

ASPHODELACEAE

BULBINELLA CALCICOLA, A NEW SPECIES FROM SALDANHA BAY, WESTERN CAPE

Bulbinella Kunth. is a small genus of rhizomatous geophytes with its primary centre of diversity in the winter rainfall region of southern Africa (17 spp.) and a secondary centre in New Zealand (6 spp.) (Smith & Van Wyk 1998; Perry 1999). This trans-Pacific disjunction places it among a handful of other geophytic genera with a similar distribution, namely *Dietes* (Iridaceae), *Wurmbia* (Colchicaceae), *Spiloxene* (Hypoxidaceae) and *Bulbine* (Asphodelaceae). *Bulbinella* is characterized among Asphodelaceae by its narrow racemes of long-lived, stellate flowers with a persistent perianth, smooth filaments, and a single pair of ovules per locule, developing into shield-shaped seeds.

The southern African species were comprehensively revised by Perry (1999), who emphasized the taxonomic value of vegetative features relative to floral and fruiting characters, which are almost invariant. She distinguished three groups of species based on a combination of foliage and root characteristics. The first, comprising the three largest species, is defined by distinctive orange-yellow roots thickened throughout their length, and leaves that diminish in size acropetally; a second group of six species, with the younger leaves markedly smaller than the older, has white-fleshed roots that are thin and wiry basally but swollen and spindle-shaped distally; and a third group, comprising the remaining eight species, is recognized by its ± equal leaves. The roots in this group, although always white, are variable in form, mostly swollen throughout but sometimes with some or all of the roots wiry basally and swollen distally. Flower colour in *Bulbinella* ranges from white or ivory through pale or deep yellow to orange. Although variable within the three allied species with yellow roots [*B. elata* P.L.Perry, *B. latifolia* Kunth., and *B. nutans* (Thunb.) T.Durand & Schinz], flower colour is almost consistent

in the remaining species. With the exception of *B. elegans* Schltr. ex P.L.Perry, which varies between pale yellow and white, all remaining species have flowers that are either white or bright yellow but never both.

Intensive documentation of the local limestone flora at Jacobsbaai, north of Saldanha on the west coast by local resident Jakobus (Koos) Claassens, has resulted in the discovery of several new species endemic to the area (Manning & Goldblatt 2008). His most recent find is a summer-flowering *Bulbinella* that resembles *B. triquetra* (L.f.) Kunth in several respects, notably the numerous, trigonous leaves with finely toothed margins, coarsely fibrous neck, and pure yellow flowers. The Jacobsbaai plants are, however, distinctive in their more numerous, broader leaves, which are dry and withered by the time that the elongate, narrowly cylindrical racemes of orange-tipped, bright yellow flowers appear in late November and December. *B. triquetra* itself has not yet been recorded from the Saldhana Peninsula (Perry 1999) and our first consideration was that the Jacobsbaai plants might represent a form of this species. We are, however, familiar with *B. triquetra* from flushes on granite rocks a few kilometres across the bay at Langebaan, where it produces corymbose racemes of canary-yellow flowers in August and September, contemporaneous with tufts of filiform leaves (Perry 3932 NBG; Manning & Goldblatt 1996). These characteristics are constant throughout other west coast populations of the species that we have examined, providing compelling evidence that the Jacobsbaai plants represent a distinct species which we describe here as *B. calcicola*.

***Bulbinella calcicola* J.C.Manning & Goldblatt, sp. nov.**

Bulbinellae triquetrae maxime similis, sed ab ea foliis latioribus 1.5–2.0 mm latis siccis sub anthesi, racemo

