

Pelargonium redactum (Geraniaceae): a new species from the Northern Cape Province and Namibia

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Pelargonium redactum is described from the Northern Cape Province and southern Namibia. It is a dwarf annual species with succulent leaves divided repeatedly into almost linear segments, and zygomorphic flowers with four petals and three fertile stamens each. Vegetatively, it resembles *P. senecioides* L' Hérit. with which it was previously confused, but differs in its reduced and conspicuously zygomorphic flowers. It also resembles *P. dolomiticum* Knuth and *P. griseum* Knuth vegetatively, as well as in its floral architecture; but differs in having only two to three instead of seven fertile stamens, in its considerably smaller flowers, and its annual habit.

Keywords: Geraniaceae, new species, *Pelargonium*, taxonomy.

In the mostly perennial genus, *Pelargonium*, the annual species are all dwarfs with minute and almost regular flowers and seven or less commonly five, fertile stamens per flower. I report here on an undescribed annual species with markedly zygomorphic flowers and only three fertile stamens per flower.

Pelargonium redactum Vorster, sp. nov.

Planta annua, pumila. Folia 2–3-pinnatifida, incana. Flores 5–6 mm diametro, zygomorphissimes; petala 4, duo petala antica vix exsertae gradatim recurva, duo petala postica auriculata et inter limbum et unguem abrupte refracta; stamina fertilia 2–3, genitalia inter petala antica et sepala declinata.

P. senecioides L' Hérit. habitu et forma foliorum simile; sed mag-nopere differt floribus zygomorphissimus versus actinomorphis, petalis 4 versus 5, petalis posticis auriculatis versus spatulatis, et staminibus fertilibus 2–3 versus 5.

TYPUS.— Southern Namibia: Farm 'Zebrafontein LUS 87' [30 km north-east of Rosh Pinah], Merxmüller & Giess 28793 (WIND, holotypus.; PRE, isotypus).

An erect to procumbent annual with a strongly developed tap-root, exposed parts well branched from base, unarmed, 50–250 mm tall and spreading to a diameter of up to 800 mm. Stems smooth, herbaceous, covered with microscopic, short, erect hairs interspersed with shorter capitate glandular hairs, green but with a silvery sheen due to indumentum. Leaves deeply 2–3-pinnatifid with segments almost linear, somewhat succulent, indumentum adaxially as on stem but abaxially denser, dull green to yellowish-green with a silvery sheen due to indumentum; lamina cordiform in outline, base cordate, apex acute to obtuse in outline, apices of segments subacute to rounded, margins of segments entire, 10–50 mm long and wide; petiole 10–150 mm long, persistent; stipules persistent, triangular, 1.5–2.5 × 1.0–2.0 mm, membranous, indumentum as on stem but sparser. Inflorescence a series of compact pseudo-umbels of 2–3(–4) flowers each; peduncle borne in axils of foliar leaves, 8–20(–50) mm long, lengthening somewhat in fruiting stage. Flower conspicuously zygomorphic, about 5 mm across. Pedicel 1–3(–5) mm long, lengthening somewhat in fruiting stage. Hypanthium about 1 mm long. Sepals narrowly ovate with apices acute, indumentum as on stem, glaucous green and longitudinally striate, 5–6 × 1.5 mm. Petals 4, dark wine-red with bases, apices, and sometimes margins white, and very dark branched veins near bases; posterior two spatulate and conspicuously auricled, abruptly narrowed to

claw which is involute to form a false tube, limb about 5 × 2 mm, claw about 2.5 × 0.5 mm, basally parallel to sepals but sharply reflected at 90° at junction between claw and limb, exceeding sepals by 2–3 mm; anterior two elliptical with a short basal claw, about 6 × 2.5 mm and almost equalling sepals, very slightly recurved. Fertile stamens 2–3, about equal in length; pollen dark orange. Ovary narrowly ovoid, about 6 × 2.5 mm, densely covered with apically directed hairs, pale green (with a silvery sheen due to indumentum); style about 1.5 mm long, tinted wine-red; stigma with 5 spreading-erect branches, tinted wine-red; mericarp bases 5–6 × about 1 mm, tails 30–35 mm long, plumose. (Figure 1).

