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Short communication

Pelargonium saxatile (Geraniaceae: Section *Hoarea*), a new species from the southwestern Cape, South Africa, and a key to the species of the *P. dipetalum* group

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Abstract

The new species *Pelargonium saxatile* is a local endemic of sandstone rock pavement in the Elandskloofberge near Wellington in Western Cape Province, South Africa. One of just seven species of sect. *Hoarea* that have only the posterior two petals developed, it most closely resembles *Pelargonium dipetalum* from the southern Cape coastal lowlands but is distinguised by its rosette of numerous, small, mainly simple leaves, glabrous above and strigose beneath only along the midrib and sometimes also the veins. In addition, the pink flowers have the dorsal filament shorter, 4–5 mm long. We include a key to the species of the *P. dipetalum* group.

Keywords: Geraniaceae; New species; *Pelargonium saxatile*; Section *Hoarea*; South Africa; Taxonomy

1. Introduction

Pelargonium L`Hérit., a large, mainly African genus of ±250 species (Vorster, 2000), has its centre of diversity in southwestern South Africa (Goldblatt and Manning, 2000). The geophytic Sect. *Hoarea* (Sweet) DC., with ±60 spp., is one of the more distinctive groups in the genus, defined by its turnip- or carrot-shaped tubers with dark brown, peeling or flaking periderm, radical leaves, and highly condensed stem (Marais, 1994). Vegetative and floral morphology in the section is diverse but many species have markedly zygomorphic flowers. Most species are ± hysteranthus, 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 (Goldblatt and Manning, 2000).

Sect. *Hoarea* was monographed relatively recently (Marais 1994), but since then an additional, highly localised endemic in the *Pelargonium dipetalum* group, *Pelargonium elandsmontanum*, was recently described from alluvial flats at the foot of the Elandskloofberge north of Wellington (Manning and Goldblatt, 2010). The *P. dipetalum* group currently comprises just six species and is readily diagnosed by the perianth, which is reduced to just the posterior (upper) two petals (Manning and Goldblatt, 2010). Here we describe yet another member of the group from the upper slopes of the Elandskloofberge, *P. saxatile*, which is restricted to shallow soils on sandstone rock pavement.

2. Materials and methods

The description and illustration were prepared from fresh material. Examination of herbarium collections at BOL, NBG,

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PRE and SAM, failed to reveal additional collections (herbarium acronyms after Holmgren et al., 1990).

3. Species description and key

3.1. *Pelargonium saxatile* J.C. Manning & Goldblatt, sp. nov

Geophyta decidua 90–150 mm alta e tubere dauciformi. Folia per anthesin viridia vel jam sicca; stipulae subulatae, ±13 mm longae, ciliatae, ad petiolum adnatae, apicibus liberibus; petiolus prostratus usque erecto-patens, 10–20 mm longus, trichomatibus albis acutis 0.7–0.9 mm longis dense adpresso-strigosus; lamina coriacea, orbicularis vel elliptica, usitate simplex, integra vel ± breviter pinnatim lobata vel lyrate incisa, acuto-apiculata, 6–17 × 5–9 mm. Inflorescentia usitate 1- vel 2-ramosa, pseudo-umbellas 1 ad 4 eandem 3- ad 7-floram ferens. Hypanthium 10–12 mm longum, rubescens, glanduloso-pilosum trichomatibus minutis scabridulis intermixtis; petala 2, spathulata, 12–14 × 4–6 mm, truncata vel leviter emarginata, superius carneum, rubro-punctatum vel pinniformiter notatum; stamina in columnam ±4 mm longam scabridulo-papillosam connata, antherifera 5 exserta, posteriora breviora 3–4 mm longa, lateralia anterioraque 7–8 mm longa, filamentis liberibus carneis usque rubris in dimidio inferiori scabridulo-papillatis, antheris ±2 mm longis, marronino-rubris, polline brunneo; staminodia minuta 0.3–0.5 mm longa; stylus 4–5 mm longus, atrocarneus, ramis stigmaticis ±1 mm longis.

