

## Tropical American Plants, X

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This contribution covers principally studies of the Asclepiadaceae made while preparing the manuscript for the "Flora of Guatemala." The Guatemalan and adjacent Mexican highlands along with the low country of Petén, British Honduras, and neighboring regions of the Yucatán Peninsula are particularly rich in Asclepiadaceae and a center of diversification in the family.

The Asclepiadaceae has not had the attention that it merits. It often has been neglected in both the field and the herbarium as an "impossible" family. It is a fascinating family of plants and would well repay the student that takes it up.

I have been fortunate in having the entire collection of Mexican and Guatemalan Asclepiadaceae from the Lundell Herbarium; the collection of the United States National Herbarium and especially the herbarium of Capt. John Donnell Smith deposited there have been most useful; Dr. Peter Raven has sent all of Dennis Breedlove's and his own excellent collections from southern Mexico and Guatemala for determination; Dr. Hugh Iltis has sent for determination the collections made by himself and students from southern Mexico and Guatemala; the New York Botanical Garden has made available the specimens collected during recent expeditions to Central America by Dr. George Proctor; all of the collections made in Central America during recent years by Antonio Molina, myself, and our associates were available for study; specimens from the Missouri Botanical Garden studied by Dr. Robert E. Woodson were made available for study; essential examinations of type material at Kew were made.

Finally, and with pleasure, I thank National Science Foundation for the help that has made our field work in Guatemala and Central America possible and productive during recent years. Field work done by some of the correspondents mentioned above was sponsored by National Science Foundation and the specimens resulting from it freely made available for study.

## ASCLEPIADACEAE

*Cynanchum*.—The preparation of the manuscript for the genus *Cynanchum* for the "Flora of Guatemala" has taken relatively more time than the number of species involved would seem to justify. There are now nine species credited to the flora of Guatemala. It was necessary in preparing the manuscript to study the material of Central America and southern Mexico. The material north of the Isthmus of Tehuantepec was studied more superficially except as this may extend into the Central American area. It seems likely that names applied to species of *Cynanchum* from northern Mexico will not replace those which we have used. The older names are largely from south Mexico.

Woodson has written of this group (Ann. Mo. Bot. Gard. 28: 214. 1941) that "Within the tiny corollas, averaging only about 2 mm. in length, are packed as many structural details and variations as within the larger flowers of other genera. Once when I was complaining to Dr. Standley of the eye and nerve strain necessary in dealing with the group, he laughingly agreed that it should be studied by an algologist or a mycologist."

The group is a fascinating one and with a good microscope presents no special problems. A monograph of the group would make a good doctoral problem.

***Cynanchum filisepalum*** (Standl.) L. Wms. comb. nov. *Metastelma filisepalum* Standl. Field Mus. Bot. 18: 956. 1938.

This distinctive and fairly rare species has been collected only in Costa Rica.

***Cynanchum glaberrimum*** (Woodson) L. Wms. comb. nov. *Metastelma glaberrimum* Woodson, Ann. Mo. Bot. Gard. 24: 200. 1937.

Costa Rica (All specimens from Costa Rica in F, except as indicated): La Palma de San Ramón, alt. 1,050 m., Dec. 22, 1926, *Brenes 5238*; south slope, Volcán de Barba, Prov. Heredia, alt. 1,950 m., May 22, 1965, *Hatheway 1353*; Las Cóncevas (Prov. Cartago), August 1919, *Lankester K107*; on the side of Barba Volcano, 25 km. from San Rafael, Prov. Heredia, alt. 1,930 m., August 14, 1964, *Lent 215*; Guacalillo, Volcán Barba (Prov. Heredia), alt. 1,900 m., August 16, 1940, *León 24*; region of Zarcero, Prov. Alajuela, *Austin Smith A-8, A157*; Las Lajas de Zarcero, Prov. Alajuela, alt. 1,600 m., June 9, 1938, *Austin Smith NY 743*; La Briza de Zarcero, Prov. Alajuela,

alt. 2,200 m., July 19, 1938, *Austin Smith NY 973*; between Aserri and Tarbaca, Prov. San José, alt. 1,200–1,700 m., Dec. 6, 1925, *Standley 41384* (US); Los Ayotes near Tilarán, Prov. Guanacaste, alt. 600–700 m., Jan. 21, 1926, *Standley & Valerio 45576* (US); Quebrada Serena, southeast of Tilarán, Prov. Guanacaste, alt. 700 m., Jan. 27, 1926, *Standley & Valerio 46139, 46164, 46190* (US); El Roble, 9,500 feet, May 16, 1928, *Stork 2021*; "El Rodes," Villa Colón, alt. 840 m., 7 octubre 1934, *Valerio 957*; Tapantí, alt. 1,200 m., July 6, 1936, *Valerio 1442*.

Panama: corolla glabrous, corona 3-pronged, a suffrutescent liana in clearings, valley of upper Río Chiriquí Viejo, vicinity of Monte Lirio, alt. 1,300–1,900 m., June 27–July 13, 1935, *Seibert 300* (type, MO).

This species is quite characteristic by reason of its small flowers (1 mm. long or even less) and by the veins of the leaves that are fewer than in most species and subparallel to the margins.

This species appears in the "Flora of Costa Rica" as *Cynanchum sepium* (Dcne.) Standl. but the description given there does not fit this species. All the specimens in our herbarium had been named as *C. sepium*.

### ***Cynanchum longicoronatum* L. Wms. sp. nov.**

Herbae volubiles usque ad 1 m. vel ultrae, sparse pilosae, pubescencia unifariam; folia lanceolata vel ovato-lanceolata, acuminata, apiculata, breviter petiolata, glabra vel ciliata; inflorescentia alterno-lateralis, subumbellata, folia multo breviora; calyx quinquelobatum, lobi lineari-lanceolati, acuti; corolla campanulata, lobi lanceolati, acuti, recurvati, intra pubescenti; lobi coronae lineari-lanceolatae, longitudine gynostemium duplo superantes; gynostemium stipitatum.

Slender twining herbaceous plants, the stems perhaps a meter or more long and mostly less than 1 mm. in diameter, sparsely pilose pubescent in single lines; leaves lanceolate or ovate-lanceolate, acuminate and apiculate, short petiolate, glabrous but obscurely ciliate, the lateral nerves 7–10 pairs, 1.5–3 cm. long and 0.4–1.2 cm. broad, petiole short, puberulous, 2–4 mm. long; inflorescences borne alternately from the axil of each pair of leaves, subumbellate, flowers 2–8, peduncle 0.5–1.5 cm. long, puberulous pedicels mostly about 1 mm. long; flowers white; calyx divided to the base or nearly so, the lobes linear-lanceolate, acute, glabrous or nearly so, about 1 mm. long; corolla campanulate, divided to near the base, about 3.5 mm. long, the lobes lanceolate, acute, recurved, glabrous outside, puberulent along the margins inside (not barbellate), the lobes about 2 mm. long and 1 mm. broad; corona about 2 mm. long, the lobes linear-lanceolate, about twice as long as the gynostemium; gynostemium stipitate, about 1 mm. long; capsules (immature) 2–3 cm. long, long rostrate, glabrous.

Mexico: vine, flowers white, steep slope with *Quercus* and *Pinus*, 3 miles south of Aguacatenango, along the road to Pinola Las Rosas,

municipio de Venustiano Carranza, Chiapas, alt. 5,600 feet, July 22, 1965, *Breedlove 11211*; vine, flowers white, slopes with *Quercus* and *Pinus*, 17 miles east of La Trinitaria, along road to the Lagos de Montebello, municipio de La Trinitaria, alt. 5,000 feet, July 26, 1965, *Breedlove 11324*; vine, flowers white, steep slope with *Quercus* and *Pinus*, 3 miles south of Aguacatenango along road to Pinola Las Rosas, municipio de Venustiano Carranza, alt. 5,600 feet, October 13, 1965, *Breedlove & Raven 13132*; vine, flowers white, steep slope with *Quercus* along Mexican Highway 190, 3 miles south of La Trinitaria, municipio La Trinitaria, alt. 5,100 feet, October 14, 1965, *Breedlove & Raven 13199* (type F; DS).

Superficially like other of the *Cynanchum* § *Metastelma* species of Central America and Mexico. This one has the longest corona lobes of any species of the section *Metastelma* known to me, the peduncles are rather long, both characters which point to a relationship with *C. stenomeres* Standl. & Steyerl.

### *Cynanchum miserum* L. Wms. sp. nov.

Herbae vel plantae suffruticosae volubiles. Caules graciles, striati, sparse pubescenti vel glabri, paucifolii; folia lineari-lanceolata, acuto-apiculata vel acuminata, glabra; inflorescentia sessilis, pauciflora; calyx perbrevis, lobi lanceolato-triangulari, acuti; corolla campanulata, glabra, lobi triangulari, obtusi, perbreves; lobi coronae lanceolati, obtusi; gynostegium stipitatum.