Flowering and reproduction

It seems likely that the growth and reproduction of this species, and the initiation thereof, is dependent on the irregular and scant winter rains, with the complete life cycle sometimes lasting only about two months. Flowering specimens have been collected from June to November with a peak in August and September, and fruiting specimens between May and October again with a peak in August and September. Its unusual flower morphology suggests a specialised pollinator, but probably not the same as that pollinating *P. dolomiticum*, *P. griseum*, or *P. tragacanthoides* which have a similar floral architecture; firstly because the flowers in *P. redactum* are much smaller, and secondly perhaps because the relatively short petals are almost covered by the sepals. It may be self-pollinating, as a cultivated example inside a closed greenhouse produced seed.

Diagnostic features and affinities

P. redactum is distinguished by the combination of its annual habit, and its tiny (about 5 mm across) flowers having a reduced number of four petals and two to three fertile stamens.

Hitherto all the annual species of *Pelargonium* have been placed in the section *Peristera* DC., which tend to be dwarfed, more or less decumbent plants with flowers seldom more than 10 mm across. Although *P. redactum* broadly conforms to these criteria, its zygomorphic flowers, reduced number of petals and stamens, and unusually large mericarps make it unique among the annual species. Species in section *Peristera* tend to be conservative in their floral morphology, yet in *P. apetalum* P. Taylor, otherwise a typical species of this section, the petals are often completely lacking.

In several aspects, *P. redactum* resembles the group of species

comprising *P. dolomiticum* Engler, *P. griseum* Knuth, and *P. tragacanthoides* Burchell (see van der Walt & Vorster 1981: 54–56, 66–68, 1988: 144–146). In all these species the petals are reduced to four, with the posterior two conspicuously spatulate, the limbs auricled proximally and the claws involute to form false tubes. Should it be allied to these species, its diminutive

flowers (about 5 mm instead of 15–25 mm across), reduced number of stamens (2–3 instead of 7), and annual instead of perennial habit distinguish it clearly. Geographically it occurs in the same general area as *P. tragacanthoides* (Vorster 1987). All these species are xerophytes with finely dissected leaves. *P. griseum* and *P. tragacanthoides* are evergreen, but highly aromatic, which

