

THE ACANTHACEAE OF COLOMBIA, I

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INTRODUCTION

PRIOR to this present revision no attempt has been made to bring together taxonomic considerations of all the Colombian Acanthaceae. In DeCandolle's *Prodromus* (vol. 11, 1847), Nees published the then known Colombian species. Subsequently, a number of isolated ones were described by Lindau and other botanists, but no general work containing keys has yet been attempted. This present paper is by no means the final word, for almost any fair-sized new collection will still produce undescribed material, especially in the genera *Mendoncia*, *Ruellia*, *Aphelandra*, and *Dicliptera*. The specimens studied so far seem to indicate that botanical exploration is still needed in eastern Colombia. The new Putumayo material, for example, has furnished abundant novelties. What further or extensive collections will reveal from Amazonas, Vaupés, Arauca, eastern Caquetá, Meta, and Boyacá can be left only to conjecture.

The purpose of this paper is to discuss, in an orderly fashion, all the known Colombian species of the family as a ready reference for botanists, so that they may identify their collections of acanthaceous plants or use the keys for detecting further undescribed species. Except for brief discussions to indicate the possible relationship of novelties to allied species, no attempt has been made in this paper to consider the phylogeny of the family. A thorough treatment of this subject is required in monographic works but is extraneous in a revision. For the same reason detailed morphological discussions, except for the formal descriptions, will also be omitted. Full synonymy has not been attempted. Only the name-bringing synonyms or those based wholly or partly on Colombian species, as a rule, have been included.

In tropical and subtropical regions, the family as a whole is cosmopolitan, although a number of genera are confined to one hemisphere only. Strange as it may seem, with the exception of a few species of *Acanthus* in the Mediterranean region, no Acanthaceae are to be found in Europe, even though Africa abounds in them. The following list will show in a general way the distribution of the genera treated in Part I of my revision:

- Staurogyne*: Both hemispheres.
Elytraria: Tropical America.
Nelsonia: Both hemispheres.
Mendoncia: Tropical America.
Thunbergia: Old World, but mostly African.
Bravaisia: Tropical America.
Trichanthera: Tropical America.
Sanchezia: Tropical America.
Hygrophila: Both hemispheres.
Blechum: Both hemispheres.
Phayloopsis: Eastern hemisphere. An escape in America.
Ruellia: Both hemispheres.
Barleria: Both hemispheres.
Teliostachya: Tropical America and west Africa.

In view of the mountainous nature of Colombia, endemism is to be expected; many of the new species treated here are based on a single collection, and the range of others is limited to a single department or to a few adjacent ones. Colombian species seldom occur in Peru. There is, nevertheless, some affinity along the eastern border to the plants of northwestern Brazil and western Venezuela. But, again, there is scarcely any affinity to the Panamanian flora except in the case of a few species that follow the mountain ranges of Panama down through El Chocó.

This large and complex group of plants has been placed by Engler, in his System,¹ between the small families Globulariaceae and Plantaginaceae, but it is near the larger and more complex family Gesneriaceae. Because of a superficial resemblance, confusion sometimes arises in distinguishing these two families. Certain characteristics are almost always present, however, by which an acanthaceous plant can be recognized. The most prominent and easiest to detect of these characters is the presence of cystoliths, small mineral concretions appearing as minute short lines on the upper surface of the leaf blades, the upper portions of the stems, on the branches of the inflorescence, and on the calyx. Similar cystoliths do occur in a few other distant families such as Urticaceae. In Acanthaceae they are lacking only on the members of the first three (relatively small) subfamilies (Nelsonioideae, Mendoncioideae, and Thunbergioideae), and for some unaccountable reason in the large genus *Aphelandra* of the fourth subfamily (Acanthoideae). In Mendoncioideae raised stelliform markings at the bases of the hairs on the upper surface of the leaf blades may appear to be of the nature of cystoliths. Bremekamp,² however, contends that they are merely large raised epidermal cells so elevated by differential shrinkage. A more general earmark of the family, and

¹ Syllabus der Pflanzenfamilien, ed. 5, 201, 1907.

² Rec. Trav. Bot. Néerl. 35: 141. 1938.

peculiar to it, is the unusual subulate hook-shaped extension of the funicle (retinacula), which supports the seed. This character is again lacking in the fruit of the first three subfamilies. Superficially there are actually few traits that associate these subfamilies with typical Acanthaceae.

Probably the best-known acanthaceous plants in cultivation belong to the genus *Acanthus* (ἀκανθος, thorny plant). This name was also given to bear's-breech or *Acanthus mollis* L. A conventionalized form of the leaf of *A. mollis* may have been the one used so extensively in Roman architecture. That ornamenting Corinthian columns was supposed to have been derived from *A. spinosus* L.⁹

Some of the plants of the family are reported to have medicinal qualities but are not included in the standard works of materia medica. Many others have beautiful and conspicuous flowers, especially in the genera *Sanchezia*, *Ruellia*, and *Aphelandra*, but most of these are difficult to grow, thrive only in greenhouses, and even there require especial care. *Jacobinia magnifica* Benth. & Hook., *Aphelandra aurantiaca* Lindl. or some of its forms, and *Sanchezia speciosa* Leonard are perhaps the species most often met with in greenhouses. Recently *Beloperone guttata* Brandeg., from Mexico, has become popular as a pot plant. In tropical regions a number of species of *Thumburgia* are encouraged as garden plants.

The sequence of subfamilies and tribes is that of Dalla Torre and Harms' Genera Siphonogamarum.

The specimens cited are chiefly those deposited in the U. S. National Herbarium. A few other herbaria have lent specimens for examination and citation in this paper. Of special interest in the Stockholm material were the Lawrance, Kjell von Sneidern, and Billberg collections. A considerable number of the specimens procured by Lawrance and von Sneidern were new to science. The Billberg collection was unique in being the oldest (1825-1826) plant material examined. By firsthand study of Billberg's No. 1 (the type of *Blechnum angustius* Nees), I was able to place it in its proper genus, *Tetramerium*. Of interest in the New York loan was a complete set of the widely distributed H. H. Smith Santa Marta plants with full collector's data accompanying each sheet.

The photographs of types in European herbaria made by J. F. Macbride and distributed by the Chicago Natural History Museum have been of the greatest value. Where cited in this paper, the negative number of the photograph is given.

To the custodians who have so generously aided by lending material from other institutions, and especially to my associates in the U. S. National Herbarium, E. P. Killip, A. C. Smith, L. B. Smith, Jason

⁹ L. H. Bailey. *Cyclopedia of Amer. Hort.* 11. 1900.

R. Swallen, and C. V. Morton, for their valuable suggestions and the checking of the manuscript, I wish to extend thanks. The herbaria contributing material for this paper are indicated by the following letters:

Bog, Instituto de la Salle, Bogotá, Colombia.

Ch, Chicago Natural History Museum.

Col, Herbario Nacional de Colombia, Bogotá, Colombia.

GH, Gray Herbarium, Harvard University.

Med, Facultad de Agronomía, Universidad Nacional, Medellín, Colombia.

Mo, Missouri Botanical Garden.

NY, New York Botanical Garden.

Ph, Academy of Natural Sciences of Philadelphia.

S, Riksmuseet, Stockholm.

US, United States National Herbarium.

Valle, Facultad de Agronomía, Universidad Nacional, Cali, Colombia.

A summarizing list of exsiccatae will be published with the concluding portion of this treatment.

SYSTEMATIC TREATMENT

ACANTHACEAE J. St. Hil.: Acanthus Family

Acanthaceae J. St. Hil. Expos. Fam. 1: 236. 1805.

Herbs, shrubs, or small trees; leaves simple, opposite, exstipulate; flowers irregular to nearly regular, perfect; calyx persistent, inferior, the segments 5 or occasionally fewer; corolla gamopetalous, the limb 5-lobed or 2-lipped (rarely 1-lipped); stamens 4, didynamous, or 2 only; staminodes often present in the 2-stamened flowers; anther sacs 2 or 1, longitudinally dehiscent; ovary 2-celled, the ovules 2 to 10 in each cavity; style filiform, simple; stigmas 1 or 2; fruit a capsule (drupaceous in *Mendoncia*), 2-celled, 2-valved; seeds usually flat, borne on retinacula which are papilliform in a few genera but usually hook-shaped, the testa smooth or roughened, often mucilaginous when moistened.

KEY TO THE SUBFAMILIES

Funicle papilliform or lacking.

Herbs (sometimes more or less shrubby) ----- 1. NELSONIOIDEAE

Vines.

Fruit a drupe ----- 2. MENDONCIOIDEAE

Fruit a beaked capsule ----- 3. THUNBERGIOIDEAE

Funicle hook-shaped (retinacula) ----- 4. ACANTHOIDEAE

Subfamily 1. NELSONIOIDEAE

Nelsonioideae Lindau in Bot. Jahrb. Engler 18: 43. 1893.

Herbs without cystoliths; flowers solitary, borne in the axils of the leaves or bracts, mostly disposed in spikes; calyx more or less equally

5-parted; corolla 2-lipped or equally 5-lobed, the lobes imbricate; stamens 2 or 4; staminodes none or 2; anthers 2-celled; pollen marked by clefts or pores ("spaltenpollen": cleft-pollen); disk poorly developed; ovules numerous in each cell, borne in 2 rows; capsules beaked or pointed; retinacula mere papilliform projections of the funicle.

KEY TO THE GENERA

- Stamens 4..... 1. *Staurogyne*
 Stamens 2.
 Scape densely covered by scalelike leaves..... 2. *Elytraria*
 Scapes none, the flowers borne in small peduncled or sessile spikes.
 3. *Nelsonia*

1. STAUROGYNE Wall.

Staurogyne Wall. Pl. Asiat. Rar. 2: 80, pl. 186, 1831. The genus consists of 80 or more species, these widely distributed throughout the tropical regions of the world. The majority of the American species occur in Brazil. The name is derived from *σταυρός*, a cross, and *γυνή*, woman, i. e., pistil, in allusion to the 3-lobed cross-shaped stigma. Type species: *S. argentea* Wall. Type locality: Silhet.

Ebermaiera Nees in Wall. Pl. Asiat. Rar. 3: 75. 1832. The genus *Ebermaiera* was named for Henrich Ebermaier, a German physician of Dusseldorf, who, in collaboration with Frederich Nees, wrote and edited a Handbook of Medical-pharmaceutical Botany. Type species: *E. humilis* Nees. Type locality: Burma.

Erythracanthus Nees in Wall. Pl. Asiat. Rar. 3: 75. 1832. The name is derived from *έρυθρός*, red, and *ἀκανθος*, *Acanthus*, in allusion to the deep red-purple color of the lower surface of the leaf blades. Type species: *E. racemosus* Nees. Type locality: Penang.

Herbs or shrubs; stems (plants rarely acaulescent) erect, ascending, or repent, simple or branched, terete or subquadrangular (sometimes winged), glabrous, pilose, tomentose, or pubescent, the hairs or some of them often glandular; leaves opposite, usually petioled, entire; flowers sessile or short-pedicelled, few or numerous, borne in terminal or axillary loose or compact spikes or racemes; calyx deeply 5-parted, the posterior segment oblong, usually conspicuously longer and broader than the others, the anterior pair usually linear, wider than the setaceous lateral pair; corolla usually red, purple, or yellow, tubular, the limb 2-lipped, the upper lip 2-lobed, the lower 3-lobed, the lobes rounded; stamens 4, usually included, a staminode usually present between the posterior pair; anthers 2-celled, their sacs ovate, subequal, muticous; stigma 2- or 3-parted; capsules oblong, obtuse, seed-bearing nearly its entire length; seeds numerous, minute, subglobose; retinacula none.

1. *Staurogyne lepidagathoides* Leonard, sp. nov.

FIGURE 1

Herba, caulibus adscendentibus, pilosis vel subtomentosis; lamina foliorum oblonga, acuta, basi angustata, integra vel undulata, glabra,

costa et venis sparse pilosis exceptis; petioli pilosi; spicae terminales et axillares; bracteae lanceolatae utrinque acutae pilosae et glanduloso-puberulentae; bracteolae lineares; calycis segmenta pilosa et glanduloso-puberulenta, posticum lineare, trinerve, altera subulata, uninervia; corolla alba, glabra; capsulae oblongae, glabrae vel apice sparse pubescentes; semina minuta brunnea crasse verrucosa.



FIGURE 1.—*Staurogyne lepidagathoides* Leonard (Pennell 3983): *a*, Tip of branch; *b*, bract; *c*, bractlet; *d*, calyx; *e*, capsule; *f*, half of capsule showing arrangement of seed; *g*, lower lip of corolla; *h*, upper lip of corolla; *i*, stamen. (*a*, Natural size; *b*-*f*, about twice natural size; *g*, *h*, about three times natural size; *i*, about five times natural size.)

Herbs; stems ascending, up to about 15 cm. high, reddish brown, pilose or subtomentose, the hairs white, up to 2 mm. long; leaf blades oblong, up to 7.5 cm. long and 2.5 cm. wide (those subtending the spikelets smaller, usually about 4.5 cm. long and 1.5 cm. wide), acute at both ends (the tip blunt), entire or undulate, glabrous or the costa and veins (7 to 9 pairs) sparingly pilose, rather prominent; petioles up to 5 mm. long, pilose; flowers borne in terminal and lateral spikes up to 4 cm. long and 1 cm. in diameter; bracts lanceolate, 6.5 mm. long, 1.75 mm. wide, acute at both ends, the pubescence a mixture of white spreading hairs up to 1.5 mm. long and minute glandular ones, the bractlets linear, 0.5 mm. wide, otherwise similar to the bracts; calyx 6 mm. long, the pubescence a mixture of white spreading or ascending hairs 1 mm. long and minute glandular ones; the posterior segment linear, 0.5 mm. wide, 3-nerved, the others subulate, 0.25 mm. wide, 1-nerved, the nerves of the lateral segments enlarged near base; corolla white, glabrous, 4 mm. long; capsule oblong, 4 mm. long, 1 to 2.5 mm. broad, rounded at tip, glabrous or having a few minute apical hairs; seeds minute, brown, coarsely verrucose.

Type in the U. S. National Herbarium, No. 1042943, collected at edge of thicket near Buena Vista, east of Sincé, Department of Bolívar, Colombia, altitude 100 to 150 meters, January 24, 1918, by Francis W. Pennell (No. 3983). Isotypes in the Gray Herbarium and the herbarium of the New York Botanical Garden.

Staurogyne lepidagathoides is related to *S. agrestis* Leonard, from Panama and Nicaragua. From this, however, it can be easily separated by its narrower and less glandular bracts and by the narrow posterior segment of the calyx. In *S. agrestis* the bracts are as much as 5 mm. wide and the posterior segment of the calyx 1 mm. wide. The epithet *lepidagathoides* (*Lepidagathis* and εἶδος, resemblance) was selected because of the resemblance of the species to certain members of *Lepidagathis*, another acanthaceous genus subtribe Barlerieae.

2. ELYTRARIA Michx.

Elytraria Michx. Fl. Bor. Amer. 1: 8. 1803. The name *Elytraria* is derived from ἔλυτρον, sheath, in reference to the firm coriaceous bracts covering the scapes and subtending the flowers. About a dozen species have been described from the Western Hemisphere, and several others are known to occur in the tropical regions of the Eastern Hemisphere. Type species: *Elytraria virgata* Michx. Type locality: Carolina.

Caulescent or acaulescent herbs; leaves alternate or sometimes subopposite, basal or crowded at the ends of the branches; flowers borne on dense peduncled spikes, both spikes and peduncles bearing imbricate coriaceous bracts; calyx scarious, the segments narrow, entire or toothed at apex; corolla white or blue, the tube slender, the limb 2-lipped, the lower lip 3-lobed; stamens 2, barely exerted; anthers 2-celled, the sacs equal, parallel, sometimes awn-tipped at base; staminodes usually wanting; ovary 2-celled; ovules 6 to 10 in each cavity; capsules narrow, contracted at base, acute at apex.

1. *Elytraria imbricata* (Vahl) Pers.

FIGURE 2

Justicia imbricata Vahl, Ecol. Amer. 1: 1. 1796. Collector and locality not given. The specific name alludes to the bracted scapes and spikes.

Verbena squamosa Jacq. Pl. Hort. Schoenbr. 1: 3, pl 5. 1797. Type locality unknown. Again the specific name alludes to the close-bracted scapes and spikes.

Elytraria tridentata Vahl, Enum. Pl. 1: 107. 1804. Based on *Justicia imbricata* Vahl. Marcgrav's collection from Brazil and Rohr's from Santa Marta, Colombia, are cited. The specific name refers to the pointed 2-winged bracts of the spikes.

Elytraria imbricata Pers. Syn. 1: 23. 1805. Based on *Justicia imbricata* Vahl.

Elytraria frondosa H. B. K. Nov. Gen. & Sp. 2: 234. 1817. Two cotypes, both collected in Colombia by Humboldt and Bonpland, are cited, one from Carthagena de Yundias and the other growing in shade near Turbaco. A photograph of one of these specimens deposited in the Paris Herbarium is in the U. S. National Herbarium (No. 39434).

Elytraria scorpioides Roem. & Schult. Syst. Veg. Mant. 1: 128. 1822. Type collected in Santa Marta by Bertero. The specific epithet (σκόρπιος, scorpion,

εἶδος, like) alludes to the fancied resemblance to a scorpion's tail of the slender, often curved spikes terminating their slender scapes.

Elytraria apargiifolia Nees in DC. Prodr. 11: 65. 1847. Two syntypes are cited, one collected on the border of Colombia and Panama by Cuming, the other along the La Plata River by Tweedie.

Elytraria squamosa Lindau, Anal. Inst. Fisco-Geogr. Costa Rica 8: 299. 1895. Based on *Verbena squamosa* Jacq.

Acaulescent or, if caulescent, the leaves crowded at the tip of a glabrous or sparingly pilosulous stem up to 30 cm. long or more; leaf blades ovate to oblong or obovate, rarely linear-lanceolate, usually 3 to 12 cm. long, 1.5 to 4 cm. wide, blunt or acutish at apex, narrowed at base to a slender winged petiole, both surfaces appressed-pilose or glabrate, the margins undulate; scapes numerous, axillary, usually 5 to 24 cm. long, simple or branched, sometimes leafy at tip, covered by tightly appressed-ovate to subulate bracts; spikes 1 to several, up to 6 cm. long; bracts oblong to elliptic, 3 to 6 mm. long, 1 to 2 mm. wide, firm, awn-tipped and bearing near the apex a pair of triangular or rhombic hyaline teeth or wings; bractlets subulate, 3 mm. long, the costa ciliate; calyx segments thin, the posterior one bidentate; corolla pale purplish, violet, blue, or blue-purple, 5 to 8 mm. long; capsule slenderly conic, about 3 mm. long, 1 mm. in diameter, glabrous.

VERNACULAR NAMES: Anamú (*Killip & Smith* 14288); cilantro de monte (*Dugand & Jaramillo* 2767); soldado parado (*Dugand & García-Barriga* 2318; *Bro. Paul* B-7; *Bro. Elias* 915).

Elytraria imbricata is extremely variable in its habit of growth, ranging from small plantainlike herbs a few centimeters high to large subligneous-stemmed plants 25 cm. high or more. Allen's 839 was taken from a "semiherb 6 ft. long," bearing bright-green leaves and blue-purple flowers.

In Central America the plant is used as a remedy for dysentery, and the crushed leaves are said to cure pimples. In Colombia it has been used as a remedy to reduce fever (*Dugand & García-Barriga* 2318).

Usually found in old fields, on grassy banks, brushy slopes, in thickets, or in other waste places. It is a plant of low altitudes usually found below 300 meters. Range: Arizona and Texas to northern and western South America. It is also found in the West Indies and has been introduced into India and the Philippine Islands.

ATLÁNTICO: Barranquilla, *Bro. Elias* 160 (US). Juan Mina, *Dugand* 3639 (US). Mare Caribe near Salgar, *Dugand & Jaramillo* 2725 (US). Near Miramar, Puerto Colombia, *Dugand* 3623 (US). Puerto Colombia, *Bro. Elias* 915 (US). Between Sabanalarga and Campeche, *Dugand & Jaramillo* 2767 (US). Near Salgar, *Pennell* 12069 (GH, Ph). Sonto Tomás, *Bro. Paul* B-7 (US). Isabel López Road, Usiacurí, *Dugand & García-Barriga* 2318 (US).



FIGURE 2.—*Elytraria imbricata* (Vahl) Pers. (Haught 3865): *a*, Plant; *b*, side view of bract; *c*, bractlet; *d*, ventral view of bract; *e*, one of a lateral pair of calyx segments; *f*, posterior calyx segment; *g*, anterior calyx segment; *h*, capsule. (*a*, Half natural size; *b-h*, about five times natural size.)

BOLÍVAR: Cartagena, *Billberg*, s. n. (S); *Bro. Heriberto* 136 (US); 312 (US). La Popa, near Cartagena, *Darbin* s. n. (S). San Lázaro, *Billberg* 113 (S). Vicinity of Turbaco, *Killip & Smith* 14186 (US, NY), 14288 (US, NY).

MAGDALENA: Bonda, *H. H. Smith* 1412 (US, NY, Ph, Mo, GH). About 15 km. northwest of Codazzi, *Haught* 3865 (US). Poponte in the Magdalena Valley, *Cyril Allen* 839 (Mo). Santa Marta, *Bertero* s. n. (Mo. isotype of *E. scorpioides*; US, photograph).

3. NELSONIA R. Br.

Nelsonia R. Br. Prodr. 480. 1810. The genus, named for David Nelson, a gardener accompanying Cook on his last voyage, consists of a single species. Type species: *Justicia brunelloides* Lam. Type locality: Java.

A diffuse softly villous herb; leaves entire; flowers borne in terminal and axillary, bracted spikes; calyx 4-lobed, the lower lobe 2-toothed or 2-cleft; corolla blue or purple, the tube slender, the limb 2-lipped, the upper lip 2-cleft, the lower one 3-lobed; stamens 2, the filaments short, the anther sacs mucronulate at base; ovules several in each cavity; stigma 2-lobed; capsule oblong, beaked.

1. *Nelsonia brunelloides* (Lam.) Kuntze

FIGURE 3

Justicia brunelloides Lam. Tab. Encycl. 1: 40. 1791. Type locality: Java.

Nelsonia albicans H. B. K. Nov. Gen. & Sp. 2: 234. 1817. Type collected in a damp place at mouth of the Río Sinú near El Zapote, Colombia.

Nelsonia brunelloides Kuntze, Rev. Gen. Pl. 2: 493. 1891. Based on *Justicia brunelloides* Lam.

Stem slender, prostrate or ascending, branched, 15 to 60 cm. long; leaves ovate, 1.5 to 7 cm. long, obtuse or acutish at apex, rounded at base or short-decurrent on the petiole; petioles 2 to 20 mm. long; spikes dense, peduncled or sessile, 2 to 6 cm. long; bracts ovate, acute or acuminate, imbricate, about 6 mm. long and 4 mm. wide; calyx about 5 mm. long, the upper lobe ovate, the others lanceolate; corolla tube 4 to 5 mm. long, the limb about 2 mm. broad; capsule sessile, glabrous, 4 mm. long, 4-seeded; seeds globose, light brown, subverrucose, sparingly pilosulous, the hairs anchoriform.

Partial to moist sandy places. Mexico, Central America, West Indies, northern South America, Old World Tropics.

ATLÁNTICO: Barranquilla, *Bro. Elias* 473 (US).

Subfamily 2. MENDONCIOIDEAE

Mendoncioideae Lindau in Engl. & Prantl, Pflanzenfam. IV. 3b: 289. 1895.

Mostly high climbing vines; leaves opposite, petioled, the blades usually ovate, entire, their upper surfaces sometimes scabrous because of the raised stellate bases of the hairs; flowers 1 to several, axillary, pediceled (peduncles rarely present), racemose in *Monochlamys*, subtended and partly enclosed by two usually rather large more or less

connate bracts; calyx reduced usually to a mere entire or low-lobed annulus; corollas purple, red, or whitish, tubular or narrowly campanulate, regularly 5-lobed or somewhat 2-lipped; stamens 4; staminodes none; anthers 2-celled, the cells parallel, the basal lobes blunt, more or less barbellate; pollen globular, smooth, bearing three equatorial pores; disc annular; ovary at first bilocular, later becoming unilocular, the ovules 1 or 2; style filiform, the stigma briefly 2-lobed, the anterior lobe often the larger; fruit drupaceous, ovoid-compressed, more or less oblique at apex, the mesocarp more or less fleshy, the endocarp bony; retinacula none.

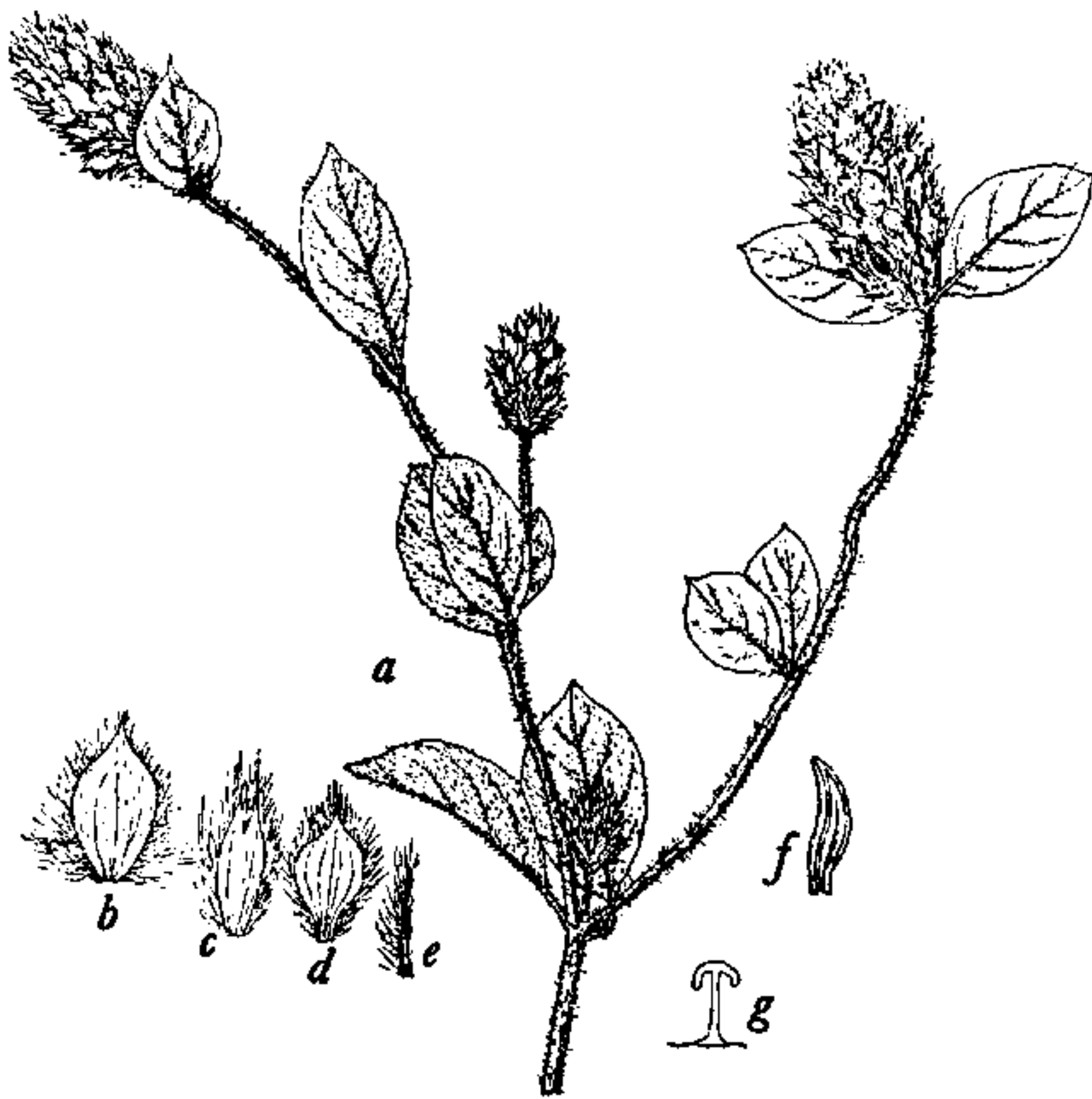


FIGURE 3.—*Nelsonia brunelloides* (Lam.) Kuntze (*Bro. Elias* 473): *a*, Branch; *b*, bract; *c*, anterior calyx lobe; *d*, posterior calyx lobe; *e*, one of a lateral pair of calyx lobes; *f*, valve of capsule showing placenta; *g*, an anchoraeform hair from seed. (*a*, Natural size; *b-f*, about $2\frac{1}{2}$ times natural size; *g*, about 25 times natural size.)

This subfamily consists of four genera, *Mendoncia*, confined to tropical America, and three small African genera, *Monochlamys*, *Afromendoncia*, and *Gillettiella*.

4. MENDONCIA Vell.

Mendoncia Vell. ex Vand. Fl. Lusit. Bras. 43, pl. 3, fig. 22. 1788. The genus was named for Cardinal Mendonça, Patriarch of Lisbon. More than 90 species have been described, the majority of these limited to tropical America. No specific combination was made either by Vandelli in his *Florae Lusitanicae*

or by Ruiz and Pavón in their Prodrômus, nor can the plants figured in each publication be assigned with certainty to any known species. The first species to be definitely established were those of Ruiz and Pavón (Syst. Veg. Peruv. Chil. 158. 1798), namely, *Mendozia aspera* and *M. racemosa*, the latter a very doubtful species. These were transferred in 1847 to *Mendoncia* (correctly spelled) by Nees (in DC. Prodr. 11). Previous to Nees' work in the Prodrômus only two valid specific combinations had been made, namely, *Mendoncia albida* and *M. coccinea*, both published by Vellozo in his Florae Fluminensis (263. 1825). Type species: *Mendozia aspera* Ruiz & Pav. Type locality: Peru.

Mendozia Ruiz & Pav. Fl. Peruv. Chil. Prodr. 89. pl. 17. 1794. The name *Mendozia* is merely an alteration of *Mendoncia* on the part of Ruiz and Pavón. It has not appeared in botanical literature since last used by Nees in Martius' Flora Brasiliensis (1874). Type species: *Mendozia aspera* Ruiz & Pav. Type locality: Peru.

Engelia Nees in DC. Prodr. 11: 721. 1847. Named for Engello, a director of the Berlin Theater. Two species are described, both from Colonia Tovar, Venezuela (not Colombia), by Nees. These are *E. towarensis* and *E. villosa*. Photographs of the types of both species are in the U. S. National Herbarium. A careful examination of these photographs leads one to no other course than to regard these plants as true *Mendoncia* in spite of the statement in Nees' generic description that the corollas possess short spurs, a split limb, and a staminode. Corollas are not shown in either photograph nor are mature corollas present on *Mutis* 895, undoubtedly representing *Engelia villosa*. More ample material is needed to clear up this troublesome point. Type species: *Engelia towarensis* Kl. & Karst. ex Nees. Type locality: Colonia Tovar, Venezuela.

Tall vines; stems herbaceous, or shrubby at base; leaves opposite, petioled, entire, pinnately veined; flowers axillary, 1 to several or occasionally many in each axil, each flower borne on a slender pedicel and subtended by 2 bracts, these flat or keeled, more or less connate; calyx short, annular or cupular, often membranous, usually glabrous; corolla tubular or funnelform, usually expanded at the base, the throat often oblique, the lobes reflexed or spreading; stamens 4, included, didynamous, the filaments short, the anthers linear-lanceolate, usually flat and acute at apex, lobed at base, the lobes more or less unequal, glandular-puberulent at tip; disk annular; ovary oblique, compressed, lenticular; style filiform, the stigma 2-lobed; fruit an ovoid, compressed drupe, often oblique at tip, the endocarp hard and bony, the mesocarp fleshy or pulpy; seeds 1 or 2.

KEY TO THE SPECIES

A. Bracts lanceolate, often subfalcate; corollas red.

Pedicels and bracts densely and softly fulvous-pubescent, the hairs

appressed or ascending----- 1. *M. aspera*

Pedicels and bracts pilose, the hairs spreading.

Leaf blades thin, never softly or velvety pilose beneath; bracts

narrowly lanceolate, 7 mm. wide or less----- 2. *M. pilosa*

Leaf blades firm, usually densely and velvety pilose beneath;

bracts oblong-lanceolate, about 10 mm. wide----- 3. *M. lindavii*

A. Bracts oblong, ovate, or elliptic.

Flower clusters more or less peduncled..... 4. *M. pedunculata*
 Flower clusters sessile; bracts usually ovate or elliptic.

B. Stems pilose, the hairs spreading or retrorse.

Bracts 3 to 5 cm. long.

Leaves cordate..... 5. *M. cordata*

Leaves rounded, obtuse or acute at base.

Bracts cordate at base, 4.5 cm. long..... 6. *M. mirabilis*

Bracts rounded at base, 3.5 cm. long or less.

Ovary densely pubescent; corolla funnelform..... 7. *M. speciosa*

Ovary minutely papillose; corolla cylindric..... 8. *M. spraguei*

Bracts 2.8 cm. long or less.

Hairs of the bracts mostly 3 to 5 mm. long..... 9. *M. hirsuta*

Hairs of the bracts 1 mm. long or less.

Pedicels densely hirsute..... 10. *M. villosa*

Pedicels sparingly to moderately hirsute but not conspicu-
 ously so..... 11. *M. puberula*

B. Stems glabrous to densely pubescent, the hairs, when present upwardly appressed.

C. Bracts glabrous or essentially so.

Pedicels 4 cm. long or more; flowers usually solitary..... 12. *M. sprucei*

Pedicels 1 to 1.5 cm. long; flowers 4 to 9 in each axil.

Corolla glandular puberulous within tube and basal por-
 tions of the lobes; leaf blades glabrous or the costa

beset with inconspicuous hairs about 125 μ long. 13. *M. glabrescens*

Corolla glabrous or nearly so; the costa of the leaf blades

bearing hairs about 250 μ long..... 14. *M. pennellii*

C. Bracts definitely pubescent.

D. Pubescence of the bracts dense, soft, silky.

Bracts small, 12 mm. long or less, the pubescence whitish;
 flowers numerous..... 15. *M. glomerata*

Bracts large, 2 to 3 cm. long, the pubescence fulvous;
 flowers 1 to several.

Bracts elliptic, 2 cm. wide..... 17a. *M. coccinea* var. *elliptica*

Bracts lanceolate-ovate, oblong-elliptic, or oblong-ovate,
 1.7 cm. wide or less.

Bracts truncate at base, 1.7 cm. wide.

17b. *M. coccinea* var. *sparatteria*

Bracts rounded or subtruncate at base, 1 to 1.5 cm.
 wide.

Leaf blades acute or gradually acuminate..... 16. *M. rosea*

Leaf blades rounded or short-acuminate at apex. 17. *M. coccinea*

D. Pubescence of the bracts thin, not soft and silky.

E. Bracts 1.5 to 2 cm. long.

Stems densely appressed-hirsute; leaf blades firm, the
 costa, veins, and veinlets prominent.

Leaf blades ovate to elliptic, the hairs of the lower
 surface confined chiefly to costa and veins.... 18. *M. litoralis*

Leaf blades elliptic to oblong-elliptic, the lower sur-
 face evenly pubescent..... 19. *M. gracilis*

Stems glabrous or sparingly to moderately pilose or
 hirtellous; leaf blades thin, the costa, veins, and
 veinlets not conspicuously prominent.

Flowers solitary; hairs of the bracts at least 1.5 mm.

long, some of them more or less ascending;

corolla cream----- 20. *M. gilva*

Flowers usually several in each axil; hairs of the

bracts 0.5 mm. long or less, closely appressed;

corolla cream with brownish markings----- 21. *M. odorata*

E. Bracts 13 mm. long or less.

Leaf blades rather copiously hirtellous beneath----- 22. *M. mutisii*

Leaf blades essentially glabrous beneath.

Bracts 8 to 10 mm. long; plants drying olive green.

23. *M. cuatrecasasti*

Bracts 5 to 6 mm. long; plants drying black-- 24. *M. microchlamys*

1. *Mendoncia aspera* (Ruiz & Pav.) Nees

Mendozia aspera Ruiz & Pav. Syst. Veg. Peruv. Chil. 158. 1798. Type collected in wooded region near the village of Chinchao and the Masapata Estate, Peru, by Ruiz & Pavón. The specific name alludes to the roughened upper surface of the mature leaf blades.

Mendoncia aspera Nees in DC. Prodr. 11: 51. 1847. Based on *Mendozia aspera* Ruiz & Pav.

Stem appressed-pubescent; leaf blades elliptic, 5 to 12 cm. long, 3 to 6.5 cm. wide, acuminate at apex (usually tipped by a mucro 1 to 4 mm. long), rounded or narrowed at base, appressed-pubescent above, becoming scabrous with age, the hairs about 0.5 mm. long, each one arising from a stellate base, the lower surface rather densely and softly appressed-pubescent, the hairs yellowish, up to 1 mm. long; flowers 1 to 3 in each axil; pedicels 2 to 6 cm. long, appressed-pubescent; bracts oblong-lanceolate to ovate-lanceolate, 3 to 3.5 cm. long, 1.2 to 1.5 cm. wide, often subfalcate, acute at apex, tipped by a short mucro, rounded at base, densely and softly sericeous, the hairs yellowish brown, closely appressed or ascending; corolla bright red, 3.5 cm. long, the throat about 4 mm. broad; ovary puberulent; style glabrous; fruit deep purple, 1.5 cm. long, 10 mm. broad, somewhat compressed, sparingly puberulous.

Woods and thickets, usually below 400 meters. Colombia, Peru, Brazil, and Surinam.

PUTUMAYO: Umbría, Klug 1760 (GH, Mo, NY, US).

2. *Mendoncia pilosa* (Mart.) Nees

Mendozia pilosa Mart. Nov. Gen. & Sp. 3: 21. pl. 209. 1829. Type collected by Martius. Type locality: "In sylvis aboriginibus fluvium Japura inumbantibus, e. g. prope Manacuru Indorum Juri habitationes, et prope Portos Miranhas," Colombia. Photograph of type material (Munich Herbarium) in the U. S. National Herbarium, No. 20540. The specific name was suggested by the numerous long spreading hairs covering the stems, leaves, peduncles, and bracts.

Mendoncia pilosa Nees in DC. Prodr. 11: 50. 1847. Based on *Mendozia pilosa* Mart.

Small suffrutescent vine; stems terete, densely pilose, the hairs brownish, spreading, up to 5 mm. long; leaf blades ovate to oblong, up to 12 cm. long and 6.5 cm. wide, slenderly acuminate, often mucronate, the mucro up to 5 mm. long, rounded, obtuse or acutish at base, entire or shallowly sinuate-dentate, thin, ciliate, pilose on both surfaces, the hairs arising from star-shaped bases, the costa and lateral veins (5 or 6 pairs) fairly prominent; petioles up to 2 cm. long, densely pilose, the hairs brown, spreading; flowers solitary or in pairs, borne in the axils of the upper leaves; pedicels up to 4.5 cm. long, 2 to 3 mm. broad at tip, tapering towards a slender base, densely brown pilose; bracts narrowly lanceolate, 3 to 4 cm. long, up to 7 mm. wide, acute and often slenderly mucronate at apex, rounded at base, more or less subfalcate, densely brown pilose without, glabrous within; corolla bright red, glabrous, 4 to 5 cm. long, the tube slender, 5 to 6 mm. broad at throat, the lobes erect-spreading, obovate, about 6 mm. long and 3 to 4 mm. wide, rounded or shallowly emarginate; style and calyx glabrous; fruit (immature) finely pilosulous.

Cuatrecasas' specimen was taken April 4, 1940, from a flowering plant growing in forests between 1,000 and 1,300 meters altitude. The corolla was a livid red (rojo cárdena).

Forests of southern Colombia and northwestern Brazil.

CAQUETÁ: Sucre, *Cuatrecasas* 9064 (US).

3. *Mendoncia lindavii* Rusby

Mendoncia lindavii Rusby, Mem. Torrey Club 4: 241. 1895. Type collected at Yungas, Bolivia, 1890, by Miguel Bang, No. 532. Isotype in the U. S. National Herbarium, No. 942655. Paratypes are also in the U. S. National Herbarium, Nos. 58334 and 942656, both collected at Tipuani-Guanai, Bolivia, by Miguel Bang, No. 1707. The species was named for Gustav Lindau, a specialist on the family Acanthaceae.

A suffrutescent vine; branches ferruginous-pilose or glabrescent; leaf blades ovate to broadly oval, 5 to 10 cm. long, 2 to 5.5 cm. wide, acuminate at apex, and usually terminating in a small awnlike tip up to 5 mm. long, rounded at the base, firm, subcoriaceous, ciliate, the upper surface papillose, scabrous-pilose, the hairs appressed or ascending, arising from stellate bases, the lower surface ferruginous-pilose, often densely so and velvety to the touch; pedicels stout, 2 to 3 cm. long, ferruginous-pilose; bracts oblong-lanceolate, falcate or subfalcate, 3 to 4 cm. long, about 1 cm. wide, acuminate at apex, usually ending in an awnlike tip 2 to 3 cm. long, rounded at base, partly connate, densely ferruginous-pilose; corolla red or pink, paler within and proximally without, 4 to 5 cm. long, 6 to 7 mm. broad at throat, the lobes rounded, 4 to 5 mm. long; style 4 cm. long, glabrous above, the lower portion hispid; drupe oblong-ovate, about 2 cm. long and 1 cm. broad, oblique at apex and tipped by a portion of the persistent style, densely brown puberulous.

Usually found in damp situations along streams in thickets and forests of the lower mountain slopes from 100 to 1,400 meters altitude. The corollas are red or bright scarlet and the ripe drupes purple black (*Pennell* 1397). Bolivia, north to British Honduras and Guatemala.

BOYACÁ: Region of Mount Chapón, northwest of Bogotá, *Laurance* 69 (Mo, NY, US).

CUNDINAMARCA: Along the road to Pacho on the Río Murca, vicinity of La Palma, *García-Barriga* 12394 (US).

META: Llanos de San Martín, near Villavicencio, *Dawe* 229 (US). Menegua, *García-Barriga* 5304 (US). Along the Río Ocoa, southeast of Villavicencio, *Killip* 34377 (US). Villavicencio, *Helen Schiefer* 790 (GH, NY); *Pennell* 1397 (NY), 1475 (NY).

SANTANDER: Between the Río Carare and Magdalena, in the vicinity of Puerto Berrío, *Haught* 1821 (US). "Kilometer 16" between Puerto Wilches and Puerto Santos, *Killip & Smith* 14895 (US).

WITHOUT DEFINITE LOCALITY: *Mutis* 894 (US); 924 (US).

4. *Mendoncia pedunculata* Leonard

Mendoncia pedunculata Leonard, Journ. Washington Acad. Sci. 21: 150. 1931. Type collected in forest at Mishuyacu, near Iquitos, Peru, 100 meters altitude, December 13, 1929, by G. Klug, No. 659 (U. S. National Herbarium, No. 1455658).

Stem terete, sulcate, sparingly puberulent toward tip, the hairs appressed; leaf blades elliptic, 10 to 16 cm. long, 6 to 10 cm. wide, abruptly acuminate at apex and tipped by a mucro 1 to 2 mm. long, obtuse at base and decurrent on the petiole, glabrous; petioles 2 to 3 cm. long, glabrous; flowers 1 to 4, borne on axillary peduncles up to 2.5 cm. long, these and the pedicels (5 to 7 mm. long) minutely appressed-pubescent; bracts violet (Klug), oblong, 4 cm. long, 1.4 to 1.8 cm. wide, rounded at both ends, tipped by a short mucro, inconspicuously and minutely appressed-pubescent without, glabrous within; corolla white, marked by reddish brown within, glabrous, 5 to 6 cm. long, the tube curved, 2.5 cm. long, the throat 1 cm. broad, the limb 3 cm. wide, the lobes oval, 1 to 1.5 cm. long; style about 5 cm. long; ovary sparingly puberulous; fruit not seen.

The specimens cited were collected during January and February.

Forests of the lower mountain slopes from 100 to 325 meters. Peru and southern Colombia.

PUTUMAYO: Umbría, *Klug* 1918 (Mo, NY, US).

VAUPÉS: Miraflores, *Gutiérrez & Schultes* 789 (Ch, GH).

5. *Mendoncia cordata* Leonard, sp. nov.

FIGURE 4

Suffrutex volubilis, caulibus quadrangularibus, dense pilosis, pilis patentibus, brunneis; lamina foliorum magna, membranacea, crasse reticulata, elliptico-ovata, abrupte acuminata, caudata, basi cordata, dense pilosa, pilis brunneis; petioli dense pilosi; flores axillares fasciculati; pedicelli tenues, pilosi; bracteae magnae, ovato-ellipticae,

apice rotundatae vel obtusae, caudatae, dense pilosae; drupa oblonga, compressa, pilosa.

