

The rediscovery of *Albuca tenuifolia*, an orophilous species from the eastern Great Escarpment in South Africa

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Albuca tenuifolia Baker was described and illustrated in 1872 from South African material sent by Peter MacOwan to William Wilson Saunders in England, without a precise locality. Since then this species has been cited in later works although with many uncertainties. In addition, no type has been designated for this taxon. After field work in the Great Escarpment in South Africa, some populations of *A. tenuifolia* have been rediscovered growing in rocky places at high altitude. Data on morphology, ecology, and distribution are reported, and a lectotype and epitype are designated to fix the use of the name. Affinities with other species are also discussed.

Albuca L. as traditionally circumscribed includes about 60 species (cf. Speta 1998, Manning et al. 2002). Recently, very different circumscriptions of *Albuca* have been presented based on molecular studies. On the one hand, Manning et al. (2004) synonymised *Albuca* in *Ornithogalum*, but later Manning et al. (2009) accepted *Albuca* as an enlarged genus to include other groups such as *Stellarioides* Medik., *Coilonox* Raf., and *Ornithogalum* subg. *Urophyllon* (Salisb.) Baker pro parte, reaching a total of 110–140 species. On the other hand, Martínez-Azorín et al. (2011a) presented results recovering the monophyly of *Albuca* as traditionally circumscribed, and allowing easy differentiation from other related genera such as *Coilonox*, *Stellarioides*, *Trimelopter* Raf. and *Battandiera* Maire.

Baker (1897, 1898) wrote the only comprehensive revision of *Albuca* s.s., mostly focusing on South African and tropical African taxa. Recent accounts by Müller-Doblies (1994, 1995, 2006) and Manning and Goldblatt (2009) have greatly improved the knowledge of groups with nodding flowers, namely *A.* subg. *Albuca* and *A.* subg. *Falconera* (Salisb.) Baker. However, information on groups with erect flowers, e.g. *A.* subg. *Mitrotepalum* U. Müller-Doblies (= *A.* sect. *Branciona* (Salisb.) J. C. Manning & Goldblatt), has remained almost unchanged from the late 19th century, and is the focus of our current research (cf. Martínez-Azorín et al. 2011b). Furthermore, identification keys are lacking for all currently accepted taxa of *Albuca*, and many of them still poorly known or in need of further studies (cf. Phillips 1926, Dyer 1947).

One of these taxa is *Albuca tenuifolia* Baker, a name published by Baker (1872a) from South African material

sent by Peter MacOwan to London, though without indication of a precise locality.

A brief story of a poorly known species

Albuca tenuifolia was described and illustrated by Baker (1872a) in July of that year (cf. Stafleu and Cowan 1985) from plants grown by William Wilson Saunders (Reigate, England), which were sent “by Mr M’Owan, of Gill College, Somerset East, Cape of Good Hope”. The characters mentioned by Baker (1872a) are: bulb ovoid, with membranous outer tunics, not crowned with setose fibres; leaves 6–9 per stem, filiform, 15 cm long, scarcely more than 1 mm wide, suberect, round on the back, channelled on the face, bright green, minutely glandulose-papillate; stem slender, 10–15 cm long; flowers 3–4 in a lax, erect corymb; pedicels erect-patent, 5–8 cm long; bracts lanceolate, 13–18 mm long; tepals 18–20 mm long, yellow with a broad green band, the outers rather exceeding the connivent inner three; stamens all fertile, but the outer anthers much smaller; style obversely pyramidal, equalling the ovary; the stigma just on a level with the top of the anthers. In the protologue no herbarium voucher was mentioned, but a detailed illustration (Fig. 1) was provided from which some important morphological characters can be added. The single plant shows an ovoid-depressed bulb with a long oblong sessile curved offset that bear two filiform leaves; tepals yellow with their basal portion white, bearing a longitudinal green band; and an ovoid or polygonal (probably immature) capsule in outline, with divergent paraseptal prominent crests.



Albuca tenuifolia, Baker

Figure 1. *Albuca tenuifolia* Baker. Lectotype (designated here): Iconotype from Baker (Saunders) (1872, t. 335).

In later accounts, Baker (1872b) remarked again that this species was described from specimens cultivated by Saunders, which were collected in “Cap. B. Spei”. Some years later, Baker (1897) included *A. tenuifolia* in his ‘Flora Capensis’ and cited: “South Africa: without locality, MacOwan. Not in Kew herbarium”. Only one collection labelled *Albuca tenuifolia* is extant at Kew (P. Wilkin pers. comm.), a plant of cultivated origin with the label “Comm. W. E. Ledger, esq., who grew it from bulbs received from the Jardin des Plantes, Paris. 30 Mar 1908”. This collection includes only a single inflorescence of at least 70 cm long,

with very long pedicels and lacking bulbs and leaves. This does not match the morphology of *A. tenuifolia*.

