

## SUBDIVISION OF *RHYTIDOCAULON* *MACROLOBUM* (ASCLEPIADACEAE)

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Within *Rhytidocaulon macrolobum* Lavranos, which is a widespread stapeliad in Saudi Arabia and in the Yemen, the subspecies *minimum* Meve & Colletette is described as new. This taxon is restricted to SW Saudi Arabia; it can be easily recognized by its miniature flowers, which are conspicuously smaller than the diameter of the stems, and by its bright-coloured corona.

*Keywords.* Flora of Arabia, new subspecies, stapeliad.

### INTRODUCTION

The stapeliad genus *Rhytidocaulon* P.R.O. Bally (*Asclepiadaceae*) is characterized by rugose and papillate surfaces of the sticklike stems and by laterally sunken, uni- to three-flowered inflorescences. All the eight described species of *Rhytidocaulon* have been brought to light in the twentieth century, the last one just a few years ago (*R. richardianum* Lavranos, 1991). A short overview with sketches of the then six species known, and a key, is given by Field (1981). Phytogeographically, the genus is another outstanding example of an element of the 'Mandab Circle' (cf. Newton, 1980), with its distribution area being split into an African (Kenya, Somalia and Ethiopia) and into two Arabian (Saudi Arabia and Yemen, and Oman) subregions. The distribution of *Rhytidocaulon* serves also as a classic example of White's (1983) 'Somalia-Masai Regional Centre of Endemism'.

Most species are morphologically very distinct and rare (cf. Field, 1981), with the variable *R. macrolobum* Lavranos as an exception. A handful of very small-flowered *Rhytidocaulon* specimens have been found in Saudi Arabia within the last 20 years; these were either attributed to true *R. macrolobum* or have remained unnamed in collections or publications (cf. Colletette, 1985: 72). Vegetatively, these plants do not differ from *R. macrolobum* s. str., but a close examination of the flower structure revealed a considerable number of distinct characters. This entity merits taxonomic recognition, and subspecific rank is considered to be the most appropriate status reflecting the allopatric distribution of the new taxon.

### TAXONOMY

*R. macrolobum* Lavranos, Cact. Succ. J. (US) 39: 3 (1967).

Type: (S) Yemen, Lodar, 1000m, 19 i 1966, Lavranos 4366 (holo. K; iso. G, P, PRE).

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*Key to the subspecies*

- 1a Flowers 8.0–16(–20)mm diam., interstaminal corona lobes purple-black \_\_\_\_\_ subsp. *macrolobum*  
 1b Flowers 4.5–6.0mm diam., interstaminal corona lobes whitish to yellowish \_\_\_\_\_ subsp. *minimum*

**subsp. *macrolobum***

*Stems* erect to procumbent, single-stemmed to sparingly and sparsely branched, up to 250 × 20mm, obscurely 4-angled; *leaf rudiments* triangular-lanceolate, 2–3mm long, fleshy, papillate on both faces, basally with globoid stipular glands. *Inflorescences* 1- to 3-flowered; *pedicel* 1.5–3 × 1mm. *Sepals* 1.5–2.0 × 0.6mm, abaxially papillate. *Flower buds* usually with a narrow beak above broadened base. *Flowers* emit a strong scent of decaying plant material with a citric tendency. *Corolla* 8–16(–20)mm diam., rotate, lobed nearly to base, exterior greyish, with purple dots and spots except towards base, interior whitish to green towards base; *tube* barely 1mm long, usually with thickened area surrounding gynostegium; *lobes* ascending in basal half then spreading, lanceolate, 5–9 × 2mm, ± basal half adaxially with dark purple, transverse lines or coarse spots against whitish background, velvety due to dense cover of acute papillae, apical half dark dull purple, brown or dark green, glabrous, margins slightly recurved towards base, subapically with two clusters of a few purplish cilia, ± 2mm long, terete, straight, very narrowly elliptic, acute, very vibratile. *Gynostegial corona* ± 2.5mm diam., basally fused to form a cup-shaped structure, purple-red except for white base, *interstaminal corona lobes* suberect to erect, concave, with lateral margins incurved, deeply bifid into narrow, erect to diverging cylindrical lobules, 0.2–0.9mm long, purple-black, often minutely tuberculate; *staminal corona lobes* broadly deltoid to subquadrate, ± 0.5mm long, truncate or emarginate, incumbent on anthers and usually exceeding them, purple-black. *Pollinia* elliptic-ovoid, ± 0.35 × 0.2mm.

*Chromosome number*: 2n = 22 (voucher: *F. Noltee* 1667, cult. at Dept of Plant Systematics, University of Bayreuth, Germany).

