Cynanchum crassipedicellatum (Asclepiadaceae), a New and Unusual Succulent from Madagascar

Ulrich Meve
Institut für Botanik und Botanischer Garten, Westf. Wilhelms-Universität, Schlossgarten 3, 48149 Münster, Germany

Sigrid Liede
Abtlg. Spezielle Botanik, Universität Ulm, 89069 Ulm, Germany

ABSTRACT. A new leafless succulent species from Madagascar, *Cynanchum crassipedicellatum*, is described. Compared with the 25 succulent *Cynanchum* species of Madagascar, the new species exhibits numerous derived characters. It probably represents the sister taxon to *C. descoingsii* Rauh.

The semiarid parts of southwestern Madagascar support a rich succulent flora. The Asclepiadaceae tribe Stapelieae, which comprise almost exclusively stem-succulent species, are represented by two genera, *Stapelianthus* Choux and *Ceropegia* L. The Asclepiadeae subtribe Cynanchinae, which are predominantly herbaceous, are represented by four to five genera with stem-succulent forms (depending on the genus concept applied) and a total of about 40 species.

In the Stapelieae (some species of *Ceropegia*) and in the Asclepiadeae subtribe Cynanchinae (e.g., *Karimbolea* Descoings) a warty and glaucous stem texture has evolved several times independently. Warty and glaucous stems characterize 9 of the 25 leafless, stem-succulent *Cynanchum* L. species of Madagascar (Liede, unpublished data). No correlation between the stem texture and plant habit could be found; warty, glaucous species are represented among twiners, creepers, and self-sustaining subshrubs. The new species possesses the putatively derived habit of a subshrub, combined with an extremely specialized floral structure.

Cynanchum crassipedicellatum is clearly distinct from all other known *Cynanchum* species by its persistent, succulent pedicels. These persistent pedicels allow quick and easy recognition of this species both in vegetative (postfloral) stage and in flower. However, the succulence of the pedicels obscures the basic inflorescence structure (Fig. 1A). Careful examination reveals that the inflorescence structure in *C. crassipedicellatum* is not different from the one encountered commonly in the Asclepiadoideae. A terminal shortshoot is displaced into a lateral position by the elongation of an axillary branch, which continues the shoot system in a sympodial manner. The arrangement of the pedicels is helicoid, so that a bostrychoid inflorescence results; however, the rachis internodes are extremely short, so the inflorescence approaches an umbelliform structure. *Cynanchum crassipedicellatum* is certainly an extraordinary, though rare, taxon. Apart from the type collection, only one specimen, *Decary 10917*, collected in 1932, is known. Many well-delimited Malagasy species are extremely localized and rare, and some, e.g., *C. tsarataranense* Choux and *C. rossii* Rauh, are known only from the type collections.

Cynanchum crassipedicellatum Meve & Liede, sp. nov. TYPE: Madagascar. Toliara–Tôlanaro: 25°12′S, 47°17′E, ca. 20 km SE of Amboasary, 1969, *Hardy 2852* (holotype, K; isotype, MSUN). Figure 1.

Cynancho descoingsii Rauh affinis, sed differt pedicellis fortibus crassis (3–5 mm diam.) et longis (10–20 mm), persistentibus, floribus pusillis (5–7 mm diam.), corona apice staminali conica, carpellis et receptaculo centrali pilosis.

Plants subshrubs with subterranean organs consisting only of fibrous roots. Stems nontwining, erect to divergent, usually branching basitonically, perennial, succulent, warty, prominently glaucous, sparsely covered with appressed trichomes 600–800 μm long; the nodes thickened, the internodes 12–40 mm long, 4–8 mm diam.; latex white. *Leaves* reduced to scales, caducous, sessile, papery, 1.1–1.2 mm long, 0.4–0.6 mm wide, ovate, with 4 adaxial colleters. *Inflorescences* bostrychoid, always one per node, extra-axillary, subsessile, producing flowers over a period of several years, partial inflorescences