Twining and often reed-like herbaceous or suffrutescent vines. Stems slender, striated at least when dry, internodes 2–4 cm. long, sparsely puberulent to glabrous and somewhat vernicose, mostly 0.5–1 mm. in diameter; leaves sparse, soon deciduous, linear or linear-lanceolate, acute-apiculate to acuminate, with 2–3 pairs of obscure lateral nerves, the lowest pair subparallel to the margin, glabrous or dorsally the mid-nerve puberulent, about 1–3 cm. long and 0.1–0.4 cm. broad; inflorescence sessile (not pedunculate), few-flowered (1–5) fascicles at leafless nodes, pedicels of the flowers mostly about 2 mm. long, glabrous or puberulous; calyx to about 0.5 mm. long, the lobes lanceolate-triangular, acute, puberulous; corolla campanulate, glabrous, about 1 mm. long, the lobes subtriangular, obtuse, about 0.3 mm. long; corona lobes lanceolate, obtuse, about 0.3 mm. long, overtopping the gynostegium; gynostegium stipitate, about 0.5 mm. long; capsule slender, 4–5 cm. long.

Mexico: vine, flowers white, steep slopes along the river of Chik Há, barrio of Yashanal, paraje of Matsab, municipio of Tenejapa, Chiapas, alt. 5,500 feet, July 17, 1965, *Breedlove 11118* (F, DS).

Guatemala: vine along small stream, hills north of finca Piamonte, between finca Piamonte and summit of Volcán Santa Luisa, Dept. El Progreso, alt. 2,400–3,333 m., Feb. 5, 1942, *Steyermark 43476*; between Yulhuitz and Maxbal, Sierra de los Cuchumatanes, Dept.

Huehuetenango, alt. 1,400–1,500 m., July 15, 1942, *Steyermark 48688*; above la Libertad on Cerro Pueblo Viejo, Dept. Huehuetenango, alt. 1,900 m., August 20, 1942, *Steyermark 51008*; im Walde in Pansamalá, von einem Baum herabhängend, Dept. Alta Verapaz, 3800, Juli 1887, *Türckheim 1290* (type US; GH; F); Coban, Dept. Alta Verapaz, alt. 1,500 m., August 1907, *Türckheim II 1911* (US).

This species is easily distinguished among those from adjacent Mexico and Central America by the sessile flower fascicles, which are essentially subumbellate as in other members of section *Metastelma*, but without a measurable peduncle; the flowers are very small and the corolla lobes are but about one-third the length of the campanulate corolla. The leaves seem to be soon deciduous and older specimens are leafless.

**Cynanchum palustre** (Pursh) Heller, Cat. N. Am. Pl. 6. 1898. *Ceropegia palustris* Pursh, Fl. Am. Sept. 1: 184. 1814. *Vincetoxicum palustre* Gray, Syn. Fl. N. Am. 2<sup>1</sup>: 102. 1878.

British Honduras: climbing 2–3 feet high in saline swampy ground, Manatee Lagoon, April 10, 1906, *Peck 405* (GH).

The only record that I have seen for this species in Central America is the specimen cited above. The species is apparently occasional in saline swamps in the southeastern United States and is reported from West Indies. The species does not fit well into the genus *Cynanchum* but is better there than in any of the other genera of Central America.

### **Cynanchum rubens** L. Wms. sp. nov.

Herbae volubiles usque ad 1 m. vel ultrae, sparse pubescentes vel glabrae; folia lineari-lanceolata vel lanceolata, acuminata, ciliolata, breviter petiolata; inflorescentia subumbellata, 5–8-flora, flores rubescentes; calyx 5-lobatum, lobi ovato-lanceolati, acuti; corolla rotata, lobi oblongo-ovati, acuti; corona carnosae, 5-lobata, lobi subcochleati, rotundati; gynostegium generis.

Twining vines to a meter or perhaps longer. Stems slender, crisped pubescent in lines or glabrous, 1–1.5 mm. in diameter; leaves linear-lanceolate or lanceolate, acuminate, obscurely ciliate, lateral nerves 4–5 pairs, obscure, 2–5 cm. long and 0.4–0.8 cm. broad, petiole short, puberulent, 1–5 mm. long; inflorescence axillary, subumbellate, mostly 5–8-flowered, the peduncle short, about 2–3 mm. long, the pedicels of the flowers 2–3 mm. long, obscurely puberulent; flowers maroon; calyx lobes ovate-lanceolate, acute, puberulent, about 1 mm. long and half as broad; corolla rotate, completely glabrous, about 2 mm. long, deeply lobate, the lobes oblong-ovate, acute, about 1.3 mm. long and 1 mm. broad; corona fleshy, 5-lobate, the lobes alternate with the corolla lobes, subcochleate, rounded, about 0.5 mm. high; gynostegium about 1 mm. high.

Guatemala: twining slender vine, flowers maroon, in cypress forest, Santa Elena, Dept. Chimaltenango, alt. 2,400-2,700 m., July 27, 1933, *Skutch 503* (type, US).

The species is easily distinguished by the fleshy corona with rounded lobes shorter than the gynostegium, and the completely glabrous corolla and maroon flowers. The type is the only specimen known.

***Cynanchum schlechtendalii*** (Dene.) Standl. & Steyerl. *Field Mus. Bot.* 23: 226. 1947. *Metastelma schlechtendalii* Decaisne in DC. *Prodr.* 8: 513. 1844. *Metastelma decipiens* Pittier, *Contr. U. S. Nat. Herb.* 13: 97, *fig.* 1910.

This species was originally described on a Schiede specimen from Mexico, number 159, of which there is a phototype in Field Museum. I believe that this is the commonest species of *Cynanchum* in south Mexico and Guatemala, extending as far as El Salvador. Like most other species of the genus it has had a number of names applied to it on the material that is to be found in herbaria. I include here specimens with narrowly oblong-lanceolate corolla lobes which are densely barbellate within, the corona filaments are slightly longer than the gynostegium, the leaves are mostly lanceolate or ovate-lanceolate and are provided with obvious lateral nerves and are glabrous, the peduncles are short and several-flowered. The species as I have treated it may well be an aggregate.

A closely related species is *C. chiapense* (Gray) Standl. & Steyerl. This species is most easily distinguished by the usually narrower leaves that do not have obvious lateral veins. *Cynanchum barbigerrum* (Scheele) Shinn. may well belong to this aggregate.

***Cynanchum sepicola*** (Pittier) L. Wms. *comb. nov.* *Metastelma sepicola* Pittier, *Contr. U. S. Nat. Herb.* 13: 98, *fig.* 5. 1910.

The species is not closely related to any other species known to me to occur in Central America. The ovate lobes of the corona and the long columnar base of the gynostegium are outstanding. The long pedunculate inflorescence occurs also in *Cynanchum woodsonianum* L. Wms. The species is known only from Costa Rica.

***Cynanchum sepium*** (Dene.) Standl. *Contr. U. S. Nat. Herb.* 23: 1177. 1924. *Vincetoxicum sepium* Decaisne in DC. *Prodr.* 8: 526. 1844.

There is available a phototype and a fragment of this species (F 26998). It shows a good specimen but only one inflorescence partially hidden by the stem of the plant. The leaves on this plant are the only ones that I know for the area that have the two lowest lateral veins paralleling the margin of the leaf almost to the middle, and at the same time a pedunculate inflorescence. I have only two specimens from Guatemala that seem to match the photograph, *Morales 1233* from the department of Chimaltenango, and *Skutch 914* from the department of Quezaltenango.

### *Cynanchum trichophyllum* L. Wms. sp. nov.

Herbae volubiles, piloso-pubescentes. Folia oblongo-lanceolata vel ovato-lanceolata, acuminato-apiculata, baso obtuso vel rotundato; inflorescentiae alternolaterales, folia breviora vel subaequalia; calyx 5-lobatum, lobi lanceolato-oblongi, obtusi; corolla subcampanulata, profunde divisa, lobi lineari-oblongi vel lineari-lanceolati, obtusi, reflexi, intra barbellati; lobi coronae lineari-lanceolatae; gynostegium stipitatum.

Slender plants often twining and forming dense mats over shrubs and trees, stems to several meters long and mostly about 1 mm. in diameter, herbaceous or at most suffrutescent; entire plant with soft, spreading pubescence; leaves oblong-lanceolate to ovate-lanceolate, acuminate-apiculate, obtuse or rounded at the base, lateral nerves evident, mostly 5-8 pairs, sparsely to densely pilose pubescent on both surfaces, (0.6-)1-3 cm. long and (0.2-)0.5-1 cm. broad, petioles slender, mostly 2-4 mm. long; inflorescences, abundant, subumbellate, usually borne in alternate axils of each succeeding pair of leaves, sometimes in both axils of a pair of leaves, each bearing 4-10 flowers, from somewhat shorter to about as long as the subtending leaves or rarely longer, peduncles 2-10 mm. long (mostly 5-6 mm.), pedicels very slender, mostly about 2-3 mm. long; flowers white or cream color; calyx deeply 5-lobed, pilose outside, the lobes at anthesis about 0.5-0.7 mm. long, lanceolate-oblong, obtuse, eglandular within; corolla subcampanulate, divided almost to the base, 2.5-3 mm. long, the lobes about 2-2.5 mm. long and 0.6-0.8 mm. broad, linear-oblong or linear-lanceolate, obtuse, tip reflexed, glabrous outside, prominently barbellate at the tip inside with two lateral lines of pubescence extending to the base of the lobe, glabrous or glabrescent between these lines; corona about 1 mm. long or less, the lobes linear-lanceolate, slightly exceeding the gynostegium in length; gynostegium stipitate, about 1 mm. long; capsule 2.5-5 cm. long, mostly about 4 cm., and about 4-5 mm. in diameter near the base, long apiculate, densely pilose pubescent.