Suffruticose; stem subquadrangular, densely pilose, the hairs spreading, brown, 4 to 8 mm. long; leaf blades ovate to elliptic-ovate, 12 to 20 cm. long, 8 to 14 cm. wide, abruptly acuminate, the tips of the upper leaves terminating in cauda up to 14 mm. long, the bases of all of the leaves strongly cordate, both surfaces densely brown-pilose, the hairs ascending, 1.5 mm. long, the lower surface minutely punctate, the costa and lateral veins (4 or 5 pairs) obscure above and prominent beneath, the veinlets of the lower leaves forming coarse

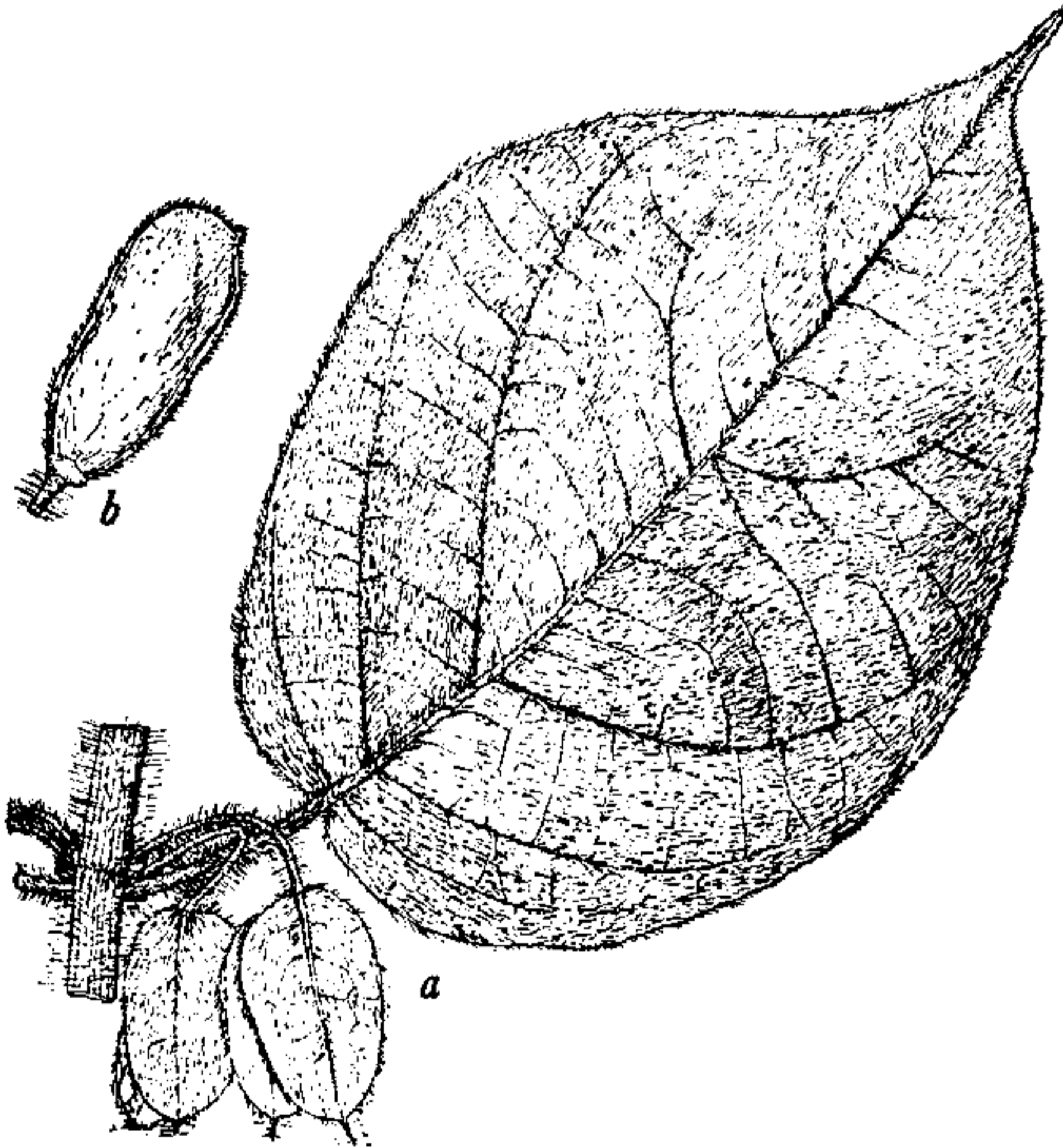


FIGURE 4.—*Mendoncia cordata* Leonard (*Cuatrecasas* 15216): *a*, Portion of plant showing leaf and inflorescence; *b*, drupe (immature). (*a*, Half natural size; *b*, natural size.)

conspicuous reticulations on the lower surface; petioles 2 to 3 cm. long, densely pilose, the hairs similar to those of the stem in color and length; flowers axillary, 1 to several in each axil; pedicels about 3.5 cm. long, slender, 0.75 mm. broad at base, gradually enlarged to 1.5 mm. at tip, densely pilose, the hairs spreading, similar in color and length to those of the stems; bracts ovate-elliptic, 3.5 cm. long, 2.5 cm. wide, rounded or obtuse at apex and tipped by a cauda 5 to 6 mm. long, shallowly cordate at base, both surfaces pilose, the hairs

spreading or ascending, those on the inner surface 0.25 mm. long, those of the outer surface a mixture of small hairs 0.25 to 1.5 mm. long and coarser ones up to 5 mm. long, the latter more abundant on the costa, tip, and mucro, the costa prominent and the veinlets reticulate; corolla not seen; calyx annular, subhyaline, 1.5 mm. high, equalling the disc; drupe (immature) oblong, flattened, 2 cm. long, 1 cm. wide, 3 mm. thick, pilose, the hairs spreading, 1 mm. long, confined chiefly to the margins.

Type in the U. S. National Herbarium, No. 1853784, collected in forest at La Planta on the right bank of the Río Anchicayá, Department of El Valle, Colombia, altitude 200 to 350 meters, September 27, 1943, by J. Cuatrecasas (No. 15216). An isotype is also in the U. S. National Herbarium, No. 1853785.

Mendoncia cordata is related to *M. speciosa*, but it is easily recognized by its cordate leaf blades and long, brown, spreading hairs on stems, pedicels, leaves, and bracts. The flowers of the upper portions of the plant seem to be erect, but older ones of the basal parts droop on recurved pedicels. Cuatrecasas gives the following color notes: "Ramos hojosas verde amarillentas, pálidas en el envés. Brácteas verde amarillento claro con venas verdes."

6. *Mendoncia mirabilis* Leonard, sp. nov.

FIGURE 5

Planta volubilis, caulibus quadrangularibus, leviter sulcatis, hirsutis, pilis patentibus vel leviter retrorsis, palide brunneis; lamina foliorum membranacea, oblongo-ovata vel elliptica, apice breviter acuminata vel subapiculata, basi rotundata vel obtusa, in petiolum decurrens, parce hisuta, supra pilis e basi stellata orientibus instructa; flores solitarii, axillares; pedicelli pilosi; bracteae membranaceae, oblongo-ovatae, apice rotundatae, mucronatae, basi cordatae, hirsutae; corolla alba, glabra, lobis rotundatis; ovarium glabrum.

Slender twiner up to 5 meters high; stems subquadrangular, shallowly sulcate, hirsute, the hairs straight, spreading or slightly retrorse, up to 1.25 mm. long, light brown; leaf blades oblong-ovate to elliptic, 6 to 10 cm. long and 5.5 cm. wide, short-acuminate and subapiculate at tip, rounded to obtuse at base and decurrent on the petiole, thin, both surfaces sparingly hirsute, the hairs ascending, up to 1 mm. long, those of the upper surface arising from flat rounded more or less star-shaped bases, the costa and lateral veins (3 or 4 pairs) barely conspicuous; petioles up to 2.5 cm. long, pilose, the hairs ascending, up to 1 mm. long, confined mostly to the channels; flowers solitary, borne in the axils of the leaves, the peduncles 3 to 3.5 cm. long, 1 mm. thick at base, gradually enlarged to 2.5 mm. at

tip, retrorsely pilose, the hairs up to 1 mm. long, the bracts oblong-ovate, subpanduriform, rounded and mucronate at tip, cordate at base, 4.5 to 5 cm. long, 23 to 25 mm. wide near base, 20 to 23 mm. wide near middle, thin, hirsute, the hairs spreading or ascending, brownish, up to 1 mm. long, the costa and veins obscure; corolla 6 cm. long, white, bearing a dark blotch at throat (Haught), glabrous, the tube subcylindric, 1 cm. broad at base, about 8 mm. broad at middle, 12 mm. broad at throat, the limb 32 mm. broad, oblique, the lobes rounded, about 13 mm. long and wide; calyx thin, cupular, subhyaline; ovary glabrous; capsule not seen.

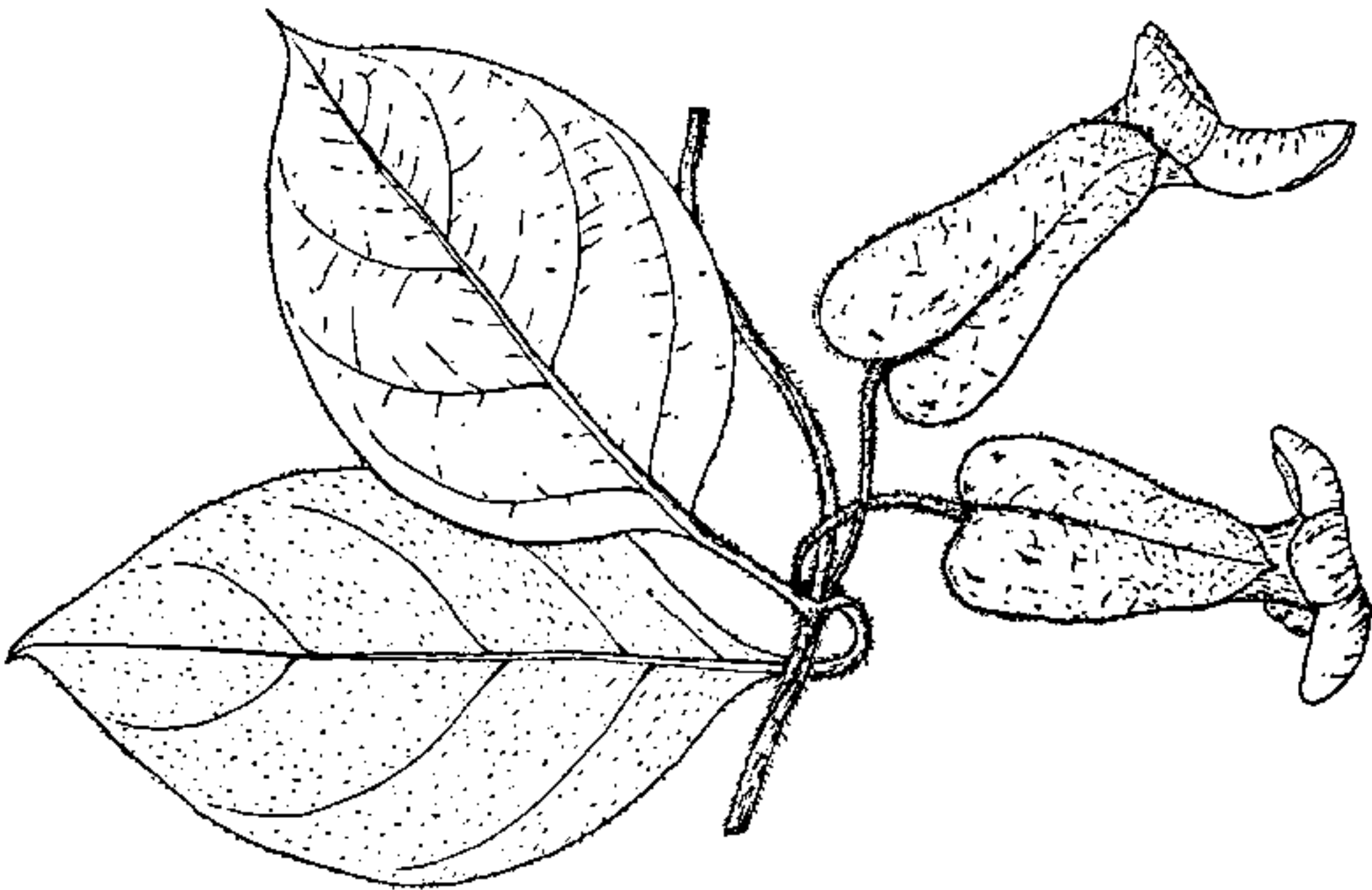


FIGURE 5.—*Mendoncia mirabilis* Leonard (Haught 4922): Portion of plant showing leaves and inflorescence (half natural size).

Type in the U. S. National Herbarium, No. 1950200, collected at edge of forest near Nicoclí, Department of Antioquia, Colombia, altitude 50 meters, June 27, 1946, by Oscar Haught (No. 4922). An isotype is likewise in the U. S. National Herbarium, No. 1950201.

Mendoncia mirabilis is related to *M. speciosa* but differs in having smaller leaf blades and cordate subpanduriform bracts. The leaf blades of *M. speciosa* are usually 10 to 17 cm. long instead of 6 to 10 cm. as in *M. mirabilis*, and its bracts are ovate, rounded, and connate at base.

7. *Mendoncia speciosa* Nees

Mendoncia speciosa Nees in DC. Prodr. 11: 54. 1847. Type locality: Atangues, Peru. Collector unknown. Type in the Hooker Herbarium, Kew.

Vine up to 5 meters high or more; stems quadrangular, retrorsely pilose, the hairs about 1 mm. long; leaf blades elliptic, 10 to 17 cm. long,

7 to 9 cm. wide, abruptly acuminate at apex and tipped by a mucro 1 to 2 mm. long, rounded at base, thin, veiny, scabrous above, sparingly pubescent, the hairs stiff, curved, up to 1 mm. long, more numerous on the upper surface than on the lower; petioles 1 to 1.3 cm. long; flowers 1 or 2 in each axil; pedicels 2 to 5 cm. long, glabrous or sparingly hirsute; bracts thin, ovate, 3.5 cm. long, about 2 cm. broad, connate below, rounded and mucronate at tip, rounded at base, sparingly pubescent; corolla white, glabrous, 5 to 6.5 cm. long, the throat mottled with light purple, the tube funnelform, 8 mm. broad at base, 15 to 20 mm. broad at throat, the lobes about 1 cm. long and 1.5 cm. wide, rounded, shallowly emarginate at apex; style 2.5 cm. long, the lower portion puberulent; ovary densely pubescent; fruit not seen.

Haught describes his No. 4282 as: "Slender twining plant, at least 5 m. high. Flowers showy, white, having a large dark brown blotch in throat." It was growing along a stream in a forest at an altitude of 450 meters. According to H. H. Smith (No. 1137) the corolla was white and its throat mottled with dark and light purple. Turrill⁴ cites a specimen collected near Ocaña, Department of Santander, by Schlim (No. 19). The flowers of this specimen were likewise white with a purple throat.

Wooded mountain slopes of Colombia and Peru.

GOAJIRA: 14 km. southwest of Garraipía, *Haught* 4282 (US).

MAGDALENA: Valparaiso, vicinity of Santa Marta, *H. H. Smith* 1137 (Mo, NY, Ph).

8. *Mendoncia spraguei* Turrill

Mendoncia spraguei Turrill, *Kew Bull.* 1919: 412. 1919. Type collected at Mocoa, Caquetá, Colombia, by Sprague, No. 402, and deposited in the herbarium of the Royal Botanic Gardens, Kew.

Suffrutescent vine; stems terete, hirsute, the hairs spreading, yellow; leaf blades elliptic-ovate, up to 9 cm. long and 5 cm. wide, acuminate at apex, rounded or acute at base, pilose, the hairs of the upper surface arising from stellate bases; petioles 1.5 to 2 cm. long, hirsute, the hairs spreading, yellow; flowers 1 to 3, axillary; pedicels 1.5 to 2.5 cm. long, hirsute, the hairs yellow; bracts oblong or oblong-ovate, up to 3.5 cm. long, 1.5 cm. wide, abruptly contracted to a slender tip 5 mm. long at apex, rounded at base, hirsute, the hairs yellow; corolla up to 6 cm. long, the tube cylindrical, curved, 5 mm. broad at base, 2.5 mm. at middle and 7 mm. at throat, the limb sublabiate; filaments short; anthers 9 to 10 mm. long, the basal lobes unequal, bearded; ovary minutely papillose; style up to 4.5 cm. long.

Known only from type material.

CAQUETÁ: Mocoa, Sprague 402 (isotype, US).

⁴ *Kew Bull.* 1919: 411. 1919.

9. *Mendoncia hirsuta* (Poepp. & Endl.) Nees

Mendoncia hirsuta Poepp. & Endl. Nov. Gen. & Sp. 3:10. 1845. Type collected between Maynas and Yurimaguas, Peru, by Poeppig, No. 2252. Photographs of type material from the Berlin Herbarium (photo No. 5871) and from the Vienna Herbarium (photo No. 32694) are in the U. S. National Herbarium. *Mendoncia hirsuta* Nees in DC. Prodr. 11:52. 1847. Based on *Mendoncia hirsuta* Poepp. & Endl.

Stem subquadrangular, sparingly hirsute, the hairs 1 to 3 mm. long, spreading; leaf blades ovate to oblong-ovate or elliptic or sometimes sublanceolate, 6 to 14 cm. long, 3 to 7 cm. wide, gradually to abruptly narrowed to an acuminate tip, this often terminated by a mucro 1 to 3 mm. long, narrowed at base and decurrent on the petiole, membranaceous, hirsute, the hairs 1 to 2.5 mm. long, the costa and veins (3 or 4 pairs) prominent; petioles 1 to 3.5 cm. long, pilose; flowers solitary or in pairs; pedicels 2 to 3 cm. long, densely hirsute, the hairs spreading, tawny, about 2 mm. long; bracts oblong-elliptic to ovate, 2 to 2.8 cm. long, 8 to 12 mm. wide, rounded or obtuse at apex, mucronate (mucro up to 1 cm. long), rounded at base, thin, veiny, long-hirsute, the hairs 3 to 5 mm. long; corolla cream white, tinged with yellow distally, about 2.5 cm. long; ovary and calyx glabrous; fruit oblong, 15 to 17 mm. long, 9 to 10 mm. broad, compressed, oblique, obtuse or rounded at tip, glabrous, deep purple when ripe.

No Colombian specimens were examined. Turrill cites⁵ a specimen collected at Naranjo, lower Magdalena River, by André.

The Guianas, Bolivia, Peru, Colombia.

10. *Mendoncia villosa* (Klotzch & Karst. ex Nees) Leonard, comb. nov.

Engelia villosa Klotzsch & Karst, ex Nees in DC. Prodr. 11: 721. 1947. Type collected at Colonia Tovar, Venezuela, by Karsten. Photograph of type material from the Berlin Herbarium (photo No. 5883) is in the U. S. National Herbarium.

Stem subquadrangular, hirsute, the hairs spreading or retrorse, up to 0.75 mm. long; leaf blades ovate to oblong-ovate, 5 to 10 cm. long, up to 6 cm. wide, obtuse to acute or abruptly and shortly acuminate at apex and tipped by a mucro 1 to 2 mm. long, obtuse to acutish at base, thin, hirsute above, the hairs arising from star-shaped bases, densely and softly hirsute or villous beneath, the hairs about 1 mm. long, spreading; petioles up to 2.5 cm. long, densely pilose; flowers 1 to several in each axil; pedicels 1.5 cm. long, densely hirsute, the hairs spreading or retrorse; bracts elliptic, up to 17 mm. long and 10 mm. wide, rounded or obtuse at both ends, tipped by a short mucro at apex, densely hirsute; corolla glabrous; calyx entire, glabrous; ovary glabrous; fruit not seen.

⁵ Kew Bull. 1919: 422. 1919.

This description was drawn from *Mutis* 895, collected in Colombia, locality unknown. Although the specimen compares favorably with the photograph of the type from the Berlin Herbarium, there remains the possibility that the two plants may belong to different species. More ample material and examination of an isotype may be necessary in order to establish the identity of *M. villosa*.

Venezuela and Colombia.

WITHOUT DEFINITE LOCALITY: *Mutis* 895 (US).

11. *Mendoncia puberula* (Mart.) Nees

Mendozia puberula Mart. Nov. Gen. & Sp. 3: 24. 1829. Type locality: "In Sylvis primaevae prope S. Crucis et alibi in montibus, Serra dos Orgãos, dictis, Provincia Sebastianopolitanae, ac similibus locis prope urbem Para."

Mendozia pubescens Poepp. & Endl. Nov. Gen. & Sp. 3: 11. 1845. Type collected in woods near Ega, northern Brazil, by Poeppig. A photograph of type material (photo No. 32696) from the Vienna Herbarium is in the U. S. National Herbarium. Poeppig and Endlicher cite *Mendozia puberula* Mart. β *micropus* as a synonym.

Mendozia selloviana Nees in Mart. Fl. Bras. 9: 10. 1847. Type collected in Brazil by Sellow, No. 91 (Berlin Herbarium).

Mendoncia selloviana Nees in DC. Prodr. 11: 53. 1847. Based on *Mendozia selloviana* Nees.

Mendoncia puberula Nees in DC. Prodr. 11: 53. 1847. Based on *Mendozia puberula* Mart.

Mendoncia splitgerberiana De Vriese in Nederl. Kruidk. Arch. 1: 353. 1848.

Type collected near the Merveille Plantation, Surinam, by Splitgerber.

Suffrutescent vines; stems quadrangular, the young branches densely hirsute, the older ones more or less hirsute to glabrate, the tips cirrose; leaf blades elliptic-ovate, elliptic, or oblong-elliptic, up to 11.5 cm. long and 8.5 cm. wide but usually smaller, acuminate, more or less rounded or short-attenuate at base, the costa and lateral veins (5 or 6 pairs) prominent, the upper leaf surface hirsute or glabrescent, the hairs sometimes arising from star-shaped bases, the lower surface, at least the larger veins, hirsute; flowers 1 or 2, borne in the axils of the leaves, the pedicels 1 to 3 cm. long, more or less hirsute, the hairs spreading; bracts oblong-elliptic, 1.5 to 2 cm. long, 1 to 1.3 cm. wide, the tip obtuse or rounded, mucronate, densely hirsute with spreading hairs or sometimes hirtose-pubescent, the hairs about 1 mm. long, the inner surface glabrous; calyx annular, about 0.5 mm. long, glabrous; corolla 2.2 to 3.7 cm. long, glabrous; anthers 8 mm. long, filaments (free portion) about 3 mm. long, glabrous; drupe lenticular, compressed, ovate, 1.6 cm. long and 1 cm. in diameter, glabrous.

No Colombian specimens were examined. The description was compiled from that of Turrill.⁶ Martius states in his description of *Mendozia puberula* that the corolla was white with blue or purple

⁶ Kew Bull. 1919: 420. 1919.

spotted markings on the limb. Turrill cites Kalbreyer's specimen (No. 830) collected at Salazar, Santander, Colombia.

Forests of Surinam, Brazil, Colombia, and Ecuador.

12. *Mendoncia sprucei* Lindau

Mendoncia sprucei Lindau, Bull. Herb. Boiss. 5: 647. 1897. Type collected along the Rio Negro near San Gabriel da Cachoeira, Brazil, by Spruce, No. 2332. Photographs of type material from the Vienna Herbarium (photo No. 32679) and the Berlin Herbarium (photo No. 5877) are in the U. S. National Herbarium.

Suffrutescent vine up to 7 meters high; stems slender, subterete, sparingly hirsute or glabrous; leaf blades ovate to oblong-ovate, up to 9 cm. long and 6 cm. wide, short acuminate at apex (the tip blunt and bearing a slender mucro up to 2 mm. long), obtuse, rounded, or narrowed at base, sparingly appressed-pilose or densely so on costa and veins (3 or 4 pairs) beneath; petioles up to 4 cm. long, sparingly appressed-pilose; flowers usually solitary in the axils of the leaves; pedicels slender, up to 4 cm. long or more, usually sparingly appressed-pilose; bracts ovate, about 2 cm. long and 1 cm. wide, rounded to acute at apex and apiculate, rounded at base, sparingly appressed-hirtellous without, glabrous within; corolla cream-color with purple streaks in throat, glabrous, 3 cm. long, about 8 mm. broad at throat; fruit slightly flattened, about 2 cm. long and 10 mm. broad, purplish black, glabrous.

Usually found in dense forests of the lower mountain slopes between 40 and 750 meters. Colombia, Peru, and Brazil.

META: Villavicencio, *Pennell* 1384 (Col, Mo, NY, US).

NORTE DE SANTANDER: El Indio, Río Cubugón, region of Río Sarare, *Cuatrecasas* 13109, in part (US).

SANTANDER: Servitá, *Triana*, s. n. (Col).

13. *Mendoncia glabrescens* Leonard, sp. nov.

FIGURE 6

Frutex volubilis, caulibus glabris, nodis parce adpresso-puberulis; lamina foliorum elliptica vel ovata vel oblonga vel obovata, apice abrupte acuminata, basi angustata, in petiolum oblique decurrens, subchartacea, glabra vel costa parce puberula, pilis minutis; flores in calcaribus axillaribus complanatis dispositi; pedicelli parce adpresso-puberuli; bracteae ovatae, apice obtusae et mucronulatae, ad apicem parce et obscure adpresso-puberulae; corolla alba, lobis suborbicularibus, rotundatis vel leviter emarginatis; drupa ovoidea, leviter compressa, glabra, caerulea.

A large branched vine up to 9 meters high; stems pale green (*Cuatrecasas*), glabrous except the nodes, these sparingly and inconspicuously appressed-puberulous; leaves elliptic, ovate, oblong or obovate, up to 12 cm. long and 8 cm. wide, rather fleshy, abruptly and

slenderly acuminate at tip, narrowed at base, sometimes obliquely so, and decurrent on the petiole, glabrous, or the costa bearing a few minute whitish appressed hairs about 125μ long, the upper surface dull green, the lower a clear pale green (Cuatrecasas), the costa and lateral veins (4 or 5 pairs) rather prominent; petioles up to 2.5 cm. long, glabrous or bearing a few scattered hairs similar to those on the costa; flowers usually 5 to 7, borne on small flattened axillary spurs, the pedicels about 1 cm. long, reaching 2 cm. at maturity, bearing scattered appressed white hairs about 125μ long; bracts pale yellowish green, ovate, up to 12 mm. long and 7 mm. wide, obtuse and mucronate at tip, pubescent toward tip, the hairs 375 to 500μ

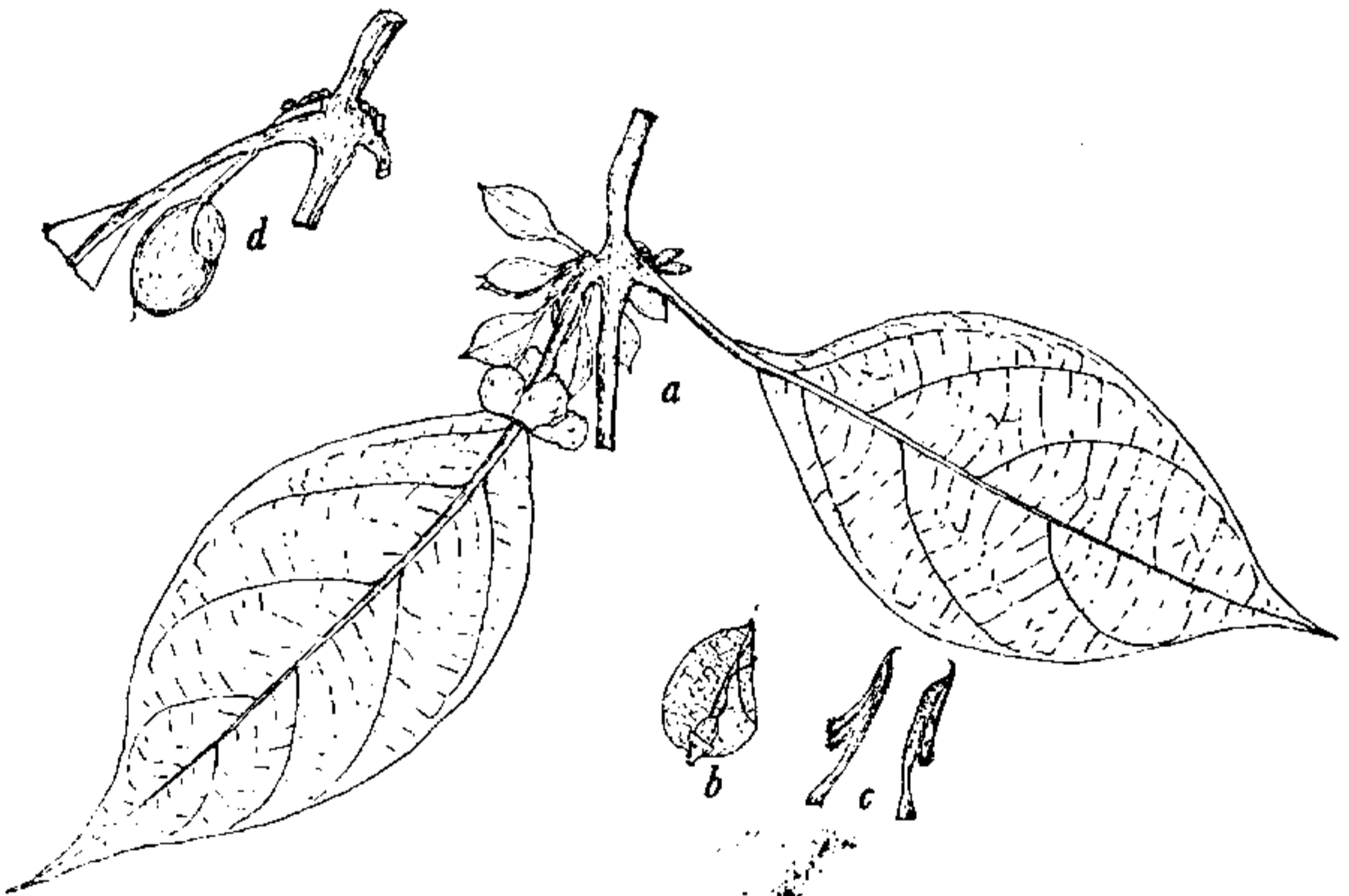


FIGURE 6.—*Mendoncia glabrescens* Leonard (Cuatrecasas 17238): *a*, Portion of plant showing inflorescence and a pair of leaves; *b*, bract (inner surface) and ovary; *c*, stamens; *d*, nodal portion of plant showing fruit and pedicel scars. (*a*, Half natural size; *b*, natural size; *c*, three times natural size; *d*, natural size.)

long, appressed or ascending; corolla white, glabrous, 12 to 15 mm. long, the tube 2 mm. broad at base, slightly restricted above the base, thence expanding to 5 or 6 mm. at mouth, the limb 12 to 15 mm. broad, the lobes suborbicular, about 7 mm. in diameter, rounded or shallowly emarginate, more or less erose, the tube glandular-papillose within; stamens attached 4 mm. above the base of the tube, 5 mm. long, the anthers 3 mm. long, sagittate, aristate, the slender tip often recurved, glandular-papillose dorsally, the tips of the basal lobes densely pilose; style 13 mm. long, glabrous; fruit resembling an elongated olive (Cuatrecasas), 18 mm. long, 13 mm. broad, 6 mm. thick, glabrous, olive when immature (Cuatrecasas), dark blue when ripe (Archer).

Type in the U. S. National Herbarium, No. 1853791, collected at Barco, along the Río Cajambre, Department of El Valle, Colombia, altitude 5 to 80 meters, April 21 to 30, 1944, by J. Cuatrecasas (No. 17238).

The following specimens are probably of this species: *Cuatrecasas* 15205 (fruiting), collected in forest near Hacienda La Planta, on the right bank of the Río Anchicayá, Department of El Valle, altitude 200 to 350 meters, September 27, 1943; *Cuatrecasas* 16847 (flowering), collected between La Trojita and Guadualito, Department of El Valle, altitude 0 to 5 meters, March 11, 1944; *Archer* 1708 (fruiting), collected between La Oveja and Quibdo, Chocó, April 1 to 2, 1931; *Cuatrecasas* 17182 (fruiting) (NY), also collected at Barco, along with the type.

Archer states that the common name of the plant is *higo silvestre* (fig of the woods) and the dark blue fruit has an odor like soap and is said to be poisonous. The species can be recognized by its nitid apparently glabrous leaves (hence its name *glabrescens*) and by its small white flowers, their tubes bearing within and near the throat minute spherical-tipped papillae resembling adherent pollen grains. Olive-green fruits measured by Cuatrecasas (No. 17182) before drying proved to be 18 mm. long, 16 mm. broad, and 12 mm. thick. The leaves and inflorescence of the type are strongly reflexed.

14. *Mendoncia pennellii* Leonard, sp. nov.

FIGURE 7

Herba volubilis, caulibus quadrangularibus, breviter sulcatis, glabris vel ad nodos parce adpresso-pubescentibus; lamina foliorum ovata vel oblonga, apice abrupte acuminata et mucronulata, basi angustata, chartacea, glabra vel minute hirsuta, pilis in costa et venis lateralibus pluribus; petioli glabri vel parce hirsuti; flores pauci, in calcaribus axillaribus complanatis dispositi; pedicelli glabri vel apice adpresso-hirsuti; bractee suborbiculares, apice mucronulatae, parce hirsutae, costa obscura; corolla alba, extus glabra, lobis obcordatis, reticulatis; ovarium glabrum.

Herbaceous climbing vine; stems subquadrangular, obscurely sulcate, glabrous or sparingly pubescent at and near the nodes, the hairs straight, closely appressed, about 625μ long; leaf blades ovate to oblong, up to 13 cm. long and 6.5 cm. wide, abruptly acuminate (the tip itself abruptly mucronate), rounded to narrowed at base, firm, glabrous or sparingly and minutely hirsute especially the younger leaves, the hairs confined chiefly to the costa and lateral veins (3 or 4 pairs), white, appressed or ascending, about 250μ long, the costa and veins fairly prominent, the upper surface of the older leaves coarsely reticulate; petioles up to 3 cm. long, glabrous or sparingly hirsute, the

hairs similar to those of the leaf blades; flowers usually several, borne on flattened suborbicular axillary spurs, the pedicels 1 to 1.5 cm. long, glabrous or bearing toward tip a few closely appressed hairs about 0.25 mm. long; bracts suborbicular, up to 11 mm. long and 0.5 mm. wide, mucronulate, sparingly hirsute, the hairs appressed or ascending, up to 0.5 mm. long, the costa barely conspicuous; corolla white, glabrous (except a small area near the insertion of the stamens, this glandular-papillose), about 1 cm. long, the tube 4 mm. broad at base, narrowed at 1.5 mm. above base to 3 mm., expanded at mouth to 4 mm., the lobes obcordate, about 7 mm. long and 6 mm. wide toward tip, entire, reticulate-veined; stamens attached 3 mm. above the base of the corolla tube, the filaments 2 mm. long, the anthers sagittate, 2.5 mm. long, the basal lobes bearded; ovary glabrous; fruit not seen.

Type in the Gray Herbarium, collected in forest at Santurario, Department of Caldas, Colombia, altitude 2,000 to 2,300 meters, September 13 or 14, 1922, by Francis W. Pennell (No. 10601). An isotype is in the herbarium of the New York Botanical Garden.

Other collections are: *Killip* 11175, in woodland below La Cumbre, El Valle, altitude 1,400 to 1,700 meters, September 11 to 18, 1922 (GH, US); *Lawrance* 761, collected at El Humbo, Boyacá (Mo).

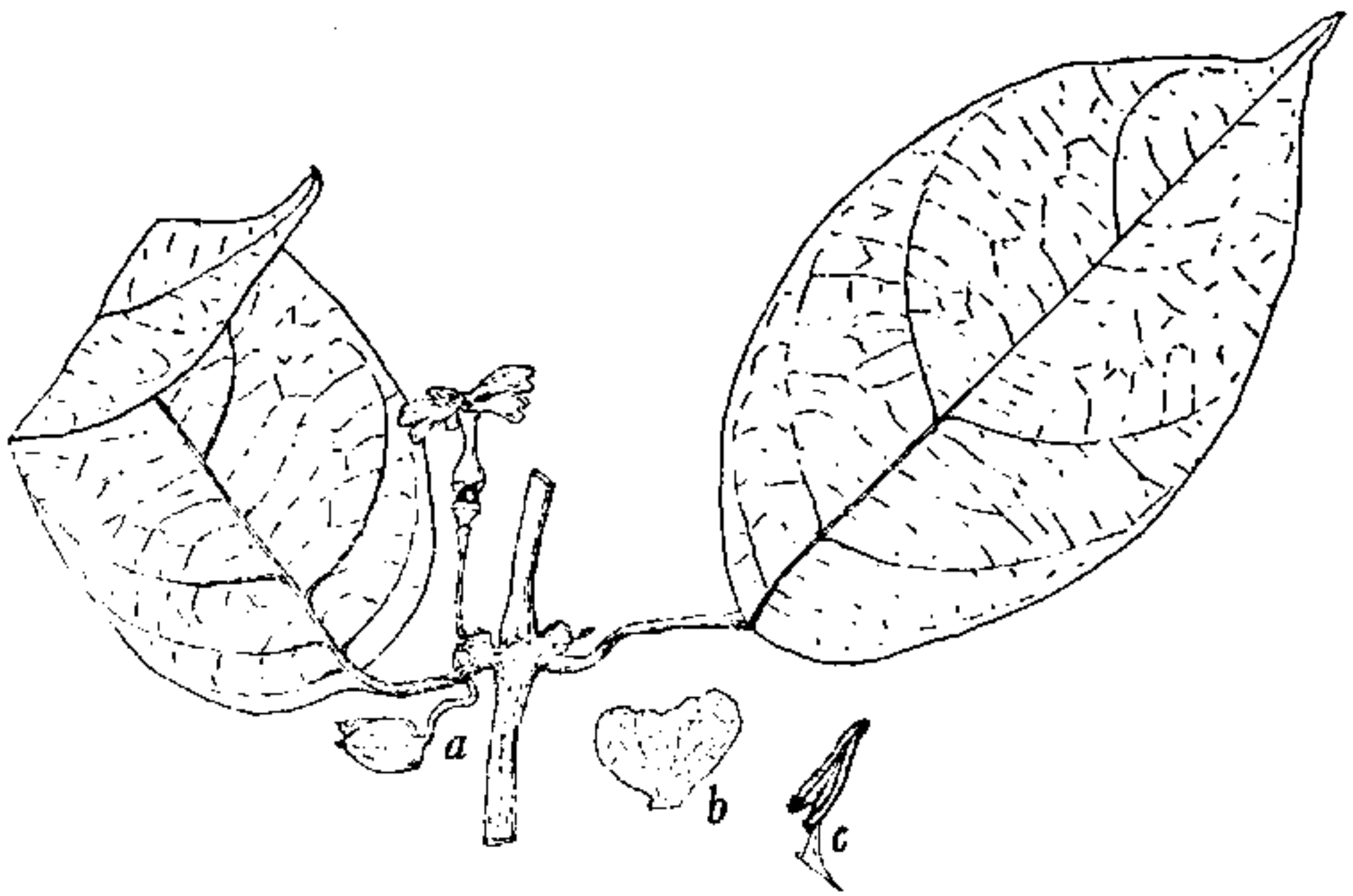


FIGURE 7.—*Mendoncia pennellii* Leonard (*Pennell* 10601): *a*, Nodal portion of plant showing a pair of leaves, spurs, and two flowers; *b*, a corolla lobe; *c*, stamen. (*a*, Half natural size; *b*, slightly larger than natural size; *c*, twice natural size.)

Mendoncia pennellii is closely related to *M. glabrescens*, differing chiefly in its almost glabrous corolla, the lobes being obcordate and entire instead of suborbicular and erose as in *M. glabrescens*, and by the thicker less slenderly acuminate leaf blades, their surfaces, at least those of the younger leaves, being more hirsute.

15. *Mendoncia glomerata* Leonard, sp. nov.

FIGURE 8

Suffrutex volubilis, caulibus subteretibus, strigosis; lamina foliorum ovata, apice acuminata, mucronata, basi rotundata vel obtusa, in petiolum decurrens, membranacea, substrigosa, pilis adpressis vel ascendentibus; flores pauci vel numerosi, axillares; pedicelli sericei, pilis adpressis vel ascendentibus; bracteae ovatae, apice rotundatae vel obtusae, basi subrotundatae, dense et molliter sericeae, pilis subadpressis; corolla alba, extus glabra vel subglabra, intus puberula, limbo obliquo; calyx chartaceus, integer; ovarium glabrum.



FIGURE 8.—*Mendoncia glomerata* Leonard (*Klug 1710*): *a*, Leaf; *b*, inflorescence; *c*, drupe; *d*, flower, showing calyx, disc, and pistil lying on the inner surface of a bract; *e*, corolla; *f*, stamen. (*a-e*, Natural size; *f*, twice natural size.)

Shrubby vine; stem subterete, grooved, strigose; leaf blades ovate, up to 8 cm. long and 4.5 cm. wide, acuminate and tipped by a mucro 1 to 3 mm. long at apex, rounded or obtuse at base and decurrent on the petiole, drying dark brown, thin, veiny, sparingly strigose or glabrate, the hairs confined chiefly to costa and lateral veins (4 pairs); petioles up to 2.5 cm. long, strigose; flowers several to numerous, forming compact axillary clusters; pedicels 1 cm. long or less, sericeous, the hairs appressed or ascending; bracts ovate, up to 12 mm. long and 8 mm. wide, rounded or obtuse at apex, apiculate, rounded at base, densely and softly sericeous, the hairs subappressed, whitish; corolla white, 1 to 1.5 cm. long, glabrous or subglabrous without, puberulous within,

the limb oblique, the basal lobes of the anthers terminating in pubescent discs; calyx chartaceous, entire; style 1 cm. long; ovary glabrous; fruit not seen.

Type in the U. S. National Herbarium, No. 1517993, collected in forest at Umbría, Comisaría of Putumayo, Colombia, altitude 325 meters, by G. Klug (No. 1710). Isotypes in the herbaria of the New York Botanical Garden and the Missouri Botanical Garden.

Mendoncia glomerata is a very distinct species, easily recognized by its relatively small and densely soft silky pubescent bracts and by the dense clusters of numerous small white flowers. The specific name *glomerata* alludes to the inflorescence.

16. *Mendoncia rosea* Leonard, sp. nov.

FIGURE 9

Suffrutex volubilis, caulibus subquadrangularibus, adpresso-pubescentibus, pilis curvatis; lamina foliorum ovata vel oblongo-ovata, apice acuminata, mucronata, basi rotundata vel obtusa, supra parce hirtella, subtus molliter pubescens; petioli dense hirtelli, pilis fulvis; flores solitarii, axillares; pedicelli dense adpresso-hirtelli; bracteae oblongo-ovatae, apice obtusae vel rotundatae, basi rotundatae vel subtruncatae, dense et molliter adpresso-hirtellae, pilis curvatis, fulvis; corolla glabra, lobis ovalibus, apice rotundatis; calyx subinteger; ovarium dense pilosulum, pilis fulvis.

Suffrutescent vine; stem subquadrangular, appressed-pubescent, the hairs curved, about 1 mm. long; leaf blades ovate to oblong-ovate, up to 10 cm. long and 6 cm. wide, acute or gradually to somewhat abruptly acuminate and tipped by a mucro 1.5 mm. long, rounded or obtuse at base, rather sparingly hirtellous above (hairs ascending curved, about 0.5 mm. long), velvety pubescent beneath, the hairs curved, ascending, about 0.75 mm. long, more numerous and appressed on costa and veins (4 pairs); petioles 1 to 2 cm. long, densely hirtellous, the hairs appressed or ascending, fulvous; flowers solitary, axillary; pedicels 4 to 5 cm. long, densely appressed-hirtellous, the hairs fulvous; bracts reddish pink, oblong-ovate, 2 cm. long, 1.3 cm. wide, obtuse or rounded at apex and tipped by a mucro 1 mm. long, rounded or subtruncate at base, densely and softly appressed-hirtellous, the hairs curved, fulvous; corolla (immature) red?, glabrous, 2 cm. long, 7 mm. broad at base, narrowed just above the ovary to 4 mm., thence enlarged to 6 mm. but contracted to 4 mm. at throat, the lobes oval, 3 mm. long, 1.5 to 2 mm. wide, rounded at apex; anthers sagittate, the lobes bearing longitudinally a ventral band of small brownish pillose hairs; calyx subentire, brownish pilosulous except the glabrous margin; densely fulvous-pilosulous; style glabrous; fruit not seen.

Type in the U. S. National Herbarium, No. 1351252, collected in woods on Mesa de los Santos, Department of Santander, Colombia,

altitude 1,500 meters, December 11-15, 1926, by E. P. Killip & A. C. Smith (No. 15368). Isotype in the herbarium of the New York Botanical Garden.

Mendoncia rosea is closely related to *M. coccinea* Vell. but is distinguishable by its smaller densely fulvous pilosulous bracts (these truncate or more broadly rounded at the base) and by its acute gradually to somewhat abruptly acuminate leaf blades. The name *rosea* alludes to the reddish-pink bracts.

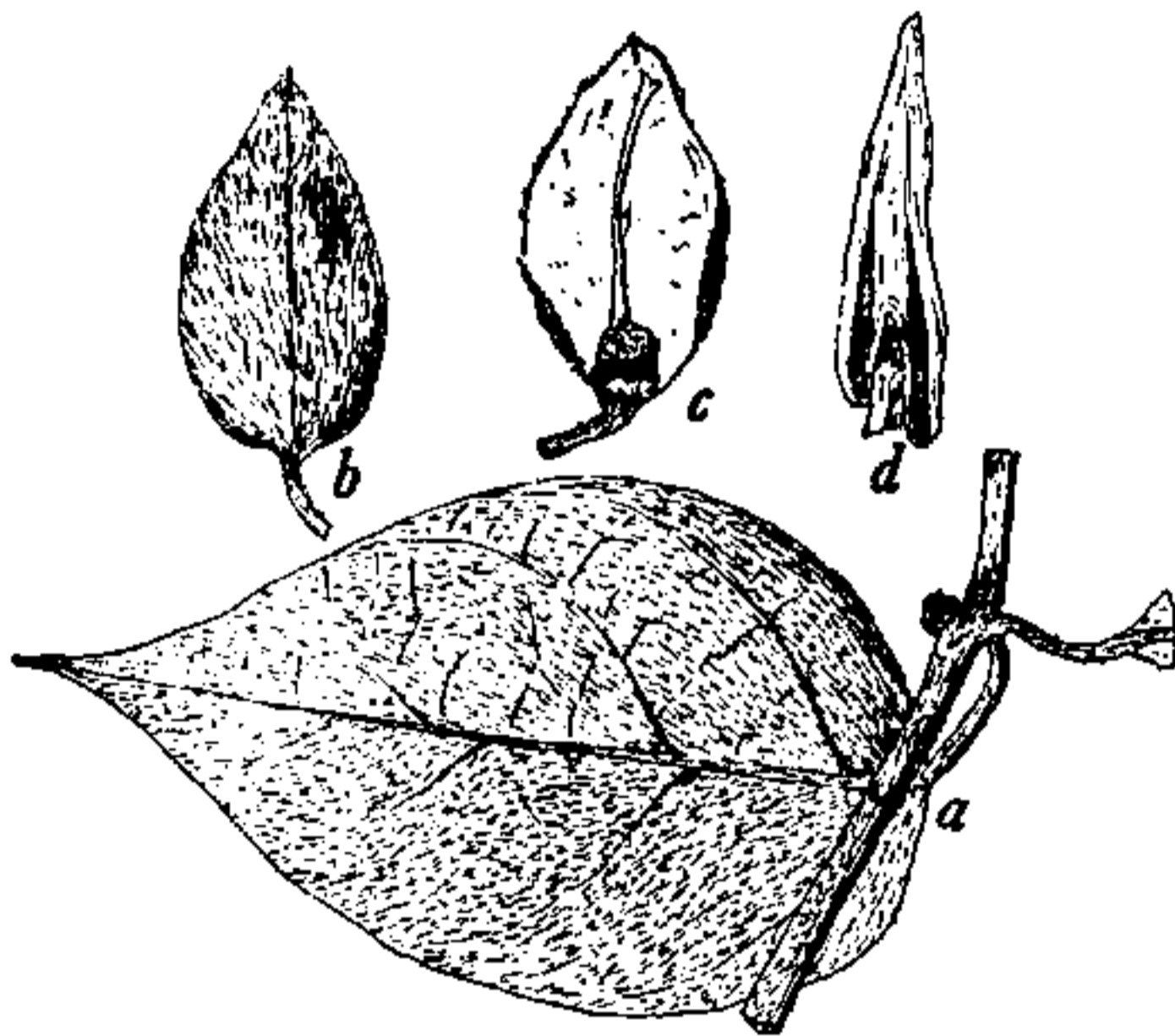


FIGURE 9.—*Mendoncia rosea* Leonard (Killip & Smith 15368): *a*, Node, showing stem and a leaf; *b*, bract; *c*, flower showing calyx, disc, and pistil on inner face of bract; *d*, stamen. (*a*, Half natural size; *b* and *c*, natural size; *d*, about twice natural size.)

17. *Mendoncia coccinea* Vell.

Mendoncia coccinea Vell. Fl. Flum. 263. 1790; Fl. Flum. Ic. 6: pl. 86. 1827.

Type locality: "Silvis maritimis Pharmacopolitanis," Brazil.

Mendozia velloziana Mart. Nov. Gen. & Sp. 3: 22, pl. 210. 1829. Type collected in Brazil by Vellozo. Several paratypes are cited, all from Brazil.

Mendoncia velloziana Nees in DC. Prodr. 11: 52. 1847. Based on *Mendozia velloziana* Mart.