Later Schönland (1905) cited a specimen of *A. tenuifolia* from Hankey (Paterson 25, GRA), and also recorded the species from Brakkloof, Grahamstown (cf. Schönland 1907) and Redhouse (cf. Schönland 1919), though without indication of any voucher. Similarly, Fourcade (1941) recorded this species from Humansdorp and Uniondale and later Martin and Noel (1960) did the same for the Albany and Bathurst districts, in both cases again without indication of any collection.

The collection Paterson 25 (GRA) comprises a poorly conserved inflorescence, composed of at least 6 flowers with pedicels of similar length, and three filiform unconnected leaves, the peduncle and leaves have long stipitate gland. These characters, together with its different habitat (karrooid lowlands), do not fit into the *A. tenuifolia* concept, and this specimen is therefore not considered further. Similarly, citations from the lowlands of Uniondale to Albany (cf. Schönland 1907, 1919, Fourcade 1941, Martin and Noel 1960) probably refer to other species with narrow to filiform leaves, probably *Albuca shawii* Baker.

Other collections labelled *A. tenuifolia* from GRA (White 96, Taylor 5, Dyer 2162, 2327) include plants with nodding flowers, leaves, peduncle and pedicels covered by long stipitate glands, not matching the protologue of *A. tenuifolia*. These collections come from lowlands in the Eastern Cape and must be included in *A. shawii*.

The most recent check list of southern African plants refers to *A. tenuifolia* as of unknown distribution (cf. Manning and Goldblatt 2003).

As a result of the field work carried out by Clark et al. (2009), Clark (2010) and Cameron McMaster, plants fitting the description of *A. tenuifolia* were found growing on rocky places at high altitude in several localities in the Sneeuwberg, Great Winterberg-Amatola and Stormberg mountains (Eastern Cape Province), with an outlying population found by Charles Craib in the Steenkampsberg (Mpumalanga Province). Among Eastern Cape localities is the Boschberg, a mountain of ca 1500 m a.s.l. located behind Somerset East, where MacOwan based most of his research (Gunn and Codd 1981, Clark et al. 2011). These plants are locally abundant on the Boschberg summit, and it is likely that MacOwan's plants were sent to Saunders from here.

According to the above information, new data on morphology, ecology, and distribution of *Albuca tenuifolia* are reported, and a lectotype and an epitype are selected below because no original herbarium material has been found.

Material and methods

Herbarium specimens from the following herbaria were studied: BOL, BNRH, GRA, J, K, KEI, KMG, NBG, NH, NU, PEU, PUC, UFH, WIND (acronyms according to Thiers 2011). A detailed morphological study of this species was undertaken based on plants from natural populations. Authors of the cited taxa follow IPNI (2011).

Albuca tenuifolia Baker (Saunders) (1872, t. 335)

Lectotype designated here (Fig. 1): Baker (Saunders) (1872, t. 335).

Epitype designated here (Fig. 2): Eastern Cape, Somerset East, summit of Boschberg, northeast of Bloukop, in shallow soil on rocky places, 1574 m a.s.l., 10 May 2010, V. R. Clark and M. Martínez-Azorín 23 (GRA) (duplicates indicated in 'Additional specimens examined').