Honduras: flores blancas, bejuco sobre *Opuntia* sp. Colinas y sabanas abiertas cerca Río Telica, camino a Montaña Uval, departamento de Olancho, alt. 550 m., November 20, 1963, *Molina 13344* (type F; EAP; LL; others).

Mexico: the following all from the state of Chiapas: *Breedlove & Raven 13270, 13314, 13531; Roe, Roe & Mori 997.*

There is in addition the following material from the departments of Morazán, El Paraíso, Olancho, and Comayagua in Central Honduras, cited by collectors and numbers. There are undoubtedly many more specimens in EAP which are not cited here: *Edwards P-510; Molina 554, 714, 900, 1246, 1378, 5135, 13226, 13243, 13370, 18455, 18607; Standley 247, 827, 1083, 2298, 13608, 13662, 13844, 18029, 18213, 26696; Williams & Molina 11149, 11157, 14719; Williams & Williams 18357; Valerio 1134, 1404, 1995.*

This species is most closely related to *Cynanchum schlechtendalii* from which it is most easily distinguished by the abundant indument covering the plants.

The specimens cited will be found in herbaria under *Cynanchum schlechtendalii* and *C. sepium*.

***Cynanchum woodsonianum*** L. Wms. nom. nov. *Metastelma pedunculare* Decaisne in DC. Prodr. 8: 514. 1844, not *Cynanchum pedunculare* Lam. 1786.

Guatemala: Cuesta de Pinula, *Hartweg 601* (Phototype F, no. 26944 from G, also fragment from type, F); Alameda, Dept. Chimaltenango, Sept. 30, 1937, *Johnston 1022* (F); flowers greenish-white, brushy slopes, Cuesta de Las Cañas above Antigua, Dept. Sacatepéquez, alt. about 1,950 m., Dec. 6, 1938, *Standley 58915* (F); on *Quercus*, same locality, *Standley 58916* (F); twining over shrubs in cloud forest, Volcán Quezaltepeque 3-4 miles northeast of Quezaltepeque, alt. 1,500-2,000 m., Nov. 8, 1939, *Steyermark 31492* (F).

This is one of the more distinct species in Guatemala and is easily distinguished by the long pedunculate, few-flowered inflorescence. Standley or Woodson had determined all the recent specimens as *Metastelma pedunculare* Dene. but Standley changed his mind when he prepared the preliminary manuscript for "Flora of Guatemala" and annotated them all as *Cynanchum schlechtendalii*, except one and this was annotated as *C. sepium*. The name *Metastelma pedunculare* was placed in synonymy under *C. schlechtendalii*.

This small plant is renamed for Dr. Robert E. Woodson, who has done so much to make the genera of American Asclepiadaceae understandable.

FISCHERIA DC. is a small genus with several species in South America, represented in the West Indies by perhaps two species. In Central America and Mexico there are two species, one certainly a widespread one extending along the lowlands from Mexico to Argen-

tina and the other a highland species described below, related to a highland species from Colombia.

The name *Fischeria martiana* Dcne. is being used in "Flora of Guatemala" for the lowland species. The use of this name seems reasonable to me but it is possible that there may be an older name for the taxon. There are, almost certainly, names published at the same time by Decaisne in De Candolle's *Prodomus* that represent the same taxon—*F. rotundifolia* Dcne. is one.

The curious thing is that a highland species known from Costa Rica, and easily distinguished superficially, was passed over by Standley as being the same as the lowland *F. martiana* (which he called *F. funebris*). The species seems to be more closely allied to *F. viridis* Moldenke from Colombia and Venezuela than to *F. martiana*.

### ***Fischeria brachycalyx* L. Wms. sp. nov.**

Herbae vel lianae suffruticosae, volubiles, usque ad 7 m. vel ultrae et caules usque ad 1 cm. diam., scopatae. Folia longe petiolata, anguste ovata vel oblanceolata-ovata, acuminata, basi obtusi vel cordato-auriculata, dense piloso-pubescentia; inflorescentia folia subaequalia, subumbellata, 8-10-flora; calyx pubescens, 5-lobata, lobi breves, lanceolati vel latiori, acuti, dense villosi; corolla rotata, profunde 5-lobata, lobi ovati vel lanceolato-ovati, obtusi, piloso-pubescenti; appendices antherorum cornei.

Scandent herbs or suffruticose vines to 7 meters high, the stems to 1 cm. or perhaps more in diameter, terminal portions densely hirsute pubescent with spreading septate hairs and with subglandular muriculate protruberance on the surface of the stem; leaves long petiolate, narrowly ovate to oblanceolate-ovate, acuminate, obtuse and shallowly cordate-auriculate at the base, densely pubescent on both sides with short pilose, septate hairs, with 4-7 pairs of lateral nerves, prominent below and joined with many reticulate tertiary nerves, the blade 9-15 cm. long and 3.5-7 cm. broad, the petioles slender, spreading pilose pubescent, 2-4 cm. long; inflorescences borne alternately from the leaf axils, about as long as the subtending leaves, subumbellate, with about 8-10 flowers, the pedicels when mature to about 3 cm. long, spreading, pilose; flowers pale green, to about 2 cm. in diameter when fresh; calyx short, divided to the base, the 5 lobes lanceolate or broader, acute, densely pilose dorsally with shorter hairs underneath, about 5-6 mm. long and 2 mm. broad; corolla rotate, deeply 5-lobed, about 14-16 mm. broad, the lobes ovate or lanceolate-ovate, obtuse, slightly constricted toward the apex, pilose pubescent, less so below, 5-7 mm. long and 5 mm. broad, faucal appendage thick and fleshy, the margin fimbriated, obscurely 5-lobate, the lobes toward the sini of the corolla; anthers with prominent dorsal appendage, the appendage corneous and about 1 mm. long; gynostegium typical of the genus; ovary densely pubescent; follicles unknown.

Costa Rica: La Palma de San Ramón, 26 agosto 1928, *Brenes 6296*; "El Silencio" de Tilarán, 31 mayo 1932, *Brenes 15671*; Las

Palma de San Ramón, agosto 3-10, 1935, *Quirós 174*; scandent suffruticose vine, stems covered with stiff hairs, to 7 meters high the terminal part of stem pendent, edge of woodland in semi-shade, caribbean watershed cloud forest, La Peña de Zarcero, Cantón de Alfaro Ruíz, Province of Alajuela, alt. 1,350 meters, September 19, 1938, *Austin Smith H1211* (type, F); El Retiro, Santa Cruz de Turrialba, alt. 1,400 m., Enero 1941, *Valerio 1327*.

The species is easily distinguished from *Fischeria martiana* which is the only other species of the genus known in Mexico and Central America, by the very short calyx lobes, smaller flowers, and by details of the corona and gynostegium. This species is a mountain species, the known localities all about 1,000 meters while *F. martiana* is found along or near the Atlantic lowlands from Mexico to Argentina. *Fischeria viridis* Moldenke and *F. colombiana* Schltr. are both mountain species from Colombia and Venezuela to which the present species is somewhat related.

GONOLOBUS, like some other genera of the Asclepiadaceae that have their center of distribution in Mexico, becomes less common in Guatemala and almost disappears from the flora before the southern extremity of the interisthmian region is reached. There are 20 species of *Gonolobus* in the account for the "Flora of Guatemala" and only two of these extend into Mexico beyond the Isthmus of Tehuantepec. There are six species found in the Mexican state of Chiapas, including those described below, which are not known to extend into Guatemala although some of them are to be expected. Southward from Guatemala to Panama there have been described 14 species of *Gonolobus*. There are some 85 species of *Gonolobus* known from Mexico and Central America. The 26 species known from the Chiapas-Guatemalan area, indicate again that the region is one of high endemism in Asclepiadaceae.

### ***Gonolobus breedlovei* L. Wms. sp. nov.**

Lianae herbaceae vel suffruticosae. Folia lanceolato-cordata vel oblongo-cordata acuminata utrinque pubescentes. Petioli gracili, lamina subaequales; inflorescentia cymosa folia subaequalis; lobi calyces lineari-lanceolati acuti; lobi corollae lineari-lanceolati acuminati; corona exterior inconspicua; corona interior carnosa lobi rotundati; folliculus ignotus.