Stems (at least the upper portions), petioles, pedicels, and bracts densely and softly silky hirsute, the hairs tawny, appressed or ascending; leaf blades elliptic-ovate, 5 to 11 cm. long, 2 to 6 cm. wide, obtuse, rounded or short-acuminate, sometimes tipped by a small mucro (1 mm. long), obtuse, rounded or subcordate at base, scabrous above and hirtellous, the hairs minute, less than 0.5 mm. long, curved, appressed or ascending, arising from star-shaped bases, more numerous on costa and veins (4 pairs), beneath copiously and softly pubescent with curved ascending hairs, these about 0.75 mm. long; flowers 1 or 2 in each axil; pedicels 2 to 5 cm. long; bracts oblong-ovate to lance-ovate, 2 to 3 cm. long, 1 to 1.5 cm. wide, obtuse and apiculate, rounded at base, purplish before drying, the hairs fulvous, closely appressed,

up to 1 mm. long, the costa prominent; calyx 1 mm. long, undulate, glabrous; corolla red, 3 cm. long, 5 mm. broad at throat, slightly constricted below the middle, swollen at base, the lobes rounded, 2 to 3 mm. long, 2 mm. wide; ovary hirtellous toward tip; style glabrous; fruit obovoid, compressed, keeled, glabrous at least when mature, usually tipped by the persistent style.

The ripe fruit (*Ynes Mexia* 4508, Minas Gerais, Brazil) is dark purple.

The Caquetá specimen cited here was taken from a plant growing among rocks in a thicket at 400 meters, on March 29, 1940. The bracts of the Triana specimen from Meta do not exceed 20 mm. in length or 13 mm. in width. In contrast, those of the Triana specimen (without locality) cited by Turrill as the type of *M. coccinea* var. *elliptica* are 30 mm. long and 20 mm. wide. Thus these two Triana specimens represent different entities.

Forests. Brazil and southern Colombia.

CAQUETÁ: Florencia, Quebrada de las Perdices, *Cuatrecasas* 8859 (US).

META: Aplaí, Llano de San Martín, *Triana* (Col).

17a. *Mendoncia coccinea* var. *elliptica* Turrill

Mendoncia coccinea var. *elliptica* Turrill, Kew Bull. 1919: 417. 1919. Type collected in Colombia by J. Triana.

Bracts broadly elliptic, 2.5 to 3 cm. long and 2 cm. wide. In other respects similar to the typical form.

Forests of Colombia.

NORTE DE SANTANDER: El Indio, Río Cubujón, 420–480 m. alt., region of Río Sarare, *Cuatrecasas* 13109, in part (US).

17b. *Mendoncia coccinea* var. *sparatteria* (Mart.) Turrill

Mendozia velloziana Mart. var. *sparatteria* Mart. Nov. Gen. & Sp. 3: 23. 1829. Type locality: Brazil. The word *sparatteria* is probably derived from *σπαράσσω*, to tear asunder, but the allusion is obscure.

Mendoncia velloziana var. *sparatteria* Nees in DC. Prodr. 11: 52, 1847.

Based on *Mendozia velloziana* var. *sparatteria* Mart.

Mendoncia coccinea var. *sparatteria* Turrill, Kew Bull. 1919: 416. 1919.

Based on *Mendozia velloziana* var. *sparatteria* Mart.

Mendoncia fulva Lindau, Bull. Herb. Boiss. 5: 646. 1897. Type collected between Panure and the Rio Uaupés, Brazil, by Spruce (No. 2683). Type in the Berlin Herbarium. A photograph (No. 5869) of this type is in the U. S. National Herbarium. An isotype is in the Gray Herbarium.

Leaf blades elliptic to ovate, obtuse to sharply acute or short-acuminate; bracts up to 3 cm. long and 1.7 cm. wide, truncate at base; densely yellowish pubescent, the hairs subappressed, more or less curved, up to 1 mm. long; fruit puberulous. Otherwise resembling the typical form.

In Minas Gerais this plant is known as *raiz preta* and is used as a purgative for cattle (*Mexia* 4135). No Colombian specimens were

seen, but since *Spruce* 2683 was collected between Panure and the Rio Uaupés, near the Colombia-Brazilian border, the variety has been included in this treatment.

Forests of Brazil and possibly Colombia.

18. *Mendoncia litoralis* Leonard, sp. nov.

FIGURE 10

Frutex volubilis, caulibus subteretibus, sursum dense pilosis, deorsum subglabrescentibus, pilis sursum incurvo-adpressis, brunneis; lamina foliorum ovata vel elliptica, apice acuminata, basi obtusa vel subacuta, supra minute hirsuta vel subglabrescens, pilis e basi stellata orientibus instructa, subtus hirsuta, pilis adpressis brunneis, costa et venis aliquanto prominentibus; petioli dense hirsuti, pilis adpressis vel paulo patentibus; flores solitarii, axillares; pedicelli dense hirsuti, pilis patentibus vel retrorsis, brunneis; bracteae ovatae, apice rotundatae et apiculatae, basi rotundatae, intus glabrae, extus hirsutae, pilis patentibus; drupa orbiculata, glabra.

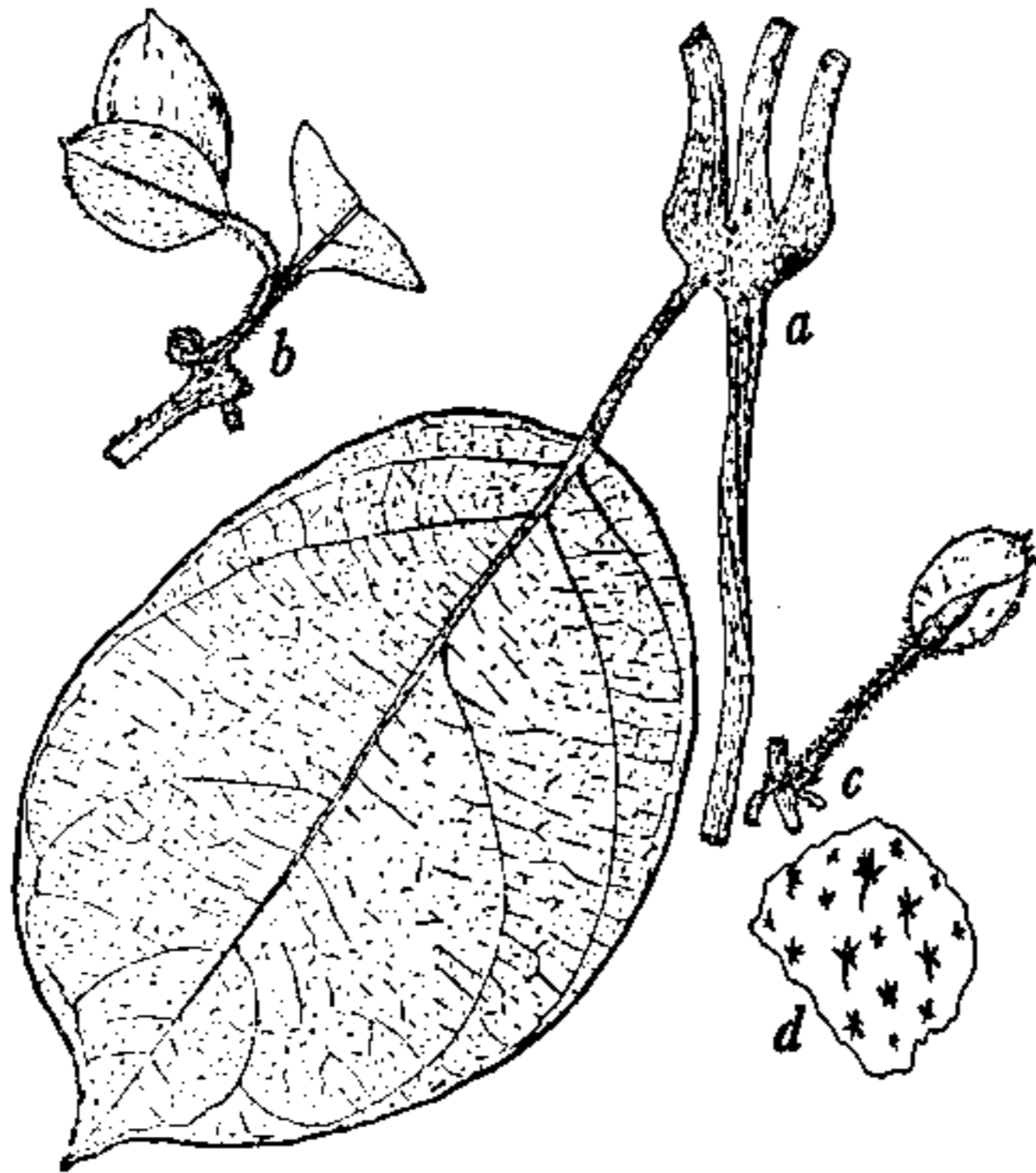


FIGURE 10.—*Mendoncia litoralis* Leonard (*Cuatrecasas* 17529): *a*, Node showing leaf; *b*, node showing fruit; *c*, node showing pedicel, inner surface of bract, and pistil; *d*, portion of the upper surface of a leaf blade showing hairs. (*a-c*, Half natural size; *d*, about three times natural size.)

Vines; stems subterete, densely hirsute above to glabrate below, the hairs straight, closely and upwardly appressed, yellowish brown, about 1 mm. long; leaf blades ovate to elliptic, 6 to 10 cm. long, 3.5 to 6.5 cm. wide, abruptly acuminate at tip, obtuse or acutish at base, the upper surface minutely hirsute or subglabrous, more or less rugose, roughened by the small obscure stellate hair bases, the lower surface

appressed-hirsute, the hairs of the costa and lateral veins (4 or 5 pairs) about 1 mm. long, those of the interspaces about 0.5 mm. long, their bases raised and stellate but not so prominently as those of the hairs of the upper surface, all yellowish brown, the venation of both surfaces rather prominent; petioles 1 to 2 cm. long, densely hirsute, the hairs appressed or slightly spreading, about 1 mm. long; flowers usually solitary in the axils of the leaf blades; pedicels about 1.5 cm. long, densely pilose, the hairs spreading or retrorsely spreading, 1 to 1.5 mm. long, yellowish brown; bracts ovate, 15 to 17 mm. long, 9 to 10 mm. wide, rounded and minutely apiculate at tip, rounded at base, glabrous within, hirsute without, the hairs spreading, 1 to 1.5 mm. long, yellowish brown, arising from rounded scalelike bases; corollas not seen; ovary glabrous; style about 12 mm. long, glabrous; drupe orbicular, 1.8 cm. long, 1.4 cm. broad, 5 mm. thick, glabrous.

Type in the U. S. National Herbarium, No. 1853796, collected at Silva, on the Río Cajambre, near the Pacific coast, Department of El Valle, Colombia, altitude 5 to 80 meters, May 5 to 15, 1944, by J. Cuatrecasas (No. 17529).

In general appearance *Mendoncia litoralis* strongly resembles *M. gracilis*, but it can be readily separated by the spreading pubescence of pedicels and bracts.

19. *Mendoncia gracilis* Turrill

Mendoncia gracilis Turrill, Kew Bull. 1919: 418. 1919. The type was collected at Mesa Grande on the Río Negro, Department of Cundinamarca, Colombia, 1,200 to 1,300 meters, by Lehmann, No. 8792, and is deposited in the herbarium of the Royal Botanic Gardens, Kew.

Stem subquadrangular, appressed-hirsute, the hairs tawny; leaf blades elliptic or oblong-elliptic, 6 to 14 cm. long, 3 to 7 cm. wide, acute or acuminate at apex, obtuse or rounded at base, firm, rather sparingly hirsute above (hairs arising from star-shaped bases), rather densely pubescent beneath, the hairs tawny, curved, ascending, the costa, veins (4 or 5 pairs), and veinlets prominent; petioles 1 to 3 cm. long, hirsute, the hairs appressed to ascending; flowers 1 to several in each axil; pedicels 2 cm. long, densely hirsute, the hairs appressed to ascending; bracts elliptic or oblong-elliptic, 1.5 cm. long, 0.8 to 1 cm. wide, obtuse and apiculate at apex, rounded at base, rather sparingly appressed-hirtellous; corolla white, proximally lined with reddish brown, 2.5 cm. long, 5 mm. broad at throat, the lobes suborbicular, about 7 mm. long and wide, shallowly emarginate; fruit elliptic-obovoid, slightly compressed, 1.5 to 2 cm. long, 1 to 1.2 cm. broad, glabrous.

Fields, pastures, and thickets on mountain slopes from 1,100 to 2,080 meters. Colombia.

ANTIOQUIA: Jardín, southwest of Antioquia, *Bro. Daniel* 2974 (GH, US).
La Suiza, near Titiribí, *Archer* 818 (US). Támesis, vicinity of Medellín, *Toro*
960 (NY).

CUNDINAMARCA: Above Sasaima, Estación Santana, *Dugand & Jaramillo* 3871
(US).

CAUCA: Quindío, *Triana* s. n. (Col.).

EL VALLE: Vicinity of La Cumbre, *Killip* 11584 (NY, US). Miraflores, Palmira,
Killip 6147 (NY, US). Alto de Miravalle, vicinity of Leonera, *Cuatrecasas*
18314 (US).

TOLIMA: Road from Fresno to Falán, Cañon del Río Gualí, *García-Barriga*
8337 (US).

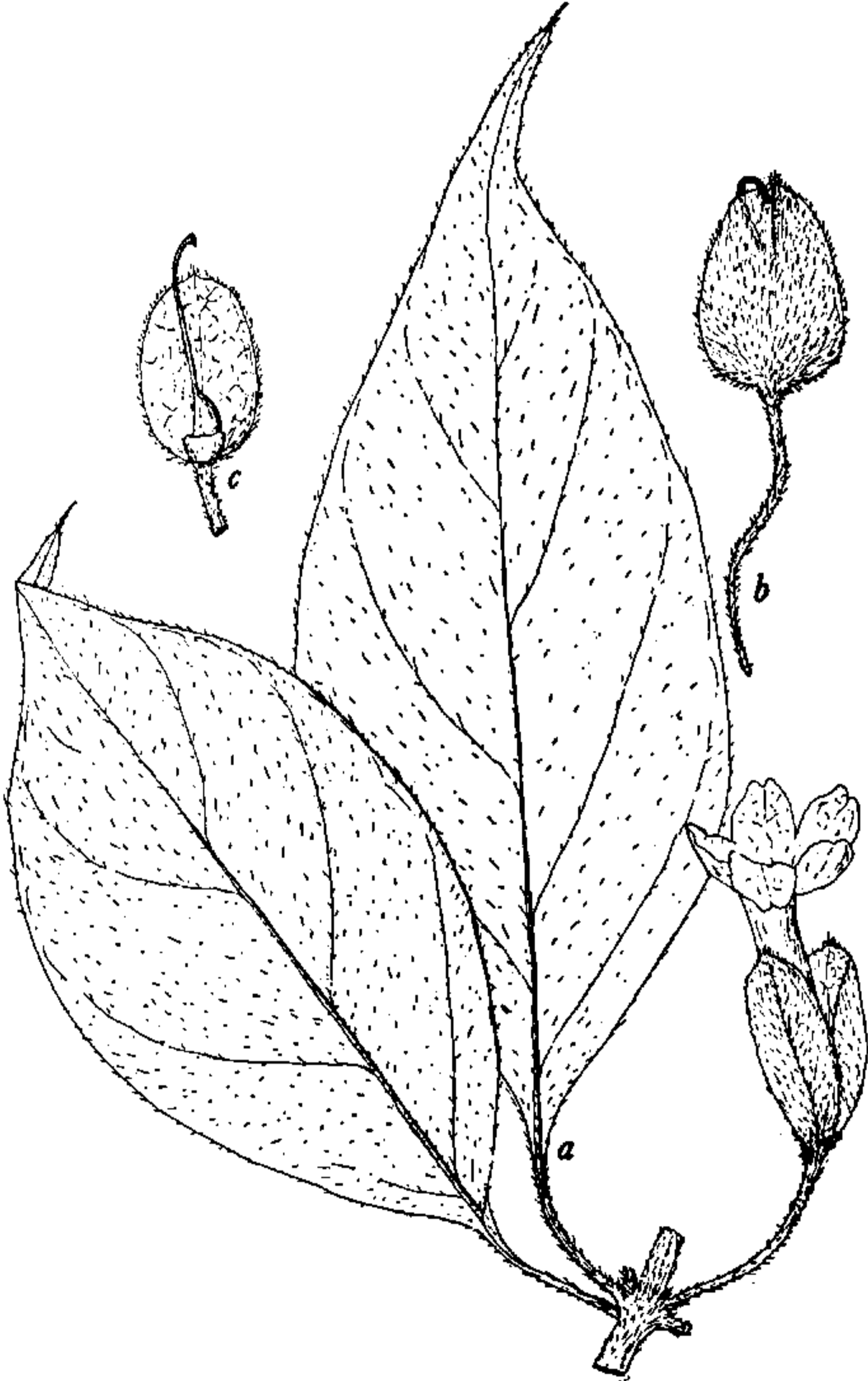


FIGURE 11.—*Mendoncia gilva* Leonard (*Haught* 1799): *a*, Node showing flower and pair of leaves; *b*, bract and pedicel; *c*, bract (inner surface), disc, and pistil. (All natural size.)

20. *Mendoncia gilva* Leonard, sp. nov.

FIGURE 11

Herba vel suffrutex volubilis, caulibus subteretibus tenuiter pilosis vel ad nodos pilosis, pilis adpressis vel adscendentibus, fulvis; lamina foliorum oblonga-elliptica, subfalcata, apice acuminata, mucronata, basi angustata, tenuis, parce strigosa vel in costa et venis lateralibus dense strigosa; petioli pilosi; flores solitarii; bracteae ovatae vel ellipticae, apice rotundatae vel obtusae, mucronatae, basi rotundatae, pilosae, pilis fulvis; corolla gilva, lobis ovatis, emarginatis; pistillum glabrum.

Slender herbaceous or suffrutescent vines; stems subterete, moderately pilose or densely so at the nodes, the hairs appressed or ascending, 1 to 2 mm. long, fulvous; leaf blades oblong-elliptic, slenderly acuminate, the tip subfalcate and tipped by a slender mucro about 3 mm. long, narrowed at base, thin, rather sparingly strigose, the hairs more numerous and more fulvous on costa and lateral veins (3 or 4 pairs), these inconspicuous; petioles 2 to 3 cm. long, sparingly pilose, the hairs ascending; flowers solitary; pedicels 2 to 3 cm. long, pilose, the hairs ascending, about 1 mm. long, light fulvous; bracts ovate to elliptic, 2 cm. long, 14 mm. wide, rounded or obtuse and mucronulate at apex, rounded at base, moderately pilose, the hairs appressed to ascending, 1 to 1.5 mm. long, light fulvous; corolla 3 cm. long, cream color, glabrous, 3 cm. long, the tube about 4 mm. broad at base, slightly constricted above ovary, thence enlarged to about 8 mm. at throat, the lobes ovate, about 5 mm. long, emarginate; ovary, style, and calyx (entire) glabrous; fruit not seen.

Type in the U. S. National Herbarium, No. 1662515, collected in the San Juan Valley near Puerto Berrío, between Río Carare and Río Magdalena, Department of Santander, Colombia, altitude 100 to 700 meters, June 19, 1935, by Oscar Haught (No. 1799).

Mendoncia gilva is closely related to *M. odorata*. When compared with this species it can be easily recognized by its solitary flowers and by the much longer and less appressed hairs of the more densely pilose bracts. The name *gilva* alludes to the cream-colored flowers.

21. *Mendoncia odorata* Leonard, sp. nov.

FIGURE 12

Suffrutex volubilis, caulibus subquadrangularibus vel teretibus, striatis, parce adpresso-hirtellis vel glabratis; lamina foliorum ovata vel ovato-elliptica, acuminata, mucronata, basi acuta vel obtusa, parce adpresso-hirtella vel glabrata, pilis supra e basi stellata orientibus instructa; flores axillares, fragrantés; pedicelli adpresso-hirtelli; bracteae ovatae vel oblongo-ovatae, obtusae, minute apiculatae, extus parce adpresso-hirtellae, intus glabrae; corolla subflava, lobis suborbicularibus; drupa ovoidea, leviter compressa, glabra.

A suffrutescent vine up to 5 meters high; branches subquadrangular to terete, striate, sparingly appressed-hirtellous to glabrate; leaf blades ovate to oblong-elliptic, up to 11 cm. long and 5 cm. wide, gradually to abruptly acuminate (the tip blunt and ending in a mucro about 2 mm. long), acute or obtuse at base, thin, sparingly appressed-hirtellous or glabrate, the hairs of the upper surface produced from star-shaped bases, the costa and veins (3 or 4 pairs) inconspicuous;

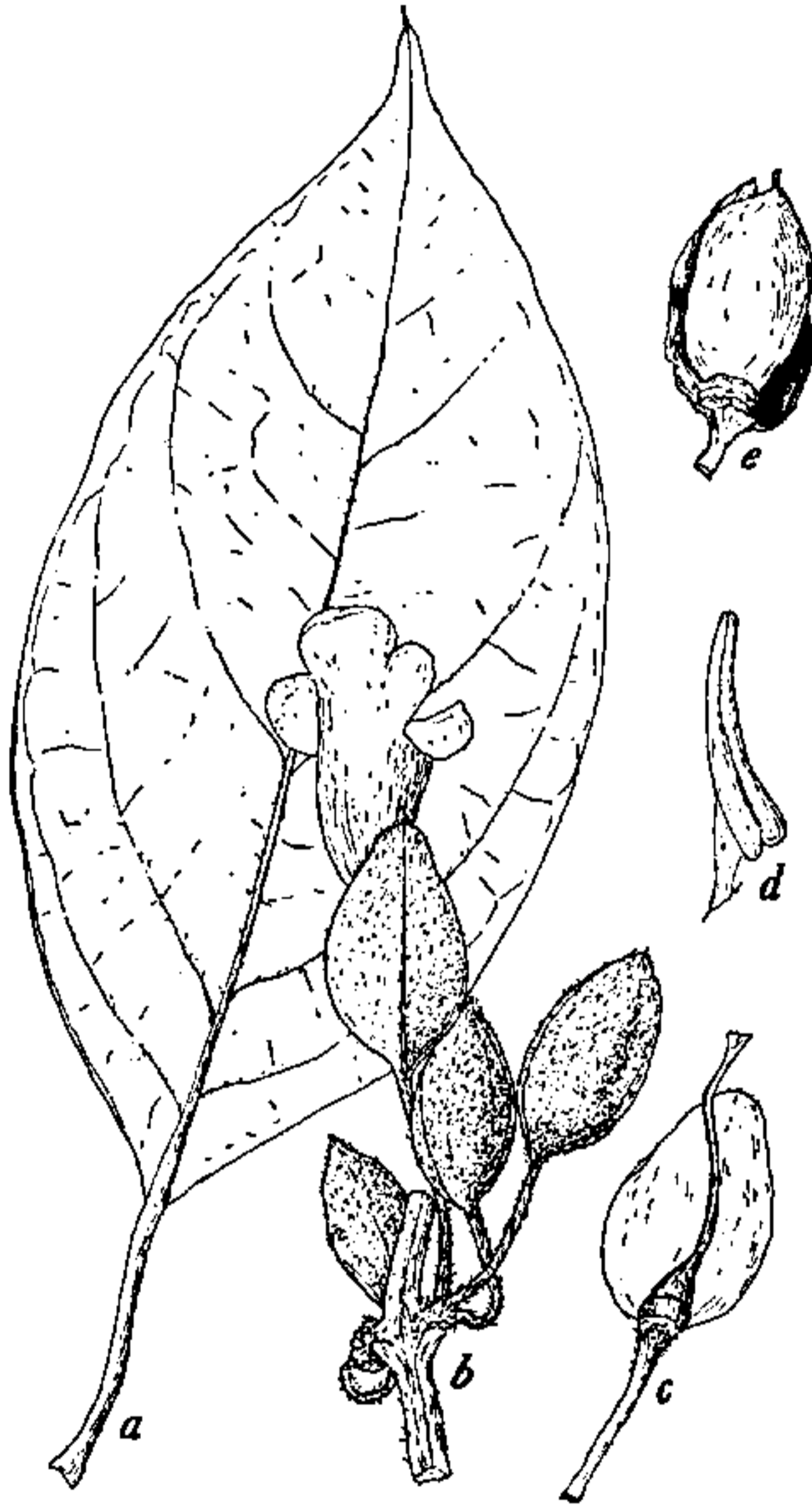


FIGURE 12.—*Mendoncia odorata* Leonard (Haught 2494): *a*, Leaf; *b*, inflorescence; *c*, flower with corolla and one bract removed to show disc and pistil; *d*, stamen; *e*, capsule. (*a*, *b*, *c*, *e*, Natural size; *d*, twice natural size.)

petioles up to 2 cm. long, glabrous or sparingly hirtellous; flowers 1 to several in each axil; pedicels up to 1.5 cm. long, appressed-hirtellous; bracts ovate to oblong-ovate, up to 2 cm. long and 1 cm. wide, obtuse and minutely apiculate at apex, rounded at base, sparingly appressed-hirtellous without, the hairs 0.5 mm. long or less, glabrous within; corolla cream with brownish markings, glabrous, fragrant, up to 3 cm. long, 6 mm. broad at base, narrowed 5 mm. above base to

3 or 4 mm., thence enlarged to 8 mm. at throat, 2-lipped, the lobes suborbicular, about 5 mm. in diameter; calyx glabrous, subentire; ovary and style glabrous; drupe ovoid, slightly compressed, 1.5 cm. long, barely 1 cm. broad, about 4 mm. thick, glabrous.

Type in the U. S. National Herbarium, No. 1706847, collected in second growth along the Río Negrito, 70 km. east of Villavicencio, Intendencia of Meta, Colombia, December 25, 1938, by Oscar Haught (No. 2494).

Other collections are: Caparrapí, in Cundinamarca, altitude 1,260 meters, *García-Barriga* 7720 (US); in the high forests of Mount Chapón, 3,000 feet, Bayacá, *Lawrance* 363 (Mo, NY).

Mendoncia odorata resembles *M. gracilis* in many respects but can be separated by its sparingly pilose stems. In *M. gracilis* the stem hairs are more numerous and usually closely appressed. The veins and veinlets of the leaf blades of *M. gracilis* are often much more prominent than those of *M. odorata*. The name *odorata* alludes to the fragrant flowers (*Haught* 2494).

22. *Mendoncia mutisii* Leonard, sp. nov.

FIGURE 13

Suffrutex volubilis, caulibus subquadrangularibus, strigosis; lamina foliorum oblonga, apice acuminata, mucronata, basi angustata, submembranacea, supra parce pubescens, pilis e basi stellata orientibus instructa, subtus dense adpresso-pubescens, pilis in costa et venis lateralibus pluribus; flores solitarii vel parci; pedicelli adpresso-pubescentes; bractee ellipticae, apice rotundatae et apiculatae, basi rotundatae, adpresso-pubescentes; corollae lobi emarginati; ovarium glabrum.

Stem subquadrangular, fulvous-strigose, the hairs closely appressed, about 0.75 mm. long; leaf blades oblong to oblong-ovate, up to 9 cm. long and 4 cm. wide, short-acuminate at apex and tipped by a mucro about 1 mm. long, narrowed at base, rather thin, sparingly hirtellous above (hairs ascending, slightly less than 0.5 mm. long, arising from star-shaped bases), rather copiously hirtellous beneath, the hairs curved, ascending, about 0.75 mm. long, those on the costa and veins (4 pairs) more numerous and more closely appressed; petioles up to 1 cm. long, densely fulvous, appressed-pilosulous; flowers 1 to several in the axils; pedicels 1.5 cm. long, densely fulvous, appressed-pilosulous; bracts elliptic, 12 to 13 mm. long, 8 to 9 mm. wide, rounded and apiculate at apex, rounded at base, rather copiously hirtellous without, the hairs curved, ascending or appressed, about 0.5 mm. long; pistil glabrous; calyx subentire, glabrous; corolla (immature) 1 cm. long, the lobes oval, 3 mm. long, 3 to 4 mm. wide, emarginate; anthers sagittate, slightly curved, 4 mm. long, 1.5 mm. wide at base, mucronate at tip, one basal lobe slightly longer than the other, both puberulous at tip; drupe not seen.

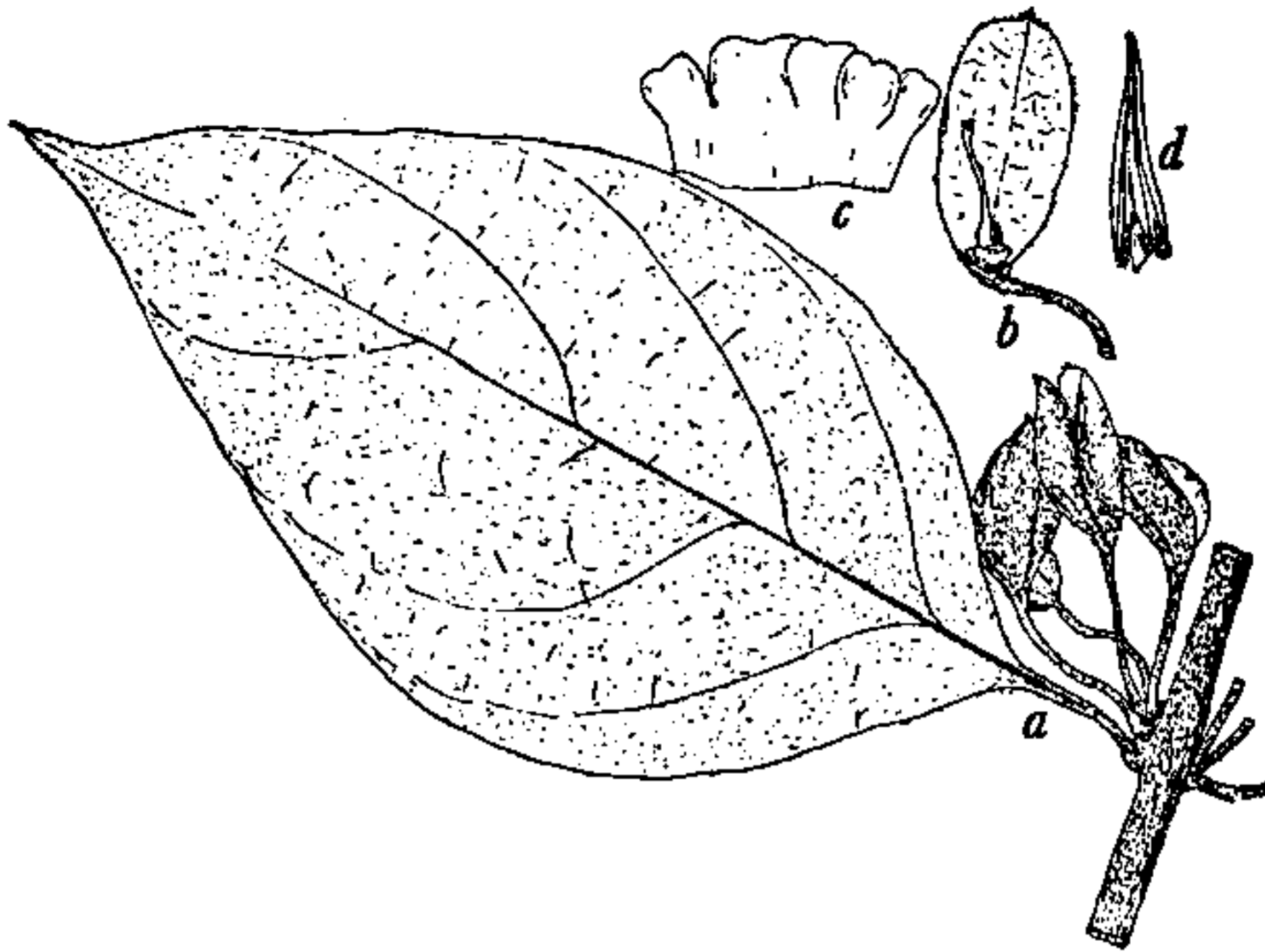


FIGURE 13.—*Mendoncia mutisii* Leonard (*Mutis* 916): *a*, Node, showing leaf and inflorescence; *b*, flower showing calyx, disc, and pistil on inner face of bract; *c*, tip of immature corolla spread to show lobation; *d*, stamen. (*a*, *b*, Natural size; *c*, *d*, about twice natural size.)

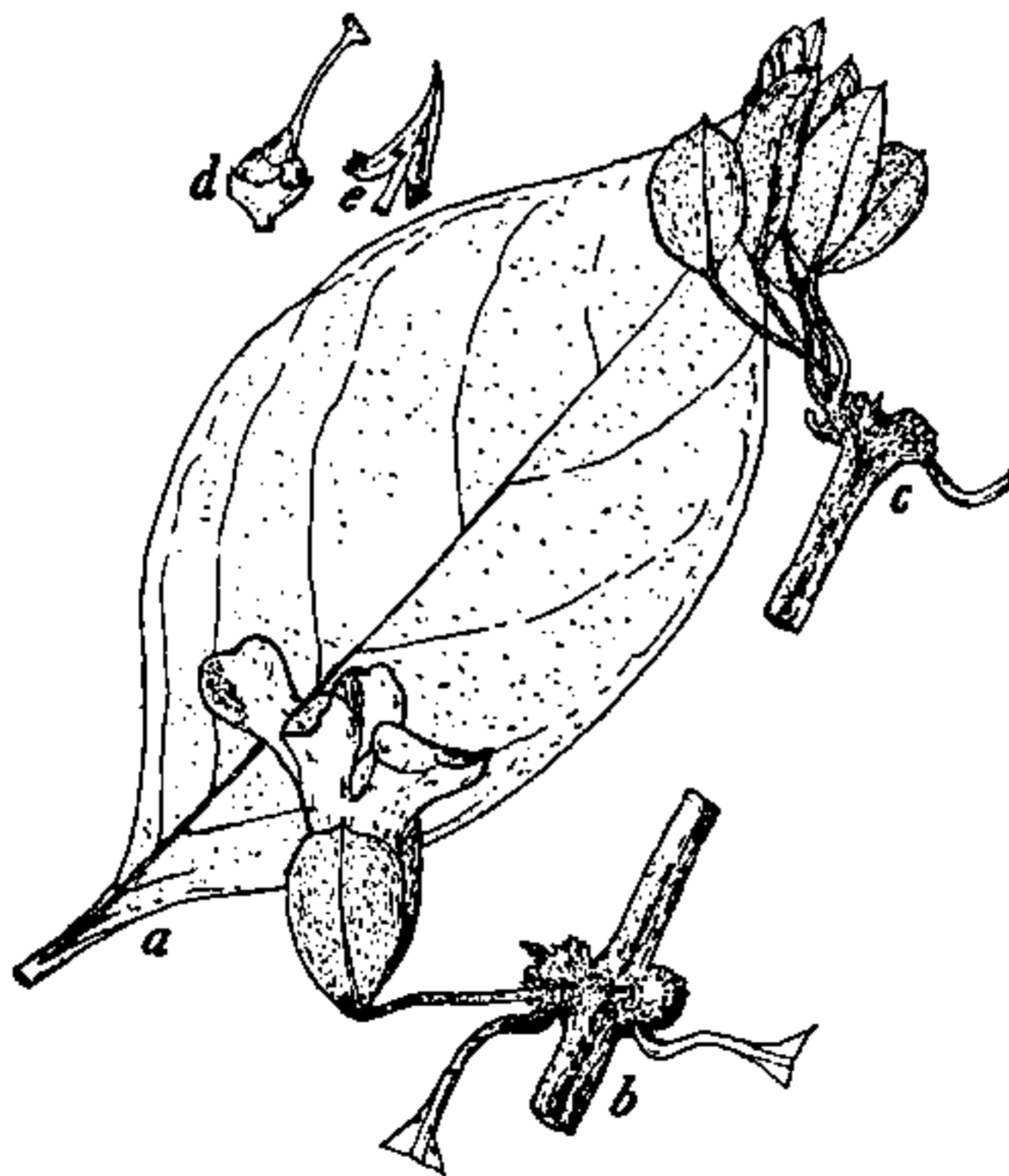


FIGURE 14.—*Mendoncia cuatrecasarii* Leonard (*Cuatrecasas* 11134): *a*, Leaf; *b*, node showing corolla; *c*, node above that pictured in *b*, showing unopened flowers; *d*, calyx, disc, and pistil; *e*, stamen. (*a*-*c*, Natural size; *d*, about four times natural size; *e*, about three times natural size.)

Type in the U. S. National Herbarium, No. 1562336, collected in Colombia by J. C. Mutis (No. 916).

Mendoncia mutisii is probably related to *M. albida*, but it has much smaller flowers and a more appressed pubescence.

23. *Mendoncia cuatrecasasii* Leonard, sp. nov.

FIGURE 14

Herba vel suffrutex volubilis, caulibus subteretibus, glabris vel minute strigosis; lamina foliorum oblongo-ovata vel oblonga, apice acuminata, basi angustata, in petiolum decurrens, chartacea, glabra vel in costa et venis lateralibus minute strigosa; flores fasciculati; bracteae ellipticae utrinque rotundatae, apice mucronatae, extus minute strigosae, intus glabrae; corolla subflava, extus glabra, lobis intus ex parte puberulis; stamina barbata; calyx subhyalinus, erosus; stylus et ovarium et discus glabri.

Herbaceous or suffrutescent vines; stems subterete, glabrous or inconspicuously and minutely strigose; leaf blades oblong-ovate to oblong, short-acuminate at apex (the tip blunt and often mucronate), narrowed at base and decurrent on the petiole, drying yellowish brown, firm, glabrous, or the costa and lateral veins (4 pairs) inconspicuously and closely strigose; petioles up to 2 cm. long, glabrous or minutely strigose; flowers usually about 10, borne on short fan-shaped spurs, these axillary or terminating the short branches; pedicels about 1 cm. long, minutely strigose; bracts elliptic, 8 to 10 mm. long, 6 to 7 mm. wide, rounded at both ends, apiculate at apex, inconspicuously strigose, the hairs minute and closely appressed; corolla yellowish white, glabrous without, 2 cm. long, the tube 5 to 10 mm. long, the limb oblique, the lobes rounded, about 5 mm. long, an oblique lateral area of the inner surface of each lobe papillose-puberulous; calyx subhyaline, erose; style and ovary glabrous; fruit not seen.

Type in the National Herbarium of Colombia, collected along the San Miguel River, in damp forest of Quebrada de la Hormiga, Comisaría of Putumayo, Colombia, altitude 290 meters, December 17, 1940, by J. Cuatrecasas (No. 11134). Fragment of type in the U. S. National Herbarium, No. 1830082.

Mendoncia cuatrecasasii is related to *M. glomerata* Leonard but differs in certain well-marked characters. In *M. cuatrecasasii* the leaf blades are oblong-ovate to oblong instead of strictly ovate; they are firm, drying yellowish brown, instead of being thin and drying dark brown as in *M. glomerata*. The corollas are yellowish white, not pure white. The most contrasting character, however, lies in the bracts; in this new species they are inconspicuously and closely strigose, with the hairs minute (0.5 mm. long), but in *M. glomerata* they are soft and silky, the hairs loosely appressed and much longer (1 mm. long).

24. *Mendoncia microchlamys* Leonard, sp. nov.

FIGURE 15

Suffrutex volubilis, caulibus subquadrangularibus, parce et minute strigosis, pilis sursum incurvis; lamina foliorum ovata vel elliptica, apice breviter acuminata et apiculata, basi rotundata, glabra vel parce strigosa, costa et venis subtus prominentibus; petioli glabri vel subglabri; flores in calcaribus axillaribus complanatis dispositi; pedicelli tenues, glabri, vel subglabri; bracteae parvae, ovatae, apice acutae, basi rotundatae, parce et minute adpresso-hirsutae; corolla parva, subviridis; ovarium glabrum.

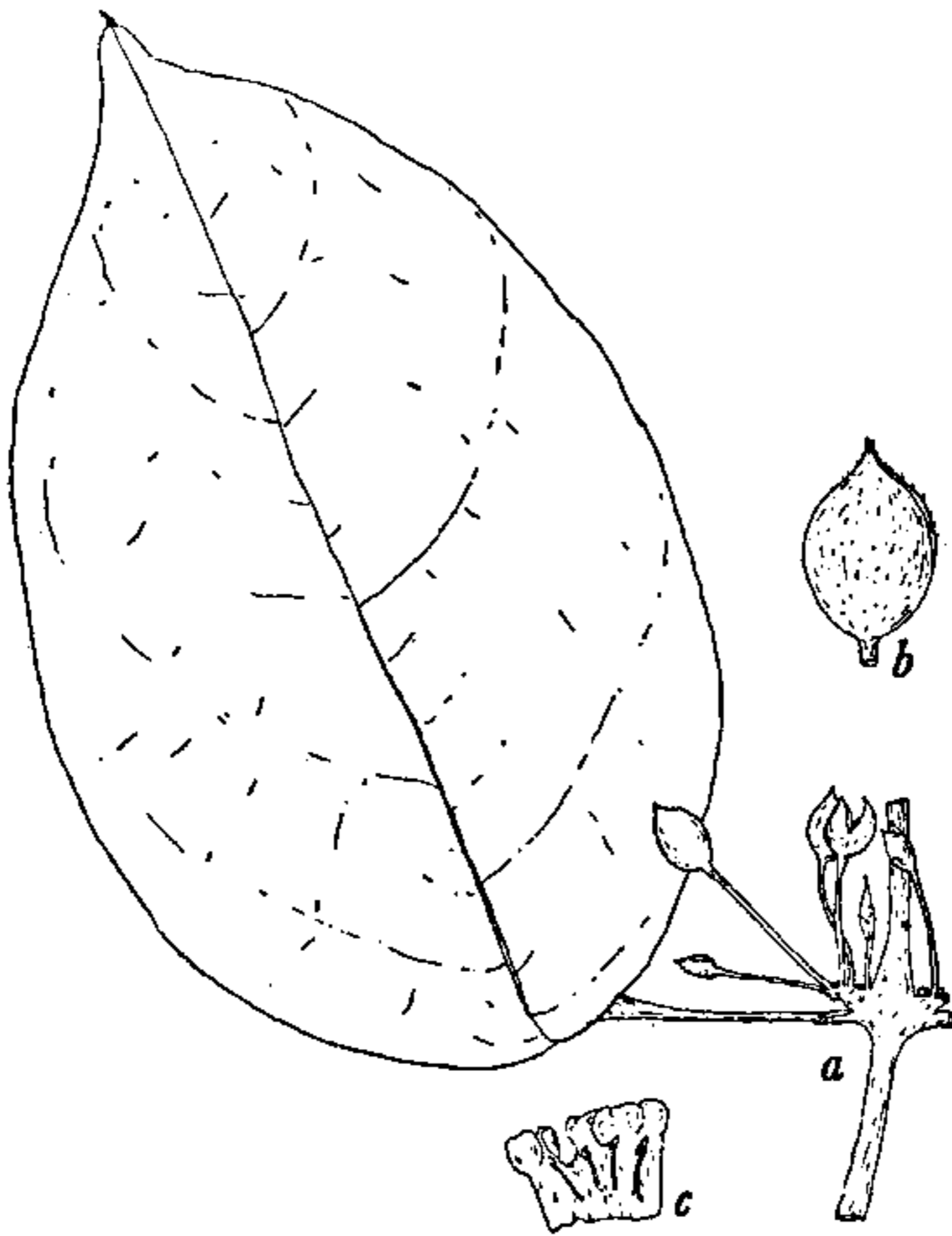


FIGURE 15.—*Mendoncia microchlamys* Leonard (*Lawrance* 264): *a*, Node showing leaf and inflorescence; *b*, bracts; *c*, dissected corolla (immature). (*a*, Natural size; *b*, twice natural size; *c*, about four times natural size.)

High climbing vines; stems subquadrangular, drying black, sparingly and minutely strigose, the hairs upwardly curved, 0.25 mm. long; internodes 10 to 11 cm. long; leaf blades elliptic-ovate, 5.5 to 8.5 cm. long, 3.3 to 5.3 cm. wide, short-acuminate and apiculate at tip, rounded at base, rather firm, drying black above and dark olive-brown beneath, glabrous or the costa of the undersurface bearing a few minute hairs, the costa and lateral veins (3 pairs) obscure above, more prominent beneath; petioles 1.5 to 2 cm. long, glabrous or sparingly hirsute, the

hairs 0.25 mm. long; flowers about 4, borne on short flattened axillary spurs; pedicels slender, 1 to 1.5 cm. long, subquadrate, glabrous or bearing a few minute hairs; bracts thick, ovate, blackened, 5 to 6 mm. long, 3.5 to 4 mm. wide, acute, rounded at base, sparingly and minutely appressed-hirsute, the hairs about 0.25 mm. long; corolla greenish white (immature), 2 mm. long, the lobes rounded, 0.5 mm. long and 0.75 mm. wide; ovary glabrous; fruit not seen.

Type in the herbarium of the Riksmuseet, Stockholm, collected in thick forest in the region of Mount Chapón, Department of Boyacá, Colombia, "altitude 3,600 feet," June 29, 1932, by A. E. Lawrance (No. 264).

Another collection is: Los Carpatos, Río Pichindé, El Valle, altitude 1,900 to 2,100 meters, *Cuatrecasas* 21641, U. S. National Herbarium, No. 1951303. Cuatrecasas accompanies his specimen with the following notes: An enormous vine, the stems clear sepia, whitish in cross section, the branches leafy, dull green, fleshy, and the bracts pale green.

Mendoncia microchlamys is easily recognized, as the specific name indicates, by its minute bracts and extremely small greenish-white flowers.

Subfamily 3. THUNBERGIOIDEAE

Thunbergioideae Lindau, Bot. Jahrb. Engler 18: 43. 1893; Engl. & Prantl, Pflanzenfam. IV. 3b: 291. 1895.

Vines or shrubs; leaves opposite, entire, toothed or lobed, petioled; cystoliths none; flowers axillary, pediceled, subtended by 2 usually conspicuous but free bracts; calyx annular or toothed; corollas usually conspicuous, white, yellow, or blue, the tube more or less curved and ventricose, the limb 5-lobed; stamens 4, the anthers 2-celled, the basal lobes blunt or spurred; pollen of the "Furchenpollen" (furrowed) or "Kammradpollen" (cog-wheeled) type; capsule beaked; seeds 2 in each cell; retinacula none, the funicles pulvinate.

Three genera are allotted to this subfamily, *Thunbergia*, *Pseudocalyx*, and *Meyenia*, all of African or Asiatic origin. Of these only a few cultivated or escaped species of *Thunbergia* are likely to be met with in the Western Hemisphere. *Thunbergia alata* has become so thoroughly established in some regions that it may appear to be native.

5. THUNBERGIA Retz.

Thunbergia Retz. Phys. Sällsk. Handl. 1: 163. 1776. The genus *Thunbergia* was named for Carl Peter Thunberg, a Swedish student of Linnaeus'. He traveled in South Africa and Japan writing floras of these regions. The genus is chiefly African, and it is indeed doubtful if any of its species

will ever be found native to the Americas. A dozen or more species occur in tropical or subtropical America, either under cultivation or as escapes. Type species: *Thunbergia capensis* Retz. (Africa).

Herbaceous vines, or shrubs; leaves usually hastate or cordate; flowers large, peduncled, axillary or borne in terminal racemes; bracts 2, foliaceous, large; calyx short, cupuliform, truncate or many-toothed; corolla with a slender tube enlarged into a spreading 5-lobed limb; stamens 4, didynamous, borne near the base of the corolla tube, the anthers with an apiculate connective, the lobes mucronulate at base; disc fleshy; ovary fleshy, the style dilated at apex; ovules 2 in each cavity; capsule coriaceous, abruptly flat-beaked, loculicidally dehiscent; seeds semi-globose, with a large excavation on the inner side.

KEY TO THE SPECIES

Petioles winged.

