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A REVISION OF *CYNANCHUM* *Sigrid Liede*<sup>2</sup>  
(ASCLEPIADACEAE) IN  
AFRICA<sup>1</sup>

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ABSTRACT

Based on the study of dried specimens and living material, a taxonomic revision of *Cynanchum* in mainland Africa is presented. *Cynanchum* here comprises 31 species (about half the number found in Madagascar), 6 of them new. One new combination is proposed and two species are neotypified. An artificial key to all taxa is presented; all species are fully described, and taxa not previously illustrated are provided with illustrations. Names for African *Cynanchum* placed into synonymy under other genera are listed with their current placement.

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Since the works of Schlechter (1895) and Brown (1902–1903, 1908), the African species of *Cynanchum* have not been revised. Asclepiadaceae have not been treated to date in most African Flora projects, with exception of Bullock (1963) for West Africa and Huber (1967) for Namibia. Therefore, even regional treatments of *Cynanchum* are lacking for most of the continent. The present account is the first one covering all of mainland Africa.

*Vincetoxicum* is understood as being separate from *Cynanchum* and is not considered here. There are only a very few species of *Vincetoxicum* in the

extreme north and northeast of the African continent. The separation of *Vincetoxicum* renders irrelevant the question of whether *Blyttia* Arnold should be maintained for the treatment of *Cynanchum*, because *Blyttia* could possibly be subsumed under *Vincetoxicum*, but certainly not under *Cynanchum*. A more detailed account on the *Cynanchum/Vincetoxicum* problem is in preparation (Liede, in press).

To date, there is no valid infrageneric classification for *Cynanchum*. The present author recognizes only some East Asian members as sufficiently

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I am deeply indebted to the artists, Jim Conrad, Graziela Hintze, and Ulrich Meve, for their patience in working with sometimes rather bad material and a very critical author. U. Meve, Münster, in addition, is taking care of the living material; he provided chromosome counts and supportive criticism at all stages of the work. The cheerful company of N. E. Newton, Kenyatta University, Kenya, during fieldwork in East Africa deserves particular mention. Helpful comments from W. D. Stevens and M. G. Gilbert, Missouri Botanical Garden, on an earlier draft of this manuscript are gratefully acknowledged.

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distinct to warrant sectional status (sect. *Rhodostegiella* (Pobed.) Tsiang & P. T. Li). All African members of the genus belong to the typical section *Cynanchum*.

In the course of a cladistic analysis, which will be published separately, it was found that the two presently recognized species of *Pentarrhinum* E. Mey., *P. abyssinicum* Decne. and *P. insipidum* E. Mey., are closely related to some species of *Cynanchum*, namely *C. balense* Liede, *C. gonoloboides* Schlechter, and *C. somaliense* (N. E. Br.) N. E. Br. Using morphological characters alone, however, evidence is not sufficient to either include *Pentarrhinum* in *Cynanchum* or to transfer the species mentioned to *Pentarrhinum*. The thick-walled follicles with protuberances, shared in Africa, as far as known, only by these five species, might constitute a stronger indication of relationships than the highly variable corona morphology. However, there are "true" *Cynanchum* species with muricate follicles in East Asia (*C. corymbosum* Wight, *C. muricatum* (Blume) Boerlage). The close relationship between *Cynanchum* and *Pentarrhinum* has been taken into account in the construction of the key, which includes the two presently recognized species of *Pentarrhinum*. As it was found during the course of this study that *Pentarrhinum* species were frequently labeled "*Cynanchum* indet." even in larger herbaria, this inclusion might also be of some practical value.

#### MATERIALS AND METHODS

A total of ca. 2000 herbarium specimens from BM, BOL, EA, G, GRA, K, L, M, MAL, MO, NBG, P, PRE, SAM, SHRG, STEU, and UPS have been studied. Several collecting trips to Africa yielded living material of numerous species. Spirit material or restored material (heated to 65°C in Water:95% Ethanol:Glycerine = 5:4:1, plus 3 drops of detergent per 200 ml) was examined under a binocular microscope, and, in most cases, under the SEM after Critical Point Drying. Data have been stored in DELTA (version 3.06, Dallwitz, 1980; Dallwitz & Paine, 1986), and the descriptions were directly generated from this database. The key has been constructed manually using the INTKEY program for confirmation. Locality information has been derived from Polhill (1988) for East Africa and from various gazetteers for the remainder of Africa. Delimitation and spelling of subdivisions follows the guidelines for the major floras in the area; for East Africa (Kenya, Tanzania, Uganda), the subdivisions of the *Flora of East Africa* according to Polhill (1988) have been used (K1–K7, T1–T8, U1–U4,

respectively). Throughout the paper, the corona terminology developed by Liede and Kunze (1993) has been used, in which Cs denotes the staminal parts of a gynostegial corona, Ci the interstaminal parts, and C(is) fused staminal and interstaminal parts. Indumentum terminology is following Hewson (1988).

**Cynanchum** L., Sp. Pl. 212. 1753. LECTOTYPE SPECIES: *Cynanchum acutum* L., designated by E. Meyer, Comm. Pl. Afr. Austr. 216. 1838.

- Bunburia* Harv., Gen. S. Afr. Pl. 416. 1838. TYPE: *Bunburia elliptica* Harv.  
*Colostephanus* Harv., Gen. S. Afr. Pl. 417. 1838. TYPE: *Colostephanus capensis* Harv.  
*Cyathella* Decne., Ann. Sci. Nat. Bot., sér. 2, 9: 332. 1838. Type species not designated.  
*Cynoctonum* E. Mey., Comm. Pl. Afr. Austr. 215. 1838, not J. F. Gmel. (1791). Type species not designated.  
*Endotropis* Endl., Gen. Pl. 591. 1838, not Raf. (1825); nor Raf. (1838). Type species not designated.  
*Flanaganiana* Schltr., Bot. Jahrb. Syst. 18, Beibl. 45: 10. 1894. TYPE: *Flanaganiana orangeana* Schltr.  
*Perianthostelma* Baill., Hist. Pl. 10: 247. 1890. Type species not designated (*Perianthostelma abyssinicum* Baill., nomen nudum in schedis P).  
*Sarcocyphula* Harvey, Thes. Cap. 2: 58. 1863. TYPE: *Sarcocyphula gerrardii* Harv.

Only synonyms relevant for mainland Africa have been considered.

*Plants* commonly twining, more rarely erect or decumbent, leafless or leafy; with milky, white to yellow latex; glabrous or with an indumentum; indumentum always consisting of uniseriate, multicellular hairs. *Inflorescences* usually bostrychoid, with geminiflorous partial inflorescences, basally occasionally with one or two dichasial ramifications; shortening of the rachis results in a sciadioidal inflorescence structure (inflorescence terminology following Weberling, 1989). *Flowers* 5-merous, small (not exceeding 1.5 cm diam., normally not exceeding 5 mm diam.); aestivation imbricate or contorted, always dextrorse. *Corolla* glabrous or adaxially with sparse, multicellular, verrucose trichomes. *Corona* present, of gynostegial origin, consisting of staminal (Cs) and interstaminal (Ci) parts fused for at least ¼ of total corona length (referred to as C(is) throughout this paper—corona terminology following Liede & Kunze, 1993); Cs, Ci, or both differentiated in shape; each lobe of Cs with or without adaxial appendage. *Anther wings* consisting of inner and outer ridges separated by a bristle-filled cavity, outer ridge either in the same plane as the back of the anther or centrifugal toward the base. *Pollinaria* consisting of two pendulous pollinia (synapomorphy of the tribe Ascle-

piadeae) and a well-developed translator apparatus. *Stylar head* with a conspicuous protrusion at the upper end of the corpusculum, dividing the stylar head in a rather uniform lower and a variable upper part. *Fruit* of two follicles, usually one aborted, follicles normally obclavate, winged or wingless, pericarp mostly thin and smooth, rare-

ly thicker and/or with protuberances (see discussion above). *Seeds* brown, elliptic to pyriform in outline, winged or wingless, smooth, sculptured or hairy, crowned with a coma of white hairs. *Chromosome number*, as far as known,  $2n = 22$ . *Chemistry*: all species studied were found to contain pregnane glycosides.

ARTIFICIAL KEY TO THE SPECIES OF *CYNANCHUM* and *PENTARRHINUM*

1. Plants twining, semi-succulent; without well-developed leaves ..... 2
- 1'. Plants erect or twining, not succulent; with well-developed leaves ..... 3
- 2(1). Staminal corona parts exceeding gynostegium and, in young flowers, connivent over it ..... *C. lenewtonii*
- 2'. Staminal corona parts not exceeding the gynostegium ..... *C. gerrardii*
- 3(1). Plants erect, rhizomatous, less than 30 cm high, sparsely branched to unbranched; leaves linear or at least three times longer than wide, corolla lobes with revolute margins; stylar head capitate ..... 4
- 3'. Combination of characters otherwise ..... 5
- 4(3). Leaves absent at the time of flowering; leaf blades 2–8 mm wide; inflorescences with well-developed rachis; caudicles flattened, straight ..... *C. praecox*
- 4'. Leaves present at the time of flowering; leaf blades less than 2 mm wide; inflorescences without well-developed rachis; caudicles cylindrical, s-shaped ..... *C. orangeanum*
- 5(3). Corolla lobes adaxially with trichomes ..... 6
- 5'. Corolla glabrous ..... 11
- 6(5). Corolla lobes only with a few basal smooth trichomes ..... *C. adalinae* subsp. *mannii*
- 6'. Corolla lobes with  $\pm$  evenly spaced, verrucose trichomes ..... 7
- 7(6). Staminal corona parts with adaxial appendages (ligules) ..... 8
- 7'. Staminal corona parts without adaxial appendages (ligules) ..... 10
- 8(7). Stylar head elongated, much exceeding the gynostegium ..... *C. umtalense*
- 8'. Stylar head not elongated, much shorter than the gynostegium ..... 9
- 9(8). Leaves triangular; peduncles 2–10 mm long; inflorescences with rachis 0–0.5 mm long; corolla lobes not contorted in bud ..... *C. virens*
- 9'. Leaves ovate; peduncles 15–40 mm long; inflorescences with rachis 2–10 mm long; corolla lobes contorted in bud ..... *C. abyssinicum*
- 10(7). Plants less than 50 cm high, sparsely branched; leaves fleshy, less than 15 mm long, elliptic; corolla lobes less than 2 mm long; Cs and Ci fused for more than  $\frac{3}{4}$  of corona length ..... *C. galgalense*
- 10'. Plants more than 2 m high, richly branched; leaves herbaceous to coriaceous, 20–40 mm long, ovate; corolla lobes more than 3 mm long; Cs and Ci fused for less than  $\frac{1}{2}$  of total corona length ..... *C. obtusifolium*
- 11(5). Staminal corona parts fused only at base; stylar head flat or umbonate; follicles thick-walled, warty or with soft spines ..... 12
- 11'. Corona fused for at least  $\frac{1}{4}$  of its length; stylar head of various shapes; follicles mostly thin-walled, smooth (except *C. gonoloboides*) ..... 15
- 12(11). Corona of five fleshy, papillate, shining, yellow parts with appendages projecting toward the center of the flower ..... *Pentarrhinum insipidum*
- 12'. Corona not fleshy or papillate, without appendages projecting toward the center of the flower ..... 13
- 13(12). Gynostegium stipitate; corona lobes prominently trifid ..... *C. somaliense*
- 13'. Gynostegium sessile; corona lobes not trifid ..... 14
- 14(13). Leaves leathery, venation prominent, slightly cordate at the base; corona lobes bifid almost to the base ..... *C. balense*
- 14'. Leaves thin, venation not prominent, prominently cordate to lobate; corona lobes slipper-shaped ..... *Pentarrhinum abyssinicum*
- 15(11). Staminal corona with prominent adaxial appendages (ligules) ..... 16
- 15'. Staminal corona without prominent adaxial appendages ..... 17
- 16(15). Leaves at least abaxially with indumentum; inflorescences 20–35-flowered, rachis 15–60 mm long; peduncles 3–10 cm; corona not exceeding the gynostegium, interstaminal corona lobes shorter than staminal corona lobes; stylar head conical ..... *C. acutum*
- 16'. Leaves glabrous; inflorescences 1–12-flowered, rachis absent; peduncles ca. 1 cm; corona exceeding the gynostegium, staminal and interstaminal corona lobes of the same length; stylar head strongly bifurcate ..... *C. mossambicense*
- 17(15). Leaves hastate; corona papillose; stylar head elongate-conical to obinfundibuliform; follicles strongly obclavate and longly beaked ..... 18
- 17'. Leaves not distinctly hastate; if triangular-deltate, then corona not papillose and stylar head not elongate-conical to obinfundibuliform; follicles not so strongly obclavate and less pronouncedly beaked ..... 19
- 18(17). Stylar head well exceeding the corona; floral buds 6–6.5 mm long ..... *C. clavidens* subsp. *clavidens*
- 18'. Stylar head not or hardly exceeding the corona; floral buds 3–4 mm long ..... *C. clavidens* subsp. *hastifolium*
- 19(17). Corona fused for more than  $\frac{3}{4}$  of its length ..... 20

- 19.' Corona fused for less than  $\frac{3}{4}$  of its length (strongly folded coronas appear more fused than they are, especially in *C. adalinae*, therefore check unfolded) ..... 30
- 20(19). Mature leaves more than 5 cm long ..... 21
- 20'. Mature leaves up to 5 cm long ..... 22
- 21(20). Leaves dark green, with nerves raised abaxially; corona white, not obscuring the long-stipitate gynostegium; follicles thick-walled, warty ..... *C. gonoloboides*
- 21'. Leaves lighter green, nerves not raised; corona purplish red, obscuring the sessile gynostegium; follicles thin-walled, smooth ..... *C. longipes*
- 22(20). Leaf blades about three times as long as wide, ovate, conspicuously paler below; gynostegium short-stipitate; stylar head umbonate, lower part of stylar head conspicuously bent upward in dried material ..... *C. rungweense*
- 22'. Leaf blades about twice as long as wide (in *C. falcatum* very rarely more than three times as long as wide, but then triangular or falcate), the same green above and below; gynostegium almost sessile to long-stipitate; stylar head conical or flat, but lower part not conspicuously bent upward in dried material ..... 23
- 23(22). Plants erect shrublets; leaf blades less than 5 mm long, with margins thickened; corona apically papillose (10×); gynostegium sessile ..... *C. blyttioides*
- 23'. Plants decumbent or twining; leaf blades more than 5 mm long, margins not thickened; corona smooth throughout; gynostegium sessile or stipitate ..... 24
- 24(23). Leaves strongly triangular, rarely falcate; Cs and Ci differentiated with the triangular Cs higher than the bifid Ci; stylar head clavate ..... *C. falcatum*
- 24'. Leaves ovate; corona either annular or with only Cs differentiated; gynostegium mostly on a bulge (sessile in *C. ellipticum*, almost sessile in some populations of *C. altiscandens*); stylar head not clavate ..... 25
- 25(24). Corolla lobes conspicuously twisted in bud, more than 6 mm long; gynostegium long-stipitate (stipe > 2 mm) ..... *C. africanum*
- 25'. Corolla lobes not conspicuously twisted in bud, less than 5 mm long; gynostegium sessile or stipitate, but stipe shorter than 2 mm ..... 26
- 26(25). Plants erect or twining; corona fused for about  $\frac{3}{4}$  of its length ..... 27
- 26'. Plants twining; corona almost totally fused ..... 28
- 27(26). Plants dwarf shrublets or decumbent, but never twining; leaves rounded or indistinctly cordate at base, less than 1 cm long; corona not adnate to the filaments ..... *C. zeyheri*
- 27'. Plants twining; leaves distinctly cordate at base, more than 3 cm long; corona connate to the filaments ..... *C. schistoglossum*
- 28(26). Plants of coastal habitats; leaves fleshy; upper margin of corona neatly five-crenate, anther wings shorter than the anther ..... *C. natalitium*
- 28'. Plants not restricted to coastal habitats; leaves not fleshy; upper margin of corona smooth or irregularly crenulate, anther wings as long as the anther ..... 29
- 29(28). Plants glabrous, mature plants forming a corky main stem, not sarmentose; peduncles 12–20 mm long; upper corona margin irregularly crenulate; gynostegium sessile (on a very short stipe in introgression forms with *C. natalitium*) ..... *C. ellipticum*
- 29'. Plants with indumentum (check the main nerves of the leaves, peduncles, and pedicels), sarmentose, not forming a corky main stem; peduncles 2–5 mm long; upper corona margin smooth; gynostegium mostly on a short bulge (almost sessile in some collections) ..... *C. altiscandens*
- 30(19). Plants erect shrublets, less than 50 cm high ..... 31
- 30'. Plants twining, more than 1 m high ..... 33
- 31(30). Leaves ovate, less than 20 mm long, base rounded, margins neither thickened nor crenulate ..... *C. meyeri*
- 31'. Leaves triangular, more than 25 mm long, base cordate to lobate, margins thickened and conspicuously crenulate ..... 32
- 32(31). Corona fleshy, pink, Cs oblong, exceeding the gynostegium and Ci, Ci with conspicuously reflexed margins; anthers not massive ..... *C. rubricoranae*
- 32'. Corona not fleshy, white, Cs extended into a long, reflexed tip, margins of Ci straight; anthers massive ..... *C. crassiantherae*
- 33(30). Corona exceeding the gynostegium and totally obscuring it; Cs forming five conspicuous folds; stylar head conical; coma of the seeds attached along almost  $\frac{1}{3}$  of seed length ..... 34
- 33'. Corona as long as the gynostegium or longer, but not obscuring it, Cs not forming folds; stylar head not conical; coma of seeds attached terminally ..... 35
- 34(33). Inflorescences sessile or very shortly pedunculate (less than 1 cm) ..... *C. adalinae* subsp. *adalinae*
- 34'. Inflorescences long-pedunculate (more than 1.5 cm) ..... *C. adalinae* subsp. *mannii*
- 35(33). Corona as high as the gynostegium, or slightly higher ..... 36
- 35'. Corona about twice as high as the gynostegium ..... 37
- 36(35). Leaves cordate, but not lobate; corona adnate to the filaments for more than  $\frac{1}{3}$  of total corona length, lobes of Cs triangular, inflexed, upper margin variably toothed ..... *C. schistoglossum*
- 36'. Leaves lobate; corona not adnate to the filaments, staminal lobes oblong, erect, with involute margins ..... *C. ledermannii*
- 37(35). Corolla lobes more than 5 mm, corona more than 5 mm long; stylar head capitate ..... *C. polyanthum*
- 37'. Corolla lobes less than 5 mm, corona less than 5 mm long; stylar head umbonate ..... *C. heteromorphum*

1. *Cynanchum abyssinicum* Decaisne in Candolle, Prodr. 8: 548. 1844. *Vincetoxicum abyssinicum* (Decne.) Kuntze, Revis. Gen. Pl. 2: 424. 1891. TYPE: Abyssinica. *Quartin-Dillon s.n.* (holotype, G not seen). Figure 1.

*Cynanchum abyssinicum* var. *tomentosum* Oliver, Trans. Linn. Soc. London, Bot. 2: 342. 1887. TYPE: Tanzania. Kilimanjaro: Moshi, 1884, *Johnston 177* (lectotype, designated here, K).

*Vincetoxicum holstii* K. Schum., Bot. Jahrb. Syst. 17: 135. 1893. *Cynanchum holstii* (K. Schum.) K. Schum., Nat. Pflanzenfam. 4(2): 253. 1895. TYPE: Tanzania. Tanga: Mlalo, Usambara, *Holst 507* (holotype, B presumably destroyed; lectotype, designated here, K).

*Plants* ascending, twining, 3–4 m high, richly and irregularly branched. *Shoots* herbaceous, sparsely covered with appressed trichomes 0.5–0.7 mm long, along two lines, basally woody, with blackish bark (fide protologue of *Vincetoxicum holstii*); internodes 2.2–12 cm long, 0.9–1.5 mm diam. “*Stipules*” absent. *Leaves* with petioles 15–25 mm long, leaf blades herbaceous, 35–75 mm long, 10–35 mm wide, ovate, basally cordate, with 1–3 collets in the adaxial sinus, apically acute to acuminate, adaxially isolatedly covered with appressed trichomes 0.35–0.4 mm long, evenly distributed over the whole surface to glabrous, abaxially slightly papillose, veins and margins isolatedly covered with appressed trichomes 0.35–0.4 mm long, to glabrous. *Inflorescences* bostrychoid, 15–20-flowered, 3–5 flowers open at a time; rachis 2–10 mm long. *Peduncles* 15–40 mm long, densely covered with appressed trichomes 0.1–0.5 mm long. *Flowers* sweetly scented (*Ash 2094*, *Maas Gesteranus 5161*); floral bracts 0.6–0.8 mm long, 0.1–0.2 mm wide at the base, triangular, with trichomes; pedicels 0.8–1.2 mm long, sparsely covered with erect trichomes 0.3–0.35 mm long. *Buds* 4.5–5 mm long, 1.6–1.7 mm diam., conical, with contorted aestivation. *Calyx* basally fused, ciliate, abaxial surface with trichomes; lobes 2.2–2.6 mm long, 0.8 mm wide, ovate, apically acute. *Corolla* rotate, basally fused; 6–7 mm long, abaxially and adaxially brownish purple, adaxially with verrucose trichomes 0.15–0.2 mm long, evenly distributed over the whole surface; lobes 1–1.2 mm wide, decurved, oblong, apically acute. *Corona* ivory, abaxially glabrous, 7–8 mm high, exceeding the gynostegium but not obscuring it; C(is) cyathiform, consisting of Cs and Ci fused for less than half of total corona length, Cs and Ci differentiated, Ci shorter than Cs. Cs not adnate to the filaments, with adaxial appendages; lobes of Cs basally laminar, elongate-triangular, apically filamentous, flat to producing a convex fold, apically erect; appendages of Cs elongate-tri-

angular, apically filamentous, erect. *Lobes of Ci* laminar, rectangular, bifid, or apiculate, producing a pronounced convex fold along the upper two-thirds of corona length, erect to reflexed, with straight, lacerate margins. *Gynostegium* 2 mm high, 1.6–1.8 mm diam., sessile. *Stamens* without free filaments; anthers about as high as broad, rectangular, abaxially planar; anther wings 1 mm long, parallel to each other, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.8–0.85 mm long, 0.8–0.85 mm wide, ovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.4–0.45 mm long, ovoid; caudicles 0.2–0.25 mm long, flattened, straight, horizontal, trapezoid; pollinia laterally attached to the caudicles, 0.5–0.55 mm long, 0.25–0.3 mm wide, ovoid, ovate in cross section. *Stylar head* cream, 1.5–1.7 mm diam., 1.1–1.3 mm high, upper part 0.8–1 mm high, depressed-conical. *Follicles* one per flower, pendulous, 70–75 mm long, 7–8 mm diam., obclavate, obtusely deltate in cross section, apically shortly beaked, irregularly keeled, dark brown, longitudinally grooved, glabrous. *Seeds* 5–5.5 mm long, 3–3.2 mm wide, pyriform, dark brown, seta and a seta side sculptured with longitudinal ridges, marginally with 0.6–0.8-mm-wide wing with entire margin; coma 25–30 mm long. (Description of follicles and seeds from the lectotype of var. *tomentosum*, *Johnston s.n.*) *Chromosome number* unknown.

*Distribution and habitat.* Africa: Eritrea, Ethiopia (Arsi, Gonder, Ilubabor, Shewa, Welega), Kenya (K3, K4, K5, K7), Tanzania (T2, T3, T7), Uganda (U2), Zaïre; 1700–3000 m; forest margins, savanna, open scrub, often in secondary vegetation. Widespread, but infrequent. Figure 2.

*Flowering time.* All year, with peak between June and October.

*Vernacular names.* Maneriat (Kipsangali).

*Uses.* Used as a relish (*Perdue & Kibura 11341*); leaves used to make tea as a tonic (*Matthews 6354*).

*Selected specimens examined.* ERITREA. Dekemehare, 2000 m, *Schimper s.n.* (UPS). ETHIOPIA. Arsi: Chilalo awraja, N slope of Mt. Chilalo, 2900 m, 20 Nov. 1971, *Thulin 1522* (K, UPS). Gonder: Fenter, 12 Dec. 1909, *Chiovenda 1450* (FT). Ilubabor: Kombolcha, 2050 m, 12 Dec. 1960, *Mooney 8789* (K). Shewa: Addis Ababa, Entoto ridge above Italian Embassy, 2550–2600 m, 18 Sep. 1975, *Gilbert & Thulin 1001* (K, MO, UPS). Welega: about 5 km E of Lekemti, ca. 1800 m, 13 Nov. 1965, *De Wilde & De Wilde-Duyffes 8843* (K, MO, UPS). KENYA. Central: Machakos, Chyulu North, 1800 m, 22 Apr. 1938, *Bally 7934*

ICONES SELECTÆ.

Asclepiadeæ .

Vol. 5. Tab. 69.

**CYNANCHUM** *abyssinicum*, Decne.

DC. Prodr. vol. 3, pag. 343.

Figure 1. *Cynanchum abyssinicum* Decne. Illustration from De Lessert, Icones plantarum. Vol. 5, Tab. 69.

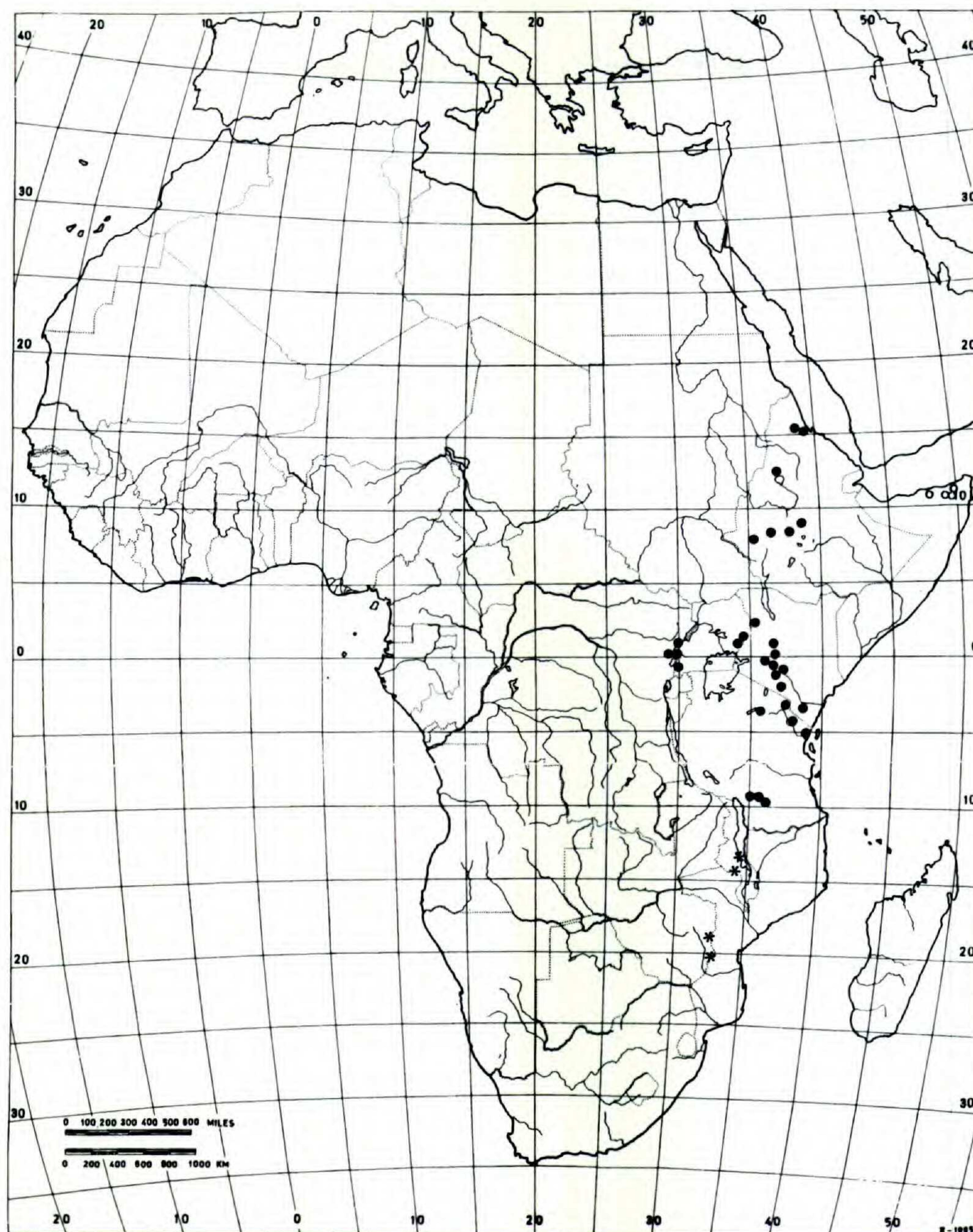


Figure 2. Known distribution of *Cynanchum abyssinicum* (dots), *C. galgalense* (open circles), and *C. umtalense* (asterisks).

(K); North Nyeri, Nyeri, 2000 m, 30 Jan. 1933, *Napier* 2495 (K); South Nyeri, Kiandongoro forest, Nyeri-Naivasha rd., ½ mi. from Kagumo bridge, 21 Aug. 1968, *Mathenge* 376 (MO). **Nyanza:** Londiani, Tinderet Forest Reserve, Camp 2, 2400 m, 22 June 1949, *Maas Gesteranus* 5161 (K). **Rift Valley:** Naivasha, S of Kinangop, 3000 m, 22 July 1961, *Polhill* 433 (EA, K); Nakuru, Nyahururu, ca. 15 km N of Thompson Falls, 23 Aug. 1981, *Gilbert* 6345 (EA, K); Trans Nzoia, E of Mt. Elgon, 2830 m, 8 Jan. 1955, *Irwin* 180 (K). **TANZANIA. Arusha:** Oldeani Mt., 2000 m, 10 Feb. 1932, *St. Clair-Thompson* 612 (K). **Iringa:** Mufindi, escarpment above Luisenga stream, 1600 m, 17 Aug. 1984, *Bridson & Lovett* 533 (K, MO). **Tanga:** Marungu, 1600 m, July 1893, *Volkens* 641 (K). **UGANDA. Kigezi,** Elephant Valley, 2330 m, 11 Mar. 1960, *Lind* 2710 (K); Mbale, Buginyanya, Bugishu, 2000 m, 1 Sep. 1932, *Thomas* 464 (K). **ZAÏRE. Biega-Kivu Mts.,** 1929, *Humbert* 7604 (K); entre Kibati et Miragongo, Mission au Parc National Albert, Jan. 1938, *Lebrun* 9391 (K).

*Comments.* The degree of hairiness varies greatly between densely tomentose and almost gla-

brous. As there is neither a sharp limit between glabrous and hairy forms nor a correlation with other characters, the separation of variety *tomentosum* Oliver does not seem advisable. This variety has never been properly published, but its name is frequently found on specimens. The specimen selected as lectotype is marked as type by N. E. Brown, but was not cited as such in, e.g., *Flora of Tropical Africa* (Brown, 1902–1903).

*Cynanchum abyssinicum* is most closely related to *C. umtalense* and *C. virens*, with which it shares the trichomes on the adaxial corolla surface and the ligulate corona.

2. ***Cynanchum acutum*** Linnaeus, Sp. Pl. 212. 1753. *Vincetoxicum acutum* (L.) Kuntze, Revis. Gen. Bot. 2: 424. 1891. *Solenostemma acutum* (L.) Wehmer, Pfl.-Stoffe, ed. 2, 2: 1004. 1931. TYPE: LINN 308/3 (holotype, LINN). Figure 3.

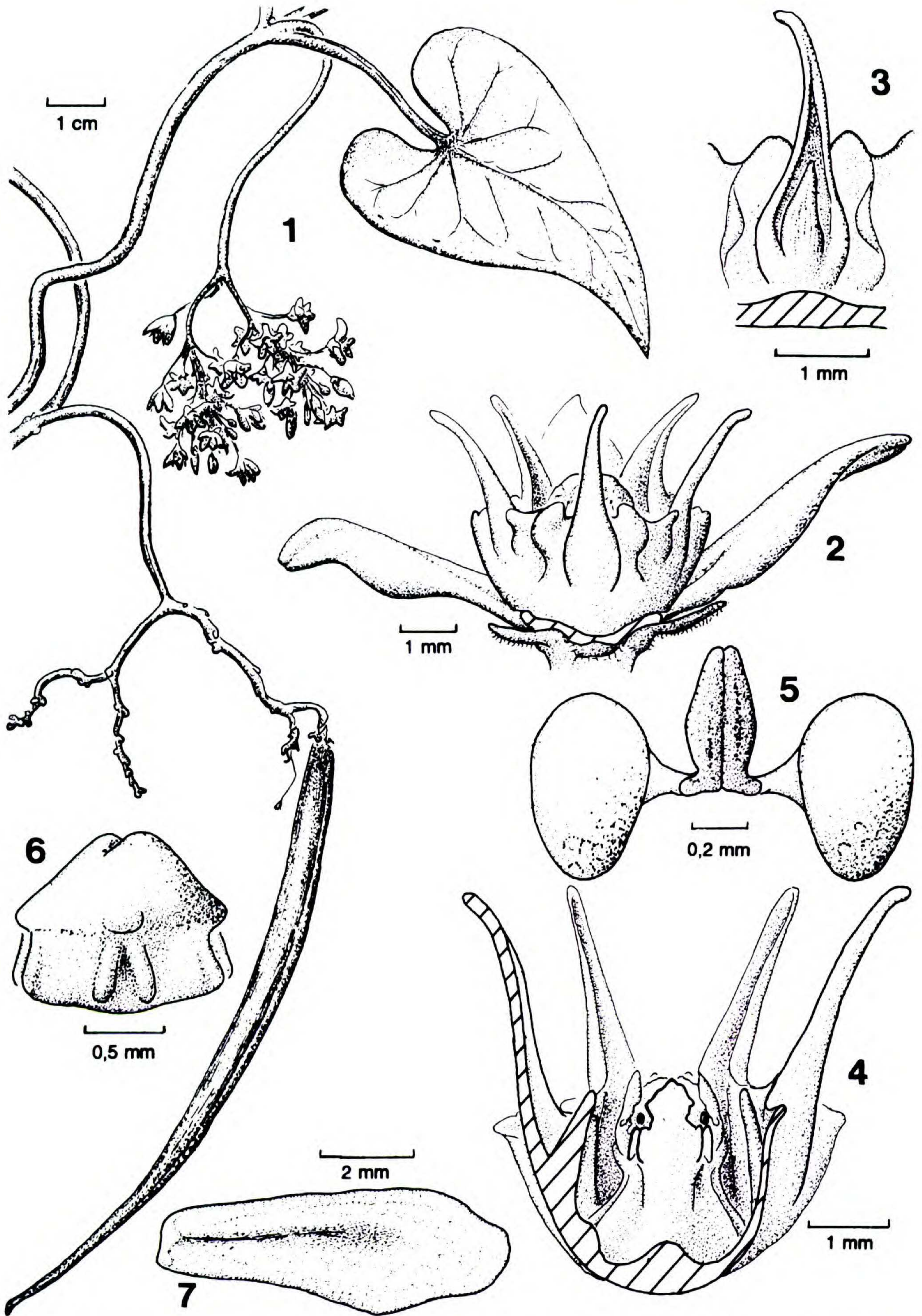


Figure 3. *Cynanchum acutum* L. 1, 7: Mashaly s.n.; 2–6: Hort. Bot. Münster s.n.—1. Habit with inflorescence and fruit.—2. Flower, two corolla lobes removed.—3. Staminal corona lobe with ligule, adaxial view.—4. Gynostegium and corona, one staminal corona lobe removed.—5. Pollinarium.—6. Stylar head.—7. Seed. Drawn by Jim Conrad.



*Cynanchum excelsum* Desf., Fl. Atlant. 1: 212. 1798. *Vincetoxicum excelsum* (Desf.) Kuntze, Revis. Gen. Pl. 2: 424. 1891. TYPE: Tunisia. Tozzer, *Desfontaines* 489 (holotype, P).

*Cynanchum fissum* Pomel, Nouv. Mat. Fl. Atl. 81. 1874. TYPE: Algeria. Berges du Chellif, *Pomel s.n.* (holotype, AL not seen; isotype, P).

*Cynanchum monspeliacum* L., Sp. Pl. 212. 1753. TYPE: LINN 308/6 (holotype, LINN).

Only synonyms relevant for Africa have been considered.

*Plants* ascending, twining, richly branched. *Shoots* herbaceous, sparsely to densely covered with flexuous trichomes 0.5–0.75 mm long; internodes 6–15 cm long, 1.5–2 mm diam. “*Stipules*” absent. *Leaves* with petioles 15–50 mm long; leaf blades herbaceous, 45–60(–70) mm long, 25–45(–70) mm wide, triangular, basally cordate to lobate, lobes 13–20 mm long, with 1–3 colleters in the adaxial sinus, apically obtuse, with flexuous trichomes 0.5–0.6 mm long, evenly distributed, abaxially isolatedly covered with flexuous trichomes 1–1.2 mm long, restricted to veins and margins. *Inflorescences* 20–35-flowered, 10–24 flowers open at a time, basally dichasial, apically bostrychoid, rachis 15–60 mm long. *Peduncles* 30–100 mm long, sparsely to densely covered with flexuous trichomes 0.8–1 mm long. *Flowers* with a sweetish carnation-like scent, very nectariferous; floral bracts 1.5–2 mm long, 0.4–0.6 mm wide at the base, ovate (–lanceolate), glabrous; pedicels 7–25 mm long, densely covered with flexuous trichomes 0.4–0.6 mm long. *Buds* 5–6 mm long, 2.5–3 mm diam., conical, with contorted aestivation. *Calyx* basally fused, abaxial surface with trichomes; lobes 2.2–2.5 mm long, 1.1–1.3 mm wide, ovate, apically acute. *Corolla* rotate, basally fused, 5–8 mm long, abaxially rose, adaxially basally purple, apically rose; lobes 1–1.3 mm wide, twisted, patent to horizontal, oblong, apically obtuse. *Corona* pink, 2.7–3 mm high, shorter than the gynostegium; C(is) consisting of Cs and Ci fused for about two-thirds of total corona length, Cs and Ci differentiated, Ci slightly shorter than Cs. Cs basally just adnate to the filaments, appressed to the back of the stamens, with adaxial appendages; lobes of Cs laminar, triangular, apically erect; appendages of Cs slightly longer than Cs, laminar, triangular, erect. *Lobes of Ci* laminar, deeply bifid, producing a cleft in front of the guide rails and a pronounced convex fold along the upper two-thirds of corona length, erect, with straight margins. *Gynostegium* 3.2–3.5 mm high, 2.5–2.7 mm diam., sessile. *Stamens* with free filaments 0.5–0.6 mm long; anthers about as high as broad, rectangular, abaxially planar. Anther

wings 1.2–1.5 mm long, parallel to each other, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.5–0.6 mm long, 0.5–0.6 mm wide, ovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.3–0.35 mm long; caudicles 0.1 mm long, flattened, straight, horizontal, triangular; pollinia laterally attached to the caudicles, 0.35–0.4 mm long, 0.35–0.4 mm wide, globose, elliptical in cross section. *Stylar head* 1.4–1.5 mm diam., 1.1–1.2 mm high; upper part 0.7–0.75 mm high, depressed-conical. *Follicles* usually one per flower, pendulous, 80–150 mm long, 7–8 mm diam., fusiform to narrowly oblong, round in cross section, apically strongly beaked, light brown, longitudinally grooved, glabrous. *Seeds* 6–6.5 mm long, 2.8–3 mm wide, ovate, light brown, seta and aleta side sculptured with longitudinal ridges, marginally with wing 0.3–0.4 mm wide with entire margin; coma 30–35 mm long. *Chromosome number*:  $2n = 22$  (voucher: *ex hort. Münster s.n.*, MSUN).

*Distribution and habitat.* Asia. Europe. Africa: Algeria, Egypt, Tunisia; lowlands, close to water. Very widespread and not rare, but uncommon in Africa. Figure 4.

*Flowering time.* September to October.

*Additional specimens examined* (Africa only). EGYPT. Kom Aushim, El Fayum, 15 July 1960, *Boulos s.n.* (G); Bords de Nil à Kasr-el-Aïm près le Caire, 13 Oct. 1908, *Burdet* 481 (G); Culhares à Koubak, 20 m, 21 Oct. 1908, *Burdet* 482 (G); Damietta, Ezbit-El-Burg, 18 Oct. 1982, *Mashaly s.n.* (K); Aegyptio superiori, 1837, *Schimper* 959 (L). TUNISIA. Gafsa, Feb. 1908, *Pitard* 434 (L).

*Comments.* This is the lectotype species of *Cynanchum*, designated by E. Meyer (1838). This Eurasian taxon extends into Africa only at the northern margins. Sometimes, infraspecific taxa are recognized under this widespread and variable species; none of them, however, is based on African material. Among African species, *C. mossambicense* is probably the closest relative.

**3. *Cynanchum adalinae*** (K. Schumann) K. Schumann in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 253. 1895. *Vincetoxicum adalinae* K. Schum., Bot. Jahrb. 17: 134. 1893. TYPE: Gabon. Ogowe, 10 Apr. 1881, *Soyaux* 277 (holotype, B presumably destroyed; lectotype, designated here, K). Figure 5.

