 km], W of Riversdale, (-AA), 7 Oct. 1928, *J.B. Gillett 1165* (NBG); bank of Kafferkuilsrivier, 80 m, (-AD), 22 Dec. 1980, *P. Bohnen 7785* (NBG, PRE). **3423** (Knysna): Brenton, shady places, (-AA), 5 Jan. 1922, *A. Duthie 722* (NBG). **3423** (Knysna): Keurbooms River Bridge, disused forest track, (-AB), 27 Sept. 1967, *J.H. Marsh 619* (NBG, PRE).

EASTERN CAPE.—**3026** (Aliwal North): Elandshoek, (-CC), Oct. 1903, *H. Bolus 152* (BOL). **3028** (Matatiele): Rhodes Dist., Naude's Nek, 2 610 m, (-CB), 11 Dec. 1999, *M. Mthogoane 185* (PRE). **3029** (Kokstad): Kokstad, Palmiet, (-AB), 21 Jan. 1957, *L.E. Taylor 5524* (NBG); between Flagstaff and Kokstad, (-CB), 4 Dec. 1928, *J. Hutchinson 1789* (PRE); Fort Donald, (-DC), forest, summer 1915, *Sr. Stephany 635* (BOL). **3126** (Queenstown): Sterkstroom, Penhoek, (-BC), 21 Dec. 1942, *W.F. Barker 2139* (NBG); Queenstown, river banks, (-DD), Oct. 1895, *E. Galpin 1937* (PRE); Andriesberg, (-DD), Dec. 1896, *E. Galpin 2223* (GRA, PRE). **3127** (Lady Frere): 25 km from Cala tunoff on Engcobo road, (-DB), 12 Jan. 1997, *C. Bredenkamp 1149* (PRE). **3128** (Umtata): Baziya, (-BB), without date, *R. Baur 277* (SAM). **3129** (Port St Johns): Goss Point, bog, (-BD), 10 Nov. 1970, *R. Strey 10146* (PRE); Port St Johns, (-DA), Oct. 1909, *H. Swinny & F. Baker 25124* (PRE). **3223** (Rietbron): Richmond Dist., Vlakplaats, (-CA), Oct. 1914, *H. Bolus 15292* (PRE). **3225** (Somerset East): 21 mi [34 km], W of Cradock, Chalmers, (-AB), 2 Dec. 1950, *S.M. Johnson 691* (BOL), *B. Maguire 691* (NBG); Mountain Zebra National Park, (-AD), 12 Dec. 2005, *S. Bester 6319* (GRA). **3226**

(Fort Beaufort): Katberg, (–BC), *Drège 10/1132* (BOL); Buffelshoek Nek on road to Cradock, (–CA), 27 Oct. 1945, *R. Story 82* (PRE); Hogsback, (–DB), Jan. 1919, *G. Ratray 15736* (BOL); Hogsback Forest Reserve, ± 800 m, (–DB), 25 Nov. 1969, *K. Dahlstrand 1832* (GRA, NBG); University of Fort Hare, Sandile's Kop, (–DD), 5 Nov. 1936, *M. Giffen 592* (PRE). **3227** (Stutterheim): Dohne Research Station, (–CB), 23 Oct. 1942, *J. Acocks 9228* (PRE); grassy valleys near Komgha, (–DB), Nov. 1891, *H. Flanagan 1109* (BOL, GRA, PRE); East London, (–DD), 1888, *J. Thode s.n.* (PRE); East London, damp places, (–DB), Aug. 1963, *A. Batten 4-Pl. 98* (NBG). **3228** (Butterworth): near Butterworth, (–AC), 26 Nov. 1945, *R.H. Compton 17705* (NBG); Qora River Mouth near Mazeppa Bay, (–BC), without date, *C. Hilner 419* (PRE); Dwessa Nature Reserve, (–BD), 24 Nov. 1978, *H. Linder 1890* (PRE); Morgan's Bay, (–CB), 17 Jan. 1951, *A.M. Wilman 1084* (BOL, PRE). **3323** (Willowmore): Deepwalls, (–CC), 1924, *J. Phillips s.n.* (GRA, PRE); Gouna, Lilyvlei Nature Reserve, ± 1000' [300m], (–CC), 19 Oct. 1971, *H.C. Taylor 8000* (NBG); Lilyvleibush, wet places, (–CC), 22 Nov. 1977, *C.J. Geldenhuys 413* (NBG); Kny-sna, forest near Blaauwkranz River, (–DC), 20 Oct. 1959, *T.M. Wurts 2007* (NBG). **3324** (Steytlerville): Bavianskloof 3 km from Geelhoutbos, (–CB), 23 Sept. 2004, *P. Goldblatt & L.J. Porter 12537* (MO, NBG); E of Gamtoos River drift, (–CD), (BOL). **3325** (Port Elizabeth): Winterhoek Mtns, (–CA), 12 Sept. 1930, *C. Fires, T. Norlindh & H. Weimarck 790* (GRA, PRE); Walmer, (–DC), Oct. 1909, *T. Paterson 817* (GRA). **3326** (Grahamstown): Belmont Valley, near Clarke's Farm, (–BC), 13 Sept. 1961, *M. Wells 2802* (GRA, PRE); Alexandria Forest, Forester's Cottage, (–CB), 9 Dec. 1953, *S. Johnson 831* (PRE); top end of Howieson's Poort, (–DA), swampy place, 28 Feb. 1932, *J. & B. Rennie 577* (BOL); Kowie Dist., road to Three Sisters, (–DB), 25 Sept. 1918, *L. Britten 730* (PRE). **3424** (Humansdorp): Oudebos Flats, (–AA), Oct. 1920, *H. Fourcade 959* (BOL); Tsitsikamma Strand, (–AA), 30 Jan. 1982, *H. Venter 8653* (PRE); Clarkson, (–AB), Oct. 1926, *Thode 737* (PRE).

