



Pelargonium uliginosum (Geraniaceae: section *Hoarea*), a new species from Western Cape, South Africa, and an updated key to the species of the *P. dipetalum* group



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ABSTRACT

The new species *Pelargonium uliginosum* is a local endemic of Breede River Alluvial Fynbos in the upper Breede River Valley, Western Cape, South Africa. One of the eight species of sect. *Hoarea* with only the posterior two petals developed, it is distinguished by its glabrous, bi- or tripinnatisect leaves with subulate ultimate segments each tipped with one or sometimes two setae. The new species is described and illustrated, and we include an updated key to the species of the *Pelargonium dipetalum* group.

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1. Introduction

Pelargonium L'Hérit. is a large, mainly African genus of ± 250 species centred in southwestern South Africa (Vorster, 2012; Manning and Goldblatt, 2012a). The geophytic Sect. *Hoarea* (Sweet) DC., with ± 85 spp., is a well-defined group characterised by its turnip- or carrot-shaped tubers with dark brown, peeling or flaking periderm, radical leaves, and highly condensed stem (Marais, 1994, 2014). Most species are ± hysteranthous, flowering in late spring and summer (Craib, 2001). The section is centred in the Cape Floristic Region (CFR), where over 50 species are recorded, many of them local endemics (Manning and Goldblatt, 2012a).

Sect. *Hoarea* was monographed relatively recently by Marais (1994) and several additional species have since been described (Marais, 2014; Manning and Goldblatt, 2011, 2012b). Vegetative and floral morphology in the section is extremely diverse but one of the most distinctive groups in the section is the *Pelargonium*

dipetalum group, diagnosed by the reduction of the perianth to just the two posterior (upper) petals (Manning and Goldblatt, 2011). The group currently includes seven species, amongst them two recently described novelties from near Tulbagh in Western Cape, *Pelargonium elandsmontanum* J.C.Manning & Goldblatt from alluvial flats at the foot of the Elands-kloofberge north of Wellington (Manning and Goldblatt, 2011) and *Pelargonium saxatile* J.C.Manning & Goldblatt from the top of the same mountain range (Manning and Goldblatt, 2012b). Here we describe a third locally endemic species from the upper Breede River Valley, *Pelargonium uliginosum* J.C.Manning & D.I.W.Euston-Brown from alluvial flats in the Slanghoek Valley northwest of Worcester, bringing to eight the number of species in the group. It is distinctive in its glabrous, bi- or tripinnatisect leaves with subulate ultimate segments.

2. Materials and methods

The description and illustration were prepared from fresh material. The examination of herbarium collections at BOL, NBG, PRE and SAM, failed to reveal additional collections (herbarium acronyms after Holmgren et al., 1990).

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3. Taxonomy

3.1. Identification key to the *P. dipetalum* group of species (adapted from Manning and Goldblatt, 2012b)

- 1a Petals inconspicuous, 4.5–6 mm long, white, much smaller than sepals; leaves large, lamina (30–)60–180 × (20–)40–200 mm, segments irregularly pinnatifid or incised ... *Pelargonium leipoldtii*
- 1b Petals conspicuous, 7–19 mm long, ± as long as or longer than sepals; leaves smaller, ± simple, entire or variously incised:
- 2a Leaves trifoliolate:
- 3a Pedicels wiry; leaflets obtrullate and apically incised, with long, adpressed hairs on both surfaces; fertile stamens four ... *Pelargonium ternifolium*
- 3b Pedicels short, thick; leaflets rhombic and acute, with hairs on upper surface erect or lacking; fertile stamens five ... *Pelargonium elandsmontanum*
- 2b Leaves ± simple, entire or variously incised:
- 4a Leaves ± densely sericeous or tomentose on lower or both surfaces; petals and filaments dark wine red:
- 5a Leaf blade lanceolate or elliptic, silky, especially on lower surface, and with appressed bristles on margins ... *Pelargonium ellaphieae*
- 5b Leaf blade cordate, glabrous above but densely grey-matted beneath ... *P. asarifolium*
- 4b Leaves subglabrous or more sparsely pubescent with appressed hairs; petals white to pink, filaments white to red:
- 6a Leaves (including petiole) glabrous, blades bipinnatisect or tripinnatisect with subulate and aristate ultimate segments 0.5–1.0 mm wide ... *P. uliginosum*
- 6b Leaves ± pubescent, simple or blades irregularly pinnatisect or bipinnatisect with lacinate and appressed hirsute ultimate segments 1–3 mm wide:
- 7a Leaves few, suberect, blade elliptic, simple or irregularly pinnatisect to bipinnatisect, 20–120 mm long, hirsute on both surfaces with soft, appressed hairs; posterior filament 6.5–11 mm long; plants from southern Cape coastal areas ... *P. dipetalum*
- 7b Leaves many, prostrate and forming rosette, blade orbicular to ovate, usually simple, rarely with 1 or more small lateral lobes and thus lyrate-pinnatifid, 6–17 mm long, glabrous above, with stiff, appressed, bristle-like hairs along midrib and sometimes veins beneath, and along margin; posterior filament 4–5 mm long; plants from montane rock sheets on the Elandsloofberge near Wellington ... *P. saxatile*