Corolla usually orange or yellow with a dark purple eye..... 1. *T. alata*
Corolla pure white..... 1a. *T. alata* var. *bakeri*

Petioles not winged.

Calyx bearing about 12 slender, subulate teeth; corolla

3 cm. long or less, pure white..... 2. *T. fragrans*

Calyx annular; corolla 5 to 6 cm. long, blue or rarely white... 3. *T. grandiflora*

1. *Thunbergia alata* Bojer

Thunbergia alata Bojer; Sims, Bot. Mag. 52: pl. 2591. 1825. Type grown from seeds procured in Mauritius. The name *alata* alludes to the winged petioles.

A pubescent trailing or climbing vine usually about 1 meter long; leaves ovate to triangular-ovate, 4 to 8 cm. long, acute at apex, cordate or hastate at base, entire or remotely few-toothed, pubescent; petiole wing-margined, as long as the leaf blades or shorter; peduncles mostly longer than the petioles; bracts ovate-lanceolate, acute or acuminate, pubescent, about 1.5 cm. long; corolla 2.5 to 4 cm. long, yellow or orange usually with a dark purple eye; capsule depressed-globose, pubescent, 8 to 10 mm. in diameter, its stout beak about 1 cm. long.

Fields, along trails, edges of thickets, gardens, and open waste places in general. The specimens cited were collected 940 to 1,700 meters altitude. Tropical America, southern and eastern Africa, Hong Kong, Guam, Amboina, Philippine Islands.

ANTIOQUIA: Medellín, Archer 47 (US); Toro 12 (US). Valparaiso, Pennell 10802 (GH, Ph, US).

CALDAS: Wayside below Apía, Pennell 10291 (GH, NY). Roadside west of Armenia, Pennell, Killip, & Hazen 8635 (GH, Ph, NY, US).

CUNDINAMARCA: El Colegio, Bro. Ariste Joseph 1055 (US). Juntas, Lehmann 1854 (US). La Esperanza, García-Barriga 4704 (US). Along stream above Melgar, Pennell 2842 (US). Sasalma, Bro. Nicéforo María s. n. (US).

EL VALLE: Roadside near Cali, *Pérez-Arbeláez & Cuatrecasas* 6333 (US). Roadsides between Cabuyal and Solorza, *Cuatrecasas* 14461 (US). Vicinity of Zaragoza, *Cuatrecasas* 22764 (US).

1a. *Thunbergia alata* var. *bakeri* Hort. (A color variant.)

Flowers white, in other respects resembling the typical form. Color variants of *T. alata* are common. Many of these have been recognized as horticultural varieties or have actually been described as valid varieties or species. It is, however, difficult if not impossible to distinguish between these forms or varieties unless fresh flowers are examined or the dried specimens are accompanied by full color notes. The following key will serve to separate the entities listed in Bailey's Standard Cyclopedia of Horticulture:

Leaves variegated----- *T. aurantiaca* subvar. *doddsii* Paxt.
Leaves green.

Corolla uniform in color.

Corolla pure white----- *T. alata* var. *bakeri* Hort.

Corolla sulphur yellow----- *T. sulphurea* Hort.

Corolla yellow----- *T. lutea* Hort.

Corolla with eye.

Corolla white with dark center----- *T. alata* var. *alba* Paxt.

Corolla bright orange with dark center----- *T. aurantiaca* Paxt.

Corolla pale orange with white center----- *T. fryeri* Hort.

Corolla orange, yellow, buff, or cream with dark center---- *T. alata* Bojer

CUNDINAMARCA: Field near La Vega, *Pérez-Arbeláez & Cuatrecasas* 5346 (US).

2. *Thunbergia fragrans* Roxb.

FIGURE 16

Thunbergia fragrans Roxb. Pl. Coromand. 1: 47. 1795. Type collected at Samulcotah, India.

Thunbergia volubilis Pers. Syn. Pl. 2: 179. 1806. Type collected in India and deposited in the herbarium of Jussieu, Paris.

A slender finely pubescent vine up to 2 meters long, usually climbing; leaves ovate to ovate-lanceolate, acuminate at apex, hastate or cordate at base, entire or remotely few-toothed toward base; petioles slender, 1 to 4 cm. long; flowers axillary; peduncles 2 to 7 cm. long; bracts lanceolate or ovate-lanceolate, 1.5 to 2 cm. long; corolla white, 2.5 to 3 cm. long, the lobes crenate, nearly as long as the tube; capsule depressed-globose, about 8 mm. in diameter, tipped by a stout flattened subulate beak 1 to 1.5 cm. long.

VERNACULAR NAME: Enredadera blanca, pico de ave (*Duque-Jaramillo* 1804, 1936).

Roadsides, thickets, waste grounds in general. Naturalized after cultivation. Found in tropical regions throughout most parts of the world. Although specifically named *fragrans* there is considerable difference of opinion as to whether the flowers are actually fragrant. Some find them so, others find them fragrant only at certain times during the day, and still others fail entirely to detect any marked odor.

ANTIOQUIA: Titiribí, vicinity of Medellín, *Toro* 554 (NY). Valparaiso, vicinity of Medellín, *Toro* 1639 (NY).

BOLÍVAR: Vicinity of Cartagena, *Bro. Heriberto* 410 (US).

CHOCÓ: Clearing at Andagoya, *Killip* 35365 (US).

CUNDINAMARCA: Girardot, *Pérez-Arbeláez* 382 (US). Jerusalem, *Pérez-Arbeláez* 577 (US).

CAUCA: Orchards, Candelaria to Palmira, *Duque-Jaramillo* 1396 (Valle).

EL VALLE: Andalucía, *Dryander* 413 (US). Orchards and gardens, Cali, *Duque-Jaramillo* 1804 (US).

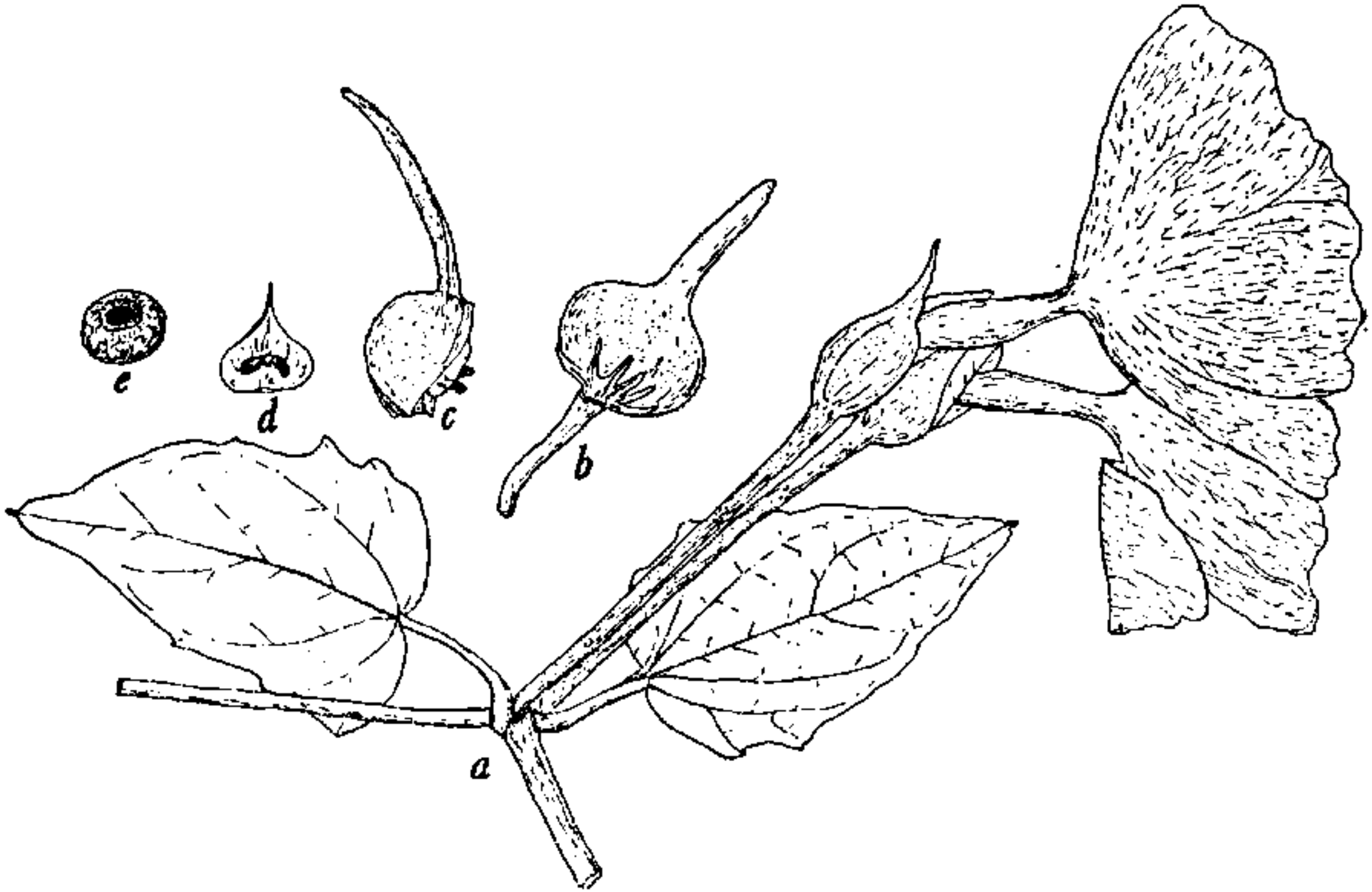


FIGURE 16.—*Thunbergia fragrans* Roxb. (*a*, *Killip* 35365; *b*, *Pérez-Arbeláez* 577; *c-e*, *Dryander* 413): *a*, Node showing inflorescence and a pair of leaves; *b*, capsule; *c*, a valve of the capsule; *d*, placenta septum showing the large papilliform retinacula; *e*, seed showing mouth of excavation. (All natural size.)

3. *Thunbergia grandiflora* Roxb.

Thunbergia grandiflora Roxb. Hort. Beng. 45. 1814; Fl. Ind. 3: 34. 1832.

Type collected near Calcutta, India.

Thunbergia cordifolia Nees in DC. Prodr. 11: 55. 1847. Type collected at Assam and deposited in the Hooker Herbarium, Kew.

A large herbaceous or suffrutescent finely pubescent vine twining up high trees; tips of stems subquadrangular and narrowly winged on the angles; leaf blades ovate, up to 20 cm. long and wide, acuminate at apex, cordate or hastate at base (basal sinus usually broad and rounded), often coarsely toothed or lobed below the middle; petioles up to 10 cm. long; flowers axillary or borne on slender bracted, termi-

nal and often recurved racemes; spathe 2-valved, the valves obliquely oblong, up to 3.5 cm. long and 2 cm. wide, acuminate, striate-nerved and bearing small scattered black dots; corolla white or light blue, campanulate, up to 6 cm. long, the limb about 5 cm. broad; stamens included, the exterior cell of each posterior anther armed with a rigid sharp white curved spur about 3 mm. long; capsule globular, 16 mm. in diameter, tipped by a stout beak about 2 cm. long.

Gardens, thickets, forests. Planted or established as an escape in tropical regions throughout many parts of the world.

ATLÁNTICO: Barranquilla, *Bro. Elias* 794 (US).

CUNDINAMARCA: Girardot, *Pérez-Arbeláez* 379 (US). Granja Cafetera Enrique Soto, La Esperanza, *Gutiérrez* 410 (GH).

Subfamily 4. ACANTHOIDEAE

Acanthoideae Lindau in Bot. Jahrb. Engler 18: 43. 1893.

Retinacula subulate, usually curved, truncate and more or less fimbriate at tip, aestivation of corolla lobes contorted or imbricate.

KEY TO THE SPECIES

Corollas contorted at aestivation; stamens usually 4 ----- A. CONTORTAE
Corollas imbricate at aestivation; stamens usually 2 ----- B. IMBRICATAE

Series A. CONTORTAE

Contortae Lindau in Bot. Jahrb. Engler 18: 43. 1893.

Of the seven tribes listed by Dalla Torre and Harms (Genera Siphonogamarum), the following five are represented by one or more genera in Colombia:

1. Trichanthereae
2. Hygrophilleae
3. Petalidieae
4. Ruellieae
5. Barlerieae

A key to the tribes has been constructed by Lindau (Engl. & Prantl, Pflanzenfam. IV. 3b: 287. 1891). His key, however, is based chiefly on pollen characters. Since pollen characters are very difficult to observe, the following artificial key based on more discernible traits will serve to separate the Colombian genera of these tribes:

- Calyx segments very dissimilar, the posterior one usually the largest, the anterior pair more or less united; flowers borne in dense terminal spikes.
Corolla large, 3 cm. long or more, subregular----- 13. Barleria
Corollas small, about 5 mm. long, 2-lipped.
Flowers secund----- 11. Phayloopsis
Flowers not secund----- 14. Teliostachya
- Calyx regular or nearly so; inflorescence various.
Shrubs or small trees; calyx segments often rounded or obtuse at tip.
Basal lobes of the anther mucicous----- 7. Trichanthera

Basal lobes of the anther calcarate.

Corolla white, campanulate, about 2 cm. long or less; flowers borne in large loose panicles..... 6. *Bravaisia*

Corolla red or yellow, tubular, usually 4 cm. long or more; flowers borne in spikes, the rachis simple or branched..... 8. *Sanchezia*

Herbs, often more or less suffrutescent (rarely shrubs); calyx segments subulate or lanceolate, usually acute or acuminate.

Corolla 2-lipped; flowers solitary or fascicled, axillary; capsule cylindrical..... 9. *Hygrophila*

Corolla regular or nearly so; inflorescence various; capsules stipitate.

Flowers borne in dense terminal quadrifarious spikes, the bracts closely imbricate..... 10. *Blechum*

Flowers axillary, or borne in loose terminal or axillary cymes or panicles (rarely in terminal heads) bracts usually small, rarely large and imbricate..... 12. *Ruellia*

Tribe 1. TRICHANTHEREAE Lindau

Trichanthereae Lindau in Bot. Jahrb. Engler 18: 44. 1893.

Herbs, shrubs, or trees; calyx 5-parted, the lobes rounded at tip; corolla regularly 5-lobed; stamens 2 or 3, free or united at the base into pairs; staminodes 2 or none; capsules oblong, short-stipitate; seeds 2 to 8.

KEY TO THE GENERA

Stamens 4; corolla campanulate, the tube relatively short.

Anther cells spurred at base..... 6. *Bravaisia*

Anther cells rounded at base..... 7. *Trichanthera*

Stamens 2; staminodes 2; corolla cylindrical..... 8. *Sanchezia*

6. BRAVAISIA DC.

Bravaisia DC. Rev. Bign. in Bibl. Univ. Genève N. S. 17: 132. 1838. Originally placed in the family Bignoniaceae by DeCandolle, this genus was first properly considered to belong to the family Acanthaceae by Bentham & Hooker (Gen. Pl. 2: 1084. 1876). It was named in honor of two brothers, C. and J. Bravais, whose notes on the leaves and flowers of the plant were utilized by DeCandolle in drawing his description. The material on which the generic description was based was collected by Vargas at Caracas, Venezuela. Type species: *Bravaisia floribunda* DC.

Onychacanthus Nees in DC. Prodr. 11: 217. 1847. Nees describes two species, *O. cumingii* (based on two specimens, one collected in Peru by Pavón and the other in Central America by Cuming, No. 1307) and *O. berlandierianus* (based on a specimen collected in Mexico by Berlandier, No. 108). The name *Onychacanthus* comes from $\delta\upsilon\upsilon\acute{\xi}$, claw or nail, and $\acute{\alpha}\kappa\alpha\nu\theta\omicron\varsigma$, *Acanthus*, in allusion, probably, to the biungulate stigmas. Type species: *O. cumingii* Nees. Type locality: Peru.

Shrubs or trees; leaves petioled, opposite, entire; inflorescence a terminal subcorymbose panicle, each flower subtended by a pair of bracts; calyx segments 5, subcoriaceous; corolla white, yellow, or purplish, the tube short, the throat campanulate, the lobes 5, subequal, rounded, spreading; stamens 4, the anther cells contiguous, spurred at base; ovules 2 to 4 in each cell.

1. *Bravaisia integerrima* (Spreng.) Standl.

FIGURE 17

Amasonia integerrima Spreng. Syst. Veg. 2: 765. 1825. The species was established by a short Latin description and the following citation of locality and collector: "Ad. fl. Magdalen, Bertero." Type Material is in the Delessert Herbarium. Photographs of this are in the U. S. National Herbarium, No. 7694, and in the herbarium of the Missouri Botanical Garden.

Bravaisia floribunda DC. Prodr. 9: 240. 1843. DeCandolle placed this species in the family Bignoniaceae, citing as synonyms *Bignonia bibracteata* Bertero, *Barleria anomala* Spreng., and *Amasonia integerrima* Spreng. He based his description on material collected at Santa Marta, Colombia, by Bertero, at Caracas, Venezuela, by Vargas, and in Mexico by Karwinski.

Onychacanthus cumingii Nees in DC. Prodr. 11: 217. 1847. Type collected in Peru by Pavón and deposited in the DeCandolle Herbarium, Geneva.

Onychacanthus berlandierianus Nees in DC. Prodr. 11: 217. 1847. Type collected at Tampico, Tamaulipas, Mexico, by Berlandier, No. 108 and deposited in the Moricand Herbarium, Geneva.

Onychacanthus speciosus Oerst. Nat. For. Kjöbenhavn Vid. Medd. 1854: 131. 1854. Type collected in rich forest of La Baranca, near Puntarenas, Costa Rica, by Oersted.

Onychacanthus arborea Karst. Fl. Columb. 2: 111. pl. 149. 1862-1869. Type collected in torrid mountainous region near Victoria and San Sebastian, Caracas, Venezuela.

Bravaisia integerrima Standley, Contr. U. S. Nat. Herb. 23: 1335. 1926. Based on *Amasonia integerrima* Spreng.

A dense tree up to 18 meters high; branches glabrous or finely puberulous, or tomentose when young; leaf blades oblong-elliptic, 8 to 28 cm. long, 3 to 10 cm. wide, acuminate or acute at apex, narrowed at base, entire or undulate, subcoriaceous, glabrous or the costa and lateral veins pilosulous; petioles up to 5 cm. long, but usually about 3 cm. long; flowers borne in leafy terminal, subcorymbose, trichotomously branched thrysi about 12 cm. long and 10 to 30 cm. broad, the branches subquadrangular, glabrous or puberulous, subtended by bracts resembling small leaves (1 to 8 cm. long, 0.5 to 4 cm. wide); pedicels 1 to 5 mm. long; bractlets ovate, 2 to 3 mm. long, 2 mm. wide, puberulous, ciliolate, subcarinate; calyx 4 to 5 mm. long, the segments ovate, 3 to 4 mm. long, 2 to 3 mm. wide, obtuse or rounded, puberulous and ciliolate; corolla white (or yellow) with a purple spot at the throat, glabrous (except the ciliate lobes), about 2 cm. long, the tube campanulate, about 8 mm. broad at throat, the limb about 2 cm. broad, the lobes 1 cm. long, 5 to 6 mm. wide, rounded or emarginate; capsule oblong, 10 to 12 mm. long, obtuse at apex, rounded at base, glabrous, 4-seeded; seeds flat, suborbicular, about 4 mm. in diameter, greenish, glabrous.

VERNACULAR NAMES: Sancarano (*Curran* 222); palo de agua (*Bro. Elias* 444, 487, 1265, 1507; *Dugand* 580); sancho araña (*Dugand* 580; *Curran* 308, 317).

Masses of aerial roots, after the fashion of mangroves, are often produced at the bases of the trees. The wood is said to be light cream

in color, medium heavy but not hard, and possessing a coarse uneven grain. It is suitable for packing boxes and food pails.⁷

Low wet woods and meadows. Peru; Colombia; Venezuela; north to Oaxaca and Tamaulipas, Mexico.

ATLÁNTICO: Woods near Arroyo de Piedras, *Dugand* 580 (US). Barranquilla, *Bro. Elias* 974 (US). Galapa, vicinity of Barranquilla, *Bro. Elias* 444 (US). Puerto Colombia, vicinity of Barranquilla, *Bro. Elias* 1265 (US), 1507 (US). Sabanalarga, vicinity of Barranquilla, *Bro. Elias* 487 (US). Usiacurí, *Dugand & García-Barriga* 2324 (US).

BOLÍVAR: Estrella, Caño Papayal, Lands of Loba, *Curran* 308 (GH, US); 317 (GH). Along the Mompos to Juana Sánchez trail, Island of Mompos, Lands of Loba, *Curran* 222 (US). Meadow at Morrocoqui on the Río Sinú, *Pennell* 4697 (GH, Mo, NY, US).

MAGDALENA: Santa Marta, *Romero* 34 (Mo); *H. H. Smith* 1869 (GH, Mo, NY, Ph, US); *Bertero* s. n. (Mo, isotype).

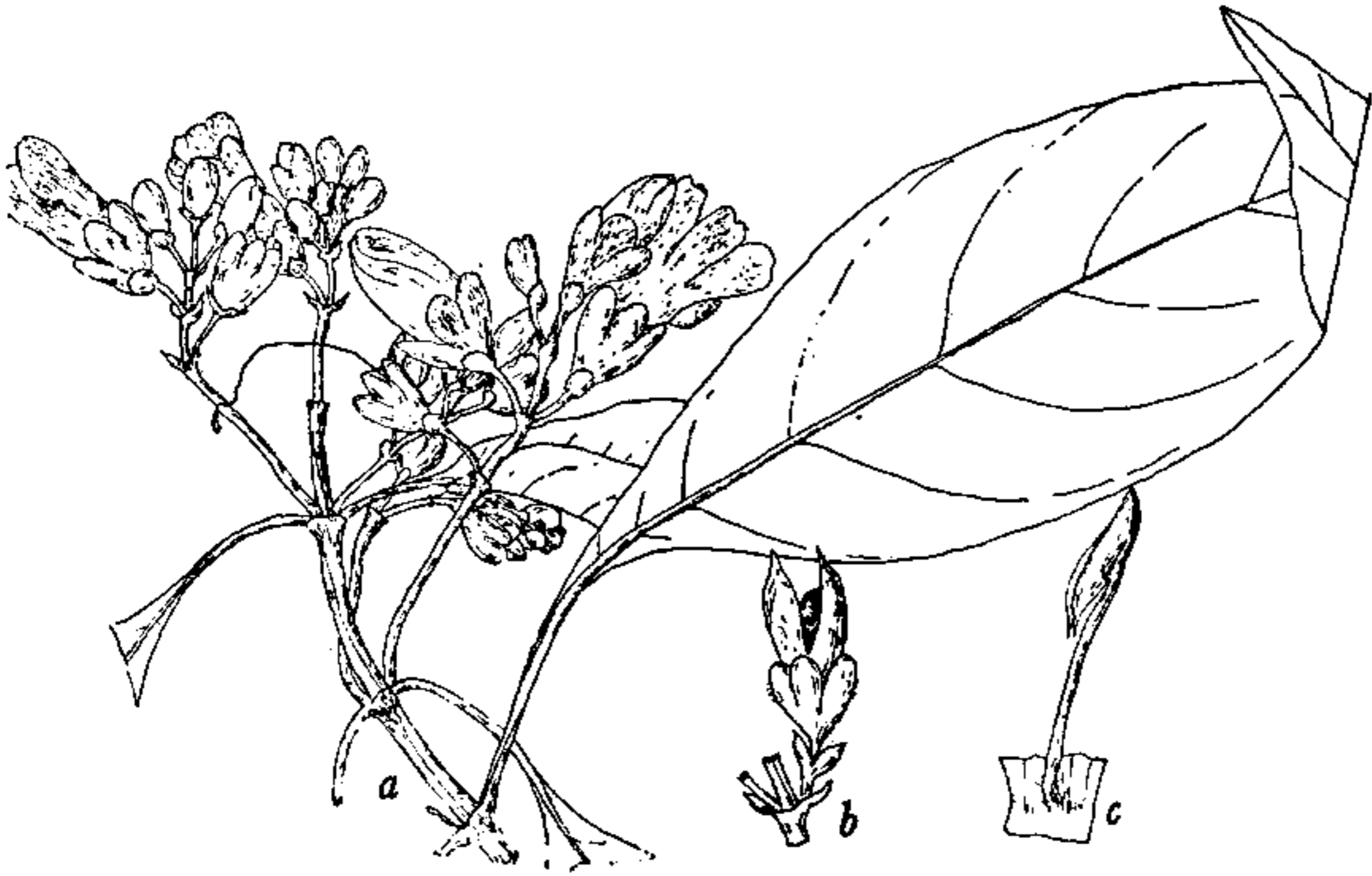


FIGURE 17.—*Bravaisia integerrima* (Spreng.) Standl. (*a, b, Dugand & García-Barriga* 2324; *c, Pennell* 4697): *a*, Portion of stem showing inflorescence and leaves; *b*, portion of inflorescence showing capsule and calyx; *c*, stamen. (*a, b*, Natural size; *c*, twice natural size.)

7. TRICHANTHERA H. B. K.

Trichanthera H. B. K. Nov. Gen. & Sp. 2: 243, in obs. 1817. *Ruellia gigantea*, the type species, was first published by Humboldt and Bonpland in their *Plantae Aequinoctiales* (2: 75. *pl.* 102. 1809). It was redescribed in their *Nova Genera et Species Plantarum* (2: 243. 1817) with the following observation appended: "Certe distincti generis ob stamina exserta, antheras pilosas et capsulae loculos dispermos. Fortasse *Trichanthera* nominandum." Nees, in DeCandolle's *Prodromus* (11: 218. 1847), published a detailed

⁷ Curran, *Tropical Woods* 19: 18. 1929.

generic description under the name *Trichanthera*. Derivation of *Trichanthera*: *θρίξ*, hair, and *ἀνθήρας*, anther. Type locality: "in sylvis fluvii Magdalenae, prope Badillas et juxta Ybague."

Shrubs or trees; leaves opposite, petioled, ovate to oblong, entire or undulate, the cystoliths numerous, small; inflorescence a terminal, dense, and many-flowered panicle or corymb; bracts small, triangular; calyx segments 5, obtuse; corolla regular, 5-lobed, tomentose, campanulate; stamens exerted, didynamous, the anthers ciliate, their basal lobes rounded; capsules 4-seeded, 2 seeds in each locule.

KEY TO THE SPECIES

- Calyx lobes rounded; inflorescence racemose, secund; lower surface of the leaf blades inconspicuously pubescent..... 1. *T. gigantea*
 Calyx lobes obtuse or acute; inflorescence corymbose; lower surface of the leaf blades conspicuously pubescent..... 2. *T. corymbosa*

1. *Trichanthera gigantea* (Humb. & Bonpl.) Nees

FIGURE 18

Ruellia gigantea Humb. & Bonpl. Pl. Aequin. 2. 75, pl. 102. 1809. Type collected along the Magdalena River, near Badilla, Colombia, by Humboldt and Bonpland. Type material in the Berlin Herbarium and Hooker Herbarium, Kew.

Trichanthera gigantea Nees in DC. Prodr. 11: 218. 1847. Based on *Ruellia gigantea* Humb. & Bonpl.

Shrubs or trees up to 5 meters high (sometimes bushy and bearing adventitious roots), the top rounded; branches quadrate, the angles rounded, the tips minutely brown-tomentose; lenticels prominent; leaf blades ovate to oblong, up to 26 cm. long and 14 cm. wide, acuminate at apex, narrowed at base, glabrous, or the costa and veins pubescent; petioles 1 to 5 cm. long; inflorescence a terminal compact more or less secund panicle 5 to 15 cm. long and 4 to 5 cm. broad, brown-tomentose; bracts triangular, 3 mm. long; calyx 10 to 12 mm. long, brown-tomentose, the segments 7 to 10 mm. long, 5 mm. wide, rounded at apex; corolla 3 to 4 cm. long, red and glabrous proximally, yellowish and silky-tomentose distally, red and glabrous within, the tube 1 to 1.5 cm. long, the limb 2 to 3 cm. broad, the lobes oblong to oblong-ovate, 3 to 5 mm. wide; ovary tomentose; style 4 to 5 cm. long; capsule 1.5 to 2 cm. long, obtuse at apex, silky-pubescent, the hairs closely appressed; retinacula 3 mm. long, curved, truncate and erose at tip; mature seed 1 to 4 in each capsule, lenticular, 3 to 4 mm. broad, glabrous.

VERNACULAR NAMES: Aro-blanco (*Killip & Smith* 15452); nacedero (*Dryander* 37); rompebarringa (*Archer* 523).

Used in the vicinity of Fredonia, Antioquia, as a remedy for cattle (*Archer* 523).

Under the impression that the species belonged to the genus *Ruellia*, Humboldt and Bonpland named it *gigantea* because of its contrast

in size when compared with the other herbaceous or suffrutescent *Ruellia*.

Forests, thickets, roadsides, and clearings, often in moist situations. Colombia, Venezuela, Panama, and Costa Rica.

ANTIOQUIA: Vicinity of Fredonia, *Archer* 523 (US). Vicinity of Medellín, *Toro* 78 (NY). Titiribi, *Archer* 574 (US). Vicinity of Turbo, *Haught* 4549 (US).

BOLÍVAR: Sahagún, *Pennell* 4101 (NY, US). San Martín de Loba, Lands of Loba, *Curran* 54 (GH, US).

BOYACÁ: Vicinity of Boavita, *Cuatrecasas* 1924 (US). Moniquirá, *Pérez-Arbeláez & Cuatrecasas* 8132 (US).

CHOCÓ: Bahía Solano, near Ciudad Mutis, *Killip & García-Barriga* 33589 (US).

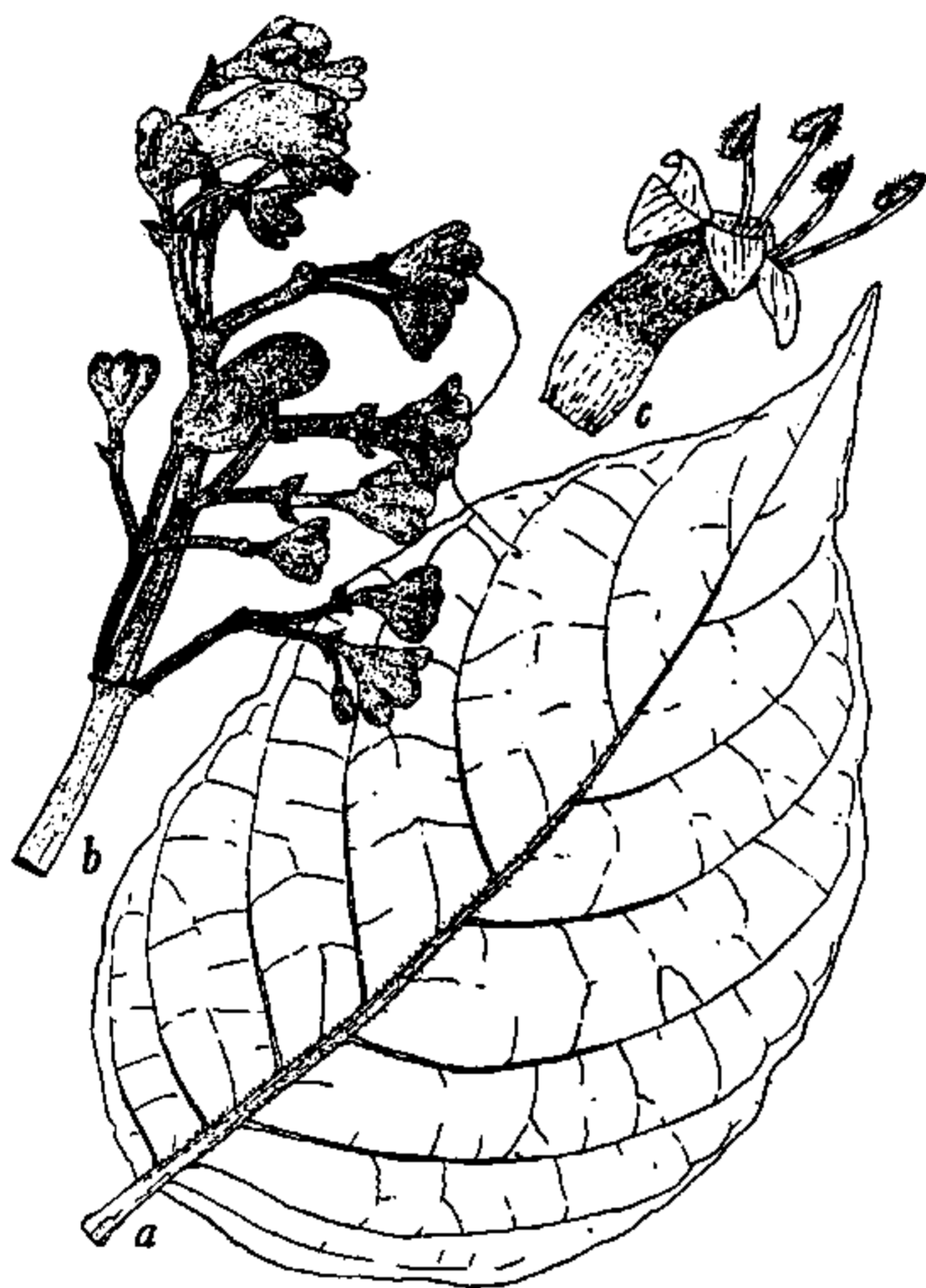


FIGURE 18.—*Trichanthera gigantea* (Humb. & Bonpl.) Nees (*a, b*, *Cuatrecasas* 13437; *c*, *Archer* 574): *a*, Leaf; *b*, inflorescence; *c*, corolla. (All half natural size.)

CUNDINAMARCA: Vicinity of Bogotá, *Hermann* 10926 (US). Caparrapi, *García-Barriga* 7658 (US). El Colegio, *Bro. Ariste Joseph* 1061 (US). Road to Girardot between La Esperanza and San Javier, *García-Barriga* 12193 (US); 12203 (US). La Mesa to Magdalena, *Triana* s. n. (NY, US). Hacienda Patasia, Pacho, *García-Barriga* 12543 (US). Hacienda La Victoria on the San Bernardo Trail near Sasaima, *García-Barriga* 12114 (US).

EL CAUCA: Cali, *García-Barriga* 4213 (US). El Tambo, *von Sneidern* 2652 (S); 2653 (S).

EL VALLE: Vicinity of Cali, *Pérez-Arbeláez & Cuatrecasas* 6332 (US). El Freijito, *Dryander* 47 (US). La Manuelita, Palmira, *Pennell & Killip* 6193 (GH,

NY, Ph). Hoya, between Quebradita del Retiro and Río Albán, *Cuatrecasas* 22631 (Ch). Timba, *von Sneidern* 1240 (NY, S).

MAGDALENA (?): Poponte, *Cyril Allen* 876 (Mo).

META: Villavicencio, *Killip* 34345 (US).

NORTE DE SANTANDER: Trail between Chinácota and Esmeralda, *Killip & Smith* 20891 (US). Culagá Valley, north of Labateca, *Killip & Smith*, 20534 (NY, US). Río Chitagá, región de Sarare, *Cuatrecasas* 13437 (US). Culagá Valley near Tapatá, *Killip & Smith* 20504 (NY, US).

PUTUMAYO: Puerto Porvenir above Puerto Ospina on the Río Putumayo, *Cuatrecasas* 10733 (Col).

SANTANDER: Bucaramanga, *Killip & Smith* 15452 (NY, US). Río Suratá Valley between El Jaboncillo and Suratá, *Killip & Smith* 16426 (US).

TOLIMA: Ibagué, *Holton* (NY).

WITHOUT LOCALITY: *Lehmann* 3040 (US).

2. *Trichanthera corymbosa* Leonard

Trichanthera corymbosa Leonard, Journ. Washington Acad. Sci. 20: 487. 1930.

The type, collected in the Culagá Valley, near Tapatá, Norte de Santander, Colombia, 1,500 to 2,100 meters, March 4, 1927, by Killip & Smith, No. 20140, is in the U. S. National Herbarium, No. 1355268. Isotypes are in the Gray Herbarium and in the herbarium of the New York Botanical Garden.

Tree up to 3 meters high; branches brownish-tomentose or gray and glabrous with age, the angles rounded, the lenticels prominent; petioles 1 to 5 cm. long, brown-tomentose; leaf blades ovate, 10 to 22 cm. long, 5 to 15 cm. wide, abruptly acuminate (the tip blunt), rounded or abruptly narrowed at base and decurrent on the petiole, firm, shallowly crenate, sparingly pubescent above, the cystoliths numerous, the lower surface rather densely pubescent with soft webby hairs or subtomentose, especially on the costa and veins (about 10 pairs); inflorescence corymbose, 10 to 20 cm. broad, the branches subquad-rangular, minutely brown-tomentose, the lenticels prominent; bracts leaflike, small, deciduous, those subtending the flowers triangular, 2 to 3 mm. long, 1 to 2 mm. wide, velvety brown-tomentose; calyx irregular (anterior lobe appreciably longer than the others), 1.5 to 2.3 cm. long, velvety brown-tomentose, the lobes oblong, 10 to 20 mm. long, 3 to 5 mm. wide, obtuse to acute, 5-nerved, the middle nerve more pronounced than the 4 lateral ones; corolla 3 cm. long, the tube 5 to 6 mm. broad, glabrous, the throat and lobes whitish or brown and densely tomentose without, purple and sparingly pubescent within, the limb 2.5 cm. broad, the lobes erect or spreading, ovate, 12 mm. long, 8 to 10 mm. wide, obtuse; stamens exserted, the filaments 15 mm. long, pilose at base, glabrous above, the anthers 7 mm. long and 2 mm. broad, the basal lobes 2 to 3 mm. long, obtuse, sparingly pilose along the sutures; capsule oblong, 1.5 to 2 cm. long, 5 to 7 mm. broad, acute or obtuse at apex, densely tomentose, the hairs brownish; mature seed not seen but probably lenticular and glabrous.

Known only from the type locality and from Tovar, Mérida, Venezuela (*Pittier* 12828).

8. *SANCHEZIA* Ruiz & Pav.

Sanchezia Ruiz & Pav. Fl. Peruv. Chil. Prodr. 5. pl. 32, 1794; Ruiz & Pav. Fl. Peruv. Chil. 1: 7. pl. 8, fig. c. & b. 1798. The genus was named for José Sánchez, a professor of botany at Cadiz.

Ancylogyne Nees in Mart. Fl. Bras. 9: 63, pl. 7. 1847. The name *Ancylogyne* is derived from ἀγκυλός, bent or curved, and γυνή, pistil. Nees published two species in Martius' Flora of Brazil, *A. munita* and *A. macrocnemis*, the latter identical with *S. oblonga* Ruiz & Pav. In DeCandolle's Prodr. (11: 221. 1847), Nees added two more species, *A. peruviana* and *A. capitata*. In 1866 Hooker (Bot. Mag. Curtis 92: pl. 5594) reestablished the name *Sanchezia*.

Erect herbs or shrubs, usually glabrous; flowers solitary or fascicled, usually large and conspicuous, yellow or red, borne on spikes or racemes, the flower clusters subtended by small or often large and partly connate bracts, these sometimes colored; calyx 5-parted; corolla tube cylindrical, 5-lobed, the lobes equal; stamens 2, usually exserted; anthers 2-celled, longitudinally ciliate, mucronulate at base; staminodes 2; capsule oblong, 6 to 8-seeded; seeds orbicular.

Sanchezias are shrubby or subherbaceous plants bearing large firm leaves and attractive, bright yellow or purple, sessile flowers disposed in spikes or racemes. Natives of tropical America, these plants are mainly confined to wet forests of the northern Andes, but, being both attractive and adaptable to cultivation, they have reached regions far removed from their native haunts. Specimens of cultivated or escaped plants have been seen from Costa Rica, Cuba, Java, Siam, and Amboina. About 30 species are now recognized.

KEY TO THE SPECIES

Calyx shorter than the bracts.

Bracts connate at least to middle; leaf blades elliptic-obovate--- 1. *S. pennellii*

Bracts not connate or scarcely so; leaf blades oblong-elliptic----- 2. *S. speciosa*

Calyx longer than the bracts.

Corolla essentially glabrous----- 3. *S. lutea*

Corolla distally retrorsely hirtellous.

Corolla bright rose----- 4. *S. putumayensis*

Corolla ochre----- 5. *S. parvibracteata*

1. *Sanchezia pennellii* Leonard

Sanchezia pennellii Leonard, Journ. Washington Acad. Sci. 16: 488. 1926.

Type collected in a sandy loam forest along the Río Magdalena at Vuelta de Acuña, Antioquia, Colombia, altitude 125 to 130 meters, January 14, 1918, by Francis W. Pennell, No. 3798. Type in the U. S. National Herbarium, No. 1043822.

Low shrub; stems glabrous; leaf blades elliptic-obovate, 10 to 30 cm. long, 5 to 13 cm. wide, abruptly narrowed at apex to a blunt tip, gradually narrowed at base, crenate, glabrous bearing cystoliths 0.5 mm. long; petioles 4 cm. long; inflorescence spicate, the flowers 6 to 8, sessile, crowded in the axils of the bracts and forming fascicles 3 to 6

cm. in diameter; bracts 5 cm. long, connate below, loosely enclosing the flowers, the free portion broadly ovate, 3 to 3.5 cm. wide, abruptly narrowed to a blunt tip, orange-red, glabrous, bearing cystoliths; bractlets elliptic-obovate, 2.5 cm. long, 1 cm. wide; sepals ligulate-obovate, 10 to 15 mm. long, the 3 outer 3 to 5 mm. wide, the 2 inner 2 to 3 mm. wide, all rounded at apex, glabrous; corolla yellow, 4 to 5 cm. long, 6 to 7 mm. broad at throat, the lobes 3 mm. wide, rounded and emarginate at apex; filaments 4 cm. long, exerted 8 mm. beyond the throat of the corolla, pilose; staminodes 4 to 5 mm. long; style 5.5 cm. long, glabrous.

Wet woods, usually on banks of streams. Panama, Colombia, Peru.

ANTIOQUIA: Vicinity of Turbo, *Haught* 4545 (US). Vuelta de Acuña on the Río Magdalena, *Pennell* 3798 (NY, US).

BOLÍVIA: Boca Verde on the Río Sinú, *Pennell* 4573 (NY).

CHOCÓ: Andagoya, *Killip* 35399 (US). Negría, along the Río San Juan, *Killip* 35008 (US). Quibdó on the Río Atrato, *Archer* 1803 (US).

EL VALLE: Along the Río Calima near La Brea, *Cuatrecasas* 21205 (Ch). Along the Río Calima at La Trojita, *Cuatrecasas* 16322 (US).

MAGDALENA: St. Juancito, *Holton* (NY).

META: Llanos de San Martín, *Triana* s. n. (Col).

PUTUMAYO: On the Río San Miguel between the mouths of Río Bermega and Río Conejo, *Cuatrecasas* 11051 (US). On the Río San Miguel at the mouth of Río Conejo, *Cuatrecasas* 10918 (US).

SANTANDER: Between Río Sogamoso and Río Colorado in the vicinity of Barranca Bermeja, *Haught* 1538 (US). Brazo de Moro above Barranca Bermeja, *Niemeyer* 1 (US). Between Río Carare and Río Magdalena in the vicinity of Puerto Berrío, *Haught* 1835 (US).

VAUPÉS: San José del Guaviare, *Cuatrecasas* 7442 (US).

2. *Sanchezia speciosa* Leonard

Sanchezia speciosa Leonard, Journ. Washington Acad. Sci. 16: 490. 1926.

The type, collected in the Botanical Garden of Havana, Cuba, January 1905, by A. H. Curtiss, No. 622, is in the U. S. National Herbarium.

Plant shrubby; stem quadrangular; leaves oblong-elliptic, 10 to 25 cm. long, 3 to 7 cm. wide (the lowermost probably larger), gradually narrowed to a slender blunt apex, narrowed or rounded at base and decurrent on the petiole, glabrous, the margins undulate, the costa and lateral veins (9 to 12 pairs) prominent beneath, the cystoliths curved, about 0.5 mm. long; inflorescence a terminal simple or forked interrupted spike equaling or exceeding the upper pair of leaves; internodes 1 to 3 cm. long; flowers (3 or more) borne in bracted fascicles 1 to 2 cm. broad; bracts ovate, blunt at apex, glabrous, bearing cystoliths; bractlets oblong-elliptic, about 2 cm. long and 8 mm. wide, obtuse; sepals ligulate, 1.5 to 1.8 cm. long, 3 to 5 mm. wide, rounded at apex; corolla orange, the tube 4 to 6 cm. long, 7 to 8 mm. broad at throat, narrowed below the middle to 3 mm., glabrous, the lobes 3 to 4 mm. long, rounded, emarginate; stamens inserted about 5 mm. above

the base of the corolla tube, the filaments 4 to 4.5 cm. long, exserted 5 to 15 mm. beyond the mouth of the corolla, sparingly pilose; anthers 5 mm. long; staminodes 2.5 cm long; style 5 cm. long, equaling or exceeding the stamens; fruit not seen.

Usually found in cultivation but undoubtedly a plant of wet forests when growing in its natural haunts. The fact that the Putumayo specimen was collected from a plant growing wild is of great interest, since all the other material in the U. S. National Herbarium is from cultivated sources.

West Indies and Colombia.

PUTUMAYO: On the left bank of Quebrada de la Hormiga along the Río San Miguel, *Cuatrecasas* 11109 (US).

3. *Sanchezia lutea* Leonard, sp. nov.

FIGURE 19

Frutex, caulibus quadrangularibus, glabris vel ad nodos parce pilosis; lamina foliorum oblonga, lanceolata, acuminata, basi angustata, in petiolum decurrens, undulata, glabra; petioli brevi, basi breviter connati; paniculae terminales, parce ramosae glabrae, floribus secundis, racemi bracteis lineari-lanceolatis suffulti; bractee floriferae oblongo-ovatae; bracteolae oblongae; calycis segmenta lineari-oblonga vel oblanceolata, acuta, apice pubescentia; corolla aurantiaca, parce pubescens, lobis rotundatis, emarginatis; stamina exserta, filamentis pilosis; staminodia glabra; antherae pilosae.

Shrub up to 3 or 4 meters high; branches quadrangular, glabrous, or the nodes sometimes beset with a few stiff straight hairs about 0.5 mm. long; leaf blades oblong-lanceolate, up to 25 cm. long and 6.5 cm. wide, gradually narrowed from the middle to a slender and sometimes curved tip, acute at base and decurrent on the petiole, undulate, glabrous, the lateral veins (10 to 12 pairs) rather prominent beneath; petioles 1 to 1.5 cm. long, connate at base by a small ridge or narrow band of leaf tissue; flower clusters secund, borne in terminal glabrous racemes about 12 cm. long, these sparingly branched; lower pair of bracts subtending the branches of the inflorescence linear-lanceolate, 2 cm. long, about 3 mm. wide at the base, slenderly acuminate, the others successively smaller toward tip; bracts subtending the flower clusters oblong-ovate, 12 mm. long and 6 mm. wide (successively smaller toward tip of the inflorescence), acute; bractlets oblong, 13 mm. long, 3 mm. wide, thinner than the outer bracts, faintly nerved; calyx segments linear-oblong to oblanceolate, slightly irregular in size, about 13 mm. long, 3 to 5 mm. wide, acute, pubescent at the tip, obscurely parallel-veined; corolla orange yellow or pale salmon, sparingly pubescent distally, the hairs curved, the tube 3.5 to 4 mm. thick at base, narrowed above the ovary to 3 mm., thence enlarged to 8 mm., but the throat itself narrowed to 5 mm., the lobes oblong, 5 mm. long, 3 mm. wide, rounded and emarginate; stamens exserted 1 cm. beyond the throat of the corolla, the filaments pilose; staminodes



FIGURE 19.—*Sanchezia lutea* Leonard (*Cuatrecasas* 4627): *a*, Tip of branch showing leaf and inflorescence; *b*, bract subtending flower clusters; *c*, bract subtending flower; *d*, calyx segment; *e*, stamen and staminode (immature); *f*, anther, dorsal view to show sutures; *g*, anther, ventral view to show connective; *h*, corolla lobe; *i*, pistil (immature). (*a*, Half natural size; *b-e*, *h*, *i*, natural size; *f*, *g*, about twice natural size.)