*R. macrolobum* subsp. *macrolobum* is probably the most widespread of all *Rhytidocaulon*. Originally described from material collected in former South Yemen it has been found in many parts of the Yemen and the western mountains of Saudi Arabia (see Fig. 1).

***R. macrolobum* subsp. *minimum* Meve & Collenette, subsp. nov.**

*Rhytidocaulon macrolobum* Lavranos typici affinis sed corolla lobis 2–3mm longis, corona partibus interstaminalibus albescentis ad claris luteolus et partibus staminalibus luteolus ad claris rubris differt.

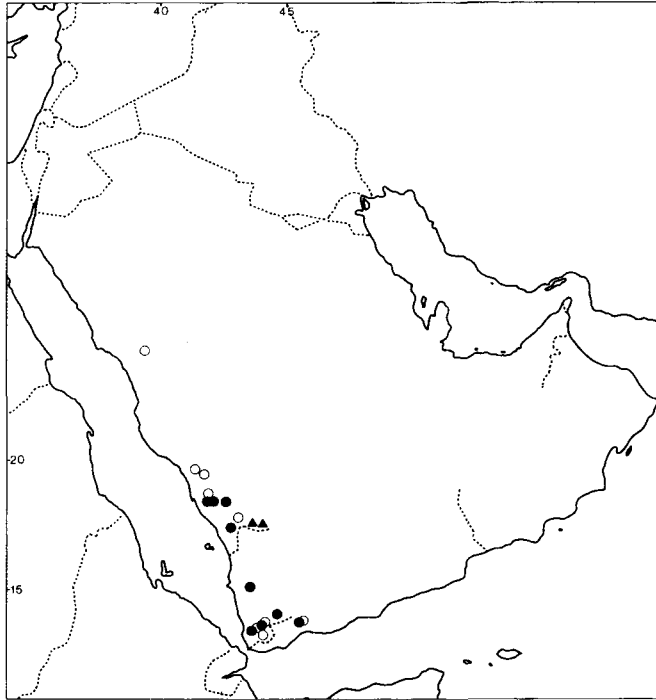


FIG. 1. Distribution of *R. macrolobum* subsp. *macrolobum* (●, herbarium specimens; ○, additional collections [without vouchers]) and ▲, *R. macrolobum* subsp. *minimum*.

Type: SW Saudi Arabia, 45km S Zahran al Jinub and 60km WNW Najran, on granite, 5 v 1990, *Collenette* 7565 (holo. K, in alc.). (Figs 2, 3A; see also *Collenette*, 1985: 72, upper left.)

*Stems and leaves* as in the typical subspecies. *Inflorescences* 1–(2)-flowered; *pedicel* 1–2mm long, ± glabrous. *Sepals* 1.2 × 0.5mm. *Flower buds* globose to ovoid; *flowers* without detectable scent. *Corolla* 4.5–6mm diam., rotate, only basally fused, abaxial side whitish, with purple-brown dots and spots and short hairs and papillae towards apex, *tube* ± flat, ± 1.5mm diam., adaxially white; *lobes* ascending, deltoid-lanceolate, 2–2.5 × 1.2–1.4mm, basal adaxial  $\frac{3}{5}$  white and with fine, transverse, purple-brown to black-brown lines, apical  $\frac{2}{5}$  purple-brown to black-brown, lamina slightly curved outwards longitudinally, ± glabrous to very finely papillate, each lobe with two sub-apical clusters of cilia, many, ± 1mm long, flattened, slightly wavy, whitish-purplish to blackish, vibratile. *Gynostegial corona* ± 2 × 1mm in total, basally fused to form a bowl-shaped structure, whitish, sometimes with scattered reddish dots outside, free *interstaminal corona lobes* linear-subquadrate, erect, concave, with lateral margins incurved, whitish to bright yellowish, deeply bifid into narrow, erect, ± spreading cylindrical, minutely tuberculate lobules; free *staminal corona lobes* ± 0.5mm long, whitish, bright yellowish to bright reddish, deltoid-subquadrate, incumbent on