Herbaceous or suffrutescent vines, the stems with spreading pubescence of multicellular hairs. Leaves lanceolate-cordate to oblong-cordate, acuminate, sparsely strigose pubescent on both surfaces, perhaps glabrescent with age, 6-9 cm. long and 2.5-5 cm. broad, the slender sparsely pubescent petioles 4-7 cm. long; inflorescences 4-10-flowered subumbellate cymes about as long as the subtending

leaf, the glabrescent peduncles 4–6 cm. long, the pedicels 4 cm. long or less; calyx lobes linear-lanceolate, acute, sparsely pubescent, 3–5 mm. long and about 1.5 mm. broad at the base; corolla green, glabrous or obscurely puberulent outside with a short inconspicuous tube about 1 mm. long, the lobes linear-lanceolate, attenuate acuminate, spreading at anthesis, about 15 mm. long and 4 mm. broad at the base, one margin of each lobe subsphacellate; faucal corona inconspicuous, lobulate; inner corona fleshy, 5-lobate, the lobes rounded and opposite the corolla lobes; dorsal appendages of the anthers entire, rounded; fruits unknown.

Mexico: flowers green, vine; steep slopes at El Sumidero, 22 km. north of Tuxtla Gutiérrez, Municipio of Tuxtla Gutiérrez, Chiapas, alt. 4,500 feet, July 4, 1966, *Breedlove 14412* (type F; DS).

*Gonolobus breedlovei* forms the third member of a small group of *Gonolobus* in which the corolla lobes are very long and slender. The other two members of the group are *Gonolobus versicolor* Woodson and *Gonolobus longipetiolatus* Woodson, both known only from Guatemala. *Gonolobus breedlovei* is more closely related to the latter but may be distinguished by several characters: the calyx lobes are broader and shorter; the corolla lobes are longer and more attenuate; the leaves are deeply cordate at the base, not merely truncate; the inflorescences are nearly as long as the leaves instead of about half as long.

It is a pleasure to name this attractive vine for its discoverer who has collected a great many fine specimens from southern Mexico and adjacent Guatemala.

### ***Gonolobus donnellsmithianus* L. Wms. sp. nov.**

Lianae herbaceae vel suffruticosae. Folia elliptica vel elliptico-oblonga, acuminata, basem acuta vel leviter truncata, utrinque pilosa, petioli breves, erecto-pilosi; inflorescentia subumbellata pedunculus brevis; calyx extus pubescens, lobi triangulari-lanceolati vel lanceolati, acuti; corolla extus sparse pubescens, lobi lineari-oblongi, obtusi, cucullati, intus glabri; corona erecta, apicem obscure lobata et ciliata.

A herbaceous or suffrutescent vine with stems spreading pilose pubescent. Leaves elliptic or elliptic-oblong, acuminate, acute to obscurely truncate at the base, sparsely fulvous pilose on both surfaces, the blade (2–)6–10 cm. long and (1–)2.5–4 cm. broad, the petioles of a pair slightly unequal, spreading pilose-pubescent, about 4–14 mm. long; inflorescence a subumbellate cyme 6–10-flowered, the peduncle about 1 cm. long, the pedicels to 1.5 cm. long, puberulent; calyx pubescent dorsally, divided nearly to the base, the lobes triangular-lanceolate or lanceolate, acute, 2–3 mm. long; corolla sparsely pubescent dorsally, deeply lobate, the lobes linear-oblong, obtuse, cucullate, glabrous within, about 5 mm. long and 2 mm. broad; faucal corona about 1 mm. high, obscurely lobate and ciliate pubescent at the apex, sides and base glabrous; staminal appendages furcate, the branches slender and arcuate; fruit unknown.



FIG. 1. *Gonolobus donnellsmithianus*. A, habit,  $\times \frac{1}{2}$ . B, flower in natural position showing petals, corona and gynostegium,  $\times 4$ . C, calyx and ovaries (stigma removed),  $\times 5$ .

Guatemala: vine, corolla greenish, on El Caribal trail, about 500 m. S.W. of Lacandon in *Acahual*, department of Petén, February 8, 1962, *Contreras 3364* (type LL; artist's sketch F).

This species is related to *Gonolobus xanthotrichus* Brandege. It is distinguished by the smaller flowers in which the inner face of the corolla is glabrous, the faucal corona with the margin obscurely lobate and ciliate at the apex.

There are five closely related species in the Chiapas-Guatemalan region, all having a prominent faucal corona which is erect. These species are *G. chiapensis*, *G. calycosus*, *G. stenosepalus*, *G. xanthotrichus*, and the species described here. *Gonolobus lasiostemma* also has a prominent faucal corona but is not closely related to this group.

This species commemorates Captain John Donnell-Smith who pioneered in the study of the Central American flora.

**Gonolobus edulis** Hemsl. Biol. Cent. Am. Bot. 2: 331. 1882.  
*Vincetoxicum edule* Standl. Contr. U. S. Nat. Herb. 23: 1680. 1926.

Hemsley described this species based upon two specimens, one a Friedrichthal specimen from Guatemala and the other *Endres 213* from Costa Rica. There is no indication of which of these two specimens had best be selected as type although I should perhaps choose *Endres 213*. Miss S. M. King at Kew has made analytical drawings of the "syntypes" and I believe them to be the same species. This species is as yet unknown from Guatemala except by the Friedrichthal specimen bearing a Guatemalan label.

Friedrichthal collected in Costa Rica, Nicaragua, and Guatemala (and perhaps later in Yucatan). To the best of my knowledge all of Friedrichthal's specimens were distributed with a uniform label indicating that they were collected in Guatemala. Most of the specimens probably came from Nicaragua and Costa Rica. There are quite a number of Friedrichthal's collections ascribed to Guatemala that are found no nearer than Costa Rica, *Gonolobus edulis* seems to be one of these.

### **Gonolobus roeanus** L. Wms. sp. nov.

Lianae herbaceae ramosae caulibus sparse hirsutae. Folia longe petiolata cordata vel oblongo-cordata acuata vel acuminata, laete pubescentia, petioli graciles puberulenti; inflorescentia subumbellata pedunculata pauci-pluri-flora; calyx glabrus, lobi lineari vel lineari-lanceolati acuti; corolla subrotata vel lobi reflexi, lobi oblongi vel oblongo-ovati obtusi; corona corollae carnosa ciliata; corona interior carnosa lobata vel leviter fimbriata; folliculi ignoti.

Branched vines with sparsely hirsute stems. Leaves long petiolate, the blades cordate or oblong-cordate, acute or somewhat acuminate, sparsely and obscurely short pubescent on both surfaces, nerves conspicuous, about 5 pairs with secondary reticulate nerves, mature leaves 4–6 cm. long and 2–3 cm. broad, petioles slender, puberulent, 2–4 cm. long; inflorescences subumbellate, axillary, pedunculate, few-several-flowered, peduncles 1–2 cm. long, pedicels 0.5–1.5 cm. long; flowers pale brown, small; calyx glabrous or nearly so, divided to the base, lobes linear or linear-lanceolate, acute, about 5-nerved, 2.5–3 mm. long and 0.5–0.7 mm. broad; corolla puberulent outside, glabrous within except corona, deeply lobed, subrotate or lobes reflexed, 10–12 mm. broad, lobes oblong or oblong-ovate, obtuse, reticulate veined, about 4 mm. long and 2 mm. broad; faucal corona fleshy, erect, margin ciliate, about 0.5 mm. high; inner corona surrounding gynostegium, carnose, lobate or somewhat fimbriate, glabrous, shorter than the gynostegium; gynostegium about 1 mm. high; follicles unknown.

Guatemala: vine growing among shrubs, flowers pale brown, in dense partially disturbed tropical evergreen forest on deep layer of volcanic ash and cinders along Pacific escarpment, 3 km. south of Alotenango on highway 14, Dept. Sacatépequez (14°25' N; 90°41' W), alt. 1,500 m., August 1–2, 1965, *Keith Roe, Eunice Roe, Scott Mori 813* (type F; WIS).

This species is very closely allied to *Gonolobus niger* (Cav.) R. Br. It may be easily distinguished by the ciliate faucal corona, brown and not deep purple ("black") flowers; narrower and longer calyx lobes.

This species brings to attention, as have others which have been "found" during the course of these studies for preparation of an account for "Flora of Guatemala," that most Asclepiadaceae have been avoided as a plague. Once collected, some sort of name was put onto the specimen and then conveniently forgotten.

### ***Gonolobus stramineus* L. Wms. sp. nov.**

Lianae herbaceae vel suffruticosae crines straminei muniti. Folia oblongo-lanceolata vel ovato-lanceolata, acuminata, piloso pubescens, petioli pilosi; inflorescentia pauciflora, pedunculus brevis; lobi calycis ovati vel lanceolato-ovati ciliati obtusi vel acuti; lobi corollae oblongo-ovati obtusi leviter cucullati glabri; corona erecta glabra intus ciliato pubescens; fructus ignotus.