Sect. *Hecatonia* (Lour.) DC. in *Prodromus systematis naturalis regni vegetabilis* 1: 30 (1824).

3. *Ranunculus dregei* J.C.Manning & Goldblatt, nom. nov. pro *Ranunculus meyeri* Harv. in Harvey & Sonder in *Flora capensis* 1: 7 (1860), hom. illegit., non Lowe: 74 (1857), nom illegit. superfl. pro *R. grandifolius* E.Mey. in Ledebour (1830); Cook: 240 (2004). Type: South Africa, [Eastern Cape], 'Katberg', Nov. [1832], *Drège s.n.* (K [K000076101]—Aluka image!, lecto., designated here; BM, K, P, PRE, TCD, iso.—Aluka images!). [Harvey cited duplicates at K and TCD in the protologue and we select the K specimen as lecto-type as being the more complete. This specimen has the collecting date 1838 inscribed on it but this is impossible as Drège left South Africa in 1834. Drège collections of the species in P are dated 9 Nov. 1832, which corresponds with the date of his arrival at the Katberg Pass on 12 November 1832 (Glen & Germishuizen 2010) and this evidently represents the true collection date.]

*R. meyeri* var. *transvaalensis* Szyszyl.: 102 (1887). Type: South Africa, [Gauteng], 'Hohes feld prope Henopsriver', *Rehmann* (?Z, holo., not located). [fide Exell & Milne-Redhead (1960)].

[*R. meyeri* var. *rogersii* Burt Davy nom. nud. in Burt Davy: 109 (1926). Specimen: *Rogers 19591* (Herb. Rogers)].

[*Ficaria radicans* E.Mey. nom. nud. in Drège: 184 (1843–1844). Specimen: *Drège s.n.* (K000076101, TCD0001712)].

[*Ranunculus volkensii* var. *meyeri* (Harv.) T.Duncan ms. on *Dieterlen s.n.* (BM 0005615516)]

Prostrate, mat-forming, perennial; stems condensed, corm-like, covered with fibrous remains of old leaf

sheaths, producing creeping runners rooting at nodes, runners glabrous, 0.5–1.5(–2.0) mm diam., internodes 10–140 mm long. *Roots* few, thong-like. *Leaves* all basal, in distant tufts of 2–5 along runners, petiole (5–)10–100(–200) mm long with stipules adnate and sheathing for 2–10 mm, glabrous or thinly villous with hairs to 1 mm long, blade ovate to cordate or reniform, (2–)5–20(–25) mm diam., weakly or strongly 4–12(–16)-crenate or dentate (rarely ± entire), with reddish callus at the tip of each serration, leathery, glabrous but usually with scattered hairs on margins, or adpressed-pilose adaxially. *Flowers* solitary at nodes, (5–)8–14 mm diam.; peduncle naked, scapose, ± as long as leaves, (5–)10–60 mm long, 0.5–1.0 mm diam. *Sepals* 5, weakly to strongly reflexed, ovate to suborbicular, cucullate, (2–)3–4 mm long, glabrous, yellowish. *Petals* 5–10, linear-lanceolate or ligulate, (3–)4–7 × 1.0–1.5 mm, pale yellow, narrowed into short claw in basal ± 1 mm, acute or attenuate, veins 3, unbranched, nectary pocket-like with acute flap. *Stamens* 11–30 in ± 2 series, filaments 0.5–2.0 mm long, anthers ± 0.5 mm long. *Carpels* 6–20(–30), glabrous. *Achenes* in subglobose head, broadly ellipsoid, ± 2 × 1.5 mm, smooth, keeled, shortly beaked; receptacle glabrous. *Flowering time*: Nov.–Jan. (–Mar.). Figure 7.

*Distribution and ecology*: distributed mainly along the eastern escarpment, from Gaika's Kop in the Amatola Mtns in Eastern Cape through KwaZulu-Natal and Lesotho to Standerton and Vaalbank in Mpumalanga and the Leolo Mountains in Limpopo (Figure 4), extending north of South Africa into the eastern highlands of Zimbabwe and Mozambique (Exell & Milne-Redhead 1960), with a remarkable southern outlying station near the summit of the Swartberg Mtns in Western Cape. Although there are early records further inland, from Parys in the Free State, Pretoria and Johannesburg in Gauteng, and Potchefstroom in North-West, the species has not been collected there since the first half of the twentieth century and is presumably extinct here.

*Ranunculus dregei* restricted to peaty seeps or boggy places at higher altitudes, 1 500–3 000m, where it forms mats in open spaces.

*Diagnosis*: a distinctive species, readily recognised by its dwarf, creeping habit, simple leaves with solitary flower per leaf tuft, and narrow, ligulate petals with unbranched veins.

