

## HYACINTHACEAE AND CRASSULACEAE

### TWO NEW CREMNOPHILOUS TAXA FROM SEMI-ARID REGIONS IN SOUTH AFRICA

Cliffs are avoided by most humans due to their hazardous nature. They represent one of the most unexplored habitats in South Africa and perhaps elsewhere on the globe. Small wonder that recent studies on cliff faces in South Africa have revealed several new succulent plant taxa (Van Jaarsveld 1998, 1999, 2001), some described below. Many succulent plants grow oppor-

tunistically on cliffs, whereas the described taxa below are mainly encountered on cliffs. Such plants are termed obligate cremnophytes (*cremno* is from the Greek word for cliff and '-phyte' is derived from the Greek word *phuton*, meaning plant). Cliffs are thus their sole habitat and refuge. Due to the vertical nature of cliffs, water runoff is extreme, resulting in a mostly very dry habitat in

which succulents are often a conspicuous feature in South Africa. Cliffs are commonly encountered throughout the mountainous parts of South Africa from the coast to the high Drakensberg escarpment at 3 000 m altitude. The vegetation of the dry river valleys of the Little Karoo and the northern part of Eastern Cape (formerly known as the Transkei) has not been well explored.

#### HYACINTHACEAE

1. *Albuca thermarum* Van Jaarsv., sp. nov., a *A. cremnophila* Van Jaarsv. & A.E.van Wyk foliis brevioribus basibus persistentibus rete fibrosum facientibus, floribus non secundis differt.

*Inflorescentia* ramosa, patens vel pendula, 400–800 mm longa; pedunculo 260–320 mm longo; bracteis acuminatis, 20–30(–45) × 8–10 mm; pedicellis adscendentibus vel erectis, basin versus 105–110 mm longis, apicem versus minoribus, prope apicem ad 35 mm longis. *Flores* erecti, tepalis luteoviridibus.

TYPE.—Western Cape, 3321 (Ladismith): Badspoot, near Calitzdorp Spa, sheer rock face, (–DA), 3-7-1994, *Van Jaarsveld 14152* (NBG, holo.).

Evergreen, solitary, bulbous plants. *Bulb* hypogeous (rarely epigeous), ovoid, up to 70 × 55 mm; tunics fleshy, imbricate, persistent, drying grey and exposing fibrous network. *Roots* fleshy, white, up to 3 mm diam. *Leaves* in an apical rosette, oblong, linear-attenuate, 300–550 × 20–30 mm, curved and drooping, channelled for most of their length, succulent, firm, dark green, glabrous, faintly striated, but more so on adaxial surface; apex acute. *Inflorescence* a spreading to pendulous raceme, 400–800 mm long; peduncle 260–320 mm long; bracts acuminate, 20–30(–45) × 8–10 mm, green with white translucent margin; scape 8–10 mm diam. at base; pedicels ascending to erect, 105–110 mm long at base becoming smaller, up to 35 mm long near top. *Flowers* erect; tepals yellowish green, tips yellow to yellowish green, becoming white lower down, but with a distinct green median stripe ± 3 mm wide; outer tepals strap-shaped, up to 25 × 7 mm, apex cucullate; inner tepals ovate, 20–21 mm long. *Stamens*: anthers oblong, versatile, outer up to 2.5 × 1.5 mm, inner up to 3.5 × 2.5 mm; filaments up to 15 mm long, up to 2 mm in diameter at base (flattened); inner up to 13 mm long with a distinct, short, channelled constriction ± 4.5 mm from base, lower third broadly triangular ovate (3 mm wide at base), margin membranous; apices of both inner and outer filaments projected forward and adpressed against style. *Ovary* oblong, 3-angled, up to 7 × 4 mm, stipitate for up to 1.5 mm, each angle with a raised emarginate base; style linear-trigonous, clavate, up to 9 × 2 mm; stigma yellowish green. *Capsule* up to 18 × 10 mm, grey-brown; valves splitting in upper quarter. *Seeds* flat, 5–6 × 3 mm, angular and distinctly wrinkled, blackish brown. *Flowering time*: October and November; seeds are released towards end of November/early December. Figure 13.