Herbaceous or suffrutescent vines having a greenish-yellow caste due to abundant segmented pilose pubescence, stems erect pilose pubescent. Leaves oblong-lanceolate to ovate-lanceolate, long acuminate, yellowish pilose pubescent below, less so above, with 5–7 pairs of lateral nerves, 7–16 cm. long and 2–6.5 cm. broad, petioles spreading pilose, short, 1.5–2.5 cm. long; inflorescence few-flowered (1–4), borne on short peduncles 5–10 mm. long, pedicels 1–2 cm. long; calyx sparsely pubescent dorsally, divided to the base; calyx lobes ovate or lanceolate-ovate, obtuse or acute, ciliate, 8–10 mm. long and 4–5 mm. broad, provided with a small mammillate gland in each sinus; corolla divided almost to the base, glabrous on both surfaces, the lobes oblong-ovate, obtuse, somewhat cucullate, 8–10 mm. long

and 4–5 mm. broad; faucal corona tubular, erect, about 3 mm. high and 3.5 mm. in diameter, glabrous outside, downy pubescent inside at the apex; anther appendage fleshy, bilobate; fruit unknown.

Mexico: Carelas near Motozintla, Chiapas, alt. 2,176 m., 27 abril 1945, *Matuda 15518* (type F; LL).

The specimen in Lundell Herbarium bears the number 5518 which Prof. Matuda later changed to 15518. The collection is the same.

There are now six closely allied species in the group of *Gonolobus* to which this belongs, all of them in Chiapas and Guatemala, one extending as far as Nicaragua. They are characterized by a rather prominent, erect and tubular faucal corona which may be as short as 1 mm. but more often higher. The original one of the group was set apart by Baillon (Hist. Pl. 10: 287. 1891) as *Trichostelma*.

Most closely related to *G. calycosus* (Donn.-Sm.) Woodson but easily distinguished by the smaller calyx and corolla with differently shaped lobes.

***Gonolobus uniflorus*** HBK. Nov. Gen. & Sp. Pl. 3: 207, *t.* 238. 1819. *Vincetoxicum uniflorum* Standl. Contr. U. S. Nat. Herb. 23: 1192. 1924.

There are a number of names that apply to plants that are very closely related to *G. uniflorus* or which are synonymous with it. A monographic study will show whether they are to be placed together or how many of them are to be maintained as separate species. Among the closely related taxa are *Gonolobus macranthus* Kunze, *G. erianthus* Dene., *G. luridus* Dene., *G. nemorosus* Dene., and perhaps others. Much of the Mexican and Guatemalan material we have separated as *G. leianthus* Donn.-Sm. which would seem to be a quite distinct species.

***Gonolobus xanthotrichus*** Brandegee, Zoe 5: 251. 1908. *Trichostelma oblongifolius* Donn.-Sm. Bot. Gaz. 48: 296. 1909. *Vincetoxicum xanthotrichum* Standl. Contr. U. S. Nat. Herb. 23: 1193. 1924. *Gonolobus oblongifolius* Woodson, Ann. Mo. Bot. Gard. 28: 243. 1941.

This species is now known to occur in Mexico and Guatemala. Donnell-Smith's description of *Trichostelma oblongifolius* was written from inadequate material but comparison of a fragment from the type with a specimen of an isotype of *Gonolobus xanthotrichus* proves them to be the same.

MARSDENIA R. Br. is to be found in the warmer regions of both hemispheres. There are fewer than 30 species in tropical North America of which 15 have been found in Guatemala.

**Marsdenia bourgeana** (Baill.) Rothe in Engler, Bot. Jahrb. 52: 408. 1915. *Pseudomarsdenia bourgeana* Baill. Hist. Pl. 10: 268. 1890. *Marsdenia gymnemoides* Rothe, l.c. 409. *Marsdenia gilgiana* Rothe, l.c. 410.

Authentic material of all three of the species combined above is at hand in Field Museum. It leaves little doubt that these are to be considered as a single species, as they will be in the next part of the "Flora of Guatemala." The species is most closely allied to *M. mexicana* Dcne.

### **Marsdenia cuneata** L. Wms. sp. nov.

Lianae suffruticosae glabrae. Folia oblanceolata, acuta vel acuminata, glabra, basi cuneati, petioli brevi, basi stipulati; inflorescentia axillaris fasciculata, paucimultiflora; calyx usque ad basem divisus, lobi ovati vel oblongo-ovati, obtusi, ciliato-fimbriati; corolla campanulata, usque ad medium divisa, lobi suborbiculari, intus obscure pubescens; gynostegium stipitatum; folliculi ignoti.

Suffruticose vines, the stems glabrous, with few lenticular lenticels. Leaves of a pair subequal, lighter in color below, oblanceolate, acute or acuminate, cuneate to the base, glabrous, the blades 8-14 cm. long and 2-3 cm. broad, the lateral veins inconspicuous, petioles to 1.5 cm. long, each provided with 2 narrowly triangular stipules at the base, these about 0.7 mm. long, interpetiolar lines evident; inflorescences axillary, fascicular, several-many-flowered, peduncles very short or none, pedicels puberulent, 2-4 mm. long; calyx divided to the base, the lobes ovate or oblong-ovate, obtuse, ciliate-fimbriate, 2-3 mm. long, provided with a small horn-shaped callus in each sinus; corolla purple, glabrous outside, campanulate, divided to about the middle, 4-5 mm. long, the lobes suborbicular, 2-2.5 mm. long and as broad, obscurely pubescent on inner surface; gynostegium stipitate, about 1.5 mm. long faucal corona obscurely lobate, fleshy, anthers terminated with an inflexed ovate membrane about 0.5 mm. long; follicles unknown.

Guatemala: vine, corolla lobes deep dull purple, leaves deep green above, pale green beneath, above canyon of Paso del Boquerón along Río Trapichillo below La Libertad, Dept. Huehuetenango, alt. 1,200-1,300 m., Aug. 21, 1942, *Steyermark 51206* (type F).

Most closely related to *M. blepharodes* Standl. & Steyer., a species also native of the highlands of western Guatemala that has three or four pairs of quite conspicuous nerves on the under surface of the leaf while the present species (with more coriaceous leaves) has no obvious lateral nerves. The calyx lobes are strigillose outside, merely ciliate in the present species; the cuneate base of the leaf in

this extends onto the petiole almost to its attachment while in *M. blepharodes* there is a long unwinged petiole.

**Marsdenia maculata** Hook. f. Bot. Mag. 73: t. 4299. 1847, was placed by Rothe, in his revision of the genus, as a synonym of *M. macrophylla* (Humb. & Bonpl.) Fourn. The plants determined by Rothe with that name perhaps belong to three or more species. Hooker's *M. maculata* seems to be one of these and is represented certainly by specimens from the Atlantic region of Mexico and Central America. A single specimen with flowers is known from Guatemala, in the department of Petén, *Lundell 16062*.

### **Marsdenia pinetorum** Standl. & L. Wms. sp. nov.

Lianae herbaceae vel suffruticosae, graciles. Folia anguste oblongo-lanceolata, acuta, glabra, basi obtusi vel truncati, petioli gracili glabri; inflorescentia axillaris, cyma pauciflora; lobi calyces oblongo-ovati, obtusi; corolla rotata vel late campanulata, lobi oblong-ovati, obtusi, glabri vel intus puberuli; folliculi ignoti.

Herbaceous or suffrutescent vines, the stems slender, pubescent but soon glabrate. Leaves narrowly oblong-lanceolate, acute, obtuse to truncate at the base, glabrous, veins 6-10 pairs, most conspicuous below on the lighter surface, the blade 3-8 cm. long and 1-3.5 cm. broad, the petioles slender, glabrous, those of a pair subequal, mostly less than 1 cm. long; inflorescence a few-flowered axillary cyme borne on a peduncle half as long as the subtending leaf, the peduncle crisped pubescent in lines, pedicels slender, pubescent, to about 1 cm. long; calyx divided nearly to the base, the lobes oblong-ovate, obtuse, with minute elongated glands within, ciliolate or not, about 1 mm. long; corolla rotate or broadly campanulate, deeply lobate, glabrous outside, about 3 mm. long, the lobes oblong-ovate, obtuse, about 2.5 mm. long and 2 mm. broad at the base, glabrous or obscurely puberulent within; gynostegium about 1 mm. high, corona somewhat thickened; folicles unknown.

Honduras: vine in shrubs in pine-oak forest near Hoya Grande, drainage of Río Yeguaré, longitude 87° W., latitude 14° N. Dept. Morazán, alt. 1,500 m., Aug. 17, 1947, *Williams & Molina 13272* (type F; EAP).

Perhaps most closely related to the Guatemalan *M. steyermarkii* from which it is distinguished by the small flowers with the smallest calyx of any Central American species. The deeply-lobed corolla almost glabrous within is distinctive, as is the lack of dorsal flaps on the anthers.

### **Marsdenia tubularis** L. Wms. sp. nov.

Lianae suffruticosae pubicaulibus. Folia ovata vel ovato-cordata, acuminata vel obtusa dense pubescentes; inflorescentiae axillares cymosae folia semilongae

multiflorae; calyx usque ad basem divisum, lobi lineari-lanceolati, acuti; corolla tubulosa, lobi angusti-oblongi obtusi; folliculi ignoti.