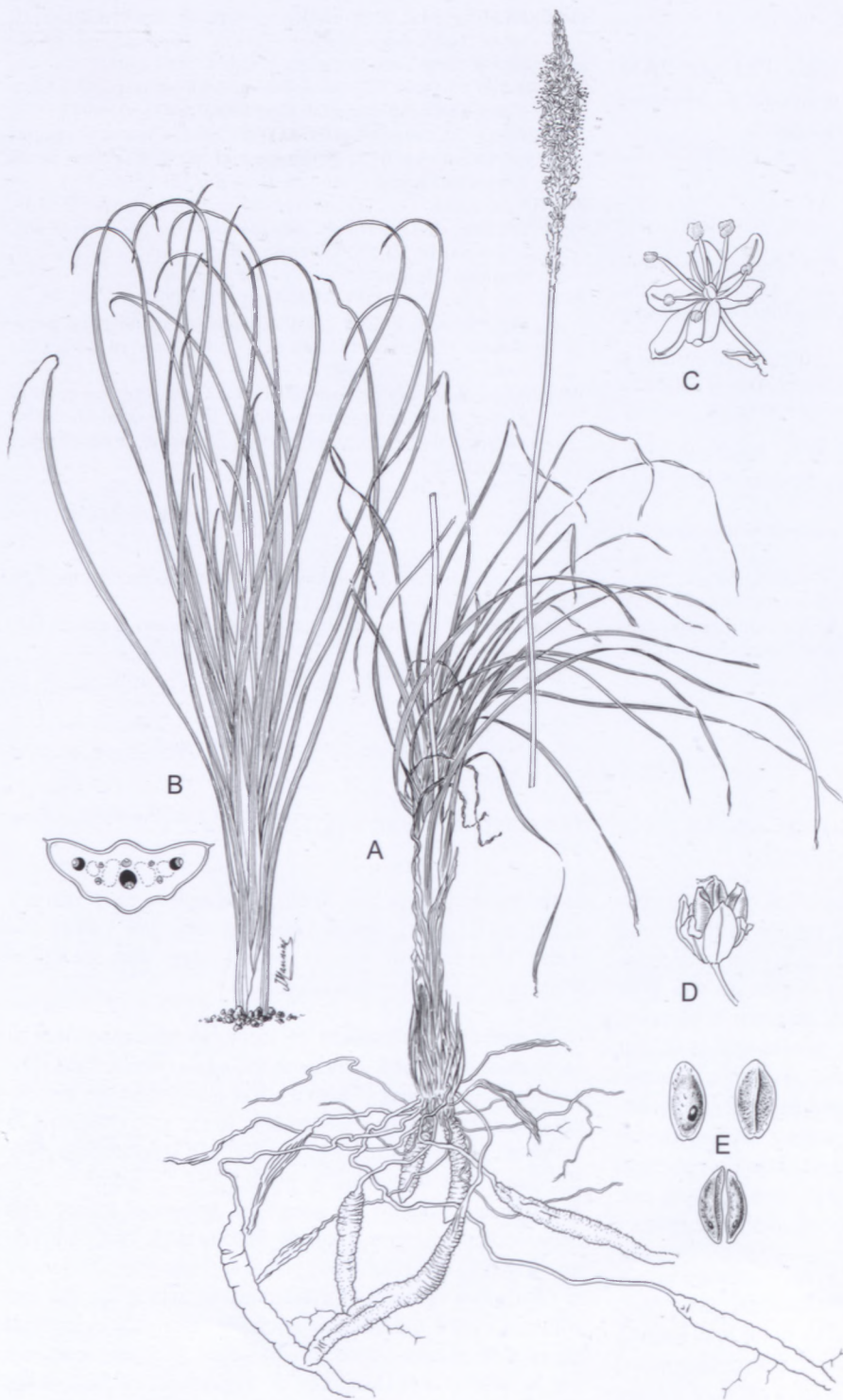


FIGURE 22.—*Bulbinella calcicola*, Claassens & Claassens 11 (NBG). A, flowering plant with persistent dry leaves; B, foliage in winter, with $\frac{1}{3}$ of leaf (much enlarged); C, flower; D, dehiscent capsule; E, seeds. Scale bar: A, B, 10 mm; C–E, 3 mm. Artist: John Manning.

anguste cylindrico \pm 10 mm diam., pedicellis brevioribus 3–4 mm longis et aestate florens distinguitur.