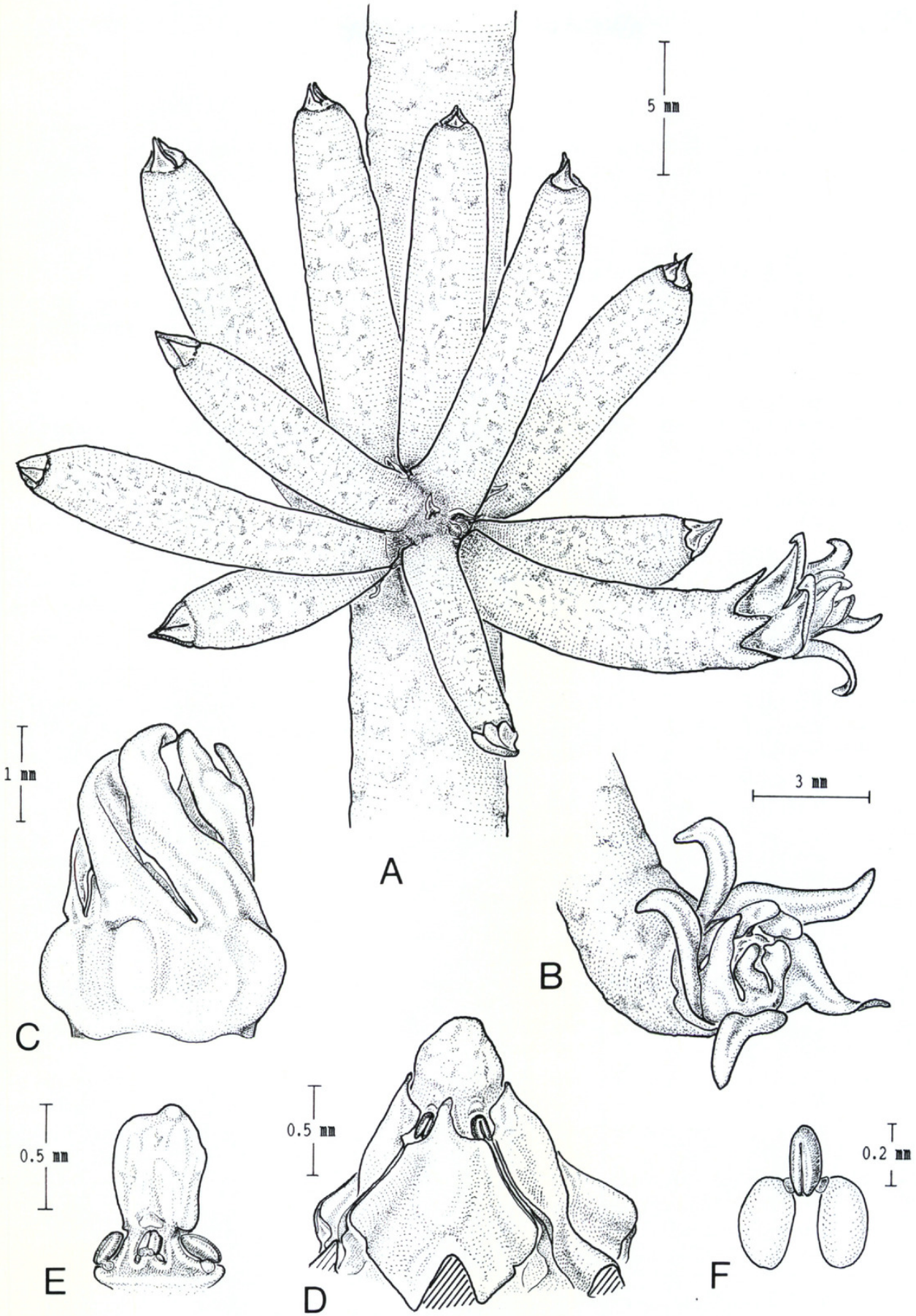

Figure 1. *Cynanchum crassipedicellatum* Meve & Liede. —A. Inflorescence with buds, one open flower, and postfloral pedicels. —B. Flower in top view. —C. Corona. —D. Gynostegium. —E. Stylar head with corpusculi (pollinia removed). —F. Pollinarium. Drawn by the senior author.