Woody vines, the stems puberulent, becoming glabrous with age, terminal stems to 5 mm. in diameter. Leaves ovate to ovate-cordate, acuminate to obtuse, with 5-6 pairs of lateral nerves, densely short crisped pubescent on both sides, the blades when mature 6-12 cm. long and 5-9 cm. broad, the petioles slender, about 2-3 cm. long; inflorescences axillary, compound cymes half as long as the subtending leaves, many-flowered; calyx divided to the base, the lobes linear-lanceolate, acute, substrigose dorsally, about 3.5 mm. long and 1 mm. broad at the base; corolla tubular, sparsely pubescent outside, the tube about 5 mm. long and the narrowly oblong obtuse lobes about 3 mm. long and 1 mm. broad; gynostegium about 3 mm. long; follicles unknown.

Mexico: vine by the river, Temascaltepec, Dist. Temascaltepec, Mexico, alt. 1,780 m., July 27, 1932, *Hinton 1129* (type F); vine in wet barranco, Luvianos, District Temascaltepec, Mexico, May 25, 1933, *Hinton 3972* (F).

Allied to the *Marsdenia mexicana* Dcne.—*M. bourgeana* (Baill.) Rothe group, but easily distinguished from all the Mexican and Central American species of the genus by the tubular corolla.

MATELEA Aubl. The genus *Matelea* in Mexico and Central America as given by Woodson in his "perspective" is the most heterogeneous of the tropical North American Asclepiads. Woodson reduced a rather large number of genera to this one, some of which there is perhaps good reason to retain. A careful generic study of the Asclepiads in our flora is still needed.

In the course of the work with the kinds of *Matelea* in Guatemala quite a few undescribed species were found. These are described in this paper. I feel that these have accumulated because many botanists are reluctant to study this supposedly difficult family, but in reality one that is fascinating.

### *Matelea abbreviata* Standl. & L. Wms. sp. nov.

Lianae suffruticosae. Folia lanceolata vel oblongo-lanceolata, breviter acuminata, basem obtusa, glabra, petioli breves; inflorescentia abbreviata, uni-(vel bi-)flora; calyx usque a basem lobatum, lobi lati ovati, acuti; corolla rotata, leviter reticulata, lobi late triangulari-ovati, acuti; corona corollae carnosa, 5-lobata; stigma 5-angulatum; folliculi ignoti.

Woody vines, the stems slender soon becoming corky and suffrutescent, glabrous or glabrescent. Leaves lanceolate to oblong-lanceolate, shortly acuminate, mostly obtuse to the base, glabrous, with (usually) 5 small digitiform corneous glands at the juncture with the petiole, (3-)5-7 cm. long and 1-3 cm. broad, the petioles short, slender, puberulous or not, mostly 5-8 mm. long; inflorescence axillary or extra axillary, abbreviated, 1-(or perhaps rarely more)-flowered, peduncles

about 2 mm. long, pedicels about 3 mm. long, obscurely puberulent; calyx lobate to the base, glabrous, the lobes broadly ovate, acute, about 1-1.5 mm. long and nearly as broad; corolla rotate, glabrous, about 15 mm. across, divided to about the middle or a little more, lobes broadly triangular-ovate, acute, each about 10-nerved, those at the margins obviously reticulate, 5 mm. long and as broad or slightly broader; faucal corona fleshy, divided into five parts, each part obtusely bilobate and with two depressions with stigma depressed; gynostegium very short; follicles unknown.

Honduras: flores amarillas, bejuco sobre arbustos, colinas secas abajo de Suyapa entre Villa San Roque y Tegucigalpa, Depto. Morazán, alt. 1,200 m., Agosto 1, 1950, *Molina 2778* (type F; EAP); wooded quebrada, large woody vine, Villa San Roque, vicinity of Suyapa, alt. 1,100-1,200 m., Aug. 1, 1950, *Standley 26260* (F; EAP).

This species appears to belong in subgenus *Matelea* but is easily distinguished from the other species of the subgenus by the glabrous leaves merely obtuse at the base and borne on short petioles. The abbreviated inflorescence of one or at most two flowers is distinctive.

### ***Matelea marsdenioides* Standl. & L. Wms. sp. nov.**

Lianae herbaceae vel suffruticosae, caules et foliis hirsuto-pubescentis. Folia oblongo-ovata vel ovata, acuminata, dense hirsuto-pubescentis; inflorescentia corymbosa, multiflora; calyx usque ad basem divisus, lobi lineari-lanceolati, acuminatis-simi; corolla subcampanulata, profunde lobata, lobi lanceolati, acuti vel obtusi; corona in medio gynostegii nata, lacerato-digitata, folliculi ignoti.

Herbaceous or suffrutescent vines with stems and leaves spreading hirsute pubescent. Leaves oblong-ovate to ovate, acuminate, densely spreading hirsute on both sides, with about 5 pairs of lateral nerves, blade 5-11 cm. long and 2.5-5 cm. broad when mature, petioles hirsute, 2-5 cm. long, with about 5 small digitiform glands at juncture with blade; inflorescence an extra axillary compound corymb about as long as the adjacent leaf, many-flowered, densely hispid; flowers whitish; calyx divided to the base, densely hispid without, glabrous within, with a digitiform gland in each sinus within, the lobes linear-lanceolate, long acuminate, 4-5 mm. long and 0.7-1 mm. broad; corolla subcampanulate, glabrous outside, arachnoid pubescent at the base within, deeply lobate, about 7 mm. long, lobes lanceolate, acute or obtuse, 5-6 mm. long and 2-2.5 mm. broad; corona borne at the middle of the gynostegium, lacerate-digitate, exceeding the gynostegium; gynostegium stipitate, about 1.5 mm. long; follicles unknown.

Honduras: flores blancas, bejuco sobre arbustos, matorrales húmedos de la Quebrada Suyapa, aldea Suyapa. Noreste de Tegucigalpa, Depto. Morazán, alt. 1,100 m., Agosto 10, 1949, *Molina 2561*; flores blanco-gris, bejuco, matorrales húmedos de Quebrada Suyapa, Depto. Morazán, alt. 1,200 m., Agosto 19, 1950, *Molina 3209* (type F; EAP); corolla whitish within, veined with green, woody vine over small tree, wooded stream bank, vicinity of Suyapa, alt. 1,000-1,200 m., August 19, 1950, *Standley 26477*.

This species is most closely allied to *Matelea gonoloboides* (Rob. & Greenm.) Woodson and belongs in the subgenus *Ibatia* of Woodson's perspective of the genera of Asclepiads (Ann. Mo. Bot. Gard. 28: 222. 1941). It is easily distinguished from the other species of the subgenus by the rather open many-flowered inflorescence, similar to that in *Marsdenia bourgeana* (Baill.) Rothe.

We distributed these specimens some years ago as an undescribed *Marsdenia*.

### *Matelea molinarum* L. Wms. sp. nov.

Lianae herbaceae, caules hirsuti. Folia ovata, cordata, breviter acuminata sparse hirsuta et puberulenta; petioli graciles, hirsuti; inflorescentia cyma subumbelliformis, pauciflora; calyx lobi late lanceolati, acuminati, extus hirsuti intus glabri; corolla rotata vel lobi reflexi, carnosa, lobi late ovati vel suborbiculari; corona corollae erecta, carnosa; folliculi subfusiformes spinis ornatis.

Vines of unknown length, the stems spreading hirsute, up to about 4 mm. in diameter. Leaves ovate, cordate, short acuminate, 4–10 cm. long and 2.5–7 cm. broad, sparsely fulvous hirsute on both surfaces, especially on the nerves, and with abundant very short puberulence, petioles slender, spreading hirsute pubescent, 3–4 cm. long; inflorescence axillary or near leaf axils, a few-flowered subumbellate cyme, abundantly hirsute, peduncles 2–4 cm. long, the pedicels 1–3 cm. long; flowers small, green; calyx deeply lobed, long hirsute pubescent outside, glabrous within, lobes broadly lanceolate, acuminate, about 7 mm. long and 3 mm. broad; corolla rotate, or the lobes reflexed, fleshy, about 1.2–1.5 cm. across, glabrous within, provided with a tuft of hirsute pubescence near the apex outside and with minute subglabular pubescence, lobes broadly ovate or suborbicular, about 6 mm. long and 5 mm. broad; faucal corona erect, fleshy, the margin with many small umbonate processes, about 1 mm. high; gynostegium stipitate; follicles subfusiform, 10–12 cm. long and 3 cm. in diameter, covered with fleshy spines 1 cm. or less long.