TYPE.—Western Cape, 3217 (Vredenburg): Jacobsbaai, (–DD), 8 December 2008, *J.G. & H.E. Claassens 11* (NBG, holo. ; K, MO, iso.).

Plants small to medium-sized, 300–500(–800) mm high, solitary. *Roots* fascicled, numerous, up to 180 mm long, some short and uniformly swollen but mostly with wiry basal portion and swollen, spindle-shaped distal section, 30–60 \times 5–6 mm, flesh white to pale pink. *Leaves* dry at flowering, 20–50, \pm subequal with only youngest, central leaves smaller, basal part expanded to form whitish, membranous sheath, outer leaf sheaths completely encircling inner leaves and scape; blade

linear, up to 630 \times 1.5–2.0 mm, slightly coiled or twisted distally, triquetrous in section with evident midrib on both surfaces when fresh but triquetrous-canalicate when dry, bright green, glabrous or minutely ciliolate-denticulate on margins and keel; fibrous sheathing neck 20–30 mm long, of coarse, straight, loose, bristle-like fibres. *Raceme* cylindrical or narrowly conical, 50–150-flowered, \pm 50 \times 10 mm in flower but elongating up to 200 mm in fruit and then slightly inclined; scape erect, 1–2 mm diam., reddish; bracts membranous, triangular-acuminate, broad-based, 2–3 \times 1.5–2.0 mm, colourless with reddish midrib; pedicels suberect, 3–4 mm long. *Flowers* stellate, 6–7 mm diam., bright yellow with greenish midrib and median orange streak near apex, slightly scented; tepals connate at base, elliptic-oblong, inner slightly broader, 3–4 \times 1.5–2.0 mm. *Filaments* filiform, suberect, adnate to base of tepals,

TABLE 3.—Diagnostic characters in *Bulbinella calcicola* and *B. triquetra*

Character	<i>B. calcicola</i>	<i>B. triquetra</i>
Leaves	linear-canaliculate, 1.5–2.0 mm wide	filiform, 1.0–1.5 mm diam.
Ethology	hysteranthus	synanthus
Flowering time	Nov.–Dec.	Aug.–Oct.(–Dec.)
Raceme width	narrowly cylindrical, \pm 10 mm	corymbose or cylindrical, 15–20 mm
Pediceal length	3–4 mm	5–8 mm
Perianth colour	yellow with orange tips	pure yellow
Habitat	limestone	granite, sandstone or clay

2.5–3.0 mm long, yellow. *Ovary* ovoid, \pm 1 mm long, 3-lobed; style filiform, 1.5–1.8 mm long. *Capsule* ovoid, 3.0–3.5 \times 2.0–2.5 mm, reddish brown, partially concealed by persistent, papery perianth. *Seeds* solitary or paired per locule, shield-shaped, slightly convex on outer surface but strongly keeled on inner surface, 3.0–3.5 \times \pm 1.8 mm when solitary but only \pm 0.8 mm wide when paired, with narrow, membranous, peripheral wing, dull black with glossy spot (sarcotestal ostiole) on basal face, sarcotesta with radially scattered, pale idioblasts. *Flowering time*: late November to December. Figure 22.

Distribution and habitat: apparently restricted to Jacobsbaai north of Saldanha (Figure 23), where plants occur on rocky limestone outcrops in Saldanha Limestone Strandveld, a rare coastal vegetation type almost entirely limited to the Saldanha Peninsula and rich in Red Data species (Mucina & Rutherford 2006).

Indications are that the species is highly localized to a few calcrete outcrops in relatively open vegetation. The main population of \pm 300 plants occupies an area \pm 40 \times 40 m in extent, with an additional three much smaller populations, comprising between 5 and 30 plants, within 500 m of the main group (J. Claassens pers. comm.).