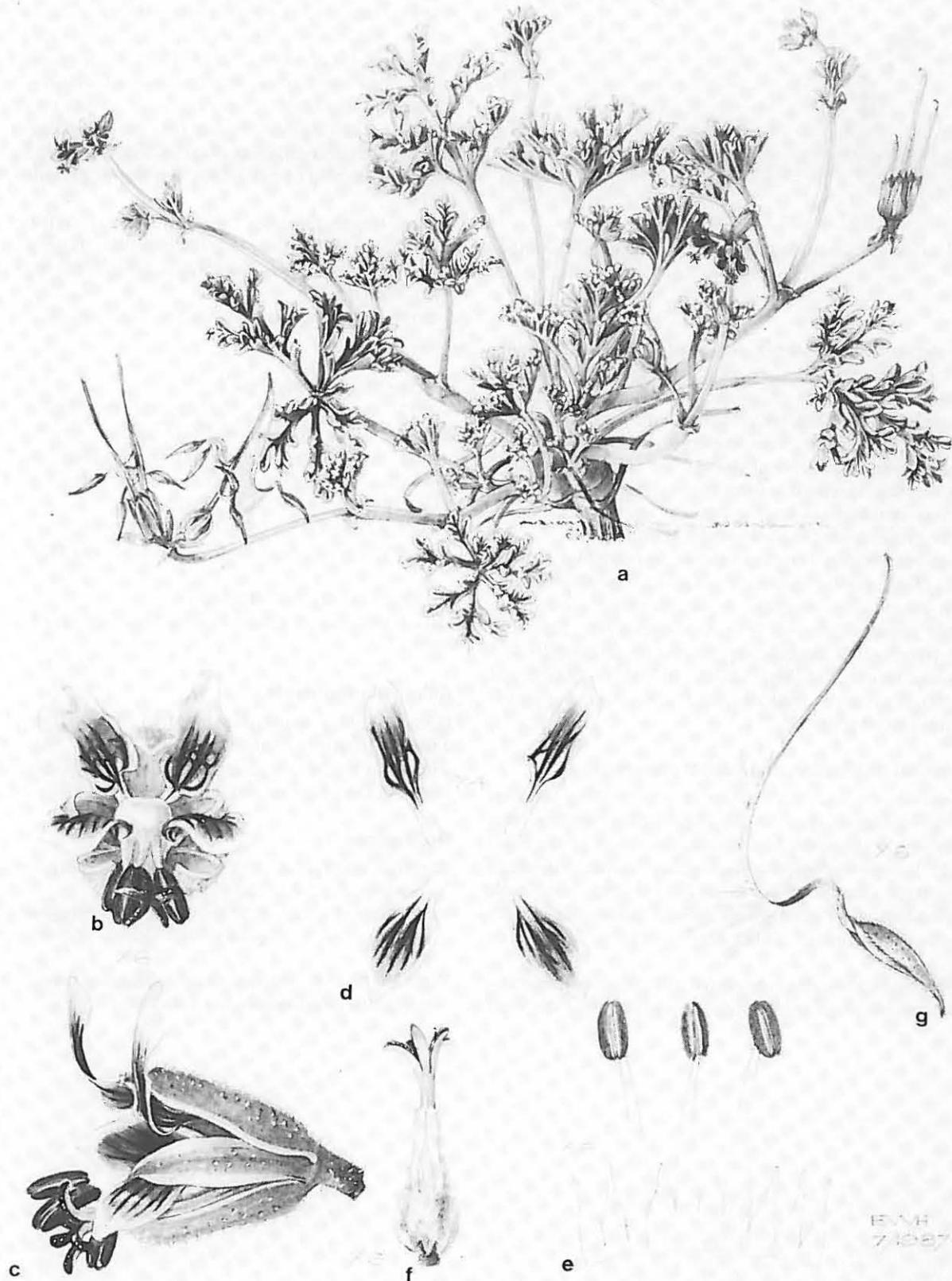


Figure 1 *Pelargonium redactum*: (a) habit, $\times 1$; (b) flower in frontal view, $\times 6$; (c) flower in lateral view, $\times 6$; (d) petals, $\times 4$; (e) androecium, $\times 6$; (f) gynoecium, $\times 6$; (g) mericarp, $\times 6$. From Van Vuuren s.n. sub STEU 3814 (PRE).

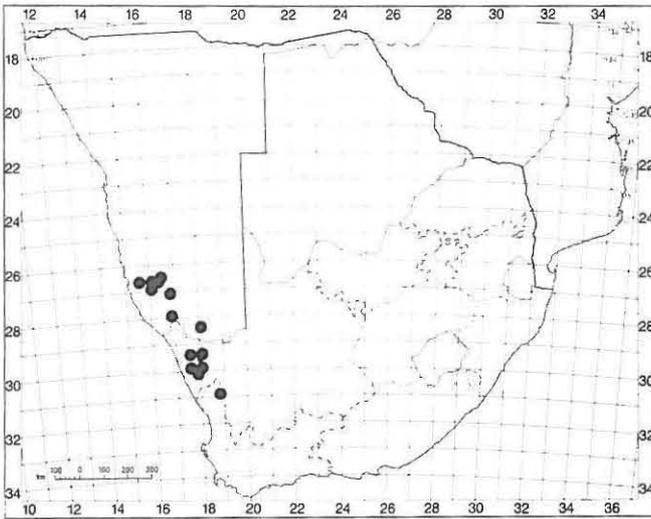


Figure 2 *Pelargonium redactum*: known geographical distribution.

probably serves as a not entirely successful deterrent to grazing. Plants of *P. tragacanthoides* are usually wedged into rock crevices where the vital parts are protected from grazing animals. The exposed parts of *P. dolomiticum* tend to die back during winter, but the plants have well-developed underground tubers which, as an additional survival strategy, are also often wedged into rock crevices. If related to these species, it is noteworthy that *P. redactum* developed a totally different strategy, that of an annual life cycle, to survive unfavourable conditions.