The species was first recorded from north of the Limpopo River Valley, in the highlands of Mozambique and Zimbabwe, in 1956 (Exell & Milne-Redhead 1960) and annotations on some herbarium specimens by T. Duncan indicate an intention to reduce it to a variety of the tropical African *Ranunculus volkensii* Engl. Although the two taxa are similar in habit, *R. volkensii* has noticeably thicker stolons, ± 2–3 mm diam., often lanceolate leaves, and more critically, obovate petals with branching venation, quite unlike the ligulate, 3-nerved petals of *R. dregei*. It also has mostly ± twice as many carpels as *R. dregei*.

*History*: first collected in Eastern Cape by J.F. Drège (1794–1881) sometime in the early summer of 1832, the specimens themselves are not localised, *Ranunculus dregei* was listed as being collected on the Katberg

in Drège's *Zwei pflanzengeographische Documente*. These collections were annotated with the manuscript name *Ficaria radicans* by Ernst Meyer, who contributed the botanical text to the *Documente*, but the species was only formally described by Harvey (1860), who named it after Meyer. Harvey (1860) unfortunately overlooked the fact that the name *R. meyeri* had already been proposed by R.T. Lowe (1857) as a replacement name for the East-Central Asian *R. grandifolius* E.Mey. (1830) under the misapprehension that the latter was synchronous with his *R. grandifolius* Lowe (1831) from Madeira. In fact it is *R. grandifolius* Lowe that is the illegitimate later homonym and thus requires a new name, and *R. meyeri* Lowe becomes an illegitimate superfluous name for *R. grandifolius* E.Mey. This renders *R. meyeri* Harv. an illegitimate later homonym requiring a new name, for which we propose *R. dregei* in honour of the original collector of the species.

A collection by Anton Rehmann (1840–1917) from Hennopsrivier, west of Pretoria, with glabrous petioles was distinguished as var. *transvaalensis* by Szyszylowicz (1887), but the name was synonymised by Exell & Milne-Redhead (1960). We have been unable to trace the type specimen in the Schinz herbarium in Zurich (H.P. Linder, pers. com. 3 Jan. 2013) but have no reason to

question this decision. Other collections from Gauteng, viz. *Repton 3430* from Rietvlei Reserve near Pretoria and *Gilfillan 162* from near Johannesburg probably represent the same variant, being almost entirely glabrous, with scattered hairs only on the sheathing leaf bases.

#### Additional specimens seen

LIMPOPO.—**2430** (Pilgrim's Rest): Sekhukuniland, Leolo Mtns, 18 km from Schoonoord Police Station, (–CA), seepage area, (–CA), 4 Dec. 1999, *A.E van Wyk & S.J. Siebert 13459* (PRE).

NORTH-WEST.—**2627** (Potchefstroom): Potchefstroom, common in marshes bordering Mooi River, (–CA), 26 Dec. 1903, *J. Burt Davy 1029* (BOL, PRE); Gerhardusminnebron Eye, (–CA), 26 Oct. 1946, *W. Louw 1520* (PRE).

GAUTENG.—**2528** (Pretoria): Rietvlei Reserve, (–CA), 4 Oct. 1947, *J. Repton 3430* (PRE). **2628** (Johannesburg): vleis near Johannesburg, (–AA), Nov./Dec. 1898, *D. Gilfillan 162* (GRA, PRE).

MPUMALANGA.—**2529** (Witbank): Middelburg, Wonderhoek, pond borders, (–CD), 15 Nov. 1922, *H. Rudatis 2647* (PRE); Vaalbank, between Middelburg and Pretoria, (–CD), 4500' [1 400 m], Sept. 1886, *H. Bolus 7639* (BOL). **2530** (Lydenburg): 15 km from Belfast on road to Dullstroom, Farm Pineglades, along dam, 2 000m, (–CA), 17 Apr. 1981, *L. du Toit 333* (PRE). **2629** (Bethal): Standerton, (–CD), 16 Oct. 1893, *R. Schlechter 3469* (BOL, GRA, PRE). **2630** (Carolina): Carolina, (–AA), 20 Oct. 1932, *E. Galpin s.n.* (BOL); Ermelo, Spitskop, (–CB), Dec. 1915, *R. Pott-Leendertz s.n.* (PRE). **2730** (Vryheid): Wakkerstroom, 6200' [1 900 m], (–AD), Nov. 1916, *H.W. Beeton 35*