3.2. *P. uliginosum* J.C.Manning & D.I.W.Euston-Brown, new species. Type: South Africa, Western Cape, Worcester (3319): upper Breede River Valley, Farm Driefontein, near SW boundary on S side of Breede River in alluvial fynbos, (–CA), 24 Oct. 2013, D. Euston-Brown 3253 (NBG, holo.; K, MO, iso.)

Deciduous geophyte 100–150 mm at flowering. Tuber carrot-shaped, sometimes branched, 15–30 mm diam., with dark reddish brown, leathery, flaking outer skin. Leaves present at flowering, green or lower drying off, 8 or 9, distinctly petiolate; lamina elliptic to oblong in outline, conduplicate, bi- or tri-pinnatisect (rarely partially 4-pinnatisect), 30–50 × 15–20 mm, 5- or 6-jugate with primary segments opposite or alternate and secund, ultimate segments subulate, 4–9 × 0.5–1.0 mm, aristate with 1(2) apical seta 1.5–2.0 mm long, glabrous, leathery, bright green or segments flushed reddish apically;

petioles suberect, 15–30(–50) mm long, glabrous; stipules ± 20 mm long, adnate to petioles with apices free, ciliate-aristate, brown and papery, decaying into dry, fibrous neck. Inflorescence usually with 1 branch, pseudo-umbels with 4 to 8 flowers each; scape up to 50 mm long, ± 1.5 mm diam. at base, strigose with patent, acute hairs up to 1 mm long intermixed with shorter obtuse, subclavate hairs and minute, gland-tipped hairs, yellowish green; peduncles 60–90 mm long, sparsely strigose with patent, subclavate hairs mixed with numerous, minute, gland-tipped hairs, yellowish green or flushed reddish; bracts lanceolate, 3–5 × 1 mm, densely strigose on lower surface with acute hairs intermixed with smaller gland-tipped hairs, appressed-pubescent on upper surface. Pedicel ± 0.5 mm long. Hypanthium 10–12 mm long, reddish, densely glandular with minute gland-tipped hairs mixed with scattered obtuse or subclavate hairs. Sepals reflexed during anthesis, lanceolate, 8–10 × 2 mm, acute, reddish with pale margins, undersurface densely glandular with minute gland-tipped hairs mixed with scattered clavate hairs but appressed strigose along the edges, especially on inner sepals. Petals two, posterior, pale to mid-pink with red feather-like markings, reflexed at ± 90° above claw, spatulate, 12–16 × 4–6 mm, truncate or shallowly emarginate, limb weakly auriculate, rarely lateral petals present as minute peg-like structures 2 mm long. Stamens: staminal column ± 4 mm long, pale pink, scabridulous-papillate, perfect stamens 5, exerted, posterior filaments shortest, 4–5 mm long, lateral and anterior filaments longer, 7–8 mm long, filaments pink to red distally, scabridulous-papillate in basal half; staminodes minute, 0.3–0.5 mm long; anthers ± 2 mm long, maroon-red, pollen brown. Gynoecium: ovary ± 2 mm long; style 5–6 mm long, dark pink; stigma branches ± 1 mm long, wine red. Fruit: bases of mericarps ± 5 mm long, appressed-strigose without glandular hairs, tails 27–30 mm long. Flowering time: mid-October to early November. (Figs. 1, 2 and 3).