*Plants* ascending, twining, 2.5–5 m high, richly and irregularly branched; rhizomatous; rhizomes 2–3 mm diam. *Shoots* perennial, herbaceous, sparsely

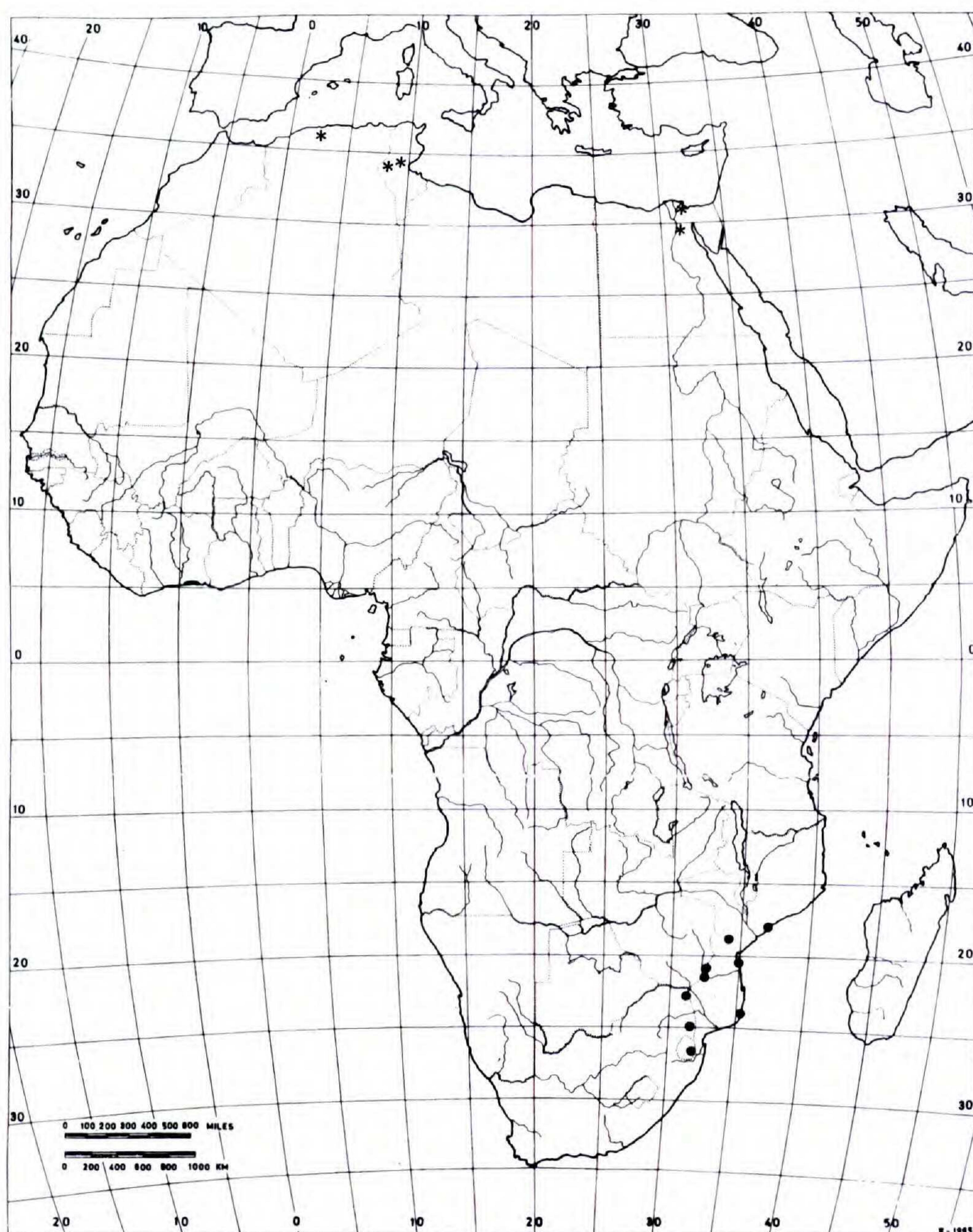


Figure 4. Known distribution of *Cynanchum acutum* (asterisks) in Africa, and of *C. mossambicense* (dots).

covered with flexuous trichomes 0.2–0.25 mm long, along a single line, basally woody, with brownish bark; internodes 7–15 cm long, 1–1.5 mm diam. “*Stipules*” absent. *Leaf blades* herbaceous to papery, ovate to elliptic, apically acuminate, apiculus 6–10 mm long, adaxially and abaxially glabrous. *Inflorescences* 15–25-flowered, 5–9 flowers open at a time, basally frequently with one or two bifurcations, apically bostrychoid. *Flowers* sweetly scented (*Breteler 1287*); floral bracts triangular, glabrous; pedicels 3–6 mm long, densely covered with flexuous trichomes 0.15–0.2 mm long, along a single line. *Buds* conical, basally with imbricate, apically contorted aestivation. *Calyx* rotate, basally fused, ciliate, lobes ovate, apically acute. *Corolla* rotate, basally fused, abaxially and adaxially creamish green, lobes incurved to patent, oblong to lanceolate. *Corona* white, 2.5–3 mm high, exceeding the gynostegium, almost entirely obscuring it; C(is) consisting of Cs and Ci fused for

$\frac{1}{2}$  to  $\frac{1}{4}$  of total corona length, Cs and Ci differentiated, Ci longer than Cs. Cs not adnate to the filaments, appressed to the back of the stamens, without adaxial appendages; lobes of Cs laminar, oblong, producing a pronounced convex fold, apically inflexed, with straight margins. *Lobes of Ci* laminar, oblong (when flattened), producing a pronounced convex fold along the upper two-thirds of corona length resulting in a cucullate shape, erect, with straight margins. *Gynostegium* 1.6–1.8 mm high, 1.5–1.6 mm diam., sessile. *Stamens* without free filaments, anthers about as high as broad, trapezoidal, abaxially planar; anther wings 0.9–1.1 mm long, convergent, extending along the whole length of the anther, stamens forming a triangular basal arch; adjacent anther wings parallel, in the same plane as the anther. *Connective appendages* 0.6–0.8 mm long, 0.3–0.35 mm wide, ovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum

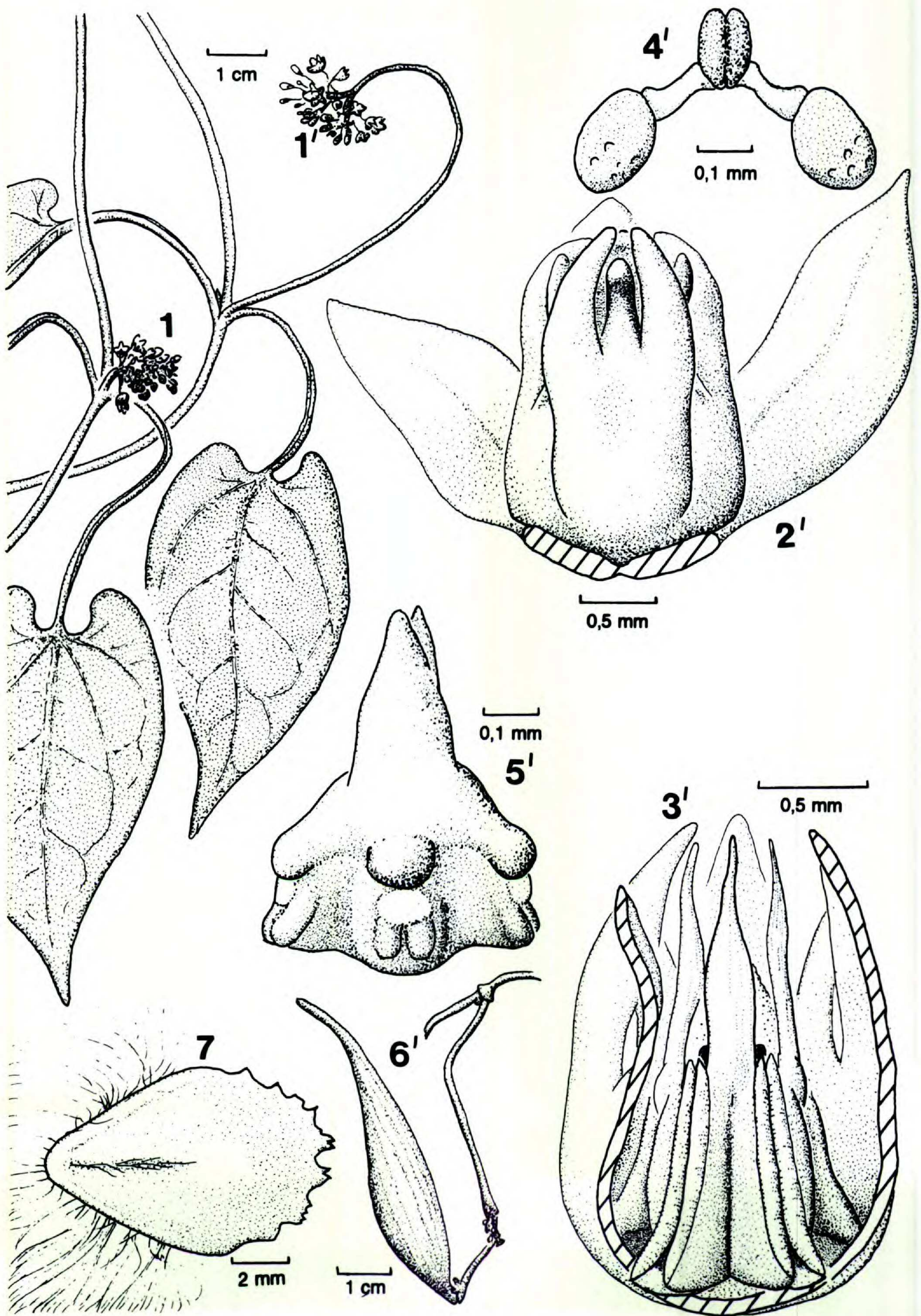


Figure 5. *Cynanchum adalinae* (K. Schum.) K. Schum. 1, 7: subspecies *adalinae* (Morton s.n.). 1'–6': subspecies *mannii* (Scott-Elliott) Bullock. 1'–5': *Bos* 1832; 6': *Deighton* 2522.—1, 1'. Internodes and inflorescences.—2'. Flower, two corolla lobes removed.—3'. Gynostegium and corona, partially removed.—4'. Pollinarium.—5'. Stylar head.—6'. Fruit.—7. Seed, seta side; note the attachment of the coma, which is unique in the genus. Drawn by Jim Conrad.

0.18–0.2 mm long; caudicles 0.12–0.15 mm long, cylindrical, straight, declinate, thickened at the insertion of the pollinium; pollinia apically attached to the caudicles, 0.14–0.16 mm long, 0.13–0.15 mm wide, globose, elliptical in cross section. *Stylar head* white, 0.75–0.8 mm diam., 0.95–1 mm high; upper part 0.65–0.7 mm high, conical. *Follicles* one, occasionally two per flower, pendulous, 60–95 mm long, 7–10 mm diam., fusiform, round to obtusely deltate in cross section, apically strongly beaked, keeled, medium brown with green mottling, longitudinally grooved, glabrous. *Seeds* 8.5–9.5 mm long, 5.5–6 mm wide, ovate, light brown, seta and a seta side sculptured with longitudinal ridges, marginally with wing 0.8–1.2 mm wide, distally with irregular, strongly dentate margin; coma 25–30 mm long, attached to the seed along about one-third of its length.

*Comments.* The affinities of *Cynanchum adalinae* are still uncertain; the closest relative is most likely among *C. altiscandens* and its relatives.

#### KEY TO THE SUBSPECIES:

Inflorescences sessile or very shortly pedunculate (less than 1 cm)..... *C. adalinae* subsp. *adalinae*  
 Inflorescences long-pedunculate (more than 1.5 cm).....  
 ..... *C. adalinae* subsp. *mannii*

### 3a. *Cynanchum adalinae* subsp. *adalinae*

*Cynanchum congolense* De Wild., Ann. Mus. Congo, Sér. 5, 1: 190. 1903–1906. TYPE: Congo. Wangata, *De-fèvre 644* (holotype, not found).

*Leaves* with petioles 15–30 mm long; leaf blades 50–75 mm long, 30–50 mm wide, basally cordate to lobate, lobes 6–11 mm long, with 1–2 colleters in the adaxial sinus. *Inflorescences* sessile to very shortly pedunculate (peduncles to 6 mm long); rachis 2–4 mm long. *Floral bracts* 0.6–0.7 mm long, 0.7–0.8 mm wide at the base. *Buds* 2.5–3 mm long, 1.5–1.8 mm diam. *Calyx lobes* 0.8–1 mm long, 0.5–0.6 mm wide. *Corolla* 3.5–4 mm long, lobes 1.5–1.8 mm wide, apically acute. *Chromosome number*:  $2n = 22$  (voucher: *Meve 903*, MSUN).

*Distribution and habitat.* Africa: Cameroon, Congo, Fernando Po, Gabon, Ghana, Ivory Coast, Nigeria, Zaïre; 6–650 m; edges and openings of secondary forest. Widespread. Figure 6.

*Flowering time.* December to September.

*Selected specimens examined.* CAMEROON. Kribi, ca. 13 km on Ebolowa rd., 14 Nov. 1968, *Bos 3277* (K, MO, WAG); Bertoua, near Catholic mission, ca. 650 m, 25 Apr. 1961, *Breteler 1287* (K, WAG); Oveng, near village, 27 km from Sangmélima along rd. to Yaoundé, 20 Mar. 1962,

*Breteler 2654* (K, WAG); Victoria, July 1904, *Kalbreyer 3* (K); Mt. Cameroon, above Likombe, 900 m, 27 Feb. 1995, *Meve 903* (MSUN). CONGO. Léfini, Région de Kindamba, environs de Meva, sur la piste d'Hamon, ca. 100 m, 4 Nov. 1963, *Descoings 11307* (MPU). FERNANDO PO. 1861, *Mann s.n.* (K). GABON. Estuaire, Forest de la Mondah, rd. from Libreville to Santa Clara, 16 Sep. 1986, *Breteler, Lemmens & Nzabi 7769* (WAG); N'gounié, Waka, ca. 380 m, 24 Nov. 1984, *Arends, Louis & De Wilde 440* (WAG); Ogoué, about 15 km SSE of Pana, 19 Oct. 1983, *Breteler 6983* (WAG). GHANA. **Ashanti:** Mampong, 8 Dec. 1953, *Morton 75* (K). **Central Region:** Cape Coast, 6 m, 7 July 1959, *Hall 1513* (K). IVORY COAST. 2 km à l'Est de Rubino, 18 June 1963, *Garnier & Bouaké 18* (K); ca. 16 km NW of Sassandra, near Gunther Fuyts house, on Pont de Neuve, c. 4 km SE of Louga, 13 June 1963, *De Wilde 200* (K, WAG). NIGERIA. Benin, Sapoba Forest reserve, near Abé village, ca. 5 mi. from Sapoba on Sapele rd., P.S.P. 89, 28 June 1957, *Onochie 36654* (K). **Lagos:** 70 mi. E of Lagos, *Lamborn 303* (K); Ogoya, Ikom/Obudu div., ca. ¼ mi. SW of Boje enclave P 43, Afi River reserve, 28 May 1946, *Jones & Onochie 18918* (K). **Ondo:** Akure, Idanre, ca. 500 m, 3 Mar. 1948, *Brenan & Keay 8691* (K). ZAIRE. Yangambi Plateau, Italowe, 9 Sep. 1938, *Louis 1265* (SHRG).

*Comments.* The type of *Cynanchum congolense* De Wild. has not been found. The fairly detailed description, however, leaves no doubt that the specimen described belongs to *C. adalinae* subsp. *adalinae*. The main differences noted are the slightly smaller flowers and the almost sagittate leaf bases. As both floral size and leaf shape tend to be slightly variable, there is no reason to maintain *C. congolense* as distinct.

**3b. *Cynanchum adalinae* subsp. *mannii*** (Scott-Elliott) Bullock, Kew Bull. 17: 185. 1963. *Vincetoxicum mannii* Scott-Elliott, J. Linn. Soc., Bot. 30: 93. 1894. *Cynanchum mannii* (Scott-Elliott) N. E. Br. in Dyer, Fl. Trop. Afr. 4(1): 394. 1903. TYPE: Sierra Leone. Bagroo River, 1861, *Mann s.n.* (holotype, K).

*Cynoctonum acuminatum* Benth. in Hook., Niger Fl. 453. 1849. *Cynanchum acuminatum* (Benth.) K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 253. 1895, non *Cynanchum acuminatum* Humb. & Bonpl. ex Schult, Syst. Veg. 6: 111. 1820. TYPE: Sierra Leone. *Don s.n.* (holotype, BM not seen).

*Leaves* with petioles 25–35 mm long; leaf blades 55–65 mm long, 20–30 mm wide, ovate to elliptic, basally cordate with 3–4 colleters in the adaxial sinus. *Inflorescences* with peduncles 15–65 mm long; rachis 5–15 mm long. *Floral bracts* 0.5–1.2 mm long, 0.4–0.6 mm wide at the base. *Buds* 3–4 mm long, 1.5–1.8 mm diam. *Calyx lobes* 1.2–1.4 mm long, 0.6–0.7 mm wide. *Corolla* 3–4 mm long, adaxially basally sometimes with a few smooth trichomes; lobes 1–1.2 mm wide, apically obtuse.

*Distribution and habitat.* Africa: Ivory Coast,

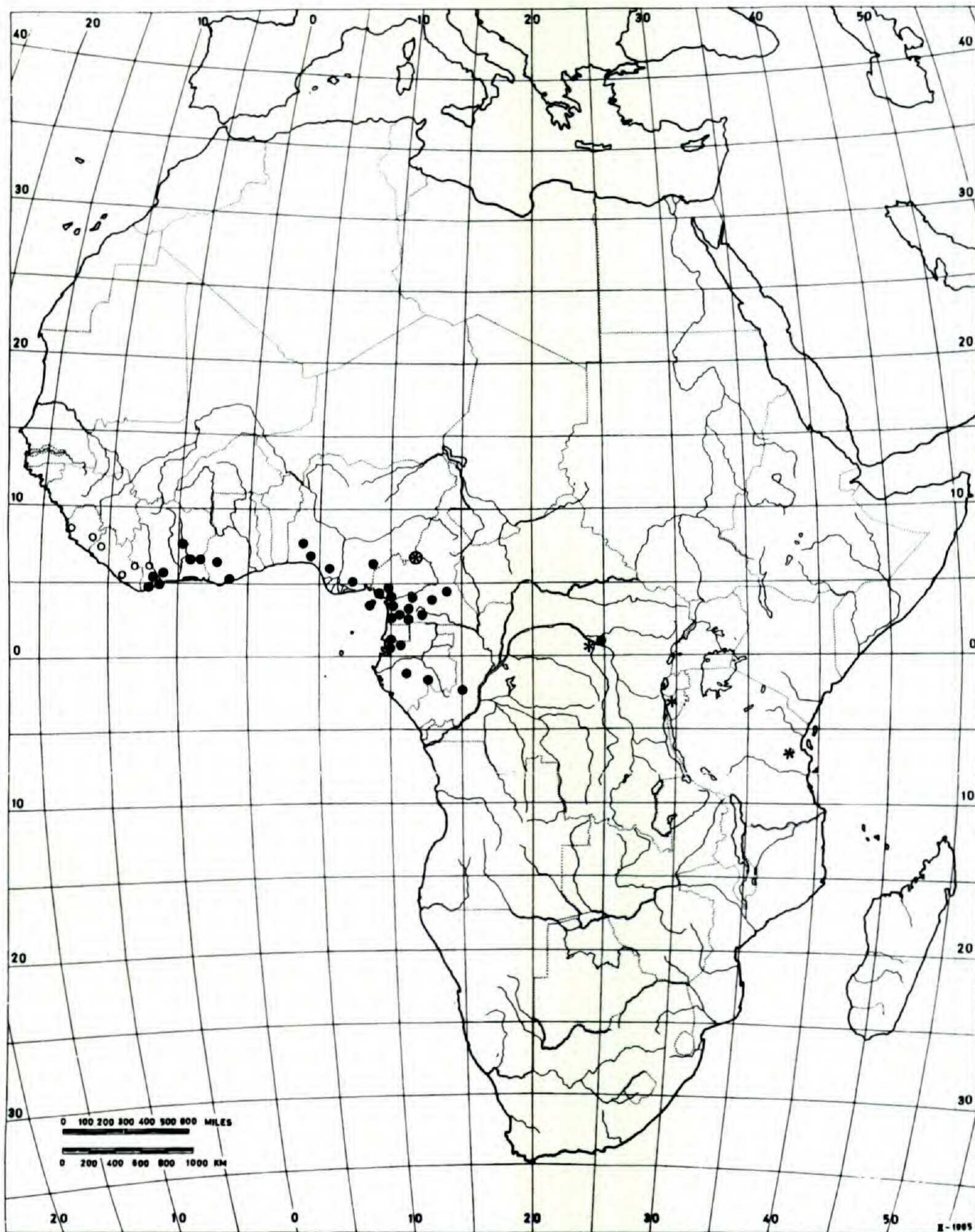


Figure 6. Known distribution of *Cynanchum adalinae* subsp. *adalinae* (dots), subspecies *mannii* (open circles), and *C. ledermannii* (asterisks). The one traced locality of one of the lost types is indicated by a circle around the asterisk.

Liberia, Sierra Leone; 50–200 m; edges and openings of primary forest. Not as widespread and frequent as the typical subspecies, but not immediately endangered. Figure 6.

*Flowering time.* February to October.

*Selected specimens examined.* IVORY COAST. 25 km SW of Guéyo, ca. 100 m, 26 Mar. 1962, *Leeuwenberg 3738* (K, MPU, WAG). LIBERIA. Grand Bassa, 20 mi. N of Buchanan, 18 Jan. 1969, *Jansen 1914* (WAG); Grand Gedeh, about 5 mi. S of Tchien, on rd. to Sinoe, 18 Jan. 1969, *Jansen 1244, 1245* (WAG); Montserrado, road from Bomi Hills to Gbama, 120 km from Monrovia, 18 Oct. 1963, *Van Harten 165* (K, WAG). SIERRA LEONE. **Southern Province:** Vevehun, between Fwendu and Potoru, 11 Apr. 1929, *Deighton 1649* (K). **Western Area:** Havelock, Freetown, 19 June 1964, *Morton 1368* (K, MO, WAG).

*Comments.* Distinguished from the typical subspecies mainly by the much longer peduncle.

Found in the western part of the distribution area of the species.

*Cynanchum dinklagei* Schltr. ex Milbr. [Repert. Spec. Nov. Regni. Veg. 41: 264. 1937, nomen nudum] represents this taxon, judging from original material (*Dinklage 3064*, K).

*Cynanchum adalinae* subsp. *mannii* is illustrated in Adam (1975: 971, pl. 505).

**4. *Cynanchum africanum*** (Linnaeus) Hoffmannsegg, Verz. Pfl.-Kult. 54. 1824. *Periploca africana* L., Sp. Pl.: 212. 1753. *Vincetoxicum africanum* (L.) Kuntze, Revis. Gen. Pl. 2: 422. 1891. *Periploca pallida* Salisb., Prodr. Stirp. Chap. Allerton 148. 1796, nom. superfl. (renaming of *P. africana* L.). TYPE: *H.S.C. 79* (lectotype, designated by Wijnands (1983), BM not seen).

*Cynanchum crassifolium* R. Br., Mem. Wern. Nat. Hist. Soc. 1: 46. 1810. *Cynoctonum crassifolium* (R. Br.) E. Mey., Comm. Pl. Afr. Austr. 216. 1838. *Cynanchum africanum* (L.) Hoffmanns. var. *crassifolium* (R. Br.) N. E. Br. in Dyer, Fl. Cap. 4(1): 749. 1908. *Cynoctonum crassiflorum* Krauss, Flora 27: 827. 1844 (spelling error for *C. crassifolium* R. Br.). TYPE: collector unknown s.n., Herbarium Banks (BM). The fact that "*Cynanchum obtusifolium*, Linn. Suppl. 169?" is cited in synonymy does not render *Cynanchum crassifolium* R. Br. superfluous because the question mark is an expression of doubt (ICBN Art. 52.2, note 1, see Greuter et al., 1994).

*Cynoctonum dregeanum* Decne. in Candolle, Prodr. 8: 531. 1844. *Vincetoxicum dregeanum* (Decne.) Kuntze, Revis. Gen. Pl. 2: 424. 1891, nom. superfl. when published, substitute name for *Cynanchum crassifolium* R. Br.

*Cynanchum pilosum* R. Br., Mem. Wern. Nat. Hist. Soc. 1: 46. 1810. *Cynoctonum pilosum* (R. Br.) E. Mey., Comm. Pl. Afr. Austr.: 216. 1838. *Vincetoxicum pilosum* (R. Br.) G. Nicholson, Ill. Dict. Gard. 4: 160. 1887. *Cynoctonum crassifolium* E. Mey. var. *pilosum* (R. Br.) Decne. in Candolle, Prodr. 8: 530. 1844. *Cynanchum obtusifolium* var. *pilosum* (R. Br.) Schltr., Bot. Jahrb. Syst. 18, Beibl. 45: 10. 1894, nom. superfl. (cites *Periploca africana* L. in synonymy).

*Cynanchum rotundifolium* Thunb. ex Decne. in Candolle, Prodr. 8: 552. 1844. TYPE: not known. Pro. syn.

*Cynanchum intermedium* N. E. Br. in Dyer, Fl. Cap. 4(1): 747. 1908. TYPE: South Africa. Cape: prope Port Elizabeth, Oct. 1897, West 1924 (holotype, SAM).

*Plants* twining, sparsely branched, 30–60 cm high, sarmentose with adventitious roots along the whole lower surface of the runner; subterranean organs rhizomatous in older plants, rhizome 5–10 mm diam. (e.g., Bayliss 6144, PRE). *Shoots* perennial, 50–100 cm long, 1–1.5 mm diam., herbaceous, glabrous or sparsely to densely covered with trichomes 0.5–0.6 mm long; in old plants basally woody with brownish bark. "*Stipules*" ovate, almost round, 4–6 mm long, 4–6 mm wide. *Leaves* with petioles 2–6 mm long, 2–3 colleters at the base of the leaves; leaf blades herbaceous to coriaceous, 20–30 mm long, 10–25 mm wide, ovate, basally cordate or rounded, apically mucronate, adaxially and abaxially glabrous, or isolatedly to sparsely covered with erect trichomes 0.4–0.5 mm long, evenly distributed over the whole surface. *Inflorescences* sciadoidal, 4–7-flowered, all flowers open at a time; peduncles 10–20 mm long, glabrous, or sparsely to densely covered with erect trichomes 0.5–0.6 mm long. *Flowers* sweetly scented; floral bracts 1.5–2.5 mm long, 0.5–0.7 mm wide at the base, triangular, glabrous, or with trichomes; pedicels 4–12 mm long, glabrous, or isolatedly to sparsely covered with erect trichomes 0.6–0.7 mm long. *Buds* 5–8 mm long, 1.5–2.5 mm diam., elongated-conical; aestivation basally imbricate, apically contorted. *Calyx* basally fused, abaxially with trichomes, lobes

2–2.7 mm long, 1–1.5 mm wide, triangular, apically acute. *Corolla* rotate, basally fused, 6–12 mm long, abaxially and adaxially purple to brown, glabrous (abaxially occasionally with a few trichomes); lobes 1.8–2.2 mm wide, recurved, oblong, apically acute, twisted. *Corona* white, tubular, 6–10 mm high, exceeding the gynostegium, partly obscuring it; C(is) consisting of Cs and Ci fused for more than  $\frac{3}{4}$  of total corona length, only Cs differentiated in shape. Cs without adaxial appendages; lobes of Cs flat, triangular to bifid (shallowly or more deeply, then giving the impression of a differentiated Ci), erect, with straight margins. *Gynostegium* 0.8–1.2 mm high, 1–1.5 mm diam., atop a stipe, 2–4 mm long. *Stamens* without free filaments, anthers deltoid, abaxially convex; anther wings 0.3–0.4 mm long, parallel to each other, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.75–0.8 mm long, 0.45–0.5 mm wide, triangular, equaling the stamen in width, slightly inflexed. *Pollinarium*: corpusculum 0.2–0.25 mm long; caudicles 0.18–0.2 mm long, flattened, concavely recurved, triangular; pollinia apically attached to caudicles, 0.4–0.45 mm long, 0.15–0.18 mm wide, pyriform, elliptical in cross section. *Stylar head* 1–1.1 mm diam., 0.8–0.9 mm high; upper part 0.5–0.55 mm high, depressed-conical. *Follicles* usually one per flower, 45–60 mm long, 9–11 mm wide, obclavate, round in cross section, apically obtuse, medium brown, longitudinally slightly grooved; glabrous. *Seeds* 6–7 mm long, 3.3–3.7 mm wide, pyriform, light brown, seta and a seta side tuberculate, marginally with indistinct wing 1–1.1 mm wide with entire margin; coma 25–30 mm long. *Chromosome number*:  $2n = 22$  (Liede 2548, Liede & Meve 642, MSUN).

*Distribution and habitat.* Africa: South Africa (Cape Province); 0–200 m, very rarely to 700 m; dunes, flats to gentle slopes, mostly on sand.

*Comments.* The late Onno Wijnands brought to my attention the fact that the lectotypification of this species (Linné 307.5, LINN) in Liede (1993) is invalid, because it is predated by his lectotypification (Wijnands, 1983).

Further details, illustration, distribution map, and citation of specimens are provided in Liede (1993).

**5. *Cynanchum altiscandens* K. Schumann, Abh. Königl. Akad. Wiss. Berlin 64. 1894. TYPE: Tanzania. Tanga: Usambara, Kwa Msfuza Hochwald, Aug. 1893, Holst 9078 (holotype, B presumably destroyed; lectotype, designated here, K). Figure 7.**

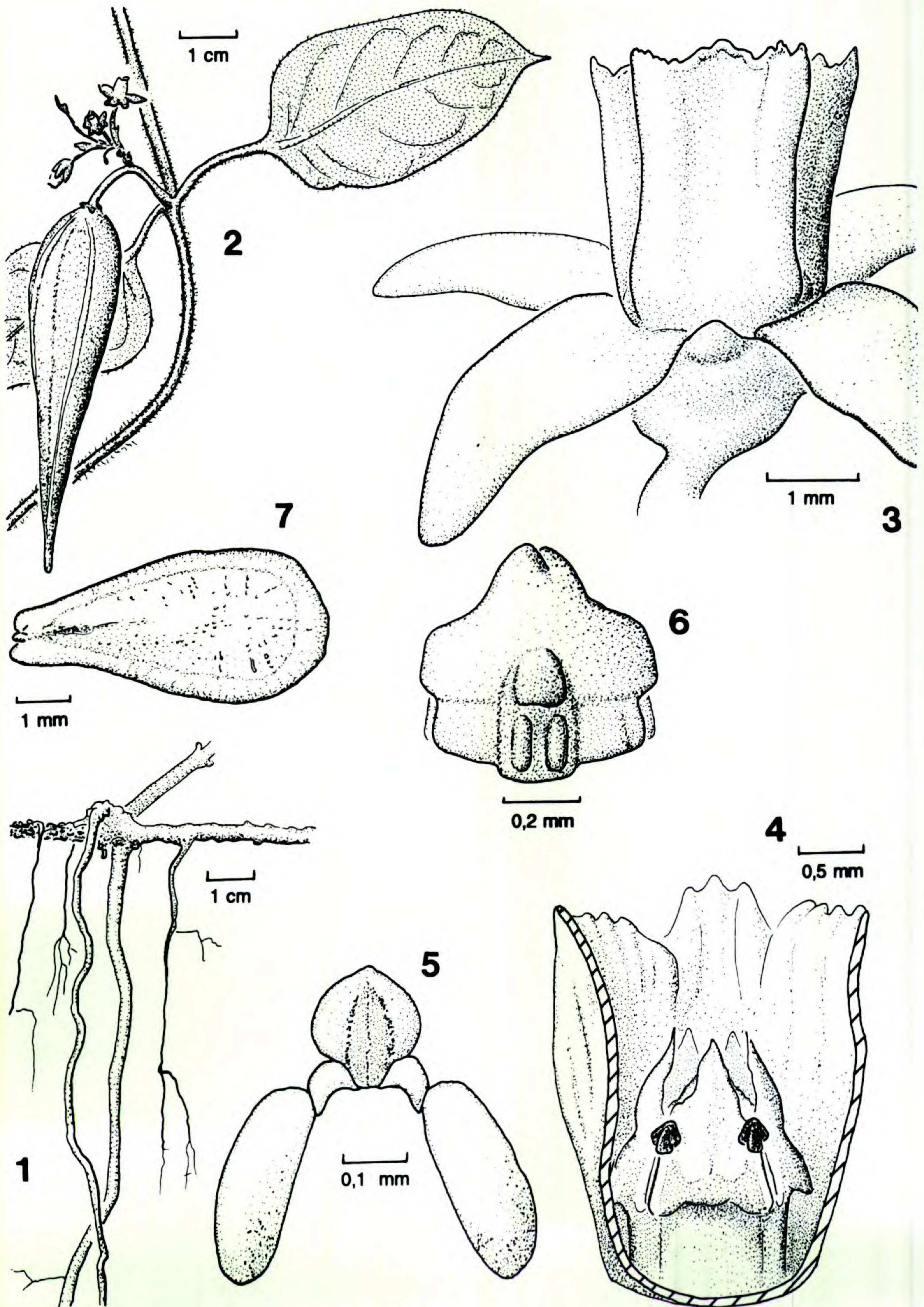


Figure 7. *Cynanchum altiscandens* K. Schum. 1-7: Drummond & Hemsley 2106.—1. Rhizome and roots.—2. Habit with inflorescence and fruit.—3. Flower.—4. Gynostegium and corona, partially removed.—5. Pollinarium.—6. Stylar head.—7. Seed, seta side. Drawn by Jim Conrad.

*Cynanchum mensense* Schweinf. ex K. Schum., Abh. Königl. Akad. Wiss. Berlin 64. 1894. TYPE: Eritrea: Gheleb, 1850 m, 17 Apr. 1891, *Schweinfurth 1505* (holotype, B presumably destroyed; lectotype, designated here, M).

*Plants* ascending, twining, 3–5 m high, richly and irregularly branched, sarmentose, with runners 2–3 mm diam., adventitious roots developing along the whole lower surface of the runner. *Shoots* herbaceous, glabrous to sparsely covered with flexuous trichomes 0.5–0.6 mm long; internodes 35–75 cm long, 1–1.5 mm diam. “*Stipules*” widely ovate, 8–12 mm long, 7–10 mm wide. *Leaves* with petioles 5–15 mm long, leaf blades herbaceous, 20–45 mm long, 12–28 mm wide, ovate, basally rounded with 1–3 colleters adaxially, apically acute or apically acuminate, apiculus 1–2 mm long, adaxially glabrous to sparsely covered with appressed trichomes 0.6–0.75 mm long, evenly distributed over the whole surface, abaxially glabrous or sparsely covered with appressed trichomes 0.5–0.6 mm long, concentrated on veins and margins. *Inflorescences* bostrychoid, 5–20-flowered, 5–12 flowers open at a time; rachis 1–5 mm long; peduncles 2–5 mm long, glabrous to densely covered with appressed trichomes 0.25–0.3 mm long. *Flowers* with floral bracts 0.6–1 mm long, 0.6–0.8 mm wide at the base, triangular, with trichomes; pedicels 5–8 mm long, glabrous to densely covered with flexuous trichomes 0.4–0.6 mm long. *Buds* 3–4 mm long, 1.5–2 mm diam., conical, with imbricate aestivation. *Calyx* basally fused; abaxial surface with trichomes; lobes 1.2–1.6 mm long, 0.7–1 mm wide, ovate, apically acute. *Corolla* rotate, basally fused; 3.5–4.5 mm long, abaxially and adaxially yellowish green; lobes 0.8–1.2 mm wide, straight, patent, horizontal or declinate, oblong, apically acute. *Corona* white, tubular to urceolate, 3–3.5 mm high, exceeding the gynostegium, entirely obscuring it; C(is) consisting of Cs and Ci completely fused, only Ci differentiated. Cs not adnate to the filaments, without adaxial appendages. *Lobes of Ci* laminar, triangular (when flattened), producing a pronounced convex fold along the upper third of corona length, apically reflexed, with straight margins. *Gynostegium* 1.7–1.8 mm high, 1.8–2 mm diam., on a bulge of 0.4–1.3 mm length. *Stamens* without free filaments, anthers broader than high, trapezoidal, abaxially planar. Anther wings 0.6–0.65 mm long, convergent, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.8–0.9 mm long, 0.45–0.5 mm wide, triangular, narrower than the stamen, erect. *Pollinarium*: corpusculum 0.25–0.3 mm long, rhomboid; caudicles 0.15–0.2 mm

long, flattened, straight, horizontal, trapezoidal; pollinia subapically attached to the caudicles, 0.35–0.4 mm long, 0.1–0.12 mm wide, ovoid to oblongoid, ovate in cross section. *Stylar head* 0.9–1 mm diam., 0.9–1 mm high; upper part 0.6–0.65 mm high, depressed-conical. *Follicles* one, occasionally two, per flower, pendulous, 55–65 mm long, 8–10 mm diam., obclavate, obtusely deltate in cross section, apically strongly beaked, keeled, medium brown, longitudinally grooved, glabrous or with isolated indumentum. *Seeds* 5–5.5 mm long, 2.2–2.5 mm wide, ovate, medium brown, seta and a seta side sculptured with longitudinal ridges, marginally with 0.4–0.6 mm wide wing with entire margin; coma 25–30 mm long. *Chromosome number*:  $2n = 22$  (voucher: *Liede & Newton 2873*, ULM).

*Distribution and habitat.* Africa: Eritrea, Ethiopia (Harerge, Shewa, Sidamo), Kenya (K2, K3, K4, K6), Tanzania (T1, T2, T3), Uganda (U2, U3, U4, U7); 1000–2600 m; forest margins, thickets, roadside shrubbery. Widespread and frequent. Figure 8.

*Flowering time.* Almost all year, with peak between September and March.

*Vernacular names.* Sandab-Ngingichet (Kipsan-gali); Ngobito-Ol’dorobo, Sinande (Masai).

*Uses.* Browsed by all domestic stock; Wandorobo use stems to sew up the ends of bee hives.