Type.— Western Cape: 3319 (Worcester): Tulbagh, Elandskloofberge, Kluitjieskraal Forest Station, rock outcrop at southern edge of Suurvlakte plantation, (–AC), 29 November 2010, *Manning 3317* (NBG, holo.; BOL, MO, iso).

Deciduous geophyte 90–150 mm at flowering. *Tuber*: carrot-shaped, sometimes forked, 10–15 mm diam., with brownish, leathery, flaking outer skin. *Leaves*: present at flowering, green or drying off, 7–12(–15), conspicuously petiolate; lamina orbicular to elliptic in outline, mostly simple or with 1 or more small lateral pinnae, thus ± lyrate-incised, acute-apiculate, 6–17 × 5–9 mm, leathery, glabrous adaxially and appressed-strigose along margins, subglabrous adaxially but appressed-strigose along midrib or all veins with white, actute hairs, mid-green or flushed with red; petioles ± prostrate, 10–20 mm long, densely adpressed-strigose with white, acute hairs 0.7–0.9 mm long intermixed with short, acute hairs, usually flushed red; stipules subulate, adnate to petioles with apices free, ±13 mm long, ciliate, decaying into dry, fibrous neck. *Inflorescence*: usually 2- or 3-branched, bearing up to 4 pseudo-umbels with 3–7 flowers each; scape up to 15 mm long, ±1.5 mm diam. at base, densely strigose with patent, acute hairs up to 1 mm long intermixed with minute, gland-tipped hairs, greyish green; peduncles 35–70 mm long, sparsely strigose with numerous, minute, gland-tipped hairs mixed with sparse, patent, acute hairs, reddish; bracts lanceolate, 3–5 × 1 mm, densely strigose adaxially with acute hairs intermixed with smaller gland-tipped hairs. *Pedicel*: ±0.5 mm long. *Hypanthium*: 10–12 mm long, reddish, glandular-hairy with minute gland-tipped hairs intermixed with scattered, short, scabridulous hairs. *Sepals*: reflexed during anthesis, lanceolate, 7–8 × 1.5–1.8 mm, acute, purplish with white margins, adaxially sparsely or more densely strigulose with adpressed, acute hairs intermixed with minute, gland-tipped hairs. *Petals*: two, posterior, pale to mid-pink with red spotting or feather-like markings, reflexed at ±90° above claw, spathulate, 12–14 × 4–6 mm, truncate or shallowly emarginate, claw weakly auriculate. *Stamens*: staminal column ±4 mm long, white, scabridulous-papillate, perfect stamens 5, exserted, posterior filaments shortest, 3–4 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 ±3 mm long; style 4–5 mm long, dark pink; stigma branches ±1 mm long, wine red. *Fruit*: bases of mericarps ±5 mm long, without glandular hairs, tails 22–25 mm long. *Flowering time*: mid-November to mid-December (Fig. 1).

Distribution and habitat: known from a single population on the Elandskloofberge, near the headwaters of the Watervalsrivier (Fig. 2), *P. saxatile* is restricted to pockets of fine silt that accumulate to a depth of 10 cm or more on sandstone rock sheets. These sheets are periodically inundated during the winter by rain but dry out completely in the summer months. Associated geophytes include *Ornithogalum dubium* Houtt. (Hyacinthaceae), *Eriospermum cernuum* Baker (Ruscaceae) and *Holothrix* sp. (Orchidaeae).

Flowering begins in early summer as the soil begins to dry out, at which time the leaves are still living in some plants but beginning to die back in others.

Diagnosis and relationships: the unusual, papillate staminal column places *P. saxatile* in the *Pelargonium auritum* group of species (Marais, 1994), where its relationships evidently lie with the small group of species centred around *P. dipetalum* L`Hérit., characterised by having only the upper two petals developed. Within the group, *P. saxatile* is distinguished by its numerous, prostrate, mostly simple leaves (sometimes with small lateral lobes or ± lyrate-incised) with remarkably small lamina, 6–17 × 5–9 mm, and its pink flowers with 5 fertile stamens, the dorsal stamen with filament 4–5 mm long and markedly shorter than the others. The rosette of 7–15, small, ± spreading leaves, often flushed reddish, is highly characteristic of the species. The lamina is glabrous above, and strigose beneath only along the midrib and sometimes the veins, as well as on the margins.