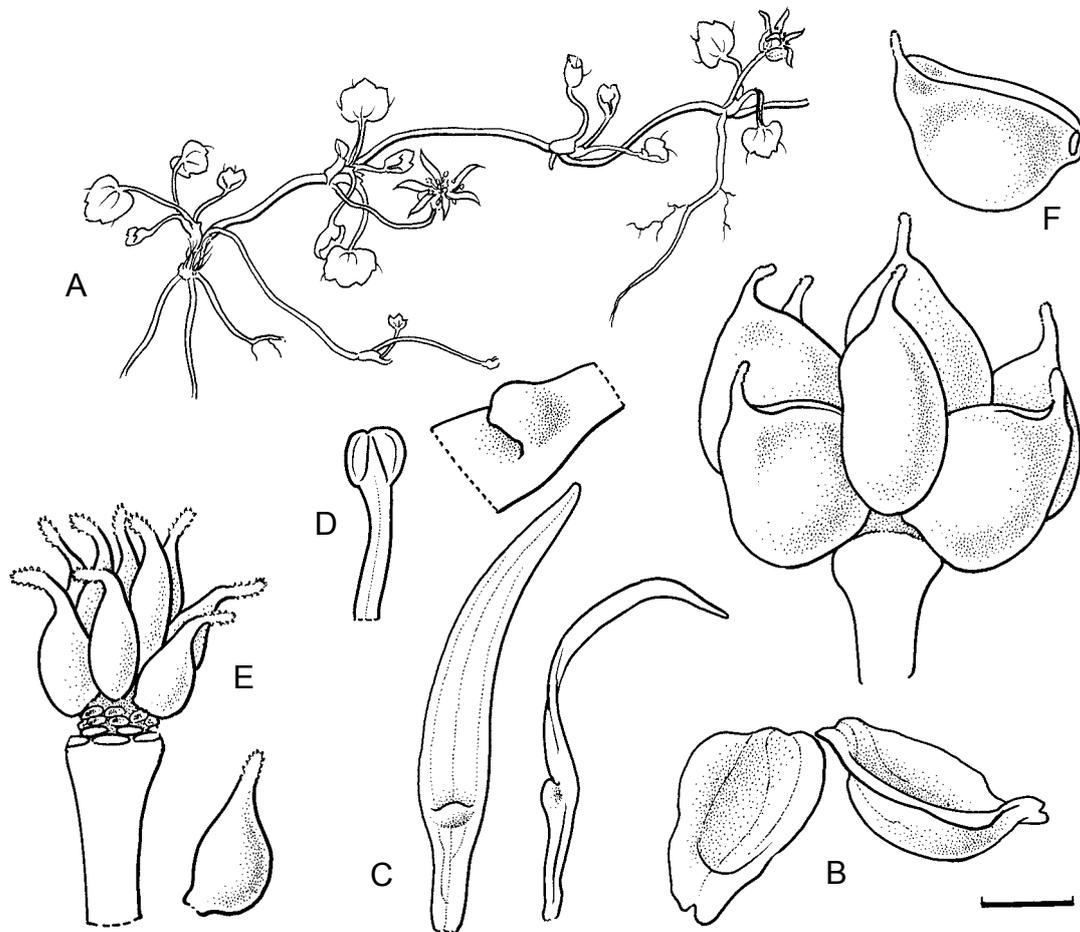


FIGURE 7.—*Ranunculus dregei*, Naude's Nek, no voucher. A, flowering plant; B, two sepals; C, petal, dorsal and lateral view; D, stamen; E, pistil and detached carpel; F, fruit and detached achene. Scale bar: A, 10 mm; B, C, E, F, 1 mm; D, 0.5 mm. Artist: John Manning.

(SAM); Pongola Bush Nature Reserve, vlei in stream, 1 400m, (–BC), 9 Oct. 1990, *H. Glen 2360* (PRE).

FREE STATE.—**2828** (Bethlehem): Bestersvlei, near Wotzieshoek, (–BD), 1893, *H. Flanagan 2093* (PRE). **2925** (Jagersfontein): Parys, (–CC), 20 Oct. 1906, *F. Rogers 5074* (PRE).

KWAZULU-NATAL.—**2729** (Volksrust): Charlestown, (–DB), 6 Dec. 1892, *J. Medley-Wood 4690* (PRE). **2929** (Underberg): Estcourt, Ntabamhlope Pasture Reserve, vlei, (–BA), 9 Nov. 1939, *O. West 1513* (PRE); Mooi River, (–BB), 26 Oct. 1918, *A. Mogg 3203* (PRE); Polela, near Underberg, in stream, (–CB), 6 Dec. 1935, *R.A. Dyer 3289* (PRE); 13 mi. [21 km] from Dargle to Mpendhle, vlei, (–DB), 26 Feb. 1964, *E.J. Moll 673* (PRE); Underberg, Watermead Farm, (–DB), 23 Sept. 1989, *R. Williams 333* (PRE).

LESOTHO.—**2828** (Bethlehem): Leribe, (–CC), 5–6000' [1 500–1 800 m], Feb. 1913, *E.P. Phillips 786* (SAM); Butha-Buthe, 9 500' [2 900 m], (–CD), 2 Feb. 1954, *B. Maguire 399* (NBG). **2928** (Marakarei): Little Bokong at Mosalamane Pass crossing, (–AA), 22 Dec. 1946, *A. Jacot-Guillarmod 99* (GRA, PRE); headwaters of Bakong River, wet fen, (–AB), 14 Jan. 1996, *P. Phillipson 4645* (GRA); Mamalapi, (–AC), 28 Dec. 1948, *G.D. Morris 21429* (NBG); Mamathes, (–BB), 14 Nov. 1948, *A. Jacot-Guillarmod 389* (PRE). **2929** (Underberg): Mokhotlong, bog near Thabana Ntlenyana, (–AC), 20 Jan. 1955, *J. Coetzee 582* (PRE); 2 Feb. 1988, *C. Schwabe 13b* (PRE); Sehlabathebe, 2 300–2 500m, (–CC), 4–14 Jan. 1973, *Jacot-Guillarmod, Getliffe & Mzamane 255a* (GRA, PRE). *Imprecise locality*: 'Basutoland, swampy ground near Buffels River Waterfall', 15 Mar. 1904, *E.E. Galpin 6565* (BOL, GRA, SAM).

WESTERN CAPE.—**3322** (Oudshoorn): Swartberg, 8 miles W of top of Swartberg Pass, (–BC), 5000' [1 500 m], 20 Nov. 1954, *T.P. Stokoe s.n. SAM70133* (SAM); Swartberg, marsh at head of stream E of pass, (–BC), 19 Jan. 1961, *E. Esterhuysen 28836* (BOL, PRE); upper slopes of Blesberg, (–BC), 5950' [1 800m], 15 Dec. 1986, *J.H.J. Vlok 1778* (NBG).