Guatemala: flores verdes, bejuco sobre el matorral del bosque mixto de Chamal. Margenes del Río Cobán, Depto. Alta Verapaz, alt. 1,200 m., Mayo 13, 1963, *Molina & Molina 12167* (type, F; EAP); small vine, corolla snuff-brown, damp limestone forest along Petén highway, between Campur and Soyocó, alt. 1,100 m., April 9, 1941, *Standley 91707* (F); vine, corolla lobes reflexed, dull orange, calyx lobes spreading, greenish, top of stigma white, above Finca San Rafael, Cerro Jolomtac, Sierra de los Cuchumatanes, alt. 900–1,200 m., July 22, 1942, *Steyermark 49149* (F).

This species seems to be quite closely related to *M. nigrescens* (Schlecht.) Woodson but is easily distinguished superficially by the glabrous inner face of the corolla as well as by other detail. Dr. Woodson had named the Steyermark specimen as *M. nigrescens* and the Standley specimen as *M. pseudobarbata* (Pittier) Woodson. The

Molinas' specimen will be found in herbaria under *M. guatemalensis* (K. Schum.) Woodson.

***Matelea picturata*** (Hemsl.) Woodson in Ann. Mo. Bot. Gard. 28: 233. 1941. *Gonolobus picturatus* Hemsl. in Godman & Salvin, Biol. Cent. Am. Bot. 2: 332, t. 56, ff. B, 5, 6. 1882.

Guatemala: Cerro de Zunil, *Salvin*; Volcán Sta. María, *Steyermark* 33810.

The determination of the Steyermark specimen is based upon the excellent plate cited above. The locality is certainly not more than a few kilometers from where the Salvins collected the original specimen. Dr. Woodson has determined the specimen as *M. pittieri* (Standl.) Woodson and an examination of the type of that indicates that it is very close to *M. picturata* and possibly a synonym of it.

***Matelea pleistantha*** (Donn.-Sm.) L. Wms. comb. nov. *Macroscepis pleistantha* Donn.-Sm. Bot. Gaz. 20: 543. 1895; *Macroscepis congestiflora* Donn.-Sm. l.c. 25: 149. 1898; *Matelea congestiflora* Woodson, Ann. Mo. Bot. Gard. 28: 224. 1941.

The two species described by Capt. Donnell-Smith are based upon the same collection, *Heyde & Lux* 6350, collected near Mataques-cuintla, department of Santa Rosa.

Most of the material of this species from Central America has been determined as *Matelea obovata* (HBK.) Woodson, a relatively rare Mexican species that seems not to extend into Central America. *Matelea pleistantha*, as I understand it, extends from southern Mexico to Costa Rica. However, it is possible that there is more than one species involved. This will require monographic study to ascertain.

***Matelea pusilliflora*** L. Wms. sp. nov.

Liana volubilis, herbacea vel suffruticosa, ramosissima. Folia breviter petiolata, glabra, lanceolata, acuta vel acuminata, basi truncata vel subcordata; petioli graciles; inflorescentia axillaris, 1-2-flora, subsessilis; calyx usque ad basem divisus, glabrus, lobi ovato-lanceolati, acuti; corolla rotata, glabra, lobi orbiculares obtusi; corona carnea intus quinqueumbonata; folliculi ignoti.

Slender, glabrous, much branched, herbaceous or suffrutescent vines, stems becoming 2-edged and finally corky, internodes on old stems short, mostly about 8 cm. long, those on lateral flowering branches mostly 2-3 cm. long. Leaves short petiolate, glabrous or nearly so, lanceolate, acute or acuminate, truncate to subcordate at the base, lateral nerves 3-5 prominent pairs, these mostly not opposite, 2.5-5 cm. long and 0.8-2.2 cm. broad, petioles slender, 2-10 mm. long, obscurely

puberulent, with 3-5 digitiform calluses at its juncture with the blade; inflorescence axillary, 1-2-flowered, nearly sessile, peduncle 1-2 mm. long, pedicel 1-2 mm. long; flowers smallest of the genus, green with petals white tipped; calyx lobed to near the base, glabrous lobes ovate-lanceolate, acute, 1.5-2 mm. long; corolla rotate, glabrous, prominently veined, 5-6 mm. broad, lobate to about the middle, the lobes orbicular, obtuse, about 2 mm. long and as broad, the apex usually white; corona fleshy, low with thin margin, 5-umbonate within; gynostegium about 1 mm. broad, the stigma depressed; fruits unknown.

British Honduras: "mosquito whist," vine, flowers green; in high ridge, near creek, near San Antonio, Toledo District, December 14, 1945, *Gentle 5461* (LL); "mosquito whist," coarse whitish color vine, flowers green, in cohune ridge, between Condemn Branch and Mofredye Lagoon, Toledo District, September 16, 1948, *Gentle 6050* (type LL).

Guatemala: vine, flowers green with petals white tipped; in *rational* around sawmill. Tikal, Dept. Petén, Oct. 19, 1959, *Contreras 299* (LL); vine, flowers green, on ruins in *platanar*, Tikal, Dept. Petén, Oct. 27, 1959, *Contreras 326* (LL).

This is the smallest flowered of all the *Mateleas* having a rotate corolla; it is easily distinguished by the nearly sessile 1-2-flowered inflorescences, the small leaves and short internodes on secondary branches.

*Matelea quirosii* (Standl.) Woodson, Ann. Mo. Bot. Gard. 28: 224. 1941. *Cynanchum rotatum* Sessé & Mociño, Fl. Mex. ed. 2: 70. 1894, *non* Velloso, 1825. *Labidostelma guatemalense* Schltr. Bull. Herb. Boiss. II, 6: 843. 1906, not *Matelea guatemalensis* Woodson, 1941. *Vincetoxicum quirosii* Standl. Field Mus. Bot. 18: 959. 1938.

This species, so far as I know, was first collected in Mexico by Sessé & Mociño. A specimen of their collection, number 1298, is in Field Museum and may well be authentic material. The species was next described from Guatemala as a new genus by Schlechter,—there is an adequate fragment of the type specimen of this in Field Museum. It was next described by Standley as a species of *Vincetoxicum*, of which we have the not-very-good type specimen. This series of authentic specimens as well as a number of additional ones from Mexico and Central America indicate that the species occurs at rather low elevations from southern Mexico to Costa Rica. It has not been reported from Panama but may be expected along the Pacific.

The illustration shows clearly the very complicated corona and gynostegium of the species. The photograph is from a herbarium specimen collected in Mexico by Roe, Roe and Mori, number 494.



FIG. 2. *Matelea quirosii*. Photograph of flower on herbarium specimen (Roe, Roe & Mori 494),  $\times 3$ , showing highly evolved gynostegium.

### *Matelea sylvicola* L. Wms. sp. nov.

Lianae herbaceae, caulibus graciles. Folia oblongo-ovata, abrupter acuminata, basi leviter cordata, glabra; inflorescentia pauciflora, subumbelliformis; flores grandes; calyx lobi lanceolati, acuminati; corolla rotata pilosa, lobi lanceolati, acuti vel acuminati; corona carnea 10-lobata umbonibus quinquebus ornatis; folliculi ignoti.

Herbaceous vines of unknown size, the stems slender, glabrous or with obscure pubescence in lines, internodes to about 20 cm. long. Leaves oblong-ovate, abruptly long acuminate, shallowly cordate at the base, completely glabrous, 7–12 cm. long and 3–5.5 cm. broad, the petiole 3–4 cm. long, bearing at its apex on base of leaf about 5 small digitiform glands; inflorescence axillary, few-flowered, subumbelliform, peduncles 6–8 cm. long, pedicels slender and to about 3 cm. long, both obscurely puberulent; flowers relatively large, about 4 cm. in diameter; calyx 6–8 mm. long, divided nearly to the base, the lobes lanceolate, acuminate, puberulent outside, corolla rotate, divided nearly to the base, obscurely puberulent outside, inside prominently pilose toward the center and puberulent, lobes narrowly lanceolate, acute or acuminate, about 15 mm. long and about 6 mm. broad at the base; corona fleshy, low, about 10-lobate with principal internal lobes opposite sinuses of corolla; stigma 2–3 mm. broad, depressed, white; follicles unknown.

Guatemala: im Walde in Pansamala, Alta Verapaz, alt. 4,000 ft., August, 1887, *Türckheim 680* (type F).

It is curious that this species was not described by Donnell-Smith or Standley since it was passed by both of them as *Gonolobus picturatus* Hemsl. or *Matelea picturata* (Hemsl.) Woodson, a quite different species which is beautifully illustrated in *Biologia Centrali-Americana*. The species does belong in subgenus *Heliostemma* (Woodson, Ann. Mo. Bot. Gard. 28: 233. 1941) and is most closely allied to *Matelea pilosa* (Benth.) Woodson, a Mexican species. Superficially, it is easily distinguished by the much larger glabrous leaves, the smaller and narrow calyx lobes, the "bosses" on the corona are not digitate.

***Matelea urceolata*** (Karst.) L. Wms. comb. nov. *Macroscepis urceolata* Karsten, Fl. Col. 2: 115, t. 161. 1866.

Costa Rica: Carrillos de Poás, Prov. Alajuela, Nov. 16, 1939, *Quirós 884*.