*Specimens seen.* ERITREA. Oculè Cusai, Monte Metaten, 2500 m, 12 Sep. 1902, *Pappi 1483* (EA); Environs de Acrou, 1900 m, 8 Apr. 1892, *Schweinfurth & Riva 1692* (K). ETHIOPIA. **Harerge:** Harar, about 5 km on the rd. to Feddis, ca. 1800 m, 5 Dec. 1976, *Jansen & De Wit 7277* (WAG). **Shewa:** Mt. Zuquala, 2600 m, 7 Dec. 1961, *Meyer 7637* (K). **Sidamo:** 13 km S of Aghere Mariam on new rd., 1950 m, 9 May 1976, *Gilbert & Jefford 4316* (K). KENYA. **Central:** Kiambu, Kijabe, where stream cuts direct rd. to Kijabe across Kedong rift side through African Inland Mission, 1 Dec. 1963, *Verdcourt 3814* (B, K); Nyeri, Aberdares, near forest station, 13 Jan. 1922, *Fries 895* (K). **North Nyeri:** Nanyuki, Sweet Waters Ranch, 1750 m, 26 Dec. 1964, *Gillett 16569* (K); Masai, Narok, Orengetok ca. 12 mi. from Narok on rd. to Olokurto, 2530 m, 17 May 1961, *Glover, Gwynne & Samuel 1429* (K). **Rift Valley:** Nakuru, Nakuru National Park, 1740 m, 20 July 1975, *Gillett 20851* (K); Naivasha, Crater Lake, 1830 m, Nov. 1958, *Newbould 3634* (K); Trans Nzoia, Hoey’s Bridge (Moi’s Bridge), 1960 m, Sep. 1971, *Tweedie 4121* (K); Turkana, Mt. Lorosuk, Chemorongit Mtns., Karasuk, 2660 m, Aug. 1965, *Wilson 1644* (K). TANZANIA. **Arusha:** Mt. Meru, E slope, 1800 m, 12 Mar. 1968, *Greenway & Kanuri 13371* (K); Ngorongoro, 2330 m, 25 Nov. 1957, *Tanner 842* (K). **Mara:** Loliondo, 10 mi. W of Klein’s Camp, ca. 2000 m, 11 Nov. 1953, *Tanner 1821* (K, MO); Moshi, Kilimanjaro Süd, 1650 m, 15 Jan. 1934, *Schlieben 4546* (K). **Tanga:** rd. to Lushoto town, 3 Mar. 1986, *Kisena 623* (K). UGANDA. Busoga, Usoga, Jan. 1894, *Scott Elliott 7227* (K); East Ankole, Mitooma, Lukiri, 1700 m, 11 Jan. 1989, *Rwaburindore 2752* (MO);



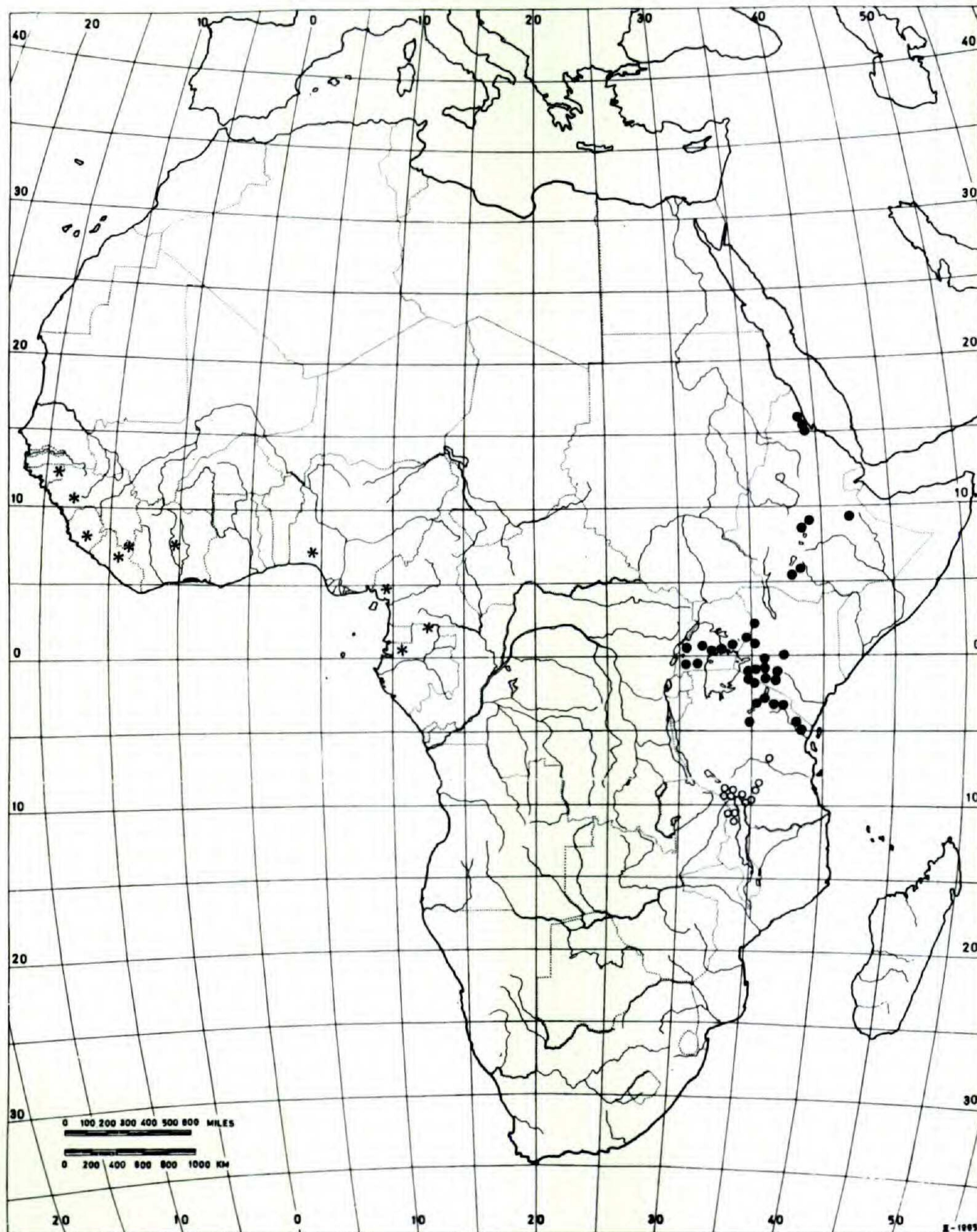


Figure 8. Known distribution of *Cynanchum altiscandens* (dots), *C. longipes* (asterisks), and *C. rungweense* (open circles).

Masaka, Kabula, 14 Mar. 1936, *Michelmores* 1328 (K); Mengo, near Mukono, Nov. 1914, *Dümmers* 1238 (BM, BOL); Mubende, Singo West, ½ mi. W of Kasanda trading center, 10 Aug. 1974, *Katende* 2249 (K); Toro, N edge of Kihabule LFR, W of Katwe, Queen Elizabeth National Park, 1030 m, 22 Apr. 1969, *Lock* 69/85 (EA).

*Comments.* *Cynanchum altiscandens* is closely related to *C. rungweense*, *C. ellipticum*, *C. natalitium*, *C. africanum*, and *C. zeyheri*, a group of species characterized by highly fused coronas and, with exception of *C. ellipticum*, stipitate gynostegia and the formation of runners or rhizomes just under the soil surface.

**6. *Cynanchum balense*** Liede, sp. nov. TYPE: Ethiopia. Bale: Rira, 3260 m, 20 Dec. 1959, *Mooney* 8359 (holotype, K). Figure 9.

*Cynanchum gonoloboides* affinis cum foliis neuraphyl-

lis, fructibus incrassatis. Differt gynostegio sessili, partibus staminalibus interstaminalibusque coronae gynostegialis non nisi basaliter connatis; partibus staminalibus profunde bifidis.

*Plants* ascending, twining, 6–7 m high, richly and irregularly branched. *Shoots* perennial, herbaceous, isolatedly glabrescent with flexuous trichomes 0.4–0.5 mm long, basally woody with brownish bark; internodes 35–45 cm long, 3–3.5 mm diam. “*Stipules*” absent. *Leaves* with petioles 17–40 mm long; leaf blades coriaceous, 55–110 mm long, 35–60 mm wide, ovate, basally cordate with 9–11 colleters in the adaxial sinus; apically acuminate, apiculus 7–10 mm long, adaxially isolatedly covered with flexuous trichomes 0.4–0.45 mm long, evenly distributed over the whole surface, abaxially sparsely covered with flexuous trichomes 0.4–0.5 mm long, concentrated on veins and mar-

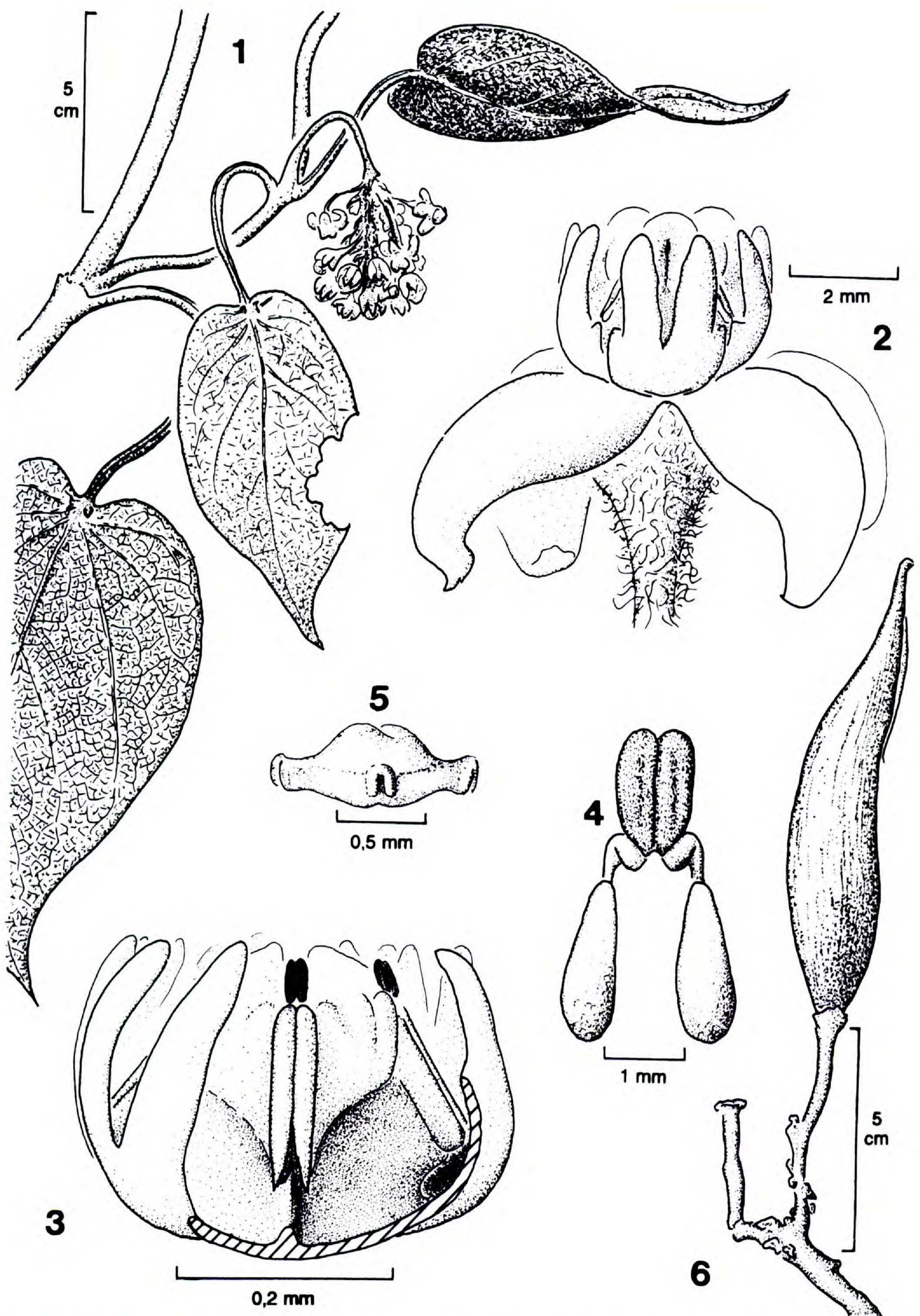


Figure 9. *Cynanchum balense* Lied. 1-6: Mooney 8359.—1. Habit with inflorescence.—2. Flower.—3. Gynostegium and corona, partially removed.—4. Pollinarium.—5. Stylar head.—6. Fruit. Drawn by Jim Conrad.

gins. *Inflorescences* basally dichasial, apically bostrychoid, 12–20-flowered, 5–15 flowers open at a time; rachis 20–50 mm long; peduncles 40–50 mm long, densely covered with flexuous trichomes 0.5–0.6 mm long. *Flowers* fragrant; floral bracts 5–6 mm long, 1–1.5 mm wide at the base, ovate, with trichomes; pedicels 15–20 mm long, densely covered with flexuous trichomes 0.5–0.6 mm long. *Buds* 4.5–5 mm long, 3.5–4 mm diam., ovoid, with imbricate aestivation. *Calyx* entirely free, abaxial surface with trichomes; lobes 4–4.2 mm long, 1.8–2 mm wide, ovate, apically acute to acuminate. *Corolla* rotate, basally fused; 4–5 mm long, abaxially and adaxially greenish purple; lobes 2–2.2 mm wide, straight, horizontal to declinate, oblong, apically acute to acuminate. *Corona* pink, 2.5–3 mm high, equaling the gynostegium in height, C(is) consisting of Cs and Ci only basally fused, only Cs differentiated. Cs not adnate to the filaments, without adaxial appendages; lobes of Cs laminar, deeply bifid, apically erect, with straight, entire margins. *Gynostegium* 2–2.2 mm high, 1.4–1.6 mm diam., sessile. Anthers about as high as broad, trapezoidal, abaxially convex; anther wings 1.4–1.6 mm long, convergent, extending beyond the anther proper, consisting of distal and proximal ridge, with space between distal and proximal ridge papillose, proximal ridge curved; adjacent anther wings parallel, centrifugal. Connective appendages 0.7–0.8 mm long, 0.8–1 mm wide, ovate, equaling the stamen in width, strongly inflexed. *Pollinarium*: corpusculum 0.4–0.45 mm long, ovoid; caudicles ca. 0.15 mm long, cylindrical, concavely recurved; pollinia apically attached to the caudicles, 0.48–0.5 mm long, 0.15–0.17 mm wide, clavate. *Stylar head* 1.2–1.3 mm diam., 0.6–0.8 mm high; upper part 0.4 mm high, umbonate. *Follicles* one per flower, 90–95 mm long, 12–15 mm diam., obclavate, keeled, apically strongly beaked, medium brown, thick-walled, longitudinally grooved, glabrous. *Seeds* and *chromosome number* unknown.

*Distribution and habitat.* Africa: Ethiopia: Bale; 3260 m (at upper forest margin); patch of forest in pasture. Only known from the type collection. Probably rare and endangered, even though Rira is included in the Mt. Bale National Park (fide M. G. Gilbert). Figure 10.

*Flowering time.* December.

*Comments.* *Cynanchum balense* is a sister species of *C. gonoloboides*, with which it shares the characteristic dark green leaves with pronounced nervature as well as similar size and shape of the fruit.

7. *Cynanchum blyttioides* Liede, sp. nov. TYPE: Somalia. Sanaag, above Geei Harre, W of Gardo airstrip, 710–840 m, 7 Oct. 1980, *Beckett* 428 (holotype, EA; isotype, K). Figure 11.

Fruticulus erectus, habitu *Blyttia* et *Diplostigma* similis, sed partibus staminalibus interstaminalibusque corollae gynostegialis late connatis, abaxialibus papillosis difert.

*Plants* erect, nontwining, 50–75 cm high, richly basicaulously branched. *Shoots* woody, with grayish bark, glabrous. “*Stipules*” absent. *Leaves* subsessile; leaf blades 3–4 mm long, 2–3 mm wide, ovate, basally rounded with 1–3 colleters adaxially, apically obtuse, marginally thickened, crenulate, adaxially and abaxially glabrous. *Inflorescences* sessile, sciadoidial, 2–4-flowered, all flowers open at a time. *Flowers* with floral bracts 0.8–1 mm long, 0.4–0.6 mm wide at the base, triangular, glandular over the whole surface; pedicels 2.5–3 mm long, glabrous. *Calyx* basally fused; lobes 1.2–1.3 mm long, 0.5–0.6 mm wide, triangular, apically acute. *Corolla* cyathiform, basally fused, with imbricate aestivation, 2–2.5 mm long; lobes 0.8–0.9 mm wide, incurved, triangular, apically acute. *Corona* cyathiform, abaxially papillose, 1.5–1.7 mm high, equaling the gynostegium in height; C(is) consisting of Cs and Ci fused for  $\frac{3}{4}$  to  $\frac{7}{8}$  of total corona length, Cs and Ci differentiated, Ci longer than Cs (and about twice as broad; upper halves of Ci folded in over Cs), with straight margins. Cs not adnate to the filaments, appressed to the back of the stamens, without adaxial appendages; lobes of Cs laminar, oblong, apically erect, with straight margins. *Lobes of Ci* laminar, ovate, producing a slight convex fold along the whole corona length, inflexed, with straight margins. *Gynostegium* 1–1.2 mm high, 0.9–1.1 mm diam., sessile. *Stamens* without free filaments, anthers about as high as broad, hexagonal, abaxially biconcave; anther wings 0.65–0.7 mm long, parallel to each other, not extending along the whole length of the anther; the anther forming a “pseudostipe” 0.3–0.4 mm high, adjacent anther wings parallel, basally centrifugal, forming a distinct “mouth” with the basal lateral margin of the anther. Connective appendages 0.36–0.4 mm long, 0.5–0.55 mm wide, ovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.15–0.17 mm long, margins of the corpuscular cleft basally widened; caudicles 0.09–0.1 mm long, flattened, convexly recurved, trapezoid; pollinia subapically attached to the caudicles, 0.2–0.25 mm long, 0.08–0.1 mm wide, ovoid. *Stylar head* 0.5–0.6 mm diam., 0.25–0.35 mm high; upper part 0.2–0.3 mm high, umbonate. *Follicles* one per flower,

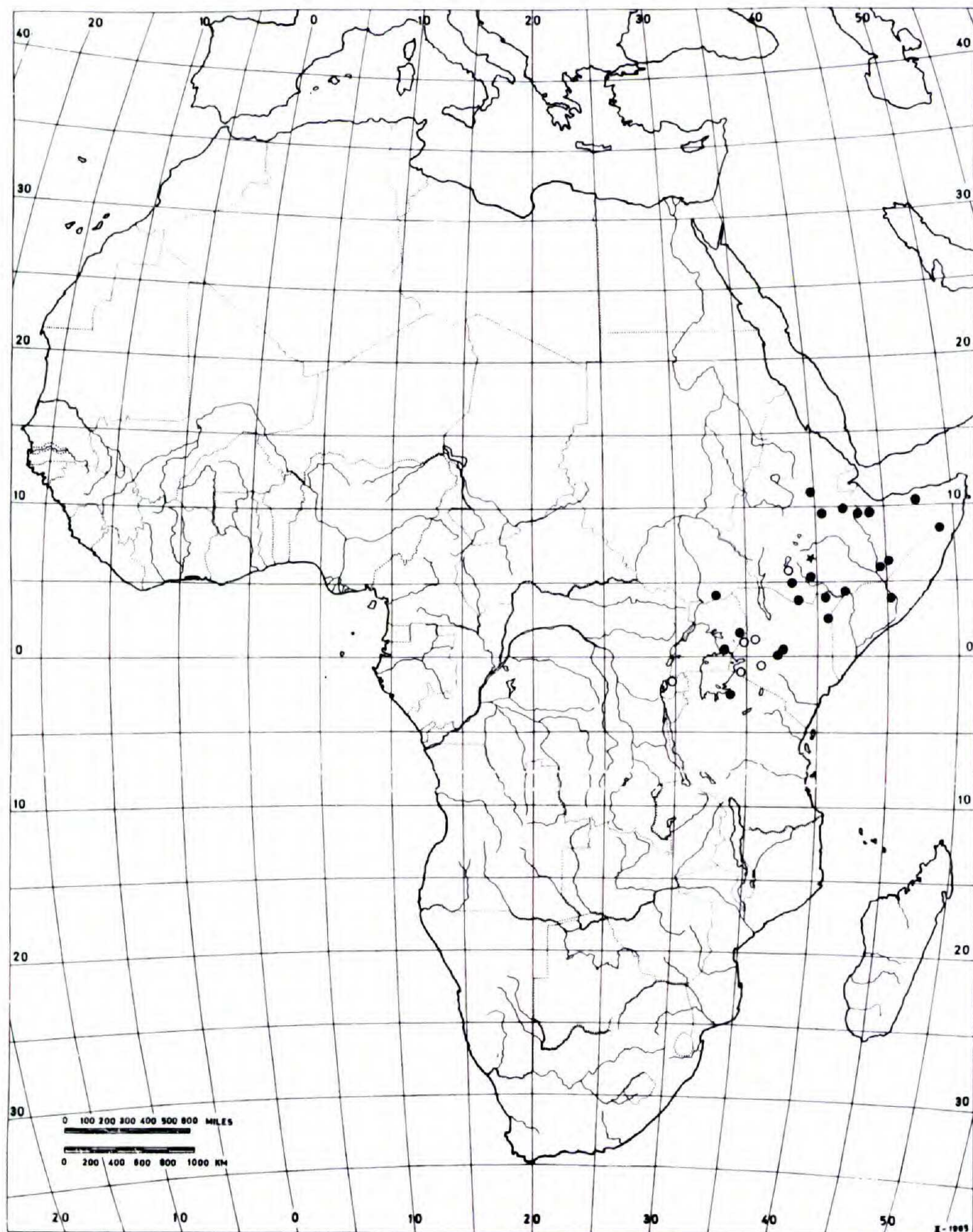


Figure 10. Known distribution of *C. balense* (star), *C. gonoloboides* (open circles), and *C. somaliense* (dots).

pendulous, 35 mm long, 7 mm diam., obclavate, obtusely triangular in cross section, apically strongly beaked, wingless, light brown, with reddish brown mottling, smooth, glabrous. Seeds 6–6.5 mm long, 3.5–4 mm wide, ovate, light brown, seta and aleta side densely covered with regularly arranged trichomes 0.5–0.7 mm long, marginally with wing 0.3–0.5 mm wide with entire margin; coma 12–15 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Somalia (Sanaag); 700–850 m; fragmented marine limestone hills, thin bush with poor grass cover. Rare and localized; but probably undercollected. Figure 12.

*Flowering time.* October.

*Vernacular name.* Sod Keh.

*Uses.* Fruits edible, nutty flavor; fruit and latex medicinal.

*Comments.* The affinities of *Cynanchum blyttoides* are unclear. In habit, it resembles strongly the genus *Blyttia*, though corona structure places it in *Cynanchum*. Within *Cynanchum*, it resembles the two other new Somalian species, *C. crassiantherae* and *C. rubricoroneae*, in habit and the peculiar undulated leaves. The slightly papillose corona reminds one of *C. clavidens*.

The specimen in EA has been chosen as holotype because the K specimen is rather poor.

**7a. *Cynanchum clavidens*** N. E. Br. subsp. **clavidens**, Bull. Misc. Inform., Kew 106: 256. 1895. *Cynanchum flavidens* N. E. Br., Index Kewensis Suppl. 1: 121. 1906. spelling error for *Cynanchum clavidens*. TYPE: Somalia. Boobi, 5 Feb. 1933, James & Thrupp s.n. (holotype, K). Figure 13.

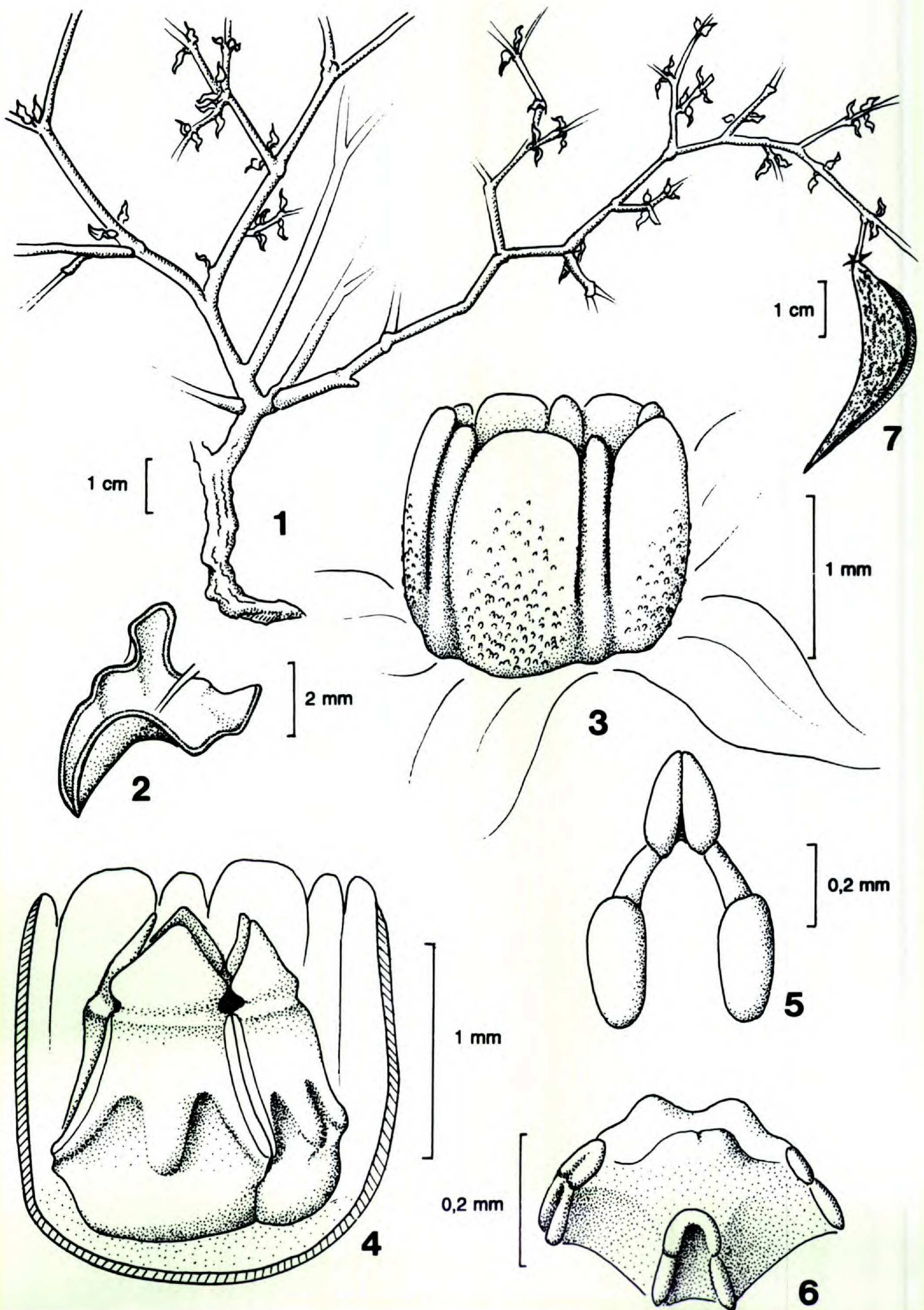


Figure 11. *Cynanchum blyttioides* Liede. 1-6: Beckett 428.—1. Habit with leaves and old fruit.—2. Leaf.—3. Flower.—4. Gynostegium and corona, partially removed.—5. Pollinarium.—6. Stylar head. Drawn by G. Hintze.

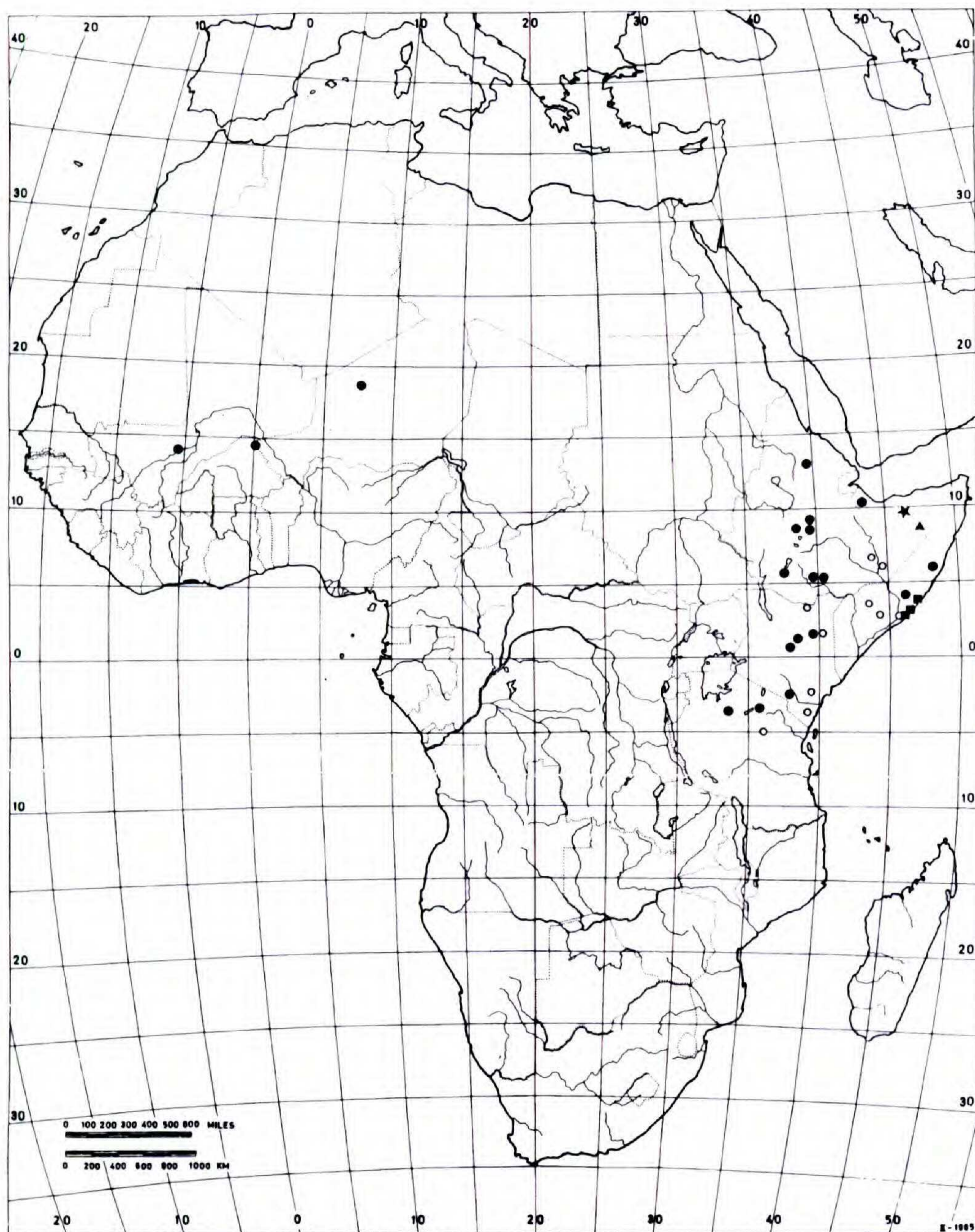


Figure 12. Known distribution of *C. blyttioides* (star), *Cynanchum clavidens* subsp. *clavidens* (open circles), subspecies *hastifolium* (dots), *C. crassiantherae* (squares), and *C. rubricorona* (triangle).

*Plants* ascending to erect, twining, 1–2.5 m high; irregularly branched. *Shoots* probably deciduous (O'Brien 43), apically herbaceous, glabrescent to sparsely covered with flexuous trichomes 0.3–0.35 mm long, along a single line; basally woody, with yellowish to brownish bark; internodes 1–5.5 cm long, 1.5–2 mm diam. “*Stipules*” hastate, 7–10 mm long, 6–8 mm wide, apically obtuse. *Leaves* with petioles 6–14 mm long; leaf blades herbaceous, 10–75 mm long, 4–35 mm wide, hastate, basally cordate to lobate, lobes 4–7 mm long, with 1–2 colleters in the adaxial sinus, apically acute to acuminate, adaxially isolatedly to sparsely covered with flexuous trichomes 0.3–0.4 mm long, concentrated on veins and margins, abaxially papillose, glabrous to isolatedly covered with flexuous trichomes 0.3–0.4 mm long, concentrated on veins and margins. *Inflorescences* sciadioidal, sessile, 3–

6-flowered, all flowers open at a time. *Flowers* with floral bracts 1–1.5 mm long, 0.4–0.7 mm wide at the base, triangular, glabrous; pedicels 3–10 mm long, sparsely to densely covered with flexuous trichomes 0.4–0.5 mm long, along a single line. *Buds* (3.5–)6–6.5 mm long, 1.5–2 mm diam., elongated-conical to conical, with imbricate, apically contorted aestivation. *Calyx* basally fused, abaxial surface with trichomes; lobes 1.6–2 mm long, 0.7–1 mm wide, linear to triangular or ovate, apically acute. *Corolla* rotate, basally fused; (3–)5–6.5 mm long, abaxially creamish green, adaxially green; lobes 1–1.2 mm wide, decurved, lanceolate, apically obtuse, with revolute margins. *Corona* tubular, white, abaxially apically papillose, 2–3 mm high, equaling to exceeding the gynostegium in height (except for the appendage of the stylar head), but not obscuring it; C(is) consisting of Cs and Ci fused for about  $\frac{3}{4}$  of

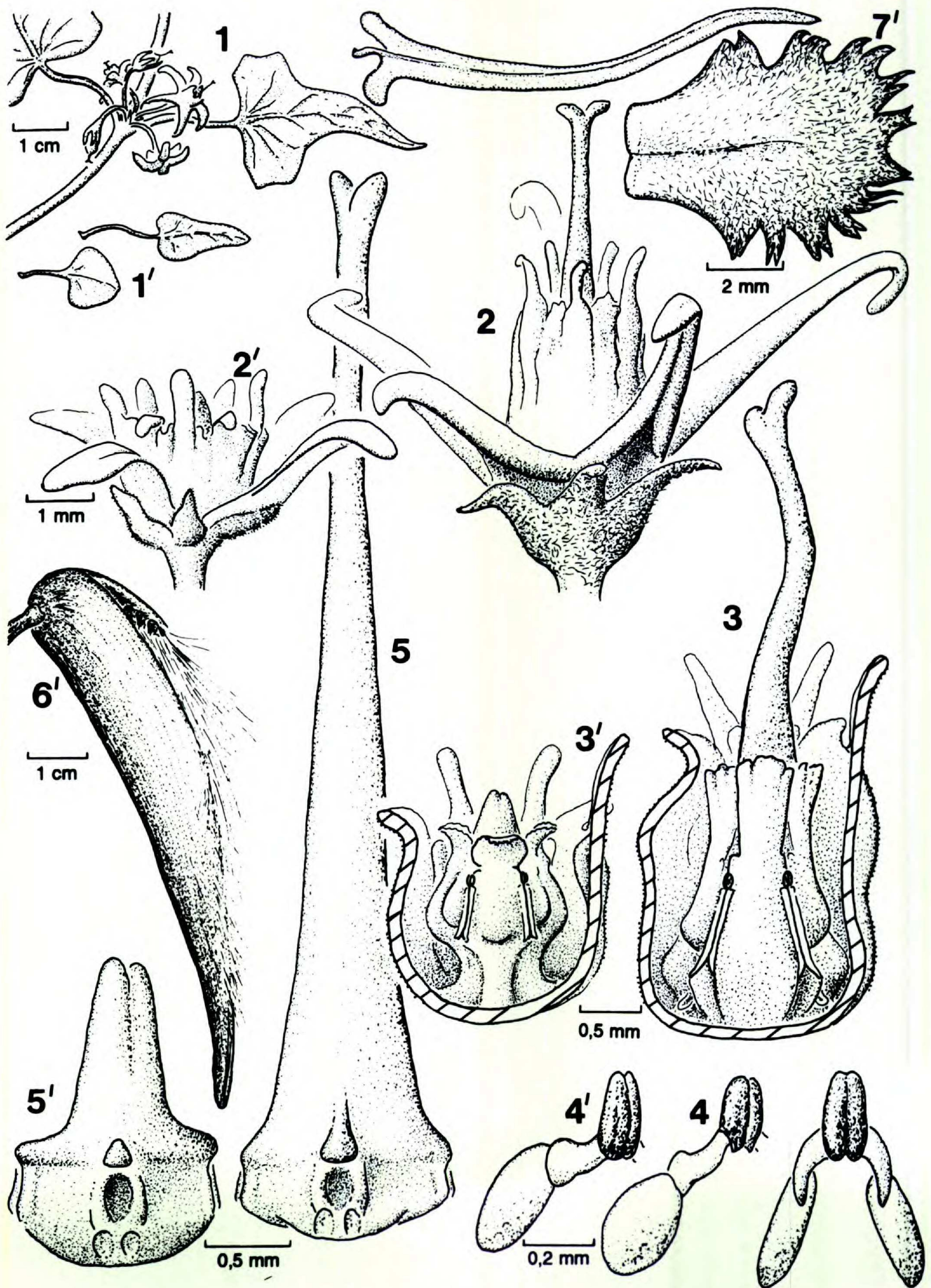


Figure 13. *Cynanchum clavidens* N. E. Br. 1–5: subspecies *clavidens*. 1'–7': subspecies *hastifolium* (N. E. Br.) Liede.—1. Node with inflorescence (O'Brien 43), deviating leaf shape (Hucks 272).—1'. Leaf shapes; left: Gillett 13863, right: Gilbert et al. 7399.—2, 2'. Flower.—3, 3'. Gynostegium and corona (partially removed).—4, 4'. Pollinarium.—5, 5'. Stylar head. 2–5: Liede & Newton 3160. 2'–5': Gillett 13863. 6', 7': Gilbert et al. 7399.—6'. Fruit.—7'. Seed, seta side. Drawn by Jim Conrad.

total corona length, Cs and Ci differentiated, Ci shorter than Cs. Cs not adnate to the filaments, not appressed to the back of the stamens, without adaxial appendages; lobes of Cs laminar, ovate, producing a pronounced convex fold, apically erect. *Lobes of Ci* laminar, ovate to oblong, erect to reflexed, with laterally involute margins. *Gynostegium* 1.4–1.7 mm high (without appendage of stylar head), 1–1.2 mm diam., sessile. *Stamens* with free filaments 0.7–0.8 mm long; anthers about as high as broad, trapezoidal, abaxially planar to convex; anther wings 0.8–0.85 mm long, convergent, extending along the whole length of the anther, adjacent anther wings parallel, centrifugal, basally forming a distinct “mouth” with the basal lateral margin of the anther. Connective appendages 0.6–0.7 mm long, 0.5–0.6 mm wide, ovate, equaling the stamen in width, erect, with denticulate margins. *Pollinarium*: corpusculum 0.3–0.35 mm long; caudicles 0.35–0.4 mm long, cylindrical, s-shaped, convex-concave; pollinia subapically attached to the caudicles, 0.35–0.4 mm long, 0.1–0.12 mm wide, ovoid, ovate in cross section. *Stylar head* white, 0.6–0.65 mm diam., 1–2.5 mm high; upper part 0.7–2.2 mm high, obinfundibuliform (the appendage exceeding the corona is the main diagnostic feature of the subspecies). *Follicles* normally one per flower, pendulous, 100–120 mm long, 15–20 mm diam., obclavate, round in cross section, apically strongly beaked, green with dark brown mottling, longitudinally grooved, glabrous. *Seeds* ca. 7.5 mm long, 4.5 mm wide, ovate, medium brown, seta and a seta side papillose with regularly arranged papillae, and with sparse, regularly arranged trichomes 0.15–0.25 mm long, marginally with wing 0.6–0.8 mm wide, with denticulate margin; coma 25–30 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Ethiopia (Bale, Harerge), Kenya (K1, K4, K7), Somalia (Bakool, Bay, Shabeellaha Dhexe), Tanzania (T5); 230–1400 m; dry savanna, *Acacia-Commiphora* bushland. Widespread, but localized. Figure 12.

*Flowering time.* January to July.

*Use.* Fruits edible.

*Selected specimens examined.* ETHIOPIA. **Harerge:** Mt. Scillavel Park, Tira R. area, 8 Apr. 1956, *Scimono 88* (K). KENYA. **Central:** Kitui, Tsavo East National Park, Tira R. area, 450 m, Apr. 1965, *Hucks 272* (K). **Coast:** Kwale, Mackinnon Rd., Tara desert, 400 m, Oct. 1965, *Tweedie 3199* (K). **Northern Frontier:** Moyale, 10 km from Moyale barrier, 10 Dec. 1993, *Liede & Newton 3160* (ULM). SOMALIA. Bakool, Wajid (17 km E of Uegit on rd. to Oddur), 415 m, 22 May 1983, *Gillett & Hemming*

*24352* (K); Bay, Bur Heybe, 230–375 m, 28 Apr. 1985, *O'Brien 43* (K); Shabeellaha Dhexe, Johwar, SW Morajiido, ca. 4–6 km S Bulo Caano, 17 July 1988, *Kilian & Lobin 1762* (K). TANZANIA. **Dodoma:** between Mando and Goma, 12 mi. E of Kondoa, 1400 m, 20 Jan. 1962, *Polhill & Paulo 1239* (K).

**7b. *Cynanchum clavidens*** N. E. Br. subsp. ***hastifolium*** (N. E. Br.) Liede, comb. nov. Basionym: *Cynanchum hastifolium* N. E. Br., Bull. Misc. Inf., Kew 1895: 257. Oct. 1895. TYPE: Ethiopia. Tigray: near Djeladgeranne, 29 Aug. 1840, *Schimper 1690* (holotype, K; isotype, P). Figure 13.

*Cynanchum hastifolium* K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 253. Oct. 1895. TYPE not located (see comments).

*Plants* ascending, twining, 0.5–1 m high, sparsely and irregularly branched. *Shoots* basally woody, with yellowish brown bark, apically herbaceous, glabrescent to sparsely covered with flexuous trichomes 0.3–0.35 mm long, along a single line; internodes 1.5–4.5 cm long. “*Stipules*” hastate, 7–10 mm long, 6–8 mm wide, apically obtuse. *Leaves* with petioles 6–25 mm long; leaf blades herbaceous, 12–48 mm long, 8–25 mm wide, hastate, basally truncate to cordate with 2–3 colleters in the adaxial sinus, apically acute, adaxially isolatedly covered with flexuous trichomes 0.5–0.6 mm long, evenly distributed over the whole surface, abaxially papillose, glabrous to isolatedly covered with flexuous trichomes 0.5–0.6 mm long, restricted to veins and margins. *Inflorescences* sciadioidal, sessile, 5–16-flowered, all flowers open at a time. *Flowers* with floral bracts 0.8–1 mm long, 0.5–0.6 mm wide at the base, ovate; pedicels 6–8 mm long, densely covered with flexuous trichomes 0.3–0.4 mm long. *Buds* 3–4 mm long, 1.2–1.8 mm diam., conical, with imbricate, apically contorted aestivation. *Calyx* basally fused; abaxial surface with trichomes; lobes 2–3 mm long, 0.4–0.6 mm wide, linear to lanceolate, apically acute. *Corolla* rotate, basally fused; 4–5 mm long, abaxially and adaxially green; lobes 0.8–1 mm wide, horizontal to decurved, linear to lanceolate, apically acute, with revolute margins. *Corona* white, tubular to urceolate, abaxially apically papillose, 5.5–6 mm high, exceeding the gynostegium (including stylar head) and partly obscuring it; C(is) consisting of Cs and Ci fused for about 2/3 of total corona length, Cs and Ci differentiated, Ci shorter than to as long as Cs. Cs not adnate to the filaments, not appressed to the back of the stamens, without adaxial appendages; lobes of Cs laminar to filamentous, ovate-oblong, producing a pronounced convex fold. *Lobes of Ci* laminar,



very elongatedly oblong, producing a pronounced convex fold along the upper two-thirds of corona length, erect, with laterally involute margins. *Gynostegium* 4–4.2 mm high, 2.3–2.5 mm diam., sessile. *Stamens* with free filaments 0.8–0.9 mm long; anthers about as high as broad, trapezoidal, abaxially planar; anther wings 0.45–0.5 mm long, convergent, extending along the whole length of the anther, adjacent anther wings parallel, centrifugal, basally forming a distinct “mouth.” Connective appendages 0.85–0.9 mm long, 0.85–0.9 mm wide, ovate, broader than the stamen, erect, with denticulate margins. *Pollinarium*: corpusculum 0.26–0.28 mm long; caudicles 0.2–0.23 mm long, flattened, s-shaped, convex-concave, trapezoid; pollinia subapically attached to the caudicles, 0.4–0.42 mm long, 0.2–0.22 mm wide, ovoid, ovate in cross section. *Stylar head* white, 1.2–1.3 mm diam., 1.4–1.5 mm high; upper part 1–1.2 mm high, umbonate (only in *Gillett et al.* 22615) or elongated-conical (not exceeding the corona, in contrast to subsp. *clavidens*). *Follicles* normally one per flower, pendulous, 60–100 mm long, 10–15 mm diam., obclavate, round in cross section, apically strongly beaked, light to medium brown, longitudinally grooved, glabrous. *Seeds* 6.5–7.5 mm long, 4–4.5 mm wide, ovate, medium brown, seta and aleta side papillose with regularly arranged papillae, and with sparse, regularly arranged trichomes 0.15–0.25 mm long, marginally with wing 0.6–0.8 mm wide, with denticulate margin; coma 22–25 mm long. *Chromosome number*:  $2n = 22$  (voucher: *Liede & Newton* 3226, ULM).