12 mm. long, glabrous, the anthers 5 mm. long, their ventral surfaces pilosulous with straight erect hairs about 0.5 mm. long; ovary and style glabrous; fruit not seen.

Type in the U. S. National Herbarium, No. 1517331, collected at headwaters of Río Tutunendo, east of Quibdó, Intendencia of Chocó, Colombia, May 20 or 21, 1931, by W. A. Archer (No. 2174).

Cuatrecasas' No. 4627 (US), collected between Villavicencio and El Parrao, Meta, Colombia, 500 meters, November 10, 1938, and Camilo's No. 78 (GH), collected at Florencia, Caquetá, also represent the species.

Sanchezia lutea resembles *S. parviflora* Leonard, an Ecuadorian species, but differs in its larger orange-yellow or pale salmon corollas (3.5 to 4 cm. long). The corollas of *S. parviflora* are 3 cm. long and pale scarlet in color.

4. *Sanchezia putumayensis* Leonard, sp. nov.

FIGURE 20

Frutex caulibus subquadrangularibus; lamina foliorum oblongo-elliptica, acuminata, apice curvata, basi angustata, in petiolum decurrens, glabra, integra vel undulata, costa et venis obscuris; paniculae terminales, parce ramosae, floribus in fasciculis paucifloris secundis dispositis; bracteae ovatae; bracteolae oblongae, glabrae vel apice hirtellae; calycis segmenta oblonga vel oblanceolata, intus glabra, extus punctulata, apice parce hirtella; corolla laete rosea, sursum retrorse hirtella, deorsum glabra, lobis rotundatis, emarginatis; stamina exserta, pilosa vel subtomentosa; antherae hirtellae; pistillum glabrum.

Shrubs up to 2 meters high; stems subquadrangular, the angles glabrous; leaf blades oblong-elliptic, up to 16 cm. long and 6 cm. wide, narrowed to a slender often curved apex (the tip blunt), narrowed at base and decurrent on the petiole, glabrous, entire or undulate, the costa and lateral veins (about 8 pairs) rather inconspicuous; inflorescence a panicle of 3 or 4 branches, up to 15 cm. long, the fascicles small, few-flowered, secund, except occasionally the lowermost, longer than the internodes; bracts ovate, up to 8 mm. long and 5 mm. wide, acutish, the veins obscure; bractlets oblong, up to 7 mm. long and 3.5 mm. wide, rounded, both bracts and bractlets glabrous except the sparingly hirsutulous tips; calyx up to 12 mm. long, oblong or oblanceolate, 3.5 to 4.5 mm. wide, acutish, glabrous without, punctulate within, the tips sparingly hirsutulous; corolla bright rose, the tube 4 to 4.5 cm. long, about 4 mm. broad at base, narrowed above ovary to 3 mm., thence gradually enlarged, becoming 7 mm. broad at mouth, rather densely and retrorsely hirtellous distally with white hairs slightly less than 0.5 mm. long, glabrous proximally, the lobes about 4 mm. in diameter, rounded, emarginate; stamens exserted 15 to 20 mm. beyond the mouth of the corolla, the filaments densely pilose or subtomentose at and above insertion, the upper portions sparingly pilose, the hairs longer, reaching 2 mm. in length; anthers 5 mm. long, the cells ventrally hirtellous, the basal spurs 1 mm. long; style and stigma glabrous; fruit not seen.

Type in the U. S. National Herbarium, No. 1691751, collected in forest along the Río Putumayo, Comisaría of Putumayo, Colombia,

September 26 to October 10, 1930, by G. Klug (No. 1653). Isotypes are in the herbaria of the Missouri and New York Botanical Gardens.

Cuatrecasas' No. 10919 (US), collected near mouth of the Río Conejo, Putumayo, 300 meters and Triana's specimen (s. n.) (Col), collected at Barbacoas, Nariño, also represent the species.

Sanchezia putumayensis is near *S. sylvestris* Leonard, of Peru, from which it differs chiefly in its relatively narrower leaf blades with narrowed rather than obtuse bases, and by the pilosulous (distally) corollas (practically glabrous in *S. sylvestris*). The type (Klug 1653) was erroneously cited under *S. sylvestris* in the original description of that Peruvian species.

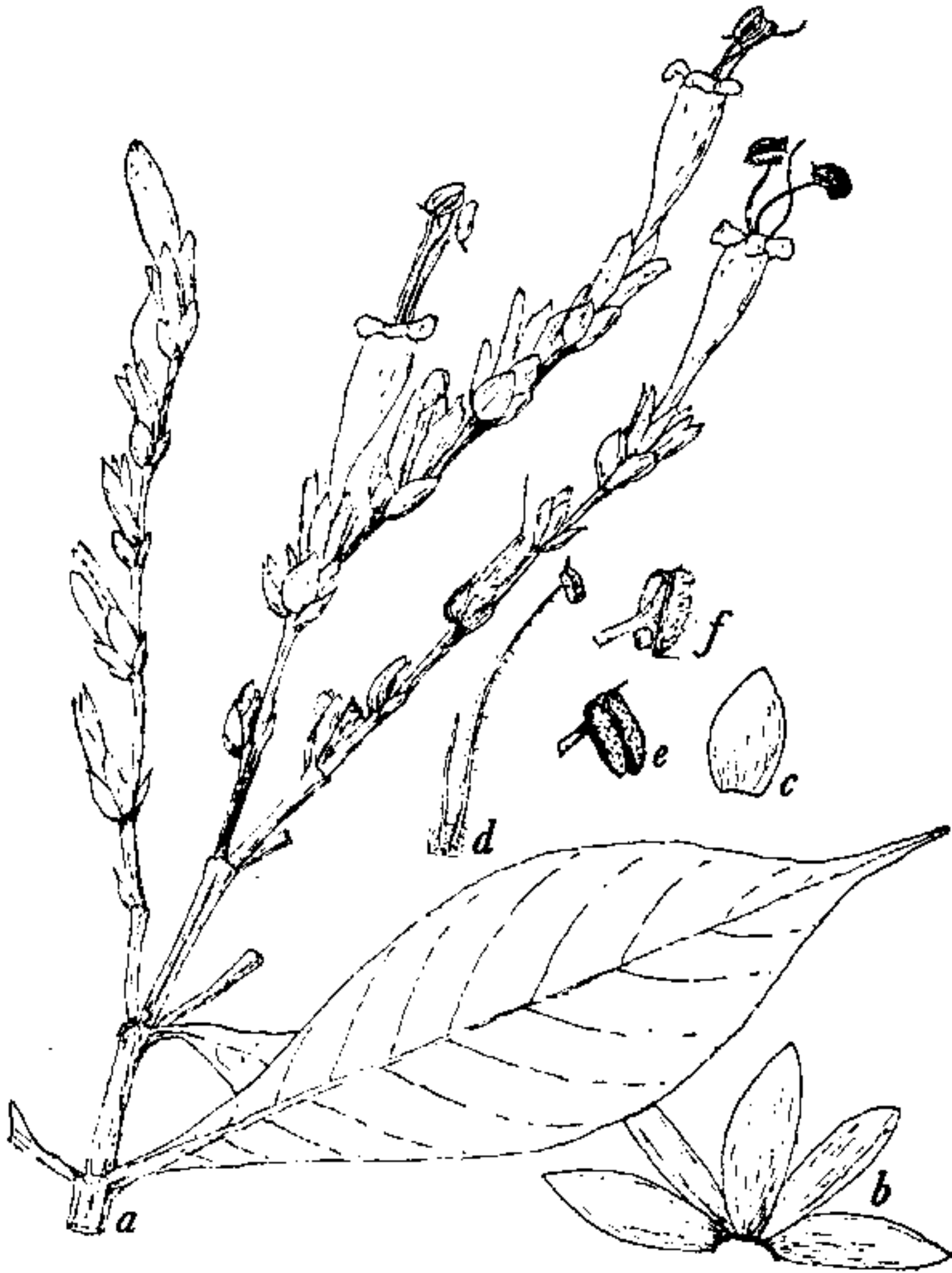


FIGURE 20.—*Sanchezia putumayensis* Leonard (Klug 1653): *a*, Tip of branch showing inflorescence and leaves; *b*, calyx opened and spread to show segments; *c*, bract subtending flower; *d*, a stamen and staminode; *e*, anther, showing sutures; *f*, anther, attachment of filament. (*a*, *d*, Half natural size; *b*, *c*, *e*, *f*, natural size.)

5. *Sanchezia parvibracteata* Sprague & Hutchinson

Sanchezia sprucei var. *salvadorensis* Donn. Smith, Bot. Gaz. 44: 116. 1907.

Type collected in a garden in the city of San Salvador, El Salvador, December, 1906, by Luis V. Velasco, No. 8985.

Sanchezia parvibracteata Sprague & Hutchinson, Kew Bull. 1908: 253. 1908.

Type taken from a plant cultivated at Kew but originally grown in the Royal Botanic Gardens at Peradeniya, Ceylon, in 1905. The stock was collected somewhere in tropical America.

A large suffrutescent herb; stems smooth, subquadrangular, the angles rounded; leaf blades oblanceolate, up to 26 cm. long and 7 cm. wide or more, acuminate, subfalcate, narrowed at base and decurrent on the petiole, glabrous, undulate or shallowly dentate, punctulate above, the costa and lateral veins (11 or 12 pairs) prominent beneath, the cystoliths on both surfaces numerous, about 0.5 mm. long; inflorescence a sparingly branched terminal panicle up to 16 cm. long, and 3 to 4 cm. broad, the fascicles usually several-flowered, sessile, subsecund, the bracts subtending them triangular-ovate, subconnate, 10 to 12 mm. long, about 6 mm. wide at base, the bracts subtending the flowers ovate, up to 16 cm. long and about 9 mm. wide, obtusish, glabrous, ciliolate; bractlets oblanceolate, 15 mm. long, about 4 mm. wide, sparingly puberulent without, ciliolate, both bracts and bractlets firm, green or yellowish toward tip; calyx 2 cm. long, the segments oblanceolate, 4 to 6 mm. wide, acutish, glabrous proximally, puberulous distally, ciliolate, yellow; corolla ochre, 4 to 5 cm. long, about 5 mm. broad immediately above the ovary, about 10 mm. in diameter at throat, rather densely pubescent distally with yellowish retrorsely curved hairs, the lower portion glabrous, the lobes oblong, about 6 mm. long and 4 mm. wide, emarginate; stamens exerted 7 to 8 mm. beyond mouth of corolla, the filaments tomentose at and above the insertion, thence sparingly pilose (the hairs up to 1.5 mm. long), but distally glabrous, the anthers 6 mm. long, 2.5 mm. broad, the sacs pubescent, the basal lobes ending in subulate spreading spurs about 1 mm. long; staminodes 15 mm. long, sparingly pilose; ovary and style glabrous; capsule not seen.

Usually found in gardens but sometimes growing wild along streams, possibly as an escape. Chiapas, Guatemala, El Salvador, Colombia.

PUTUMAYO: Banks of the Río Guamués between its mouth and San Antonio, *Cuatrecasas* 11231 (US).

Tribe 2. HYGROPHILEAE Nees

Hygrophileae Nees in Wall. Pl. Asiat. Rar. 3: 75. 1832.

Herbs or shrubs; flowers mostly crowded in the axils of the leaves; bracts usually small; calyx 4- or 5-parted; corolla ringent, 2-lipped, the upper lip 2-lobed or rarely entire, the lower one 3-lobed; stamens 4, didynamous, one stamen of each pair sometimes rudimentary, in some species 2 stamens only; anthers 2-celled, the cells parallel or

the basal lobes slightly divergent, these muticous or calcarate; pollen of the "Rippenpollen" type, the grains provided with pores, these on or between the ribs; capsules cylindrical, usually seed-bearing to the base.

In this tribe, consisting of about six genera, *Hygrophila* is the only genus represented in the Western Hemisphere.

9. HYGROPHILA R. Br.

Hygrophila R. Br. Prodr. Fl. Nov. Holl. 479. 1810. The name comes from *ὕγρως*, wet, and *φίλος*, loving. Type species: *Hygrophila angustifolia* R. Br.

Herbs; flowers borne in axillary fascicles; bracts linear; calyx segments 5, subequal; corolla tube cylindrical, slightly ampliate, the limb 2-lipped; stamens 4, didynamous, or 2 perfect stamens with 2 staminodes, the filaments of each pair united at base by a membrane; anthers 2-celled, muticous or mucronulate; posterior stigma lobe abortive; capsule oblong, nonstipitate; seeds 4 to 18, or more.

The genus *Hygrophila* is cosmopolitan. Of the numerous species described, only about 80 are now considered as valid.

1. *Hygrophila guianensis* Nees

FIGURE 21

Hygrophila guianensis Nees, Lond. Journ. Bot. 4: 634. 1845. Type collected in British Guiana by Schomburgk, second collection, 331 (291).

Hygrophila conferta Nees in Mart. Fl. Bras. 9: 21. 1847. Two cotypes are cited, one collected "Ad flumen Rio dos Indios grande," Brazil, by Pohl, the other "prope Fazenda da Piedade" São Paulo, Brazil, by Sellow. The specific name *conferta* (dense, compact) probably alludes to the densely set flowers and capsules.

Herbs up to 50 cm. high, sparingly hirtellous to glabrate; stems obtusely quadrangular, branching; leaf blades lanceolate, 5 to 15 cm. long, 0.5 to 4 cm. wide, acuminate at both ends, entire; flowers sessile, clustered in the axils; calyx segments 5, lanceolate, about 5 mm. long, white-margined, pilose; corolla white, purplish, or yellow (*García-Barriga* 11524), puberulent, the tube 5 mm. long, the upper lip bidentate, 2.5 mm. long, the lower lip 3-lobed; stamens 4, didynamous, the filaments of each pair united at base; capsules narrowly oblong, 1.2 to 1.4 cm. long, glabrous, 16- to 18-seeded.

Marshy regions along streams or on shores of ponds or lakes occurring between sea level and 1,560 meters altitude. Mexico to central Argentina.

ANTIOQUIA: Barbosa, *Alfaro-P.* 27 (US). Medellín, *Archer* 460 (US); 899 (US); *Mesa* 82 (US). Porcesito, *Bro. Daniel* 897 (US).

CALDAS: Roadside west of Armenia, *Killip & Hazen* 8637 (GH). Santa Elena above Santuario, *Pennell* 10593 (GH, NY). Tabeja, west of Armenia, *Pennell, Killip, & Hazen* 8630 (US).

CHOCÓ: On the Río San Juan between Istmina and Condoto, *García-Barriga* 11524 (Col).

CUNDINAMARCA: La Mesa, *Triana* s. n. (Col). Road to Pacho, on the Río Murca, La Palma, *García-Barriga* 12390 (US). La Vega, *Pérez-Arbeláez & Cuatrecasas* 5369 (US). Albán, San José, *Pérez-Arbeláez* 2380 (US).

CAUCA: El Tambo, *von Sneidern* 311 (S). Bank of Río Palacé, north of Popayán, *Pennell & Killip* 8270 (GH). Río Micay, vicinity of Noanamito, *Cuatrecasas* 14236 (US).



FIGURE 21.—*Hygrophila guianensis* Nees (*a, b, Archer* 899; *c, Mesa* 82): *a*, Tip of stem showing leaves and inflorescence; *b*, flower and calyx; *c*, capsule and calyx. (*a*, Natural size; *b, c*, twice natural size.)

EL VALLE: Waste land near Buenaventura, *Killip* 5294 (GH, NY, US). Hacienda El Trejo, north of Palmira, *García-Barriga* 6327 (US). Quebrada Nueva to Cuchilla, east of Zarzál, Cauca Valley, *Pennell, Killip, & Hazen* 8493 (GH, NY). Along the Río Engaña, in the Río Digua Valley, *Killip* 34839 (US). Río de San Juan below Queremal, *Cuatrecasas* 23866 (US).

MAGDALENA: Pueblo Bello, *Bro. Apolinar Angel* 704 (US). Santa Marta, *H. H. Smith* 89 (GH, Ph, NY, US).

META: Near Río Guatiquía, vicinity of Villavicencio, *Pennell* 1551 (GH, NY).

PUTUMAYO: Bank of the Río Putumayo between Guamués and Puerto Asís, *Cuatrecasas* 11241 (US).

TOLIMA: Espinal to Cuamo, *Pennell & Rusby* 199a (NY). La Trinidad, Líbano, *Pennell* 3218 (NY).

WITHOUT DEFINITE LOCALITY: *Triana* (Col, NY).

Nees cites a specimen of his *Hygrophila rivularis* (in DC. Prodr. 11: 87. 1847) collected from a river bank in Colombia (collector not given, Hooker Herbarium). *Hygrophila rivularis* is a Mexican species closely resembling and probably synonymous with *H. guianensis*. The Hooker Herbarium specimen might well be *H. guianensis*.

Tribe 3. PETALIDIEAE Lindau

Petalidieae Lindau in Bot. Jahrb. Engler 18: 45. 1893. In all, six genera belong to this tribe. Of these, *Blechnum* only is native to America, the others occurring in the Old World. The tribe is based on *Petalidium*, a genus consisting of about a dozen species found mainly in tropical Africa.

Herbs or shrubs; calyx 4- or 5-lobed; bracts or calyx segments large, conspicuous; corolla regularly 5-lobed; stamens 4, fused in pairs at base of filaments and decurrent; staminodes none; anther lobes rounded or acute at base; capsules compressed, the partitions of the lobes parallel; seeds usually 2 in each section.

Spikes quadrifarious; calyx segments subequal, linear-subulate. 10. *Blechnum*
Spikes secund; calyx segments unequal, one ovate, nervose, the others linear.

11. *Phaylopsis*

10. BLECHUM P. Br.

Blechnum P. Br. Civ. Nat. Hist. Jam. 261. 1756; Juss. Ann. Mus. Paris 9: 269. 1807. *Blechnum* is a Greek name, more correctly applied to wild pennyroyal (*Mentha pulegium* L.) Type species *Ruellia blechnum* L.

Perennial herbs; leaves petioled, crenate, repand-dentate, or entire; flowers borne in dense terminal spikes, the bracts imbricate; calyx 5-parted, the slightly unequal segments linear-subulate; corolla white or purplish, the tube slender, the limb nearly equally 5-lobed; stamens 4, didynamous, the anther sacs parallel; ovules few in each cavity; capsules broadly oblong with a short narrow base.

Although many species have been described from both the Eastern and Western Hemispheres, the genus *Blechnum* actually consists of only about six tenable entities, these all native to tropical America. A close relationship exists between *Blechnum* and *Ruellia*, but *Blechnum* can be recognized readily by its dense 4-sided spikes and very small flowers. In the few cases where confusion might arise, the conclusive test can be made by an examination of mature capsules. In those of *Blechnum* the dissepiment breaks away from the capsule wall as in *Dicliptera*, but in *Ruellia* it remains intact.

Corollas 1.5 cm. long; bracts puberulous and pilose... 1. *B. brownei* f. *puberulum*
Corollas 2.5 cm. long; bracts pilose..... 2. *B. haughtii*

1. *Blechnum brownei* Juss. f. *puberulum* Leonard

FIGURE 22

Blechnum brownei Juss. f. *puberulum* Leonard, Journ. Washington Acad. Sci. 32: 184. 1942. Type collected on dry roadbed along bank of Jean Rabel River, vicinity of Jean Rabel, Haiti, January 30, 1929, by E. C. and G. M. Leonard No. 12696. Type in the U. S. National Herbarium, No. 1451437.

Herbs; stems erect or ascending, 20 to 70 cm. high, the branches slender, more or less puberulous; leaves ovate, 2 to 7 cm. long, 1 to 5 cm. wide, acute or obtuse at apex, obtuse to acute at base, glabrous to sparingly pilose, thin, the cystoliths rather conspicuous; spikes dense, 4-sided, 3 to 6 cm. long; bracts ovate, pinnately veined, 1 to 2.5 cm. long, about 1 cm. wide, acutish at apex, rounded at base, loosely strigose and ciliate, and, in addition to the coarser hairs, more or less softly and densely puberulous, the hairs minute, curved, and white; corolla white or purplish, a little longer than the subtending bracts; capsules broadly oblong, about 6 mm. long, puberulous, 16-seeded; seeds flat, brown, about 1.5 mm. in diameter, apparently glabrous when dry, if moistened the edge bearing a densely set gelatinous band of minute straight white hairs.



FIGURE 22.—*Blechum brownei* Juss. forma *puberulum* Leonard (*a, d*, Archer 88; *b, c*, Archer 1417): *a*, Tip of branch showing inflorescence and leaves; *b*, corolla; *c*, a pair of stamens; *d*, capsule and calyx. (*a*, Natural size; *b, d*, twice natural size; *c*, about three times natural size.)

Many of the synonyms usually placed under *Blechum brownei* Juss., could the type be examined, would probably fall, at least in part, under this form. Although widely distributed and in many places a common plant, the lack or presence of the puberulous bracts, characterizing the form *puberulum*, is rarely mentioned in the numerous published descriptions.

Open waste or cultivated places in either dry or moist situations. Eastern and southern Mexico, throughout Central America, Panama,

northern South America, and the West Indies. Also in Guam, Formosa, and the Philippine and Caroline Islands.

ANTIOQUIA: Botero, Cauca Valley, *Pennell* 10974 (Ph). Medellín, *Archer* 14 (US); 88 (US). Granja de las Mercedes, Venecia, *Gutiérrez-V. & Barkley* 17C 523 (US). Puerto Berrío, *Archer* 1417 (US); *Pennell* 3752 (NY, US). Between Río Guapá and León, *Landa, Rivera, & Barkley* 18C 316 (US). Valparaiso, *Pennell* 10798 (Ph, NY, US).

ATLÁNTICO: Hacienda Riodulce, Los Pendales, *Dugand & Jaramillo* 4164 (US). Piojó, vicinity of Barranquilla, *Bro. Elias* 676 (US). Hacienda Cachubana, Usiacurí, *Dugand & García-Barriga* 2384 (US).

BOLÍVAR: Cartagena, *Bro. Hilarino Angel* 97 (US). Sincé, *Pennell* 4030 (NY).

CAUCA: Río Timbío, *von Sneidern* 2650 (S). Río Timbiquí, *Lehmann* 654 (NY).

CHOCÓ: Without definite locality, *Triana* s. n. (Col).

CUNDINAMARCA: La Esperanza, *García-Barriga* 4702 (US). Mesa, *Triana* s. n. (US).

EL VALLE: Buenaventura, *Killip* 5290 (Ph, NY, US). Cisneros, *Killip* 11451 (GH). Cliffs of Río Dagua, Córdoba, *Killip* 5078 (US). Córdoba, *Killip & García* 33400 (US). Between Gordona and Puerto Cabuyo, *Cuatrecasas* 14510 (US). Margarita, Río Digua Valley, *Killip* 34890 (US). La Trojita, on Río Calima, *Cuatrecasas* 16334 (US). Plantations of El Abismo, Pichindé, *Cuatrecasas* 18656 (US). Between Río Agua Bonito and Río Vieja, east of Zarzal, *Pennell, Killip, & Hazen* 8572 (Ph, NY, US).

HUILA: Natagaima, *Rusby & Pennell* 1178 (NY).

MAGDALENA: Mamacasaca, vicinity of Santa Marta, *H. H. Smith* 81 (NY). Mamatoca, vicinity of Santa Marta, *H. H. Smith* 2114 (NY, US). Masinga Viejo, vicinity of Santa Marta, *H. H. Smith* 1409 (Ph, NY, S). Papare, vicinity of Santa Marta, *H. H. Smith* 81 (Ph, NY). Playa Barba, vicinity of Santa Marta, *H. H. Smith* 81 (NY, US). Poponte, Magdalena Valley, *Cyril Allen* 841 (Mo).

META: Orocué on Río Meta, *Cuatrecasas* 4422 (US).

SANTANDER: Puerto Wilches, *Killip & Smith* 14767 (NY).

WITHOUT DEFINITE LOCALITY: *Triana* s. n. (NY).

2. *Blechum haughtii* Leonard, sp. nov.

FIGURE 23

Herba, caulibus subquadrangularibus, glabris vel hirtellis, interdum bifarium hirtellis; lamina foliorum ovato-lanceolata, apice acuta vel acuminata, basi angustata, in petiolum decurrens, tenuis, leviter serrata, supra pilosa, subtus parce hirtella; petioli tenues, hirtelli; spicae breves, terminales; bractee dense imbricatae, ovatae, apice acutae, pilosae et ciliatae, leviter serratae; bracteolae lanceolatae, subintegrae, ciliatae; calycis segmenta lanceolata, acuminata, ciliata; corolla purpurea, hypocrateriformis, minute pubescens; capsulae ovoideae, puberulae.

Herbs up to 30 cm. high or more; stems subquadrangular (the angles rounded), glabrous, hirtellous, the hairs sometimes arranged in two lines; leaf blades lanceolate, up to 8 cm. long and 2.5 cm. wide, acute or acuminate (the tip itself sometimes blunt), narrowed at base and decurrent on the petiole, thin, shallowly serrate, the upper surface moderately pilose, the hairs 1.5 mm. long, curved, the lower surface sparingly hirtellous, the hairs up to 0.75 mm. long, the costa and

lateral veins rather inconspicuous; petioles 1 to 1.5 cm. long, hirtellous; spikes terminal, about 2 cm. long and broad; bracts imbricate, ovate, 17 mm. long, 11 mm. wide (or the uppermost somewhat smaller), acuminate or acute at apex, pilose and ciliate; bractlets lanceolate, 10 mm. long, 3 mm. wide at middle, acute, entire or nearly so, ciliate; corolla purple, hypocrateriform, finely pubescent, 2.5 cm. long, the cylindrical basal portion of the tube 1.5 mm. broad, the throat 6 mm. broad, the limb about 12 mm. broad, the lobes ovate, rounded, about 6 mm. long and broad; stamens included; capsule ovoid, puberulous.

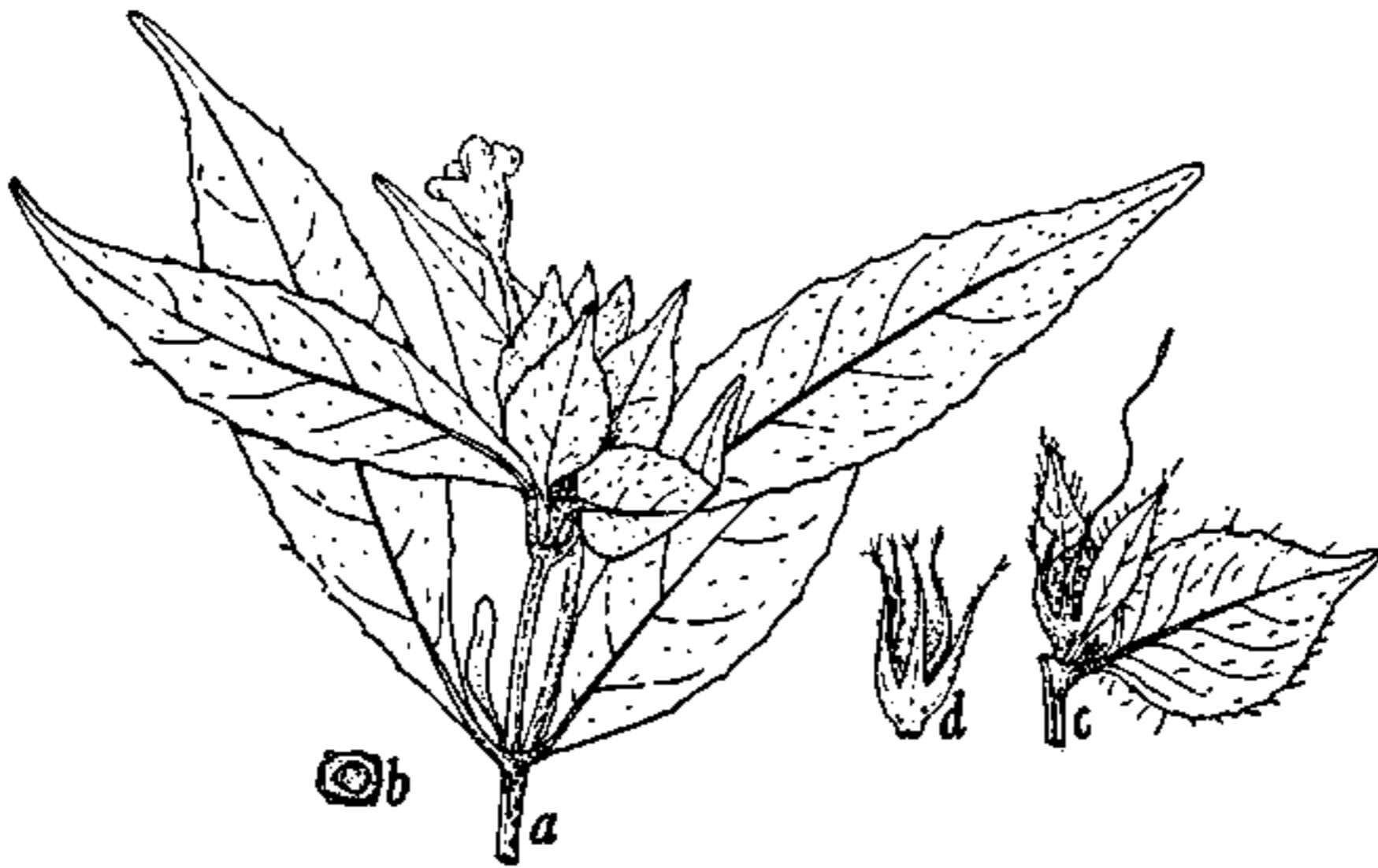


FIGURE 23.—*Blechum haughtii* Leonard (Haught 4976): *a*, Tip of branch showing inflorescence; *b*, cross section of stem; *c*, portion of inflorescence showing bract, bractlets, calyx, and ovary; *d*, calyx. (*a*, Half natural size; *b*, *c*, natural size; *d*, twice natural size.)

Type in the U. S. National Herbarium, No. 1950441, collected from wet soil on a ridge just east of Quebrada de los Indios, east of Turbo, Department of Antioquia, about 200 meters altitude, July 15, 1946, by Oscar Haught (No. 4976).

Blechum haughtii can be separated easily from *B. brownei* f. *puberulum* Leonard by its pilose leaf blades and bracts and large corollas (2.5 cm. long instead of 1.5 cm.). Its closest relative is *B. costaricense* Oerst., of Costa Rica and Panama. From this it can be distinguished by its relatively narrower leaf blades, their margins plainly serrate instead of entire, and by the more slenderly acuminate bracts. The leaf blades (or at least some of them) of *B. costaricense* are as much as 12 cm. long and 4 cm. wide.

DOUBTFUL SPECIES

BLECHUM ANGUSTIUS Nees

Blechum angustius Nees in DC. Prodr. 11: 467. 1847. Type collected at Cartagena, Bolívar, Colombia, January to February 1826, by Billberg, No. 1, deposited in the Berlin Herbarium.

A careful examination of isotype material of Billberg's No. 1, from the Stockholm Herbarium, discloses several traits; the seeds are strongly muricate, the corollas have 2 stamens and are bilabiate, and

the bark has a tendency to separate in thin strips from the stem. These characters indicate that Billberg's specimens should be classed in the genus *Tetramerium*.

11. PHAYLOPSIS Willd.

Phaylopsis Willd. Sp. Pl. 3: 342. 1801. The derivation of *Phaylopsis* is somewhat obscure, but the name may possibly come from φαῦλος, mean, common, and δψis, appearance. Type species: *Phaylopsis parviflora* Willd. Type locality: India.

Perennial branching herbs; leaves petioled, opposite, ovate, entire or crenate; spikes terminal, dense, the flowers secund; bracts orbicular, closely imbricate, usually subtending 3 flowers; bractlets none; sepals 5, the posterior one ovate, veiny, the others linear-subulate; corollas small, the tube slender, cylindric, the 5 lobes rounded, subequal; stamens 4, didynamous, the anthers 2-celled, the cells parallel, the base of the lobes minutely mucronate; style and stigma linear; capsules clavate, compressed, 4-seeded, the placentae dehiscing from the base of the capsule; seeds discoid, white-pilose when moistened.

The ten or more species comprising the genus are found chiefly in Africa, Asia, and India.

1. *Phaylopsis parviflora* Willd.

FIGURE 24

Phaylopsis parviflora Willd. Sp. Pl. 3: 342. 1800. Type locality: India.

Prostrate or ascending much-branched herbs up to 40 cm. high; branches quadrangular or terete toward base, more or less puberulous, the hairs up to 175 μ long, retrorsely curved, confined chiefly to the angles, the smaller branches pilose, the hairs more or less spreading, white, some of them as much as 3 mm. long; leaf blades ovate, up to 9 cm. long and 4 cm. wide, short-acuminate (the tip itself rounded or obtuse), narrowed at base and decurrent on the petiole, thin, undulate, sparingly pubescent on both surfaces, the costa and lateral veins (5 or 6 pairs) very slightly prominent; petioles up to 2.5 cm. long, the pubescence like that of the stems; leaves of the lateral branches much smaller than the main stem leaves, usually not exceeding 3 cm. in length or 2 cm. in width, their petioles often long-pilose; spikes numerous, terminal and lateral, compact, up to 4 cm. long and 1.5 cm. broad, the flowers and bracts crowded and more or less secund; peduncles 4 or 5 mm. long, these and the rachis densely pilose, the hairs white and spreading, up to 3 mm. long, some of the shorter ones glandular; bracts suborbicular, up to 8 mm. long and 10.5 mm. wide, rounded or obtuse at tip, truncate at base and short-petioled, thin, reticulate-veined, glabrous or sparingly pilose, the margins ciliate, some of the hairs as much as 3 mm. long, the shorter hairs occasionally glandular; posterior segment of the calyx ovate, 8 mm. long, 4.5 mm. wide, obtuse

at apex, narrowed at base, thin, veiny, glabrous or sparingly pilose, the margins long-ciliate, the hairs spreading, up to 3 mm. long, the anterior segments lance-subulate, 7 mm. long, 0.75 mm. wide near base, the lateral pair similar but slightly shorter, all pilose, the pubescence a mixture of short hairs about 0.5 mm. long and longer ones as much as 2 mm. long, some of them gland-tipped; corollas whitish, about 7 mm. long, the tube slender, about 1 mm. broad at base and throat, the middle part about 0.5 mm. broad, the upper lip 2-lobed, the lobes oval, rounded, 1 mm. long and broad, the lower lip 3-lobed, the lobes slightly smaller than those of the upper lip; stamens about 2 mm. long, the filaments slender, the anthers 0.5 mm. long; capsule clavate, 5.5 mm. long, 2.5 mm. wide, 2 mm. from tip, 0.75 mm. thick, pointed, narrowed to a short stipitate base, glabrous except the tip, this sparingly puberulous, the sides of the valves scarious; seeds flat, suborbicular, 1.5 mm. long and 1.25 mm. broad, densely white-pilose when moistened, the hairs 0.5 mm. long.



FIGURE 24.—*Phayloopsis parviflora* Willd. (Bro. Apollinaire "F"): a, Branch, showing inflorescence and leaves; b, calyx; c, corolla; d, capsule; e, capsule dehiscent. (a, Natural size; b, d, e, twice natural size; c, $2\frac{1}{2}$ times natural size.)

Thickets in pastures. India, Madagascar, and tropical Africa. The specimens cited here constitute our first record of the plant occurring in America.

META: Restrepo, *García-Barriga* 5181 (US). Villavicencio, Bro. Appollinaire (US).

Tribe 4. RUELLIEAE Nees

Ruellieae Nees in Wall. Pl. Asiat. Rar. 3: 75. 1832.

Herbs or shrubs; inflorescence various, the flowers axillary, sessile or in cymes, often forming panicles, sometimes spicate and subtended by leaflike bracts or spicate above and axillary below; corolla mauve,

purple, white, red, or rarely greenish, sometimes rudimentary (the flower cleistogamous), the limb regular or sublunate, the tube more or less elongate, the upper expanded portion more or less ventricose, the lobes rounded, sometimes emarginate; stamens 4, didynamous; anthers 2-celled, the cells equal or nearly so, the basal lobes usually mucicous; capsules clavate to subcylindrical, more or less flattened, 2- to many-seeded, the lower portion narrowed and sterile; seeds discoid, usually brown, often apparently glabrous when dry but variously mucilaginous-pubescent when moistened.

The tribe consists of about 15 genera. Only one of these is represented in Colombia.

12. RUELLIA Plum. ex L.

Ruellia Plum. ex L. Sp. Pl. 634. 1753; Gen. Pl. ed. 5. 238. 1754. Named in honor of I. De la Ruelle, a French herbalist. Type species: *R. tuberosa* L.

Dipteracanthus Wall. Pl. Asiat. Rar. 3: 75. 1832. Usually herbs, the flowers axillary, solitary or produced in fascicles, sessile or short-peduncled, the uppermost flowers forming a raceme, the bracts often large and leaflike, the bractlets none or few and inconspicuous, the stamens included. The name is derived from *διπτερος*, 2-winged, and *ἀκανθος*, referring to the genus *Acanthus*. Type species: *D. ciliatus* Nees. Type locality: Prome, Burma.

Aphragmia Lindl. Nat. Syst. ed. 2. 444. 1836. Meaning obscure. Type species: *A. haenkei* Lindl. Type locality: Mexico.

Cryphiacanthus Nees in Del. Sem. Hort. Verat. 1841. Derivation: *κρύφιος*, hidden, and *ἀκανθος*, the genus *Acanthus*. Type species: *C. barbadosis* Nees. Type locality: Barbados.

Scorodoxyllum Nees in Benth. Pl. Hartw. 236. 1846. Meaning of name obscure. Type species: *S. hartwegianum*. Type locality: Mexico.

Stemonacanthus Nees in Mart. Fl. Bras. 9: 53. 1847. Derivation: *στήμων*, stamen, and *ἀκανθος*, the genus *Acanthus*. Type species: *S. salviaefolius* Nees. Type locality: Brazil.

Arrhostoxylum Nees in Mart. Fl. Bras. 9: 57. 1847. The group consists of more or less suffrutescent herbs with quadrangular stems, repand or crenate leaf blades, and conspicuous flowers borne in thyrsi terminating slender dichotomously branched peduncles (the peduncle sometimes simple, terminated by a head), the bracts deciduous, the corollas narrowly infundibular, the stamens exerted. Derivation: *ἄρρωστος*, weak, and *ξύλον*, wood or stems. Type species: *A. laxum* Nees. Type locality: Brazil.

Perennial herbs or shrubs; leaves petioled, entire, undulate, or rarely dentate; flowers usually large and showy, solitary or clustered in the axils or borne on terminal cymose panicles; calyx usually 5-parted, the segments often narrow; corolla red, yellow, white, or purple (usually mauve), funnelform or salverform, sometimes saccate, the tube usually narrow below, the upper portion more or less campanulate, the limb of 5 obtuse spreading lobes; stamens 4, didynamous, the anther sacs blunt at base; stigma lobes unequal; capsules oblong or clavate.

KEY TO THE SPECIES

- A. Inflorescence paniculate, the flowers borne on simple or dichotomously branched peduncles.
 Flowers borne in headlike clusters, these terminating the peduncles.
 1. *R. fulgida* var. *angustissima*
- Flowers borne on dichotomously branched peduncles.
 Corollas white.
 Peduncles flattened, pilose, once dichotomous..... 2. *R. tolimensis*
 Peduncles subterete, essentially glabrous, 2 to 3 times dichotomous.
 3. *R. potamophila*
- Corollas red, pink, purple, or mauve.
 Calyx more or less glandular-pubescent.
 Corollas large, the limb 4 cm. broad 4. *R. malacosperma*
 Corollas small, the limb 1 to 1.5 cm. broad.
 Peduncles slender, 12 cm. long or more, glabrous..... 5. *R. chariessa*
 Peduncles short, 3 cm. long or less, more or less pubescent.
 Capsules cylindrical.....6. *R. paniculata*
 Capsules clavate.....7. *R. inundata*
- Calyx glabrous or, if pubescent, the hairs eglandular.
 Corollas mauve, the limb about 4 cm. broad.....8. *R. tuberosa*
 Corollas red, the limb about 3 cm. broad or less.
 Calyx segments thin, obtusish, shorter than the calyx tube.
 Stems, peduncles, pedicels, and the under surface of the leaf blades
 glabrous or sparingly puberulous.....9. *R. macrophylla*
 Stems (at least the upper portions), peduncles, pedicels, and the
 under surface of the leaf blades densely and softly puberulous.
 9a. *R. macrophylla* var. *puberula*
- Calyx segments firm, linear or subulate, gradually narrowed from
 base to a slender tip, longer than the calyx tube.
 Plants grayish puberulous.....10. *R. grisea*
 Plants not uniformly grayish puberulous.
 Lower surface of the leaf blades densely pubescent.
 11. *R. ischnopoda*
- Lower surface of the leaf blades essentially glabrous.
 Calyx segments 3 mm. long.....12. *R. caucensis*
 Calyx segments 8 mm. long.....13. *R. rusbyi*
- A. Inflorescence spicate, axillary, or if paniculate, not borne on slender peduncles.
 B. Rachis short, thick, conelike after the falling of the bracts and flowers;
 various parts of the plants bearing small resinous scales.
 Flowers borne in panicles.
 Corollas yellow, the stamens exerted about 2 cm. beyond the mouth of
 the corolla tube, the filaments strongly curved; corolla lobes about
 1 cm. long.....14. *R. longiflamentosa*
 Corollas red, the stamens exerted about 1 cm. beyond the mouth of the
 corolla tube, the filaments straight or slightly curved; corolla lobes
 usually 2 to 3 cm. long.....15. *R. humboldtiana*
- Flowers borne in a terminal spike subtended by numerous large leafy bracts.
 Corollas large, 4 to 8 cm. long.
 Plants strongly hirsute.....16d. *R. tubiflora* var. *hirsuta*
 Plants glabrous or more or less puberulous.
 Corollas white with purple throat.
 16b. *R. tubiflora* var. *tetrastichantha* f. *bicolor*

Corollas uniform in color.

Corollas pure white.....16a. *R. tubiflora* var. *tetrastichantha*

Corollas not white.

Endemic in Costa Rica ; corollas yellow.

16c. *R. tubiflora* var. *tetrastichantha* f. *flava*

Species of Panama and Colombia ; corollas crimson, lilac, or red.

16. *R. tubiflora*

Corollas small, 4 cm. long or less.

Corollas pale violet.....16e. *R. tubiflora* var. *parviflora*

Corollas white.....16f. *R. tubiflora* var. *parviflora* f. *alba*

B. Rachis various or lacking, not short, thickish and conelike.

Pubescence of the inflorescence or at least that of the calyx lobes consisting in part of glandular hairs.

Plants glandular-puberulous..... 17. *R. lorentziana*

Plants glabrous or sparingly pilose, only the calyx bearing scattered minute glandular hairs..... 4. *R. malacosperma*

Pubescence eglandular.

C. Stems glabrous, puberulous, or pilosulous.

Corollas mauve.

Capsules clavate, puberulous ; flowers axillary.

Leaf blades oblong to lanceolate ; corollas 2.5 to 3 cm. long.

18. *R. geminiflora*

Leaf blades narrowly lanceolate ; corollas 4 to 5 cm long.

18a. *R. geminiflora* var. *angustifolia*

Capsules cylindrical, glabrous or the calluses bearing a few hairs ; inflorescence verticillate, forming a naked interrupted spike.

19. *R. obtusa*

Corollas red, white, greenish, or pink.

Bracts bright red..... 20. *R. colorata*

Bracts green.

Plants 4 to 5 meters high ; leaf blades large (up to 30 cm. long and 17 cm. wide) ; corolla pale green.....21. *R. viridiflora*

Plants one meter high or less ; leaf blades smaller (16 cm. long and 6 cm. wide or less) ; corolla blue, white, violet, or pink.

Leaf blades oblong-lanceolate, narrowed at base... 22. *R. pennellii*

Leaf blades ovate, rounded or obtuse at base... 23. *R. colombiana*

C. Stems or at least the uppermost portions densely pilose.

Flowers borne in terminal spikes, the bracts imbricate.

Spikes 3 cm. long or less ; calyx 8 mm. long ; leaf blades 8 cm. long and 3.5 cm. wide or less..... 24. *R. aquatica*

Spikes as much as 12 cm. long ; calyx 4.5 mm. long ; leaf blades up to 16 cm. long and 8.5 cm. wide..... 25. *R. lasiostachya*

Flowers borne in axillary bracted clusters.

Leaf blades oblong, elliptic, 12 cm. long or less... 26. *R. putumayensis*

Leaf blades oblong-lanceolate, up to 24 cm. long..... 27. *R. uribei*

1. *Ruellia fulgida* Andr. var. *angustissima* (Hochr.) Leonard, comb. nov.

Arrhoxylum fulgidum Nees var. *angustissimum* Hochr. Bull. N. Y. Bot. Gard. 6: 287. 1910. Type collected at La Paila, El Valle, Colombia, April 1853, by Holton, No. 599, deposited in the herbarium of the New York Botanical Garden. Isotype in the herbarium of the Royal Botanic Gardens, Kew.

Herbaceous or suffrutescent plants; stems quadrangular, sulcate, pubescent or glabrate, the hairs minute and curved; leaf blades lanceolate, sometimes falcate, usually 5 to 9 cm. long, 2 to 3 cm. wide, slenderly acuminate (the tip itself blunt), narrowed at base and decurrent on the petiole, both surfaces glabrous or sparingly pilose or the upper surface of the young leaves rather densely pubescent, the hairs straight or curved, the cystoliths prominent where not obscured by hairs; petioles usually 0.5 to 1 cm. long, glabrous or more or less pubescent; flowers sessile or subsessile, borne in heads at the tips of slender curved quadrangular axillary peduncles up to 11 cm. long, these glabrous or sparingly pilose, the cystoliths prominent; flowers several to a dozen or more in each head; bracts subtending the heads leaflike, up to 3 cm. long and 8 mm. wide; bractlets triangular to oblanceolate, 2 to 4 mm. long, about 1 mm. wide, glabrous or pubescent; calyx 4 to 8 mm. long, puberulous, some of the hairs glandular, the segments linear, 0.5 to 0.75 mm. wide; corolla red, glabrous or puberulous toward base, the tube funnelform, curved, 1.5 mm. broad at base, 5 to 7 mm. broad at mouth, the lobes ovate, 7 to 10 mm. long, 3 to 5 mm. wide, rounded at tip; stamens exerted to about 5 mm. beyond the mouth of the tube, the anthers oblong, 2 mm. long, 0.5 mm. wide; capsules 12 or 13 mm. long, 3 mm. broad, 8-seeded, puberulous, pointed at tip, the solid stipitate base about 4 mm. long and 1 mm. broad; retinacula slender, curved, about 2 mm. long; seed (immature) flat, orbicular, 1.5 mm. in diameter.

A sheet of Lehmann's No. 4739 in the Berlin Herbarium (photo in U. S. National Herbarium) bears in Lindau's handwriting an apparently unpublished name.