geminiflorous, (1)3–15-flowered, 1–2 flowers open at the same time. *Flowers* not nectariferous; floral bracts 1–1.2 mm long, 0.9–1 mm wide at the base, triangular, apically glandular, glabrous. *Pedicels* 10–12 mm long, ca. 3 mm thick, persistent, increasing in size with age to 20 mm long and 5 mm thick), slightly warty, glaucous, sparsely covered with flexuous trichomes, 400–500 μm long. *Floral buds* 3–4 mm long, 2.5–3 mm wide, conical, the aestivation contorted. *Calyx* fused ca. ¼ of its length, glabrous, the lobes 1.2–1.4 mm long, 0.9–1 mm wide, reddish gray, triangular, apically acute. *Corolla* elongated-conical, 2.5–3.5 mm long, 1.2–1.7 mm wide at the base, abaxially and adaxially purple, the lobes basally fused, triangular, twisted, the apices acute, recurved, the margins slightly recurved. *Gynostegial corona* conical, 2.4–3.2 mm high, exceeding the gynostegium and entirely obscuring it, basally purplish red, apically ivory, consisting of only basally fused staminal and interstaminal parts. Staminal parts differentiated, connate to the filament; lobes laminar, twisted, oblong, erect, apically conical and abaxially papillose, slightly inflexed. *Gynostegium* sessile, 1.6–1.8 mm high, 1.6–1.8 mm diam. *Stamens* with the column 0.25 mm long, the anthers ca. as long as broad, trapezoidal, abaxially planar, the anther wings 500–550 μm long, parallel to one another, extending along the whole length of the anther, slightly contorted, forming a distinct "mouth" with the basal lateral margin of the anther, the connective appendages triangular, narrower than the anthers, slightly inflexed. *Pollinarium* with the corpusculum 230–250 μm long, ovoid, dark brown, the caudicles ca. 50 μm diam., flattened, straight, horizontal, trapezoid-discoid, the pollinia subapically attached to the caudicles, ca. 300 μm long, 180–200 μm wide, yellow, ovate, elliptic in cross section. *Stylar head* 700–900 μm high, 500–600 μm diam., upper part 600–650 μm high, much higher than lower part, capitate, greenish. *Receptacle* with central dense brush of translucent trichomes, 500–1,200 μm long, basally filling the cleft between the carpels. *Carpels* obtusely triangular, 1.4–1.6 mm long, 1.5–1.8 mm diam. at the base, kidney-shaped in cross section, with adaxial sides flattened, adaxially sparsely, abaxially and along the margins more densely covered with whitish translucent, irregularly bent trichomes, 100–1,000 μm long, filling intragynostegial cavities. *Fruits* and *seeds* unknown. *Chromosome number:* $2n = 22$ (voucher: *Hardy 2852*).

Ecology. In dense bush on calcrete soil, with a few *Pachypodium lamerei* Drake and *Stapelianthus madagascariensis* (Choux) Choux.

Flowering time. September.

Distribution. Toliara–Tôlanaro; vicinity of Amboasary.

The name of this new species refers to its unique persistent, succulent pedicels.

Cynanchum crassipedicellatum represents the sister taxon to *C. descoingsii* Rauh. The two taxa are probably most closely related to a group of Malagasy endemic taxa, *C. antandroy* Descoings, *C. macrolobum* Jumelle & Perrottet, *C. rauhianum* Descoings, and *C. rossii* Rauh. *Cynanchum crassipedicellatum*, *C. descoingsii*, *C. antandroy*, and *C. rossii* are each known from a single locality in the arid southwest of Madagascar. *Cynanchum macrolobum* and *C. rauhianum* are slightly more widely distributed, occurring at several sites in the Isalo mountains.

Cynanchum descoingsii, only recently described by Rauh (1993), exhibits a very similar growth form and shoot texture to *C. crassipedicellatum*. However, *C. descoingsii* grows almost straight, while *C. crassipedicellatum* branches in a characteristically divaricate manner. Both species share a twisted corolla and corona lobes. Whereas twisted corolla lobes occur in various species of the genus, the twisted, fleshy, papillose corona lobes represent a unique synapomorphy.

As might be expected for two closely related, sympatric species, *Cynanchum descoingsii* and *Cynanchum crassipedicellatum* have developed significantly different floral biology strategies. The flowers of *C. descoingsii* are among the largest known in succulent *Cynanchum*, while those of *C. crassipedicellatum* are among the smallest. In general floral morphology the two species are quite similar, with the exception of the more slender corona-lobes with conical apices and the hairy carpels and receptacle of *C. crassipedicellatum*. In contrast, flower presentation is very different. *Cynanchum descoingsii* opens several flowers at the same time, these arranged on a true peduncle. The flowers of *C. crassipedicellatum*, in contrast, are usually single during anthesis and characteristically long-stalked. These long pedicels reach almost the same degree of succulence as the stem. They are persistent long after the flower has been shed and adopt a photosynthetic function.

Paratypes. MADAGASCAR. **Toliara–Tôlanaro:** Amboasaritelo, 9 Sep. 1932, *Decary 10917* (P).

Acknowledgments. For the donation of the type collection we owe thanks to Dave Hardy, Pretoria. The support of Heike Schoppmann (Münster) in preparing micro-sections of *C. crassipedicellatum*

flowers, and Peter Deitelhoff (Münster) in improving the Latin diagnosis is gratefully acknowledged. We thank Focke Albers (Münster) for his generous support of our studies.

Literature Cited

Rauh, W. 1993. Neue Asclepiadaceen aus Madagaskar. Trop. Subtrop. Pflanzenwelt 85: 7–41.