*Distribution and habitat.* Africa: Eritrea, Ethiopia (Gamo Gofa, Shewa, Sidamo, Tigray), Kenya (K1, K4), Mali, Niger, Somalia (Hiiraan, Mudug, Sanaag), Tanzania (T1, T2), Upper Volta; 200–1600 m; *Acacia seyal*–*Balanites* bushland. Widespread, but localized. Figure 12.

*Flowering time.* March to October.

*Vernacular name.* Gesuriat (Somali); Shubkax (Hoby).

*Uses.* Fruits edible.

*Selected specimens examined.* ERITREA. E of Amba-Tokhan, 27 Feb. 1892, *Schweinfurth & Riva* 398m (FT, K). ETHIOPIA. **Gamo Gofa**: Gidole area, Argoba, 1400 m, 16 Apr. 1985, *Haugen* 576 (K). **Shewa**: 1 km W of Birrta on track to Koye; 10 km N of Meki, 1700 m, 22 Sep. 1973, *Gilbert & Gelahun Abate* 3123 (K). **Sidamo**: Borana, 46 mi. SE of Neghelle on road to Filtu and Dolo, 1450 m, 16 Apr. 1974, *Ash* 2421 (K, MO, UPS). **Tigray**: 37 km S of Quiha, along the road to Maichew, ca. 2150 m, 5 Sep. 1970, *De Wilde* 6986 (MO, WAG). KENYA. **Central**: Machakos, Ithaba, 1000 m, 15 May 1938, *Bally*

8357 (K). **Northern Frontier**: 13 km N of Isiolo on rd. to Marsabit, 1050 m, 2 Nov. 1978, *Gilbert, Gathachi & Gatheri* 5316 (K). NIGER. Plateau Koutou, 9 Sep. 1966, *Fabrègues* 2065 (P). SOMALIA. Hiiraan, 5 km W of Mukwakori on the rd. to Buloburti, 200 m, 13 June 1979, *Gillett, Hemming & Watson* 22615 (K); Mudug, 53.4 km N of Hoby along Hoby-Budbud inland route, 26 May 1987, *Wieland* 4319 (MO); Sanaag, Dobo pass, 1330 m, 5 Feb. 1933, *Gillett* 4952 (FT, K). TANZANIA. **Arusha**: Mbulu, Mbagaya River–Ndabash, Lake Manyara Nat. Park, 1580 m, 2 Mar. 1964, *Greenway & Kanuri* 11282 (K). **Shinyanga**: Shinyanga, *Koritschoner* 2084 (K). UPPER VOLTA. Markoye, 21 Aug. 1975, *Toutain* 46782 (P).

*Comments.* Both *Cynanchum hastifolium* N. E. Br. and *C. hastifolium* K. Schum. were described in October 1895, so that priority cannot be established. Here, the common practice to attribute the name to N. E. Brown, who provided a detailed description and a type, is followed. Schumann, in contrast, just mentioned the taxon and did not indicate any type material.

*Cynanchum macinense* A. Chev. [*Explor. Bot. Afrique Occ. Franç.* 1: 435. 1920, nomen nudum. Mali. Macina, pays de Habés, de Koboro-Kendé à Kanikombolé, 2 Sep. 1910, *Chevalier* 24861 (P)] represents this taxon.

The differences between subspecies *hastifolium* and subspecies *clavidens* are of such minor nature that species rank cannot be maintained. The best distinguishing character is the long-exserted stylar head in subspecies *clavidens*. Mature buds and flowers of subspecies *clavidens* are almost always much larger than those of subspecies *hastifolium*, but floral size is quite variable in both subspecies. Subspecies *clavidens* commonly inhabits low-lying, eastern localities; subspecies *hastifolium* is commonly found in the more western highlands. This pattern, however, breaks down in southern Somalia, where subspecies *hastifolium* is found in low-lying coastal areas. The distribution of subspecies *hastifolium* is remarkable for the fact that it is one of the very few African species that shows a marked disjunction between East and West Africa.

*Cynanchum clavidens* shows affinities to the two Somalian endemics, *C. crassiantherae* and *C. rubricoronae*, but is otherwise isolated in *Cynanchum*.

The only known material of *Perianthostelma* Baillon, a specimen with the unpublished name *P. abyssinicum* in P, represents *C. clavidens* subsp. *hastifolium*.

## 8. *Cynanchum crassiantherae* Liede, sp. nov.

TYPE: Somalia. Shaabeellaha Dhexe, 10–12 km N of Adale on rd. to Haji Ali, 15 m, May–June 1983, *Gillett & Hemming* 24513 (holotype, K; isotype, EA). Figure 14.

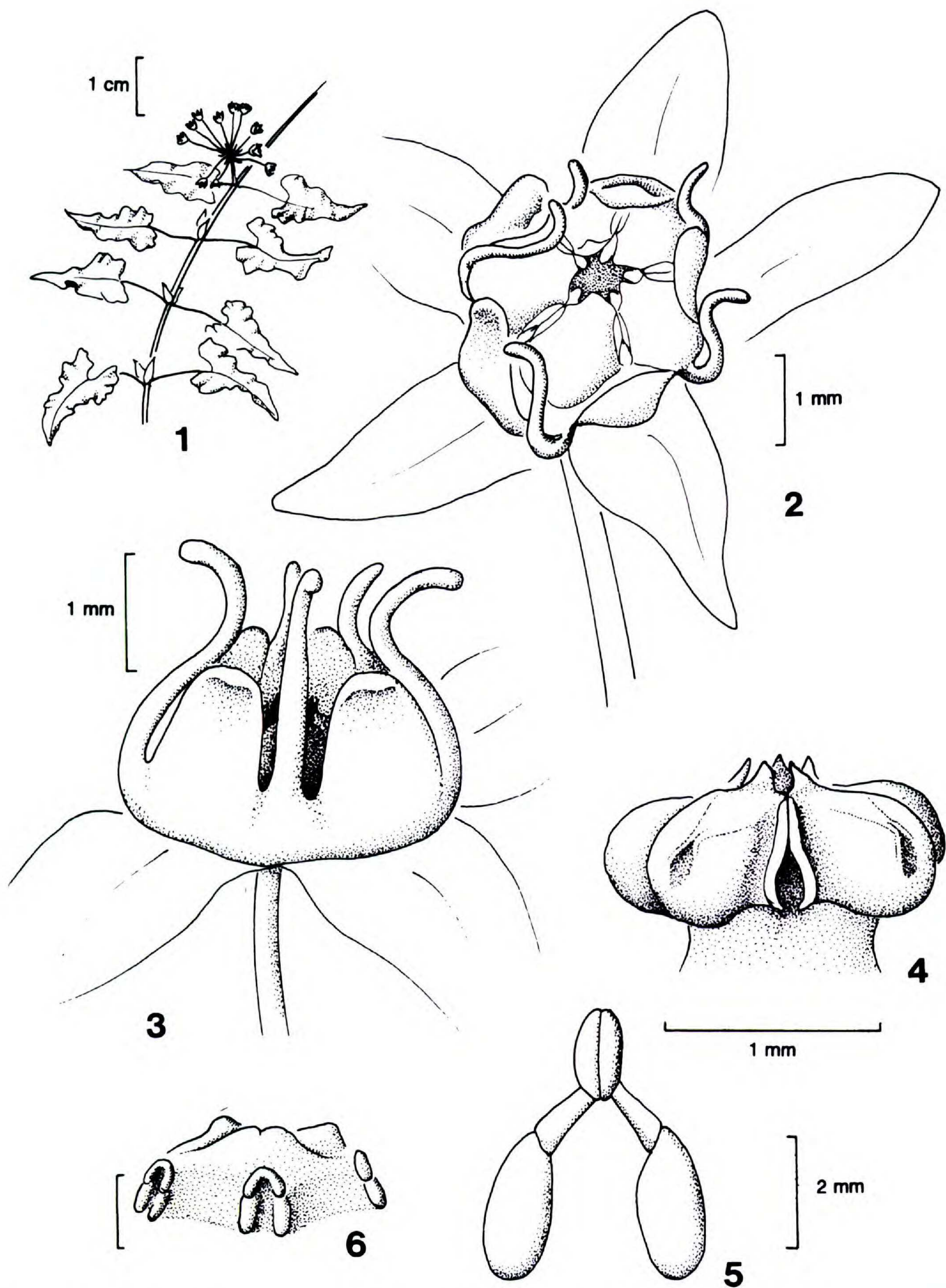


Figure 14. *Cynanchum crassiantherae* Liede. 1–6: Gillett & Hemming 24513.—1. Shoot with inflorescences.—2. Flower.—3. Flower in lateral view.—4. Gynostegium.—5. Pollinarium.—6. Styler head. Drawn by G. Hintze.

Plantae erectae, rhizomatosae, foliis carnosulis, marginale crenulatis; partibus staminalibus interstaminalibusque coronae gynostegialis ad mediam connatis; partibus staminalibus filamentosis apicale reflexis; gynostegio breve stipitato, antheris crassis.

*Plants* erect, 20–25 cm high, sparsely basically branched; rhizomatous, rhizomes 2–2.5 mm diam. *Shoots* herbaceous, glabrous; internodes 12–20 cm long, 1–1.5 mm diam. “*Stipules*” ovate, 3–8 mm long, 2–3.5 mm wide. *Leaves* with petioles 10–15 mm long; leaf blades fleshy, 15–25 mm long, 10–13 mm wide, triangular, basally lobate to auriculate, lobes 3–5 mm long, without colleters, apically acute to acuminate, adaxially and abaxially glabrous, margins thickened, crenulate. *Inflorescences* bostrychoid to sciadioid, 10–16-flowered, 8–12 flowers open at a time. *Peduncles* 0–2 mm long, glabrous. *Flowers* with floral bracts 2–2.2 mm long, 0.2–0.3 mm wide at the base, linear, glabrous; pedicels 5–8 mm long, glabrous. *Buds* 2.8–3 mm long, 1.8–2 mm diam., conical, with imbricate aestivation. *Calyx* basally fused, abaxial surface glabrous; lobes 1.6–1.8 mm long, 0.4–0.5 mm wide, ovate-lanceolate, apically acute. *Corolla* rotate, basally fused; 3–3.5 mm long, abaxially and adaxially yellowish green; lobes 1–1.2 mm wide, horizontally spreading, oblong, apically acute. *Corona* cyathiform, white, 1.8–2 mm high, exceeding the gynostegium but not obscuring it; C(is) consisting of Cs and Ci fused for about 1/3 of total corona length, Cs and Ci differentiated, Ci shorter than Cs. Cs not adnate to the filaments, without adaxial appendages; lobes of Cs lobes filamentous, apically reflexed. *Lobes of Ci* laminar, ovate to triangular, flat, erect. *Gynostegium* 1–1.1 mm high, 1.6–1.7 mm diam., atop a stipe, 0.4–0.5 mm long. *Stamens* without free filaments; anthers about as high as broad, massive, deltoid, abaxially convex; anther wings 0.4–0.45 mm long, parallel to each other, extending along the whole length of the anther, with space between distal and proximal ridge of anther wings glabrous; adjacent anther wings divergent toward the base, in the same plane as the anther. Connective appendages 0.5–0.6 mm long, 0.4–0.5 mm wide, triangular, equaling the stamen in width, slightly inflexed. *Pollinarium*: corpusculum 0.2 mm long, ovoid; caudicles 0.1 mm long, flattened, straight, declinate, triangular; pollinia subapically attached to the caudicles, 0.3–0.35 mm long, 0.1–0.12 mm wide, ovate in cross section, oblongoid. *Stylar head* 0.7–0.8 mm diam., 0.6–0.65 mm high; upper part 0.3 mm high, equaling the lower part in height, conical. *Fruits, seeds, and chromosome number* unknown.

*Distribution and habitat.* Africa: Somalia (Gal-

guduud, Shabeellaha Dhexe); < 50 m; coastal dunes. Rarely collected. Figure 12.

*Flowering time.* May.

*Additional specimens examined.* SOMALIA. Galguduud, 21 km on rd. between Ceeldheer (El Dere) and Cadale, 40 m, 30 May 1989, Thulin & Abdi M. Dahir 6718 (K); Shabeellaha Dhexe, 13 km N of Cadale along rd. to Ceeldheer, 10 m, 6 May 1990, Thulin, Hedrén & Abdi M. Dahir 7231 (UPS).

*Comments.* *Cynanchum crassiantherae* is closely related to another Somali endemic, *C. rubricoronae*. It is clearly distinct from this and all other species of *Cynanchum* by its massive anthers.

**9. *Cynanchum ellipticum*** (Harvey) R. A. Dyer, Mem. Bot. Surv. South Africa 17: 138. 1937. *Bunburia elliptica* Harvey, Gen. S. Afr. Pl. 416. 1838. TYPE: South Africa. Cape: near Grahamstown, *Bunbury s.n.* (holotype, Herb. Hook. 1867, K).

*Plants* twining, 1.5–3 m high, richly branched; subterranean organs consisting only of fibrous roots. *Shoots* perennial, 200–300 cm long, 1–1.5 mm diam., herbaceous, glabrous, basally woody with grayish bark. “*Stipules*” ovate, almost round, 4–6 mm long, 4–6 mm wide. *Leaves* with petioles 5–15 mm long; leaf blades herbaceous, 20–40 mm long, 10–20 mm wide, elliptic to oblong, basally rounded with 2 colleters adaxially, apically obtuse to acute, apiculate, adaxially and abaxially glabrous. *Inflorescences* bostrychoid to sciadioid, 2–15 (rarely – 30)-flowered, 4–10 flowers open at a time; rachis to 8 mm long; peduncles 12–20 mm long, glabrous. *Flowers* sweetly scented; floral bracts 0.8–1 mm long, 0.5–0.7 mm wide at the base, triangular, glabrous; pedicels 5–10 mm long, glabrous. *Buds* 2.5–3.5 mm long, 1.5–2.5 mm diam., ovoid; aestivation imbricate. *Calyx* basally fused, abaxially glabrous; lobes 0.8–1.2 mm long, 0.4–0.6 mm wide, ovate to oblong, apically obtuse. *Corolla* rotate, basally fused, spreading to recurved, 2.5–4 mm long, abaxially and adaxially glabrous, brown to green; lobes 0.8–1.2 mm wide, spreading to recurved, cucullate, apically obtuse, straight, or apically twisted. *Corona* white, cyathiform, 2.5–3.5 mm high, exceeding the gynostegium but not obscuring it, abaxially glabrous; C(is) consisting of Cs and Ci completely fused; upper margin entire or irregularly crenulate. Cs without adaxial appendages. *Gynostegium* 1–1.4 mm high, 1.2–1.6 mm diam., sessile. *Stamens* without free filaments, anthers broader than high, trapezoidal, abaxially convex; anther wings 0.5–0.6 mm long, convergent, extending beyond the anther proper forming a basal arch, adjacent anther wings

parallel, in the same plane as the anther. Connective appendages 0.35–0.4 mm long, 0.25–0.3 mm wide, triangular, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.2–0.22 mm long; caudicles 0.15–0.17 mm long, flattened, straight, declinate, thickened at the insertion of the pollinium, trapezoid; pollinia laterally attached to the caudicles, 0.3–0.35 mm long, 0.1–0.12 mm wide, ovate, round in cross section. *Stylar head* 0.8–0.85 mm diam., 0.7–0.8 mm high; upper part 0.45–0.48 mm high, depressed-conical. *Follicles* 45–60 mm long, 6–8 mm wide, obclavate, obtusely deltate in cross section, apically strongly beaked, keeled, medium brown, longitudinally slightly grooved, glabrous. *Seeds* 6–7 mm long, 3.5–4.5 mm wide, pyriform, dark brown, seta and aseta side tuberculate and sculptured with longitudinal ridges (less pronouncedly so on the aseta side); margins wingless, entire; coma 25 mm long. *Chromosome number*:  $2n = 22$  (voucher: *Liede 2933*, ULM).

*Distribution and habitat.* Africa: Mozambique, South Africa (Cape Province, Natal, Transvaal); 0–1300 m; flats to moderate slopes, in sand or between rocks, indigenous forests and forest margins, thickets, frequently in disturbed habitats.

*Comments.* In Liede (1993), this species was discussed under *C. capense* Thunb. However, *Cynanchum capense* L.f. [Suppl.: 168. 1782] was interpreted by N. E. Brown (1908) as a synonym of *Pentatropis microphylla* Wight & Arn., because the description is clearly taken from the specimen *König s.n.*, which represents *Pentatropis microphylla*. The other specimen cited in the protologue (*Sparmann s.n.*) represents *Cynanchum obtusifolium* L.f. *Cynanchum capense* Thunb. [Prodr. Fl. Cap.: 47. 1800; type: *Thunberg s.n.*, UPS 6289, UPS] represents a later homonym of *Cynanchum capense* L.f.

Further details, illustration, distribution map, and citation of specimens are provided in Liede (1993) under *C. capense*.

**10. *Cynanchum falcatum*** Hutchinson & E. A. Bruce, Bull. Misc. Inform., Kew 1941: 145. 1941. TYPE: Somalia. Woqooyi Galbeed, boundary, 44°10'E, 8°57'N, 1290 m, 4 Oct. 1932, *Gillett 4114* (holotype, K). Figure 15.

*Plants* ascending, twining, 1–1.5 m high, richly and irregularly branched. *Shoots* herbaceous, sparsely to densely covered with appressed trichomes 0.3–0.4 mm long; internodes 3–8 cm long, 0.5–1 mm diam. “*Stipules*” absent. *Leaves* with petioles 2–10 mm long; leaf blades herbaceous, 20–

40 mm long, 2–16 mm wide, triangular to falcate, basally truncate, obtuse, rounded or cordate with 4–5 colleters in the adaxial sinus, apically acute to acuminate, adaxially papillose, sparsely covered with erect trichomes 0.3–0.4 mm long, evenly distributed over the whole surface, abaxially sparsely to densely covered with appressed trichomes 0.23–0.3 mm long, evenly distributed over the whole surface. *Inflorescences* bostrychoid to sciadioid, 5–12-flowered, 4–10 flowers open at a time; rachis to 2 mm long; peduncles 0–5 mm long, densely covered with appressed trichomes 0.16–0.25 mm long. *Flowers* with floral bracts 0.5–1 mm long, 0.4–0.6 mm wide at the base, ovate, with trichomes; pedicels 2–5 mm long, densely covered with flexuous trichomes 0.15–0.25 mm long. *Buds* 2.2–3 mm long, 1.5–1.7 mm diam., ovoid, with imbricate aestivation. *Calyx* fused for about 1/3 of its length; abaxial surface with trichomes; lobes 0.9–1.2 mm long, 0.6–0.8 mm wide, ovate, apically acute. *Corolla* cyathiform, basally fused; 2–3 mm long, abaxially and adaxially creamish green to yellow; lobes 1–1.3 mm wide, patent, oblong to lanceolate, apically obtuse to acute. *Corona* cyathiform, white, 1.8–2 mm high, equaling the gynostegium in height; C(is) consisting of Cs and Ci fused for 3/4 to 7/8 of total corona length, Cs and Ci differentiated, Ci shorter than Cs. Cs not adnate to the filaments, without adaxial appendages; lobes of Cs laminar, broadly triangular, flat, apically reflexed. *Lobes of Ci* laminar, ovate to bifid, reflexed, with straight, entire margins. *Gynostegium* 2–2.5 mm high, 1.4–1.6 mm diam., sessile. *Stamens* without free filaments, anthers about as high as broad, trapezoidal, abaxially planar; anther wings 0.7–0.8 mm long, parallel to each other, extending along the whole length of the anther; adjacent anther wings parallel, centrifugal. Connective appendages 1–1.2 mm long, 0.8–1 mm wide, ovate, broader than the stamen, erect, inflated, with denticulate margins. *Pollinarium*: corpusculum 0.2–0.25 mm long, ovoid; caudicles 0.1–0.15 mm long, cylindrical, concavely recurved, thickened at the insertion of the pollinium; pollinia subapically attached to the caudicles, 0.45–0.55 mm long, 0.12–0.15 mm wide, oblongoid, ovate in cross section. *Stylar head* 0.8–1 mm diam., 1.2–1.3 mm high; upper part 0.9–1 mm high, capitate. *Follicles* one per flower, pendulous, 50–65 mm long, 4 mm diam., obclavate, apically strongly beaked, keeled, dark brown, with dense indument. *Seeds* 5.5–6 mm long, 3.5–4 mm wide, ovate, light to medium brown, seta and aseta side sculptured with longitudinal ridges, margins with 0.3–0.5-mm-wide wing with dentate margin; coma 20–23 mm long. *Chromosome number* unknown.

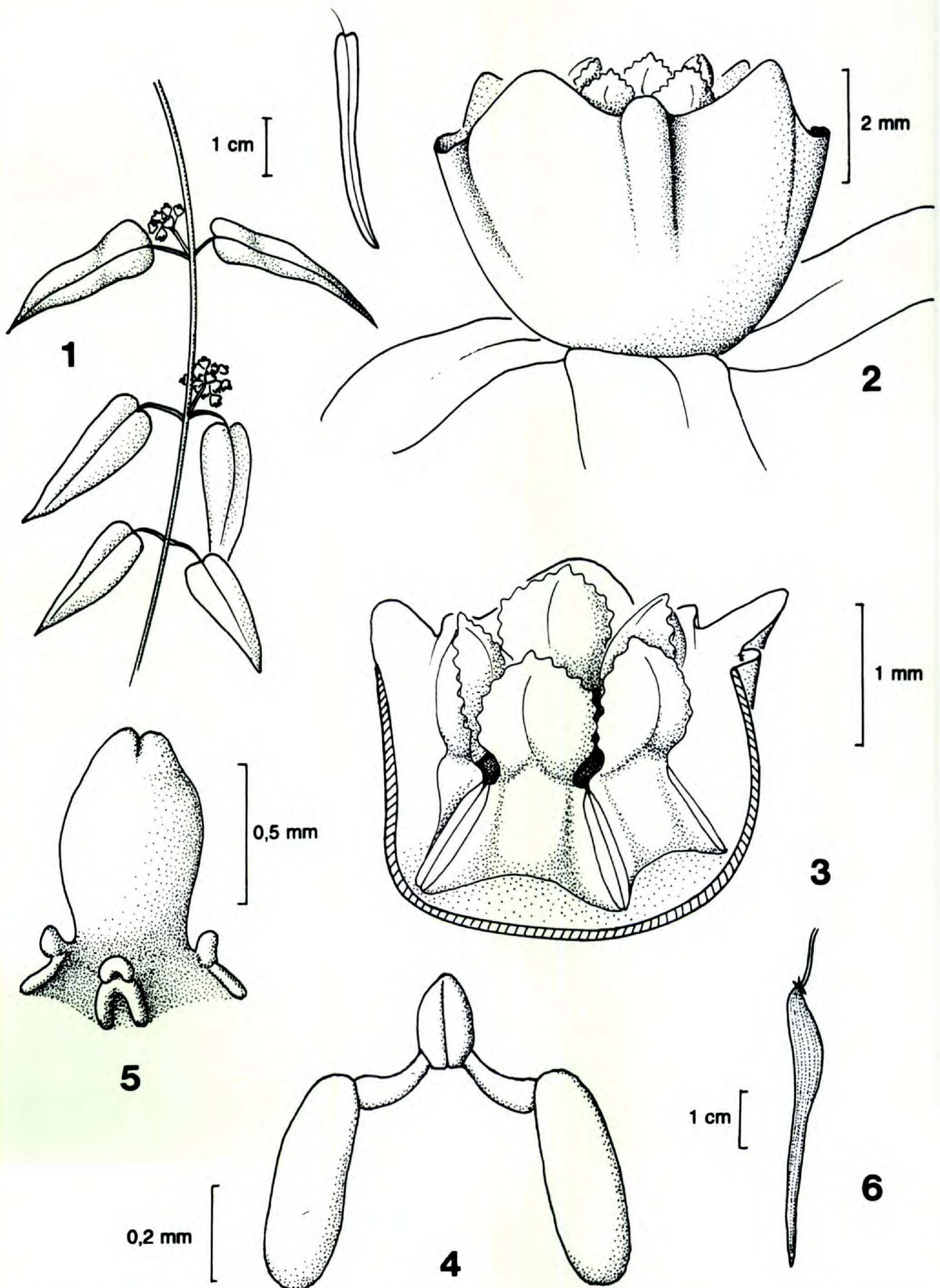


Figure 15. *Cynanchum falcatum* Hutchinson & E. A. Bruce.—1. Shoot with inflorescences (Friis et al. 3169); extra leaf of the type (Gillett 4114). 2–5: De Wilde 6331.—2. Flower.—3. Gynostegium.—4. Pollinarium.—5. Styler head.—6. Fruit (Friis et al. 3169). Drawn by G. Hintze.

*Distribution and habitat.* Africa: Ethiopia (Shewa, Sidamo), Kenya (K1), Somalia (Bakool, Nugaal); 250–1500 m; *Acacia-Commiphora* open bushland. Rare. Figure 16.

*Flowering time.* February to August.

*Vernacular name.* Hayab (Gessariad).

*Additional specimens examined.* ETHIOPIA. Shewa:

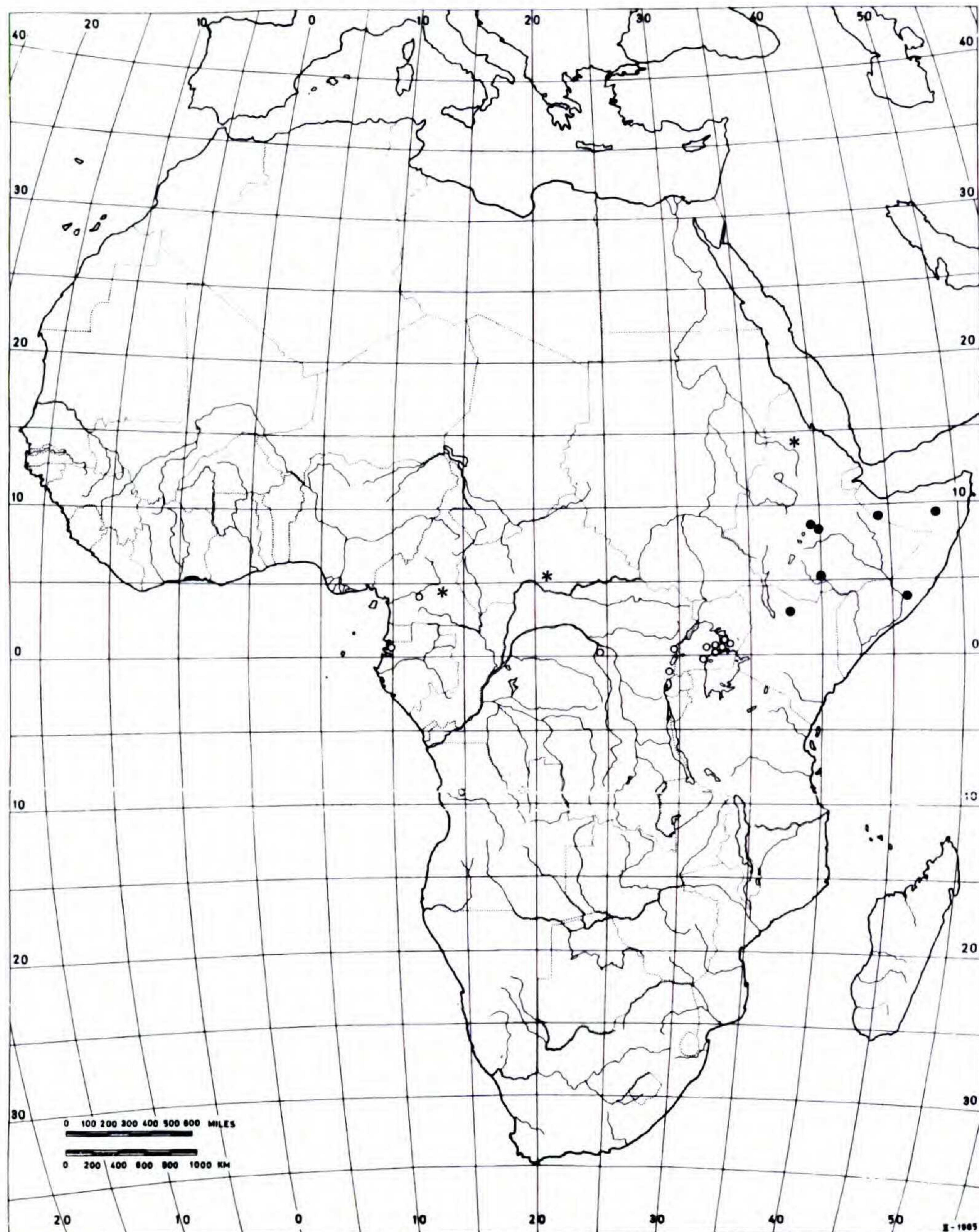


Figure 16. Known distribution of *Cynanchum falcatum* (dots), *C. heteromorphum* (asterisks), and *C. polyanthum* (open circles).

23 km N of Awash on rd. to Nazareth, ca. 1090 m, 30 Aug. 1967, *Westphal & Westphal-Stevens 1466* (K); 37 km NE Nazareth along rd. to Awash, ca. 1350 m, 4 Feb. 1970, *De Wilde 6331* (K, WAG). **Sidamo:** 40 km NE Neghelle along rd. to Filtu, 1450 m, 20 May 1982, *Friis, Mesfin & Vollesen 3169* (K). **KENYA. Northern Frontier:** Huri Hills, 25 Feb. 1963, *Bally 12526* (K). **SOMALIA.** Bakool, 22 km W of Mukwakori, 250 m, 13 June 1979, *Gillett, Hemming & Watson 22616* (K); Nugaal, Gardo-Hudun Rd., 950 m, 20 June 1981, *Gillett & Beckett 23533* (EA).

*Comments.* *Cynanchum falcatum* is close to *C. heteromorphum*, but the leaves are triangular and the corona more highly fused. The type is an unrepresentative specimen with very slender, falci-form leaves, perhaps caused by disease. Most specimens exhibit leaves more like those widespread in the genus, while floral structure is the same.

**11. *Cynanchum galgalense*** Liede, sp. nov.  
TYPE: Somalia. Bari, Al Miskat Mts., ca. 15 km SW of Candala, Toh well, 800–850 m, 2 Dec. 1985, *Thulin 5612* (holotype, K; isotype, UPS). Figure 17.

Plantae foliis carnosulis marginibus incrassatis, inferioribus caducis; partibus staminalibus interstaminalibusque coronae gynostegialis late connatis, sulcatis, gynostegium obducenibus; capite stylorum tabulari.

*Plants* ascending, twining, 5–30 cm high, sparsely basicaulously branched. *Shoots* herbaceous, densely covered with erect trichomes 0.1–0.12 mm long, basally slightly woody, with yellowish to brownish bark; internodes 10–50 cm long, 0.7–1.2 mm diam. “*Stipules*” absent. *Leaves* caducous, the upper ones sessile, lower ones with

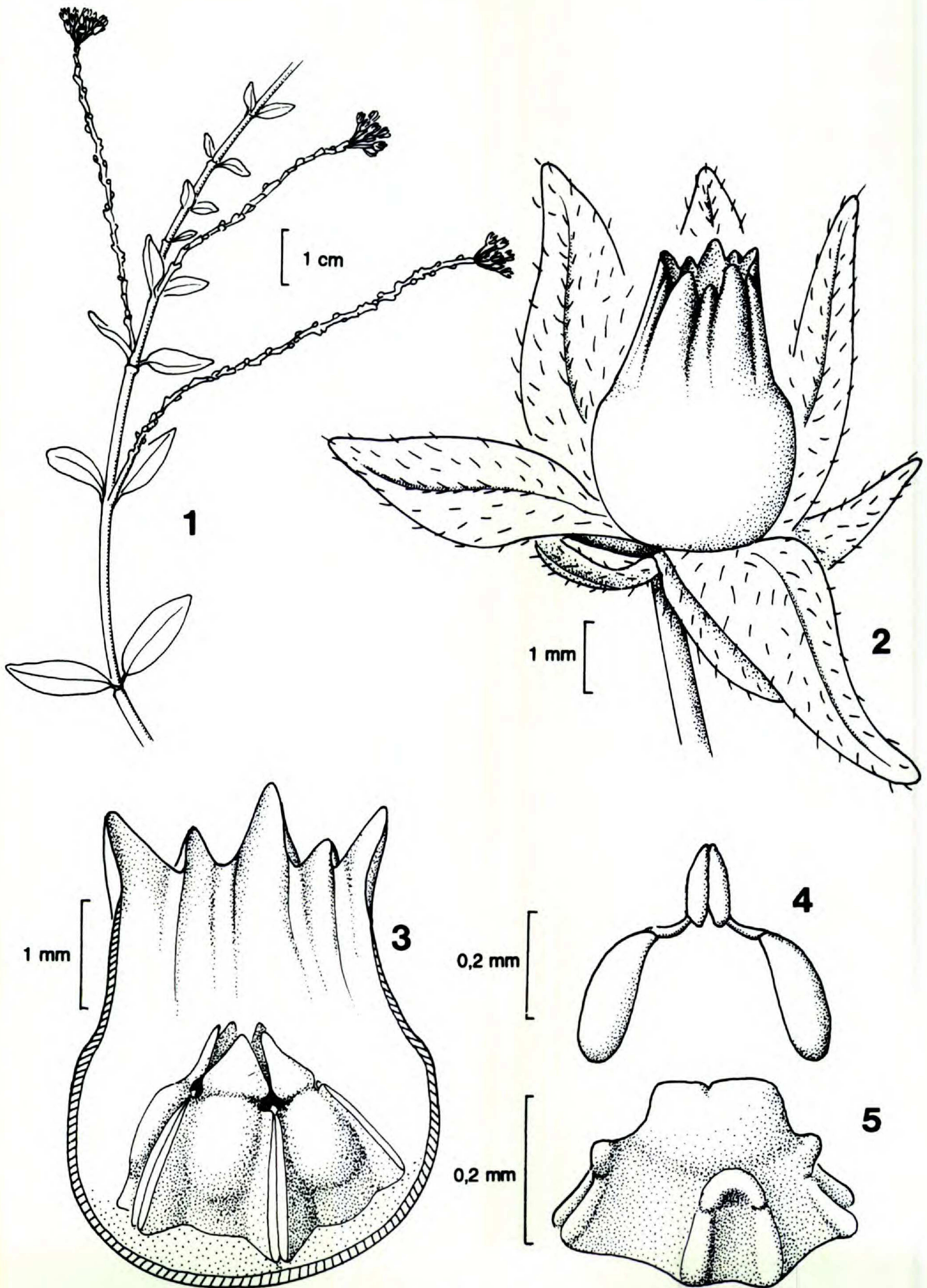


Figure 17. *Cynanchum galgalense* Liede. 1: Thulin & Warfa 5612; 2-5: Newbould 1095.—1. Habit with inflorescences.—2. Flower.—3. Gynostegium and corona, partially removed.—4. Pollinarium.—5. Styler head. Drawn by G. Hintze.

petioles to 5 mm long; leaf blades fleshy, 4–14 mm long, 2–9(–13) mm wide, elliptic, basally rounded, without colleters, apically acute, margins straight and thickened, adaxially and abaxially sparsely to densely covered with erect trichomes 0.1–0.12 mm long, evenly distributed over the whole surface. *Inflorescences* bostrychoid, 5–24-flowered, all flowers open at a time; rachis 5–50 mm long; peduncles 5–7 mm long, densely covered with erect trichomes 0.1–0.15 mm long. *Flowers* with floral bracts 1–1.2 mm long, 0.1–0.2 mm wide at the base, linear, with trichomes; pedicels 3–4 mm long, sparsely covered with erect trichomes 0.1–0.12 mm long. *Buds* 1.4–1.5 mm long, 1 mm diam., conical, with imbricate aestivation. *Calyx* basally fused; abaxial surface with trichomes; lobes 0.8–1 mm long, 0.4–0.5 mm wide, ovate, apically acute. *Corolla* cyathiform, basally fused; 1.5–1.7 mm long, abaxially and adaxially cream-colored; adaxially with verrucose trichomes 0.04–0.05 mm long, evenly distributed over the whole surface; lobes 0.5–0.7 mm wide, incurved to patent, ovate to oblong, apically acute. *Corona* urceolate, ivory, ca. 0.8 mm high, exceeding the gynostegium and partly obscuring it; C(is) consisting of Cs and Ci fused for more than  $\frac{3}{4}$  of total corona length, Cs and Ci differentiated, Ci as long as Cs. Cs basally just adnate to the filaments, without adaxial appendages; lobes of Cs laminar, ovate, producing a pronounced convex fold along the upper half of corona length, apically erect. *Lobes of Ci* laminar, oblong, producing a pronounced convex fold along the upper half of corona length, erect to reflexed, with straight margins. *Gynostegium* sessile, 0.9–1 mm high, 1–1.1 mm diam. Anthers broader than high, trapezoidal, abaxially convex; anther wings 0.7–0.8 mm long, convergent, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.3–0.4 mm long, 0.3–0.4 mm wide, ovate, narrower than the stamen, strongly inflexed. *Pollinarium*: corpusculum ca. 0.15 mm long, elliptic, margins of the corpuscular cleft basally widened; caudicles ca. 0.05 mm long, flattened, concavely recurved, trapezoid; pollinia subapically attached to the caudicles, 0.11–0.12 mm long, 0.045–0.055 mm wide, elliptical in cross section, oblongoid. *Stylar head* 0.35–0.4 mm diam., 0.2–0.25 mm high; upper part 0.08–0.1 mm high, equaling the lower part in height, tabular. *Follicles* one per flower, ca. 30 mm long, 4 mm diam., fusiform, apically acute but not beaked, light brown, smooth, isolatedly covered with trichomes, with papery pericarp. *Seeds* and *chromosome number* unknown.

*Distribution and habitat.* Africa: Somalia (Bari, Nugaal, Sanaag); 800–2600 m; in rock crevices of limestone cliffs. Localized and rare. Figure 2.

*Flowering time.* July, November to December.

*Vernacular name.* Darjo.

*Additional specimens examined.* SOMALIA. Bari, Galgalo, 1000–1150 m, 1 Dec. 1986, *Thulin & Warfa 6205* (K, UPS); above Galgalo, ca. 1150 m, 27 Nov. 1971, *Lavranos 9014* (K); Nugaal, Elalo, Tukalamis, *Newbould 1095* (K); Sanaag, Surud Range, N of Erigavo, 1900–2060 m, 8 July 1981, *Gillett & Watson 23843* (K).

*Comments.* *Cynanchum galgalense* is a very unusual species, but most likely a *Cynanchum* with verrucose, sparse trichomes on the adaxial side of the corolla lobes and a highly fused corona. Probably related to *C. obtusifolium* and its allies. White latex would confirm its position in the genus.

**12. *Cynanchum gerrardii*** (Harvey) Liede, *Taxon* 40: 117. 1991. *Sarcocyphula gerrardii* Harv., *Thes. Cap.* 2: 58, t. 191. 1863. TYPE: South Africa. Natal: Tugela, *Gerrard 1321* (holotype, TCD; isotype, BM).

*Cynanchum sarcostemmatoides* K. Schum. in Engl., *Pflanzenw. Ost-Afrikas C*, 323. Aug. 1895. *Cynanchum sarcostemmoides* K. Schum. in Engl. & Prantl, *Nat. Pflanzenfam.* 4(2): 252. Oct. 1895. (orth. var.). TYPE: Tanzania. Tanga: Amboni, June 1893, *Holst 2706* (lectotype, designated by Liede (1993), K).