The variety *angustissima* differs from the typical form *R. fulgida* chiefly in the narrowness of the leaf blades and the shortness of the petioles. As Hochreutiner points out in his original description, the leaves of the typical form are 7.5 to 12 cm. long and 1.7 to 2.5 cm. wide and the petioles 2 to 8 cm. long. The height of the plant can scarcely be ascertained from the herbarium material examined, but a portion of the original label shown by the photo of the Berlin Herbarium sheet of Lehmann's No. 4739 bears the following legend: "Straucher dunnen, bei 1 m. hohen Stangel, Blat. . . ." The plants are probably erect when young, the stems ascending or even becoming procumbent with age.

Damp thickets or woods. Colombia, Venezuela, and Tobago.

CUNDINAMARCA: Vicinity of Bogotá, *Bro. Ariste-Joseph*, s. n. (US). Hacienda Paramillo, between Guaduas and Alto de Aguaclara, *García-Barriga* 12322 (US). Santandersito, *Silvano-J.* 178 (GH). Tenasuca, *Triana* s. n. (Col, NY, US).

ANTIOQUIA: Dabeiba, *Lehmann* 4739 (US).

EL VALLE: La Paila, *Holton* 599 (NY).

SANTANDER: San Gil, *Bro. Antonio-Miguel* 121 (GH).

WITHOUT LOCALITY: *Lehmann* 4739 (US).

2. *Ruellia tolimensis* Leonard, sp. nov.

FIGURE 25

Herba vel suffrutex, caulibus quadrangularibus, leviter sulcatis, angulis anguste alatis, ciliatis; lamina foliorum oblongo-ovata, apice acuminata, basi angustata, in petiolum decurrens, glabra, costa et venis pilosis; pedunculi complanati, ciliati, dichotomo-ramosi; bracteae angustatae, oblongae, pilosae; pedicelli graciles glabri; calycis segmenta subulata, ciliata; corolla alba, glabra, leviter curvata, ventricosa, lobis ovatis vel ellipticis, rotundatis; capsulae clavatae, glabrae; semina ovata, marginibus madefactis puberulis; retinacula subulata, acute curvata.



FIGURE 25.—*Ruellia tolimensis* Leonard (*Cuatrecasas* 10529a): *a*, Leaf; *b*, portion of upper surface of leaf showing cystoliths; *c*, nodal region of stem and inflorescence; *d*, enlarged portion of peduncle to show flatness, wings, and pubescence; *e*, flower; *f*, stamen. (*a*, *c*, Half natural size; *b*, *f*, about twice natural size; *d*, $2\frac{1}{2}$ times natural size; *e*, natural size.)

Plants herbaceous or suffrutescent; stems quadrangular, shallowly sulcate, the angles narrowly winged, the wings pilose, the hairs barely 1 mm. long, the cystoliths minute; leaf blades oblong-ovate, up to 17 cm. long and 7 cm. wide, rather slenderly acuminate, narrowed at base and decurrent on the petiole, thin, shallowly crenate, glabrous except the costa, lateral veins (10 pairs), and the margins, these pilose, the hairs about 0.5 mm. long, spreading or subappressed; petioles up to 3 cm. long, minutely pilose; flowers borne on axillary dichotomously branched peduncles, these up to 11 cm. long to the first fork, flattened, the edges pilose with white spreading hairs 0.5 mm. long, the secondary

peduncles 1.5 to 3 cm. long, flattened or obscurely quadrangular, the narrowly winged edges pilose with white spreading hairs 0.5 to 0.75 mm. long or when young the entire surface pilose; bracts narrowly oblong, narrowed at both ends, up to 14 mm. long and 4 mm. wide, but usually smaller, the margins pilose; pedicels slender, up to 14 mm. long, glabrous; calyx 8 to 10 mm. long, divided nearly to base, the segments subulate, 0.75 to 1 mm. wide at base, ciliate, the hairs about 0.25 mm. long; corolla 2.5 cm. long, white, glabrous, the lower portion of the tube slightly curved, about 2 mm. broad from base to 5 mm. above base, thence gradually enlarged to 7 mm. at throat, the enlarged portion slightly ventricose, the lobes ovate or elliptic, about 8 mm. long and 5 mm. wide, rounded, shallowly to rather deeply emarginate; stamens barely exerted; capsules clavate, glabrous, 1.5 cm. long, the solid stipitate base about 6 mm. long, the seed-bearing portion about 3 mm. broad, each capsule usually maturing 4 seeds, these ovate, flattened, about 3.5 mm. long and 2.5 mm. broad, the margins puberulous; retinacula slender, sharply curved or bent at an angle.

Type in the National Herbarium of Colombia, collected in pasture lands at Armero, in the Magdalena Valley, Department of Tolima, Colombia, 400 meters altitude, October 6, 1940, by J. Cuatrecasas (No. 10529a). Fragment of type in the U. S. National Herbarium, No. 1854310. The name alludes to the Department of Tolima, where the type was procured.

Ruellia tolimensis is closely related to *R. potamophila* but can be separated by the pilose peduncles, these once instead of 2 or 3 times branched, and by the more numerous veins of the leaf blades (10 pairs instead of 8).

3. *Ruellia potamophila* Leonard, sp. nov.

FIGURE 26

Suffrutex, caulibus subquadrangularibus, glabris, nodis tumidis, perspicue cystolithigeris; lamina foliorum oblongo-ovata, apice acuminata, basi angustata, integra vel leviter crenata; pedunculi subteretes, dichotomo-ramosi, glabri, parce et minute pubescentes; bracteae infimae foliosae, supremas parvas, spathulatas vel lineares; pedicelli parce pubescentes vel glabrati; calycis segmenta subulata; corolla alba, glabra, hypocrateriformis, leviter ventricosa, lobis ovatis, rotundatis vel emarginatis; capsulae clavatae, glabrae, stipite gracili.

Suffrutescent herbs up to 2 meters high; stems subquadrangular, glabrous, the nodes swollen, the cystoliths numerous and conspicuous; leaf blades oblong-ovate, up to 18 cm. long and 6.5 cm. wide, acuminate, narrowed at base, glabrous, entire or shallowly crenate, the costa and lateral veins (8 pairs) rather prominent, the cystoliths prominent; petioles up to 2 cm. long; flowers borne in lax dichotomously branched cymes, the peduncles up to 8 cm. long, subterete, the primary branches 3 to 4 cm. long, the others relatively shorter, all terete and, like the

peduncles, glabrous or sparingly and minutely pubescent, the hairs spreading; lower bracts leaflike, deciduous in some plants, the uppermost bracts spatulate or linear, 5 to 10 mm. long; pedicels 2 to 10 mm. long, minutely and sparingly pubescent or glabrate; calyx 7 to 10 mm. long, glabrous, the segments subulate; corolla white, 28 mm. long, glabrous, the lower half slender, 2 mm. in diameter, the upper half funnelform, slightly ventricose, 8 mm. broad at mouth, the lobes ovate, 6 to 8 mm. long, 3 to 5 mm. wide, rounded or shallowly emarginate, the stamens included; capsules 2 cm. long, glabrous, the stipe slender, 8 to 9 mm. long, the seed-bearing portion oval, 5 mm. broad, 4-seeded, pointed.

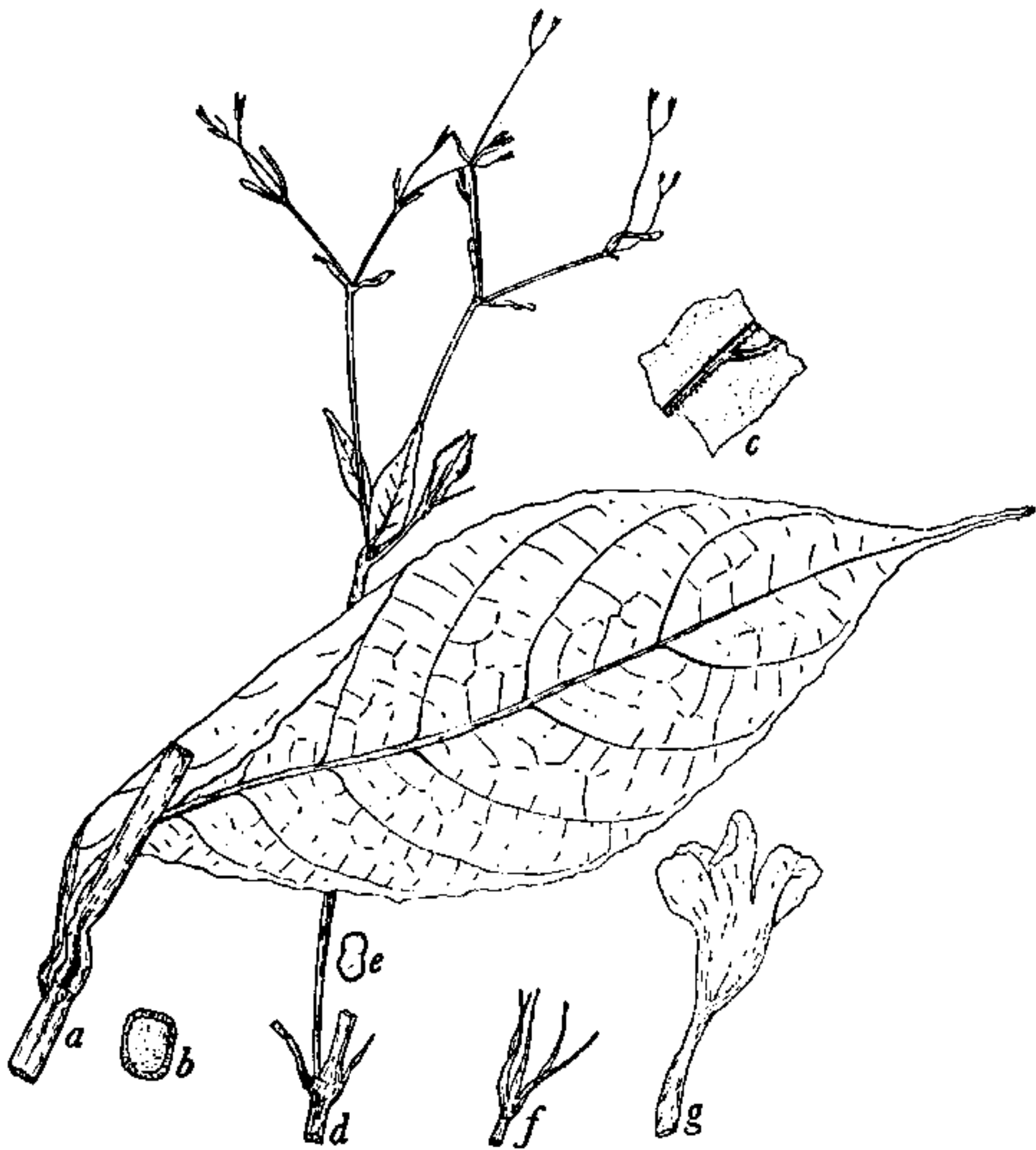


FIGURE 26. *Ruellia potamophila* Leonard (*a-f*, Killip 34747; *g*, Cuatrecasas 15035): *a*, Nodal region and leaf showing under surface; *b*, cross section of stem; *c*, portion of leaf blade (upper surface), showing arrangement of cystoliths at juncture of costa and a vein; *d*, inflorescence; *e*, cross section of peduncle; *f*, calyx; *g*, corolla. (*a*, *d*, Half natural size; *b*, *c*, *f*, *g*, about natural size; *e*, about four times natural size.)

Type in the U. S. National Herbarium, No. 1771543, collected in dense forest along the Río Engaña, Río Digua Valley, Department of El Valle, Colombia, 675 meters altitude, April 2 to 4, 1939, by E. P. Killip (No. 34747). Also represented by:

CALDAS: Santa Cecilia, 800 meters altitude, *von Sneidern* 5075 (Ch).

EL VALLE: Woods at Piedra de Moler, on the left bank of the Río Digua, 900 to 1,180 meters, *Cuatrecasas* 15035 (US). Below Queremal, along the Río San Juan, 1,300 to 1,500 meters altitude, *Cuatrecasas* 23947 (US).

Ruellia potamophila is related in a general way to *R. macrophylla*, but it is distinguishable by its white flowers, subulate calyx segments, and narrowly winged ciliate peduncles. The name *potamophila* (ποταμός, river, and φιλέω, loving) alludes to the plant's predilection for growing on banks of streams and rivers. It is usually found in densely wooded regions.

4. *Ruellia malacosperma* Greenm.

Ruellia malacosperma Greenm. Proc. Amer. Acad. 34: 572. 1899. Type collected at Tampico, Tamaulipas, Mexico, by Pringle, No. 6806.

Herbaceous plants up to 0.5 meters high; stems subquadrangular, glabrous or sparingly pilose, the cystoliths minute and numerous; leaf blades narrowly oblong, acute or obtusish at apex, narrowed at base and decurrent on the petiole, up to 13 cm. long and 3.8 cm. wide, rather firm, entire or undulate, both surfaces glabrous or the costa and basal margins bearing a few white spreading hairs 1.5 to 2 mm. long, the cystoliths numerous and conspicuous under a lens; petioles up to 2 cm. long, sparingly long-pilose; flowers borne on once to twice dichotomously branched peduncles, these up to 8 cm. long, their branches 4 to 2 cm. long, all subquadrangular and glabrous, bearing conspicuous cystoliths, the ultimate forks flower-bearing; bracts linear, about 1 cm. long and 1.5 mm. wide at base or the uppermost smaller, all glabrous; calyx 13 to 15 mm. long, divided nearly to the base, the segments subulate, 1.25 mm. wide at base, gradually narrowed to tip and bearing minute scattered hairs on or near the margins, some of the hairs gland-tipped; corolla 5.5 cm. long, minutely pubescent, mauve, the tube about 4 mm. broad at base, gradually narrowed to 2 mm. at 1 cm. above base, thence enlarged to 2 cm. at mouth, the throat funnelform and somewhat ventricose, the limb 4 cm. broad, the lobes oval, about 1.5 cm. long and broad; capsules narrowly clavate, 2.3 cm. long, 8- to 20-seeded, glabrous or the apical calluses puberulous, the solid basal portion about 6 mm. long and 2 mm. broad, the seed-bearing portion 6 mm. broad; seed suborbicular, about 3 mm. in diameter, silky with white appressed hairs when dry but mucilaginous-pilose when moistened; retinacula 2 mm. long, slightly curved.

The majority of the collections in the U. S. National Herbarium, including the type, are from cultivation. In fact, the distribution of the species in its wild state cannot be definitely established. It is, however, probably a native of Mexico. The specific name comes from μαλακός, soft, and σπέρμα, seed, in allusion to the silky appressed

pubescence of the dry seed or even possibly to the spreading velvety mucilaginous pubescence of the moistened seed.

The plant cited below was collected on roadside in a cultivated hacienda at 1,000 meters altitude, July 4, 1943.

CAUCA: Between Gordona and Puerto Cabuyo, *Cuatrecasas* 14530 (US).

5. *Ruellia chariessa* Leonard, sp. nov.

FIGURE 27

Herba vel suffrutex, caulibus quadrangularibus, plus minusve pubescentibus, angulis rotundatis; laminae foliorum oblongo-elliptica, apice subacuta, basi angustata, in petiolum decurrens, integra vel leviter crenata, glabra vel in costa parce pubescentes; pedunculi graciles, plus minusve curvati, glabri, quadrangulares, dichotomo-ramosi, bracteae oblanceolatae, apice rotundatae, basi angustatae, glabrae; calyx glanduloso-puberulus, segmentis anguste lanceolatis; pedicelli complanati, parce glanduloso-puberulenti; corolla purpurea, hypocrateriformis, limbo glabro, tubo pubescente; stamina inclusa; capsulae graciles, clavatae, glanduloso-puberulentes; semina purpurea, plana; retinacula curvata, subulata.

Shrub or suffrutescent herb; stems quadrangular, more or less pubescent, the hairs weak, upwardly curved or appressed, the angles rounded; leaf blades oblong-elliptic, up to 20 cm. long and 7.3 cm. wide, acutish at tip, narrowed at base and decurrent on the petiole, entire or shallowly crenate, drying dull green, glabrous or the costa inconspicuously pubescent beneath, this and lateral veins (10 or 11 pairs) rather prominent, the cystoliths numerous and conspicuous under lens; petioles up to 1.5 cm. long, pubescent; flowers borne in 1 to 3 times dichotomously branched panicles terminating slender, more or less curved, glabrous quadrangular peduncles up to 16 cm. long, the secondary branches up to 3 cm. long, the others successively shorter, all slender, quadrangular, glabrous or the uppermost finely pubescent; bracts oblanceolate, rounded at apex, narrowed at base, unludate or entire, the lowermost pair 16 mm. long and 4 mm. wide, the others successively shorter; calyx 4 to 5 mm. long, moderately glandular-puberulous, the hairs about 0.25 mm. long, the segments narrowly lanceolate, gradually narrowed to a bluntish tip, the costa more or less prominent; pedicels flattened, up to 2.5 mm. long, sparingly glandular-puberulous; corolla purple, 2 cm. long, the lower half of the tube slender, cylindrical, 1.5 mm. broad, finely and inconspicuously pubescent, the upper half funnelform, glabrous, 7 mm. broad at mouth, the limb about 1 cm. broad, the lobes rounded; stamens short, included; capsules slenderly clavate, about 13 mm. long, puberulous, some of the hairs gland-tipped, the slender sterile basal portion about 7 mm. long and 1 mm. broad at base, enlarging to 1.25

mm. at base of seed-bearing cavity, this flattened and about 3 mm. broad; seeds 4 to 8, purplish when mature, round, flat, 2 mm. in diameter, the margins gelatinous-puberulous when moistened; retinacula curved, subulate, 1.5 mm. long, the slender tip more or less erose.

Type in the U. S. National Herbarium, No. 1950440, collected in forest east of Turbo, Department of Antioquia, Colombia, 50 meters altitude or less, July 2, 1946, by Oscar Haught (No. 4929). An isotype is also in the U. S. National Herbarium, No. 1950439.

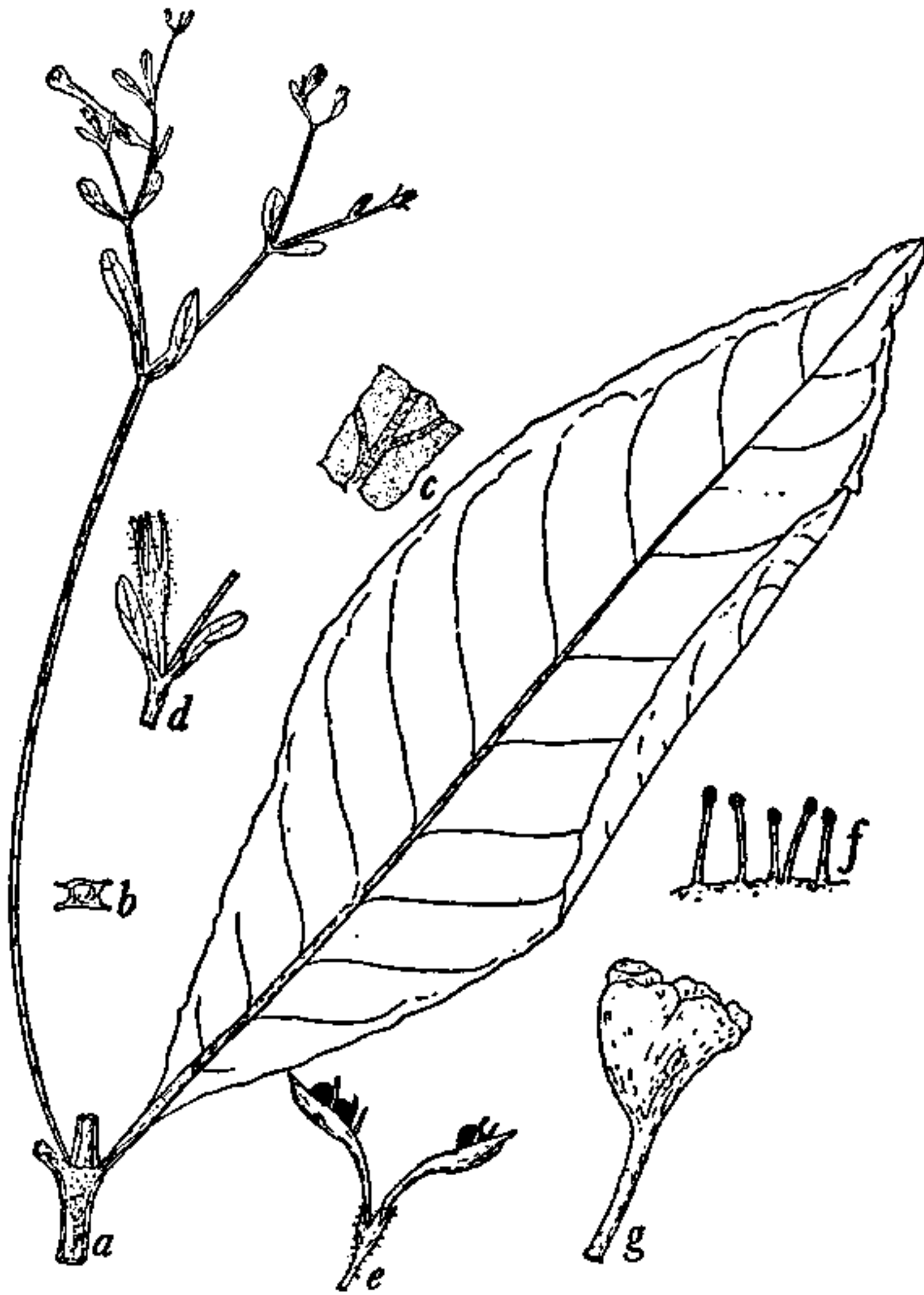


FIGURE 27.—*Ruellia chariessa* Leonard (Haught 4929): *a*, Node, leaf, and inflorescence; *b*, cross section of peduncle; *c*, portion of leaf to show cystoliths; *d*, portion of inflorescence showing bracts and calyx; *e*, calyx and capsule; *f*, glandular hairs of calyx; *g*, corolla. (*a*, Half natural size; *b*, about five times natural size; *c*, *e*, *g*, natural size; *d*, twice natural size; *f*, about eight times natural size.)

Ruellia chariessa is a well-marked species apparently with no close relative, at least in Colombia. Haught states that it has the leaves red beneath and is probably a widespread species. The name *chariessa* means graceful or pleasing.

6. *Ruellia paniculata* L.

Ruellia paniculata L. Sp. Pl. 635. 1753. Linnaeus based his species on a brief description published in Hortus Cliffortianus (p. 313) and on Sloan's description and figure (Cat. Jam. p. 59 and Hist. 1: 158. pl. 100, fig. 2). The name was suggested by the large spreading panicles so conspicuous in mature plants.

Ruellia paniculata H. B. K. Nov. Gen. & Sp. 2: 239. 1817. Type collected at Turbaco, Bolívar, Colombia. *Ruellia paniculata* L. is cited as a synonym. Photograph No. 39433, of the Paris Herbarium sheet, is in the U. S. National Herbarium.

Ruellia viscosa H. B. K. Nov. Gen. & Sp. 2: 239. 1817. Humboldt bases his description on plants he collected "in ripa fluminis Apures" and "in sylvis Orinocensibus justa pagum Carichana."

Dipteracanthus paniculatus Nees in DC. Prodr. 11: 142. 1847. Based on *Ruellia paniculata* L.

Dipteracanthus turbacensis Nees in DC. Prodr. 11: 143. 1847. Type collected by Humboldt at Turbaco, Colombia, deposited in the Willdenow Herbarium.

Ruellia turbacensis Lindau in Engl. & Prantl, Pflanzenfam. IV. 3b: 309. 1895. Based on *Ruellia paniculata* H. B. K.

Herbaceous or suffrutescent plants; stems up to 1 meter high, erect, ascending or sometimes procumbent and rooting at the nodes, the pubescence a mixture of minute grayish hairs and longer glandular ones; petioles slender, 1 to 4 cm. long; leaf blades ovate to oblong-ovate, 3 to 17 cm. long and 1.5 to 6.5 cm. wide, obtuse or acute at apex, abruptly narrowed at base, glandular-pubescent, grayish-puberulous or glabrate; inflorescence axillary, divaricate or ascending, dichotomously branched; bracts leaflike, glandular-pubescent, those subtending the flowers 2 to 10 mm. long and 1 to 4 mm. wide; calyx 1 to 1.5 cm. long, glandular-pubescent, the segments linear-subulate, unequal; corolla blue, finely pubescent, 2 to 4 cm. long, the lobes oval, 6 to 7 mm. long, 5 mm. wide, the limb 1 to 1.5 cm. broad; capsule cylindrical, 10 to 13 mm. long, 2 mm. in diameter, erect, pointed, glabrous, 8-seeded; seeds flat, 2 mm. long, 1.5 mm. wide, mucilaginous-pubescent when moistened.

VERNACULAR NAME: Culantro (*Bro. Elias* 720).

A strong penetrating rather unpleasant odor is often associated with the living plants ("Planta hedionda," *Dugand & Jaramillo* 4091). In Atlántico, *Dugand* states, the plants often grow in scattered colonies in dry thorny thickets.

Thickets and waste places in general. Usually found in dry situations from 0 to 200 meters altitude. Mexico to northern South America and the West Indies.

ATLÁNTICO: Barranquilla, *Bro. Elias* 433 (US); *Bro. Paul* B34 (US); 42 (US). Juan Mina, *Dugand* 1063 (US); *Dugand & Jaramillo* 4091 (US). Miramar, vicinity of Puerto Colombia, *Dugand* 3633 (US). Between Molinero and Arroyo de Piedras, *Dugand & García-Barriga* 2545 (US). Hacienda El Paraíso along the Río Magdalena between Palmar de Varela and Ponedera, *Dugand & García-Barriga* 2445 (US). Piojó, vicinity of Barranquilla, *Bro. Elias* 720 (US).

Ponedera, *Dugand & Jaramillo* 2740 (US). Puerto Colombia, *Bro. Ariste-Joseph* A946 (US); *Barkley & Gutiérrez* 1834 (US); *Bro. Elias* 821 (US); 1375 (US). Savanilla, *Donnell Smith* s. n. (US). Hacienda Cachubana, Utiacurí, *Dugand & García-Barriga* 2362 (US).

BOLÍVAR: Cartagena, *Bro. Heriberto* 303 (US); 304 (US); *Pennell* 4728 (NY). Tierrabomba, vicinity of Cartagena, *Billberg* 3 (S). Turbaco, *Pennell* 4743 (GH, NY, US).

MAGDALENA: Ciénaga, vicinity of Santa Marta, *H. H. Smith* 1359 (Ph, Mo, NY, US). Goajira on the Río Ranchería, *Haught* 4021 (US). Palmas, *Haught* 4766 (US).

7. *Ruellia inundata* H. B. K.

Ruellia inundata H. B. K. Nov. Gen. & Sp. 2: 239. 1817. Type collected on the banks of the Río Magdalena near Mompox and Badillas, Bolívar or Magdalena, Colombia. The banks of the Magdalena in this region are subject to overflow, hence the specific name *inundata*, in spite of the fact that the plants are more likely to be found in very dry situations. They seem to be partial to limestone soil.

Ruellia albicaulis Bertero in Spreng. Syst. 2: 822. 1825. The type of this species was collected also along the Río Magdalena in Colombia. It was so named because of the whitish glabrate stems (at least the lower portions) of the mature plants.

Aphragmia haenkei Lindl. Nat. Syst. 444. 1836. Type collected in Mexico by Haenke.

Dipteracanthus haenkei Nees in DC. Prodr. 11: 141. 1847. Several specimens are cited. Among these are Cuming's No. 1163, collected "in oris occidentali-bus Columbiae et Panamae," and Bertero's specimen from Santa Marta (Berlin and De Candolle herbaria). A fragmentary specimen is in the herbarium of the Missouri Botanical Garden.

Herbaceous or suffrutescent plants up to 2 meters high; stems simple or branched, the tips glandular-pilose, the lower portions becoming whitish and glabrate; leaf blades oblong-lanceolate to ovate, up to 15 cm. long and 7 cm. wide, acuminate at apex, acute or rounded at base, denticulate, repand-crenulate or subentire, hispidulous or occasionally grayish-pubescent beneath; petioles up to 9 cm. long, pilose; inflorescence axillary, erect or ascending, dichotomously branched, sometimes forming a dense cylindric panicle, glandular-pubescent; bracts oblong, 3 to 8 mm. long, to 1 to 3 mm. wide; calyx 8 to 15 mm. long, glandular-pilose, the segments linear; corolla purplish, pubescent, 2 to 2.5 cm. long, the lobes rounded, about 5 mm. wide, the limb 1 cm. broad; stamens included; capsules clavate, 8 to 9 mm. long, 3 mm. wide, flattened, pointed, glabrous, 2- to 4-seeded; seeds flat, ovate, 4 mm. long and 3 mm. wide, smoothish when dry, mucilaginous-pubescent when moistened.

VERNACULAR NAME: Escobilla de ratón (*Bro. Elias* 1385).

Found along roadsides, on open slopes or in fields in either dry or moist situations. Mexico, Central America, Colombia, and Brazil.

ATLÁNTICO: Arroyo de Megua, *Dugand & Jaramillo* 2797 (US). Barranquilla, *Bro. Paul* B36 (US). Hacienda El Paraíso, on the banks of the Río Magdalena

between Palmar de Varela and Ponedera, *Dugand & Garcia-Barriga* 2436 (US). Píojó, vicinity of Barranquilla, *Bro. Elias* 707 (US); 746 (US). Puerto Colombia, *Barkley & Gutiérrez-V.* 1835 (US); *Bro. Elias* 857 (US); 1155 (US); 1385 (US); s. n. (NY). Playa de Miramar, vicinity of Puerto Colombia, *Dugand* 3630 (US); 4014 (US). Savanilla, *Donnell Smith* s. n. (US).

BOLÍVAR: Cartagena, *Billberg* (S). La Popa, vicinity of Cartagena, *Billberg* (S); *Darbin* s. n. (S). Sincé, *Pennell* 4028 (GH, NY, US).

MAGDALENA: Barroblanco, *Haught* 4751 (US). Codazzi, *Haught* 3864 (US). Don Jaco, *H. H. Smith* 1410 (Mo, NY, Ph, US). La Paz, *Haught* 3930 (US). Santa Marta, *Bertero* s. n. (Mo).

8. *Ruellia tuberosa* L.

Ruellia tuberosa L. Sp. Pl. 635. 1753. The name *tuberosa* alludes to the thickened fusiform roots. These are especially conspicuous on living plants but usually inconspicuous in herbarium specimens. Type locality: Jamaica

Ruellia clandestina L. Sp. Pl. 634. 1753. The species was based on cleistogamous material, hence its name *clandestina* (concealed or hidden), alluding to the minute abortive corollas. Cleistogamy is exhibited in other members of the genus. Type locality: Barbados.

Cryphiacanthus barbadensis Nees in DC. Prodr. 11: 197. 1847, in part. Based on *Ruellia clandestina* and *R. tuberosa*. In his treatment of *C. barbadensis* Nees cites a number of *nomina nuda* found on herbarium sheets, representing a considerable geographical range, including Colombia, several of the West Indian Islands, Peru, Guiana, Mexico, Virginia, and Carolina. Some of this material is undoubtedly *Ruellia nudiflora* (Engelm. & Gray) Urb. or some of its varieties or even other species.

Roots thick-fibrous or fusiform; stems erect or ascending, usually branched, obscurely quadrangular, pilose or glabrate, bearing numerous minute cystoliths; leaf blades ovate or oblong, 2 to 11 cm. long, 1.5 to 6 cm. wide, obtuse at apex, abruptly narrowed at base to a short petiole, undulate-crisped, rather thick, sparingly pilose or glabrous, the cystoliths numerous; flowers one to several, borne in erect or ascending dichotomous cymes, the peduncles up to 4 cm. long, glabrous or pilosulous, obscurely quadrangular; bracts linear, 3 to 8 mm. long; pedicels 5 to 10 mm. long, puberulous or glabrate; calyx 15 to 28 mm. long, the tube very short, the segments narrowly linear or subulate, ciliate or glabrous, often spreading; corolla showy, mauve, 3 to 6 cm. long, sparingly puberulous, the throat narrowly campanulate, 15 mm. broad at mouth, the limb 2 to 4 cm. broad, the lobes suborbicular, 12 to 15 mm. wide, undulate or erose; stamens included; style 2 cm. long, glabrous, the stigma lobes unequal; capsules cylindrical, 17 to 20 mm. long, 3 mm. broad, acute at apex, glabrous except the pilosulous callus; seeds 20 or more in each cavity, lenticular, 2 to 2.5 mm. in diameter, appearing glabrous when dry, mucilaginous-pilose when moistened.

VERNACULAR NAMES: Yuca-e-puerco, yuca de puerco (*Garganta-Fábrega* 1075).

In dry situations the plants seldom exceed 35 cm. in height, but in wet places they may reach the height of 1.5 meters (*Metcalf* 30019). Its bright mauve flowers make it a very attractive plant. During

certain seasons an abundance of blossoms is produced, but at other times scarcely a fully developed corolla can be found. At these times the plant produces an almost pure crop of cleistogamous flowers.

Roadsides, clearings, and open places in general, often in sandy loam. Partial to both dry and damp situations. West Indies and northern South America. It has been reported from Florida, Mexico, and Central America, but no authentic specimens have been examined from these regions.

ANTIOQUIA: Between Medellín and Antioquia, *Metcalf* 30019 (Mo, US).

BOLÍVAR: Caño Papayal, vicinity of Estrella, Lands of Loba, *Curran* 415 (GH, US). Cartagena, *Bro. Heriberto* 100 (US).

BOYACÁ: Valle de Soatá, *Cuatrecasas* 1088 (US); 1119 (US).

CUNDINAMARCA: Girardot, *Pennell & Rusby* 167 (GH, NY). La Mesa to San Javier, *García-Barriga* 12137 (Col); 12148 (US).

HUILA: Vicinity of Natagaima, *Rusby & Pennell* 1163 (GH, NY).

MAGDALENA: Gaira, vicinity of Santa Marta, *H. H. Smith* 746 (GH, Mo, NY, Ph, US). Santa Marta, *Pérez-Arbeláez* 4890 (US). Río Frío, Santa Marta, *Walker* 1205 (Mo, US). Sierra Nevada de Santa Marta, *Barkley & Araque* 20 (US); 21 (US).

META: Llano de San Martín, *Triana* s. n. (Col).

NORTE DE SANTANDER: Aguacaliente de San Luis (Cúcuta), *Miguel de Garganta-Fábrega* 1075 (Ch). Vicinity of Cúcuta, *Killip & Smith* 20978 (US). Petrólea (cultivated at Orlando, Florida), *Foster* 2360 (US).

TOLIMA: Tocaima, *Pérez-Arbeláez* 2471 (US). Río Magdalena, vicinity of Mariquita, *Triana* (Col, US).

WITHOUT LOCALITY: *Funck & Schlim* 694 (NY).

9. *Ruellia macrophylla* Vahl

Ruellia macrophylla Vahl, *Symb. Bot.* 2: 72, pl. 39. 1791. Type collected at Santa Marta by Rohr. Photograph of type in the U. S. National Herbarium, No. 22212.

Stemonacanthus macrophyllus Nees in DC. *Prodr.* 11: 205. 1847. Based in part on *Ruellia macrophylla* Vahl. Nees cites, among other collections, Rohr's Santa Marta specimen (Vahl Herbarium) and Goudot's specimen (Hooker Herbarium).

Plants erect, up to 2.5 meters high, shrubby at base; stems quadrangular, glabrous or sparingly puberulous; leaf blades ovate to oblong-elliptic or lanceolate, 6 to 24 cm. long, 3 to 9 cm. wide, acuminate, ending in a blunt tip, rounded or narrowed at base, decurrent on the petiole, undulate or shallowly crenate, glabrous or sparingly puberulous; petioles 2 to 6 cm. long, sparingly puberulous or glabrous; flowers few, borne on axillary peduncled cymes, the peduncles 4 to 18 cm. long, the branches of the cyme 1 to 8 cm. long, these and the peduncles glabrous or sparingly pilosulous, broadest at the nodes, often with a flower in the forks; bracts subtending the flowers lanceolate, 2 to 7 mm. long and about 1 mm. wide, those subtending the branches of the inflorescence somewhat larger, all glabrous or sparingly puberulous; pedicels 1 to 4 mm. long; calyx about 1 cm. long,

narrowly campanulate, glabrous or bearing a few minute hairs, the segments linear to lanceolate, about 4 mm. long and 2 mm. wide at base, acute to obtusish at apex; corolla scarlet or crimson, 4 to 5 cm. long, sparingly puberulous, the tube salverform, about 8 mm. broad at mouth, the limb 2.5 to 3 cm. broad, the lobes oblong, about 12 mm. long, 5 to 6 mm. wide, rounded or emarginate; ovary glabrous; style up to 4.5 cm. long, pilosulous; capsules clavate, 14 mm. long, 4 mm. broad, pointed at tip, narrowed to a solid stipitate base 4 to 5 mm. long and 2 to 2.5 mm. broad, glabrous, 16-seeded; retinacula bidentate at apex; seeds reddish brown, lenticular, 3 mm. broad, appressed-puberulous when dry, mucilaginous-pubescent with spreading hairs when moistened.

Damp shady places, in woods or thickets, often along streams or in ravines. Panama, West Indies, Colombia, Venezuela, Brazil, and Peru.

ATLÁNTICO: Barranquilla, *Bro. Elias* 788 (US). Hacienda Río Dulce, Los Pendales *Dugand & Jaramillo* 4155 (US). Piojó, vicinity of Barranquilla, *Bro. Elias* 695 (US).

BOLÍVAR: Sahagún, *Pennell* 4115 (GH, NY). Tierra Alta, along the Río Sinó, *Pennell* 4178 (in part) (GH, NY). Turbaco, *Bro. Heriberto* 460 (US).

MAGDALENA: Agua Dulce Road, vicinity of Santa Marta, *H. H. Smith* 381 (GH, Mo, NY, Ph, US). Agua Fría, north of Chiriguaná, *Haught* 3659 (US). El Recuerdo, Santa Marta mountains, *Niemeyer* 27 (US). Minca, *Bro. Apollinar-Angel* 515 (US). Poponte, *Cyril Allen* 865 (Mo). Río Magdalena, *Dawe* 789 (US). Santa Marta, *Bertero* s. n. (Mo); *Romero* 257 (Mo).

9a. *Ruellia macrophylla* Vahl var. *puberula* Leonard, var. nov.

A forma typica caulibus et pedunculis puberulentis et lamina foliorum subtus dense puberula recedit.

Erect subherbaceous plants up to 2 meters high; stems (at least the upper portions), branches of the inflorescence, and lower surface of the leaf blades densely and softly puberulous, the hairs straight or slightly curved, mostly spreading, about 0.25 mm. long. In other respects similar to the typical form.

Type in the U. S. National Herbarium, No. 1709427, collected in forest on sandstone soil near Codazzi, Department of Magdalena, Colombia, 300 meters altitude, October 15, 1943, by Oscar Haught, (No. 3746). An isotype is also in the U. S. National Herbarium, No. 1709428.

The flowers, according to Haught, are bright red and very showy.

A specimen in the Berlin Herbarium, bearing the name *Ruellia macrophylla* β *pubescens* Moritz,⁸ may be this variety.

⁸ DC. Prodr. 11: 205. 1847.

A yellow-flowered form of *R. macrophylla* has been found in Venezuela.⁹

10. *Ruellia grisea* Leonard, sp. nov.

FIGURE 28

Suffrutex, caulibus quadrangularibus, angulis acutis vel anguste alatis, puberulis; lamina foliorum ovata, apice subobtusa, basi obtusa vel rotundata, griseo-puberula; petioli puberuli; pedunculi quadrangulares, dichotomo-ramosi, puberuli; flores secundi; bracteae triangulares; pediceli graciles, puberuli; calycis segmenta subulata, puberula; corolla rubra, hypocrateriformis, glabra, lobis ovatis, rotundatis; stamina inclusa.



FIGURE 28.—*Ruellia grisea* Leonard (*Pérez-Arbeláez & Cuatrecasas* 8336): *a*, Tip of branch; *b*, cross section of stem; *c*, cross section of peduncle; *d*, portion of inflorescence to show dichotomous branching; *e*, bract subtending fork of inflorescence; *f*, bractlet and calyx; *g*, calyx, ovary, and stigma. (*a*, Half natural size; *b*, *d*, *e*, natural size; *c*, about $3\frac{1}{2}$ times natural size; *f*, *g*, twice natural size.)

Suffrutescent herb; stems simple or branched, up to 1 meter high or more, erect or ascending, sulcate, quadrangular, the angles sharp or narrowly winged, puberulous, the hairs up to 0.5 mm. long, spreading or retrorsely curved; leaf blades ovate, up to 7.5 cm. long and 5 cm. wide, obtusish at apex, obtuse or rounded at base, entire or undulate,

⁹ *Ruellia macrophylla* Vahl var. *lutea* Leonard, var. nov.

A forma typica corolla lutea recedit.

Type in the U. S. National Herbarium, No. 1855197, collected near Rancho Grande, Parque Nacional, State of Aragua, Venezuela, 800 to 1,000 meters altitude, March 18, 1943, by E. P. Killip (No. 37107).

The leaf blades of the type of the variety are oblong-ovate, slenderly acuminate, rounded or abruptly narrowed at base, and decurrent on the petiole, the margins crenate, the under surface rather densely puberulous, the hairs curved and about 0.25 mm. long. Killip states that the plant is a shrub, 1.6 meters high, branched above, the branches lax and the corolla bright yellow.

both surfaces densely gray puberulous, the hairs up to 0.5 mm. long; petioles up to 2 cm. long, puberulous; flowers secund on dichotomously branched peduncles, the peduncles from base to first fork up to 7 cm. long, quadrangular, puberulous, the primary and secondary branches 5 to 15 mm. long, sulcate and densely puberulous, the ultimate branches sometimes forming short racemes; bracts leaflike but much smaller, deciduous; bractlets narrowly triangular, up to 2 mm. long; pedicels slender, 4 to 5 mm. long, puberulous; calyx 3 to 3.5 mm. long, puberulous, the segments subulate; corolla red, glabrous, about 22 mm. long, the narrow portion of the tube 5 mm. long, 2 mm. broad at base, narrowed to 1.5 mm., thence gradually enlarged to 8 mm. at mouth, slightly ventricose, the limb about 1 cm. broad, the lobes ovate, 7 mm. long, about 4 mm. wide, rounded; stamens barely reaching tip of corolla lobes, the anthers 3 mm. long and 1 mm. broad; ovary cylindrical, 3 mm. long, glabrous; style about 8 mm. long, glabrous; stigma lobes linear, one 1 mm. long, the other 1.5 mm. long, both 0.25 mm. wide.

Type in the U. S. National Herbarium, No. 1795001, collected in a thicket on a dry savanna between Gigante and Rioloro, Department of Huila, Colombia, 820 to 860 meters altitude, March 19, 1940, by E. Pérez-Arbeláez and J. Cuatrecasas (No. 8336).

Ruellia grisea is characterized by its crowded red flowers, secund on dichotomously axillary peduncles, and by the fine gray pubescence. From this last character the species derives its specific epithet.

11. *Ruellia ischnopoda* Leonard, sp. nov.

FIGURE 29

Herba vel suffrutex, caulibus quadrangularibus, parce vel dense pubescentibus, angulis acutis vel anguste alatis; lamina foliorum ovata vel elliptica vel oblonga, apice breviter acuminata, basi angustata vel rotundata, in petiolum breviter decurrens, integra vel leviter crenata, supra minute et parce pubescens, subtus dense pubescens; pedunculi quadrangulares, angulis acutis, pubescentibus; pedicelli graciles, pubescentes vel glabrati; bracteae oblongae, angustatae, deciduae; calyx parce et minute pubescens, segmentis subulatis; corolla hypocrateriformis, rubra, curvata, ventricosa, lobis ovatis, obtusis vel leviter emarginatis; stamina exserta; antherae lineares, curvatae; capsulae anguste clavatae, glabrae; semina plana, brunnea, marginibus madefactis dense mucoso-puberulentis.

Suffrutescent or herbaceous, up to 1 meter high; stems erect or ascending, quadrangular with sharp or narrowly winged angles, sparingly to rather densely pubescent, the hairs curved to straight and spreading; leaf blades ovate to elliptic or oblong-elliptic, 7 to 14 cm. long, 3 to 7 cm. wide, short-acuminate, narrowed or rounded at base and briefly decurrent on the petiole, entire or shallowly crenate, the upper surface sparingly pubescent, the lower densely so, the hairs

about 0.5 mm. long, the costa and lateral veins (8 or 9 pairs) fairly prominent, the cystoliths of the upper surface, if not obscured by the hairs, prominent; petioles 1 to 2.5 cm. long, pubescent; flowers borne on axillary dichotomously branched peduncles up to 14 cm. long, sharply quadrangular, straight or curved, pubescent, the hairs about 0.5 mm. long, the secondary peduncles, if present, about 1.5 cm. long, quadrangular, pubescent; pedicels slender, about 1 cm. long, finely



FIGURE 29.—*Ruellia ischnopoda* Leonard (*a, b, e, Haught 2364; d, Cuatrecasas 19710*): *a*, Tip of stem, showing leaves and inflorescence; *b*, small area of leaf blade (upper surface) showing cystoliths; *c*, cross section of peduncle; *d*, capsule and calyx; *e*, stamens. (*a, d*, Natural size; *b, e*, about three times natural size; *c*, about seven times natural size.)

and rather sparingly pubescent or glabrate; bracts at tip of the peduncle narrowly oblong, 1 to 1.5 cm. long and 1.5 to 3.5 mm. wide, early deciduous, the smaller bracts, subtending the branches of the inflorescence, narrowly spatulate or linear, about 1 mm. wide; calyx 8 mm. long, sparingly and minutely pubescent, the segments subulate, about 7 mm. long and 0.75 mm. wide at base, the cystoliths apparent; corolla bright red, salmon, or scarlet (Rusby & Pennell), about 3 cm. long,

glabrous or minutely and sparingly pubescent toward base, the tube narrowly funnelform, curved, ventricose, about 1 cm. broad at mouth, the lower unexpanded portion about 1 cm. long and 2 mm. broad, the lobes ovate, about 15 mm. long and 9 mm. wide, obtuse or emarginate at tip; stamens exserted about 5 mm. beyond the mouth of the tube, the anthers linear, curved, 3 mm. long and 0.5 mm. wide; ovary bearing a few minute glandular hairs; style glabrous, barely 3 cm. long, the stigma narrowly linear-lanceolate, 2 mm. long and 0.5 mm. wide; capsules narrowly clavate, 1.5 to 2.2 cm. long and 4 mm. broad, glabrous, the narrow solid stipe 5 to 8 mm. long and nearly 2 mm. broad; seeds flat, 3 mm. long and 2.5 mm. broad, brown, the margins densely white gelatinous-puberulous when moistened.

Type in the U. S. National Herbarium, No. 1706762, collected along the Río Totare near Palmarrosa, Department of Tolima, Colombia, October 18, 1938, by Oscar Haught (No. 2364). Also represented by:

CAUCA: El Tambo, *von Sneidern* 2643 (S).

CUNDINAMARCA: Fusagasugá, *Holton* 25 (NY).

EL VALLE: Anserma to Yotoco, *Lehmann* 3335 (US). El Carmen, *Cuatrecasas* 19710 (US).

