

OXALIDACEAE

A NEW SPECIES OF *OXALIS* FROM THE HANTAM-ROGGEVELD PLATEAU, NORTHERN CAPE, SOUTH AFRICA

Oxalis L. is a large genus of more than 800 species, and although world-wide in distribution, most of the species, some 90%, are concentrated in South-Central America (± 500 spp.) and South Africa (± 210 spp.). Among the South African species, all but a half-dozen are concentrated in the winter rainfall region, in the Fynbos and Succulent Karoo Biomes (Oberlander *et al.* 2002).

Although now over 60 years old, the revision of the South African species of *Oxalis* by Salter (1944) remains the only complete study of the genus in the subregion. Salter travelled extensively through the southwestern Cape and Namaqualand but the adjacent Hantam and Roggeveld escarpments remained mostly inaccessible to him, which is why a species as common and attractive as the one described here eluded him.

***Oxalis odorata* J.C. Manning & Goldblatt, sp. nov.**

Planta acaulescens stolonifera, foliis basalibus, foliolis (2)3 vel 4(5) ellipticis vel oblanceolatis ad anguste oblanceolatis, conduplicato-falcatis, emarginatis, (7–)10–15(–25) \times 2–5(–8) mm, pallide griseo-viridibus adaxiale minute papillato-puberulis, glabris, subglabris vel sparse pubescentibus, atroviridibus abaxiale callosis dispersis punctiformibus nigris, floribus lilacinis vel albis distale pallide lilacinis tubo viridi fauce viridi vel purpureo, grateodoratis, sepalis lanceolatis, acutis vel obtu-

sis 4–5 \times 1.0–1.25 mm, marginibus sparse ciliatis distale et callis aurantiacis angustis ad apicem et in medio, petalis oblique oblanceolatis 15–25 \times 5–7 mm, filamentis edentatis, antheris ellipsoideis.

TYPE.—Northern Cape, 3220 (Sutherland): 7 km south of Sutherland, top of Verlatekloof Pass, Farm Jakkalsvlei, seasonally wet clay flats, (–BC), 2 June 2007, Manning 3095 (NBG, holo.; MO, iso.).

Deciduous, acaulescent bulbous herb, not tufted. *Bulb* narrowly ovoid, 15–20 \times 7–10 mm; outer tunics papery, brown, minutely striatulate. *Rhizome* 25–100 mm long, bearing brown, papery scales and developing a slender stolon in each scale axil; aerial stem absent. *Leaves* 4–18, basal; petioles 10–40(–100) mm, glabrous or thinly patent-pubescent, reddish, outer dilated or scale-like below basal articulation; leaflets (2)3 or 4(5), elliptic or oblanceolate to narrowly oblanceolate, conduplicate-falcate, emarginate, (7–)10–15(–25) \times 2–5(–8) mm, pale matte greyish green and minutely papillate-puberulous adaxially, glabrous, subglabrous or thinly pubescent and darker green abaxially with scattered, punctiform, black calli. *Peduncles* 1-flowered, 12–30 mm long, mostly a little shorter than leaves, glabrous or thinly patent-pubescent, with 2 subopposite, subulate, glabrous bracts inserted in distal half 1–5(–7) mm below flower. *Flowers* tristylous, lilac or white flushed pale lilac, with pale

green, narrowly funnel-shaped tube, veins darker green or purple in throat, sweetly scented; sepals lanceolate, acute or obtuse, $4-5 \times 1.0-1.25$ mm, adpressed-pubescent or subglabrous with few short hairs towards base, margins sparsely ciliate distally, with narrow orange calli at apex and towards midline; petals adhering for ± 6 mm, obliquely oblanceolate, $15-25 \times 5-7$ mm; lamina obtuse, \pm twice as long as claw, glabrous or ciliate on outer margin, with or without several elongated calli near apex. *Stamens*: filaments erect, shorter 4–5 mm long, longer 6–7 mm long, longest 8–9 mm long and exerted ± 3 mm from tube, minutely glandular-pubescent, edentate; anthers ellipsoid, ± 0.75 mm long, yellow. *Ovary* densely hairy in distal half with a mixture of short, glandular hairs and longer, unicellular, eglandular hairs; locules 2-ovulate; styles minutely glandular-pubescent. *Capsules and seeds* unknown. *Flowering time*: mid-May to mid-June, rarely to late June. Figure 8.