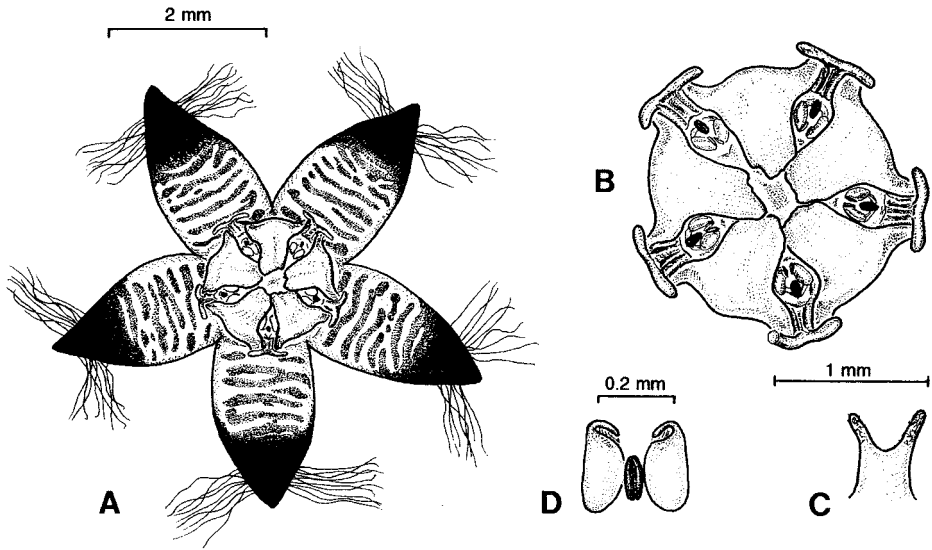


FIG. 2. Flower and flower details of *R. macrolobum* subsp. *minimum*. A, flower in top view; B, corona in top view; C, interstaminal corona lobe in lateral view; D, pollinarium (All from Coll. 8792X, drawn by U. Meve).

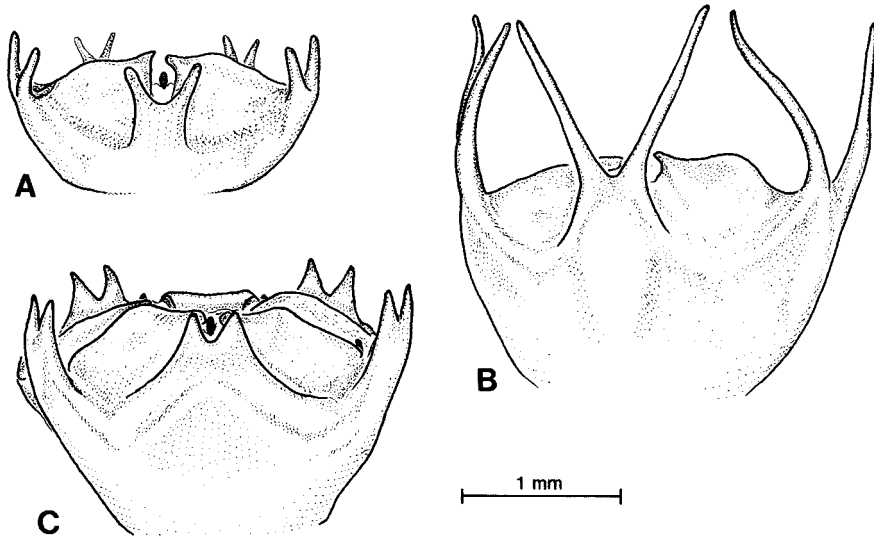


FIG. 3. Gynostegium with corona in lateral view. A, *R. macrolobum* subsp. *minimum*; B, *R. macrolobum* subsp. *macrolobum*; C, *R. sheilae*. (A from Coll. 8792X, B from Noltee 1667, and C from *ex hort.* Univ. Bayreuth, drawn by U. Meve).

anthers, apically emarginate. *Pollinia* elliptic-ovoid,  $\pm 0.3 \times 0.15$  mm. *Follicles* erect, diverging  $30\text{--}50^\circ$ , 4–6 cm long, grey.

*Chromosome number*:  $2n=22$  (voucher: *ex seed* Collenette 8792X, cult. at Dept of Plant Systematics, University of Bayreuth, Germany).

Apart from the very small size and the lack of scent, the flowers of subsp. *minimum* mainly differ from subsp. *macrolobum* in the shape and orientation of the corolla lobes. These are straight and ascending but not distinctly bent back from the middle to become horizontally spread as in the typical subspecies. The lined portion of the nearly glabrous inner side of the lobes occupies three fifth of the whole length (Fig. 2A). In subspecies *macrolobum* it occupies more or less half the length of the lobes and is clearly velvety due to the fine papillae. In addition, the shape of the vibratile hairs is different. Furthermore, the interstaminal corona lobes of subsp. *minimum* are shorter than in the typical subspecies (Figs 3A,B), and are whitish to brightly yellowish, but purple-black in subsp. *macrolobum*.

Finally, the pickling of flowers in 70% ethanol can add a helpful character in discerning both taxa: open flowers of subsp. *macrolobum* close more or less with this treatment, while flowers of subsp. *minimum* stay expanded as in the living state.