EASTERN CAPE.—**3027** (Lady Grey): Witteberg, Beddgelert, (–DA), 2 Dec. 1981, *O. Hilliard & B. Burt 14631* (PRE); S slopes of Ben MacDhui Mtn, Tiffendell Ski resort, 2 730 m, (–DB), 6 Jan. 1997 [fruiting], *T. Dold 3483* (GRA). **3028** (Matatiele): Barkly East, 3 km SE of Cairmtoul Police Hut, wet places, (–CA), 19 Dec. 1982, *P. Phillipson 709* (PRE); Maclear, Woodcliffe Trails, riverine grassland, 2 300 m, (–CC), 15 Nov. 1992, *A. Abbott 5865* (PRE). **3126** (Queenstown): 19 km from Dordrecht to Queenstown, 1 311m, (–DB), 13 Jan. 1997, *G. Germishuizen 8915* (PRE). **3127** (Lady Frere): Dordrecht, 5300' [1 600 m], swampy ground, (–AD), Jan. 1899, *T.R. Sim s.n.* (SAM). **3225** (Somerset East): Boschberg, (–DA), Feb. without year, *MacOwan 1555* (BOL, GRA). **3226** (Fort Beaufort): summit of Great Winterberg, locally common in seeps on dolerite, 2 250 m, (–AD), 17 Feb 2013, *N.A. Helme 7715* (NBG); Katberg, Effingham, (–BC), 26 Dec. 1912, *E. Galpin 8337* (PRE); Hogsback, foot of Gaika's Kop (–DB), Jan. 1919, *G. Rattray s.n.* (BOL); Hogsback, Hunterstown, (–DB), 9 Apr. 1944, *M. Giffen s.n.* (PRE). **3227** (Stutterheim): Keiskammahoeck, Gxulu Mtn [Cata Peak], (–CA), 26 Jan. 1949, *R. Story 3734* (GRA); small river near Kologha Forest, (–CB), 28 Nov. 1956, *G. Theron 2126* (PRE).

Sect. *Batrachium* DC. in Regni vegetabilis systema naturale 1: 323 (1817).

4. *Ranunculus trichophyllus* Chaix in Villars: 335 (1786); Cook: 126 (1966). *Batrachium trichophyllus* (Chaix.) Bosch: 5 (1850); Eichler & Walsh: 312 (2007). Type: 'Frequentissimus in rivulis quietis, fossisque aqua plenis', *Haller 1162* (G, neo., designated by Lourteig (1951), not seen).

*R. drouetii* F.W.Schultz ex Godron: 10 (1842). Type: *Flora Galliae et Germaniae exsiccatae n. 404* (not seen).

[*R. aquatilis* sensu Harvey: 6 (1860), non L. (1753)]

[See Cook (1966) for additional synonyms.]

Submerged aquatic annual (?or perennial), rooted in water up to 500 mm deep; stems hollow, 2–3 mm diam., rooting at lower nodes. *Roots* fibrous. *Leaves* cauline, petiole 25–40 mm long with stipules adnate and forming oblong to ovate sheath 3–6 mm long, glabrous, blade globose or obconical in outline, 15–45 mm diam., repeatedly tri- or dichotomously divided into rigid or flaccid capillary segments spreading in three dimensions. *Flowers* solitary at nodes, emergent, (4–)8–15 mm diam.; peduncle naked, scapose, 10–50 mm long, 0.5–1.0 mm diam., usually recurved in fruit. *Sepals* 5, spreading, ovate, cucullate, 2.5–3.5 mm long, glabrous. *Petals* 5, obovate, (3.0)3.5–5.5(–6.0) × 2–5 mm, white with yellow claw, narrowed into short claw in basal ± 1 mm, obtuse or truncate, veins branched, nectary lunate. *Stamens* 9–15 in ± 2 series, filaments 1.0–1.5 mm long, anthers ± 0.75 mm long. *Carpels* 16–35, hispid. *Achenes* in subglobose head, ovoid to obovoid, not compressed, 1.20–1.50(–1.75) mm long, transversely rugose, mostly sparsely hispid subapically along lower keel, rarely glabrous, not beaked; receptacle densely hispid. *Flowering time*: dependent on rainfall and coinciding with the wet season, mainly Aug.–Sept. in the winter-rainfall zone and Oct.–Jan. in the summer rainfall zone. Figure 8.

*Distribution and ecology*: distributed widely through Eurasia and North Africa, North America, Australia, Tasmania, and southern (but not tropical) Africa, where it is recorded so far only from Lesotho and South Africa (Figure 9), and reportedly also Botswana (Cook 2004) but not Namibia (Craven 1999). In South Africa the species is scattered through the southern and eastern interior of the county along the Vaal/Orange Rivers and tributaries, and along the southern escarpment from Calvinia to Queenstown, with a few coastal stations in the southwestern and southern Cape around Velddrif, Cape Town, Bredasdorp and Uitenhage.

Plants grow submerged in freshwater seasonal pools and ponds and in slow, intermittent or perennial streams, furrows or irrigation ditches up to 50 cm deep, persisting only briefly along the muddy edges as the water dries up. It has been recorded from sea level to well over 2 000 m. In southern Africa *R. trichophyllus* has occasionally been regarded as troublesome in the past, viz. as a 'serious impediment in the irrigation canals' near Craddock in the 1950s [*Barnes s.n.* (GRA)].