*Albuca thermarum* is characterized by its solitary bulb, pendulous or curved, firm, channelled, dark green leaves and yellowish green flowers. It is at once distinguished from *A. cremnophila* by the persistent leaf bases exposing the fibrous network of old leaves, as well as its

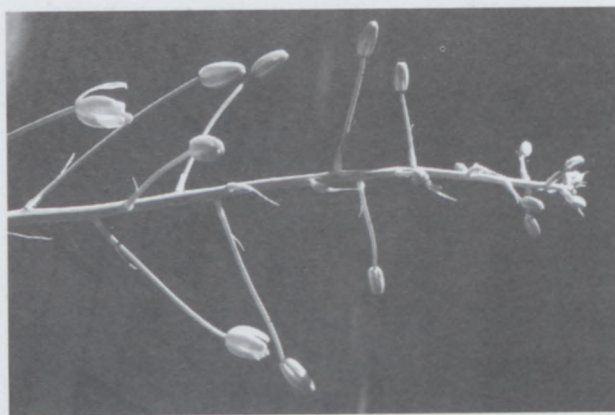


FIGURE 13.—Inflorescence of *Albuca thermarum*.

flowers which are not secondly arranged. *Albuca cremnophila* is larger than *A. thermarum*, its leaves have a basal abscission layer and are therefore shed and do not develop a fibrous network.

Plants of *Albuca thermarum* are usually found firmly wedged in rock crevices or pockets on sheer cliff faces of the Bokkeveld Group (Cape Super Group) at Badspoot near Calitzdorp Spa (Figure 14). The substrate is slightly acidic quartzitic sandstone. Associated species include *Aloe comptonii*, *Crassula badspootense*, *C. perforata*, *C. rupestris*, *Cotyledon tomentosa* subsp. *tomentosa*, *Haworthia integra* var. *rycroftiana* and *Senecio ficoides*. Plants thrive in cultivation and when planted in containers the leaves become pendent. Unlike *A. cremnophila*, the fruiting capsules do not fully dehisce, resulting in slower seed release. The extended inflorescence and flat seeds suggest dispersal by wind. The specific epithet *thermarum* pertains to the nearby Calitzdorp Spa or thermal spring where the plant was first recorded.

#### CRASSULACEAE

2. *Crassula foveata* Van Jaarsv., sp. nov. a *C. cymbiformi* Toelken foliis linearo-lanceolatis vel paene subulatis, superficie adaxiali dense foveata, et lobis corollae usque ad 2 mm longis differt.

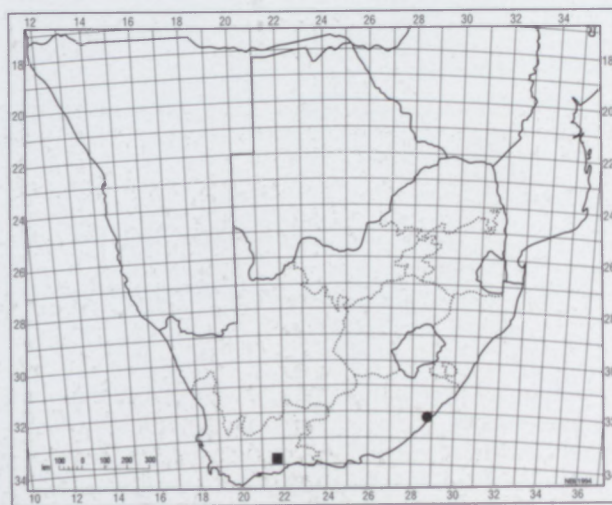


FIGURE 14.—Distribution of *Albuca thermarum*, ■, and *Crassula foveata*, ●.



TYPE.—Eastern Cape, 3228 (Butterworth): Colleywobbles, north-facing rock face, (-BA), 7-12-2000, Van Jaarsveld & Ems 16652 (NBG, holo.).