Distribution and ecology: known from the summit of the Hantamsberg at Calvinia and from the Roggeveld Escarpment, from near Middelpos and Sutherland

(Figure 9). The species is locally common, forming large populations on seasonally wet flats or around the margins of ephemeral pools in shallow soil on dolerite sills, multiplying and spreading through the production of axillary stolons from the scales along the rhizome.

Diagnostic characters and affinities: the pale lilac flower of *Oxalis odorata* with a slight greenish or pink eye, is sweetly scented during the day. Floral fragrance in *Oxalis* is extremely rare, and its occurrence is not mentioned by Salter (1944). The leaves of *O. odorata* are highly distinctive, with a pale, greyish green, matte upper surface densely covered with minute papillae, contrasting with the smooth or sparsely pubescent, darker green underside. Electron microscopic examination of the leaf surface shows the adaxial epidermal cells to be relatively small, highly domed, and covered with a thick coating of epicuticular wax platelets (Figure 10A, B), which cause the characteristic greyish bloom on the leaf upper surface. The abaxial epidermal cells, in contrast, are larger, with a thick, laevigate cuticle lacking distinctive epicuticular wax deposits, and those over the midline are longitudi-

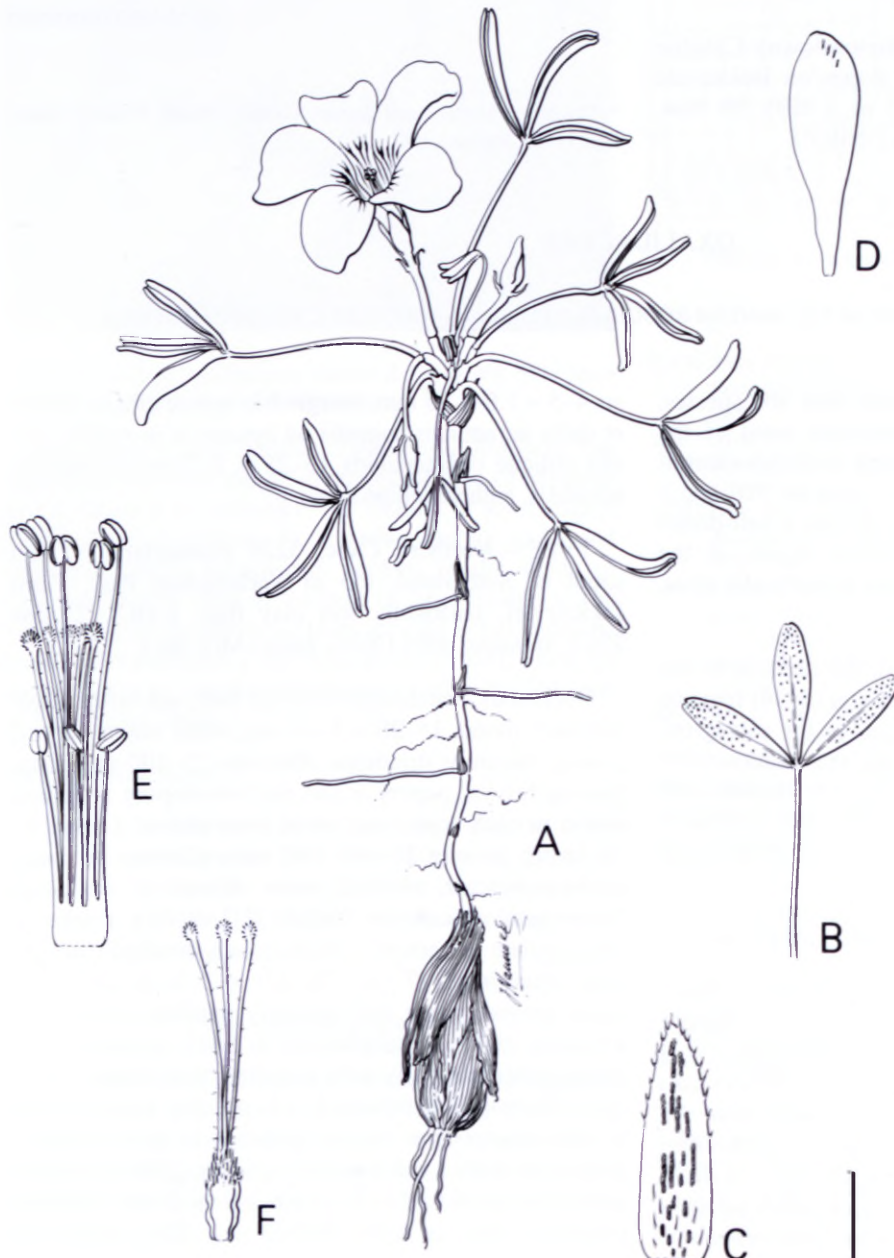


FIGURE 8.—*Oxalis odorata*, Manning 3095. A, whole plant; B, single leaf flattened out showing adaxial surface. C–F, floral details: C, detached sepal; D, detached petal; E, stamens and ovary; F, ovary (rear two styles not shown). Scale bar: A–C, 10 mm; D–F, 2 mm. Artist: John Manning.