The natural occurrence of the species in the Southern Hemisphere is worth closer examination given the large disjunction to Eurasia and North America. The early collection of the species in pristine habitats in Australia suggests that it is probably native there (Eichler & Walsh 2007), and similar considerations apply in southern Africa, where it was first documented (under the name *Ranunculus aquatilis* L.) in the early 1800s from the Eastern Cape, around Uitenhage and Graaff Reinet, by C.F. Ecklon (1795–1868), C.L. Zeyher (1799–1858) and I.L. Drège (1853–1921). Documentation of *R. trichophyllus* on the Cape Peninsula only dates from the end of the 19<sup>th</sup> century, which is unusually late for such a distinctive species.

*Diagnosis*: the only aquatic species in the subregion, distinguished at once by its habit, finely dissected leaves, white petals with yellow claws, and small, ovoid,

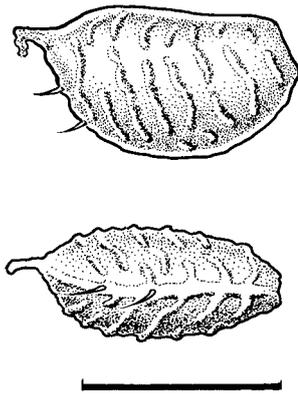


FIGURE 8.—*Ranunculus trichophyllus*, Kareehoutrivier, *Snijman 771* (NBG). Achene, lateral and dorsal view. Scale bar: 1 mm. Artist: John Manning.

transversely rugose achenes, usually with a few, scattered bristles along the lower keel below the remains of the style but sometimes glabrous or  $\pm$  densely bristly. The transverse folds on the mature achenes are due to the presence of styloid crystals in the carpel walls (Cook 1966).

**History:** The recent determination of the southern African material as *Ranunculus rionii* (Glen 2003; Winter 2006) follows the identifications of the southern African material by C.D.K. Cook (1966, 2004), a specialist in the taxonomy of *Ranunculus* sect. *Batrachium*. Prior to this, the South African collections had been identified as *R. trichophyllus* (Adamson 1950) or its synonym *R. drouetii* (Burt Davy 1926). The two species *R. rionii* and *R. trichophyllus* are sympatric in Europe and differ solely in the number and size of their achenes, with *R. rionii* characterised by smaller, more numerous achenes (Cook 1964, 1966, 1993; Pizarro 1995). The number of achenes per fruiting head ranges from 60–90 in *R. rionii* and from 16–35 in *R. trichophyllus* (Cook 1966). Dimensions for the achenes in *R. rionii* have been variously given as up to 1 mm long (Cook 1964, 1966, 1993) or 1.0–1.2 mm long (Pizarro 1995) and for *R. trichophyllus* as more than 2 mm long (Cook 1964), more than 1.5 mm long (Cook 1966, 1993), or 1.20–1.75 mm long (Pizarro 1995). *R. trichophyllus* is a very widespread species, occurring throughout Eurasia, including the Mediterranean Basin, North America and Australia, where it is probably also native, but *R. rionii* has a more restricted distribution in Central and Eastern Europe and the eastern Mediterranean into Asia Minor (Cook 1966).

The illustration of the fruiting head of *Ranunculus rionii* given by Cook (2004) in his guide to *Aquatic and wetland plants of southern Africa* certainly conforms to that species in its numerous achenes, as does the illustration of the individual achene, with a length of less than 1 mm, but the source of the original material for these drawings is not given. The majority of the southern African material that we have examined has fewer than 40 achenes per fruiting head, with individual mature achenes measuring 1.2–1.8 mm long, excluding the styler remnants (immature achenes are smaller), thus

consistent with *R. trichophyllus* and not *R. rionii*. Some specimens, however, including *Comins 800* (BOL) from Tarkastad and others from along the Vaal River, have heads of 40–60 achenes, each achene  $\pm$  1 mm long, thus potentially *R. rionii*. Although the difference between the two taxa in achene number and size as initially treated by Cook (1963) was absolute, the ranges of variation in the two characters have gradually converged (Cook 1966, 1993; Pizarro 1995) to the stage where it is difficult to assign ‘intermediate’ specimens. It may also be relevant here that *R. rionii* has been treated as conspecific with *R. trichophyllus* in the past at subspecific or varietal rank (Cook 1963). The size of the achenes may bear relation to the number of (developing) carpels, as seen in *Wilman 21494* (PRE), in which heads with over 40 ripened carpels have the individual achenes  $\pm$  1 mm long whereas those with few fertilised carpels have achenes  $\pm$  1.3 mm long. Significantly, no authors have as yet proposed that more than one aquatic species occurs in the subcontinent, although it is not impossible that there has been more than one introduction from Europe. The matter deserves attention but until then we adopt a conservative approach and provisionally treat all of the southern African material under the older name *R. trichophyllus*. This name has also been applied to the material from Ethiopia (Teketay & Edwards 2000).

#### *Additional specimens seen*

GAUTENG.—**2627** (Potchefstroom): Vereeniging, Vaal River, (–CB), Nov. 1911, *R. Leendertz 3892* (PRE).

MPUMALANGA.—**2629** (Bethal): near Ermelo, still pools in river, (–DB), 25 Aug. 1904, *J. Burt Davy 1875* (BOL, PRE).