3.2.1. Distribution and habitat

Known from a single population on the western side of the upper Breede River Valley opposite Botha (Fig. 4), *P. uliginosum* is restricted to cobbled flats in seasonally wet loamy sandstone soils in Breede River Alluvial Fynbos vegetation (Mucina and Rutherford, 2006). The site, which lies at the edge of the floodplain, is seasonally wet or marshy. This suggested the choice of the Latin epithet, *uliginosus* (adj., growing in marshes). The asteraceous shrub *Elytropappus gnaphaloides* (L.) Levyns may dominate in parts at the type locality but *P. uliginosum* prefers more open habitats without woody cover. Several other locally endemic species are associated with this community, notably the proteoids *Leucadendron chameleae* (Lam.) I. Williams and *Diastella parilis* Salisb. ex Knight (both Critically Endangered) and the geophytes *Ixia campanulata* Houtt. (Endangered) and *Ixia polystachya* var. *longistylis* M.P.de Vos.

Flowering in *P. uliginosum* takes place in early summer as the soil begins to dry out, at which time the younger leaves are still green but the lower older leaves are dying back. This is unusually early for the group as most other two-petalled species from the Western Cape flower later in the season, in mid- to late summer or autumn.

3.2.2. Diagnosis and relationships

The retrorsely scabrid-papillate staminal column and perianth with only the upper two petals developed (Fig. 3) place *Pelargonium uliginosum* in the small group of species centred around *P. dipetalum* L.Hérit. (Marais, 1994). Within the group, *P. uliginosum* is distinguished by its 2- to 4-pinnatisect leaves with subulate ultimate segments 4–9 × 0.5–1.0 mm. The ultimate segments are conspicuously aristate, with 1 or 2 apical setae 1.5–2.0 mm long but the leaf blades and petioles are otherwise entirely glabrous. The subclavate hairs on the scape are also distinctive. The flowers are unremarkable in the group, with a hypanthium 10–12 mm long, pink petals feathered with red, and five fertile stamens.