This Costa Rica specimen matches almost exactly the superb plate in Karsten's *Florae Columbiae*. Inadequate specimens indicate that the species may reach to Nicaragua and Honduras.

*Matelea stellulifera* Standl. & L. Wms. (*Ceiba* 1: 245. 1951), from Costa Rica, is very near if not the same as *M. urceolata*.

***Matelea urophylla*** L. Wms. sp. nov.

Lianae herbaceae vel suffruticosae, hirsutae. Caules pubescentia fulva, hispida ornata; folia ovato-lanceolata, longe caudato-acuminata, basi cordata, utrinque hispida; inflorescentia brevis, 1-pauciflora; calyx usque ad basim divisa, lobi ovato-lanceolata, acuminata, extus hispida; corolla rotata puberulenta, lobi ovati, obtusi; corona annularis, margo minute segmentatus; folliculi ignoti.

Herbaceous or perhaps suffrutescent hirsute vines. Stems terete, hispid with fulvous hairs, becoming glabrous, about 2 mm. in diameter at growing ends; leaves ovate-lanceolate, long caudate-acuminate, shallowly cordate at the base, densely hirsute pubescent with long fulvous segmented hairs, especially so along the mid-vein dorsally, blade 9-11 cm. long and 4-5 cm. broad, petioles with spreading hirsute pubescence, mostly about 2 cm. long, inflorescence short, 1-few-flowered, the peduncle up to 1 cm. long, the pedicels shorter; calyx divided to the base, densely hirsute outside, glabrous within, the lobes ovate-lanceolate, acuminate, about 5 mm. long and 2 mm. broad; corolla rotate, conspicuously puberulent on both sides, lobed beyond the middle, up to 3 cm. across, lobes ovate, obtuse, about 10 mm. long and 8 mm. broad; corona annular, free at the margin but strongly adnate to the corolla, minutely divided into segment (bead-like); stigma pentagonal, the gynostegium about 3 mm. across; follicles unknown.

Honduras: flores café-violáceo, bejuco, bosque lluvioso de Montaña de Cusuco, Cordillera de Idalfonso, Depto. Cortes, alt. 1,500–2,000 m., May 26, 1956, *Molina 7239* (type F; EAP).

A member of the subgenus *Matelea* quite distinctive in its rotate flower with annular corona with a "beaded" margin. The fulvous pubescence on leaves with a long (up to 1.5 cm.) apical tail will help to distinguish the species.

***Matelea velutina*** (Schlecht.) Woodson in Ann. Mo. Bot. Gard. 28: 234. 1941. *Gonolobus velutinus* Schlecht. Linnaea 8: 521. 1883. *Vincetoxicum velutinum* Standl. Contr. U. S. Nat. Herb. 23: 1189. 1924. *V. gentlei* Lundell & Standl. Field Mus. Bot. 17: 269. 1937. *Matelea gentlei* Woodson, l.c.

This species, as it will be treated in the "Flora of Guatemala," is a quite variable one. It is apparently widely distributed in south Mexico, Guatemala, and British Honduras and extends from rather low elevations to nearly 2,000 meters. There is considerable variation in the size of flowers; the calyx lobes vary from quite small ones in some of the material from British Honduras ( $\pm 3$ –4 mm. long and obtuse) to ones that are twice as large and even somewhat acute. Monographic study of this complex may prove that there are really two species involved but I do not find a point at which the smaller flowered ones can be distinguished from the ones that have larger flowers for there seems to be an almost complete series.

**SARCOSTEMMA.** A monographic treatment of "The American Species of *Sarcostemma* R. Br." by Dr. Richard W. Holm is one of the few modern studies in the Asclepiadaceae (Ann. Mo. Bot. Gard. 37: 477–560. 1950).

***Sarcostemma bellum*** Standl. & L. Wms. Ceiba 1: 90. 1950.

Dr. Holm has reduced this species to *S. bilobum* Hook. & Arn. ex char., in his monograph of the genus. The type of the species is said to be in Field Museum Herbarium but it is not there. It may have been in a shipment of specimens that was lost. *Molina 1643* collected at the same time and place as *Standley 14814* is available and indicates that the reduction may not be justified.

***Sarcostemma refractum*** (Donn.-Sm.) L. Wms. comb. Nov. *Philibertia refracta* Donn.-Sm. Bot. Gaz. 18: 207. 1893.

Mexico: municipio of Tenejapa, Chiapas, alt. 2,300 m., July 13, 1965, *Breedlove 10891* (F; DS); same general locality, 1,680 m., July 17, 1965, *Breedlove 11659* (F, DS).

Guatemala: Santiago, Sacatepéquez, *Rosalío Gómez 787* (US; photo F); San Mateo Ixtatán, Huehuetenango, alt. 1,800 m., August 7, 1965, *Breedlove 11659* (F; DS); mountain slopes south of Nebaj, Quiché, alt. 2,000 m., July 19, 1964, *Proctor 25175* (LL); Río de las Violetas, north of Nebaj, Quiché, alt.  $\pm 1,800$  m., August 2, 1964, *Proctor 25388* (LL).

Holm in his monograph of the American species of *Sarcostemma* placed *Philibertia refracta* Donn.-Sm. as a synonym of *Sarcostemma bilobum*, I think incorrectly. *Sarcostemma bilobum* subsp. *bilobum* is a species of the lowlands of southern Mexico and Central America, with broadly ovate-cordate to orbicular leaves having the basal lobes convergent; the lobes of the corolla not ciliate and lanceolate to narrowly ovate; the corona ring prominent and about 1 mm. high; the vesicles quite obtuse and widest above the middle. *Sarcostemma refractum* is a species of the highlands of Guatemala and adjacent Mexico and has oblong-lanceolate to oblong-ovate leaves shallowly cordate at the base and with the lobes diverging; the lobes of the corolla are ovate, prominently ciliate with crisped hairs, especially on one margin; the corona ring is inconspicuous and less than 0.5 mm. high; the vesicles are differently shaped, widest near the apex and diverging.

## MARCGRAVIACEAE

### *Norantea sessilis* L. Wms. sp. nov.

Planta viminea suffruticosa epiphytica. Folia coriacea, elliptica vel late elliptica, acuta, apiculata, nerviis lateralibus usque ad 25, petioli perbrevis; inflorescentia spicata, multiflora; flores parvi sessiles; lobi calycis suborbiculares imbricati cucullati; petala oblongo-ovata obtusa prope basem connata; bractee unguiculatae et saccatae.

Epiphytic woody vines. Stems glabrous, 4–5 mm. in diameter; leaves coriaceous, elliptic to broadly elliptic, acute and apiculate, 7–9 cm. long and 2.5–3.7 cm. broad, with about 25 pairs of inconspicuous lateral nerves, petiole short, about 2 mm. long, with 2 inconspicuous glands dorsally above the junctures of the petiole; inflorescence spicate, with many small flowers borne in loose spirals and each in the axis of a saccate bract, the bracts soon deciduous; flowers small, sessile, the calyx lobes suborbicular, imbricated, cucullate, about 1 mm. long and as broad, about 5 to 7 in number; corolla with 5 oblong-ovate obtuse petals connate at the base, about 2 mm. long and 1.5 mm. broad; floral bracts inserted below fertile flowers unguiculate at the base and formed into a saccate hood above, the claw about 5–8 mm. long and the saccate hood to 15 mm. long; stamens mostly eight,

inserted on the base of the petals and with the filaments adnate, shorter than the petals; stigma sessile.

Nicaragua: high-climbing woody vine, nectaries becoming dark red at anthesis, ca. 3.1 km. N. of base camp;—Base Camp 3.6 km. S.E. Cerro San Isidro, Río Cama, Río Escondido, lat. 12° 05'–12° 15' (N), long. 83° 45'–84° 20' W, alt. 0–65 m., March 27, 1966, *Proctor, Jones & Facey 27267* (type F; NY).

There have been five species of *Norantea* described from Central America, and possibly a sixth from Panama described as a *Ruyschia*. *Norantea anomala* HBK. was described from “inter tropicos Americanae.” Doubtless a Nicaraguan specimen was seen along with South American material. The present species seems to be most closely allied to *N. anomala* HBK. but based on the illustration (HBK. *Nova Gen. et Sp. Pl.* 7: 218, *t. 547 bis.* 1825) would seem to be amply distinct. The leaves of our species have a very short petiole, almost none, are smaller and differently shaped, the inflorescence contains no sterile flowers, details of the flowers are quite different.

The spicate inflorescence is unusual in the family as are also the fertile flowers borne in the axils of the fleshy, saccate, floral bracts.

## RUBIACEAE

***Chione costaricensis*** Standl. *Field Mus. Bot.* 22: 111. 1940.

Nicaragua: small tree 6.5 m., Cerro San Isidro, Río Kama, Río Escondido, Dept. Bluefields, alt. 0–65 m., March 26, 1966, *Proctor, Jones & Facey 27260* (F; NY).

The genus is new to Nicaragua. The Costa Rican type came from an altitude of 825 m. while the present one is from near sea level. The flowers of this specimen have a six-lobate corolla and six anthers.