*Plants* ascending, twining, 0.5–2 m high, richly acrocaulously branched; subterranean organs consisting only of fibrous roots. *Shoots* perennial, semi-succulent, finely striate, obscurely glaucous, glabrescent, isolatedly covered with appressed multicellular trichomes 0.2–0.4 mm long, basally corky, with thin, yellowish bark; internodes (2–)4–8(–10) cm long, 1.5–2.5 mm diam. Latex white to slightly ivory. *Leaf scales* often not exactly opposite, 0.8–1.2 mm long, 0.5–0.8 mm wide, apically acute. *Inflorescences* bostrychoid to sciadioidal, 4–7-flowered, 2–4 flowers open at a time; rachis to 4 mm long; peduncles 0–2.5 mm long, sparsely covered with appressed trichomes 0.2–0.4 mm long. *Flowers* sweetly scented, nectariferous; floral bracts 0.2–0.5 mm long, 0.5–0.6 mm wide at the base, deltoid, with trichomes; pedicels 3–4.5 mm long, glabrous. *Buds* 0.4–0.5 mm long, 0.3–0.4 mm diam., globose to ovoid, with imbricate aestivation. *Calyx* basally fused; abaxial surface glabrous; lobes 0.3–0.4 mm long, 0.5–0.6 mm wide, ovate to triangular, apically acute. *Corolla* rotate, petals fused for about a quarter of their length; 2–3 mm long, abaxially green to white, adaxially green; lobes 1–1.5 mm wide, declinate, ovate, apically acuminate. *Corona* white,



cyathiform, 1.2–1.5 mm high, slightly exceeding the gynostegium. *C(is)* consisting of Cs and Ci fused for  $\frac{3}{4}$  to  $\frac{7}{8}$  of total corona height, only Cs differentiated, Ci thinner than Cs. Cs adnate to the filaments, appressed to the back of the stamens, without adaxial appendages; lobes of Cs laminar, triangular, apically erect to inflexed, with straight margins. *Gynostegium* sessile, 1.2–1.5 mm high, 0.8–1.2 mm diam. *Stamens* with free filaments 0.6–0.8 mm long. Anthers broader than high, trapezoidal, abaxially planar to convex; anther wings 0.3–0.4 mm long, parallel to each other, extending along the whole length of the anther; adjacent anther wings divergent toward the base, in the same plane as the anther. Connective appendages 0.38–0.42 mm long, 0.5–0.55 mm wide, ovate to triangular, narrower than the stamen, strongly inflexed. *Pollinarium*: corpusculum ca. 0.15 mm long; caudicles 0.1–0.12 mm long, flattened, straight, declinate, triangular, thickened at the insertion of the pollinium; pollinia subapically attached to the caudicles, 0.4–0.45 mm long, 0.15–0.2 mm wide, ovoid, round in cross section. *Stylar head* white, 0.8–0.85 mm diam., 0.25–0.3 mm high; upper part 0.2–0.23 mm high, flat to depressed-conical. *Follicles* one, occasionally two per flower, 85–120 mm long, 6–8 mm diam., elongated, round in cross section, apically short beaked, light brown to dark brown, smooth, glabrous. *Seeds* 5–6 mm long, 2–3 mm wide, pyriform, medium brown; seta and a seta side with regularly arranged papillae and trichomes 0.3 mm long, wingless, margins entire; coma 20–25 mm long. *Chromosome number*:  $2n = 22$  (voucher: *Noltee 995*, MSUN).

*Distribution and habitat.* Arabian Peninsula: Saudi Arabia, Yemen. Africa: Eritrea, Ethiopia (Gamo Gofa, Shewa, Sidamo); Kenya (K1, K2, K4, K5, K6, K7), Somalia (Sanaag, Woqooyi Galbeed), South Africa (Cape, Natal, Transvaal), Tanzania (T2, T3, T6, T7), Uganda (U1, U4), Zaïre, Zambia, Zimbabwe. Mascarene Islands: Comores, Madagascar (Antsiranana, Toliara). 0–1500 m; close to the sea or further inland, on rocky outcrops, in sandy or clayey depressions, often in slightly disturbed sites. Very widespread, but not frequent. Figure 18.

*Flowering time.* All year; mostly after rains.

*Vernacular names.* Debina Dir (Somalia); Kipagoro (Kitamba), Melktou (South Africa).

*Uses.* Zulus eat young shoots; in East Africa used as fish poison; in Somalia eaten, much liked by pregnant women (*Gillett 3939*).

*Selected specimens examined.* ETHIOPIA. **Gamo**

**Gofa:** 27.5 km S of Arba Minch, 1150–1300 m, 3 Aug. 1975, *Gilbert, Thulin & Aweke 330* (K, MO, UPS). **Shewa:** ca. 40 km E of Nazareth, ca. 1200 m, 5 Apr. 1966, *De Wilde & De Wilde-Duyffes 10519* (K, MO). **Sidamo:** 1 km N of Harekelo along rd. to Kebre Mengist 1450 m, 24 May 1982, *Friis, Tadesse & Vollesen 3292* (K). KENYA. **Central:** Kitui, 1 mi. N of Kangonde on Kangonde–Embu rd., 8 May 1960, *Napper 1664* (K); Machakos, Kibwezi Plains, 1000 m, 15 May 1938, *Bally 8333* (K). **Coast:** Kilifi, Malindi Golf Course, 10 m, 22 Sep. 1989, *Robertson 5914* (K); Kwale, Kilibasi Hill, 450–827 m, 19 Nov. 1989, *Luke & Robertson 2105* (K); Mombasa, Port Tudor, Mombasa, 660 m, Oct. 1931, *MacNaughtan 26* (K); Tana River, Kurawa, 30 mi. S of Garsen, 15 m, 25 Sep. 1961, *Polhill & Paulo 569* (K); Taita, Voi, 660 m, 11 May 1931, *Napier 1064* (K); Masai, SW of Ngong hills, 1860 m, 4 Aug. 1968, *Gillet 18689* (K). **Nyanza:** South Kavirondo, Homa Mountain, 2 Dec. 1934, *Turner 6628* (K, MO); Turkana, 1 km NE of Loiya on Lodwar rd., 1075 m, 8 Nov. 1977, *Carter & Stannar 264* (K). MOZAMBIQUE. Cabo Delgado, Pemba, 12 Aug. 1983, *Groenendijk & Dunge 566* (MO); Manica & Aofala, between Divinhe & Cherinda, 2 Sep. 1961, *Leach 11258* (K, MO, SRHG); Maputo, Marracuene, Macaneta, 5–10 m, 1 Aug. 1980, *Schäfer 7218* (K, MO); Zambezia, 20 mi. N of Quelimane, 20 Aug. 1962, *Wild 5877* (K, MO, SRHG). SOMALIA. Sanaag, Surud, 1973, *Bally & Melville s.n.* (K); Woqooyi Galbeed, Hargesia, 1130 m, 21 Sep. 1932, *Gillett 3939* (K). SOUTH AFRICA. **Cape:** Albany, N of Pluto's Vale, 11 Apr. 1954, *Noel 1544* (GRA); Alexandria, Zuurkop, Addo National Park, 330 m, 18 Oct. 1951, *Archibald 3854* (GRA); Butterworth, along the Kei River, Jan. 1892, *Flanagan 1038* (BOL, SAM); Grahamstown, Piggott Bridge, 265 m, 13 Apr. 1978, *Bayliss 8474* (MO); Jansenville, Gannahoek, 8 May 1985, *Hoffman 791* (GRA); Peddie, banks of Fish River, 600 m, 15 Mar. 1970, *Bayliss 4554* (MO); Port Elizabeth, Farm Vaalkrans, 600 m, 1 June 1972, *Bayliss 5100* (MO); Somerset East, Zuurberg, 20 Nov. 1947, *Barker 4928* (NBG); Steytlerville, 2 km S of Mt. Stewart toward Steytlerville, 8 Dec. 1978, *Bruyns 1887* (NBG); Stutterheim, prope Kingwilliamstown, Dec. 1870, *Munsel-Weale s.n.* (SAM 18599, SAM). **Natal:** Durban, Durban, Bluff, 23 Apr. 1914, *Wood 12613* (PRE); Lower Tugela, Lower Tugela valley opposite Gnembe River confluence, ca. 170 m, 27 Feb. 1963, *Edwards 3048* (PRE); Nkandhla, Nogeysa, Umhlatuzi Valley, 31 May 1967, *Venter 3708* (PRE); Port Shepstone, Oriba Flats, Umzimkulu Gorge, Apr. 1937, *McClellan 408* (MO, PRE); Ubombo, Jozini, 16 Apr. 1968, *Strey 8128* (PRE). **Transvaal:** Selati River, Eastern Transvaal, *Rogers 2661a* (BOL). SWAZILAND. Louwsburg, Maloma, ca. 500 m, 5 Sep. 1963, *Dlamini s.n.* (NBG 71759, NBG); Mbabane, near Croydon, 9 Sep. 1957, *Compton 27031* (NBG); Stegi, Mhlumeni Border Station, 22 mi. NE of Stegi, 330 m, 4 June 1947, *Codd & Dyer 2929* (PRE). TANZANIA. **Arusha:** Kemosomu gorge, 1660 m, 19 Feb. 1971, *Richards & Arasululu 26688* (K). **Iringa:** top of Kitonga gorge, Image mountain, 1200–1800 m, 9 Dec. 1986, *Lovett & Congden 1070* (K, MO). **Morogoro:** Uluguru Gebirge, 500 m, 6 June 1933, *Schlieben 3993* (B); Moshi, Kikafu River bridge, 15 Apr. 1968, *Bigger 1773* (EA). **Pwani:** Mafia Island, Tretole, 2 Aug. 1932, *Schlieben 2620* (B). **Tanga:** Sawa, sea level, 3 Sep. 1956, *Faulkner 1914* (K). **Zanzibar:** M'beoni, sea level, 26 June 1960, *Faulkner 2624* (K). UGANDA. Bunyoro, Budongo Forest, July 1936, *Eggeling 3069* (K); Karamoja, near Amudat, 1330 m, *Wilson 858* (K). ZAÏRE. Ruindi, Oct. 1937, *Lebrun 8000* (K); Katanda, Sep. 1937,

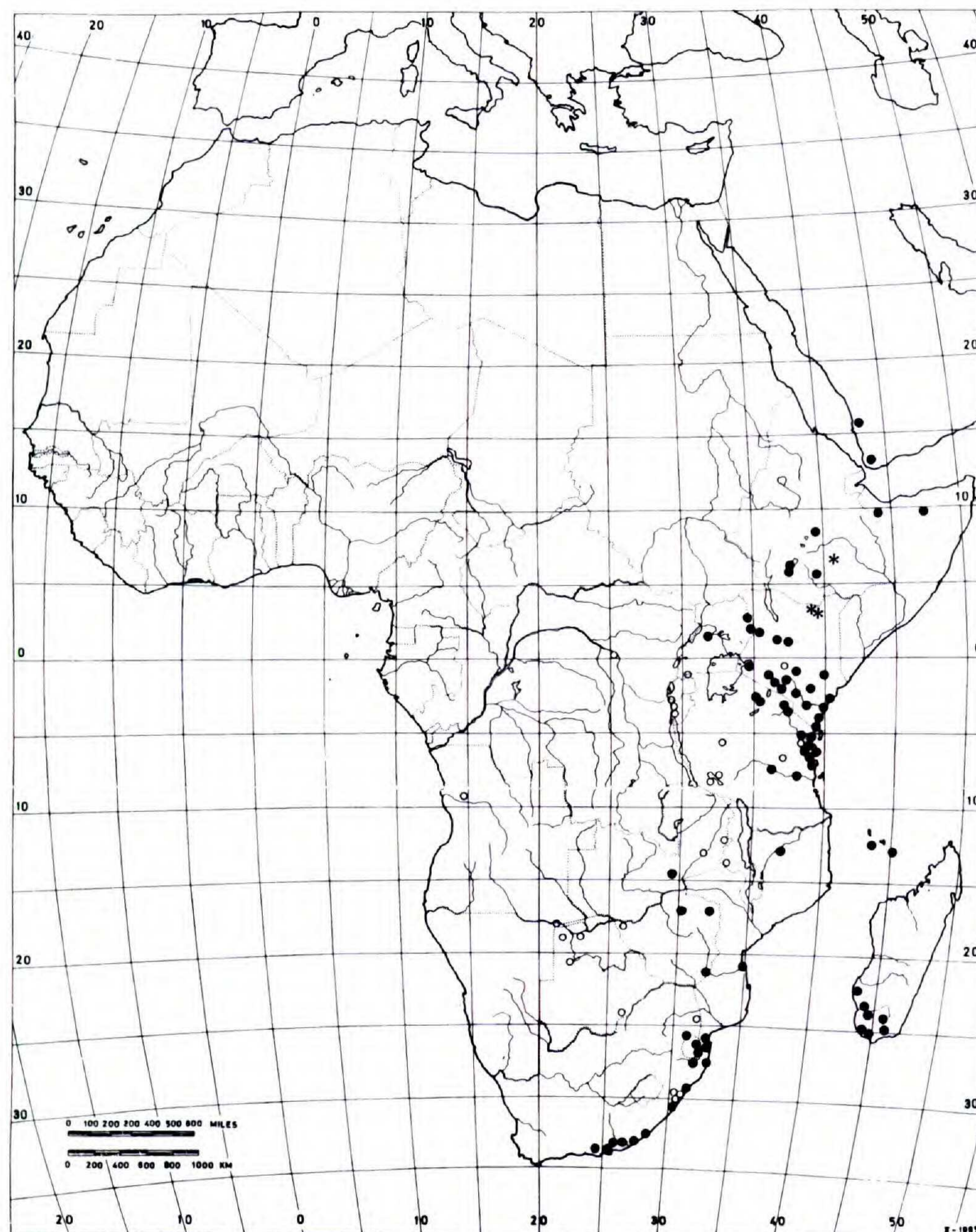


Figure 18. Known distribution of *Cynanchum gerrardii* (dots), *C. leneutonii* (asterisks), and *C. schistoglossum* (open circles).

*Lebrun* 7702 (K); May-yo-moto, Sep. 1937, *Lebrun* 9217 (K); Mwuvito et la Kamakaba, Jan. 1938, *Lebrun* 9694 (K). ZAMBIA. Lusaka, 8 Mar. 1971, *Fanshawe* 11191 (K). ZIMBABWE. Chiredzi, Chuanja Hill, Lona-re Zhau Game Reserve, 27 May 1971, *Ngoni* 134 (MO); Mandula, Whindale Ranch, Mandula, above farm-house, ca. 1000 m, 24 Mar. 1969, *Leach, Biegel & Pope* 14328 (K, MO, SRGH); Mtoko, Kopje near village, 4 Dec. 1960, *Wild* 5287 (K, MO); Wankie, Inyantue sale pens, ca. 915 m, 24 Mar. 1969, *Leach* 11630 (K, SRGH); Nuanetsi, near Kapatenis, 65 km NE of Malvernia, 25 Apr. 1962, *Drummond* 7718 (K, SRGH).

*Comments.* Throughout its history, several names have been applied to *Cynanchum gerrardii*. Of these, *Cynanchum aphyllum* (Thunb.) Schltr. is not an available name for this species, because *Asclepias aphylla* Thunb. [Prod. Fl. Cap. 47 (1794)], a later homonym of *A. aphylla* Forssk., has been lectotypified (Liede, 1991) in such a way

that it is a synonym of *Sarcostemma viminale* (L.) R. Br.

Likewise, *Cynanchum tetrapterum* (Turcz.) R. A. Dyer ex Bullock [Kew Bull. 10: 624. 1955] is based on *Sarcostemma tetrapterum* Turcz., which has been lectotypified (Liede, 1991) on a specimen representing *Sarcostemma viminale* (L.) R. Br. sensu lato.

*Vincetoxicum sarcostemmoides* Schweinf. ex Penzig [Atti Congr. Bot. Int. Genova 349 (1893), nomen nudum] also represents this *C. gerrardii* (fide Bullock, 1955).

An extremely adaptable species, also easy to cultivate. The affinities of *C. gerrardii* clearly lie with a group of leafless Malagasy species.

Further details, illustration, and a detailed southern African distribution map are provided in Liede (1993).

**13. *Cynanchum gonoloboides*** Schlechter, *Wiss. Erg. Deut. Zentr.-Afr. Exped., Bot.* 2: 543. 1913. TYPE: Rwanda: *Schlechter 1617* (holotype, B presumably destroyed). NEO-TYPE: Kenya. Rift Valley: Nakuru, Doboti, about 9 mi. from Cobb's gate near the Mau Forest Reserve on the track to Nairagie Ngare, 3200 m, *Glover, Gwynne & Samuel 1492* (neotype, designated here, K; isoneotypes, EA, FT). Figure 19.

*Plants* ascending, twining, 4–5 m high, richly and irregularly branched, rhizomatous; subterranean organs woody rootstocks, 7–9 cm diam. *Shoots* perennial, herbaceous, glabrescent, densely covered with flexuous trichomes 0.4–0.5 mm long, when young; basally woody, with yellowish bark, internodes 7–20 cm long, 2.5–3 mm diam. “*Stipules*” absent. *Leaves* with petioles 12–20(–40) mm long, leaf blades herbaceous, 55–90 mm long, 35–60 mm wide, ovate, basally cordate with 8–12 collets in the adaxial sinus, apically acuminate, apiculus 4–10 mm long, adaxially densely covered with flexuous trichomes 0.2–0.25 mm long, evenly distributed over the whole surface (when young), abaxially densely covered with flexuous trichomes 0.4–0.5 mm long, restricted to veins and margins (when young). *Inflorescences* bostrychoid, 6–15-flowered, 3–7 flowers open at a time; rachis 5–30 mm long; peduncles 15–25(–30) mm long, sparsely covered with flexuous trichomes 0.25–0.35 mm long. *Flowers* pleasantly honey-scented; floral bracts 2–2.5 mm long, 0.5–0.7 mm wide at the base, linear to triangular, with trichomes; pedicels 10–22 mm long, densely covered with flexuous trichomes 0.15–0.25 mm long. *Buds* 3.5–4 mm long, 4–4.5 mm diam., globose, with imbricate aestivation. *Calyx* basally fused; abaxial surface densely covered with trichomes; lobes 3.5–4 mm long, 2–2.5 mm wide, ovate, apically acuminate. *Corolla* rotate, basally fused, 4–5 mm long, abaxially and adaxially greenish yellow, brown along the main nerves, often also basally; lobes 2–2.5 mm wide, horizontal to declinate, oblong, apically acute. *Corona* white, 3.5–4 mm high, equaling the gynostegium in height, C(is) consisting of Cs and Ci fused for more than  $\frac{3}{4}$  of total corona length, only Cs differentiated. Cs not adnate to the filaments, adaxially with a basal protuberance corresponding to the lower margin of the anther proper, without adaxial appendages; lobes of Cs laminar, trifid (the medium lobe widely ovate, occupying about  $\frac{2}{3}$  of the total width, the lateral lobes triangular), apically inflexed. *Gynostegium* 1.2–1.3 mm high, 3.5–3.7 mm diam., atop a stipe, 1.5–1.7 mm long. *Stamens* with-

out free filaments, anthers broader than high, deltoid, abaxially convex; anther wings 0.35–0.4 mm long, parallel to each other, not extending along the whole length of the anther; the anther forming a “pseudostipe,” of 0.2–0.25 mm height, adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.75–0.8 mm long, 1.4–1.5 mm wide, ovate, narrower than the stamen, strongly inflexed, with emarginate margins. *Pollinarium*: corpusculum 0.35–0.4 mm long; caudicles 0.8–0.9 mm long, cylindrical, s-shaped, concave-convex, horizontal; pollinia laterally attached to the caudicles, 0.35–0.4 mm long, 0.24–0.26 mm wide, globose to ovoid, ovate in cross section. *Stylar head* white to cream, 2.25–2.5 mm diam., 0.35–0.4 mm high; upper part flat. *Follicles* ca. 110 mm long, 15 mm diam., obclavate, round in cross section, apically acute, wingless, light brown, isolatedly covered with short protuberances, with thick pericarp. *Seeds* 9–11 mm long, 4–6 mm wide, ovate, medium brown, seta side smooth, marginally with 0.4 mm wide wing, coma 20–25 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Ethiopia (Sidamo), Kenya (K3, K4); Rwanda, Tanzania (T6); 2800–3800 m; bamboo forest. Rather localized, but neither rare nor endangered. Figure 10.

*Flowering time.* January to April.

*Vernacular name.* Ol'obito (Masai).

*Additional specimens seen.* ETHIOPIA. **Sidamo:** Mt. Delo, Amaro Mts., 3400 m, 28 Jan. 1953, *Gillett 14973* (EA). KENYA. **Central:** Nyeri, Aberdares Nat. Park Rd., Nyeri end, 2900 m, *Agnew 7179* (EA). **Rift Valley:** Elgeyo, Charanqui Hills, Embobut forest, in Arorr & Embobut valleys, 3460–3800 m, Jan. 1971, *Tweedie 3912* (K); Trans Nzoia, N. E. Elgon, top of Arawa Forest, ca. 2860 m, Feb. 1961, *Tweedie 2103* (BR, K).

*Comments.* The type specimen [Rwanda. Karisimbi, ca. 2500 m, Nov. 1907, *Schlechter 1617*] could not be found and was most probably destroyed in B. The description of the species, however, clearly matches Sp. A in Agnew (1974: 387) with *C. gonoloboides*. Therefore, Schlechter's old name is neotypified here. Despite its highly fused corona and the distinctive stipe, the species is easily identified as a sister species of *C. balense*.

**14. *Cynanchum heteromorphum*** Vatke, *Linnaea* 40: 215. 1876. TYPE: Ethiopia. Tigray: Hamedo plain, 1530 m, 31 Aug. 1862, *Schimper 940* (holotype, B presumably destroyed; lectotype, designated here, K). Figure 20.

*Cynanchum fraternum* N. E. Br., *Bull. Misc. Inform., Kew*

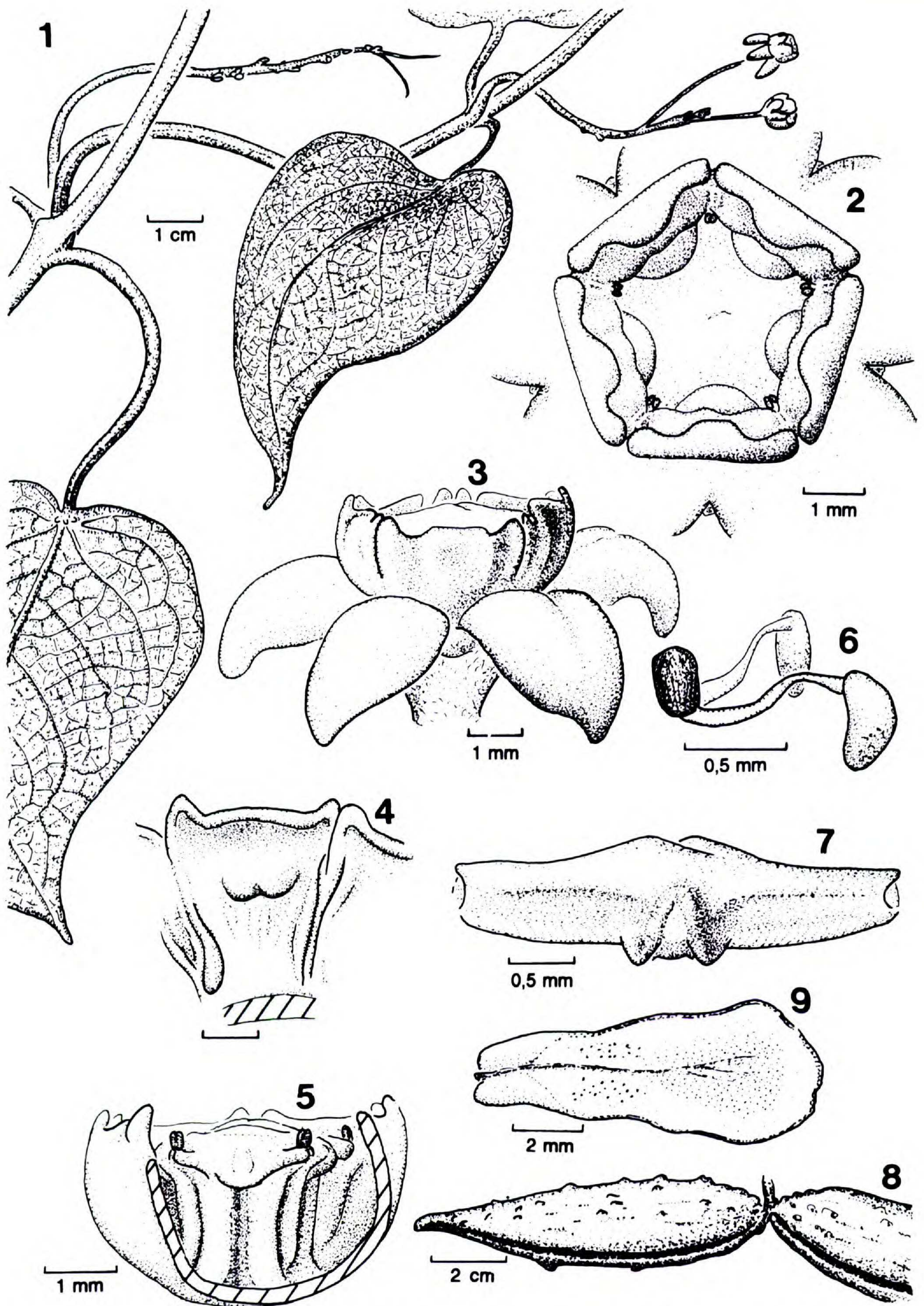


Figure 19. *Cynanchum gonoloboides* Schltr. 1: Glover *et al.* 1492; 2–9: Liede & Newton 3157.—1. Habit with inflorescence.—2. Flower, top view.—3. Flower, lateral view.—4. Corona, staminal lobe; adaxial view.—5. Gynostegium and corona, partially removed.—6. Pollinarium.—7. Styler head.—8. Fruits.—9. Seed, seta side. Drawn by Jim Conrad.

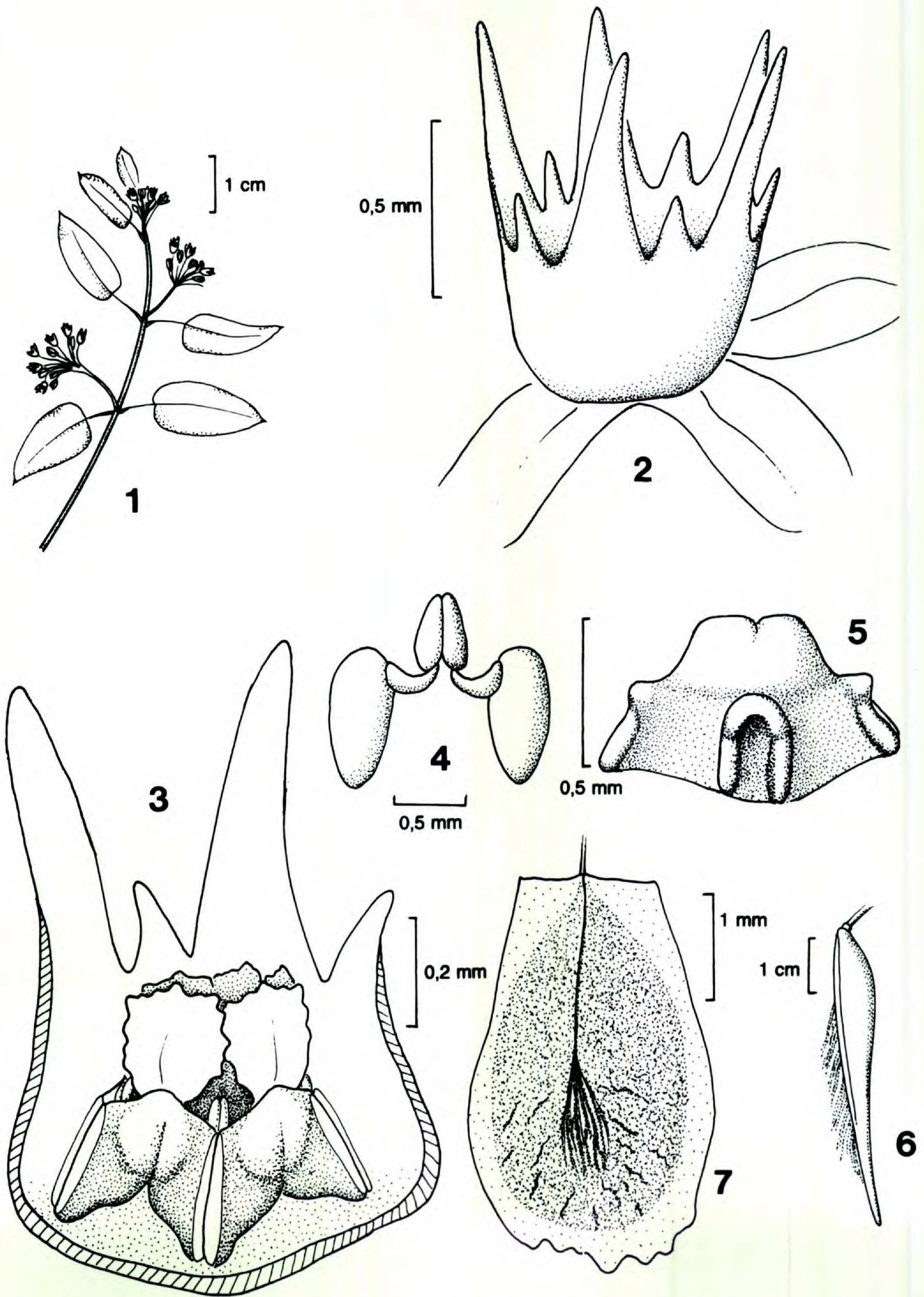


Figure 20. *Cynanchum heteromorphum* Vatke. 1-5: Schimper 1802; 6, 7: Schimper 940.—1. Shoot with inflorescences.—2. Flower.—3. Gynostegium and corona, partially removed.—4. Pollinarium.—5. Stylar head.—6. Fruit.—7. Seed, seta side. Drawn by G. Hintze.

106: 256. 1895. TYPE: Ethiopia. Tigray: Djeladjerranne, 24 Oct. 1840, *Schimper s.n.* (holotype, B presumably destroyed; lectotype, designated here, K).

*Cynanchum pleianthum* K. Schum., *Annuario Reale Ist. Bot. Roma* 7: 39. 1898. TYPE: Somalia. Locis paludosis in Pianure di Savati, 25 Nov. 1893, *Ruspoli & Riva 1533* (holotype, B presumably destroyed; lectotype, designated here, FT).

*Plants* ascending, twining, sparsely branched. *Shoots* herbaceous, sparsely glabrescent with appressed trichomes 0.25–0.3 mm long; internodes 6.5–10 cm long, 0.8–1.1 mm diam. “*Stipules*” absent. *Leaves* with petioles 6–8 mm long; leaf blades herbaceous, 18–32 mm long, 8–14 mm wide, ovate, basally rounded to obtuse with 5 colleters adaxially, apically acute to acuminate, apiculus 0.5–1 mm long, adaxially isolatedly covered with appressed trichomes 0.25–0.3 mm long, evenly distributed over the whole surface, abaxially with appressed trichomes 0.25–0.3 mm long, concentrated on veins and margins. *Inflorescences* bostrychoid, 8–10-flowered, 3–5 flowers open at a time; rachis 1–3 mm long; peduncles 7–9 mm long, densely covered with appressed trichomes 0.15–0.18 mm long. *Flowers* with floral bracts 0.6–0.7 mm long, 0.3–0.5 mm wide at the base, triangular; pedicels 4–6 mm long, sparsely covered with appressed trichomes 0.15–0.2 mm long. *Buds* 1.8–2 mm long, 1.3–1.5 mm diam., ovoid, with imbricate aestivation. *Calyx* basally fused; abaxial surface with trichomes; lobes 1–1.2 mm long, 0.5–0.6 mm wide, ovate, apically acute. *Corolla* cyathiform, basally fused; 2.5–3 mm long; lobes 0.8–1 mm wide, patent, oblong, apically obtuse. *Corona* cyathiform, 3 mm high, exceeding the gynostegium but not obscuring it; C(is) consisting of Cs and Ci fused for a little less than ½ of total corona length, Cs and Ci differentiated, Ci shorter than Cs. Cs not adnate to the filaments, without adaxial appendages; lobes of Cs laminar, elongate-triangular, apically reflexed. *Lobes of Ci* laminar, oblong, flat, reflexed. *Gynostegium* 1.8–1.9 mm high, 1.8–1.9 mm diam., sessile. *Stamens* without free filaments, anthers about as high as broad, rectangular, abaxially planar; anther wings 0.9–1 mm long, parallel to each other, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther. *Connective appendages* 0.65–0.7 mm long, 0.7–0.75 mm wide, ovate, narrower than the stamen, erect, with dentate margins. *Pollinarium*: corpusculum 0.2 mm long, about as long as broad, rhomboid; caudicles 0.12–0.15 mm long, cylindrical, concavely recurved; pollinia subapically attached to the caudicles, 0.35–0.4 mm long, 0.15–0.17 mm wide, oblongoid, ovate in cross section. *Stylar head* 0.7–1 mm diam., 0.5–0.6 mm high; upper part

0.25–0.3 mm high, umbonate. *Follicles* one per flower, pendulous, 50–65 mm long, 7–8 mm diam., obclavate, obtusely deltate in cross section, apically strongly beaked, keeled, light brown, longitudinally grooved, sparsely covered with trichomes. *Seeds* 4–5 mm long, 2.5–3 mm wide, ovate, medium brown, seta and aleta side sculptured with longitudinal ridges, marginally with 0.4–0.5 mm wide wing with dentate margin; coma 15–20 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Cameroon, Central African Republic, Eritrea, Ethiopia (Tigray), Somalia; around 1600 m, on sandy soil. Very rarely collected and even less so in recent years; presumably endangered. Figure 16.

*Flowering time.* October to November.

*Additional specimens examined.* CAMEROON. Bertoua, near Catholic mission, 5 Nov. 1960, *Breteler 615* (K, WAG). CENTRAL AFRICAN REPUBLIC. Krébidjé (Fort Sibut), vallée de la moyenne Tomi, 6 Oct. 1902, *Chevalier 5649* (P). ERITREA. Medri od Tesfa. Adi Ghebsus, 1600 m, 2 Nov. 1906, *Pappi 7300* (FT).

*Comments.* The flower of *Cynanchum heteromorphum* is quite similar to that of *C. falcatum*; however, the clavate stylar head and the pronouncedly triangular leaves of the latter are unmistakable. With *C. clavidens* subsp. *hastifolium*, this taxon shares the unusual East African–West African disjunction.

**15. *Cynanchum ledermannii*** Schlechter *Bot. Jahrb. Syst.* 51: 140. 1913. TYPE: Burundi. Bubanza, Mugomero (Rugazi), 2000 m, 2 May 1981, *Reekmans 10069* (neotype, designated here, K). Syntypes cited in the protologue: Cameroon. Northern: Bansa Mtns., ca. 2000 m, Oct. 1909, *Ledermann 5757*; Muti-slopes, near Mfongu, 1700–1800 m, Oct.–Nov. 1909, *Ledermann 5892, 5931a* (all probably destroyed in B, no isotypes found). Figure 21.

*Plants* ascending, twining, to 3 m high, richly and irregularly branched. *Shoots* perennial, herbaceous, sparsely covered with flexuous trichomes 0.4–0.5 mm long, along a single line; internodes 15–25 cm long, 1–1.2 mm diam. “*Stipules*” ovate, 5–7 mm long, 5–7 mm wide. *Leaves* with petioles 35–50 mm long, 4–6 colleters at the base of the leaves; leaf blades herbaceous, 60–70 mm long, 30–35 mm wide, ovate, basally lobate, lobes 4–7 mm long, apically acuminate, apiculus 10–12 mm long, adaxially glabrous, abaxially isolatedly covered with flexuous trichomes 0.15–0.2 mm long, concentrated on veins and margins. *Inflorescences*

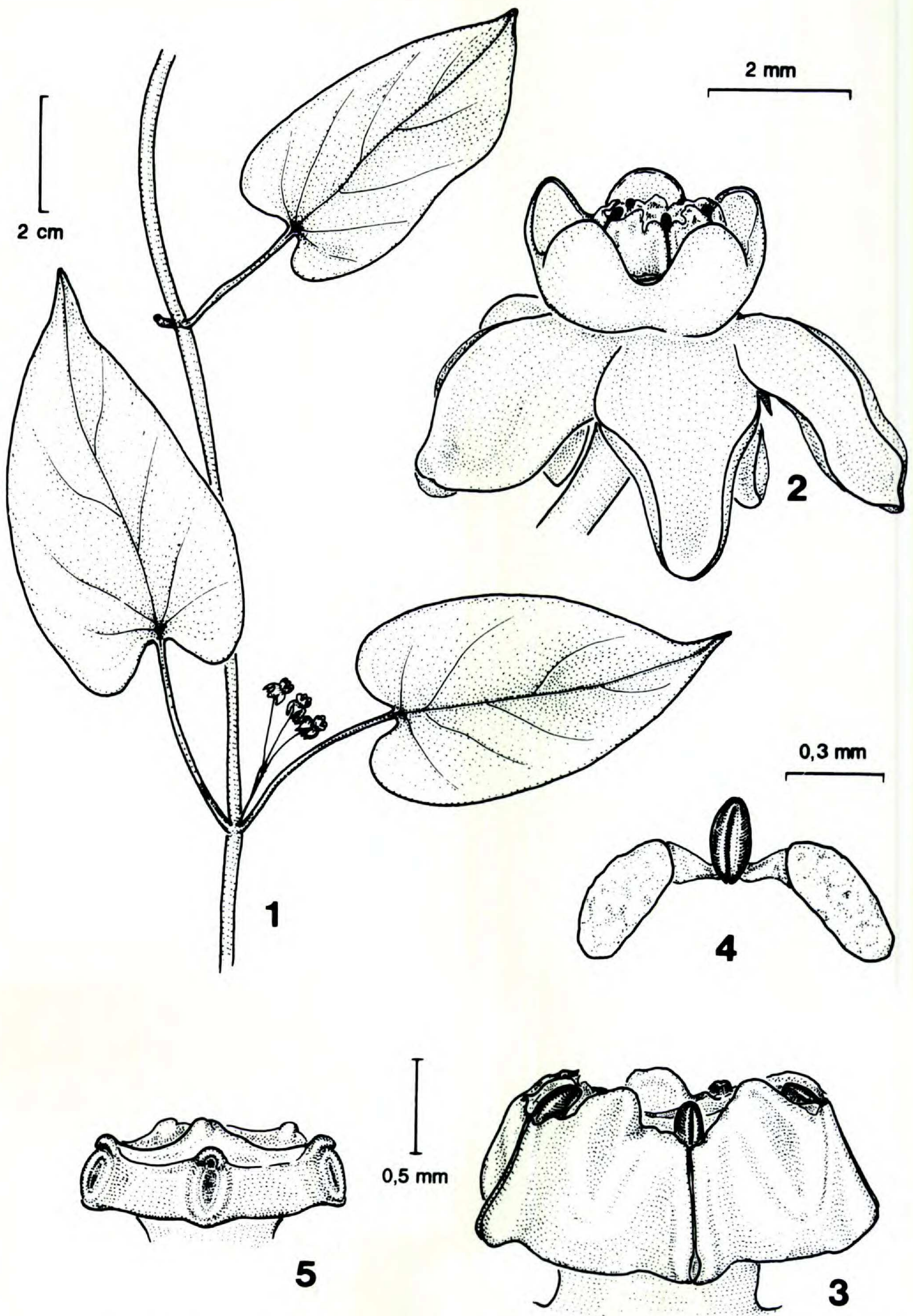


Figure 21. *Cynanchum ledermannii* Schltr. 1, 3–5: Schlieben 3436; 2: Reekmans 30069.—1. Shoot with inflorescence.—2. Flower.—3. Gynostegium.—4. Pollinarium.—5. Stylar head. Drawn by U. Meve.

sciadioidal, 8–15-flowered; peduncles 35–50 mm long, densely covered with flexuous trichomes 0.25–0.3 mm long, along a single line. *Flowers* with floral bracts 1.6–1.8 mm long, 0.3–0.5 mm wide at the base, elongate-triangular, with trichomes; pedicels 5–7 mm long, densely covered with flexuous trichomes 0.2–0.25 mm long. *Buds* 2–2.5 mm long, 2–2.5 mm diam., globose, with imbricate aestivation. *Calyx* basally fused; abaxial surface with trichomes; lobes 0.8–1 mm long, 0.5–0.7 mm wide, lanceolate, apically acute. *Corolla* rotate, basally fused; 3.5–4 mm long; lobes 1.7–2 mm wide, decurved, ovate, apically obtuse. *Corona* 1.8–2 mm high, equaling or very slightly exceeding the gynostegium, C(is) consisting of Cs and Ci fused for almost ½ of total corona length, C(is) only Cs differentiated, cyathiform. Cs not adnate to the filaments, not appressed to the back of the stamens, without adaxial appendages; lobes of Cs laminar, oblong, flat, apically erect, with laterally and apically involute margins. *Gynostegium* 1–1.2 mm high, 1.3–1.5 mm diam., on a bulge 0.5–0.7 mm high. *Stamens* without free filaments; anthers broader than high, trapezoidal, abaxially planar; anther wings 0.7 mm long, convergent, extending beyond the anther proper with stamens forming a basal arch; adjacent anther wings parallel, in the same plane as the anther. Connective appendages ca. 0.5 mm long, 0.5 mm wide, ovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.5 mm long, caudicles ca. 0.075 mm long, flattened, straight, horizontal, triangular; pollinia subapically attached to the caudicles, ca. 0.25 mm long, 0.12–0.15 mm wide, ovoid, ovate in cross section. *Stylar head* 0.9–1 mm diam., 0.35–0.4 mm high; upper part 0.1–0.15 mm high, umbonate. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Burundi, Cameroon, Tanzania (T6), Zaïre; 1700–2000 m; mountain forest. Very rarely collected, but a few collections are probably erroneously hidden among the stacks of *C. schistoglossum* or *C. adalinae* subsp. *mannii*; presumably endangered. Figure 6.