FREE STATE.—**2627** (Potchefstroom): Parys, irrigation ditch along Vaal opposite the ‘Small Island’, (–CD), Sept. 1932, *C. Smith 6309* (PRE). **2727** (Kroonstad): Kroonstad, Vals River, (–CC), Dec. 1927, *J. Pont 268* (PRE). **2827** (Senekal): Ficksburg, at Gansfontein, (–DD), 24 Oct. 1884, *E. Galpin s.n.* (BOL, PRE). **2828** (Bethlehem): ‘Kroonspruit’, (–AD), 22 Sept. 1976, *J. Blom 305* (PRE). **2925** (Gersfontein): 12 mi [19 km] E of Fauresmith, (–CC), 3 Sept. 1925, *C. Smith 479* (PRE); Farm ‘Driefontein West’, in Kaffirrivier, (–DB), 6 Oct. 1972, *R. Marshall M72/053/C* (PRE); Fauresmith, Boomplaats, in spruit, (–DC), 3 May 1934, *I. Verdoorn 1383* (BOL). **3026** (Aliwal North): ¼ mi [0.4 km] S of Loftes Siding, (–BA), 15 Nov. 1969, *D. Edwards 4163* (PRE).

LESOTHO.—**2828** (Bethlehem): Hlotse River at Makokoane, (–BC), 23 Oct. 1909, *A. Dieterlen 808* (BOL, PRE, SAM). **2928** (Marakabei): Semongkong, (–CC), 12 Jan. 1954, *A. Jacot-Guillarmod 1754* (PRE). **2929** (Underberg): Maluti Mtns, near Mokhotlong, 2 300 m, (–AC), 22 Feb. 1987, *M. Panagos 87* (PRE).

NORTHERN CAPE.—**2824** (Kimberley): Riverton, (–DA), Nov. 1919, *M. Wilman 21494* (PRE). **2922** (Prieska): Prieska, Orange River, (–DA), Oct. 1933, *E.G. Bisach 963* (NBG). **2923** (Douglas): Griqualand West, [Douglas], Mazelsfontein, (–BA), Oct. 1919, *E. Anderson 609* (BOL). **2924** (Hopetown): Modder River, (–BA), 4 Aug. 1908, *H.H.W. Pearson 1650* (NBG). **3024** (De Aar): 40 km from Philipstown on road to Colesberg, pool in small stream, (–DB), 19 May 1989, *H. Burrows 2991* (GRA). **3025** (Colesberg): near Colesberg, (–CA), Nov. 1939, *C. Thorne s.n. SAM54455* (SAM). **3119** (Calvinia): along Kareehoutrivier, 24 km S of Bo-Downes homestead, (–DD), 27 Oct. 1983, *D. Snijman 771* (NBG). **3220** (Sutherland): Roggeveld, Soekop, Witfontein, (–AA), permanent free water, 16 Sept. 2006, *H. Rösch 552* (NBG); Roggeveld Escarpment, pools on Farm Blesfontein, (–AD), 4 Nov. 2012, *P. Goldblatt & J. Porter 13715* (NBG); Verlatekloof Pass, pools in stream, (–DA), 7 Sept. 1926, *M. Levyns 1587* (BOL); 8 Sept. 1988, *M. Crosby 988* (PRE); 4 km from Klein Roggeveld via Komsberg on way down pass, (–DA), 1 300 m, 6 Sept. 1986, *I. Cloete & W. Haselau 245* (NBG); road to Komsberg Pass,  $\pm$  4–5 km SE of Farm Tonteldoosfontein, (–DB), 15 Sept. 2004, *D.A. Snijman 1946* (NBG). **3221** (Merweville): Phisante River, in stream, (–AC), 11 May. 1976, *M.F. Thompson 3015* (NBG, PRE); Bok se Plaas,  $\pm$  60 km S of