P. saxatile is most similar to *P. dipetalum* from the southern Cape coastal plain between Betty's Bay and Keurboomsriver (Marais, 1994), including the vestiture of the scape and peduncles, which bear numerous, minute gland-tipped hairs sparsely interspered with patent, acute hairs. The two species differ most markedly in their foliage. The leaves in *P. dipetalum*, which are much fewer in number (one to five per plant) and erect, vary from elliptic to pinnatisect or bipinnatisect, are substantially larger than in *P. saxatile*, measuring 20–120 × 13–30 mm when simple and substantially wider when pinnatisect, and are hirsute on both surfaces with soft hairs not restricted to the midrib and veins. The two species differ also in details of the androecium: the dorsal stamen in *P. dipetalum* is only slightly shorter than the others, with the filament 6.5–11 mm long, thus much longer than in

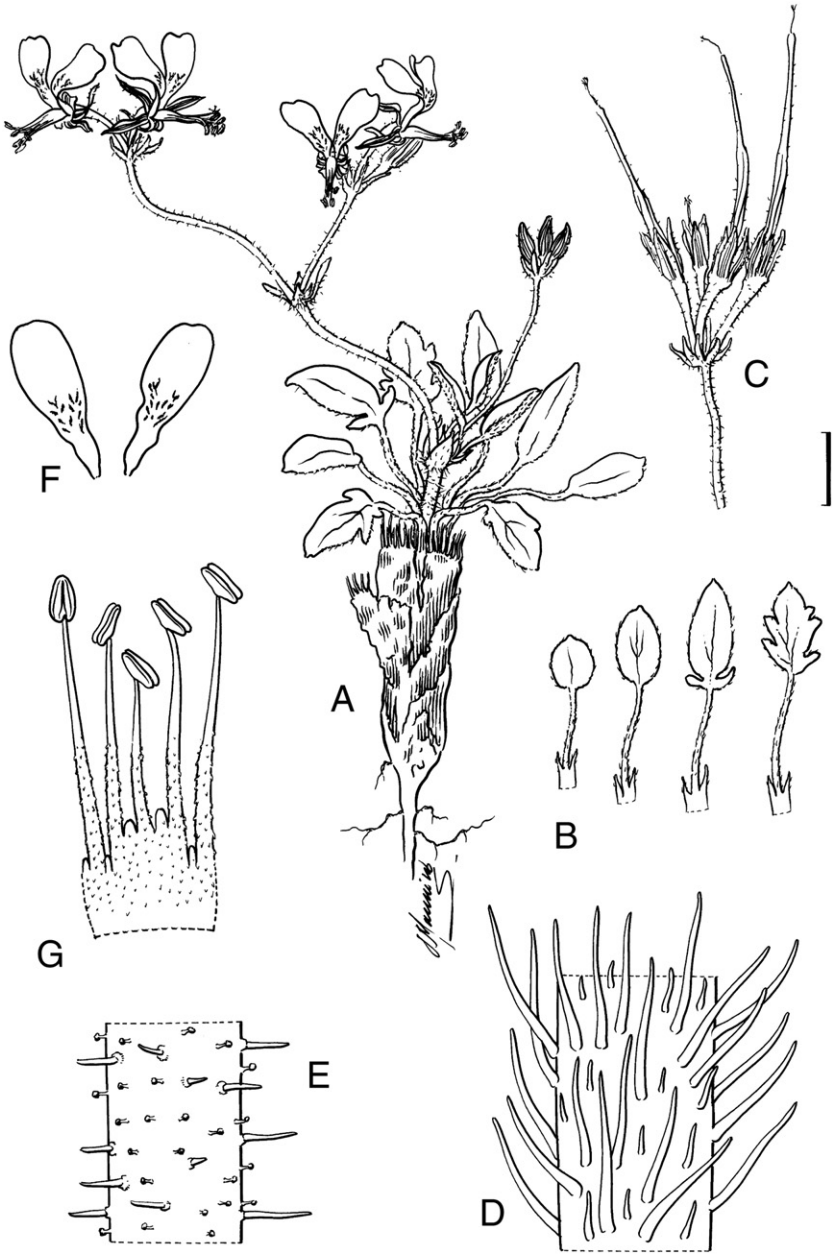

Fig. 1. *Pelargonium saxatile*, *Manning 3317* (NBG). (A) flowering plant; (B) variation in leaf morphology; (C) infructescence; (D) detail of petiole vestiture; (E) detail of peduncle vestiture; (F) petals; (G) androecium. Scale bar: A–C, 10 mm; D, E, G, 2.5 mm; F, 5 mm. Artist: John C. Manning.

P. saxatile, in which the dorsal filaments are only 4–5 mm long. The two species are separated geographically and ecologically: *P. dipetalum* occurring on limestone, sandstone or clay flats at low elevation, and flowering mainly from December to May; and *P. saxatile* restricted to montane rock sheets and flowering from November to mid-December.