*Flowering time.* May, October to November.

*Additional specimens examined.* TANZANIA. **Morogoro:** Uluguru, Nordwestseite, ca. 1100 m, 13 Feb. 1933, Schlieben 3436 (B). ZAÏRE. Yangambi, 21 July 1950, Deviet 539 (SRGH).

*Comments.* In habit, *Cynanchum ledermannii* reminds one strongly of *C. adalinae* subsp. *mannii*; but, as Schlechter remarked in the protologue, the corona of the two species is very distinct. Also, the gynostegium is sessile, the stylar head conspicu-

ously conical in *C. adalinae*, while here, the gynostegium is elevated on a bulge and the stylar head flat to umbonate. The corona reminds one a little of *Pentarrhinum*.

All three syntypes cited by Schlechter (1913) were probably destroyed in B, and isotypes could not be located. As the accurate description allows an exact match of the characters of this species, it is neotypified here.

**16. *Cynanchum lenewtonii*** Liede, Kew Bull. 49: 119. 1994. TYPE: Kenya. Northern Frontier: Moyale, 13 Dec. 1952, Gillett 14031 (holotype, K; isotype, B).

*Plants* twining, to 2.5 m high, richly basicaulously branched. *Shoots* perennial, semi-succulent, finely striate; obscurely glaucous, sparsely glabrescent with flexuous trichomes 0.3–0.4 mm long; internodes 25–60 cm long, 1.5–2.5 mm diam. Latex present, white (the note “clear juice” on the specimen Gillett 12964 could not be confirmed by my own field observations). *Leaf scales* papery, 1.2–1.7 mm long, 0.6–0.8 mm wide, ovate, apically acute. *Inflorescences* sciadioidal, 2–6-flowered, 2–4 flowers open at a time, subsessile. *Flowers* with floral bracts 0.5–0.7 mm long, 0.6–0.8 mm wide at the base, triangular, glabrous; pedicels 3–4 mm long, glabrous. *Buds* 2–2.5 mm long, 1.5–2 mm diam., ovoid to cylindrical, with imbricate aestivation. *Calyx* basally fused, abaxial surface glabrous; lobes 0.6–0.7 mm long, 0.4–0.5 mm wide ovate, apically acute. *Corolla* rotate to very widely campanulate, fused between ¼–½ of their length; 2.5–3.5 mm long, abaxially and adaxially greenish yellow; lobes 1–1.2 mm wide, recurved, oblong to triangular, apically obtuse to acute. *Corona* white, cyathiform to campanulate, 2–2.5 mm high, exceeding the gynostegium, partly obscuring it, consisting of Cs and Ci fused for ½ to ¾ of total corona length, both Cs and Ci differentiated, Ci shorter than Cs. Cs adnate to the filaments, appressed to the back of the stamens, adaxially with a basal protuberance corresponding to the filament, without adaxial appendages; lobes of Cs filamentose, apically inflexed to erect (when young, they bend over the gynostegium and touch each other in the middle, later they open up); Ci laminar, triangular to very narrowly triangular, erect to reflexed; with straight upper margin. *Gynostegium* 1.5–1.6 mm high, 1.3–1.4 mm diam., sessile. *Stamens* with free filaments 0.6–0.7 mm long, broader than high, rectangular, abaxially planar; anther wings 0.18–0.2 mm long, extending along the whole length of the anther, parallel to each other, adjacent anther wings divergent toward



the base, in the same plane as the anther. Connective appendages 0.5–0.6 mm long, 0.65–0.7 mm wide, widely ovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.18–0.2 mm long, margins of the corpuscular cleft sinuate; caudicles 0.1–0.12 mm long, flattened, straight, horizontal, not thickened at the insertion of the pollinium; pollinia laterally attached to the caudicles, 0.25–0.3 mm long, 0.13–0.15 mm wide, ovoid, ovate to round in cross section. *Stylar head* 0.6–0.65 mm diam., 0.45–0.5 mm high; upper part 0.17–0.2 mm high, flat to depressed-conical. *Follicles* one, occasionally two, per flower, erect, 65–70 mm long, obclavate, wingless. *Seeds* unknown. *Chromosome number*:  $2n = 22$  (voucher: *Liede & Newton 3161*, MSUN).

*Distribution.* Africa: Ethiopia (Bale), Kenya (K1). Figure 18.

*Comments.* *Cynanchum lenewtonii* is closely related to *C. gerrardii*, but is easily recognized by its long staminal corona parts closing over the gynostegium in young flowers.

Further comments, citation of specimens, and illustration are provided in Liede (1994).

**17. *Cynanchum longipes*** N. E. Brown, Bull. Misc. Inform., Kew 1897: 273. 1897. TYPE: Nigeria. Lagos: Papalayito, 1895, *Millen 48* (holotype, K). Figure 22.

*Plants* ascending, twining, 5–8 m high, richly and irregularly branched. *Shoots* perennial, herbaceous, sparsely covered with erect trichomes 0.7–0.9 mm long, along a single line; internodes 10–20 cm long, 1.5–1.7 mm diam. “*Stipules*” ovate, acute, 10–15 mm long, 8–12 mm wide. *Leaves* with petioles 15–100 mm long; leaf blades herbaceous, 60–115 mm long, 23–65 mm wide, ovate, basally lobate, lobes 10–15 mm long, with 9–11 colleters in the adaxial sinus, leaves apically acuminate, apiculus 8–12 mm long, adaxially and abaxially glabrous. *Inflorescences* bostrychoid, 5–9-flowered, all flowers open at a time; rachis 2–7 mm long; peduncles 5–7 mm long, sparsely covered with flexuous trichomes 0.15–0.2 mm long, along a single line. *Flowers* with floral bracts 1–1.2 mm long, 0.2–0.4 mm wide at the base, triangular; pedicels 10–20 mm long, densely covered with flexuous trichomes 0.15–0.25 mm long. *Buds* 5–6 mm long, 3.5–4 mm diam., conical, with imbricate aestivation. *Calyx* basally fused, ciliate; lobes 1.4–1.5 mm long, 0.9–1 mm wide, ovate, apically acute. *Corolla* rotate, basally fused; 6–8 mm long, abaxially greenish yellow, adaxially yellow; lobes 2–2.5 mm wide,

horizontal, oblong, apically obtuse. *Corona* purplish red, 5–6 mm high, exceeding the gynostegium, partly obscuring it; C(is) consisting of Cs and Ci fused for more than  $\frac{3}{4}$  of total corona length, Cs and Ci differentiated, Ci shorter than Cs. Cs basally just adnate to the filaments, without adaxial appendages; lobes of Cs laminar, triangular or trifid (with two short side teeth), apically erect. *Lobes of Ci* laminar, triangular, erect. *Gynostegium* 0.35–0.4 mm high, 0.45–0.5 mm diam., sessile. *Stamens* without free filaments, anthers about as high as broad, pentagonal, abaxially convex; anther wings 0.24–0.26 mm long, parallel to each other, extending along the whole length of the anther, adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.15–0.2 mm long, 0.14–0.16 mm wide, triangular, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.35–0.37 mm long, between 1.5 times and twice as long as broad, rhomboid; caudicles 0.2 mm long, flattened, straight, declinate, triangular; pollinia subapically attached to the caudicles, 0.66–0.68 mm long, 0.25 mm wide, oblongoid, round in cross section. *Stylar head* 0.28–0.3 mm diam., 0.6–0.8 mm high; upper part 0.3–0.45 mm high, flat to depressed-conical to conical. *Follicles* one per flower, pendulous, ca. 90 mm long, 7.5 mm diam., fusiform, apically acute, but not beaked, keeled, medium brown. *Seeds* and *chromosome number* unknown.

*Distribution and habitat.* Africa: Cameroon, Gabon, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Nigeria, Sierra Leone, Uganda, Zaïre; 250–1300 m; forest, gallery forest, forest clearings and plantations. Not frequent, but very widespread. Figure 8.

*Flowering time.* (May–)July to November.

*Selected specimens examined.* CAMEROON. Southwest, around Kumba, 150 m, 16 May 1984, *Thomas 3483* (MO); Biteye near River Ja, Sep. 1922, *Bates 1856* (K). GABON. La Waka, Oubangui-Chari A.E.F., Glatemazé, 20 km NE Boubani, 1927, *Le Testu 2285* (BM); Mbaïki, Boukoko, 5 July 1948, *Le Testu 1027* (BM); Woleu-Ntem, Minvoul, 15 Aug. 1923, *Le Testu 234* (BM). GUINEA. Fá, 10 Sep. 1962, *Guerra 3839* (K); Kinsan, Kindia, July 1937, *Jacques-Félix 1810* (K, P). GUINEA-BISSAU. Bafatá, entre Geba e Mato de Cao, 15 Sep. 1955, *Junta de Investigações coloniais 3370* (K). IVORY COAST. Bouaké, route de Sakasso, km 12, 250 m, 9 Aug. 1963, *Garnier & Bouaké 95* (K); Boukoka, 2 Aug. 1947, *Tiss 102* (G). LIBERIA. Bong, Gbanga, 1926, *Linder 653* (K); Nimba, Nimba Reserve, Mount Bele Rd., 500 m, 10 Sep. 1964, *Adames 512* (K). NIGERIA. West, Ife, Shasha forest Reserve, on track 26, 20 Sep. 1973, *Latilo s.n. (67538 FHI)*, K). SIERRA LEONE. Mamaba, 2 Nov. 1914, *Thomas 4553* (K); Njala, 8 Oct. 1949, *Deighton 5188* (B, K); Ronietta, 250 m, 17

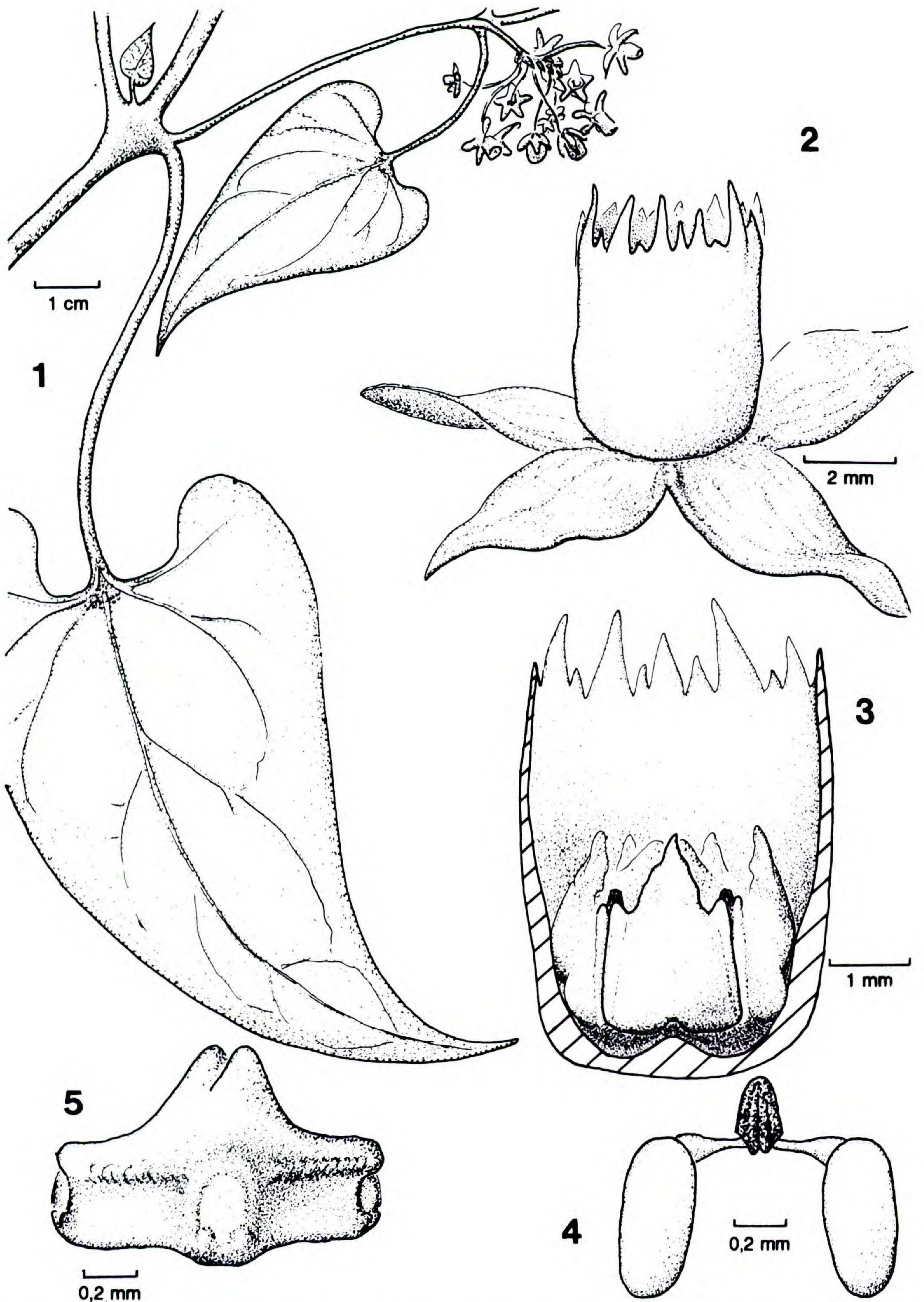


Figure 22. *Cynanchum longipes* N. E. Br. 1: *Junta de investigações coloniais* 3311; 2-5: *Adames* 512. —1. Habit with inflorescence.—2. Flower.—3. Gynostegium and corona, partially removed.—4. Pollinarium.—5. Styler head. Drawn by Jim Conrad.

Nov. 1914, *Thomas 5377* (K). ZAÏRE. Lilando, 15 Aug. 1938, *Louis 10843* (K).

*Comments.* *Cynanchum longipes* is a species of uncertain affinities, the red corona resembling the Malagasy *C. papillatum* alliance, but with the habit of a rather unspecialized species.

This species is illustrated in Adam (1975: 971, pl. 506).

**18. *Cynanchum meyeri*** (Decaisne) Schlechter, Bot. Jahrb. Syst. 20, Beibl. 51: 2. 1895. *Cyanoctonum meyeri* Decne. in Candolle, Prodr. 8: 531. 1844. (nom. superfl. when published, based on *S. ovatum* E. Mey.). *Vincetoxicum meyeri* (Decne.) Kuntze, Revis. Gen. Pl. 2: 424. 1891. *Sarcostemma ovatum* E. Mey., Comm. Pl. Afr. Austr.: 216. 1838. *Cynanchum ovatum* (E. Mey.) Druce, Bot. Soc. Exch. Club Brit. Isles 4: 618. 1917, non *Cynanchum ovatum* Thunb., Observ. Cynanch.: 6. 1821 (= *Leptadenia*). TYPE: Namibia. Garip, in collibus ad ostium fluminis, < 200 m, Oct., *Drège s.n.* (holotype, SAM sub SAM 18556; isotype, MO sub MO 2760941).

*Metaplexis mucronata* Spreng., Neue Entdeck. Pflanzenk. 1: 269. 1820. *Cynanchum mucronatum* (Spreng.) N. E. Br. in Dyer, Fl. Cap. 4(1): 745. 1908, non *Cynanchum mucronatum* Andrews, Bot. Repos. 8: t. 515. 1808. TYPE: not known.

*Cynanchum pearsonii* N. E. Br., Bull. Misc. Inform., Kew 1914: 18. 1914. TYPE: Namibia. Great Namaqualand, Lüderitz, N of Rotkuppe Station, 23 Feb. 1909, *Pearson 4466* (holotype, K; isotype, BOL).

*Plants* erect, 20–40 cm high, richly branched. *Shoots* perennial, 15–30 cm long, 4 mm diam., obscurely glaucous, woody with grayish bark, isolatedly to densely covered with appressed trichomes 0.2–0.25 mm long, glabrescent. “*Stipules*” ovate, 5 mm long, 3 mm wide. *Leaves* with petioles 1–3.5 mm long; leaf blades coriaceous, 7–20 mm long, 4–10 mm wide, ovate, basally rounded, without coleters, apically acute, or obtuse and apiculate, adaxially isolatedly covered with appressed trichomes 0.1–0.15 mm long, evenly distributed over the whole surface; abaxially glabrous. *Inflorescences* bostrychoid, 6–13-flowered, 2–8 flowers open at a time; rachis 1–2 mm long; peduncles 1–3 mm long, densely covered with appressed trichomes 0.15–0.2 mm long. *Flowers* with floral bracts 0.6–0.8 mm long, 0.7–0.9 mm wide at the base, triangular, with trichomes; pedicels 2–4 mm long, densely covered with appressed trichomes 0.15–0.2 mm long. *Buds* 0.8–1.2 mm long, 0.7–0.9 mm diam., conical; aestivation imbricate. *Calyx* basally fused, abaxially with trichomes; lobes 1–1.2 mm long, 0.5–0.6 mm

wide, ovate, apically obtuse to acute. *Corolla* rotate to subglobose, fused for about ¼ of their length, 1.5–2 mm long, abaxially glabrous, or with isolated trichomes, green to white; adaxially glabrous, green to white; lobes 0.5–1 mm wide, ovate, apically obtuse to acute, patent to recurved. *Corona* white, cyathiform, 1–1.5 mm high, exceeding the gynostegium but not obscuring it; *C(is)* consisting of Cs and Ci for about half of total height, only Cs differentiated in shape. Cs without adaxial appendages; lobes of Cs flat, triangular, erect, with straight margins. *Gynostegium* 0.7–0.75 mm high, 0.9–0.95 mm diam., sessile. *Stamens* with free filaments 0.2–0.25 mm long, anthers broader than high, trapezoidal, abaxially convex; anther wings 0.25–0.26 mm long, convergent, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.35–0.4 mm long, 0.22–0.25 mm wide, ovate, narrower than the stamens, erect. *Pollinarium*: corpusculum 0.12–0.13 mm long; caudicles 0.04–0.05 mm long, cylindrical, s-shaped, concave-convex; pollinia apically attached to the caudicles, 0.15–0.17 mm long, 0.05–0.06 mm wide, pyriform, elliptical in cross section. *Stylar head* 0.6–0.65 mm diam., 0.5–0.55 mm high; upper part 0.25–0.3 mm high, conical to depressed-conical. *Follicles* 30–35 mm long, 4–6 mm wide, obclavate, round in cross section, apically strongly beaked, gray, smooth, with isolated hairs. *Seeds* 4.5–5.5 mm long, 2.5–3.5 mm wide, pyriform, dark brown, seta and aleta side tuberculate, marginally wingless, entire; coma 15 mm long. *Chromosome number* unknown.

*Distribution.* Africa: Namibia. Lüderitz; 0–200 m; flats and slopes; sand and rock crevices; frequently on granite.

*Comments.* Further details, illustration, distribution map, and citation of specimens are provided in Liede (1993).

**19. *Cynanchum mossambicense*** K. Schumann in Engler, Pflanzenw. Ost-Afrikas C: 323. 1895. TYPE: Mozambique. Zambesia: Quillimane, *Stuhlmann 843* (holotype, B presumably destroyed; lectotype, designated here, K)

*Cynanchum complexum* N. E. Br., Bull. Misc. Inform., Kew 1895: 256, 337. 1895. TYPE: Mozambique. Mapanga, Oct. 1887, *Scott s.n.* (lectotype, designated here, K).

*Plants* twining, richly branched. *Shoots* perennial, 1–1.5 mm diam., herbaceous, sparsely to densely covered with erect trichomes 0.5 mm long.

"*Stipules*" absent. *Leaves* with petioles 15–20 mm long; leaf blades herbaceous, 25–50 mm long, 15–30 mm wide, ovate, basally cordate with 2 colleters in the adaxial sinus, apically acute and apiculate, apiculus 1–2 mm long, adaxially and abaxially nearly glabrous. *Inflorescences* sciadioidal, 5–12-flowered, all flowers open at a time; peduncles 8–12 mm long, glabrous, or sparsely covered with appressed trichomes 0.4 mm long. *Flowers* with floral bracts 1–1.2 mm long, 0.5–0.6 mm wide at the base, ovate, with trichomes; pedicels 5–7 mm long, glabrous. *Buds* 5.5–7 mm long, ca. 3.5 mm diam., conical to elongate-conical; aestivation slightly contorted. *Calyx* basally fused, abaxially glabrous; lobes 1.2–1.5 mm long, 0.5–0.7 mm wide, ovate, apically acute. *Corolla* rotate, fused at the base, 6–7 mm long; abaxially and adaxially glabrous, white; lobes 1.5–2 mm wide, spreading to recurved, oblong, apically obtuse, twisted. *Corona* white, tubular, 5–6 mm high, exceeding the gynostegium, partly obscuring it; C(is) consisting of Cs and Ci fused for little more than half of total corona length; Cs and Ci differentiated in shape; Ci as long as Cs, thinner than Cs. Cs appressed to the back of the stamens, with adaxial appendages; lobes of Cs flat, triangular, erect, with laterally involute margins; adaxial appendages shorter than Cs, erect, liguliform. *Lobes of Ci* basally flat, elongatedly triangular, apically filamentose, twisted, erect, with laterally involute margins. *Gynostegium* 1.8–1.9 mm high, 1.8–1.9 mm diam., sessile. *Stamens* without free filaments; anthers higher than broad, trapezoid, abaxially planar; anther wings convergent, 0.9–0.95 mm long, extending beyond the anther proper with stamens basally slightly arched; adjacent anther wings parallel, centrifugal, outer guide rail smooth. Connective appendages 0.75–0.8 mm long, 0.47–0.5 mm wide, triangular, equaling the stamen in width, slightly inflexed. *Pollinarium*: corpusculum 0.3–0.35 mm long; margins of the corpuscular cleft sinuate; caudicles 0.05–0.06 mm long, flattened, straight, horizontal to declinate, triangular; pollinia subapically attached to the caudicles, 0.42–0.45 mm long, 0.2–0.23 mm wide, ovoid to oblong, ovate in cross section. *Stylar head* 0.8–0.85 mm diam., 1–1.1 mm high; upper part 0.4–0.45 mm high, bifurcate. *Follicles* 55–70 mm long, 4–5 mm diam., obclavate, obtusely deltate in cross section, apically shortly beaked, keeled, medium brown, longitudinally grooved, glabrous. *Seeds* 5.5–6 mm long, 4 mm wide, ovate, medium brown, seta and a seta side sculptured with longitudinal ridges, marginally with 0.3–0.35 mm wide wing with entire margin; coma 15–20 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Mozambique, South Africa (Transvaal), Swaziland, Zimbabwe; 0–1000 m; on sand and over rocks, coastal dune scrub, riverine forest. Not frequent, but probably not endangered. Figure 4.

*Flowering time.* March to October.

*Selected specimens examined.* MOZAMBIQUE. Inhambane, 0 m, 14 Oct. 1906, *Johnson s.n.* (K); Manica, near Gondola, 1000 m, 16 June 1957, *Pole Evans 5226* (K); Sofala, Chiloane, Oct. 1887, *Scott s.n.* (K); Zambesia, Quelimane (20 mi. N of), 20 Aug. 1962, *Wild 5882* (K, MO, SRGH). SOUTH AFRICA. **Transvaal:** Acornhoek, between Skukuza and Pretorius Kop, on banks of Sabi near Hippo Pool, Oct. 1931, *Letty 91* (PRE, SRGH). SWAZILAND. Stegi, Mbuluzi River, near Ranches, ca. 330 m, 25 July 1958, *Compton 27923* (NBG, PRE). ZIMBABWE. Chiredzi, Gona-re-zhou, 2 km from Chipindas Pools on N bank of Lundi River, on edge of research Officer's garden, 28 May 1971, *Grosvenor 554* (K, SRGH); Darwin, near upper reaches of Nyatandi river, 900 m, 27 Jan. 1960, *Phipps 2426* (K, SRGH); Ndanga, Sabi-Lundi-Junction, Chitsis Kraal, 270 m, 6 June 1950, *Wild 3393* (K, SRGH).

*Comments.* *Cynanchum mossambicense*, a species restricted to a rather small area in southeastern Africa, is probably the closest African relative of *C. acutum*.

Lectotypification of *C. mossambicense* is necessary because the original material was destroyed in B. The isotype in K is chosen as lectotype. N. E. Brown cited two specimens (*Kirk s.n.* and *Scott s.n.*, both K) as syntypes for *C. complexum*. The better specimen, *Scott s.n.*, is chosen as lectotype.

Illustration and additional information on southern African material are provided in Liede (1993).

**20. *Cynanchum natalitium*** Schlechter, Bot. Jahrb. Syst. 18, Beibl. 45: 32. 1894. TYPE: South Africa. Natal: Durban, 14 Aug. 1893, *Schlechter 3082* (lectotype, designated by Liede (1993), BOL; isolectotype, GRA).

*Plants* twining, to 30 cm high, richly branched, sarmentose, adventitious roots formed along the whole lower surface of the runner; subterranean organs consisting only of fibrous roots. *Shoots* perennial, 30–150 cm long, 1–2 mm diam., herbaceous, isolatedly glabrescent with appressed trichomes 0.25–0.3 mm long; in old plants basally corky, then bark yellowish. "*Stipules*" ovate, 5–6 mm long, 3–4 mm wide. *Leaves* with petioles 7–25 mm long; leaf blades fleshy, 20–50 mm long, 15–35 mm wide, ovate to orbicular, or obovate, basally rounded, or cuneate with 1 colleter adaxially, apically obtuse and acuminate, acumen 0.5–1.5 mm long, glabrous, or isolatedly covered with appressed trichomes 0.35–0.5 mm long, evenly distributed over the whole surface. *Inflorescences* sciadioidal (some-

times two sciadioids in dichasial arrangement), 6–16-flowered, 6–12 flowers open at a time; peduncles 5–15 mm long, glabrous, or isolatedly covered with appressed trichomes 0.25–0.35 mm long. *Flowers* sweetly scented; floral bracts 1–1.5 mm long, 0.5–1 mm wide at the base, ovate, with trichomes; pedicels 5–10 mm long, isolatedly covered with appressed trichomes 0.3–0.35 mm long. *Buds* 4–5 mm long, 2–3 mm diam., elongated-conical; aestivation imbricate. *Calyx* basally fused, abaxially with trichomes; lobes 0.8–1.2 mm long, 0.6–1 mm wide, triangular, apically acute. *Corolla* rotate, basally fused 3.5–5 mm long, abaxially and adaxially glabrous, dull green to brown; lobes 1.5–2 mm wide, spreading to patent, oblong, apically obtuse. *Corona* white, urceolate, 3.5–4 mm high, exceeding the gynostegium but not obscuring it; C(is) consisting of Cs and Ci completely fused, upper margin deeply 5-crenate, margins of sinuses recurved; Cs without adaxial appendages. *Gynostegium* 0.8–1.2 mm high, 1.5–1.8 mm diam., atop a stipe 1–1.5 mm long. *Stamens* without free filaments; anthers about as high as broad, trapezoidal, abaxially convex; anther wings 0.23–0.25 mm long, not extending along the whole length of the anther, adjacent anther wings parallel, basally widened, in the same plane as the anther. Connective appendages 0.5–0.55 mm long, 0.4–0.45 mm wide, ovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.3–0.32 mm long; margins of the corpuscular cleft divergent toward the base; caudicles 0.1–0.12 mm long, flattened, straight, declinate, triangular; pollinia subapically attached to the caudicles, 0.4–0.45 mm long, 0.15–0.17 mm wide, clavate, elliptical in cross section. *Stylar head* 0.5–0.55 mm diam., 0.3–0.35 mm high, upper part ca. 0.1 mm high, flat. *Follicles* 40–45 mm long, 5–8 mm wide, obclavate, obtusely deltate in cross section, apically strongly beaked, keeled to winged with 0.5–1 mm broad wing, medium brown, longitudinally grooved, with isolated trichomes. *Seeds* 5.5–6.0 mm long, 3–3.5 mm wide, ovate, light to medium brown, seta and a seta side sculptured with longitudinal ridges, marginally with indistinct, 0.5 mm wide wing with entire margin; coma 15–17 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: South Africa (Cape Province, Natal); 0–60 m; on littoral dunes, dune forest; full sun to light shade.

*Comments.* Further details, illustration, distribution map, and citation of specimens are provided in Liede (1993).

**21. *Cynanchum obtusifolium*** Linnaeus f., Suppl. Pl. 169. 1784. *Vincetoxicum obtusifolium* (L. f.) Kuntze, Revis. Gen. Pl. 3, 2: 200. 1898. TYPE: *Thunberg s.n.* (holotype, UPS 6311, UPS; seen on IDC microfiche).

*Cynoctonum brownii* Meisn., J. Bot. 2: 546 (“446”). 1843. Nom. superfl. when published, substitute name for *Cynanchum obtusifolium* L.f.

*Plants* twining, 2–3 m high, richly branched; subterranean organs consisting only of fibrous roots. *Shoots* perennial, 50–200 cm long, 1–1.5 mm diam., herbaceous, glabrous, or sparsely to densely covered with erect trichomes 0.4–0.7 mm long, basally woody with yellowish bark. “*Stipules*” ovate, almost round, 5–7 mm long, 6–8 mm wide. *Leaves* with petioles 5–15 mm long; leaf blades herbaceous to thinly coriaceous, 20–40 mm long, 15–40 mm wide, ovate to elliptic, basally rounded to subtruncate, or cordate, with 2–4 colleters in the adaxial sinus, apically obtuse and acuminate, or obcordate and acuminate, marginally entire or crenulate, adaxially and abaxially glabrous, or with a sparse indumentum concentrated on veins and margins; trichomes appressed, 0.3–0.45 mm long. *Inflorescences* bostrychoid, 8–15-flowered, 3–6 flowers open at a time; rachis 1–3 mm long; peduncles 3–5 mm long, densely covered with erect trichomes 0.5–0.7 mm long. *Flowers* sweetly scented; floral bracts 1–2.5 mm long, 0.5–0.7 mm wide at the base, ovate, with trichomes; pedicels 3.5–6 mm long, densely covered with appressed trichomes 0.4–0.7 mm long. *Buds* 4–5 mm long, 2–3 mm diam., elongated-conical; aestivation imbricate. *Calyx* basally fused, abaxially with trichomes; lobes 1.5–2 mm long, 0.8–1.2 mm wide, ovate, apically acute to acuminate. *Corolla* rotate, fused at the base, 3–4 mm long, abaxially glabrous, green, adaxially with verrucose trichomes, green; lobes 1–1.5 mm wide, patent, ovate to oblong, apically obtuse. *Corona* white, cyathiform, 2–2.5 mm high, exceeding the gynostegium but not obscuring it; C(is) consisting of Cs and Ci fused between for about ½ of total corona length; Cs and Ci differentiated in shape, Ci shorter than Cs, dorsally connate to Cs. Cs without adaxial appendages; lobes of Cs flat, trifid (the two lateral teeth much smaller than the middle one), inflexed, with laterally involute margins. *Lobes of Ci* flat, rectangular, erect, with straight, emarginate margins. *Gynostegium* 1.5–2 mm high, 1.5–2 mm diam., sessile. *Stamens* without free filaments, anthers about as broad as high, trapezoidal, abaxially convex; anther wings 0.5–0.55 mm long, extending beyond the anther proper, which does not form a basal arch; adjacent anther

wings parallel, basally widened. Connective appendages 0.25–0.3 mm long, 0.5–0.55 mm wide, depressed ovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.25–0.27 mm long; margins of the corpuscular cleft sinuate; caudicles 0.12–0.13 mm long, flattened, straight, declinate, triangular; pollinia subapically attached to the caudicles, 0.375–0.4 mm long, 0.16–0.18 mm wide, ovoid. *Stylar head* 1–1.1 mm diam., 0.7–0.75 mm high; upper part 0.5–0.55 mm high, upper part depressed-conical and umbonate. *Follicles* 40–50 mm long, 10–12 mm wide, obclavate, obtusely deltate in cross section, apically obtuse, keeled, medium to dark brown, longitudinally grooved, sparsely to densely covered with trichomes. *Seeds* 6–7 mm long, 3.5–4 mm wide, pyriform, dark brown, seta and a seta side sculptured with longitudinal ridges and papillose, marginally with 1.0–1.1-mm-wide wing with entire margin; coma 30 mm long. *Chromosome number*:  $2n = 22$  (voucher: *Liede 2924*, MSUN).

*Distribution and habitat.* Africa: Mozambique, South Africa (Cape Province, Natal); 0–250 m; dunes; mostly on sand; dune scrub and coastal vegetation; frequently in disturbed habitats; full sun to partial shade.

*Comments.* *Periploca africana* L. var.  $\beta$  L. [Sp. Pl. ed. 1: 211, 1753, illustrated with Burman, Rar. Afr. Pl.: p. 34, t. 14, fig. 2. 1738] also represents this taxon.

Further details, illustration, distribution map, and citation of specimens are provided in Liede (1993).

**22. *Cynanchum orangeanum*** (Schlechter) N. E. Brown in Dyer, Fl. Cap. 4(1): 745. 1908. *Flanaganiana orangeana* Schltr., Bot. Jahrb. Syst. 18, Beibl. 45: 10. 1894. TYPE: South Africa. Orange Free State: Colesberg, Orange River near Bethulie, 1330 m, Dec. 1892, *Flanagan 1502* (lectotype, designated by Liede (1993), SAM; isotype, BOL).

*Plants* erect, 10–20 cm high, basally sparsely branched; subterranean organs rhizomatous, rhizome 5–7 mm diam. *Shoots* 15–20 cm long, 1–1.5 mm diam., herbaceous, densely to sparsely covered with erect trichomes 0.25–0.27 mm long, basally woody with grayish bark. “*Stipules*” absent. *Leaves* sessile; leaf blades herbaceous, 30–50 mm long, 0.7–1.5 mm wide, linear, basally decurrent, without colleters, apically acute, or obtuse, marginally straight and thickened, adaxially and abaxially glabrous, or isolatedly covered with appressed tri-

chomes 0.15–0.2 mm long, restricted to the veins and margins. *Inflorescences* sciadioidal, 1–5-flowered, all flowers open at a time (one extraordinary umbel seen with 16 flowers, *Hardy 6583*, PRE); peduncles 0–5 mm long, isolatedly to sparsely covered with erect trichomes 0.2–0.25 mm long. *Flowers* with floral bracts 1–1.5 mm long, 0.3–0.5 mm wide at the base, linear, with trichomes; pedicels 3–7 mm long, sparsely to densely covered with appressed trichomes 0.25–0.3 mm long. *Buds* 2.5–4 mm long, 2–3 mm diam., depressed-conical; aestivation imbricate. *Calyx* basally fused, abaxially with trichomes (prominently so along the midrib); lobes 2–2.5 mm long, 0.8–1.2 mm wide, ovate, apically acute. *Corolla* rotate, basally fused, 4–6 mm long, abaxially glabrous (or with a few isolated trichomes), brown, adaxially glabrous, brown; lobes 1.5–2 mm wide, incurved, ovate to lanceolate, apically acute, margins revolute. *Corona* white, cyathiform, 4–5 mm high, shorter than the gynostegium; C(is) consisting of Cs and Ci fused for about  $\frac{1}{2}$  of total height, both Cs and Ci differentiated in shape, Ci as long as Cs. Cs appressed to the back of the stamens; lobes of Cs flat, oblong, reflexed, without adaxial appendages. *Lobes of Ci* filamentous, reflexed, with straight margins. *Gynostegium* 1.5–2 mm high, 1.5–2 mm diam., sessile. *Stamens* without free filaments; anthers broader than high, rectangular, abaxially convex; anther wings 0.4–0.5 mm long, convergent, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.5–0.55 mm long, 0.65–0.7 mm wide, widely ovate, narrower than the stamen, erect. *Pollinarium*: corpusculum 0.2–0.25 mm long; margins of the corpuscular cleft parallel; caudicles 0.15–0.175 mm long, cylindrical, s-shaped, concave-convex, thickened at the insertion of the pollinium; pollinia subapically attached to the caudicles, 0.3–0.35 mm long, 0.12–0.15 mm wide, ovoid, round in cross section. *Stylar head* 0.8–0.85 mm diam., 0.9–1 mm high; upper part 0.7–0.75 mm high, capitate. *Follicles* 40–70 mm long, 4–7 mm wide, fusiform, round in cross section, apically strongly beaked, light brown, smooth, glabrous. *Seeds* 5–6 mm long, 3–3.5 mm wide, ovate, dark brown; seta and a seta side tuberculate, marginally with 0.6-mm-wide wing with entire margin; coma 15–20 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Botswana, Namibia, South Africa (Cape Province, Orange Free State), Zimbabwe; 1000–1500 m; on flats, in sand, frequently red Kalahari sand, between rocks, short grassland; full sun. Figure 23.

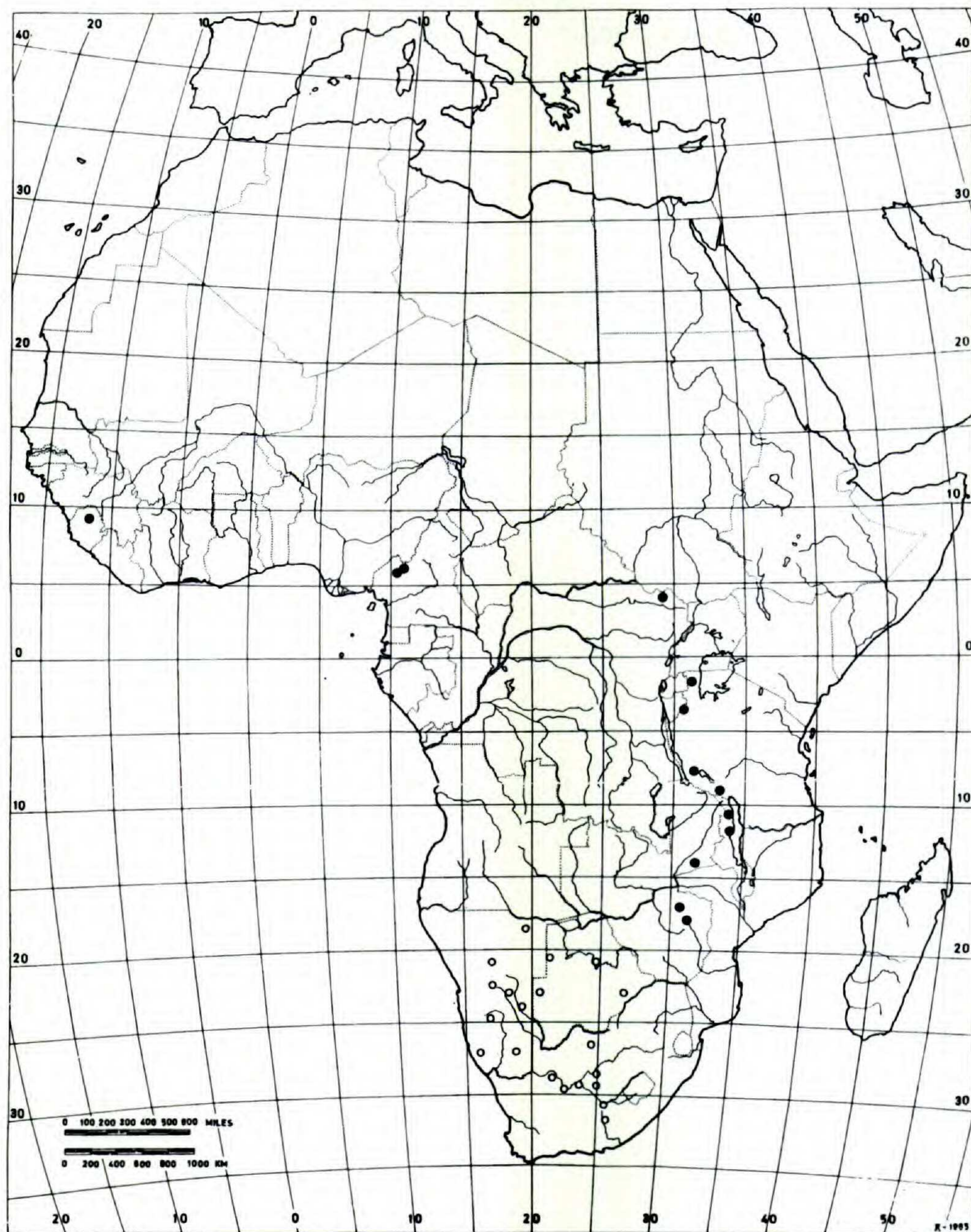


Figure 23. Known distribution of *C. orangeanum* (open circles) and *C. praecox* (dots).

*Comments.* *Cynanchum orangeanum* is closely related to *C. praecox*, but is otherwise isolated among African *Cynanchum*.

Further details, illustration, and citation of specimens are provided in Liede (1993).

**23. *Cynanchum polyanthum*** K. Schumann in Engler & Prantl, Nat. Pflanzenfam. 4(2): 253. 1895. TYPE: "Im Land der Monbuttu bei Manza," *Schweinfurth 3345* (holotype, B presumably destroyed; lectotype, designated here, K). Figure 24.

*Vincetoxicum polyanthum* K. Schum., Bot. Jahrb. Syst. 17: 136. 1893, non *Vincetoxicum polyanthum* Kuntze, Revis. Gen. Pl. 2: 424. 1891, replacement name for *Tylophora floribunda* Miq.