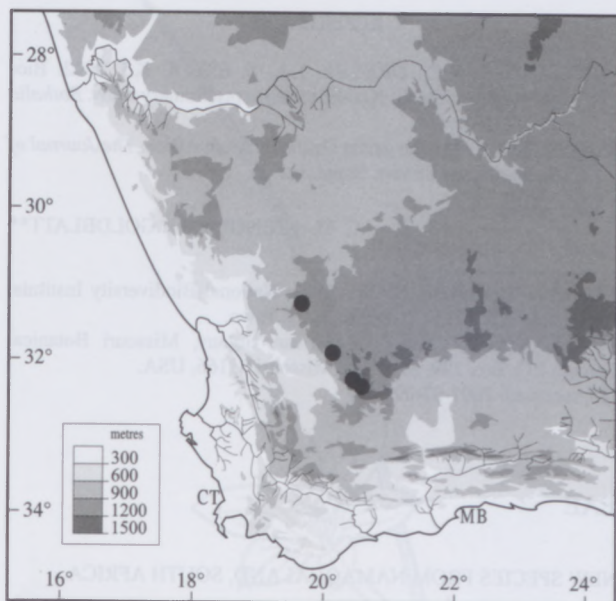


FIGURE 9.—Known distribution of *Oxalis odorata*.

nally elongated (Figure 10C). Stomata are restricted to the adaxial leaf surface, where they are protected by the conduplicate folding of the blade.

Salter (1944) divides the South African species of *Oxalis* with 1-flowered peduncles into eight sections. Among these, *O. odorata* keys out to section *Angustatae* Salter subsection *Lineares* Salter on the basis of its relatively narrow leaflets more than twice as long as broad. It is somewhat anomalous here in several features, notably its acaulescent habit and the elliptical leaflets that lack paired apical calli. In section *Latifoliae* Salter, however, three other species of *Oxalis* are known with similar discolorous, elliptical to ovate leaflets and mauve flowers with some sort of darker eye in the mouth of the tube (*O. callosa* R.Knuth, *O. petiolulata* L.Bolus and *O. stokoei* Weintraub) and the relationships of *O. odorata* are more likely to lie with them. Although not mentioned by Salter (1944), the pale greyish upper leaf sur-

face is characteristic of this small group of species. In this group, *O. petiolulata* from the Cedarberg has ebracteate peduncles and leaflets with broadly ovate leaflets bearing a single line of black calli along the margin. This contrasts with the bracteate peduncles and leaflets with scattered, punctiform calli found in the remaining two species as well as in *O. odorata*. Among these, *O. stokoei* from the Hex River Mountains is distinguished by its unusual, subfibrous outer bulb tunics that split into matted segments.