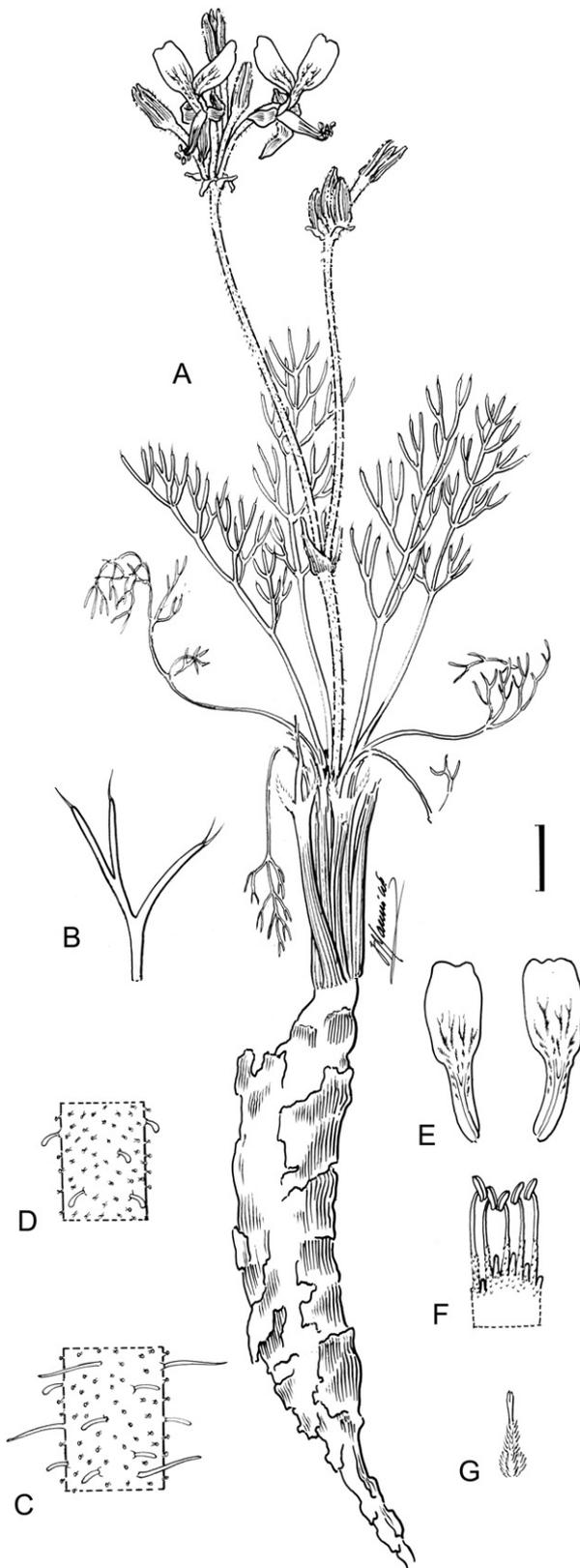


Fig. 1. *Pelargonium uliginosum*, D. Euston-Brown 3523 (NBG). A, flowering plant; B, detail of ultimate leaf segments showing apical setae; C, detail of scape vestiture; D, detail of peduncle vestiture; E, petals; F, androecium; G, gynoecium. Scale bar: A, 10 mm; B, E–G, 5 mm; C, D, 1 mm. Artist: John C. Manning.

P. uliginosum might only be confused with pink-flowered forms of *P. dipetalum* with bipinnatisect leaves but this species of the southern Cape coastal plain between Betty's Bay and Keurbooms river (Marais,



Fig. 2. *Pelargonium uliginosum* in habitat. Photographer: Douglas Euston-Brown.

1994) has fewer leaves (up to five per plant) with the petiole and blade \pm densely hirsute, either simple or with lacinate terminal segments 1–3 mm wide. The leaf segments are strongly appressed-ciliate on the margins, lack an evident apical seta, and the patent hairs on the scapes are acute and not subclavate as in *P. uliginosum*. Flowering in *P. dipetalum* takes place from December to May, and the two species are thus separated geographically, ecologically and temporally.

The glabrous, finely bipinnatisect, carrot-like leaves of *P. uliginosum*, about twice as long as wide, are highly distinctive in the section. They bear a striking superficial similarity to the leaves of *Pelargonium rapaceum*, one of the few members of sect. *Horaea* that can be identified with absolute certainty from its foliage alone but the leaves of *P. rapaceum* are conspicuously hirsute. *P. rapaceum*, which is widespread through the Greater Cape Floristic Region and taxonomically isolated in the genus in its papilionaceous flowers, with reflexed upper petals and conduplicate lower petal covered by the lateral petals.

3.2.3. Conservation notes

The species is known from a single population less than 500 m² in extent, numbering over one hundred plants. Suitable habitats around the site have been converted to vineyards and the present site is being utilized for grazing and is being invaded by the alien tree species *Acacia mearnsii* De Wild, *A. saligna* (Labill.) H.L.Wendl. and *Hakea sericea*



Fig. 3. *Pelargonium uliginosum* flowers. Photographer: Douglas Euston-Brown.

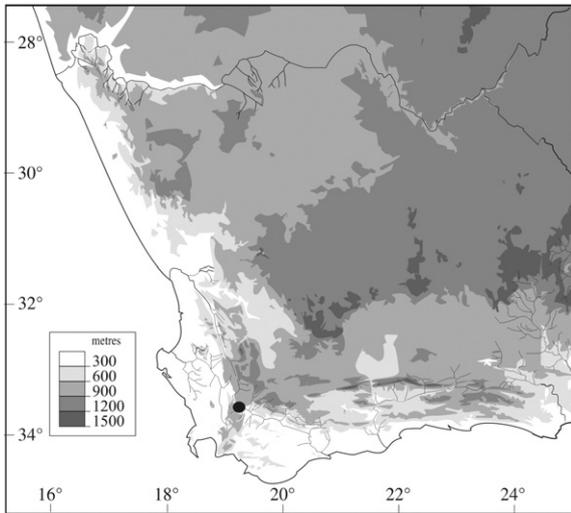


Fig. 4. Known distribution of *Pelargonium uliginosum*.

Schrad. & J.C.Wendl. The species is thus not only under threat at the only known locality but its range has almost certainly already been reduced by agriculture. Further to this, the species appears to be associated with damper soils that dry out relatively slowly in summer, and drainage of adjacent vineyards and thickening stands of alien vegetation are certain

to impact negatively on the natural drainage patterns at the site. We therefore recommend a conservation status of Critically Endangered.

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