Bulb hypogaeal, 15–40 × 5–20 mm, ovoid to oblong, proliferous, sometimes constricted transversally to accommodate the bulbils; outer tunics membranous, white to brown; offsets sessile, 1–2 cm long, long ovoid to oblong, tuberose, arising from the base of the bulb, curved and ascending; roots up to 70 × 3 mm, fleshy, somewhat thickened, numerous. Leaves 4–9 per scape, filiform, up to 25 cm long × 1.0–1.2 mm wide, suberect or spreading-prostrate, terete, rounded on the back, and slightly channelled on the upper face (sometimes with polygonal spirally twisted section), bright green, minutely papillose on all surfaces (only visible under microscope). Stem erect or curved, 4–17 cm long, glabrous. Inflorescence a 3–4(5)-flowered corymb, 4–7 cm long; pedicels 3–7 cm long, glabrous, erect-patent, the lowermost pedicels much longer and usually overtopping the uppermost pedicels; bracts lanceolate to triangular, long acuminate, 5–25(40) × 3–7 mm, green or reddish and papery when dry, with wide and white membranous margins and a central green or brownish band coincident with aggregated nerves that converge at the tips, much shorter than pedicels. Flowers erect; tepals mostly yellow with the lower third white, bearing a median green stripe 2–3 mm wide, with bright yellow tips; outer tepals 17–21 × 5–7 mm, lanceolate-oblong, with apex slightly cucullate or apiculate; inner tepals 13–17 × 6–8 mm, ovate, with a strongly cucullate yellow apex ca 2 mm long. Stamens all fertile; outer filaments 9–10 × 1.2–1.5 mm, linear lanceolate to narrowly oblong, not pinched down, somewhat fleshy and channelled along their length on their adaxial side, outer anthers 1.5–2.0 mm long, fertile; inner filaments 10–11 × 1.5–2.5 mm, linear oblong, wider and pinched in the lower half, inner anthers 3–4 mm long, fertile. Ovary ca 4.0 × 2.5–3.0 mm, subsphaerical to obovoid, green, stipitate, with prominent paraseptal crests divergent in the lower part and forming three prominent tuberculate ridges; style 8–10 × 1.5–2.0 mm, yellow, narrowly obpyramidal or clavate, trigonous, stigma yellow to orange, trigonous, flattened, depressed or ending in a conical structure disposed among the three erect lobes. Capsule 13–15 × 10–11 mm, ovate, trigonous to subsphaerical in section, pale brown when mature; valves splitting in upper quarter. Seeds ca 3–5 × 2–3 mm, dark brown to black, flattened and semidiscoidal, biseriate and horizontally stacked in each locule.

Etymology

The specific epithet '*tenuifolia*' refers to the slender, filiform leaves.

Habitat and distribution

Albuca tenuifolia is associated with rocky areas, favouring cliffs and scarp crests. It occurs in moist, shallow, humic-rich, loamy-clay and clay soils, or wedged in cliff crevices, on dolerite and basalt. It occurs singly, in small groups, or in abundant colonies in Karoo Escarpment Grassland, Amathole Montane Grassland, Stormberg Plateau Grassland and Drakensberg Amathole Afromontane Fynbos (Mucina and Rutherford 2006, Clark et al. 2011). It appears to tolerate full sun to deep shade, but is more