Thus, *O. odorata* is most likely to be confused with *O. callosa*, another early-blooming species endemic to the Bokkeveld Plateau and Hantam, and which also produces stolons from the rhizome. Several vegetative and floral characters separate the two. The bulbs in *O. callosa* are \pm ovoid and the species invariably produces trifoliolate leaves with obovate leaflets $6-8 \times 4-6$ mm, thus 1.5–2.0 times as long as wide, with the upper surface \pm smooth and the lower surface densely adpressed-pubescent and marked with reddish or orange calli; the calli on the sepals are marginal; and the flowers have a conspicuous dark red eye in the mouth. In contrast, *O. odorata* has narrowly ovoid bulbs and variably foliolate leaves, usually with 3 or 4 leaflets but not uncommonly up to 5, which are narrowly elliptical-oblongate and mostly $10-15 \times 2-5$ mm, thus (3–)4–8 times as long as wide, with the upper surface papillate-puberulous and the lower subglabrous or sparsely pubescent and marked with black calli; sepals with the calli concentrated towards the midline; and flowers with the central eye only weakly developed. In addition, *O. callosa* is not uncommonly caulescent and favours damp clay flats over shale, although it will also grow in dolerite outcrops, whereas *O. odorata* is strictly acaulescent and restricted to seasonally wet or waterlogged habitats over dolerite sills.

Additional specimens examined

NORTHERN CAPE.—3119 (Calvinia): summit of Hantamsberg, (–BD), 31 May 1999, Manning 2223 (NBG). 3120 (Williston): 66 km from Calvinia on Blomfontein road to Middelpos, (–CC), 4 June

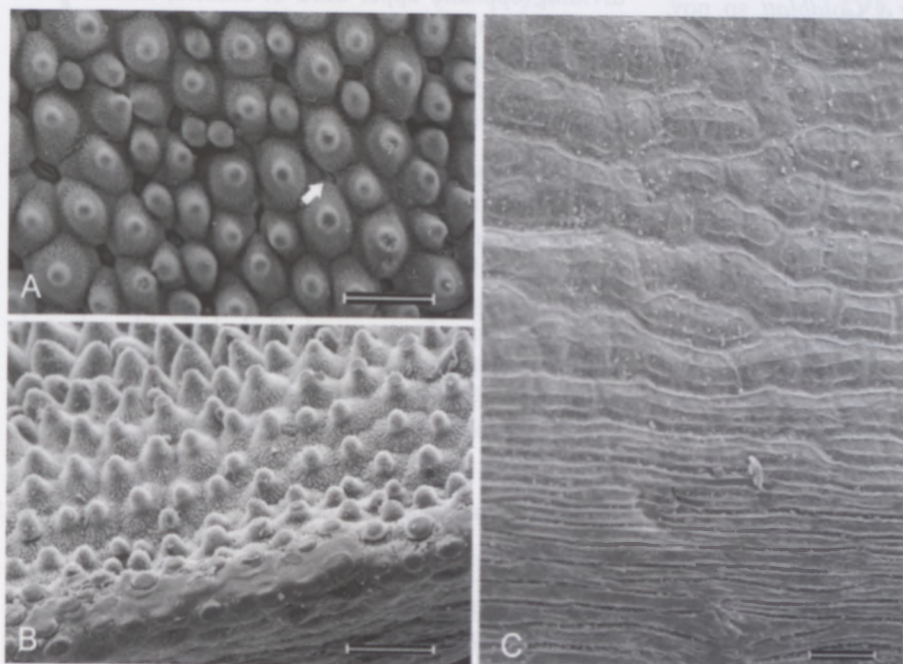


FIGURE 10.—Scanning electron micrographs of leaflet surface micromorphology. A, adaxial surface (stoma arrowed); B, leaflet margin; C, abaxial surface with longitudinally elongated epidermal cells with narrower epidermal cells along midline. Scale bars: 30 μ m.

1980, *Goldblatt 5533* (MO, NBG, PRE). 3220 (Sutherland): top of Verlatekloof Pass, (-DA), 26 June 1977, *M.B. Bayer 906* (NBG); 25 May 2003, *Manning 2808* (NBG).

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