*Cynanchum obscurum* K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 253. 1895. TYPE: Angola. Cuanza Norte, Golungo Alto, Ad dumeta in Sobato de

Mussengue, Jan. 1870, *Welwitsch 4222* (holotype, K; isotype, BM).

*Cynanchum welwitschii* Schltr. & Rendle, J. Bot. 34: 99. 1896. Nom. illeg., because the protologue included a reference to the holotype of *Cynanchum obscurum* K. Schum. (Art. 52.1 ICBN, see Greuter et al., 1994).

*Periploca batesii* Wernham, J. Bot. 54: 228. 1916. TYPE: Cameroon. Bitye, 2 Dec. 1914, *Bates 643* (holotype, BM).

*Plants* ascending, twining, 2.5–3 m high, sparsely and irregularly branched; subterranean organs woody rootstocks. *Shoots* perennial, herbaceous, sparsely covered with flexuous trichomes 0.5–0.6 mm long, along two lines; internodes 7–10 cm long, 0.5–2 mm diam. "*Stipules*" absent. *Leaves* with petioles 15–50 mm long; leaf blades herbaceous, 55–100 mm long, 35–55 mm wide, ovate, basally lobate, lobes 10–15 mm long, with 3–5 colleters in the adaxial sinus, apically acuminate, acumen 1–2

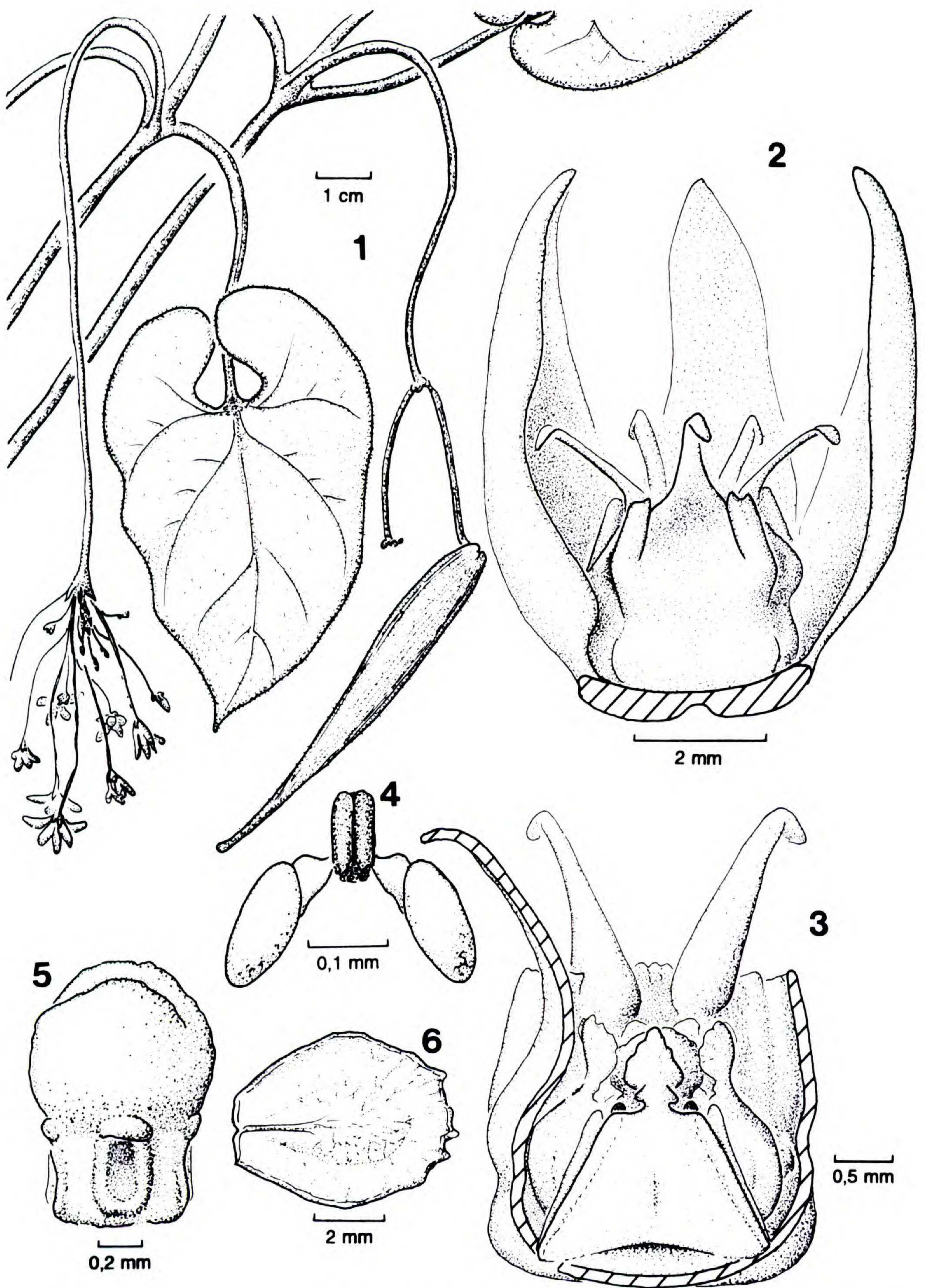


Figure 24. *Cynanchum polyanthum* K. Schum.—1. Habit with inflorescence (*De Witte 11112*) and fruit (*Gossweiler 4866*). 2–5: *De Witte 11112*.—2. Flower and corona, two corolla lobes removed.—3. Gynostegium and corona, partially removed.—4. Pollinarium.—5. Stylar head.—6. Seed, seta side (*Synnott 688*). Drawn by Jim Conrad.



mm long, adaxially isolatedly covered with flexuous trichomes 0.55–0.6 mm long, restricted to veins and margins, abaxially sparsely covered with flexuous trichomes 0.4–0.5 mm long. *Inflorescences* bostrychoid to sciadioidal, 8–15-flowered, 6–10 flowers open at a time; rachis to 7 mm long; peduncles 35–75 mm long, sparsely covered with appressed trichomes 0.5–0.6 mm long. *Flowers* with floral bracts 1.2–1.4 mm long, 0.4–0.8 mm wide at the base, ovate, with trichomes; pedicels 12–35 mm long, densely covered with erect trichomes 0.4–0.5 mm long. *Buds* 5–6 mm long, 2.5–3 mm diam., conical, basally with imbricate, apically with contorted aestivation. *Calyx* basally fused, abaxial surface with trichomes; lobes 0.8–1 mm long, 0.6–0.7 mm wide, ovate, apically acute. *Corolla* rotate, basally fused; 7–9 mm long, abaxially greenish yellow, adaxially greenish yellow to purple, with a very few isolated trichomes at the sinuses; lobes 1.5–2 mm wide, horizontal, lanceolate to oblong, apically obtuse. *Corona* white, 6–7.5 mm high, exceeding the gynostegium, partly obscuring it; C(is) consisting of Cs and Ci fused for more than ½ of total corona length, Cs and Ci differentiated, Ci shorter than Cs. Cs not adnate to the filaments, without adaxial appendages; lobes of Cs laminar, elongated-triangular, apically erect. *Lobes of Ci* laminar, bifid, producing a pronounced convex fold along the upper half of corona length, reflexed. *Gynostegium* 2–2.5 mm high, 2–2.5 mm diam., sessile. *Stamens* without free filaments; anthers broader than high, trapezoidal, abaxially planar; anther wings 2 mm long, convergent, extending along the whole length of the anther, adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.5–0.6 mm long, 0.5–0.6 mm wide, obovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.3–0.35 mm long, ovoid; caudicles 0.1 mm long, flattened, straight, declinate, trapezoid; pollinia subapically attached to the caudicles, 0.3–0.35 mm long, 0.12 mm wide, oblongoid, ovate in cross section. *Stylar head* 0.7–0.85 mm diam., 0.7–0.85 mm high; upper part 0.4–0.5 mm high, capitate. *Follicles* usually one per flower, pendulous, 80–90 mm long, 7.5–8 mm diam., obclavate, obtusely deltate in cross section, apically strongly beaked, keeled, with isolated indumentum. *Seeds* 5.5–6 mm long, 4.3–4.5 mm wide, ovate, medium brown, seta and a seta side sculptured with longitudinal ridges, marginally with 1-mm-wide wing with dentate margin; coma 12–15 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Angola, Cameroon, Gabon, Uganda (U3, U4), Zaïre; 1200–1600

m, moist grassland, forest margins, thickets. Very widespread, but not frequent. Figure 16.

*Flowering time.* September to May.

*Vernacular name.* Molo-Busyo (Lissango).

*Selected specimens examined.* ANGOLA. Cuanza Norte, Golungo alto, Nov. 1878, *Welwitsch 4200* (G, K). CAMEROON. Yaunde, *Zenker 223* (K). GABON. Mbaïki, Boukoko 27 June 1949, *Le Testu 1510* (BM). UGANDA. Buganda, Mengo, Mutingo, edge of Lake Victoria, a few miles from Kampala, 1250 m, Dec. 1935, *Chandler 1496* (K); Masaka, 4 mi. from Masaka on rd. to Bukakata, 1150 m, 11 Oct. 1953, *Drummond & Hemsley 4736* (K); Eastern, Busoga, Bugabula, Musumu swamp at crossing of Jinja-Kamuli rd., 10 mi. S of Kamuli, 1160 m, 27 May 1953, *Wood 760* (K); Western, Mubende, Singo, 1–2 mi. SE of Kikandwa, 1200 m, 16 Mar. 1969, *Lye 2354* (K). ZAÏRE. **Kivu:** Beni, Mutsora, Parc National Albert, 1200 m, 26 Mar. 1955, *De Witte 12092* (K); Yangambi, 21 May 1938, *Louis 9479* (K); Rutshuru, plaine route de Djombo, 28 Mar. 1937, *Ghesquiere 3918* (K, SRGH).

*Comments.* *Cynanchum polyanthum* K. Schum. can be treated as a new species, because the name was published without citing the earlier *Vincetoxicum (Cynoctonum) polyanthum* K. Schum. as basionym; the latter represents a later homonym to *Vincetoxicum polyanthum* Kuntze.

The affinities of *C. polyanthum* remain obscure. Its closest relatives are probably *C. heteromorphum* and *C. falcatum* from Ethiopia.

**24. *Cynanchum praecox*** Schlechter ex S. Moore, J. Bot. 40: 256. 1902. TYPE: Zimbabwe. Harare, valley of Mazoe River, Sep. 1898, *Rand 512* (holotype, BM). Figure 25.

*Cynanchum pygmaeum* Schltr., Bot. Jahrb. Syst. 51: 140. 1913. TYPE: Cameroon. Bamenda, ca. 3 mi. from Kumbo along Oku rd., 1850 m, 15 Feb. 1958, *Hepper 2011* (neotype, designated here, K); syntypes cited in the protologue: *Ledermann 2226, 2230* (both probably destroyed in B, no isotypes found).

*Plants* erect, nontwining, 3–10 cm high, unbranched, with rhizomes 1.5–3 mm diam. *Shoots* herbaceous, densely covered with erect trichomes, 0.35–0.4 mm long, along a single line; internodes 3 mm diam. “*Stipules*” absent. *Leaves* absent at the time of flowering, sessile, leaf blades herbaceous, 40–60 mm long, 2–8 mm wide, linear to elliptic to ovate, basally decurrent, without colleters, apically acute, marginally straight and thickened, adaxially and abaxially glabrous. *Inflorescences* supported by inflorescence bracts different from the vegetative leaves, bostrychoid, 5–15-flowered, all flowers open at a time; rachis 1–2 mm long; inflorescence bracts ca. 0.9 mm long, 0.5 mm wide, ovate, with apiculate apex, ciliate; peduncles 4–6(–8) mm long, sparsely covered with erect trichomes 0.35–0.4 mm

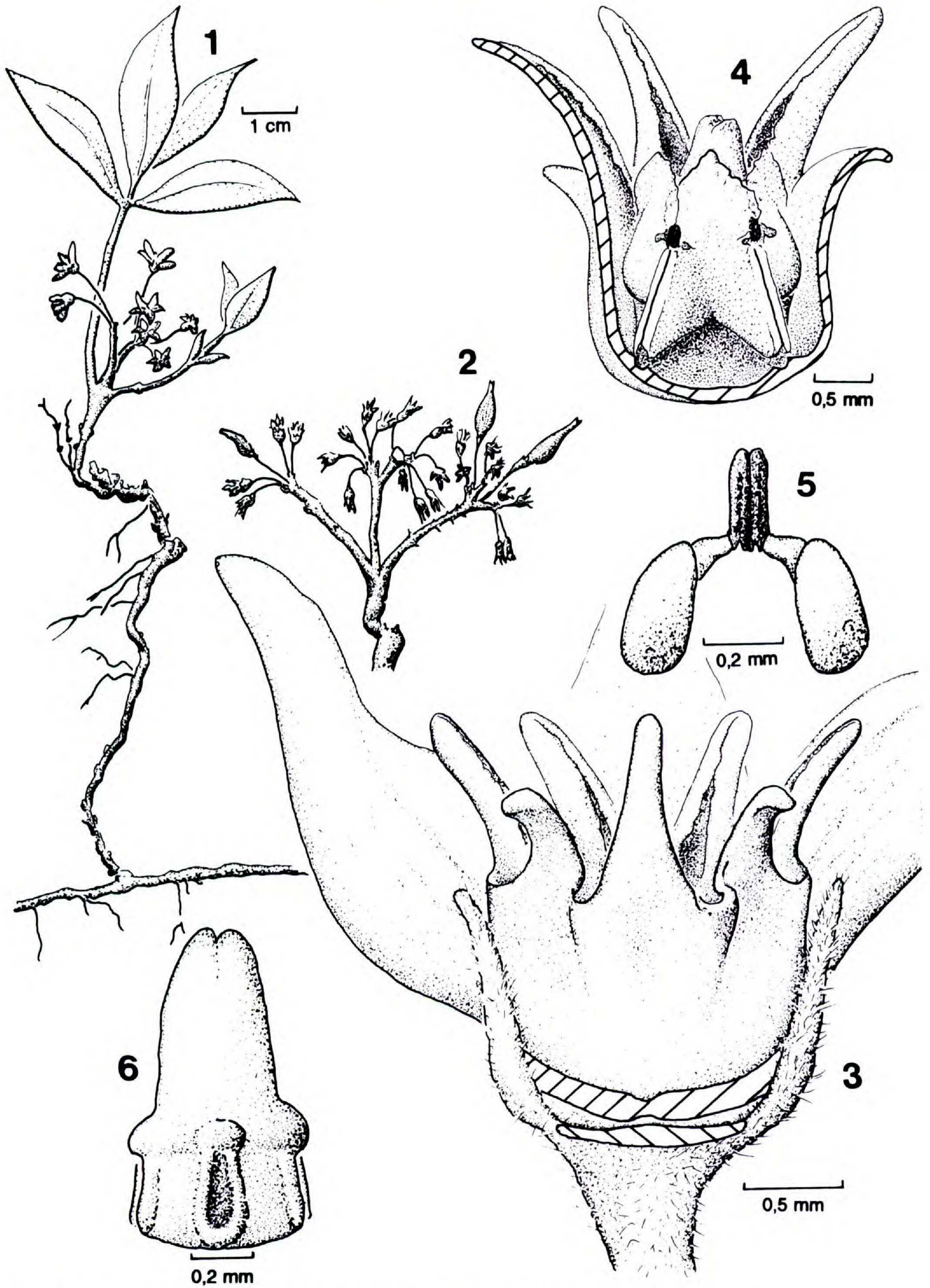


Figure 25. *Cynanchum praecox* Schltr. ex Moore.—1. Habit (Hepper 2011). 2–6: Drummond 4893.—2. Inflorescence with young fruits.—3. Flower, corolla partially removed.—4. Gynostegium and corona, partially removed.—5. Pollinarium.—6. Styler head. Drawn by Jim Conrad.

long, along a single line. *Flowers* with a musky scent; floral bracts 0.5–0.7 mm long, 0.2–0.3 mm wide at the base, triangular, with trichomes; pedicels 5–15 mm long, densely covered with erect trichomes 0.4–0.45 mm long. *Buds* 6–6.5 mm long, 3–3.5 mm diam., elongated-conical, with imbricate aestivation, dextrorse. *Calyx* basally fused, ciliate; lobes 1.5–2.5 mm long, 0.7–0.8 mm wide, triangular, apically acute. *Corolla* rotate, fused for about  $\frac{1}{5}$  of total length; 5.5–6.5 mm long, abaxially and adaxially yellowish brown; lobes 0.5–1 mm wide, incurved, oblong, apically acute, with revolute margins. *Corona* white, 2–4 mm high, exceeding the gynostegium but not obscuring it; C(is) consisting of Cs and Ci fused for more than half of total corona length, Cs and Ci differentiated, Ci as long as Cs, urceolate to campanulate. Cs not adnate to the filaments, appressed to the back of the stamens, without adaxial appendages; lobes of Cs laminar, ovate, apically erect, with laterally slightly involute margins. *Lobes of Ci* laminar, oblong, reflexed, with straight margins. *Gynostegium* 1–1.1 mm high, 0.8–0.9 mm diam., sessile. *Stamens* without free filaments; anthers broader than high, trapezoidal, abaxially planar; anther wings 0.45–0.5 mm long, parallel to each other, extending beyond the anther proper, stamens forming a basal arch, adjacent anther wings parallel, centrifugal. Connective appendages 0.4–0.45 mm long, 0.35–0.4 mm wide, ovate, equaling the stamen in width, erect, with emarginate margins. *Pollinarium*: corpusculum 0.2–0.25 mm long, ovoid, margins of the corpuscular cleft sinuate; caudicles 0.05–0.06 mm long, flattened, straight, horizontal, rectangular; pollinia laterally attached to the caudicles, 0.22–0.25 mm long, 0.12–0.13 mm wide, ovoid, round in cross section. *Stylar head* 1–1.2 mm diam., 1.5–1.8 mm high; upper part 1–1.2 mm high, capitate. Mature *fruits, seeds, and chromosome number* unknown.

*Distribution and habitat.* Africa: Cameroon, Malawi, Nigeria, Sierra Leone, Tanzania (T1, T4, T7), Zaïre, Zambia, Zimbabwe; 1500–2500 m; burnt savanna and grasslands. Rare, but very widespread. Probably undercollected because of its small size. Figure 23.

*Flowering time.* August to February.

*Selected specimens examined.* CAMEROON. Bamenda, Kumbo, ca. 3 mi. along Oku rd., 1850 m, 15 Feb. 1958, *Hepper 2011* (K). MALAWI. North, Mzimba, Vipya Plateau, 3 mi. in Vipya link road, 1900 m, 25 Sep. 1972, *Pawek 5814* (K, MAL, MO); Rumpi, Nyika Plateau, Chelinda bridge, 1500 m, 10 Sep. 1976, *Pawek 11793* (K, MO). NIGERIA. Ca. 5 km N of Lana, 15 Feb. 1941, *Milne-Redhead 5030* (K). SIERRA LEONE. Kabala, Loma Mountains, 8 Jan. 1966, *Adam 22989*

(MO). TANZANIA. Lake. Bukoba, Bugene, 1660 m, 21 July 1947, *Ford 190* (K). Southern Highlands. Rungwe, Mbogo Mtn., 2250 m, 7 Nov. 1966, *Gillett 17641* (EA). Western. Buha, Kibondo, 1500 m, 7 Aug. 1950, *Bullock 3096* (K); Ufipa, Mbisi, Ufipa Plateau, 2500 m, 6 Oct. 1950, *Bullock 3419* (K). ZAÏRE. Garamba-Bagbele (parc nat.), Uele, 3 Feb. 1950, *De Saeger 106 g* (K). ZAMBIA. Abercorn, Kawimbe, ca. 3 mi. from on Kara rd., 1500 m, 29 Aug. 1956, *Richards 6027* (K). ZIMBABWE. Harare, Makabusi woodlands, upper Chiravra R. near entrance gate, 10 Sep. 1981, *Best 1647* (MO).

*Comments.* Both syntypes of *Cynanchum pygmaeum* have been destroyed in B, and duplicate specimens, or any specimens annotated "*C. pygmaeum*" in Schlechter's handwriting, were not found. Therefore, the name has to be neotypified.

Bullock (1953) presented a detailed account on *C. praecox* and established the synonym of *C. praecox* and *C. pygmaeum*.

The closest relative of *C. praecox* clearly is *C. orangeanum*, which is found south of the area of *C. praecox*. The affinities of these two sister species, however, remain obscure.

**25. *Cynanchum rubricoronae* Liede, sp. nov.**  
TYPE: Somalia. Nugaal: Aska, near Las Anod, 28 Oct. 1944, *Glover & Gilliland 199* (holotype, K). Figure 26.

Plantae habitu foliisque *C. crassiantherae*. Differt structura coronae gynostegialis roseae succulentis, partibus staminalibus oblongis erectisque, partibus interstaminalibus liguliformibus, reflexisque.

*Plants* erect, nontwining, 20–40 cm high, sparsely basicaulously branched. *Shoots* herbaceous, warty (*Kuchar 16793*), glabrous; internodes 20–40 cm long, 1–1.5 mm diam. "*Stipules*" ovate, 10–12 mm long, 6–7 mm wide. *Leaves* with petioles 15–20 mm long; leaf blades fleshy, 25–40 mm long, 15–24 mm wide, triangular, basally lobate to auriculate, lobes 7–10 mm long, without colleters, apically acuminate, acumen 0.5–1 mm long, marginally thickened, crenulate, adaxially and abaxially glabrous. *Inflorescences* 10–20-flowered, all flowers open at a time, bostrychoid to sciadioid; peduncles 0–2.5 mm long, sparsely covered with flexuous trichomes 0.4–0.5 mm long. *Flowers* with floral bracts 1–1.2 mm long, 0.2–0.3 mm wide at the base, linear, with trichomes; pedicels 5–7 mm long, glabrous. *Buds* 3–3.5 mm long, 1.5–1.7 mm diam., conical, with imbricate aestivation. *Calyx* basally fused; abaxial surface glabrous; lobes 1.6–1.7 mm long, 0.4–0.5 mm wide, triangular, apically acute. *Corolla* rotate, basally fused; 3–3.5 mm long, abaxially and adaxially cream; lobes 0.7–0.8 mm wide, incurved, ovate, apically acute to apically obtuse. *Corona* basally purplish red, fading to white

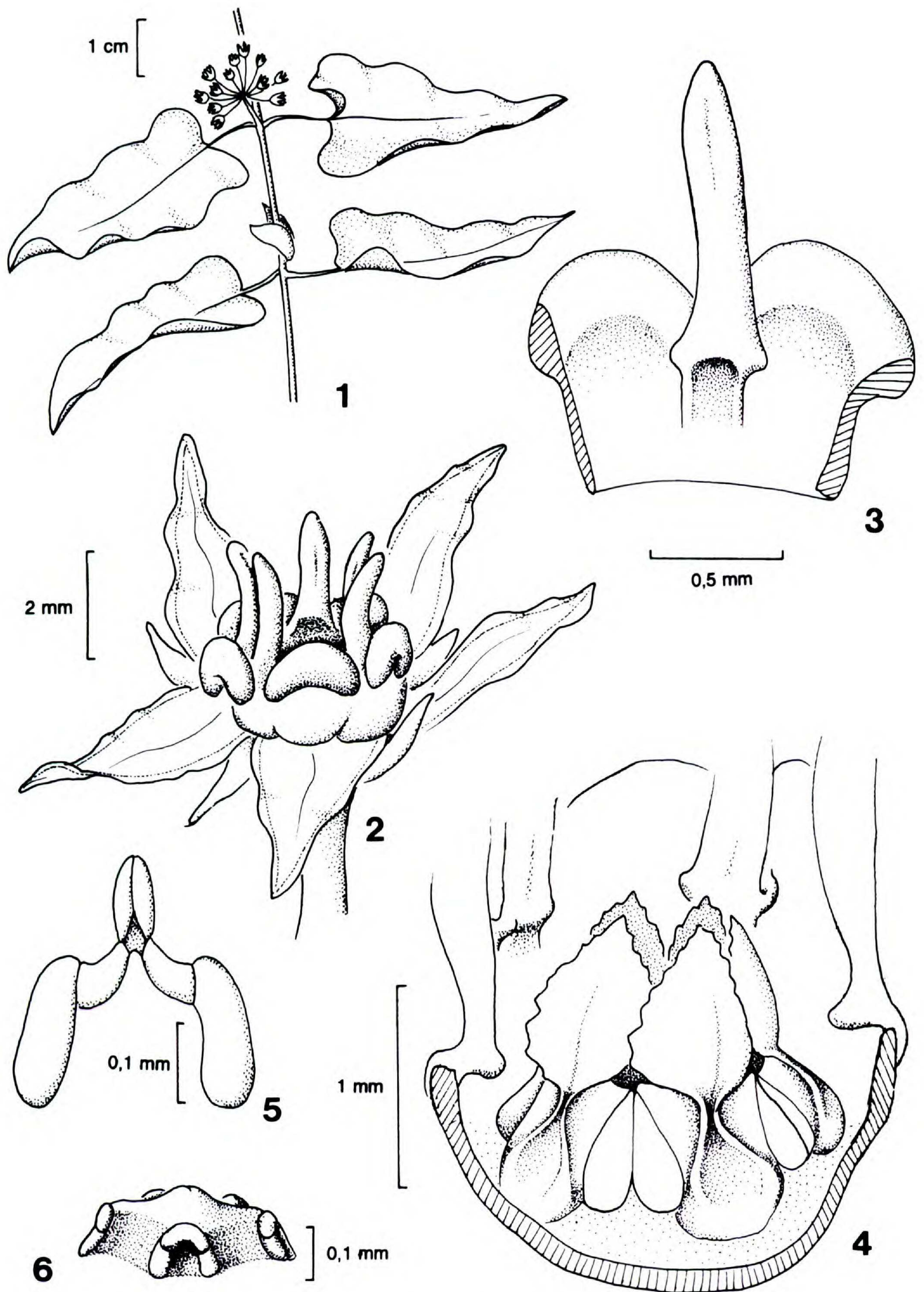


Figure 26. *Cynanchum rubricoronae* Liede. 1-6: Glover & Gilliland 190.—1. Shoot with inflorescence.—2. Flower.—3. Staminal corona lobe (center) and adjacent interstaminal lobes.—4. Gynostegium and corona, partially removed.—5. Pollinarium.—6. Styler head. Drawn by G. Hintze.

toward the apex, 1.8–2 mm high, exceeding the gynostegium, partly obscuring it; C(is) consisting of Cs and Ci fused for a little more than  $\frac{1}{2}$  of total corona length, Cs and Ci differentiated, Ci shorter than Cs, thicker than Cs. Cs not adnate to the filaments, apically appressed to the back of the stamens, without adaxial appendages; lobes of Cs laminar, oblong, apically erect, with straight margins. Lobes of Ci solid, massive, reflexed, flatly lingulate. Gynostegium 0.8–1 mm high, 0.8–1 mm diam., sessile. Stamens without filament, anthers broader than high, trapezoidal, abaxially planar; anther wings 0.3–0.4 mm long, convergent, very vaguely differentiated, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther, basally forming a distinct “mouth” with the basal lateral margin of the anther. Connective appendages 0.3–0.4 mm long, 0.4–0.5 mm wide, ovate, equaling the stamen in width, slightly inflexed, with emarginate margins. Pollinarium: corpusculum 0.14–0.16 mm long, ovoid; caudicles 0.12–0.13 mm long, flattened, concavely recurved, trapezoid; pollinia laterally attached to the caudicles, 0.26–0.28 mm long, 0.1–0.12 mm wide, oblongoid, ovate in cross section. Stylar head 0.3–0.4 mm diam., 0.17–0.2 mm high; upper part ca. 0.05 mm high, umbonate. Follicles one per flower, pendulous, ca. 70 mm long, 7 mm diam., obclavate, apically strongly beaked, wingless, light brown, with dark brown mottling, smooth, glabrous. Seeds and chromosome number unknown.

*Distribution and habitat.* Africa: Somalia; ca. 300 m; sandplains, hills with shrubland. From the scanty documentation in herbaria, the species appears to be very rare and is probably endangered. Figure 12.

*Flowering time.* May, October.

*Additional specimens examined.* SOMALIA. Hiiran, Bulo Burte, 23 km from Yasoomman along rd. to Maxaas, then SE  $3\frac{1}{2}$  km along cutline, then NE 2 km along cutline, 285 m, 1 May 1985, Kuchar 16793 (K); Noogaal, 124 km NW of Eil, on the road to Gardo, 5 Jan. 1973, Bally & Melville 15561 (K, MO).

*Comments.* *Cynanchum rubricorona* is a very distinctive plant with quite attractive flowers. Its closest relative is probably the Somalian *C. crasiantherae*, with which it shares vegetative characters. However, its corona morphology is very distinct and is unique in the genus.

The two paratypes cited are rather poor (*Bally & Melville 15561* is completely without flowers) and are assigned to *C. rubricorona* only tentatively.

**26. *Cynanchum rungweense*** Bullock, Kew Bull. 10: 622. 1956. TYPE: Tanzania. Mbeya: Mbeya, below Mporoto, Inkuyu, 17 Mar. 1932, St. Clair-Thompson 846 (holotype, K). Figure 27.

*Plants* ascending, twining, 5–6 m high, richly and irregularly branched. *Subterranean organs* woody rootstocks. *Shoots* perennial, herbaceous, sparsely covered with appressed trichomes 0.4–0.5 mm long, along a single line, glabrescent; internodes 3–6.5 cm long, 0.8–1 mm diam. “*Stipules*” widely ovate, 4–6 mm long, 6–8 mm wide, acuminate. *Leaves* with petioles 15–30 mm long; leaf blades herbaceous, 40–50 mm long, 14–20 mm wide, ovate, basally cordate to lobate, lobes 4–6 mm long, with 2 colleters in the adaxial sinus, apically acute, adaxially dark green, sparsely covered with appressed trichomes 0.4–0.5 mm long, restricted to veins and margins, abaxially much paler green, papillose, glabrous. *Inflorescences* bostrychoid to sciadioidal, 12–16-flowered, 6–9 flowers open at a time; rachis to 2 mm long; peduncles 10–30 mm long, glabrous to densely covered with erect trichomes 0.2–0.3 mm long, along a single line. *Flowers* with floral bracts 1.3–1.4 mm long, 0.4–0.5 mm wide at the base, elongate-triangular, apically glandular, with trichomes; pedicels 11–15 mm long, densely covered with flexuous trichomes 0.3–0.35 mm long. *Buds* 5–7 mm long, 3–4 mm diam., conical, with imbricate aestivation. *Calyx* basally fused, abaxial surface glabrous; lobes 1.6–1.8 mm long, 1.2–1.4 mm wide, ovate, apically obtuse to acute. *Corolla* rotate, basally fused; 6–7 mm long, abaxially green, adaxially greenish brown; lobes 2.5–3 mm wide, horizontal, oblong, apically obtuse. *Corona* urceolate, white, 4.5–5 mm high, exceeding the gynostegium, partly obscuring it; C(is) consisting of Cs and Ci fused for more than  $\frac{3}{4}$  of total corona length, Cs and Ci differentiated, Ci slightly longer than Cs. Cs not adnate to the filaments, without adaxial appendages; lobes of Cs laminar, triangular, apically erect. Lobes of Ci laminar, triangular, erect. Gynostegium 1.6–1.7 mm high, 1.8–2 mm diam., atop a stipe, 0.55–0.66 mm long. Anthers broader than high, pentagonal, abaxially planar; anther wings 0.8–1 mm long, convergent, extending along the whole length of the anther; adjacent anther wings parallel, basally centrifugal. Connective appendages 0.7–0.75 mm long, 0.5–0.55 mm wide, ovate, narrower than the stamen, slightly inflexed. Pollinarium: corpusculum 0.3–0.35 mm long, more than twice as long as broad, obovoid; caudicles 0.45–0.5 mm long, apically cylindrical, then flattened, s-shaped, convex-concave;

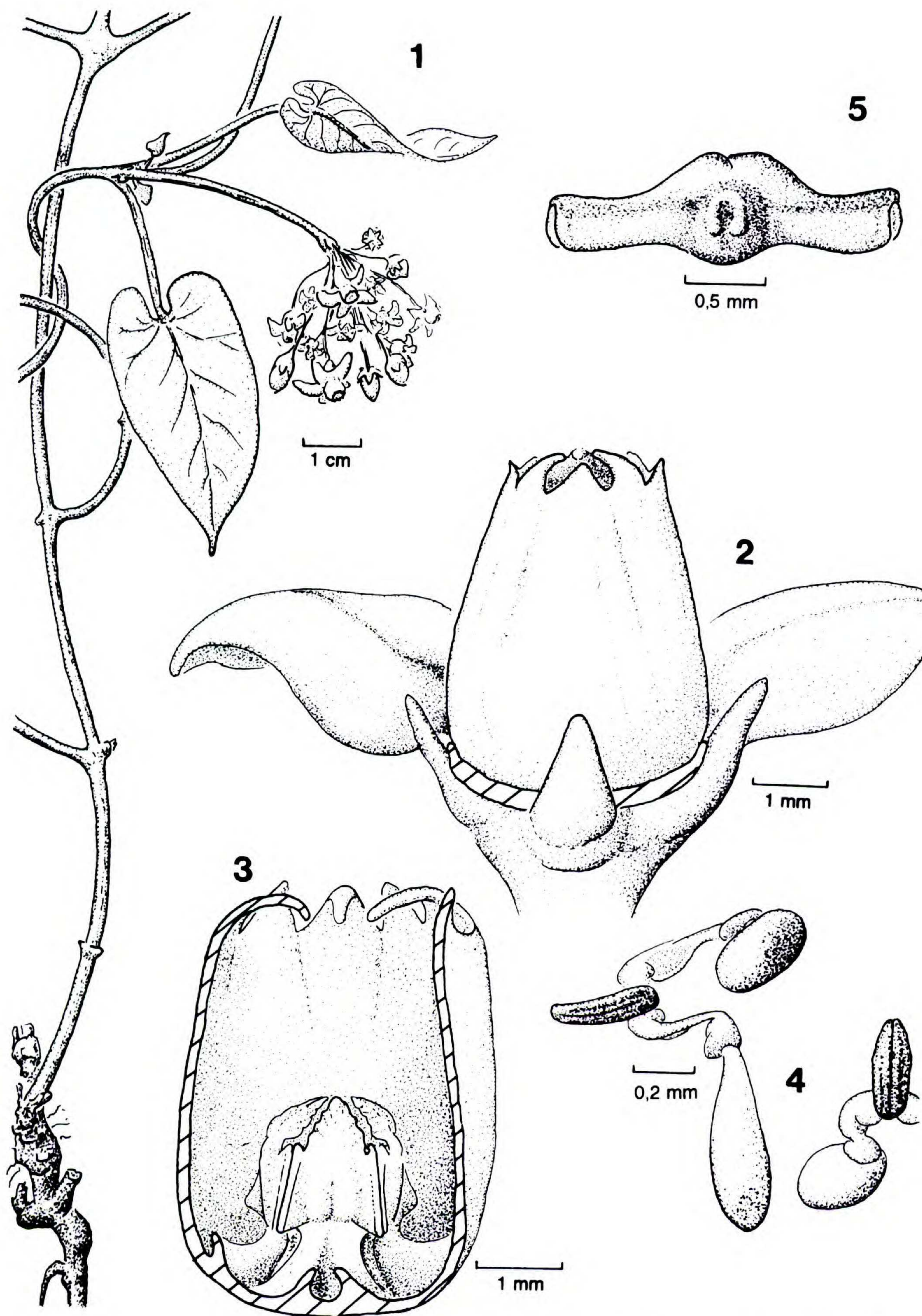


Figure 27. *Cynanchum rungweense* Bullock.—1. Habit (*Goyder 3269*) and inflorescence (*Leedal 4015*). 2–5: *Dowsett-Lemaire 236*.—2. Flower, corolla partially removed.—3. Gynostegium and corona, partially removed.—4. Pollinarium.—5. Stylar head. Drawn by Jim Conrad.

pollinia apically attached to the caudicles, 0.58–0.6 mm long, 0.24–0.26 mm wide, ovate in cross section, pyriform. *Stylar head* 1.3–1.5 mm diam., 0.3–0.4 mm high; upper part 0.05–0.1 mm high, shorter than the lower part, umbonate. *Fruits, seeds, and chromosome number* unknown.

*Distribution and habitat.* Africa: Malawi, Tanzania (T7), Zambia; 1700–2600 m; forests and forest margins. Fairly localized and infrequent, but probably not threatened. Figure 8.

*Flowering time.* October to March, May.

*Vernacular name.* Ilago (Safwa).

*Selected specimens examined.* MALAWI. North, Rumpi, Station Kyimbila, Nyassa Hochland, 2000 m, 19 Dec. 1911, *Stolz 1034* (B, K, M). TANZANIA. **Iringa:** Mufindi, Luisenga Stream, forest path by stream, 1830 m, 3 Jan. 1987, *Lovett 1303* (K, MO). **Mbeya:** Mbeya range, World's End view, Ipinda, 2660 m, 6 Feb. 1976, *Cribb, Grey-Wilson & Mwasumbi 10576* (K). **Ruvuma:** near Uwemba village, 18 km S of Njombe, 12 km from Njombe–Songea rd., ca. 2200 m, 27 Nov. 1986, *Brummitt, Goldblatt, Lovett & Mwasumbi 18209* (K). ZAMBIA. Eastern (FZ), Chama, Nyika Plateau, S of Zambian Rest House, 21 May 1989, *Goyder, Pope & Radcliffe-Smith 3269* (K).

*Comments.* *Cynanchum rungweense* is one of the more attractive, relatively large-flowered species of the genus. It belongs to the *C. altiscandens* group with a very highly fused corona and a stipitate gynostegium. Its closest relative is probably *C. altiscandens*.

Schlechter was obviously aware of this species, as it is found under the name *Cynanchum stolzii* Schltr. in several herbaria. However, the name was never published, so *C. rungweense* Bullock is the valid name for the taxon.

Cribb and Leedal (1982: 105) reported *C. rungweense* from the mountains of southern Tanzania.

**27. *Cynanchum schistoglossum*** Schlechter, J. Bot. 33: 271. Sep. 1895. TYPE: South Africa. Natal. Stanger, Phoenix, Apr. 1895, *Schlechter 7090* (neotype, B; isoneotypes, AMD, BM); syntypes cited in the protologue: *Schlechter 7106, Taylor 1895* (both probably destroyed in B, no isotypes found).

*Cynanchum brevidens* N. E. Br., Bull. Misc. Inform., Kew 1895: 257. Oct. 1895. TYPE: Congo, Sep. 1863, *Burton s.n.* (holotype, BM).

*Cynanchum brevidens* N. E. Br. var. *zambesiaca* N. E. Br., Bull. Misc. Inform., Kew 1895: 257. Oct. 1895. TYPE: Mozambique. Expedition Island, July 1838, *Kirk s.n.* (holotype, K).

*Cynanchum vagum* N. E. Br., Bull. Misc. Inform., Kew 1895: 257. Oct. 1895. TYPE: Zaïre. Stanley Pool, 26 Aug. 1888, *Hens 77* (holotype, K). *Cynanchum minutiflorum* K. Schum., Bull. Soc. Roy. Bot. Belg.

37: 123 (1898), nom. illeg., because Schumann cited *Hens 77*, the type of *Cynanchum vagum* N. E. Br., as type.

*Cynanchum dewevrei* De Wild. & T. Durand, Ann. Mus. Congo, Ser. 1, Bot. Ser. 2, 1(2): 42. 1900. TYPE: Zaïre. Mwanana Toumbwé, 27 July 1890, *Dewèvre 904* (lectotype, designated here, BR).