Diagnosis and relationships: its numerous, \pm subequal leaves place *Bulbinella calcicola* in Perry's (1999) third group of species, where it most resembles *B. triquetra*. *Bulbinella triquetra* is distinguished by its filiform leaves, 1.0–1.5 mm wide, sheathed by coarse, bristle-like fibres, contemporaneous with the corymbose to cylindrical raceme, 15–20 mm in diameter, of pure yellow flowers borne on longer pedicels, 5–8 mm long, and (in some populations) spindle-shaped roots with wiry basal parts (Table 3). *B. triquetra* is widespread through the south-western Cape, favouring seasonally damp flats and flowering mainly in spring, August to October but as late as December at higher altitudes. It is restricted to organic-rich sandy or clay

soils, and has never been collected on limestone or calcrete (Perry 1999).

Bulbinella calcicola, in contrast, produces broader, canaliculate leaves, 1.5–2.0 mm wide, that are dry and withered at flowering, and narrowly cylindrical racemes, \pm 10 mm in diameter, of distinctly orange-tipped flowers on shorter pedicels 3–4 mm long. Flowering in the species, which grows near sea level, is delayed until late November and December, at the height of summer.

A similar morphological-temporal relationship appears to exist in another pair of species, *Bulbinella caudafelis* (L.f.) T. Durand & Schinz, which produces racemes \pm 30 mm in diameter of pink-tipped flowers from late August to December, and *B. graminifolia* P.L. Perry, which produces narrower racemes \pm 15 mm in diameter of pure white flowers from July to mid-August (Perry 1999).

Selected additional specimens examined

Bulbinella triquetra

WESTERN CAPE.—3318 (Cape Town): Langebaan, (–AA), 30 August 1995, Perry 3932 (NBG); Darling Flora Reserve, (–AD), 4 October 1956, Barker 8647, Lewis 5071 (NBG); Mamre Hills, (–AD), 26 September 1941, Compton 11776 (NBG), 22 September 1942, Barker 1823 (NBG); Ganzekraal, (–CB), 15 September 1940, Compton 9447 (NBG); Rondebosch Common, (–CD), 7 September 1982, Edwards s.n. (NBG); Sewefontein above Kuilsrivier, (–DC), 2 October 1973, Oliver 4735 (NBG).

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J.C. MANNING* and P. GOLDBLATT**

* Compton Herbarium, South African National Biodiversity Institute, Private Bag X7, 7735 Claremont, Cape Town.

** B.A. Krukoff Curator of African Botany, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166, USA.
MS. received: 2009-11-05.

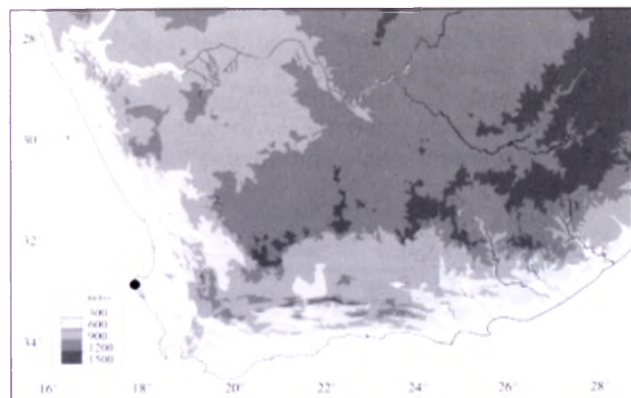


FIGURE 23.—Known distribution of *Bulbinella calcicola*.