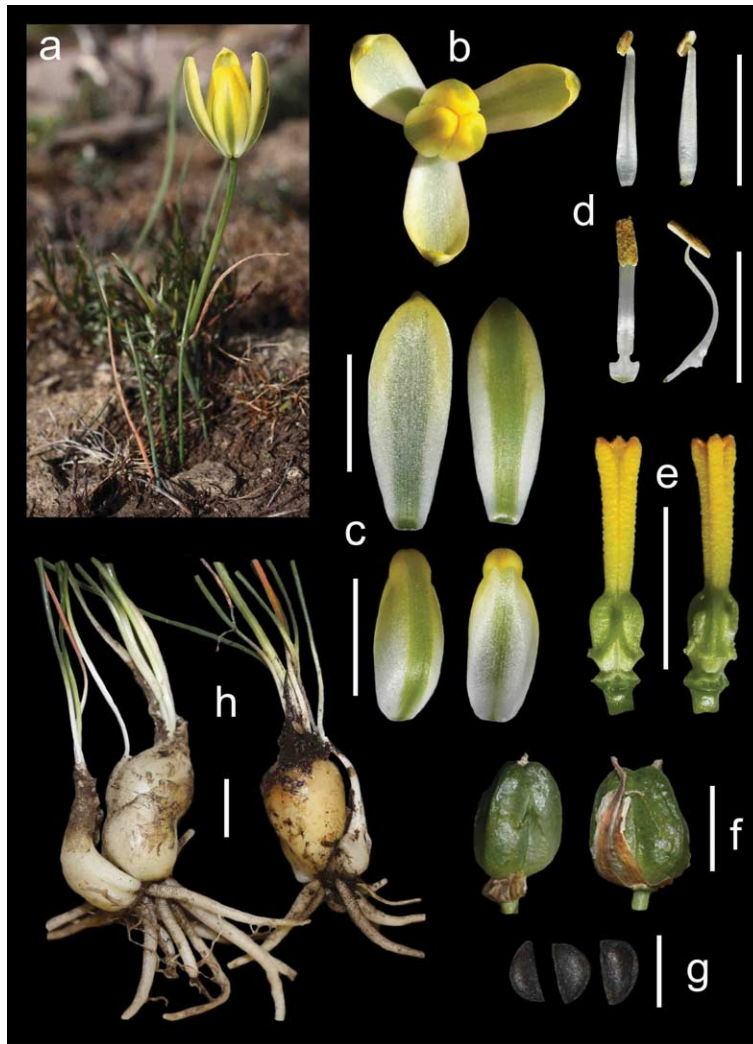


Figure 2. *Albuca tenuifolia* Baker. Eastern Cape, Somerset East, summit of Boschberg (epitype selected here: Clark and Martínez-Azorín 23 GRA): (a) general view, (b) flower in frontal view, (c) tepals, outer (above) and inner (below), (d) stamens, outer (above) and inner (below), (e) gynoecium, lateral view, (f) capsules, lateral view, (g) seeds, (h) bulb with offsets and leaves. Scale bars: (c)–(f), (h) = 1 cm, (g) = 5 mm.

partial to shaded southern aspects and moist exposed positions.

Albuca tenuifolia occurs in the Sneeberg, Great Winterberg-Amatola and Stormberg mountains, with an outlying population in the Steenkampsberg in Mpumalanga (Fig. 3). New populations are expected to exist in the connecting territories with similar ecological conditions.

Phenology

Albuca tenuifolia flowers in Nov–Jan, though some individuals were found in flower in May (Boschberg). Seeds are released in Jan–Mar.

Diagnostic characters and similar species

Albuca tenuifolia can be easily identified by its hypogean and proliferous irregularly compressed bulbs; filiform, numerous, minutely papillate (only visible under microscope) leaves; glabrous peduncle and pedicels; erect pale yellow flowers with all six stamens bearing fertile anthers; the

subglobose ovary with divergent paraseptal crest; and the long narrowly obpyramidal trigonous style (Fig. 2).

Other species have been described with similar narrow leaves inhabiting high mountain places in the Drakensberg, such as *A. rupestris* Hilliard & B. L. Burtt and *A. humilis* Baker. However, *Albuca rupestris* differs from *A. tenuifolia* by its wider canaliculated leaves (up to 6 mm), its outer stamens with sterile (not bearing pollen) anthers ca 1 mm long, and its slightly longer ovary (ca 6 mm), and it is distributed in the Natal Drakensberg between the Umkomaas and Ngwangwane rivers, at altitudes between 1600–2600 m a.s.l. (2929CB, –CC, –CD; Hilliard and Burtt 1985). Furthermore, these authors cited an outlying specimen of *A. rupestris* from much further north (Newcastle district, Normandien Pass, Hilliard 2373 E, NU), only differing by the shorter bracts. After studying a wild population of *Albuca rupestris* from Bamboo Mt, near its type locality (e.g. Martínez-Azorín et al. 495 GRA), we conclude that this species shares with *A. tenuifolia* the filiform leaves with minute papillae, and its outer anthers vary from almost absent up to 1.8 mm long, though lacking

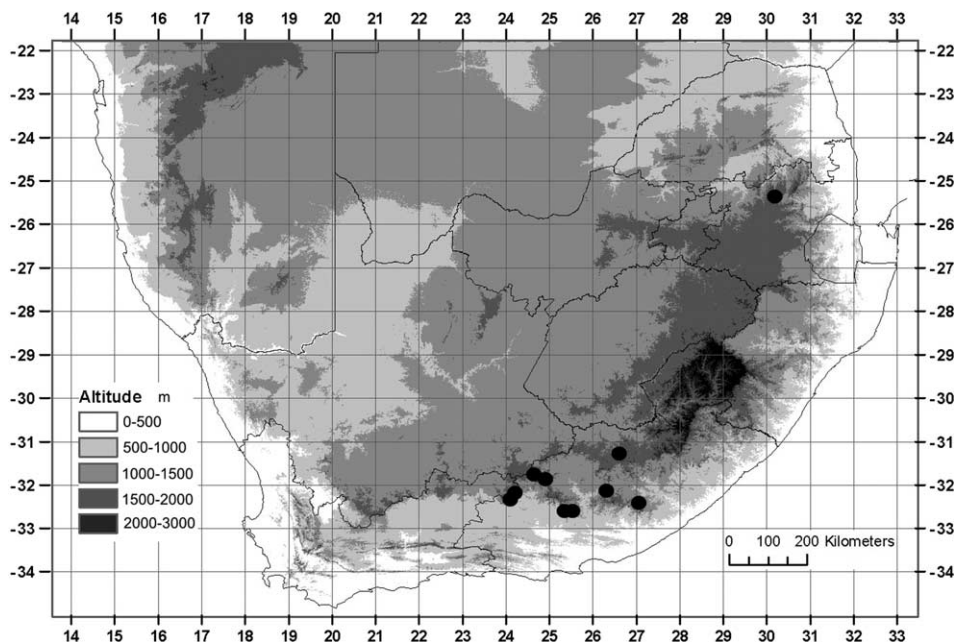


Figure 3. Known distribution of *A. tenuifolia* Baker in South Africa (●). Axes show longitude and latitude in degrees.