*R. sheilae* D.V. Field is the most closely related species to *R. macrolobum*. However, *R. sheilae* is quite different with regard to the emerald-green, olive-green to purple-green corolla coloration and corona structure. The very short interstaminal lobes have laterally broadened bases that merge with the slightly winged bases of the staminal lobes (Fig. 3C). The view, that *R. sheilae* is clearly distinct from *R. macrolobum*, is supported by vegetative differences, such as the very low growth and small leaves. *R. sheilae* is sympatric with *R. macrolobum* subsp. *macrolobum*, but so far as is known, allopatric with subsp. *minimum*.

Also to be placed within the '*R. macrolobum* complex' is *R. piliferum* Lavranos. This taxon, with very similar corolla characters to *R. macrolobum*, obviously represents the sister taxon of the latter being distributed in Somalia and in the southernmost Arabian Peninsula. The single known Arabian collection of *R. piliferum* (Yemen: Al Barh) was made by G.S. Barad (unpubl., photo only).

The two subspecies of *Rhytidocaulon macrolobum* are allopatrically distributed, demonstrating the independent status of the new subspecies. *R. macrolobum* subsp. *minimum* is known only in the hinterland of the Red Sea escarpment in the southernmost southwestern corner of Saudi Arabia (Fig. 1). The distribution area of subsp. *minimum* is markedly dry, because it is situated in the rain shadow of the escarpment. Subsp. *minimum* is rare and has so far been found only at a few locations. The stands are restricted to isolated limestone or granitic outcrops. Nowadays, the region is very barren and heavily overgrazed, and all the populations revisited by the second author have been found to be extinct.

*Material examined*. *R. macrolobum* subsp. *macrolobum*: SAUDIA ARABIA: Jabal Fayfa, 4500ft, steep, well vegetated granite hillside, Collenette 3600 (ZSS); Muhayl, 1200ft, iv 1982, Collenette 3611 (ZSS); 10km W Muhayl, 5 iii 1980, Lavranos & Collenette 18239 (ZSS, in

alc.); Wadi al Uss, 4000ft, 19 viii 1983, *Collenette* 4470 (E). YEMEN: Lodar, 13°52'30"N 45°51'30"E, 19 i 1966, *Lavranos* 4366 (holo. K, iso. G, P, PRE); 50km from Taiz'z on road to Hodeida, *Lavranos* 13154C (ZSS, in alc.); Dhabab Market, 13°32'N 43°57'E, 4 x 1976, *Lavranos* 13122C (ZSS, in alc.); Damt, *Noltee* 1667 (MSUN, in alc.); W Taiz'z, Al Barh, 21 ix 1977, *Lavranos* & *Newton* 15917 (MSUN, in alc.); 34km N Kahmis Bani Sad, *Noltee* 2259 (MSUN, in alc.).

*Additional collections (but without vouchers in herbaria).* SAUDI ARABIA: 21km east of Namrah, al Abna descent, 2500ft, under *Acacia oerfota* in pink granite sand, 13 x 1981, *Collenette* 2919; Hema Fiqra, 6000ft, among junipers on a steep granite hillside, 30 iv 1990, *Collenette* 7515; 44km N Muhayl, 1200ft, on low granite and mica hills, in gravel under *Cissus rotundifolius*, 9 v 1990, *Collenette* 7564; Jabal Fayfa, 4500ft, 2 v 1990, *Collenette* 7566; Wadi Taruf, 2200ft, among granite boulders on old river levels, under *Acacia ehrenbergiana*, 24 ix 1992, *Collenette* 8268; Jabal Qahar, north side near summit, 5800ft, under *Juniperus*, 2 ii 1996, *Collenette* 9400. YEMEN: Wadi Salul, near Mukeiras, 19 i 1998, *Lavranos*, *Al-Gifri* & *Mies* 30738; 23km S Ibb, *Noltee* 1791, 31km S Ibb, *Noltee* 1824; 17km NW At Turbah, *Noltee* 2019; Al Ramadah, *Noltee* 2098; 13km E Hajdah, *Noltee* 2145; 8km W Hajdah, *Noltee* 1112; near Taiz'z, 13°34'N 44°00'E, *Hanacek* et al. 275 (in cult Univ. Bayreuth).

*Material examined. R. macrolobum subsp. minimum:* SAUDI ARABIA: 45km S Zahran al Jinub, 6000ft, on a rare limestone hill in limestone crevices, 28 iv 1979, *Collenette* 1470 (K, fruiting specimen only); 60km NNW Najran, Abha road, 5800ft, among granite boulders, 21 ii 1982, *Collenette* 3301 (ZSS, K, in alc.); Return to 60km NNW of Najran, granites, ix 1993, ex seed *Collenette* 8792X (MSUN).

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