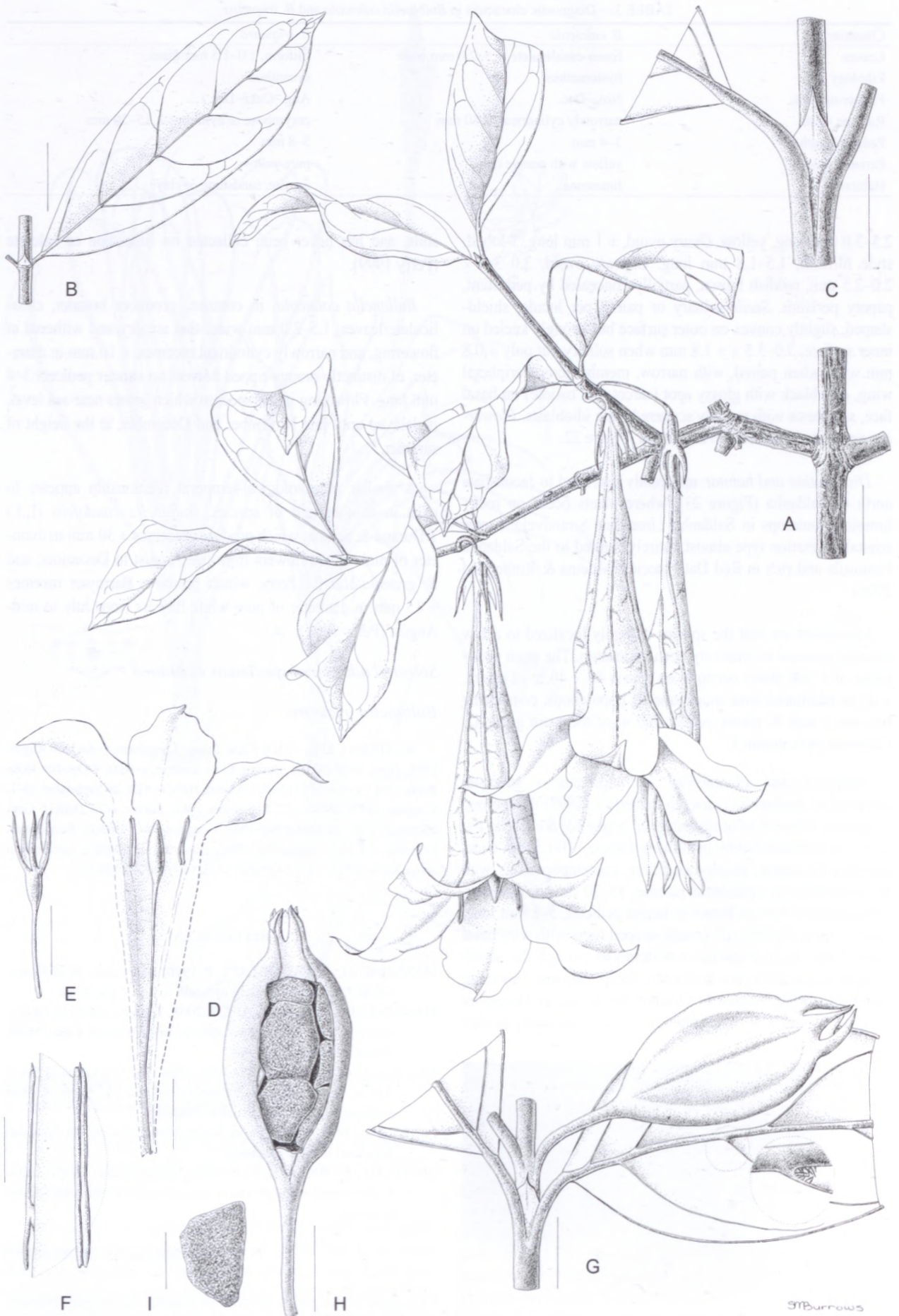


FIGURE 24.—*Didymosalpinx callianthus*. A–F, Burrows & Burrows 10998: A, flowering branch; B, leaf; C, stipule and petioles; D, flower with tube cut away; E, calyx; F, anther and anther attachment view. G–I, Burrows & Burrows 11285: G, fruiting branch; H, fruit, with seeds exposed; I, seed. Scale bars: A, B, D, E, 20 mm; G, H, 10 mm; C, F, I, 5 mm. Artist: Sandra Burrows.