Plants proliferating from base, forming small, dense mats or clusters up to 140 mm diam. and up to 180 mm tall when in flower. *Roots* fibrous. *Branches* short, herbaceous, terete, 20–40 mm long, glabrous, lower down sparsely strigose, 1–3 mm diam., green, becoming reddish when exposed to sunlight. *Leaves* dorsiventrally compressed to almost subulate when fully turgid, in a loose rosette, sessile, decussately arranged, sometimes falcate and spreading, slightly recurved, becoming smaller upwards, linear-lanceolate to triangular-lanceolate, 12–44 × 37 mm, abaxial surface rounded, glabrous, green becoming reddish, pitted, adaxial surface canaliculate, becoming flat when turgid, sparsely but distinctly pitted (shallow leaf depressions); pits consisting of rounded, reddish depressions, 0.3–0.5 mm diam.; apex acute, apiculate; margin rounded, thickened, sparsely beset with recurved, translucent cilia. *Inflorescence* a conspicuous rounded to flat-topped thyrse, up to 180 mm high, 25–50 mm diam., bearing 1 to several dichasia, diurnal, sweetly scented; peduncle with translucent, recurved hairs and with a gradual transition from leaves to bracts, reddish; bracts ascending, spreading, upper bracts cymbiform, sparsely pitted, margin entire to sparsely ciliate. *Flowers* white to pale pink, buds up to 3 mm long, open flowers up to 4 mm diam.; calyx lobes triangular, 1.5 × 0.8 mm, with stout hairs at apex; corolla tubular, lobes spreading, oblong-ovate to ovate-lanceolate, up to 2 mm long, acute, white to pink. *Stamens* up to 1.5 mm long; anthers up to 0.1 mm long, yellowish. *Squamae* transversely oblong, up to 0.4 × 0.1 mm, yellowish orange; carpels and style up to 2 mm long. *Flowering time*: summer to early autumn (February–April). Figure 15.

*Crassula foveata* can be immediately recognized by its linear-lanceolate, spreading, reddish green leaves, densely spotted (pitted), hence the specific epithet, and small, white to pink corolla lobes, up to 2 mm long. *C. foveata* belongs to section *Rosulares* Haw. consisting of 25 species of which eight are cremnophilous. Members of section *Rosulares* are characterized by their ciliate leaves in a basal rosette which can become very large, as in *Crassula acinacifolia*. In *C. foveata* the leaves are arranged in a loose rosette and the margins are only sparsely ciliate. Furthermore, the leaves are densely cov-



FIGURE 15.—*Crassula foveata* in flower (January).



FIGURE 16.—The habitat of *Crassula foveata* at Colleywobbles, Eastern Cape.

ered with sunken, purplish hydathodes, resulting in the spotted appearance. Other species with darker purple markings with pitted hydathodes include *Crassula exilis* subsp. *sedifolia* and subsp. *cooperi*, both dwarf cremnophilous species from the central and western parts of South Africa. In these subspecies the leaves are in dense rosettes, the abaxial surface is without pitted areas, and the adaxial surface is sparsely dotted. These plants grow in dense, tight mats on cliff faces.

*Crassula foveata* grows on cliffs and steep outcrops from 300–400 m in altitude, on mainly exposed, northern and western aspects of Beaufort shale, Adelaide subgroup, Karoo Supergroup, at Colleywobbles (Figures 14, 16). Temperatures are high in summer and mild in winter. Rainfall occurs mainly in summer and ranges from 500–600 mm (thunder showers, October to May). Plants grow on rocky ledges in shallow soil among leaf litter and often in the shade of cliffs. The associated vegetation is thicket and grassland and the plants share their habitat with *Aloe reynoldsii*, *Crassula perfoliata* var. *minor*, *Cotyledon orbiculata*, *Euphorbia tirucalli* and *Ornithogalum longibracteatum*. The epithet *foveata* pertains to the spotted leaf ornamentation found in these plants.

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