HUILA: El Gigante, *Bro. Ariste-Joseph* s. n. (US). Vicinity of Neiva, *Rusby & Pennell* 1069 (GH, NY); 1104 (GH, NY).

TOLIMA: Ibagué, *Holton* 600 (NY).

WITHOUT DEFINITE LOCALITY: *Mutis* 440 (US); 1498 (US).

Ruellia ischnopoda is related to *R. ruiziana* (Nees) Lindau, a Peruvian species, but it can easily be separated by its smaller and relatively narrower and less shaggily pubescent leaf blades. The bracts and calyces of its Peruvian relative are, moreover, strongly hirsute instead of sparingly and minutely pubescent as in *R. ischnopoda*. The New York sheet of *Holton* 600 from Colombia bears the name *R. ruiziana* in Lindau's handwriting; yet *Holton*'s collection resembles the specimens cited here under *R. ischnopoda* much more closely than it does the authentically named material of *R. ruiziana* from Peru (in the U. S. National Herbarium). The epithet *ischnopoda* comes from *ισχνός*, weak or feeble, and *πούς*, foot or stem, in allusion to the slender weak pedicels.

12. *Ruellia caucensis* Leonard, sp. nov.

FIGURE 30

Suffrutex, caulibus subquadrangularibus, glabris vel ad nodos parce bifariam pilosulis; lamina foliorum oblongo-elliptica, apice acuminata, basi angustata, crenata vel leviter dentata, glabra vel in costa et venis prominentibus parce pubescens; pedunculi graciles, glabri, complanati, plus minusve curvati, anguste alati, apice plus minusve ramosi, glabri; calyx parvus, segmentis subulatis, ciliolatis; corolla rubra, glabra, ventricosa; stamina exserta; antherae lineares; capsulae clavatae, glabrae.

Stem subquadrangular, glabrous or sparingly and bifariously pilosulous near nodes; leaf blades oblong-elliptic, up to 12 cm. long and 4 cm. wide, slenderly short-acuminate, (the tip itself blunt to acute), rather firm, crenate or shallowly dentate, glabrous or the costa of the upper surface bearing a few small hairs, both costa and lateral veins (6 or 7 pairs) prominent; cystoliths prominent under a lens; petioles 1 to 2 cm. long, glabrous or the margins ciliate; flowers several, borne in subcapitate clusters or on short bifurcate branches terminating the

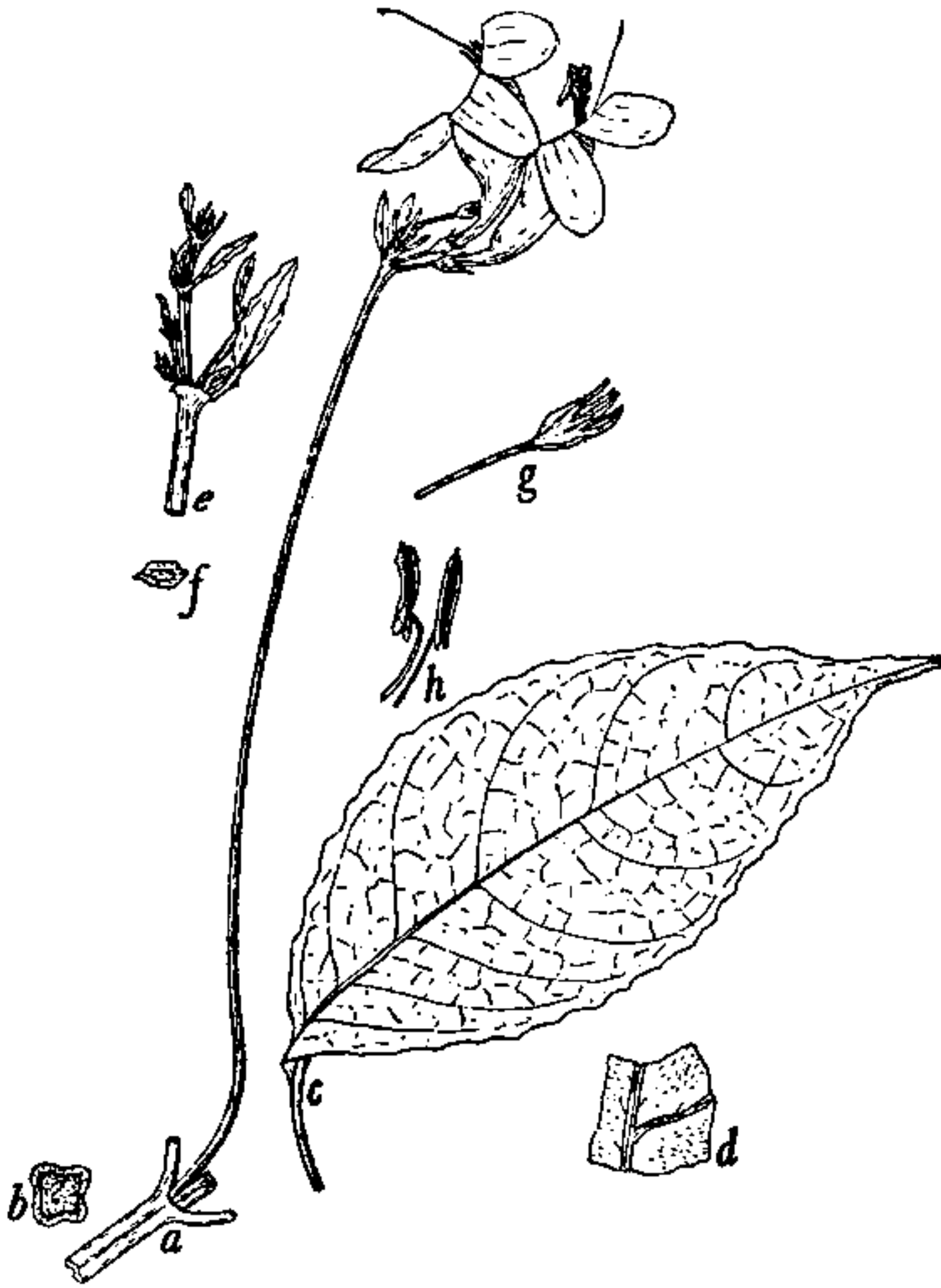


FIGURE 30.—*Ruellia caucensis* Leonard (von Sneidern 2647): *a*, Node and inflorescence; *b*, cross section of stem; *c*, leaf; *d*, enlarged portion of leaf blade (upper surface) showing cystoliths; *e*, inflorescence to show dichotomous branching; *f*, cross section of peduncle; *g*, calyx and pedicel; *h*, stamens. (*a*, *c*, Half natural size; *b*, *e*, natural size; *d*, *g*, *h*, twice natural size; *f*, about three times natural size.)

long slender peduncles, these up to 15 cm. long, glabrous, flattened, narrowly winged, more or less curved, the branches, when present, 5 to 15 mm. long; bracts linear-lanceolate, 14 mm. long, 4 mm. wide or less; pedicels 5 mm. long, slender, glabrous; calyx 5 mm. long, glabrous except the sparingly ciliolate segments, these subulate, 3 mm. long and about 0.5 mm. wide; corolla red, 3 cm. long, curved, glabrous, the tube cylindric and about 2 mm. in diameter for about 7 mm. of

its length, thence enlarged to a ventricose funnelform throat about 1 cm. broad, the limb 3 cm. broad, the lobes oblong, 14 mm. long and 8 mm. wide, rounded; stamens exerted about 5 mm. beyond the mouth of the corolla tube, the anthers linear, 3.5 mm. long, about 0.5 mm. wide; style slender, exerted about 2 cm. beyond the corolla tube; ovary glabrous; fruit not seen.

Type in the herbarium of the Riksmuseet, Stockholm, collected in woods along the Río Timbío, Department of Cauca, Colombia, 1,100 meters altitude, September 15, 1938, by Kjell von Sneidern (No. 2647).

A specimen collected by Triana, s. n. (S), in the vicinity of Popayán, Cauca, also represents the species.

Ruellia caucensis is closely allied to *R. ischnopoda*, from which it differs chiefly in its glabrous character and in its much smaller calyx.

13. *Ruellia rusbyi* Leonard, sp. nov.

FIGURE 31

Suffrutex, caulibus quadrangularibus, angulis rotundatis, glabris vel ad nodos parce pubescentibus; lamina foliorum oblongo-elliptica, apice acuminata, basi angustata, glabra, costa et venis prominentibus, petioli glabri; pedunculi recti vel curvati, infra complanati, superne quadrangulares, glabri, 1- vel 2-ramosi; bracteae lineares; pedicelli glabri; calyx glaber, segmentis lineari-subulatis, apice subobtusis; corolla punicea vel rubra, curvata, hypocrateriformis, glabra, lobis rotundatis vel leviter emarginatis; capsulae clavatae, glabrae; semina plana, ovata, madefactis dense mucoso-puberulis; retinacula subcucullata, apice truncata, plus minusve lacerata.

Suffrutescent herbs; stems quadrangular (the angles rounded), glabrous or bearing a few small hairs at or near the nodes; leaf blades oblong-elliptic, up to 15 cm. long and 6 cm. wide, acuminate at tip, narrowed at base, rather thin, drying dark olive or blackish, glabrous, the costa and lateral veins (7 or 8 pairs) rather prominent, the cystoliths conspicuous under a lens, 0.25 mm. long, straight or nearly so; petioles 0.5 to 10 cm. long, glabrous; flowers borne in axillary peduncled cymes, the peduncles 10 to 12 cm. long, straight or slightly curved, flattened toward base, quadrangular toward tip, glabrous, once to twice branched at tip, both branches and flowers produced at the nodes, the secondary peduncles up to 12 mm. long, quadrangular, glabrous, the lowest node subtended by a pair of linear leaflike bracts 8 to 12 mm. long and 4 mm. wide, their margins undulate, the bracts subtending the secondary peduncles linear, about 4 mm. long and 1 mm. wide, glabrous; pedicels (mature) slender, 12 mm. long, glabrous; calyx 10 mm. long, glabrous, the cystoliths numerous and prominent under a lens, the segments linear, 8 mm. long, 1 mm. wide at base, obtusish at tip; corolla pink or red; capsule

clavate, glabrous, 2 cm. long, 8-seeded, the seed-bearing portion 4 mm. broad at middle, the narrowed solid basal portion about 10 mm. long, 1.5 mm. wide at base and 2.5 mm. wide at base of cavity; seeds (immature) cordate, flat, about 3 mm. in diameter, gelatinous-puberulous when moistened; retinacula linear, 2.5 mm. long, the tip truncate and lacerate.



FIGURE 31.—*Ruellia rusbyi* Leonard (*a, b, f, Rusby & Pennell 548; c-e, Rusby & Pennell 1000*): *a*, Tip of branch; *b*, cross section of stem; *c*, portion of leaf blade to show cystoliths; *d*, cross section of peduncle; *e*, capsule; *f*, stamen. (*a*, Half natural size; *b*, natural size; *c*, about $1\frac{1}{2}$ times natural size; *d*, four times natural size; *e*, twice natural size; *f*, three times natural size.)

Type in the Gray Herbarium, collected in forest east of Neiva, Department of Huila, Colombia, 1,300 to 1,800 meters altitude, August 1 to 8, 1917, by H. H. Rusby & F. W. Pennell (No. 1000). A fragment of the type is in the U. S. National Herbarium, No. 1933917; an isotype is in the herbarium of the New York Botanical Garden.

Rusby and Pennell's No. 510 (NY), collected east of Neiva, 700 to 1,500 meters altitude, and No. 548 (NY), collected in the same general region, 1,200 to 1,700 meters altitude, also represent the species.

Ruellia rusbyi is related to *R. caucensis*. In their general appearance and in the type of inflorescence the two species are very similar; yet there exist several differences by which they can be readily separated. The calyx of *R. caucensis* is smaller (5 mm. long instead of 10 mm. as in *R. rusbyi*), the channels of its petioles are definitely pubescent, and the leaf blades are shallowly dentate instead of undulate or entire, drying to a lighter olive-green.

14. *Ruellia longifilamentosa* Lindau

Ruellia longifilamentosa Lindau, Ann. Naturhist. Hofmus. (Wein) 16: 72. 1901. Type collected in Cauca by Karsten.

Shrub up to 3 meters high; stems quadrangular above, terete below, gray-tomentose, the hairs about 0.5 mm. long; leaf blades oblong-ovate, up to 14 cm. long and 5.5 cm. wide, acuminate at apex (the tip itself blunt), more or less abruptly narrowed at base and decurrent on the petiole, the margins entire or undulate, the upper surface finely pubescent, the hairs up to 0.5 mm. long, more numerous on costa and veins, the lower surface densely velvety pubescent, the hairs spreading, straight or curved, densest on costa and veins (6 or 7 pairs), the venation prominent beneath, less so above; petioles up to 2 cm. long, tomentose; flowers borne in short racemes up to about 3 cm. long (including corollas), forming a terminal panicle about 10 cm. long and broad, its branches softly and finely pubescent, the lowermost up to 4.5 cm. long, the others successively shorter, the hairs about 0.25 mm. long, retrorsely curved, the pedicels up to 5 mm. long, finely pubescent, leaving prominent scars after falling, thus giving the rachis a conelike appearance; calyx finely pubescent and resin-dotted, the tube about 1 mm. long, the segments linear, about 1 cm. long, 2 mm. wide at base, acute at tip, densely pubescent, the hairs about 100 μ long, spreading or recurved; corolla yellow, densely pubescent except at base, the hairs straight and spreading, up to 150 μ long, intermixed with resinous discs, the tube 3 mm. broad at base, gradually enlarged to 3 mm. at 2 mm. above base, thence abruptly expanding to 1 cm. at mouth, the enlarged portion oblique, the lobes oval, 1 cm. long and about 6 mm. wide, rounded and emarginate at tip, their margins ciliolate; stamens long-exserted at maturity, the filaments attached near base of expanded part of tube, about 3 cm. long, strongly curved, glabrous or sparingly puberulous near base, the anthers 4.5 mm. long, 2 mm. broad; ovary puberulous and resin-dotted, the style about 3.5 cm. long, sparingly and minutely pubescent; capsule clavate, 2 cm. long, 7 mm. broad and 5 mm. thick, finely and densely puberulous, bearing interspersed, minute resin discs, the cavity extending nearly to base, 8-seeded (?).

Ruellia longifilamentosa is characterized by its yellow flowers and long exserted, strongly curved stamens. In his comments on the spe-

cies, Lindau states that he is unable to relate this species to any other *Ruellia*. It should, however, be near *R. humboldtiana* and *R. tubiflora*, as indicated by its conelike rachis.

Found at altitudes between 1,050 and 1,550 meters, in Cauca and Cundinamarca.

CUNDINAMARCA: Finca La Esmeralda, Vereda Tórriba, San Francisco, *García-Barriga* 10998 (US). Hacienda Curiche, El Peñón, between Río Bunque and Río Murca, *García-Barriga* 12478 (US).

15. *Ruellia humboldtiana* (Nees) Lindau

Stemonacanthus humboldtianus Nees in DC. Prodr. 11: 206. 1847. Nees' description is based on Humboldt's No. 709, collected at the Hacienda Materolla, Aragua, Venezuela, and deposited in the Berlin Herbarium. A photograph of this specimen is in the U. S. National Herbarium, No. 18210. As a Greek-letter variety, Nees also cites here Linden's No. 1526, which he examined in the Hooker Herbarium. A photograph of an isotype in the Vienna Herbarium (U. S. National Herbarium, No. 32745) portrays an apparently glabrous plant with thin elliptical leaf blades, acute to obtusish at apex, and a small slender few-flowered thyrse. This Linden specimen might well represent an undescribed species.

Ruellia humboldtiana Lindau, Bull. Herb. Boiss. 3: 366. 1895. Based presumably on *Stemonacanthus humboldtianus* Nees.

Suffrutescent herbs; stems obscurely quadrangular, glabrous or the nodes and tips puberulous; leaf blades ovate to oblong-ovate or oblong-elliptic, 4 to 15 cm. long, 2.5 to 8 cm. wide, acuminate (the tip itself obtuse), acute or rounded at base and decurrent on the petiole, undulate, both surfaces pilosulous, the hairs confined chiefly to costa and lateral veins, the lower surface minutely punctate; petioles 1 to 1.5 cm. long, puberulous; inflorescence a thryoid panicle up to 10 cm. long, the branches each bearing from several to 20 or more flowers, the rachis conelike, minutely puberulous; bracts lanceolate, about as long as the calyx, often deciduous; calyx 9 to 12 mm. long, puberulous, punctate, the segments linear-lanceolate, 6 to 9 mm. long, 1 mm. wide at base; corollas pink, red, or bright carmine, salverform, minutely pubescent, up to 6 cm. long, the tube slightly curved and ventricose, 3 mm. broad at base, narrowed above ovary to 2 mm., thence gradually enlarged to about 12 mm. at mouth, the limb up to 5 cm. broad, the lobes oblong-ovate, up to 3 cm. long and 8 to 9 mm. wide near tip, emarginate; stamens exserted; capsules clavate, puberulous, gland-dotted, 1.5 cm. long, 5 mm. broad, rather bluntly pointed, narrowed to a slender solid base about 3 mm. long; seed brown, appressed-puberulous, about 5.5 mm. long and 5 mm. wide.

Roadsides, borders of damp woods or thickets, and in open places in general. Found usually between 100 and 820 meters altitude. Panama, Colombia, and Venezuela.

META: Camino de Restrepo to Cumaral, *García-Barriga* 5126 (US). Woods of the Ríos Ocoa and Apiay, Llanos Orientales, *Dugand & Jaramillo* 3113 (US).

Villavicencio and vicinity, *Bro. Apollinaire* s. n. (US); *Cuatrecasas* 4536 (US); *Haught* 2458 (US); *Killip* 34361 (US); *Pennell* 1630 (NY); *Pérez-Arbeláez* 50 (US). Tres Esquinas Mill, Villavicencio, *Helen Schiefer* 757 (GH).

NORTE DE SANTANDER: Santa Librada, Quebrada de la China, a tributary of the Río Cubugón, region of Río Sarare, *Cuatrecasas* 12976 (US).

VAUPÉS: Calamar on the Río Unilla, *Cuatrecasas* 7317 (US). Caño Popore, valley of the Río Apaporis, *Cuatrecasas* 7075 (US).

VICHADA: Vicinity of San José de Ocune, *Haught* 2812 (US); *Hermann* 10942 (US).

16. *Ruellia tubiflora* H. B. K.

Ruellia tubiflora H. B. K. Nov. Gen. & Sp. 2: 241. 1817. Type collected on shaded bank of Río Magdalena near Honda; Tolima, Colombia. The specific name alludes to the long tubular flowers.

Scorodoxyllum hartwegianum Nees in Benth. Pl. Hartw. 236. 1846. Type collected in a shady place near the village of Guaduas, Bogotá, Colombia, by Hartweg.

Ruellia purdieana Hook. Bot. Mag. Curtis 73: pl. 4298. 1847. Named in honor of Purdie and based on cultivated material. The type may possibly have been grown from seed collected by Purdie in the Santa Marta region of Colombia.

Arrhostoxylum hartwegianum Nees in DC. Prodr. 11: 209. 1847. A new combination based on Hartweg's specimen from Guadas.

Ruellia stuebelii Lindau in Bot. Jahrb. Engler 21: 377. 1896. Type collected in the vicinity of Honda by Stuebel, No. 68a.

Suffrutescent herbs up to 1 meter high; stems ascending, subquadrangular, glabrous, or puberulous at tips and nodes, the upper portions bearing minute glandular scales; leaf blades oblong-elliptic, 6 to 24 cm. long, 6 to 9 cm. wide, more or less abruptly acuminate at apex (the tip itself blunt), narrowed at base and decurrent on the petiole, entire, undulate or shallowly crenate, glabrous, both surfaces bearing minute semitranslucent reddish glands, or, in absence of these, minute pits, the glands and pits more conspicuous on the lower surface than on the upper, the cystoliths (upper surface) numerous, slender, minute, the costa and lateral veins (7 to 9 pairs) fairly prominent; petioles 1 to 3 cm. long, glabrous or puberulous; inflorescence a short terminal spike subtended by leafy bracts 2 to 5 cm. long and 1.5 to 2 cm. wide, the rachis conelike, 5 to 12 mm. long, bearing 4 rows of conspicuous scars after the falling of bracts and flowers; bractlets triangular, 1 to 2 mm. long; pedicels 2 to 3 mm. long; calyx up to 15 mm. long, gland-dotted, the segments lanceolate, 3 to 14 mm. long, 1 to 2 mm. wide, glabrous or puberulous; corolla crimson, lilac, or red, sparingly puberulous, gland-dotted, about 4 cm. long, the tube infundibular, curved, 1 to 1.5 cm. broad at throat, the limb about 3 cm. broad, the lobes oval or suborbicular, 1 cm. long or more, spreading; anthers slightly exserted, sagittate, 3.5 mm. long; capsule clavate, 15 mm. long, about 8 mm. broad, puberulous or glabrate, gland-dotted, the solid basal portion 3 to 4 mm. long and broad, the retinacula curved,

slender, 5 mm. long, seeds 8 or more, flat, orbicular, 5 mm. in diameter, 1 mm. thick, appressed-pilose when dry, mucilaginous-pilose when moistened.

Ruellia tubiflora is extremely variable in the color and size of the corolla, in the type and abundance of the pubescence, and in the relative size, shape, and texture of the leaf blades. On the other hand, it is very constant in the type of inflorescence, the presence of the minute glandular scales, dots, or pits on various parts of the plant, especially the leaf blades, calyx, bracts, and capsules, and in the presence of the large leaflike bracts supporting the flower cluster. The typical form is glabrous or more or less puberulous and produces large purple or reddish flowers. White-flowered plants from Costa Rica were called *R. tetrastichantha* by Lindau. This name is often applied to the white-flowered plants of Colombia as well as to those with purple-throated corollas. Still other plants produce yellow flowers (Costa Rica), others, small white or purple ones, and one Colombian plant, although producing large white flowers, is strongly hirsute. These variations are here given varietal or form status.

The leaf blades of some of the specimens examined (*Cuatrecasas* 10529) are thin, drying green, but those of others (*Ariste-Joseph* A973) are thickish and turn blackish on drying. This variation might possibly be due to a difference in habitat, the thin-leaved plants growing in shaded regions and the thick-leaved ones in more open situations.

Damp forests or thickets at lower elevations (400 to 450 meters). Panama, Colombia.

BOLÍVAB: La Popa, vicinity of Cartagena, *Billberg* s. n. (S).

HUILA: Río Saldaña to Natagaima, *Rusby & Pennell* 250 (GH, NY).

META: Susumoco, vicinity of Villavicencio, *Triana* s. n. (Col).

TOLIMA: Armero, *Cuatrecasas* 10529 (US). Honda, *Bro. Ariste-Joseph* A973 (US). Río Seco, above Honda, *Holton* 282 (GH); *Triana* s. n. (Col).

16a. *Ruellia tubiflora* var. *tetrastichantha* (Lindau) Leonard, comb. nov.

Ruellia tetrastichantha Lindau in Pittier, Prim. Fl. Costar. 2: 300. 1900.

The type of *R. tetrastichantha* was collected on the bank of the Río Corrozal near Santo Domingo de Osa, Costa Rica, April 1896, by A. Tonduz, No. 9984. The name *tetrastichantha* (τετρα-, four, and στίχος, a row or rank) alludes apparently to the short conical axis of the spike, this bearing four rows of conspicuous scars after the fall of the flowers and bracts.

Shrubs or suffrutescent herbs up to 4 meters high; stems subquadrangular, glabrous or puberulous toward tip, the hairs minute, brownish, curved; leaf blades oblong-elliptic to elliptic-ovate, 7 to 18 or occasionally 25 cm. long, 2.5 to 9 cm. wide, acuminate, sometimes abruptly so (the tip itself blunt), narrowed at base and decurrent on the petioles, the margins entire or shallowly crenate, both surfaces glabrous or the costa and lateral veins (8 or 9 pairs) brown-puberulous; calyx segments subulate to linear-lanceolate, up to 2 cm. long;

corollas pure white, 6 to 8 cm. long, funnellform, the mouth 1 to 2 cm. broad, the limb 2 to 3 cm. broad; capsules about 2 cm. long and 1 cm. broad.

Wet forests or thickets, often along roads and trails or on banks of streams. Generally found at lower altitudes. Costa Rica, Panama, Colombia.

CUNDINAMARCA: Jerusalem, *Pérez-Arbeláez* 576 (US).

CAUCA: La Costa, El Tambo, *von Sneidern* 864 (S).

META: Villavicencio, *Cuatrecasas* 4535 (US); 4631 (US); *Collector?* 188 (US).

SANTANDER: Vicinity of El Roble, *Killip & Smith* 19359 (NY, US).

16b. *Ruellia tubiflora* H. B. K. var. *tetrastichantha* (Lindau) Leonard, f. *bicolor* Leonard, f. nov.

A forma typica corolla grandis alba forcibus purpureis recedit.

Shrub or suffrutescent herb 1 to 2 meters high, essentially glabrous; leaf blades oblong-ovate, 10 to 20 cm. long, 4 to 8 cm. wide, slenderly and more or less abruptly acuminate, the tip often curved and blunt, narrowed at base and decurrent on the petiole, thin to subcoriaceous, the costa and veins (about 10 pairs) prominent, especially beneath; petioles 1 to 2.5 cm. long; corolla about 9 cm. long, white with blue, violet, or purple throat, sparingly puberulous, the tube funnellform, curved, 2 to 3 cm. broad at mouth, the limb 4 to 5 cm. broad, the lobes suborbicular, rounded or emarginate, 1.5 to 2 cm. long and broad; capsule clavate, 2 to 2.5 cm. long, about 6 mm. broad, blunt at tip; seed brown, about 5 mm. long and broad, densely appressed-pilose when dry.

Type in the U. S. National Herbarium, No. 1706866, collected along stream at Villavicencio, Intendencia of Meta, Colombia, 500 meters altitude, January 29, 1939, by Oscar Haught (No. 2569). The following collections also represent the new form:

BOYACÁ: El Humbo, *Laigrance* 564 (GH, Mo. NY, S).

META: Monte de Machadero, Ocoa, vicinity of Villavicencio, *Hermann* 11117 (US). Sitio de Montenegro, on the Guayuriba Road between Villavicencio and Ocoa, *Dugand & Jaramillo* 2920 (US). Villavicencio, *Killip* 34354 (US).

Borders of damp thickets and woods or along trails and roads. Found at elevations of about 500 meters. Endemic. The name *bicolor* alludes to the purple-throated white corollas.

16c. *Ruellia tubiflora* H. B. K. var. *tetrastichantha* (Lindau) Leonard f. *flava* Leonard, f. nov.

A forma typica corolla flava recedit.

Shrubs or suffrutescent herbs up to about 1.5 meters high; leaf blades oblong-elliptic, 15 to 25 cm. long, 8 to 10 cm. wide, abruptly short-acuminate, narrowed at base and decurrent on the petiole; corolla about 7 cm. long, yellow, puberulous, the tube funnellform, about 18 mm. broad at mouth, the limb about 2.5 cm. broad; capsules not seen.

VERNACULAR NAME: Corteza de venado (*Biolley* 16331).

Type in the U. S. National Herbarium, No. 472479, collected at Surubres near San Mateo, on the Pacific watershed, Alajuela, Costa Rica, 250 meters altitude, January 1901, by P. Biolley (No. 16331). Biolley's Nos. 17305 and 17323, collected in the same general region, 150 meters altitude, February 1909, also represent the new form.

Ruellia tubiflora var. *tetrastichantha* f. *flava* is easily recognized by its yellow flowers and large leaf blades.

16d. *Ruellia tubiflora* H. B. K. var. *hirsuta* Leonard, var. nov.

Frutex vel subfrutex hirsutus; corolla alba, grandis.

Shrub or suffrutescent herb; stem subquadrangular, hirsute, the upper portions subtomentose; leaf blades oblong to oblong-ovate, slenderly acuminate (the tip itself blunt), both surfaces rather densely hirsute, the hairs up to 1.5 mm. long; corolla up to 10 cm. long, white, finely puberulous, the tube infundibular, 1.5 cm. broad at mouth, the limb about 4 cm. broad.

Type in the U. S. National Herbarium, No. 1853779, collected toward El Parrao, vicinity of Villavicencio, Intendencia of Meta, Colombia, 500 meters altitude, November 10, 1938, by Cuatrecasas (No. 4591).

Another specimen is: *Bro. Apollinaire* s. n. (Bog, US), collected at Villavicencio, December 1928.

Except for its hairiness, *Ruellia tubiflora* var. *hirsuta* closely resembles the variety *tetrastichantha*.

16e. *Ruellia tubiflora* H. B. K. var. *parviflora* Leonard, var. nov.

Herba vel suffrutex, caulibus glabris; lamina oblonga, glabra, apice subobtusata, basi angustata, in petiolun decurrens, glabra; corolla purpurella.

Suffrutescent herb up to about 60 cm. high, stems subquadrangular, glabrous or obscurely puberulous at nodes; leaf blades oblong, 8 to 15 cm. long, 2.5 to 6 cm. wide, obtusish at apex, narrowed at base and decurrent on the petiole, glabrous or the veins and margins minutely and obscurely puberulous, the costa and lateral veins (10 to 12 pairs) prominent; petioles 1 to 2 cm. long; corolla about 4 cm. long, minutely puberulous, pale violet-white, infundibular, the tube about 1 cm. broad at mouth, the limb about 2 cm. broad; capsule clavate, 2 cm. long and 8 mm. broad, puberulous.

Type in the U. S. National Herbarium, No. 1858494, collected between San Pedro and La Joya, below Umbría, Comisaría of Putumayo, Colombia, January 16, 1945, by J. Ewan (No. 16785).

The collector found a single colony of these plants in partial shade of a small clearing. The pale violet-white flowers were inodorous.

16f. *Ruellia tubiflora* H. B. K. var. *parviflora* Leonard, f. *alba* Leonard, f. nov.

Herba; corolla parva, alba.

Herb; stems subquadrangular, glabrous; leaf blades oblong-ovate, 6 to 11 cm. long, 2 to 4 cm. wide, obtusish at apex, narrowed and decurrent on the petiole nearly to its base, glabrous; corolla minutely puberulous, white, 4 cm. long, the tube infundibular, about 12 mm. broad at mouth, the limb about 2 cm. broad.

Type in the National Herbarium of Colombia, collected in damp forest on the bank of the Río Mulato, at Mocoa, Comisaría of Putumayo, Colombia, 570 to 600 meters, December 26, 1940, by J. Cuatrecasas (No. 11276). Type fragment in the U. S. National Herbarium, No. 1853886.

The leaf blades of the specimen have a faint mottled area of lighter green about midway between the costa and margin. This character is probably all the more apparent in living plants.

17. *Ruellia lorentziana* Griseb.

Ruellia lorentziana Griseb. Abh. Boehm. Ges. Wiss. 24: 259. 1879. Grisebach based his description on Lorentz's No. 1598, collected at Tucumán, Argentina.

Suffrutescent; stems erect, obscurely quadrangular, glandular-puberulous; petioles 1 to 3 cm. long, glabrous or sparingly pilose; leaf blades ovate, up to 16 cm. long and 9 cm. wide, obtuse at apex, narrowed at base and decurrent on the petiole, rather firm, crenulate-crisped, both surfaces glabrous or sparingly pilose, the cystoliths numerous and prominent; inflorescence a terminal interrupted narrow panicle, the branches 2- or 3-flowered; peduncles 1 to 3 cm. long, glandular-puberulous; bracts linear, 3 to 8 mm. long, glandular-puberulous; pedicels 1 to 2 mm. long; calyx 10 to 12 mm. long, glandular-puberulous, the tube 2 mm. long, the segments linear-subulate, unequal, 0.5 mm. wide near base; corolla, when fully expanded, 3 to 3.5 cm. long, sparingly puberulous, mauve, the narrow basal portion of the tube about 8 mm. long and 3 mm. in diameter, the upper portion campanulate, 10 to 13 mm. in diameter at mouth, the limb 3 mm. broad, the lobes rounded; stamens included; capsule fusiform, 2 cm. long, 4 mm. broad, abruptly narrowed and pointed at apex, narrowed at base (the solid basal portion about 4 mm. long), glandular-puberulous, 12- to 16-seeded; seed flat, ovate, subcordate at base, about 3 mm. long and 2 mm. broad, mucilaginous-pilose when moistened.

VERNACULAR NAME: Campanula morada (*Duque* 1446).

Ruellia lorentziana closely resembles *R. obtusa* Nees and *R. tuberosa* L. It can, however, be easily separated from these two species by its puberulous capsules and the glandular hairs of the inflorescence. The species was named in honor of Paul Guenther Lorentz, a collector of Argentine plants.

Along roads or railways and open waste places in general. Colombia, Peru, and Argentina.

- CUNDINAMARCA: Vicinity of Apulo, Killip, Dugand, & Jaramillo 38257 (US).
 Nariño, Pérez-Arbeláez 399 (US). Tocaima, Pérez-Arbeláez 2518 (US).
 EL VALLE: Vicinity of Aqueduct, Río Cali, Duque 1446 (Valle).
 MAGDALENA: Sierra Nevada de Santa Marta, Barkley & Araque 22 (US).
 TOLIMA: Mariquita, Triana s. n. (Col).
 WITHOUT DEFINITE LOCALITY: Holton 598 (GH, NY).

18. *Ruellia geminiflora* H. B. K.

Ruellia geminiflora H. B. K. Nov. Gen. & Sp. 2: 240. 1817. Type collected in "locis temperatis, siccis prope Santa Ana et Ibaguè, Novo-Granatensium," 500 to 700 meters altitude, by Humboldt. Photograph (No. 29431) of the Paris Herbarium specimen in the U. S. National Herbarium.

Dipteracanthus geminiflorus Nees in Mart. Fl. Bras. 9: 40. 1847. Based on *Ruellia geminiflora* H. B. K.

Herb up to 50 cm. high; stems erect or ascending, pilosulous; leaf blades ovate, oblong, or lanceolate, short-petioled, 1.5 to 5 cm. long, 0.5 to 2 cm. wide, obtuse or acutish at apex, narrowed at base, entire, hirtellous; flowers axillary; calyx 10 mm. long or less, pilosulous, the segments linear-lanceolate; corolla mauve, pubescent, usually 2.5 to 3 cm. long, the lobes suborbicular, 5 to 10 mm. wide; capsules clavate, 8 mm. long, 4 mm. wide, puberulous, 4-seeded, the seeds apparently glabrous when dry, mucilaginous-pubescent when moistened.

VERNACULAR NAMES: Jasmín (*García-Barriga* 5107); yuquilla (*García-Barriga* 5158).

The name *geminiflora*, twin flower, was given to the species because the flower usually occur in pairs. Nees, on transferring the species to the genus *Dipteracanthus*, recognized five Greek-letter entities, namely α , *procumbens*, β , *hirsutior*, γ , *erectus*, δ , *subacaulis*, and ϵ , *angustifolius*. None of these have been validly published except β and ϵ .¹⁰

Pastures, savannas, open hillsides, and fields. Central America, West Indies, northern South America.

CUNDINAMARCA: Icononzo, Pennell 2783 (NY).

CAUCA: El Tambo, von Sneider 1061 (S); 1062 (S). Río Timbío, von Sneider 2651 (S).

EL VALLE: El Negro, Dryander 2337 (US). Vicinity of La Cumbre, Pennell & Killip 5970 (GH, NY). Pavas, Pennell 5475 (GH, NY, US). Potredillo to Miraflores, Palmira, Pennell 6047 (GH). Vicinity of Pavas, Killip 11635 (GH). La Paila, Holton 597 (NY, Ph).

HUILIA: East of Neiva, Rusby & Pennell 398 (NY).

META: Apial, Villavicencio, Cuatrecasas 4727 (US). Cabuyaro, Río Meta, *García-Barriga* 5158 (Col). Sabana del Vergel, *García-Barriga* 5107 (US). San Martín, Hermann 11198 (US).

TOLIMA: Mariquita, Pennell 3675 (GH, Mo, NY, US).

18a. *Ruellia geminiflora* H. B. K. var. *angustifolia* (Nees) Griseb.

Dipteracanthus geminiflorus Nees var. *angustifolius* Nees in Mart. Fl. Bras. 9: 40. 1847. Type collected "prope Valenciã in Venezuela" by Moritz.

¹⁰ *Ruellia geminiflora* var. *hirsutior* Nees ex Hicken, Darwiniana 1: 140. 1924.
Ruellia geminiflora var. *angustifolia* Nees ex Griseb. Fl. Brit. W. Ind. 451. 1861.

Dipteracanthus angustifolius Brem. Rec. Trav. Bot. Néerl. 35: 157. 1938.

Based on *Dipteracanthus geminiflorus* Nees var. *angustifolius* Nees.

Ruellia geminiflora var. *angustifolia* Griseb. Fl. Brit. W. Ind. 451. 1861. Based on *Dipteracanthus geminiflorus* Nees var. *angustifolius* Nees.

Herbs up to 40 cm. high; stems subquadrangular, sulcate, densely to sparsely hirsute or glabrescent, the cystoliths inconspicuous; leaves sessile or subsessile, linear to narrowly lanceolate, up to 6.5 cm. long and 1.2 cm. wide or occasionally as much as 1.5 cm. wide, acute to obtusish (the tip itself blunt), narrowed at base, both surfaces densely to sparsely hirsute, the costa and lateral nerves (5 to 8 pairs) usually prominent beneath, the cystoliths obscure; flowers often opposite, usually terminal at blossoming stage; bractlets linear, up to 6.5 mm. long and 0.8 mm. wide, hirsute; calyx lobes linear-lanceolate, about 1.5 cm. long and 1 mm. wide near base, densely hirsute; corolla blue, pink, white, violet, or blue-violet, pubescent, 4.5 to 5 cm. long, the tube funnelform, about 2 cm. broad at throat, the narrow basal portion about 1 cm. long and 2 mm. in diameter, the lobes about 1.5 cm. long; capsule ovoid, 10 mm. long, 5 mm. broad, pubescent, apiculate, the sterile basal portion about 3 mm. long.

In addition to the narrowness of the leaf blades mentioned by Nees, Bremekamp states in his discussion of *Dipteracanthus angustifolius* that he finds a number of characters by which to separate his species from Humboldt's *R. geminiflora*, namely, "the stem is erect and not procumbent; the leaves are sessile, not shortly petiolate, at the top acute, not obtuse, and at the base cuneate, not rounded; the number of the nerve pairs varies between 5 and 8, instead of being always 5; bracteoles are present and not even small, instead of being absent; the calyx lobes are 15 mm. long and all of the same size, not posticous, one 10 mm. and the others shorter; the corolla is up to 5 cm. long, instead of 2.5-3.5 cm.; the capsule shortly pubescent, not more or less tomentose." Some of these differences are not very apparent in the Colombian specimens, which, in fact, seem in some respects to verge strongly toward the typical form, i. e. Humboldt's *R. geminiflora*. Inasmuch as eastern Colombia is at the edge of the range of the var. *angustifolia*, this could naturally be expected.

Savannas, meadows, open places in general. The specimens cited were collected from 100 to 500 meters altitude. Guiana, Venezuela, and eastern Colombia.

META: Caño Ijoa, road from Macapay to Barranca de Upía, Haught 2596 (US). Sabanas del Verjel, García-Barriga 5131 (US). Vicinity of Villavicencio, Killip 34330 (US).

VAUPÉS: San José del Guaviare, Río Guaviare, Cuatrecasas 7640 (US).

VICHADA: Along the Río Vichada at Bopimí, Hermann 11102.

19. *Ruellia obtusa* Nees

Ruellia obtusa Nees in DC. Prodr. 11: 152. 1847. Type collected at Cartagena, Colombia, by Goudot, deposited in the Hooker Herbarium.

Herbs up to 70 cm. high; stems erect or ascending, quadrangular, narrowly winged, pilosulous or the internodes glabrescent; petioles up to 3 cm. long; leaf blades ovate, up to 15 cm. long and 9 cm. wide, obtuse or rounded at apex, abruptly narrowed at base and decurrent on the petiole, repand-crenate, both surfaces sparingly hirsute or glabrescent; flowers borne in an interrupted spike of verticillasters, the lowermost short-pediceled; bracts small, lanceolate, or those subtending the lower verticillasters leaflike; bractlets subulate, 1 to 3 mm. long; calyx segments subulate, about 15 mm. long, pilose and ciliate, the hairs up to 1 mm. long; corolla lavender or purplish pink, up to 5 cm. long, finely pubescent, the throat narrowly campanulate, 1.5 to 2 cm. in diameter at mouth, the limb about 3 cm. broad; stamens included; style glabrous; capsules cylindric, 2 to 2.5 cm. long, slightly flattened, glabrous or a few minute hairs on the calluses; seeds 20 or more, lenticular.

VERNACULAR NAME: Oreja de mula (*Bro. Elias* 247; 988).

The name *obtusa* alludes to the obtuse or round-tipped leaf blades.

Thickets, roadsides, waste places in general. Grows at low altitudes, usually below 300 meters.

ATLÁNTICO: Barranquilla, *Bro. Paul* C11 (US). Vicinity of Galapa and Baranoa, *Dugand & Jaramillo* 3280 (US). Hacienda El Paraíso on the Río Magdalena between Palmar de Varela and Ponedera, *Dugand & García-Barriga* 2539 (US). Puerto Colombia, *Pennell* 12047 (GH, NY, US); *Dugand & Jaramillo* 3242 (US); *Bro. Elias* 988 (US). Hacienda Cachubana, Usiacurí, *Dugand & García-Barriga* 2369 (US); 2383 (US); *Bro. Elias* 247 (US). Without definite locality, *Bro. Elias* s. n. (NY).

BOLÍVAR: Calamar, *Pennell & Rusby* 18 (NY). Juana Sanchez Trail, Island of Mompos, Lands of Loba, *Curran* 264a (US). Turbaco, *Killip & Smith* 14212 (NY, US); *Pennell* 4764 (GH, NY).

MAGDALENA: Vicinity of Fonseca, *Haught* 4348 (US).

SANTANDER: Puerto Wilches, *Rusby* 4799 (NY).

20. *Ruellia colorata* Baill.

Ruellia colorata Baill. Bull. Mens. Soc. Linn. Paris 2: 853. 1890. Type collected by Grisar in Peru or Ecuador.

Suffrutescent herbs; stems glabrous, quadrangular; leaf blades large, oblong-elliptic, up to 30 cm. long and 15 cm. wide, more or less abruptly acuminate, narrowed at base and decurrent on the petiole, thin, the margins undulate or shallowly or sometimes coarsely crenate, both surfaces glabrous, the cystoliths prominent under a lens, the costa and lateral veins (8 or 9 pairs) conspicuous; petioles up to 2 cm. long, glabrous; flowers borne in a terminal spike up to 12 cm. long and 8 cm. wide, bracts ovate, up to 6 cm. long and 3.5 cm. wide, acutish to obtuse at apex, rounded or slightly narrowed at base, both surfaces minutely and sparingly hirsute or glabrate, the margins entire, the peduncles up to 10 mm. long, these and the rachis more or less puberulous; bractlets linear, 1.5 cm. long, 2 mm. wide, obtusish at apex, red, sparingly

and minutely pubescent; calyx about 1 cm. long, red, sparingly and minutely pubescent, the segments lanceolate, 8 to 9 mm. long, 2 mm. wide; bracts ovate, up to 6 cm. long and 3.5 cm. wide, acutish to obtuse pubescent without, glabrous within, the tube about 6 mm. broad at base, narrowed to 2 mm. at about 10 mm. above base, thence rather abruptly enlarged to 7 mm., then gradually to 12 mm. at mouth, ventricose, the segments oblong, up to 19 mm. long and 9 mm. wide, rounded at tip, the filaments exerted 1 cm. beyond mouth of the corolla tube; anthers linear-lanceolate, 5.5 to 6 mm. long, 1 to 1.5 mm. wide at base, gradually narrowed to 0.5 mm. at tip; ovary glabrous; mature capsule not seen.

Dense forests. Peru, Ecuador, and southern Colombia.

PUTUMAYO: Río San Miguel in the region of Bermeja, *Cuatrecasas* 11027 (US). Río San Miguel, in the vicinity of Conejo, *Schultes* 3507 (US).

21. *Ruellia viridiflora* Leonard, sp. nov.

FIGURE 32

Suffrutex, caulibus subquadrangularibus, glabris, angulis rotundatis, nodis verrucosis; lamina foliorum lanceolata vel rhombica, apice acuminata vel acuta, basi angustata, in petiolum decurrens, crenata, membranacea, supra glabra, subtus in costa et venis appresso-pubescentia; petioli brevi; flores numerosi, axillares; calycis segmenta lanceolata, acuminata, apice parce pilosula; corolla parce puberula, subviridis, tubo hypocrateriformi, lobis ovatis; stamina inclusa; capsula clavata, glabra.

Suffrutescent herb up to 5 meters high; stems quadrangular (the angles rounded), up to 2 cm. in diameter, glabrous, verrucose at nodes; leaf blades lanceolate to rhombic, up to 30 cm. long and 17 cm. wide, acuminate or acute, acute at base and decurrent on the petiole, crenate, rather thin, glabrous above, the cystoliths conspicuous under a lens, the costa and lateral veins (8 to 10 pairs) finely appressed pubescent; petioles 1 to 2 cm. long; flowers numerous, clustered in the axils of the upper leaves; calyx up to 7 mm. long, the segments lanceolate, acuminate, 6 mm. long and 2 mm. wide, glabrous below, sparingly pilosulose toward tip of segments; corolla 3 to 3.5 cm. long, pale green, sparingly puberulous, the tube hypocrateriform, the lower half slender, about 1.5 mm. in diameter, the upper half narrowly campanulate, about 8 mm. in diameter at mouth, 1.5 to 2 cm. broad, the lobes ovate; stamens included; capsule 17 mm. long, 4 mm. broad, clavate, the solid basal portions slender, comprising about one-half the length of the capsule, glabrous, 6-seeded; retinacula 2 mm. long.

Type in the Herbarium of the Riksmuseet, Stockholm, collected in thick forest 130 miles north of Bogotá at "El Humbo," Department of Boyacá, Colombia, "2500 feet" altitude, September 30, 1932, by A. E. Lawrance (No. 491). Isotypes are in the Gray Herbarium and the

herbaria of the Missouri and New York Botanical Gardens. A type fragment is in the U. S. National Herbarium, No. 59583.