On herbarium sheets *P. redactum* strongly resembles *P. senecioides* L' Hérit.; but the latter is in essence a very different species with almost actinomorphic, 5-petalled flowers, each with five fertile stamens (van der Walt & Vorster 1988: 126–128). Material from near Windhoek, represented by *Merxmüller* 775 (SRGH), and *Seydel* 3631 (MO, SRGH), 4010 (MO, SRGH), and 4409 (MO), is neither *P. redactum* nor *P. senecioides* but probably an undescribed species.

Geographical distribution and habitat preference

This species has a wide distribution in a strip along the west coast of the Northern Cape Province and southern Namibia, from Vanrhynsdorp in the south to the vicinity of Aus in the north (Figure 2). It occurs in desert areas with low, scattered shrublets and grass tufts, usually but not invariably on deep, loose sand, with a predilection for open places such as sand washes in dry watercourses. The annual rainfall does not exceed 200 mm on average.

Doubtlessly its life cycle is triggered by rain, as evidenced by the complete absence of plants during dry years. Once the seeds

have germinated, growth tends to be rapid and plants can flower while still very small. Dry conditions after germination can result in very small and stunted individuals (e.g. *Dinter* 8065, Z), while favourable conditions lead to lush and sprawling individuals (e.g. *Giess* 14663, WIND) hardly reconcilable with the former.

Material examined

NAMIBIA

- 2615: Tschaukaib near Haalenberg (–DA), *Wendt s.n.* (WIND).
- 2616: Aus, 8 km north-east of (–CA), *Dinter* 8065 (Z); Farm 'Klein Aus' (–CA), *Kinges* 2238 (PRE); Farm 'Kubub' near Aus (–CB), *Giess* 14676 (PRE, WIND); Aus (–CB), *Dinter* 3656 (BOL, Z); Farm 'Augustfelde', 10 km north-east of Aus (–CB), *Giess* & *Van Vuuren* 615 (WIND); Namib flats between Neisip (–BC) and Eureka (–CB), *Merxmüller* & *Giess* 2893 (PRE, WIND); Farm 'Pad-daputs', 8 km west of Aus (–CC), *Van Vuuren s.n. sub STEU* 3814 (PRE).
- 2716: Udidab Mountain (–BB), *Müller* 811 (WIND); North of Rosh Pinah (–DD), *Giess* 14663 (PRE, WIND); Farm 'Zebrafontein, LUS 87' (–DD), *Merxmüller* & *Giess* 28748 (PRE, WIND), 28793 (PRE, WIND).
- 2818: Farm 'Bankwasser, WAR 139' (–AC), *Kotze s.n. sub Giess* 10491 (WIND).

NORTHERN CAPE PROVINCE

- 2917: Steinkopf (–BC), *Schlechter* 11499 (BOL); Springbok: Tkouberg (–DC), *Van der Schijff* 8116 (PRE).
- 2918: Areb, 27 miles north-east of Springbok (–AC), *Van der Westhuizen* 279 (PRE); Springbok: Farm 'Silverfontein' (–CC), *Drège* 7481 (P), *Van der Walt* 1394 (STEU).
- 3017: Arakup (–BB), *Schlechter* 11252 (PRE).
- 3018 Vanrhynsdorp: Grootklip (–DD), *Acocks* 19047 (PRE).

PRECISE LOCATION UNKNOWN

- Little Namaqualand, *Kraphol s.n. sub Marloth* 11144 (PRE), 1147 (PRE).

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Figure 1, from a watercolour by Mrs E. Ward-Hilhorst, is reproduced by courtesy of the Brenthurst Library. The research, of which this article is a result, is financed by the Foundation for Research Development and the University of Stellenbosch.

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