*Plants* twining, to 3 m high, richly branched; rhizomatous; rhizomes 1–2 mm diam. *Subterranean organs* woody rootstocks. *Shoots* perennial, 1–1.5 mm diam., herbaceous, sparsely glabrescent with erect trichomes 0.3–0.4 mm long. “*Stipules*” ovate, 3–7 mm long, 2–5 mm wide. *Leaves* with petioles 10–25 mm long, leaf blades herbaceous, 35–60 mm long, 15–35 mm wide, ovate-lanceolate to ovate, basally cuneate or cordate to lobate with 4 colleters in the adaxial sinus, apically acute to acuminate, adaxially isolatedly covered with erect trichomes 0.3–0.4 mm long, evenly distributed over the whole surface, abaxially sparsely covered with erect trichomes 0.3–0.4 mm long restricted to veins and margins. *Inflorescences* bostrychoid, 5–20-flowered, 5–10 flowers open at a time; rachis 1–2 mm long; peduncles 5–12 mm long, densely covered with erect trichomes 0.3–0.4 mm long. *Flowers* musky scented; floral bracts 1 mm long, 0.5 mm wide at the base, triangular, with trichomes; pedicels 3–8 mm long, densely covered with appressed trichomes 0.3–0.4 mm long. *Buds* 1–1.5 mm long, 1–1.5 mm diam., globose; aestivation imbricate. *Calyx* entirely free, abaxially with trichomes; lobes 0.8–1.2 mm long, 0.4–0.6 mm wide, triangular, apically acute. *Corolla* cyathiform, 1.2–3.5 mm long, abaxially with a few isolated trichomes, adaxially glabrous, whitish to yellowish green; lobes 0.8–1 mm wide, incurved, lanceolate, apically acute to acuminate. *Corona* white, cyathiform, 1.2–1.7 mm high, equaling the gynostegium; C(is) consisting of Cs and Ci fused for ½–¾ of total corona length, Cs and Ci differentiated in shape; Ci shorter and thinner than Cs, laterally connate to Cs. Cs adnate to the filaments for not more than ⅓ of total corona length, appressed to the back of the stamens, without adaxial appendages; lobes of Cs flat, equally bifid or trifid with the two lateral lobes much smaller than the medium one, inflexed with straight margins. *Lobes of Ci* flat, triangular, erect with straight margins. *Gynostegium* 0.75–1 mm high, 0.8–1.1 mm diam., sessile. *Stamens* with free filaments 0.1–0.2 mm long, anthers broader than high, trapezoidal, abaxially planar; anther wings 0.375–0.45 mm long, paralleling the anther, extending along the whole length of the anther, adjacent anther wings parallel, in the same plane as the anther; outer guide rail smooth; connective appendages 0.3–0.4

mm long, 0.4–0.5 mm wide, widely ovate, narrower than the stamen, strongly inflexed; margins emarginate, slightly bifid. *Pollinarium*: corpusculum 0.14–0.15 mm long; margins of the corpuscular cleft parallel; caudicles 0.09–0.1 mm long, cylindrical, straight, horizontal; pollinia laterally attached to the caudicles, 0.2–0.25 mm long, 0.09–0.1 mm wide, ovoid, ovate in cross section. *Stylar head* 0.7–0.9 mm diam., 0.3–0.35 mm high; upper part 0.1–0.15 mm high, depressed-conical. *Follicles* 50–55 mm long, 5–6 mm wide, fusiform, round in cross section, apically obtuse, medium brown, smooth, glabrous. *Seeds* 4.5–5 mm long, 3.5–4 mm wide, ovate, light brown, seta and aleta side almost smooth, with 0.4–0.5 mm wide wing with distally dentate margin; coma 20–25 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Angola, Botswana, Burundi, Kenya (K4), Malawi, Mozambique, Namibia, Rwanda, South Africa (Natal, Transvaal), Tanzania (T2, T3, T4, T6), Uganda (U2, U4), Zaïre, Zambia, Zimbabwe; 0–1800 m; on clayey loam; forest margins, thickets, grasslands; often near water, also roadsides and disturbed areas. Figure 18.

*Flowering time.* All year, with peak between April and October.

*Selected specimens examined.* ANGOLA. Golungo Alto, Punto de Felix Simoes, June 1856, *Welwitsch 4241* (K); Huilla, near Lopollo, Oct. 1895, *Welwitsch 4251* (K). BOTSWANA. Mochudi, Jan.–Apr. 1914, *Rogers 6617* (BOL, PRE); Ngamiland, E bank of Okavanga river, near boundary with SWA, ca. 1020 m, 27 Apr. 1975, *Müller & Biegel 2282* (K, MO, PRE, SRGH); Northern, Bushman Pits, Botlethe River at Loromoja, 22 Apr. 1975, *Ngoni 408* (K, MO, PRE, SRGH); Nokaneng, Nokaneng, 20 mi. from the abandoned village of Kanozo, 1 June 1967, *Lambrecht 220* (K, SRGH). BURUNDI. Bubanza, plaine de la Rusizi, km 14, 850 m, 18 May 1974, *Reekmans 3456* (K, MO); Bujumbura, Aérodrome, 800 m, 28 Apr. 1967, *Lewalle 1852* (K). KENYA. **Central:** North Nyeri, Nyeri, 19 Dec. 1921, *Fries & Fries 139* (K). MALAWI. Between Kondowe and Kawanga, 2000–2300 m, June 1890, *Whyte s.n.* (K); Mamitete River below bridge on Lilongwe–Ft. Jameson Rd., 1150 m, 5 Feb. 1959, *Robson 1464* (K). MOZAMBIQUE. Momba, Managra, 13 July 1949, *Faulkner 459* (K); Barada, 21 July 1950, *Chase 2230* (K, SRGH). NAMIBIA. Andara, bei Dikundu, im Omuramba (19.2 km S Andara), 15 June 1971, *Giess 11436* (PRE). RWANDA. Biumba, colline Karukwanzi, région du Mutara, près de la river Kakitumba, 21 Mar. 1958, *Troupin 6762* (MO). SOUTH AFRICA. **Natal:** Durban, Merebank, S.W., 19 Feb. 1967, *Bajinath 132* (PRE); Pietermaritzburg, Inanda, July 1880, *Wood 611* (BM); Port Shepstone, Isipingo Rail (Platts Estate), ca. 13 m, 7 Apr. 1966, *Ward 5548* (PRE); Stanger, near Umhlanga river, 24 Apr. 1895, *Wood 5664* (BOL, MO, PRE); Umzinto, Hazlewood, 6 Apr. 1967, *Bajinath 287* (PRE). **Transvaal:** Acornhoek, 1½ mi. E of Skukuza, Kruger National Park, 300 m, 5 Apr. 1949, *Codd 5491* (PRE). TANZANIA. **Arusha:** Sakila, rd. to

Sakila swamp, 1500 m, 14 Sep. 1971, *Richards 27219* (K, MO). **Morogoro:** Uluguru Gebirge, ca. 1200 m, 30 June 1933, *Schlieben 4044* (K, MO). **Rukwa:** Sakalilo (nr), 1000 m, 25 May 1951, *Bullock 3896* (K). **Ruvuma:** Ilonga, 530 m, 20 June 1967, *Robertson 733* (K). **Tabora:** near Kisanga, ca. 700 m, 19 Aug. 1970, *Thulin & Mhoro 765* (K). **Tanga:** Korogwe, Kisarake, near Mnyusi Railway station, 30 Apr. 1971, *Semsei 4239* (K). UGANDA. Ankole, Mitoma, 1500 m, Mar. 1939, *Purseglove 600* (K); Kigezi, Kanungu, 1830 m, June 1939, *Purseglove 821* (K); Mengo, Mulange, 1430 m, Sep. 1919, *Dümmer 4306* (BM, K); Toro, near Sempayo, Oct. 1924, *Liebenberg 947* (K). ZAÏRE. Dolo (Congo), June 1899, *Schlechter 12485* (K, L). ZAMBIA. Chipata, Musandile, Nsefu, Luangwe valley, 12 Apr. 1968, *Phiri 158* (K, SRGH); Lundazi, 4 mi. S of Lundazi Boma, 27 Apr. 1952, *White 2479* (K, MO); near Chilanga, Mt. Makulu Research Station, 24 Mar. 1962, *Angus 3078* (K). ZIMBABWE. Kasungula, Oct. 1855, *Gairdner 546* (K); Victoria Falls, S. Bank of Zambesi, 1000 m, May 1915, *Rogers 13125* (BOL).

*Comments.* Neither of the two syntypes of *Cynanchum schistoglossum* could be traced and both have probably been destroyed in B. The specimen selected as neotype was collected and identified by Schlechter and can thus be considered to conform to his concept of the species.

Schumann (1895) published *C. minutiflorum* as nomen nudum and only typified it three years later on *Hens 77*, the type specimen of *C. vagum* N. E. Br.

Of the two well-preserved syntypes of the description of *C. dewevrei* (*Dewèvre 904* and *976a*, both in BR), the one with the more precise collection data has been chosen as lectotype.

*Cynanchum schistoglossum* is perhaps the most variable species on the African mainland. Corona dentation and degree of fusion differ considerably among the populations. The species can be recognized by the very small flowers (smallest-flowered species on the African mainland) and the distinct fusion of the staminal corona parts with the filaments, which is only found in *C. gerrardii* and *C. lenewtonii*, with which it also shares the characteristic shape of the anthers and anther wings.

**28. *Cynanchum somaliense*** (N. E. Brown) N. E. Brown in Dyer, *Fl. Trop. Afr.* 4(1): 398. 1903. *Schizostephanus somaliensis* N. E. Br. in *Bull. Misc. Inform., Kew* 1895: 250. 1895. *Cynanchum trifurcatum* Schltr., *Bull. Herb. Boissier* 4: 448. 1896, nom. nov. TYPE: Somalia. Boobi, *James & Thrupp s.n.* (holotype, K). Figure 28.

*Cynanchum dentatum* K. Schum., *Annuario Reale Ist. Bot. Roma* 7: 39. 1898. TYPE: Somalia. Inter Sassaber et Cabaden iter duorum dierum a Mil-Mil et Ogaden distans locis aridis silvaticis, Jan., *Riva 844* (holotype, FT).



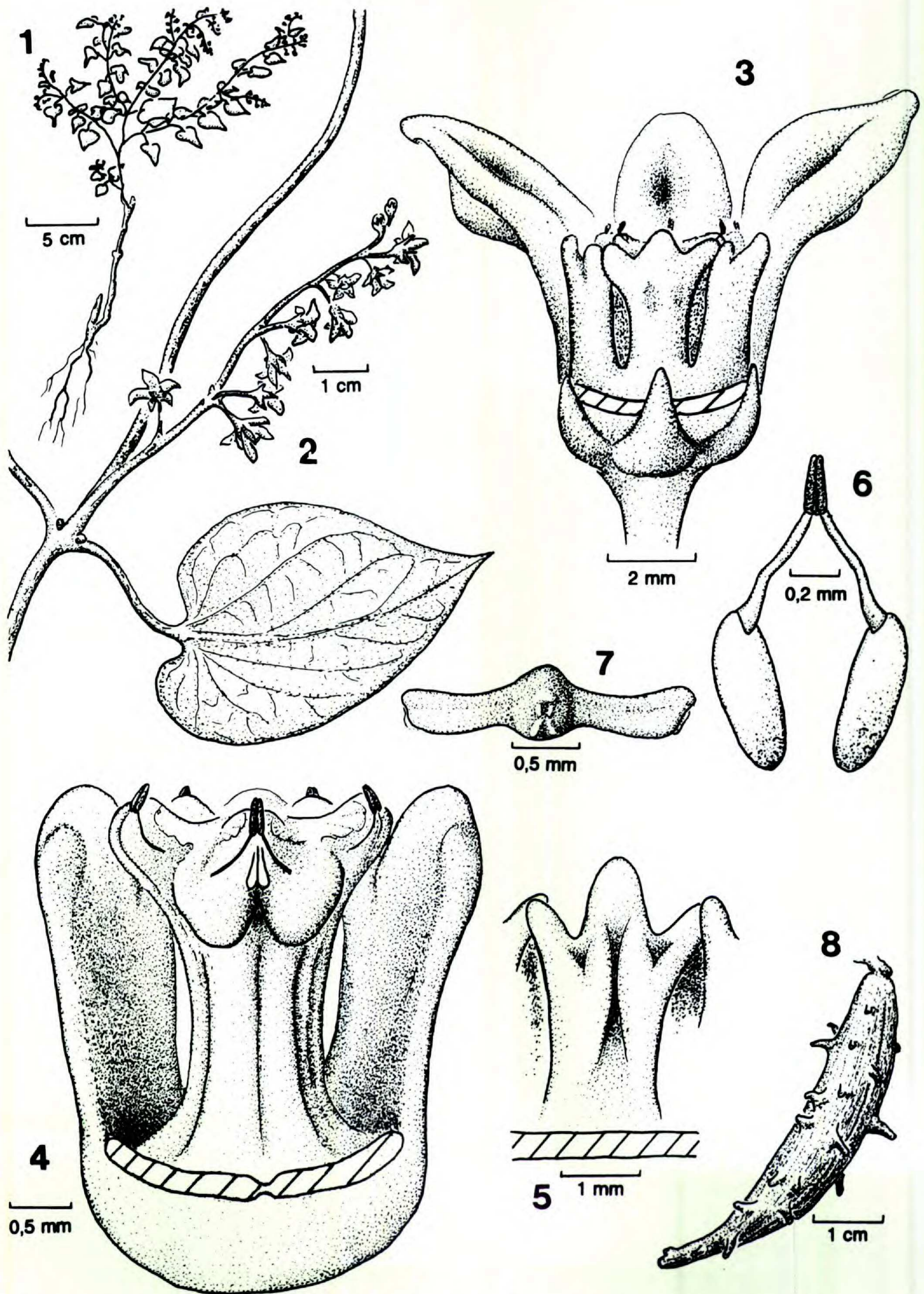


Figure 28. *Cynanchum somaliense* (N. E. Br.) N. E. Br. 1, 2: Gilbert & Thulin 1510; 3-7: Mesfin & Vollesen 4238; 8: Friis *et al.* 3221.—1. Habit.—2. Node with inflorescence.—3. Flower, corolla partially removed.—4. Gynostegium and corona, partially removed.—5. Corona lobe, adaxially.—6. Pollinarium.—7. Stylar head.—8. Fruit. Drawn by Jim Conrad.

*Plants* erect or ascending, twining, 1–4 m high, sparsely basicaulously branched, with rhizomes. *Shoots* herbaceous, sparsely covered with flexuous trichomes 0.3–0.4 mm long; internodes 4–11 cm long, 0.8–2 mm diam. “*Stipules*” ovate, apiculate, 10–12 mm long, 7–10 mm wide. *Leaves* with petioles 15–45 mm long, leaf blades herbaceous, 30–85 mm long, 20–60 mm wide, ovate, basally cordate to lobate, lobes 3–5 mm long, with 5–7 collets in the adaxial sinus, apically acute to acuminate, adaxially and abaxially isolatedly covered with appressed trichomes 0.3–0.4 mm long, concentrated on veins and margins. *Inflorescences* botrychoid, 10–15-flowered, 6–8 flowers open at a time; rachis 1 mm long; peduncles 10–30 mm long, densely covered with flexuous trichomes 0.2–0.3 mm long, along a single line. *Flowers* aromatically scented (fide Gillett 13340); floral bracts 1.4–1.8 mm long, 0.3 mm wide at the base, linear, with trichomes; pedicels 4–7 mm long, densely covered with flexuous trichomes 0.2–0.3 mm long. *Buds* 1.6–1.8 mm long, 1.4–1.5 mm diam., cylindrical (apically widened), with imbricate aestivation. *Calyx* basally fused; abaxial surface glabrous; lobes 2–2.2 mm long, 0.6–1.1 mm wide, ovate to oblong, apically acute. *Corolla* rotate; basally fused; 3.5–4 mm long, abaxially yellowish purple, adaxially yellow; lobes 1–1.2 mm wide, patent, cucullate, apically obtuse. *Corona* white, changing to purplish red with age, 3–3.5 mm high, equaling the gynostegium; C(is) consisting of Cs and Ci only basally fused, only Cs differentiated. Cs not adnate to the filaments, without adaxial appendages; lobes of Cs laminar, trifid (central lobe internally with two strong folds), apically erect. *Gynostegium* 1–1.2 mm high, 2–2.2 mm diam., atop a stipe 2.2–2.3 mm long. *Stamens* without free filaments, anthers broader than high, deltoid, abaxially convex; anther wings 0.4–0.45 mm long, divergent, not extending along the whole length of the anther; the anther forming a “pseudostipe” 0.6–0.7 mm high; adjacent anther wings parallel, basally widened, in the same plane as the anther. Connective appendages ca. 0.25 mm long, 0.7–0.8 mm wide, ovate, equaling the stamen in width, strongly inflexed. *Pollinarium*: corpusculum ca. 0.3 mm long, more than twice as long as broad, elliptic; caudicles ca. 0.8 mm long, cylindrical, straight, declinate; pollinia apically attached to the caudicles, 0.75–0.8 mm long, 0.25–0.3 mm wide, ovoid, ovate in cross section. *Stylar head* white, 1.1–1.2 mm diam., 0.3–0.35 mm high; upper part 0–0.05 mm high, flat to umbonate. *Follicles* one per flower, 50–60 mm long, 8–10 mm diam., obclavate, apically obtuse, medium brown, sparsely covered with 3–5-mm-long protuberances,

with sparse indumentum. *Seeds* approximately 60–80 per follicle, marginally winged (only immature seeds known). *Chromosome number* unknown.

*Distribution and habitat.* Africa: Ethiopia (Bale, Haverge, Sidamo, Welo), Kenya (K1, K4), Somalia (Hiiraan, Sanaag, Woqooyi Galbeed/Todgheer), Sudan, Tanzania (T1), Uganda (U1, U4); 350–1700 m, *Acacia-Commiphora* bushland, open shrub, and grasslands. Widespread and fairly common. Figure 10.

*Flowering time.* March to November.

*Vernacular names.* Goriss (Boran), gasur riyoli (Ogaden), yapo (Uganda).

*Uses.* Helps women in childbirth, also for abdominal pains (Dyson-Hudson 224, 225, 226).

*Selected specimens examined* ETHIOPIA. **Bale:** between Gaad and Harrana, ca. 860 m, 26 Sep. 1964, Burger 3524 (EA); Haverge, Scillave, 630 m, 11 Apr. 1956, Simmons 141 (K). **Sidamo:** Borana, 46 mi. SE of Neghelle, on Filtu-Dolo Road, 1450 m, 4 Apr. 1974, Ash 2425 (K, MO). **Welo:** below Back on Assab rd., 700 m, 19 Sep. 1962, Mooney 9662 (WAG). KENYA. **Central:** Meru, 13 km N of Isiolo on road to Marsabit, 1050 m, 11 Feb. 1978, Gilbert, Gachathi & Gatheri 5314 (K, MO); North Nyeri, Nan, Ngare Ndare Farm, 1500 m, 19 Apr. 1981, Gilbert 6093 (K). **Northern Frontier:** Mandera, 2 km N of El Wak, 30 Apr. 1978, Gilbert & Thulin 1265 (K). SOMALIA. Hiiraan, Bulu Burti, ca. 25 km along the rd. to Buqda Caqable, then 5 km SW along cutline, 180 m, 17 May 1986, Kuchar 17017 (K, MO); Sanaag, 32 km S of Eri-gavo, 1340 m, 26 Nov. 1980, Hemming & Watson 3279 (K); Woqooyi Galbeed/Todgheer, Boundary Pillar 93, 1100 m, 10 Apr. 1932, Gillett 4173 (K). SUDAN. Imatong Mts., just S of Ngarama, along rd. to Molongori, near northernmost point of cont. mountain chain, 700 m, 13 Mar. 1986, Friis & Vollesen 1189 (K). TANZANIA. **Mwanza:** Igalukiro, Narso, Mwanza, 1200 m, 18 July 1953, Tanner 1597 (K). UGANDA. Karamoya, near Emonayaben, Nabilatuk, 1200 m, 26 June 1957, Dyson-Hudson 226 (K); Mengo, Buvuma, Namunyoro, Maitland 1190 (K).

*Comments.* Schlechter (1896) suggested *Cynanchum trifurcatum* as a nomen novum for *Cynanchum somaliense* (N. E. Br.) N. E. Br., stating that there was another species known by the name of *Cynanchum somaliense*. However, he neither indicated an author of this species, nor is any such species known to me as validly published. Therefore, there is no need to rename *Cynanchum somaliense* (N. E. Br.) N. E. Br.

*Cynanchum somaliense* has long been regarded as the closest relative of *Schizostephanus alatus*. However, while this judgment was derived from the long stipe and the seemingly similar pollinarium structure, *Schizostephanus* has recently been identified as a member of a different subtribe (Liede, 1993). While long stipes have been developed sev-

eral times independently, the unique fine structure of the pollinarium of *Schizostephanus* has been illustrated in Liede (1993). Liede and Nicholas (1992) have deduced that the corona in *Pentarrhinum* can be interpreted morphologically as a development from the type found in *P. somaliense*. The close relationship of *C. somaliense* and *Pentarrhinum* is further supported by the wingless follicles with soft spines. *Schizostephanus*, in contrast, possesses smooth follicles with conspicuous wings.

**29. *Cynanchum umtalense*** Liede, sp. nov.  
TYPE: Zimbabwe. Melsetter: Chirinda Forest Margin, ca. 1200 m, Jan. 1962, *Goldsmith 1/62* (holotype, K; isotypes, B, BR, FI, SRGH). Figure 29.

Volubilis. Corollae lobis introrsum pilis singularibus ornatis; partibus staminalibus corollae gynostegialis ligulatis; capite stylorum longe elongato.

*Plants* ascending, twining, 5–6 m high, richly and irregularly branched. *Shoots* perennial, herbaceous, densely covered with flexuous trichomes 0.7–0.8 mm long; internodes 7–10 cm long, 0.5–1 mm diam. “*Stipules*” absent. *Leaves* with petioles 15–20 mm long, leaf blades herbaceous, 35–70 mm long, 15–45 mm wide, ovate, basally cordate to obtuse with 2–3 colleters in the adaxial sinus, apically acuminate (acumen 2–3 mm long), adaxially and abaxially sparsely covered with appressed trichomes 0.6–0.8 mm long evenly distributed over the whole surface. *Inflorescences* sciadioidal, 7–11-flowered, 2–5 flowers open at a time; peduncles 7–15 mm long, densely covered with flexuous trichomes 0.5–0.6 mm long. *Flowers* with floral bracts 1.6–1.8 mm long, 0.4–0.5 mm wide at the base, triangular, with trichomes; pedicels 8–10 mm long, densely covered with flexuous trichomes 0.4–0.5 mm long. *Buds* 5–6 mm long, 2–2.5 mm diam., conical, basally with imbricate, apically with contorted aestivation. *Calyx* basally fused; abaxial surface with trichomes; lobes 1.4–1.6 mm long, 0.7–0.8 mm wide, ovate, apically acute. *Corolla* rotate, basally fused; 6–7 mm long, abaxially with trichomes, adaxially cream, rose to purple along the main nerves; adaxially with verrucose trichomes 0.1–0.12 mm long, evenly distributed over the whole surface; lobes 1.8–2 mm wide, apically twisted, patent to recurved, linear to triangular, apically obtuse to acute. *Corona* white, 2.3–2.5 mm high, equaling the gynostegium (except for stylar head appendage); C(is) consisting of Cs and Ci fused for more than  $\frac{3}{4}$  of total corona length, Cs and Ci differentiated, Ci shorter than Cs. Cs not adnate to the filaments, with adaxial appendages; lobes of Cs

lobes laminar, triangular, apically erect; appendages of Cs slightly longer than Cs, laminar, triangular, erect. *Lobes of Ci* laminar, rectangular, producing a pronounced convex fold along the upper third of corona length, erect, with straight, emarginate margins. *Gynostegium* 1.6–1.8 mm high (without stylar head appendage), 1.6–1.8 mm diam., sessile. *Stamens* without free filaments, anthers about as high as broad, rectangular, abaxially planar; anther wings 0.7–0.8 mm long, parallel to each other, extending along the whole length of the anther; adjacent anther wings parallel, in the same plane as the anther. Connective appendages 0.5–0.6 mm long, 0.7–0.8 mm wide, ovate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.2–0.22 mm long, rhomboid; caudicles 0.09–0.1 mm long, flattened, straight, horizontal, triangular; pollinia subapically attached to the caudicles, 0.3–0.35 mm long, 0.12 mm wide, clavate, ovate in cross section. *Stylar head* white, 0.5–0.6 mm diam., 2.5–2.6 mm high; upper part 2.3–2.4 mm high, obinfundibuliform. *Follicles* one per flower, 45 mm long, 6–8 mm diam., obclavate, keeled, apically shortly beaked, medium brown, with dense indumentum. *Seeds* 6.5–7 mm long, 3.5–4 mm wide, ovate, medium brown, seta and a seta side sculptured with longitudinal ridges, marginally with 0.3-mm-wide wing with entire margin; coma 18–20 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Malawi (North, Central), Zimbabwe (Melsetter, Umtali); 1200–2000 m; forest margins. A fairly infrequent species with a rather limited distribution, but probably not immediately threatened because it grows inside forest reserves. Figure 2.

*Flowering time.* January, April to July.

*Specimens examined.* MALAWI. Central. Dedza, Dedza Mountain, 1750 m, 5 Apr. 1978, *Pawek 14228* (BR, K, MAL, MO, WAG); lower eastern slopes of Domwe Hill, above Trinidad's Place, 1 Apr. 1961, *Chapman 1212* (K). North. Nkhata Bay, 3 km S of Chikangawa, 1950 m, 10 July 1978, *Phillips 3515* (K, MAL, MO, SRGH, WAG). ZIMBABWE. Umtali, Vumba Mts., 28 Apr. 1957, *Chase 6465* (B, FI, K, SHRG), 4 June 1957, *Chase 6541* (K), 2 Apr. 1958, *Chase 6866* (K), 12 May 1957, *Pole-Evans 5210* (K); Hawkdale, Vumba, 29 Jan. 1957, *Chase 6562* (K).

*Comments.* *Cynanchum umtalense* is a very distinctive species, but clearly identifiable as a member of the group with verrucose trichomes on the corolla lobes and ligules; probably closest to *Cynanchum abyssinicum*.

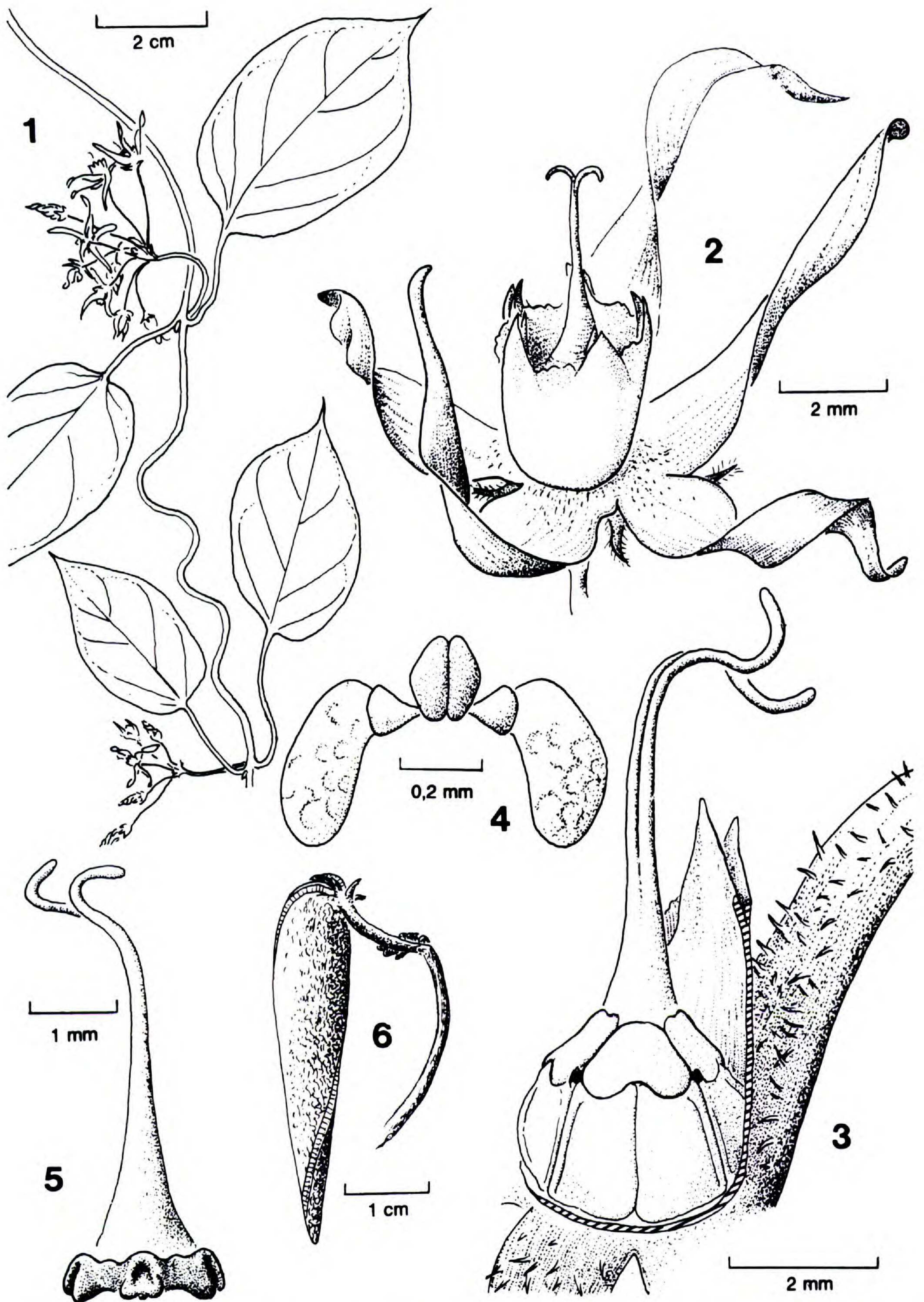


Figure 29. *Cynanchum umtalense* Liede. 1–5: Chase 6866; 6: Chase 2562.—1. Habit with inflorescences.—2. Flower.—3. Gynostegium and corona, partially removed.—4. Pollinarium.—5. Stylar head.—6. Fruit. Drawn by Jim Conrad.

**30. *Cynanchum virens*** (E. Meyer) D. Dietrich, Syn. Pl. 2: 905. 1840. *Cynoctonum virens* E. Mey., Comm. Pl. Afr. Austr. 216. 1838. *Cynanchum virens* (E. Mey.) Steud., Nomencl. Bot. (ed. 2) 1: 462. 1841, nom. superfl. *Vincetoxicum virens* (E. Mey.) Kuntze, Revis. Gen. Pl. 2: 424. 1891. *Endotropis meyeri* Decne. in Candolle, Prodr. 8: 546. 1844, nom. superfl. TYPE: Namibia. Garip, 19 Dec. 1832, Drège 3439 (lectotype, designated by Liede (1993), P).

Not *Cynanchum virens* (E. Mey.) D. Dietr., Syn. Pl. 2: 906. 1840, based on *Schizoglossum virens* E. Mey., Comm. Pl. Afr. Austr. 219. 1838. TYPE: South Africa. Natal: inter Omsamcaba et Port Natal, Drège s.n., as cited by Schlechter, Bot. Jahrb. Syst. 20, Beih. 51: 7. 1895 (see comments).

*Plants* twining, 0.5–1 m high, sparsely branched; subterranean organs rhizomatous; rhizome 10–15 mm diam. *Shoots* perennial, 50–100 cm long, 1 mm diam., herbaceous, glabrous, or isolatedly to sparsely covered with appressed trichomes 0.25–0.3 mm long, basally woody with yellowish bark. “*Stipules*” ovate, 3–5 mm long, 2–5 mm wide. *Leaves* with petioles 10–25 mm long; leaf blades herbaceous, 30–50 mm long, 15–30 mm wide, lanceolate, basally cordate with 4 colleters in the adaxial sinus, apically acute, abaxially and adaxially glabrous to isolatedly indumented with appressed trichomes 0.25–0.3 mm long, evenly distributed over the whole surface. *Inflorescence* bostrychoid to sciadoid, 7–15-flowered, 3–8 flowers open at a time; rachis to 0.5 mm long; peduncles 2–10 mm long, glabrous isolatedly covered with appressed trichomes 0.25–0.3 mm long. *Flowers* with floral bracts 0.8–1 mm long, 0.2–0.3 mm wide at the base, linear to triangular, with trichomes; pedicels 5–7 mm long, glabrous to isolatedly covered with erect trichomes 0.25–0.3 mm long. *Buds* 4–4.5 mm long, 2.5–3 mm diam., elongated-conical; aestivation imbricate. *Calyx* basally fused, abaxially glabrous or with trichomes; lobes 1–1.5 mm long, 0.5–0.7 mm wide, triangular, apically acute. *Corolla* rotate, fused at the base, 6–8 mm long, abaxially glabrous, greenish white, adaxially with verrucose trichomes, whitish green; lobes 1–1.5 mm wide, spreading, ovate, apically acuminate, twisted. *Corona* white, cyathiform, 5–5.5 mm high, exceeding the gynostegium but not obscuring it; C(is) consisting of Cs and Ci fused for ca. 1/3 of corona length, both Cs and Ci differentiated in shape, Ci shorter and thinner than Cs, dorsally connate to Cs. Cs adaxially with adaxial appendages; lobes of Cs flat, long-apiculate, inflexed, with straight margins; ad-

axial appendages shorter than Cs, erect, liguliform. *Lobes of Ci* flat, ovate, erect, with straight, denticulate margins. *Gynostegium* sessile, 1.4–1.6 mm high, 1–1.2 mm diam. *Stamens* without free filaments; anthers about as high as broad, trapezoidal, abaxially planar, anther wings 0.55–0.6 mm long, parallel to each other, extending beyond the anther proper forming a basal arch; adjacent anther wings parallel, in the same plane as the anther. *Connective* appendages 0.6–0.65 mm long, 0.5–0.55 mm wide, deltate, narrower than the stamen, slightly inflexed. *Pollinarium*: corpusculum 0.2–0.22 mm long; margins of the corpuscular cleft sinuate; caudicles 0.14–0.16 mm long, flattened, straight, horizontal, triangular; pollinia laterally attached to the caudicles, 0.32–0.35 mm long, 0.14–0.16 mm wide, ovoid, round in cross section. *Stylar head* 0.6–0.75 mm diam., 0.8–1 mm high, upper part 0.57–0.6 mm high, conical. *Follicles* 50–60 mm long, 15–20 mm wide, obclavate, obtusely deltate in cross section, apically shortly to strongly beaked, keeled, light to dark brown, longitudinally grooved, glabrous. *Seeds* 5–5.5 mm long, 3–4 mm wide, ovate, medium to dark brown, seta and a seta side sculptured with longitudinal ridges, marginally with 0.4–0.6-mm-wide wing with entire margin; coma 20–25 mm long. *Chromosome number* unknown.

*Distribution and habitat.* Africa: Lesotho, Namibia, South Africa (Cape Province, Transvaal, Orange Free State); 1200–2000 m, flats and gentle slopes; sandy to loamy soil; riverine vegetation; partial shade.

*Comments.* Dietrich (1840: 905, 906) published two combinations as *Cynanchum virens* (E. Mey.) D. Dietr., one based on *Cynoctonum virens* E. Mey., the other one on *Schizoglossum virens* E. Mey. Schlechter (1895) is the only author using the latter, because all other authors regard *Schizoglossum*, a member of the subtribe Asclepiadinae, as well distinct from *Cynanchum*.

Further details, illustration, distribution map, and citation of specimens are provided in Liede (1993).

**31. *Cynanchum zeyheri*** Schlechter, Bot. Jahrb. Syst. 20, Beibl. 51: 3. 1895. TYPE: Ecklon & Zeyer 78 (lectotype, designated by Liede (1993), SAM).

*Plants* decumbent, 15–20 cm high, richly branched; subterranean organs consisting only of fibrous roots. *Shoots* perennial, 15–20 cm long, 1–1.5 mm diam., herbaceous, glabrous, or isolatedly to sparsely covered with appressed trichomes 0.15–

0.2 m long, basally woody with yellowish bark. "Stipules" 2–3 mm long, 3–4 mm wide. Leaves with petioles 5–10 mm long; leaf blades herbaceous, 10–15 mm long, 5–10 mm wide, ovate, basally rounded, without colleters, apically obtuse, or acute and apiculate, adaxially and abaxially glabrous. Inflorescence sciadioidal, 2–5-flowered, all flowers open at a time; peduncles 0.5–5 mm long, glabrous to isolatedly covered with appressed trichomes 0.15–0.2 mm long. Flowers sweetly scented; floral bracts 0.7–1 mm long, 0.2–0.5 mm wide at the base, triangular, papillose; pedicels 5–10 mm long, glabrous. Buds 3.5–4 mm long, 1–1.5 mm diam., elongate-conical; aestivation imbricate, apically contorted. Calyx basally fused, abaxially glabrous; lobes 1–1.5 mm long, 0.5–0.8 mm wide, ovate, apically acute and apiculate. Corolla rotate, fused at the base, 3–4 mm long, abaxially glabrous, brown, adaxially minutely papillose brown; lobes ca. 1 mm wide, spreading, oblong, apically obtuse, mostly twisted, with revolute margins. Corona white, tubular to campanulate, 1.5–2 mm high, shorter than the gynostegium; C(is) consisting of Cs and Ci fused for about  $\frac{3}{4}$  of total length, only Cs differentiated in shape. Cs without adaxial appendages; lobes of Cs flat, ovate, erect, with straight margins. Gynostegium 0.7–0.8 mm high, 0.8–1 mm diam., atop a stipe, 0.7–1 mm long. Stamens without free filaments; anthers trapezoid, abaxially rounded; anther wings 0.25–0.3 mm long, clearly differentiated, paralleling the anther, parallel to each other, extending along the whole length of the anther margin; connective appendages 0.55–0.6 mm long, 0.4–0.45 mm wide, ovate, narrower than the stamen, erect. Pollinarium: corpusculum 0.13–0.14 mm long; caudicles 0.07–0.08 mm long, flattened, straight, horizontal to declinate, triangular; pollinia 0.3–0.35 mm long, 0.12–0.13 mm wide, clavate, elliptical in cross section. Stylar head 1–1.1 mm diam., 0.5–0.55 mm high; upper part 0.47–0.5 mm high, conical. Follicles 35–45 mm long, 12–15 mm wide, club-shaped, sharply deltate in cross section, apically shortly beaked, wingless, light brown to medium brown, longitudinally grooved, glabrous. Seeds 5–6 mm long, 4–5 mm wide, pyriform, medium brown, seta and a seta side tuberculate (but less pronouncedly so on the seta side); marginally with indistinct wing 0.2–0.3 mm wide, with entire margin; coma 20–25 mm long. Chromosome number unknown.

*Distribution and habitat.* Africa: South Africa [Cape Province, disjunction Cape Peninsula (Lionshead)–Bredasdorp]; 0–1000 m; flats to moderate

slopes; shales and limestone; fynbos, renosterveld, strandveld.

*Comments.* Further details, illustration, distribution map, and citation of specimens are provided in Liede (1993).

#### EXCLUDED SPECIES

- Cynanchum aphyllum* (Thunb.) Schltr. = *Sarcostemma viminale* (L.) R. Br. (Liede, 1991)  
*Cynanchum arboreum* Forssk. = *Leptadenia arborea* (Forssk.) Schweinf.  
*Cynanchum atropurpureum* (E. Mey.) D. Dietr. = *Schizoglossum atropurpureum* E. Mey.  
*Cynanchum argel* Delile = *Solenostemma argel* (Delile) Hayne  
*Cynanchum bidens* (E. Mey.) D. Dietr. = *Schizoglossum bidens* E. Mey.  
*Cynanchum boveanum* Decne. = *Glossonema boveanum* (Decne.) Decne.  
*Cynanchum chirindense* S. Moore = *Tylophora* sp.  
*Cynanchum cordifolium* (E. Mey.) D. Dietr. = *Schizoglossum* sp.  
*Cynanchum crispum* Thunb. = *Gomphocarpus crispus* (P. J. Bergius) W. T. Aiton  
*Cynanchum defoliascens* K. Schum. = *Blyttia fruticosum* (Decne.) D. V. Field & J. R. I. Wood  
*Cynanchum filiforme* L. f. = *Schizoglossum* sp. fide Schlechter (1895)  
*Cynanchum fruticosum* Decne. = *Blyttia fruticosum* (Decne.) D. V. Field & J. R. I. Wood  
*Cynanchum gossweileri* S. Moore = *Schizostephanus gossweileri* (S. Moore) Liede  
*Cynanchum hamatum* (E. Mey.) D. Dietr. = *Schizoglossum hamatum* E. Mey.  
*Cynanchum heterophyllum* Delile = *Leptadenia heterophylla* (Delile) Decne.  
*Cynanchum lancifolium* Schumach. & Thonn. = *Leptadenia lancifolium* (Schumach.) Decne.  
*Cynanchum latifolium* Schumach. & Thonn. = *Leptadenia lancifolium* Decne.  
*Cynanchum linifolium* (Balf. f.) Bullock = *Vincetoxicum linifolium* Balf. f.  
*Cynanchum mauritianum* Bojer ex Decne. = *Tylophora laevigata* Decne.  
*Cynanchum microstegium* K. Schum. = *Blyttia fruticosum* (Decne.) D. V. Field & J. R. I. Wood  
*Cynanchum molle* (E. Mey.) D. Dietr. = *Anisotoma cordifolia* Fenzl  
*Cynanchum oleaefolium* Nectoux = *Solenostemma argel* (Delile) Hayne  
*Cynanchum omissum* Bullock = *Fockea angustifolia* K. Schum.  
*Cynanchum ovatum* Thunb. = *Leptadenia reticulata* (Retz.) Wight

- Cynanchum pendulum* Poir. = *Leptadenia* sp.  
*Cynanchum radians* (Forssk.) Lam. = *Odontanthera radians* (Forssk.) D. V. Field  
*Cynanchum reticulatum* Retz. = *Leptadenia reticulata* (Retz.) Wight  
*Cynanchum roseum* Chiov. = *Tylophora heterophylla* A. Rich.  
*Cynanchum scabrum* Schumach. & Thonn. = *Marsdenieae* sp.  
*Cynanchum senegalense* Sieber ex Decne. = *Gymnema subvolubile* (Schumach.) Decne.  
*Cynanchum subvolubile* Schumach. & Thonn. = *Gymnema subvolubile* (Schumach.) Decne.  
*Cynanchum tetrapterum* (Turcz.) R. A. Dyer = *S. viminale* (L.) R. Br.  
*Cynanchum validum* N. E. Br. = *Schizostephanus alatus* Hochst. ex K. Schum.  
*Cynanchum verticillare* Lam. = *Schizoglossum* sp. fide Schlechter (1895)  
*Cynanchum viminale* L. = *Sarcostemma viminale* (L.) R. Br.

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