3.2. Identification key to the *P. dipetalum* group of species

1. Petals inconspicuous, 4.5–6 mm long, white, much smaller than sepals; leaves large, lamina (30–)60–180 × (20–)40–200 mm, segments irregularly pinnatilobed or incised… *Pelargonium leipoldtii*.

1.’ Petals conspicuous, 7–19 mm long, ± as long as or longer than sepals; leaves smaller, ± simple, entire or variously incised:

2. Leaves trifoliolate:

3. Pedicels wiry; leaflets obtrullate and apically incised, with long, adpressed hairs on both surfaces; fertile stamens four… *Pelargonium ternifolium*.

3.’ Pedicels short, thick; leaflets rhombic and acute, with hairs on upper surface erect or lacking; fertile stamens five… *Pelargonium elandsmontanum*.

2.’ Leaves ± simple, entire or variously incised:

4. Leaves ± densely sericeous or tomentose on lower or both surfaces; petals and filaments dark wine red:

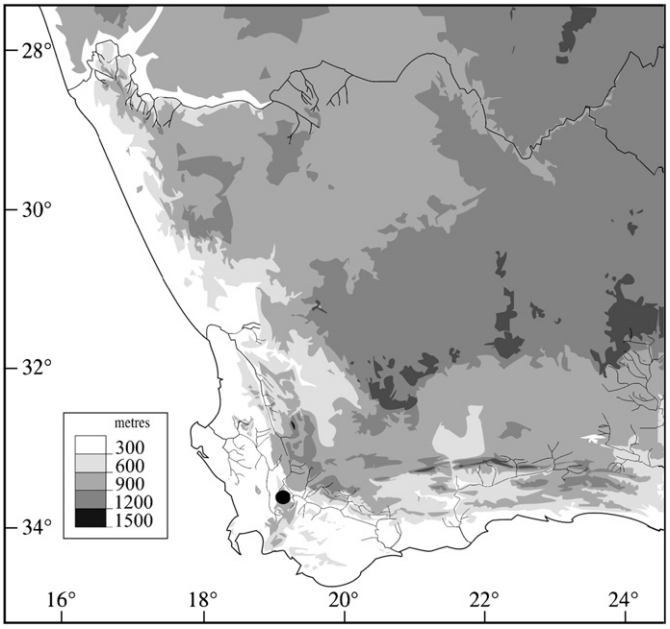

Fig. 2. Known distribution of *Pelargonium saxatile*.

5. Leaf blade lanceolate or elliptic, silky, especially on lower surface, and with appressed bristles on margins… *Pelargonium ellaphiae*.

5.' Leaf blade cordate, glabrous above but densely grey-matted beneath… *Pelargonium asarifolium*.

4.' Leaf blade subglabrous or more sparsely pubescent with appressed hairs; petals white to pink, filaments white to red:

6. 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*.

6.' 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 Elandskloofberge near Welington… *P. saxatile*.

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