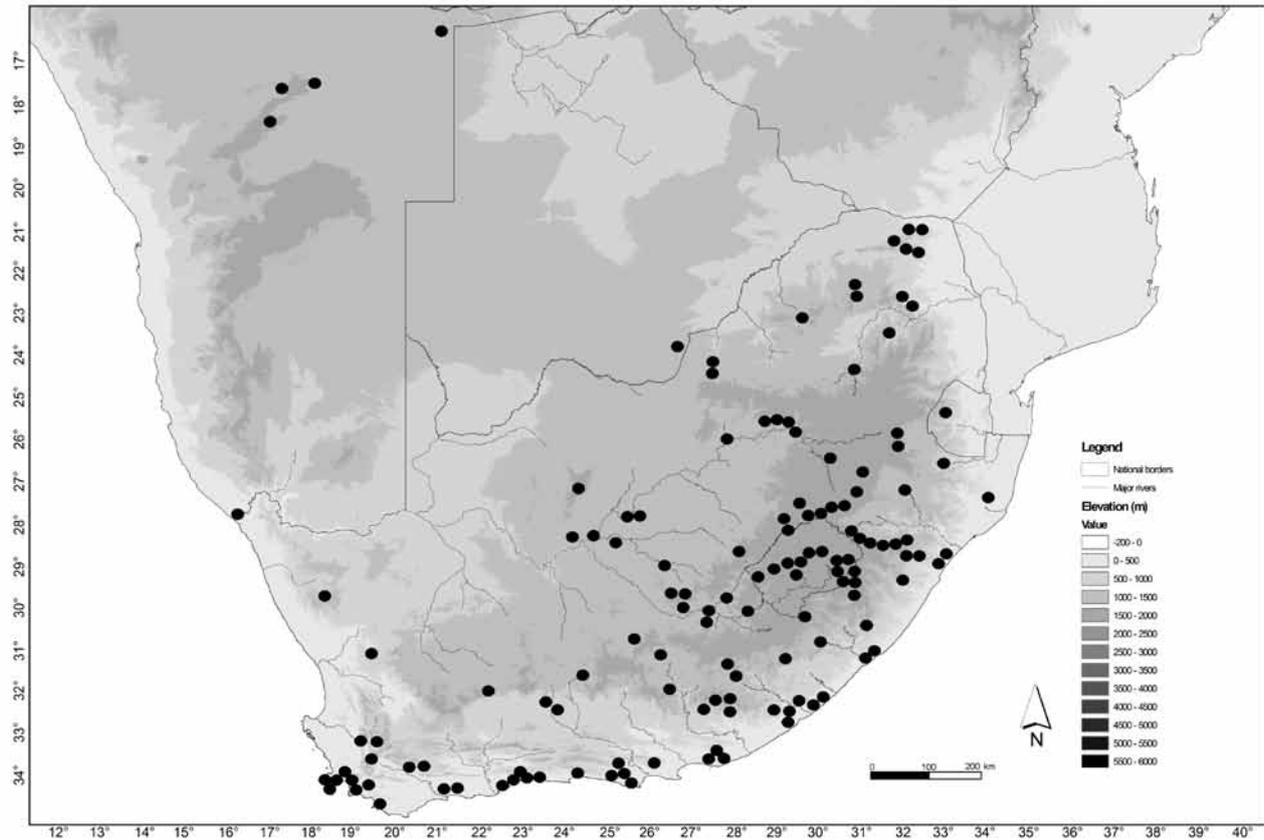


FIGURE 9.—Distribution of *R. trichophyllus* in southern Africa.

Fraserburg, 1 530 m, (–BA), *Moffett & Steersma 4022* (NBG); Layton, Rietvlei, (–BB), 914 m, *D. Shearing 187* (PRE).

WESTERN CAPE.—**3218** (Clanwilliam): Velddrift, (–CA), without date, *C. Gaigher 5* (NBG). **3318** (Cape Town): Sea Point, (–CD), July 1895, *MacOwan 1701* (SAM); pools near Salt River junction, (–CD), 3 Nov. 1891, *Wolley-Dod 3659* (BOL); Vygekraal River, (–CD), 30 Nov. 1891, *A. Wolley-Dod 3623* (BOL, PRE); Rietvlei, (–CD), 10 Oct. 1965, *A. Mauve 4384* (PRE); Bellville, pool in granite outcrop, (–DC), 8 Sept. 1938, *E. Cohen s.n.* (NBG). **3321** (Ladismith): Prince Albert, Gamka Poort, (–BC), Nov. 1935, *C. Thorne s.n. SAM51869* (SAM). **3418** (Simonstown): Noordhoek, salt pan, (–AB), 31 Jan. 1971, *I. Waher 45* (BOL); Ottery, (–BA), 18 Oct. 1935, *R. Adamson 2170* (BOL, SAM); Cape Flats, (–BA), no date, *E. Stephens s.n.* (BOL); Cape Flats near Phillipi, Edith Stevens Reserve, (–BA), in temporary pools up to 0.5 m deep, 26 Sept. 1994, *J.P. Rourke 2065* (NBG, PRE). **3420** (Bredasdorp): Bredasdorp, Nachtwacht, vlei, (–CA), Nov. 1926, *C. Smith 3047* (PRE).

EASTERN CAPE.—**3124** (Hanover): Wapadsberg Pass, running stream, (–DD), 26 Nov. 1977, *O. Hilliard & B. Burt 10679* (NU, PRE). **3126** (Queenstown): Broughton, near Molteno, 6300' [1 900 m], (–BC), Dec. 1892, *H.G. Flanagan 1563* (PRE, GRA, SAM). **3222** (Beaufort West): Beaufort West, Nieuweveld Mtns, 1 676 m, (–BA), 16 Apr. 1978, *B. Gibbs Russell, Robinson & Herman 448* (PRE); Mountain View Farm, (–BD), 16 Apr. 1978, *Gibbs Russell, Robinson & Herman 448* (GRA). **3223** (Rietbron): Murraysburg, Roode Poort [Rooipoort], (–BC), Sept. 1879, 4500', *W. Tyson 66* (SAM). **3224** (Graaff Reinet): Graaff Reinet, near Zontag's River [Sondagsrivier], (–BA), Nov. 1865, *H. Bolus s.n.* (GRA). **3225** (Somerset East): Craddock, Junction Farm, (–AA), Dec. 1952, *H. Barnes s.n.* (GRA); Craddock, Farm Zuurfontein near Nardouwsberg, (–AA), 1 550 m, local in permanent stream, 14 Jan. 1990, *H.P. Linder 5085* (NBG). **3226** (Fort Beaufort): Great Winterberg, S of Tarkastad, Fairfield Farm, 5500', [1 700 m], (–AD), 24 March 1954, *D. Comins 800* (BOL); Shiloh prope Queenstown, (–BB), without date, *R. Baur 919* (SAM). **3325** (Port Elizabeth): in stagnis prope Uitenhage, (–CD), *Ecklon 1766* (SAM). **3326** (Grahamstown): Grahamstown, Stowan Farm, (–AD), 17 Apr. 1934, *L. Britten 5978* (GRA).

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