pollen grains. Further studies are needed to elucidate relationships between these two closely related species. Moreover, the presence of one population of *A. tenuifolia* in Mpumalanga could evidence a link between these two taxa.

Albucca humilis was described from Tabamhlope Mountain, Natal, from 2000–2300 m altitude, and shows erect flowers, tepals white with a reddish to brown central band, glabrous leaves, and the style as long as the ovary (Baker 1895, 1897).

Additional specimens examined

Eastern Cape Province: 3124CA, Middelburg district, Compassberg, in sand wet rocks on north- and west-facing slopes, 7000 ft, 25 Dec 1951, E. Esterhuysen 19726 (BOL); Eastern Cape Province: 3225DA, Somerset East District, Boschberg Nature Reserve, on summit of Boschberg near Bloukop, 32°42'3"S, 25°31'46"E, 1550 m a.s.l., 5 Dec 2008, V. R. Clark, R. Daniels, J. A. Le Roux and M. Fabricius 291 (NBS, GRA); Eastern Cape Province: 3225DA, Somerset East District, Boschberg Nature Reserve, on summit of Boschberg above Rooikrans, 32°41'44"S, 25°36'07"E, 1430 m a.s.l., 11 Jun 2010, V. R. Clark and M. Martínez-Azorín 180 (GRA); Eastern Cape Province: 3225DA, Somerset East District, summit of Boschberg, northeast of Bloukop, in shallow soil on rocky places, 1574 m a.s.l., 10 May 2010, V. R. Clark and M. Martínez-Azorín 23 (GRA, K, PRE); Eastern Cape Province: 3225DA, Somerset East District, Boschberg, near Charlton Falls, between homestead and Falls along upper valley of Naudesrivier, 32°40'39"S, 25°37'17"E, 1200 m a.s.l., 11 Dec 2008, V. R. Clark, R. Daniels, J. A. Le Roux and M. Fabricius 498 (NBS); Eastern Cape Province: 3124DD, Graaff-Reinet/Middelburg District, Sneeberg, saddle southeast of the Wapadsberg, Farm Springfontein 313, 31°52'55"S, 24°54'53"E, 2037 m a.s.l., 11 Dec 2007, V. R. Clark and C. Pienaar 56 (GRA); Eastern Cape

Province: 3224AA, Graaff-Reinet District, in cliffs of Koudeveldberge, Farm Onbedacht 294, 32°10'4"S, 24°2'45"E, 1850 m a.s.l., 21 Nov 2006, V. R. Clark and T. Te Water Naude 59 (GRA); Eastern Cape Province: 3224AA, Graaff-Reinet District, Koudeveldberge, Farm Mordendal 35, in wet cliffs below Kafferskop, 32°11'26"S, 24°2'7"E, 1800 m a.s.l., 16 Dec 2007, V. R. Clark and C. Pienaar 368 (GRA); Eastern Cape Province: 3226AB, 'Martha', Tarkastad District, 32°05'50"S, 26°20'50"E, 1923 m a.s.l., 6 Dec 2010, V. R. Clark and R. Daniels 36 (GRA); Eastern Cape Province: 3126BB, Molteno District, Stormberg, Farm Noordhoek 7, 31°15'30"S, 26°33'30"E, 2000 m a.s.l., 7 Dec 2010, V. R. Clark and R. Daniels 202 (GRA); Eastern Cape Province: 3227AC, Windvogel Mt, Cathcart, 22 Jan, C. McMaster s.n. (photographic voucher); Mpumalanga Province: 2530AA, summit of the Steenkampsberg, about 1 km east of the dirt road turn off to Nederhorst, in seepage areas beside rocks, 2300 m a.s.l., 16 Jan 2011, C. Craib s.n. (GRA).

Notes

One specimen from GRA, listed as *A. tenuifolia* (MacOwan 1851, GRA) was sent on loan to U. and D. Müller-Doblies in 1979, and has not yet been returned. This specimen should be considered for future treatments.

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