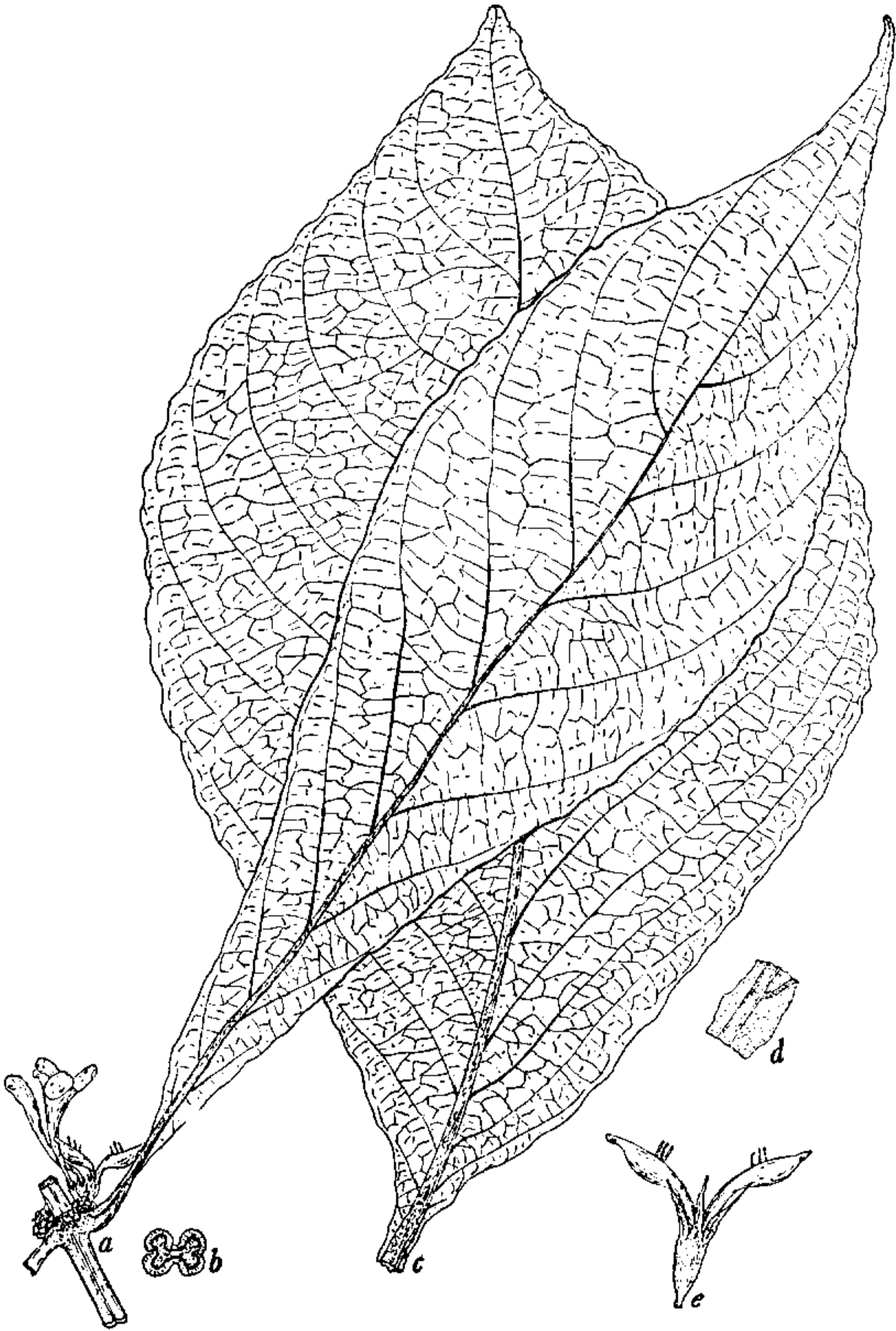


FIGURE 32.—*Ruellia viridiflora* Leonard (*Lawrance* 491): *a*, Node, showing inflorescence and leaf; *b*, cross section of stem; *c*, lower stem leaf; *d*, portion of leaf showing cystoliths; *e*, calyx and capsule. (*a*, *c*, Half natural size; *b*, *d*, *e*, natural size.)

Ruellia viridiflora is a well-marked species, easily recognized by its large size, large crenate leaves, and axillary clusters of pale green flowers.

22. *Ruellia pennellii* Leonard, sp. nov.

FIGURE 33

Herba, caulibus infra suffrutescens, quadrangularibus, glabris vel parce (aliquando bifariam) pubescentibus, pilis albis, curvatis; lamina foliorum ovato-lanceolata, apice acuminata, basi angustata, in petiolum decurrens, undulata, glabra, in costa et venis pubescens, pilis parvis, adpressis; flores sessiles, spicam vel thyrsus contractum formantes; bracteae lanceolatae vel lineares, saepe grandes; bracteolae triangulari-subulatae, minute pubescentes; calycis segmenta lineari-subulata; corolla alba vel punicea vel rubra vel violacea, hypocrateriformis, tubo infra puberulento, lobis emarginatis, glabris; stamina inclusa; capsulae clavatae, glabrae, semina orbiculata, plana, brunneo-purpurea; retinacula curvata, subulata.

Herb, sometimes suffrutescent at base; stems up to 1 meter high, subquadrangular, glabrous or thinly pubescent with minute white curved hairs, these sometimes in lines; leaf blades ovate-lanceolate, up to 16 cm. long and 6 cm. wide, acuminate at apex, acute and decurrent on petiole at base, undulate, bright green, glabrous except the costa and lateral veins (6 to 8 pairs), these pubescent with small appressed hairs, the cystoliths numerous, conspicuous under a lens; petioles up to 4 cm. long, glabrous or minutely pubescent; flowers borne in small, opposite, sessile clusters, forming a terminal naked spike or contracted thyrsus, the lowermost clusters in the axils of the upper leaves, the uppermost clusters confluent; rachis pubescent, the hairs minute, curved; bracts linear, 1 to 2 cm. long, 0.5 to 1 mm. wide, or occasionally larger and more leaflike; bractlets triangular-subulate, 1 to 5 mm. long, minutely pubescent; calyx 4 to 6 mm. long, the segments linear-subulate, 3 to 4 mm. long, about 0.5 mm. wide at base, dark colored in dried specimens, bearing a few minute hairs, the cystoliths prominent under a lens; corolla 3 to 3.5 cm. long, white, blue, violet, red, or pink with dark stripes, glabrous above, the lower half of the tube slender, pilosulous, about 1.5 mm. in diameter, the upper half campanulate, slightly oblique, 8 to 9 mm. at mouth, the limb about 1.5 cm. broad, the lobes ovate, about 10 mm. long and 7 mm. wide, emarginate, somewhat irregular; stamens included; capsules 12 mm. long, glabrous, the solid stipitate portion about 8 mm. long, the seed-bearing portion flattened, oval, about 3 mm. broad, 4-seeded; retinacula 1.5 mm. long; seed suborbicular, flat, reddish brown, 3.25 mm. broad, the flat surfaces glabrous, the margins minutely mucilaginous-tomentose when moistened.

Type in the U. S. National Herbarium, No. 1043209, collected in quebrada in forest, Tierra Alba on the Río Sinú, Department of Bolívar, Colombia, 70 to 150 meters altitude, by Francis W. Pennell

(No. 4658). Isotypes are in the Gray Herbarium and the herbarium of the New York Botanical Garden. The species is also represented by the following collections:

ANTIOQUIA: Banks of the Río Cauca at Puerto Valdivia, 240 to 260 meters altitude, *Metcalf & Cuatrecasas* 30075 (Mo, US).



FIGURE 33.—*Ruellia pennellii* Leonard (*a, b, e, Pennell* 4658; *c, d, f, g, Killip & García* 33559; *h, Haught* 1561): *a*, Tip of plant; *b*, cross section of stem; *c*, leaflike bract subtending flower cluster; *d*, same; *e*, portion of leaf blade (upper surface) to show cystoliths; *f*, calyx; *g*, corolla; *h*, capsule. (*a, c, d*, Half natural size; *b, e, g, h*, natural size; *f*, twice natural size.)

CALDAS: Moist soil at Manizales, near the Río Chinchina, 1,300 to 1,400 meters altitude, *Pennell* 10184 (GH, NY).

CAUCA: Primeval forest at El Tambo, 700 meters altitude, *von Sneidern* 971 (S); 1012 (S).

CHOCO: Dense forest along the Quebrada Jellita, Bahía Solano, 50 to 100 meters, *Killip & García* 33559 (US).

EL VALLE: Forest along the Río Sabaletas, Km. 29 of highway from Buenaventura to Cali, vicinity of Sabaletas, 25 meters altitude, *Killip & Cuatrecasas* 38857 (US).

SANTANDER: Magdalena Valley, in the vicinity of Barranca Bermeja between Sogamoso and Carare Rivers, 100 to 500 meters, *Haught* 2099 (US). Magdalena Valley, in the vicinity of Barranca Bermeja, between the Sogamosa and Colorado Rivers, 100 to 500 meters, *Haught* 1498 (US); 1561 (US); 1580 (US).

Ruellia pennellii is, apparently, distinct from all other Colombian species hitherto described, being related to the following new species, *R. colombiana*. The variation in the color of the corolla is indeed remarkable.

23. *Ruellia colombiana* Leonard, sp. nov.

FIGURE 34

Herbae decumbentae, caulibus infra suffrutescentibus, quadrangularibus, angulis rotundatis, puberulis, pilis retrorso-curvatis; lamina foliorum ovata, apice abrupte acuminata, basi rotundata, crenata, supra glabra, subtus in costa et venis puberula, pilis adpressis; flores sessiles, axillares; bracteae et bracteolae subulatae; calycis segmenta lanceolato-subulata, puberula, ciliata; corolla caeruleo-purpurea, hypocrateriformis, tubo puberulo, lobis suborbicularibus, glabris, leviter emarginatis; stamina inclusa; capsulae clavatae, puberulae vel glabrae; semina brunnea, plana; retinacula subulata, recta, apice truncata, lacerata.

Herbs up to 1 meter high, suffrutescent at base, ascending, rooting at the lower nodes; stems subquadrangular, grooved and rounded on the angles, puberulous, the hairs 175μ long, retrorsely curved; leaf blades ovate, 6 to 9 cm. long, 3 to 6 cm. wide, abruptly acuminate at tip, rounded or obtuse at base, thin, the margins crenate, the upper surface dull green, glabrous, the lower surface grayish green, rather densely puberulous, the hairs up to 200μ long, gray, appressed, confined chiefly to costa and lateral veins (about 8 pairs) these fairly conspicuous both above and beneath; petioles 5 to 10 mm. long, appressed-puberulous; flowers clustered in the axils of the upper leaves, several in each fascicle; bracts subtending the flowers narrowly lanceolate, about 8 mm. long and 0.75 mm. wide, thick and subcarinate, sparingly puberulous, the hairs appressed, the bractlets similar but much smaller; calyx about 7 mm. long, the segments lance-subulate, 0.75 mm. wide, the tips blunt or rounded, sparingly puberulous and ciliate, the hairs appressed, about 100μ long; corolla bluish purple (azul lila), the upper portion glabrous, the lower inconspicuously puberulous, the hairs spreading, 75μ long, the tube 2 mm. broad at base, narrowed to 1.5 mm. at 3 mm. above base, thence abruptly enlarged to 8 mm. at throat, the limb 15 mm. broad, the enlarged portion of the tube slightly oblique, the lobes suborbicular, about 6 mm. long and 7 mm. wide, shallowly emarginate, the margins crenate; stamens attached to base of the expanded portion of the corolla tube, the longer of each pair about 5 mm. long, the shorter 3 mm. long, the filaments very slender, glabrous, the anthers 2 mm. long, 0.5 mm. wide; pistil 17 mm. long,

the ovary and style minutely hirsute, the hairs ascending, about 50μ long, the stigma lobe oblong, thin, 1.5 mm. long, 0.5 mm. wide; capsule clavate, 10 to 12 mm. long, minutely puberulous or glabrate, the solid stipitate base about 5 mm. long; seed flat, suborbicular, brown, the margins gelatinous-puberulous when moistened; retinacula erect, straight, subulate, truncate, 1.5 mm. long.

Type in the U. S. National Herbarium, No. 1852483, collected along the Río Calima at La Trojita, Department of El Valle, Colombia, 5 to 50 meters altitude, February 19 to March 10, 1944, by J. Cuatrecasas (No. 16424). The following also represent the species:

ANTIOQUIA: In dense damp woods between Villa Arteaga and Río Mutatá, Johnston & Barkley 18C448 (Med).

BOLÍVAR: River-flat of the Río Sinú at Boca Tai, 50 to 80 meters altitude, Pennell 4182 (NY). Moist forest, Las Dantas to Puerto Canoa, on the Río Esmeralda, 400 to 800 meters, Pennell 4526 (NY).

Ruellia colombiana is an indefinite species, differing from the polymorphic *R. pennellii* only in its rounded leaf bases and the general lack of the long narrow leaflike bracts of the inflorescence.

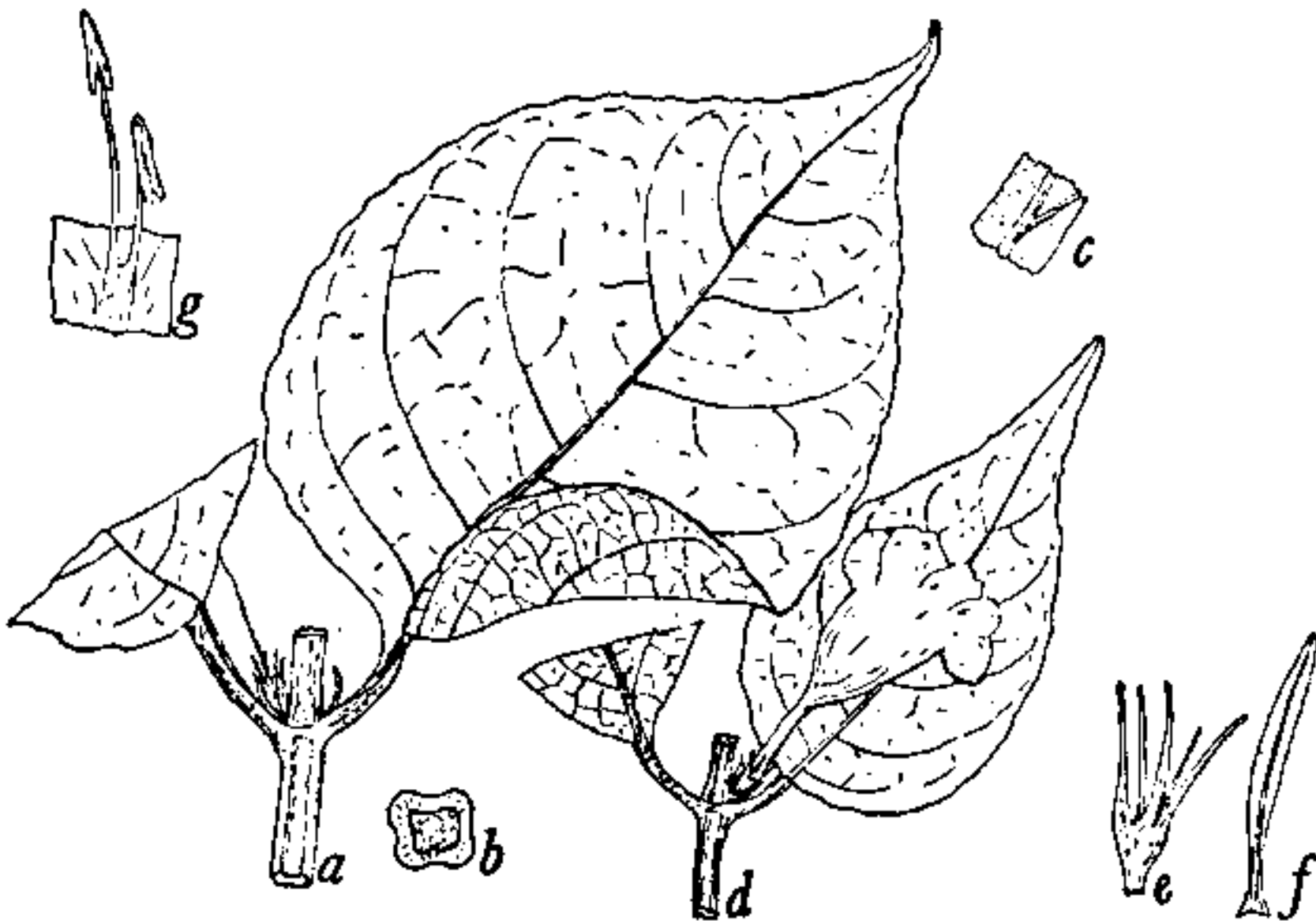


FIGURE 34.—*Ruellia colombiana* Leonard (Cuatrecasas 16424): *a*, Lower node, showing leaves and axillary flowers; *b*, cross section of stem; *c*, portion of leaf blade (upper surface) showing cystoliths; *d*, upper node; *e*, calyx, *f*, bract; *g*, a pair of stamens. (*a*, *d*, Half natural size; *b*, *c*, natural size; *d*-*g*, twice natural size.)

24. *Ruellia aquatica* Leonard, sp. nov.

FIGURE 35

Herbae, caulibus erectis vel adscendentibus, subquadrangularibus, infra glabris, sursum pilosis; lamina foliorum oblongo-elliptica, apice obtusa vel rotundata, basi angustata, glabra; petioli glabri vel parce pilosi, spica terminalis; bracteae imbricatae, lanceolatae, apice obtusae, basi angustatae, pilosae, ciliatae; calycis segmenta lanceolata, ciliata; corolla purpurea, hypocrateriformis, minute pubescens, lobis ovatis; capsulae calvatae, glabrae; semina rubro-brunnea, plana,

suborbicularia, glabra, vel madefactis subtiliter mucoso-pubescentia; retinacula subulata, curvata, apice truncata, lacerata.

Herbs; stems erect or ascending, 20 to 30 cm. high, subquadrangular, glabrous below, pilose above, the hairs 1.5 mm. long; leaf blades oblong-elliptic, 2 to 8 cm. long, 1 to 3.5 cm. wide, obtuse or rounded at apex, sometimes bluntly acuminate, narrowed at base, glabrous, the cystoliths numerous; petioles up to 2 cm. long, glabrous or sparingly pilose; flowers borne in terminal bracted spikes up to 3 cm. long; bracts imbricate, lanceolate, about 15 mm. long and 6 mm. wide, obtuse at apex, pilose and strongly ciliate; bractlets linear, 13 mm. long,



FIGURE 35.—*Ruellia aquatica* Leonard (Haught 1762): *a*, Tip of branch; *b*, cross section of stem; *c*, portion of leaf blade (upper surface) to show cystoliths; *d*, bract; *e*, bractlet; *f*, calyx and capsule. (*a*, Half natural size; *b*–*f*, natural size.)

1.5 mm. wide, pilose; calyx 8 mm. long, the tube glabrous, the segments lanceolate, 7 mm. long, 1.5 mm. wide near base, ciliate; corolla about 2.5 cm. long, purple, minutely pubescent, the tube hypocrateriform, the lower half slender, the upper half campanulate, about 6 mm. broad at throat, the limb 10 to 12 mm. broad, the lobes ovate; capsules 8 mm. long, about 3 mm. wide, clavate, glabrous, the solid basal portion about 1 mm. long, 6-seeded; seeds flat, reddish brown, suborbicular, 2 mm. long and 2.5 mm. broad, glabrous when dry, very finely mucilaginous-pilose when moistened; retinacula 1.5 mm. long, subulate, curved, truncate and lacerate at tip.

Type in the U. S. National Herbarium, collected in frequently submerged areas in the San Juan Valley (Camp VI), Department of Santander, Colombia, 100 to 700 meters altitude, June 9, 1935, by Oscar Haught (No. 1762).

Haught's No. 1496a, collected at Camp Mesa, vicinity of Barranca Bermeja, Magdalena Valley, between the Sogamoso and Colorado

Rivers, Santander, 100 to 500 meters altitude, also represents the species.

Ruellia aquatica is unlike any other Colombian *Ruellia* hitherto described. The name *aquatica* alludes to the habitat of the species.

25. *Ruellia lasiostachya* Leonard, sp. nov.

FIGURE 36

Suffrutex, caulibus quadrangularibus, angulis rotundatis, dense pilosis vel subtomentosis, pilis brunneis; lamina foliorum ovata vel elliptica, apice subacuta (?), basi angustata, integra vel undulata, pilosa; petioli tomentosi; spica terminalis; bracteae magnae, imbricatae, infimae lanceolato-ovatae, supremae obtusae; bracteolae lineari-lanceolatae, dense pilosae; pedicelli glabri; calycis segmenta carinata, glabra vel apice minute pilosa; corolla purpurea (?), hypocrateriformis, minute pubescens, lobis ovatis; stamina inclusa; ovarium et stylus apice pilosi.



FIGURE 36.—*Ruellia lasiostachya* Leonard (*Uribe* s. n.): *a*, Leaf blade; *b*, inflorescence; *c*, cross section of stem; *d*, *e*, bractlets; *f*, hair from bractlet; *g*, calyx. (*a*, *b*, Half natural size; *c*, *d*, *e*, *g*, natural size; *f*, about eight times natural size.)

Suffrutescent herbs; stems obtusely quadrangular, densely pilose or subtomentose with brownish hairs up to 4 mm. long; leaf blades ovate or elliptic, 16 cm. long and 8.5 cm. wide, acute (?) at apex, narrowed at base, entire or undulate, both surfaces pilose, the hairs

1 to 2 mm. long, confined chiefly to the costa and lateral veins (10 to 12 pairs); petioles 15 mm. long or more, loosely tomentose; flowers borne in a dense terminal spike 12 cm. long and about 3 cm. broad, each flower cluster subtended by a large leaflike bract, the lowermost of these ovate-lanceolate, 9 cm. long, 3 cm. wide, thence gradually reduced toward tip, the uppermost ovate, about 14 mm. long and 8 mm. wide, all obtuse and closely imbricate; primary bractlets linear-lanceolate, about 10 mm. long and 1.5 mm. wide, densely pilose with yellowish hairs up to 4 mm. long; secondary bractlets oblong-lanceolate, 1.5 to 2 cm. long, 3 to 5 mm. wide, densely pilose; pedicels 1.5 cm. long, glabrous; calyx 4.5 mm. long, thin, glabrous or minutely pilosulous at tip of segments, these subulate, 3 mm. long, 1.75 mm. wide at base, keeled; corolla hypocrateriform, 3 to 3.5 cm. long, minutely pubescent, mauve (?), the lower half slender, cylindric, about 1.5 mm. in diameter, the upper portion campanulate, 12 mm. broad at mouth, the limb about 2 cm. in diameter, the lobes ovate, about 8 mm. long and 7 mm. wide, rounded; stamens included, ovary and lower portion of the style (2 cm. long) pilosulous.

Type in the Herbarium of the Instituto de la Salle, Bogotá, Colombia, collected in the Comisaría of Caquetá, Colombia, December 1930, by C. Uribe. Type fragment in the U. S. National Herbarium, No. 1692608.

Ruellia lasiostachya is probably related to *R. uribei*, but it is easily distinguished by its dense terminal spike and large imbricated bracts. The type material is very fragmentary, and thus the dimensions given for the leaf blades may prove too small when more ample material is examined. The name *lasiostachya* is derived from *λάσιος*, shaggy, and *στάχυς*, spike.

26. *Ruellia putumayensis* Leonard, sp. nov.

FIGURE 37

Herba, caulibus quadrangularibus, fusco-pilosis; lamina foliorum oblongo-elliptica, apice subobtusata, basi angustata, tenuia, integra vel undulata, supra pilosa, subtus plus minusve adpresso-pilosa; petioli pilosi; flores axillares; bracteae ellipticae, apice subobtusatae, basi acutae; bracteoli lineares, pilosae; calycis tubus glaber, segmentis angusto-triangularis, glabris vel apice minute pilosulis; corolla alba, lilacino-virgata, minute pubescens, hypocrateriformis, lobis ovatis, crenatis, rotundatis; stamina inclusa; ovarium et stylus pilosuli; capsulae clavatae, glabrae vel apice parce pilosulae; semina plana, orbiculata, marginibus madefactis mucoso-tomentosis; retinacula apice fimbriata.

Herb; stems subquadrangular, pilose, the hairs brownish, up to 5 mm. long; leaf blades oblong-elliptic, 4 to 12 cm. long, 1.5 to 6 cm. wide, obtusish at apex, acute at base, rather thin, entire or undulate, both surfaces pilose, the hairs up to 2.5 mm. long, those of the upper surface scattered, ascending, those of the lower surface confined to costa and lateral veins and more or less appressed; the cystoliths

minute but easily seen under a lens; petioles up to 8 mm. long, pilose; flowers borne in axillary bracted clusters 1.5 to 2 cm. long; bracts elliptic, 12 to 15 mm. long, 4 to 5 mm. wide, obtusish at apex, acute at base, long-pilose; bractlets linear, up to 7 mm. long and 0.75 mm. wide near base, 1-nerved, pilose; calyx 4.5 mm. long, glabrous or bearing several

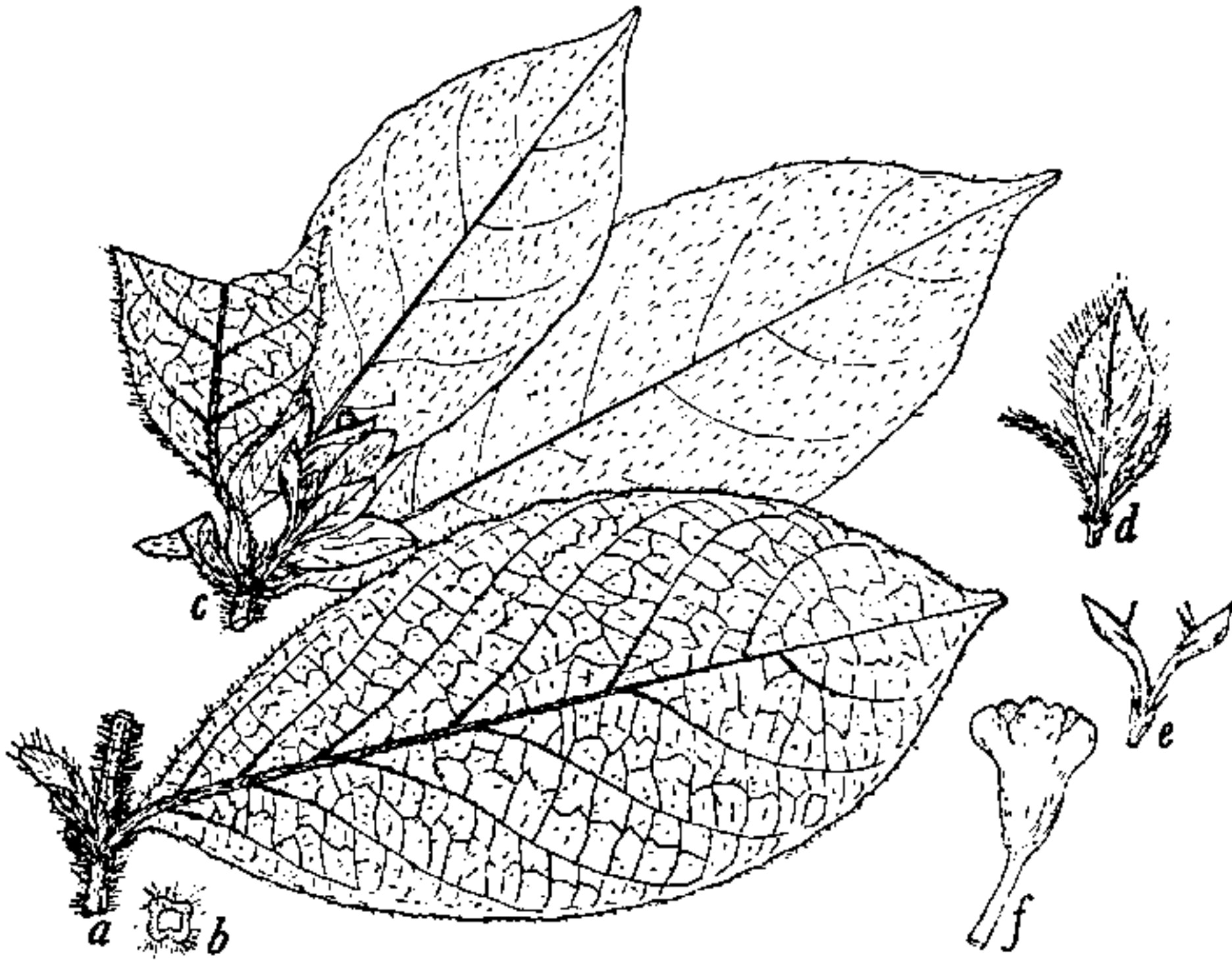


FIGURE 37.—*Ruellia putumayensis* Leonard (Klug 1696): *a*, Node and leaf; *b*, cross section of stem; *c*, tip of plant showing inflorescence; *d*, bract and bractlets; *e*, capsule and calyx; *f*, corolla. (*a*, *c*, *f*, Half natural size; *b*, *d*, *e*, natural size.)

minute hairs near tip of segments, these narrowly triangular, about 3 mm. long, 0.75 mm. wide at base; corolla 3 to 3.5 cm. long, white, striped with lilac, minutely pubescent, hypocrateriform, the lower half slender, tubular, about 1.5 mm. in diameter, the upper half campanulate, about 1 cm. broad at mouth, the limb 1.5 to 2 cm. broad, the lobes ovate, crenate, rounded; stamens included; ovary and style pilosulous; capsule clavate, about 1 cm. long, and 5 mm. broad, the lower half slender and solid, glabrous or sparingly pilosulous toward tip, 4-seeded; seeds flat, suborbicular, reddish brown, about 3 mm. in diameter, the flat surfaces glabrous, the edges puberulous, mucilaginous-tomentose when moistened; retacula 2.5 mm. long, fimbriate at apex.

Type in the U. S. National Herbarium No. 1517990, collected in forest at Cifbría, Comisaría of Putumayo, Colombia, 325 meters altitude, November 1930, by G. Klug (No. 1696).

Ruellia putumayensis resembles no other *Ruellia* hitherto described. It can be recognized by its white lilac-striped corollas and the dense pilosity of the stems and the upper surface of the leaf blades.

27. *Ruellia uribei* Leonard, sp. nov.

FIGURE 38

Herba, caulibus quadrangularibus, angulis obtusis, dense fusco-pilosis; lamina foliorum oblongo-lanceolata, apice acuminata, basi angustata, in petiolum decurrens, tenuia, integra vel undulata, parce pilosa, subtus pilis praecipue in costa et venis; petioli pilosi; flores sessiles, axillares; bracteae lineares, dense pilosae; calycis segmenta subulata, puberula; corolla pilosa hypocrateriformis, lobis ovalibus, rotundatis; stamina inclusa; stylus dense puberulus; ovarium tomentosum.



FIGURE 38.—*Ruellia uribei* Leonard (*Uribe* s. n., December 1930): *a*, Tip of branch; *b*, cross section of stem; *c*, leaf blade; *d*, portion of leaf blade (upper surface) showing cystoliths; *e*, bract; *f*, bractlet; *g*, calyx, style, and stigma; *h*, corolla. (*a*, *c*, *h*, Half natural size; *b*, *d*, *e*, *f*, natural size; *g*, $1\frac{1}{2}$ times natural size.)

Herb; stems obtusely quadrangular, densely pilose with brownish hairs 1.5 to 2 mm. long; leaves oblong-lanceolate, up to 24 cm. long and 6.5 cm. wide, gradually narrowed from middle to a slender blunt pointed tip, acute at base and decurrent on the petiole, thin, entire or undulate, both surfaces rather sparingly pilose with hairs about 1 mm. long, those of the lower surface confined chiefly to costa and lateral veins (8 or 9 pairs), the upper surface bearing numerous cystoliths, these conspicuous under the lens; petioles 1 to 3.5 cm. long, pilose; flowers several, sessile or subsessile, clustered in the axils of the upper

leaves; bracts narrowly linear, 1.5 to 3 cm. long 0.5 to 1 mm. wide, densely pilose with brownish hairs up to 2.5 mm. long; bractlets similar but smaller; calyx 5 mm. long, the segments unequal, subulate, 2.5 to 3.5 mm. long, pilosulous with white hairs 0.5 mm. long or a few reaching 1 mm. in length; corolla erect, 3.5 to 4.5 cm. long, minutely pubescent, the tube narrowly hypocrateriform, about 1 cm. in diameter at mouth, the limb about 2 cm. broad, the lobes oval, 12 mm. long and 10 mm. wide, rounded, the stamens included; style densely pilosulous; ovary tomentose.

Type in the Herbarium of the Instituto de la Salle, Bogotá, Colombia, collected in the Comisaría of Caquetá, December 1930, by C. Uribe. Isotype in the U. S. National Herbarium, No. 1692607.

Among the Colombian *Ruelliae*, *R. uribei* is a well-marked species. It can be easily recognized by its long, narrow, pilose leaves, narrowly linear densely pilose bracts, and the relatively small irregular calyx. The color of the corolla is not apparent in the dried material.

SPECIES NOT POSITIVELY KNOWN FROM COLOMBIA

RUELLIA SPRUCEI Lindau, Bull. Herb. Boiss. 5: 653. 1897.

Type collected at Panuré on the Rio Vaupés, October 1852 to January 1853, by Spruce, No. 2605.

Panuré is in Amazonian Brazil, about 65 km. from the Colombian border, and not in Colombia as given by Lindau.

Tribe 5. BARLERIEAE Nees

Barlerieae Nees in Wall. Pl. Asiat. Rar. 3: 75. 1832.

Herbs or shrubs; stems usually subquadrangular; leaf blades ovate to lanceolate; flowers sessile, axillary or in terminal spikes, the bracts often large, conspicuous and imbricate; calyx irregular, often 4-parted; corolla infundibular, the narrow portion short, the expanded portion more or less elongated; stamens 4, didynamous; anther lobes parallel; capsules 4-seeded, seed-bearing to base.

Species of two of the nine genera comprising the tribe *Barlerieae* occur in Colombia.

KEY TO THE GENERA

Calyx segments 4; corollas large and conspicuous, subregular----- 13. *Barleria*
Calyx segments 5; corollas small, 2-lipped, 5 mm. long or less-- 14. *Tellostachya*

13. BARLERIA L.

Barleria L. Sp. Pl. 636. 1753; Gen. Pl. ed. 5, 283. 1754. Named for Jaques Barrelier, a French botanist (1634 to 1673). More than 100 species have been described. These occur in tropical regions, mostly in the Old World. Type species: *Barleria prionitis* L. (India).

Shrubs or herbs; leaves opposite, entire; flowers axillary or borne in terminal bracted spikes; calyx deeply 4-parted, 2 of the segments

larger than the others; corolla usually yellow or blue, the tube about as long as the spreading limb or longer, the limb with 5 rounded lobes; stamens 4, didynamous, borne on the base of the corolla tube; style elongated; stigma obtuse, ovules 2 in each cavity; capsules ovoid to oblong; seeds flattened, ovate to suborbicular.

KEY TO THE SPECIES

Flowers borne in a terminal spike, yellow, turning purple on drying—1. *B. micans*
Flowers axillary, blue----- 2. *B. cristata*

1. *Barleria micans* Nees

Barleria micans Nees; Benth. Bot. Voy. Sulph. 146. 1844. *Micans*: sparkling, glittering, in allusion to the attractively bracted inflorescence. Type locality: Taboga Island, Bay of Panama, Panama.

Barleria discolor Nees; Benth. Bot. Voy. Sulph. 146. 1844. *Discolor*: variegated, of various colors, in allusion to the leaf blades green above and silvery beneath. Type locality: Nicoya, Costa Rica.

Herbs, sometimes subligneous at base, 1 to 1.5 meters high; stems glabrous or strigose, terete; leaf blades ovate to narrowly lanceolate, 10 to 25 cm. long, usually about 4 to 5 cm. wide, long-acuminate at apex, attenuate or abruptly decurrent at base, sparingly strigose or hirtellous, the leaves subtending the spike sessile; petioles 1 to 2 cm. long; flowers borne in a large dense terminal spike, the bracts ovate-lanceolate to broadly ovate, 2 to 3 cm. long, about 1 cm. wide, acute or obtuse, tipped by a small spine, chartaceous, veiny, more or less strigose, the margins with spinelike teeth up to 3 mm. long, sometimes drying bluish; bractlets narrowly linear, 1.5 to 2 cm. long; calyx segments very unequal, the anterior segment oblong, 1.5 to 2 cm. long, 1 to 1.4 cm. wide, bidentate at apex, the posterior segments slightly longer and narrower, acuminate at apex, the lateral segments narrowly lanceolate, about half as long as the others; corolla 5 to 5.5 cm. long, yellow, turning bluish purple when dry, the tube slender, the lobes oblanceolate, subequal, spreading; capsules cylindrical, slender-pointed at apex, glabrous, 4-seeded.

Rocky banks and waste places in general; usually in more or less shaded situations. Colombia northwards to southern Mexico.

ATLANTICO: Hacienda Riodulce, Los Pendales, *Dugand & Jaramillo* 4154 (US). Pto. J. Bro. *Elias* 735 (US). Sahagún, *Pennell* 4104 (GH, NY). Tubará, *Dugand & Jaramillo* 4061 (US).

SANTANDER: Between Bucaramanga and El Jaboncillo, Río Suratá Valley, *Killip & Smith* 16355 (NY, US).

2. *Barleria cristata* L.

FIGURE 39

Barleria cristata L. Sp. Pl. 636. 1753. *Cristata*: cristate or crested, in allusion to the pectinate outer calyx segments. Type locality: India. An ample description is given by Linnaeus.

Herbaceous or suffrutescent at base, up to 1 meter high, the stems subterete, both strigose and puberulous, the minute hairs white and

curved, the appressed ones yellowish; leaf blades ovate-lanceolate, up to 10 cm. long and 3.5 cm. wide, acute at apex, narrowed at base, entire, strigose or both strigose and puberulent, the hairs often confined to costa and lateral veins; petioles about 1 cm. long; flowers solitary or paired, subsessile, borne in the axils of the leaves, or occasionally crowded in a headlike cluster at the ends of the branchlets; bracts linear-lanceolate, about 12 mm. long and 1.5 mm. wide, strigose; outer segments of the calyx ovate-lanceolate, 1.5 to 2.5 cm. long, veiny, spine-tipped, hirtellous, pectinate-toothed, the inner segments lanceolate, acuminate, 8 or 9 mm. long, 2 mm. wide, whitish, puberulous; corolla



FIGURE 39.—*Barleria cristata* L. (Bro. Elias 980): *a*, Tip of stem; *b*, cross section of stem; *c*, bract; *d*, posterior calyx segment; *e*, enlarged portion of calyx segment to show teeth and glandular hairs; *f*, one of the anterior calyx segments; *g*, ovary and style. (*a*, Half natural size; *b*, *e*, *g*, twice natural size; *c*, *d*, *f*, natural size.)

up to 6 cm. long, violet with paler spots at throat, finely pubescent, the tube hypocrateriform, straight, gradually enlarged from about 3 mm. in diameter at middle to 12 mm. at throat, the limb about 3 cm. broad, the lobes nearly equal, rounded, the 2 upper ones erect; 2 of the stamens perfect, reaching to mouth of tube, and 2 imperfect and much shorter; styles exserted; capsules subcylindric, about 12 mm. long and 4 mm. broad, glabrous, 4-seeded.

VERNACULAR NAME: Lila (*Dugand & García-Barriga* 2535).

Gardens. Found occasionally as an escape throughout tropical America.

ATLÁNTICO: Barranquilla, *Dugand & García-Barriga* 2535 (US); Bro. Elias 502 (US); 753 (US); 980 (US).

14. TELIOSTACHYA Nees

Teliostachya Nees in Mart. Fl. Bras. 9: 71. 1847. Τέλειος, perfect, and στάχος, spike in allusion to the well-defined spikes of the species. Nees separates *Teliostachya* from *Lepidagathis* Willd. and describes three species, *T. cataractae*, *T. diffusa*, and *T. alopecuroidea*, the last based on *Ruellia alope-*

curoidea Vahl. Bremekamp¹¹ justifies Nees' establishment of the genus *Teliostachya* as distinct from *Lepidagathis* by pointing out the following contrasting characters: In *Teliostachya* the spike is radically symmetric and definitely terminal, the anticous calyx lobes entirely free, the anther lobes are inserted at different heights, and the pollen grains are entirely free from reticulations. *Lepidagathis*, on the other hand, is characterized by a dorsal-ventral, often axillary inflorescence, the anticous calyx lobes are at least partly united, the anther lobes are at the same height, and the pollen grains are finely reticulate. Limited to tropical America and west Africa. Ten or more species are found in America. Type species: *T. cataractae* Nees. Type locality: Brazil.

Lepidagathis Willd. Sp. Pl. 3: 400. 1801. *Λεπίς*, scale or bract, *ἀγαθίς*, a round head, in reference to the bracted inflorescence. All the known species of this genus are natives of the Old World. Type species: *L. cristata* Willd. India.

Herbs; leaves entire, bearing cylindrical cystoliths; flowers borne in cylindrical or ovoid spikes composed of verticillasters, the spikes solitary or several, borne at the tips of the branches, the verticillasters (subtended by 3-nerved bracts or the lowermost by a pair of ordinary leaves) consisting of 3 to 7 flowers, the lateral flowers subtended by 1- to 3-nerved bracts; bractlets 1-nerved; calyx divided nearly to base, the upper lobe the largest, 3-nerved, the lateral lobes 1-nerved, the lower lobes slightly longer than the lateral ones, 1- or 2-nerved; corolla about as long as the calyx, the tube cylindric, the throat slightly enlarged, the limb 2-lipped, the upper lip obtuse, emarginate, or subentire, the lower lip 3-parted, the lobes subequal, obtuse; stamens 4, didynamous, barely exerted; anthers 2-lobed, the lobes attached at unequal heights, the lower or sometimes both lobes apiculate at base; ovules 2 in each cavity; style 2-lobed, the lobes semi-globose; capsules oblong, sexangular, acute, each valve bearing 2 seeds; retinacula short; seeds lenticular, yellow, covered with mucous hairs.

KEY TO THE SPECIES

Leaf blades ovate to elliptic; upper calyx segment 2 mm. wide.

1. *T. alopecuroidea*

Leaf blades lanceolate to narrowly elliptic; upper calyx segment 1.25 mm. wide.

Leaf blades, thin sparingly pilosulous to glabrous; plants diffuse,

often 30 cm. high----- 2. *T. lanceolata*

Leaf blades firm, rather densely hirtellous; plants rigid, rarely over

23 cm. high----- 2a. *T. lanceolata* var. *crispa*

1. *Teliostachya alopecuroidea* (Vahl) Nees

Ruellia alopecuroidea Vahl, Eclog. Amer. 2: 49. 1798. *Alopecurus* and *είδος*, the form of i. e., resembling the genus *Alopecurus* L. Type collected in Montserrat, West Indies, by Ryan. Photograph of type in the U. S. National Herbarium, No. 22196.

Teliostachya alopecuroidea Nees in Mart. Fl. Bras. 9: 72. 1847. Based on *Ruellia alopecuroidea* Vahl.

Lepidagathis alopecuroides R. Br. ex Griseb. Fl. Brit. W. Ind. 453. 1864. A transfer based on *Ruellia alopecuroidea* Vahl.

¹¹ Rec. Trav. Bot. Néerl. 35: 149. 1938.

Herbs up to 50 cm. high, usually much branched, erect, decumbent or ascending, sometimes rooting at the lower nodes, short-pilose; leaf blades thin, ovate to elliptic, 3 to 8 cm. long, 2 to 3 cm. wide, acute or obtuse at apex, narrowed at base, repand or entire; spikes usually terminal, 2 to 8 cm. long, 1 to 1.5 cm. in diameter, many-flowered; bracts lanceolate to oblong, about 6 mm. long, venose, ciliate; calyx segments unequal, 4 to 6 mm. long, the anterior pair lanceolate, connate at the base, the lateral pair linear, the posterior segment obovate; corolla white or violet, about as long as the calyx; stamens 4, free at base, the anther sacs parallel, slightly unequal, blunt at base; capsules sessile, glabrous, 4-seeded, about 4 mm. long.

Wet shaded banks in woods, thickets, and fields. Brazil, British Guiana, Colombia, French Guiana, Peru, Trinidad, Venezuela. Extending northward into Central America and the West Indies.

MAGDALENA: Poponte, Magdalena Valley, *Cyril Allen* 912 (Mo).

META: Villavicencio, *Hermann* 11156 (US).



FIGURE 40.—*Teliostachya lanceolata* Nees (*a-g*, Cuatrecasas 18716; *h-j*, Cuatrecasas 7586): *a*, Tip of stem; *b*, cross section of stem; *c*, section of stem to show groove; *d*, stem leaf; *e*, bracts; *f*, posterior calyx segment; *g*, anterior and lateral calyx segments; *h*, corolla; *i*, capsule; *j*, valve of capsule to show retinacula. (*a*, *d*, Half natural size; *b*, three times natural size; *c*, *e-j*, twice natural size.)

2. *Teliostachya lanceolata* Nees

FIGURE 40

Teliostachya lanceolata Nees in Mart. Fl. Brass. 9: 74. 1847. Several cotypes from Brazil and one from Peru are cited.

Herbs up to 30 cm. high or more; stems ascending, rooting at the lower nodes, subquadrangular (the angles narrowly and obscurely winged), pubescent with appressed or ascending hairs about 0.5 mm. long (the lower portions sparingly pubescent or glabrate); leaf blades lanceolate or narrowly elliptic, up to 6 cm. long and 2.2 cm. wide, obtuse or acute (the tip blunt), narrowed at base, glabrous or the

costa and lateral veins (4 or 5 pairs, obscure) sparingly hirtellous, the hairs appressed; petioles up to 1.5 cm. long, winged; spikes terminating the branches, narrowly conic, up to 4.5 cm. long, about 1 cm. in diameter at base and 5 mm. near tip; cymes 3- to 5-flowered; bracts subulate (or the lowermost leaflike), up to 6 mm. long and 0.5 mm. wide, 3-nerved (the lateral pair faint), ciliate toward apex with small curved hairs; bractlets setiform, about 5 mm. long, sparingly hirtellous; calyx prominently nerved, the margins and nerves beset with scattered straight spreading hairs up to 0.5 mm. long, the posterior segment lanceolate, 5 to 7 mm. long, 1.25 mm. wide, gradually narrowed and cuspidate, 5-nerved with the outer pair of nerves marginal, the anterior segments subulate, 4 mm. long, 0.5 mm. wide, 3-nerved with the outer pair of nerves faint and submarginal, the lateral segment subulate, 3.5 mm. long, about 0.25 mm. wide, 1-nerved; corolla white or purplish, 4 mm. long, glabrous without or the lobes sparingly ciliate, pubescent within below insertion of the stamens, filaments glabrous, those of the longer pair 2 mm. long, those of the shorter pair 1.5 mm. long; style 3.5 mm. long, bearing a few hairs toward base; ovary pubescent at tip; capsule 3.5 mm. long, subhexagonal, hirtellous toward tip, the lower half glabrous; seeds flat, yellowish brown, about 1 mm. in diameter.

Wooded river banks usually in damp situations. Brazil, Colombia, Peru.

CHOCÓ: Bank of the Río San Juan, near Andagoya, *Killip* 35386 (US).

EL VALLE: Between Puente Sofia and Yanaconas, *Cuatrecasas* 18716 (US).

PUTUMAYO: Along the Río San Miguel between the tributaries Río Bermeja and Río Conejo, *Cuatrecasas* 11044 (US).

VAUPÉS: Along the Río Guaviare, *Cuatrecasas* 7586 (US).

2a. *Teliostachya lanceolata* Nees var. *crispa* Nees

Teliostachya lanceolata Nees var. *crispa* Nees in Fl. Mart. Bras. 9: 74. 1847.

Type locality: "Maynas [Yurimaguas, Peru] et ad fluvium Amazonum."

Type material in the Delessert Herbarium collected by Poeppig, No. 2240.

A photograph of this sheet (No. 7823) is in the U. S. National Herbarium.

The variety differs from the typical form in that the mature plants are shorter (20 to 23 cm. high) and more rigid, the stems and leaf blades are rather densely hirtellous, the hairs up to 0.5 mm. long, appressed or ascending, and the margins of the leaf blades recurved.

The Colombian specimens cited do not show the strongly recurved leaves mentioned in the type description and shown in the photograph of Poeppig's specimen. This character may have been accentuated by a possible wilting or shriveling of the type material when the specimen was pressed.

On river banks. Colombia and Peru.

CALDAS: Near La Dorada, *Haught* 2138 (US).

META: Villavicencio, *Cuatrecasas* 1985 (US).

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