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VELVA E. RUDD



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FRANK A. TAYLOR,
Director, United States National Museum.

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CONTRIBUTIONS
FROM THE
UNITED STATES NATIONAL HERBARIUM
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THE AMERICAN SPECIES
OF AESCHYNOMENE

By VELVA E. RUDD



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III

THE AMERICAN SPECIES OF AESCHYNOMENE ¹

BY VELVA E. RUDD

Introduction

The genus *Aeschynomene* is a member of the legume family characterized by papilionaceous flowers and jointed fruits, or loments. Its species range from herbaceous annuals to woody perennials, some treelike, as much as 8 m. tall. The plants may be erect to prostrate, but none are true vines. The leaflets are sensitive to light and, in most cases, to touch, placing this group in a general category commonly referred to as "sensitive plants."

Some 350 species have been ascribed to *Aeschynomene*. Approximately one half of them have been described from New World material, the others from the Old World, principally from Africa. About 50 species have since been transferred to other genera.

A complete monographic study of the genus has never been published. The early encyclopedic works lack many recently described species, and the limited regional treatments have produced considerable synonymy and misinterpretations. The desirability of clarification becomes obvious to anyone attempting to identify field collections.

The scope of this paper is a revision of the American species of *Aeschynomene*. No attempt has been made to include Old World synonymy, but a few Old World names and ranges are mentioned incidentally.

Thanks and appreciation are due the other staff members of the U. S. National Herbarium for their criticism and counsel, especially Ellsworth P. Killip, at whose suggestion the project was undertaken, Lyman B. Smith, and Albert C. Smith.

In addition to the facilities of the U. S. National Herbarium, it has been a privilege to consult specimens from other herbaria, especially the following. To the curators of those institutions the writer is grateful. Chicago Museum of Natural History (Ch), Gray Her-

¹ This paper is largely based on a dissertation submitted to the faculty of the Graduate Council of The George Washington University in partial satisfaction of the requirements for the degree of Doctor of Philosophy.

barium of Harvard University (GH), Instituto Agronomico do Norte, Belém, Brazil (IAN), Royal Botanic Gardens, Kew (K), Missouri Botanical Garden (Mo), New York Botanical Garden (NY), Muséum National d'Histoire Naturelle, Paris (P), Museu Nacional, Rio de Janeiro (R), Instituto de Botánica Darwinion, San Isidro, Argentina (SI), University of California (UC), Herbario San Marcos, Museo de Historia Natural, Lima, Perú (USM), Instituto Botánico, Ministerio de Agricultura y Cría, Caracas (Ven).

The abbreviations of herbarium names used above and in the citation of specimens, except for the Chicago Museum of Natural History, follow those of Lanjouw and Stafleu (*Index Herbariorum*, 1952, ed. 2, 1954).

Photographs of types in European herbaria made by J. F. Macbride and distributed by the Chicago Museum of Natural History (formerly Field Museum) are cited as "F. M. neg.," with the negative number and the initials of the herbarium in which the specimen was located. Other photographs consulted are cited with what information is available.

All the maps presented in this paper are based on Goode base maps No. 101 M, copyright 1939 by the University of Chicago, and are used by permission of the University of Chicago Press.

Historical consideration

The name *Aeschynomene* was derived from the Greek word *αισχυνω*, meaning to be bashful or ashamed. It was used by early Greeks and others apparently as a generic term for sensitive plants, particularly for legumes such as *Acacia*, *Mimosa*, and *Cassia*. Pliny the Elder (Bostock and Riley, trans. 5:67. 1856), in discussing medicinal plants, included, as known to the Magi, "the herb *aeschynomene*, so-called from the shrinking of its leaves at the approach of the hand." The precise identity of that plant is not known. Adanson (*Familles des Plantes*, 2:328. 1763) cited Pliny's *Aeschynomene* as a *Mimosa*, and, considering Linnaeus' *Aeschynomene* a homonym, proposed the generic name *Gajati* for the latter.

Pre-Linnaean writers, such as Breyne (*Exoticarum Aliarumque Minus Cognitarum Plantarum Centuria Prima*. 1678), Ray (*Historia Plantarum*. 1686-1704), Rheede (*Horti Malabarici pars nona de Herbis et Diversis Illarum Speciebus*. 1689), and van Royen (*Florae Leydensis Prodrromus*. 1740), continued to use the name *Aeschynomene*, although not wholly in the modern sense. Breyne, for example, designated *Ae. aspera* L. as "Mimosa non spinosa." *Mimosa pigra* L. he called "Aeschynomene spinosa" but captioned the illustrative plates "Mimosa spinosa."

Linnaeus validated the generic name *Aeschynomene* for modern nomenclature by including it in the first edition of his "Species Plantarum" (713. 1753). Of the five species he listed, however, only three, *Ae. aspera*, *Ae. americana*, and *Ae. indica*, remain in the genus today; another, *Ae. arborea*, is a *Desmodium*, and *Ae. sesban* is a *Sesbania*. He failed to include *Ae. virginica*, which he cited as *Hedysarum virginicum*.

In the second (1060, 1061. 1753) and third (3:1162–1165. 1764) editions, Linnaeus included two additional species of *Aeschynomene*, *Ae. grandiflora* (actually a *Sesbania*) and *Ae. pumila*. The fourth edition, edited by Willdenow (3:1163, 1164. 1802) added *Ae. hispida* and *Ae. diffusa*.

Jacquin (Collect. ad Bot. 2:283. 1788; Ic. Pl. Rar. 3:13. 1792; Plantae Rarae Hort. Schoenbr. 2:59, t. 237. 1797; Fragm. Bot. 37, t. 42, f. 2. 1809) published four species of *Aeschynomene*, none of which are now retained in the genus.

Poiret, in Lamarck's "Encyclopedia Methodique" (4:447–453. 1797; Suppl. 4:76–78. 1816) described all the species of *Aeschynomene* known to him, some 29, 10 of which are now placed in other genera. Four species which he placed under *Hedysarum* (op. cit. 6:446–449. 1804) have been transferred to *Aeschynomene*.

Michaux, in his "Flora Boreali-Americana" (2:75. 1803), listed *Ae. platycarpa*, now placed in *Glottidium*, and *Ae. viscidula*.

The American travels of Humboldt and Bonpland resulted in the publication of four more South American species of *Aeschynomene* in "Nova Genera et Species Plantarum" (6:530–532. 1824).

DeCandolle, in his "Prodromus" (2:320–323. 1825), gave a list, with brief descriptions, of the then known 36 species of *Aeschynomene*. His generic definitions were more in line with present ideas, and, with the exception of about four species "minus notae aut dubiae," all were correctly placed as to genus. Twenty-two species were based on New World material.

In his "General System of Gardening and Botany" (2:283–286. 1832), Don listed, with brief descriptions, 40 species of *Aeschynomene*, adding three new species based on collections attributed to Ruiz and Pavon.

Vogel (Linnaea 12:81–96. 1838) published "De Hedysareis Brasiliae," based chiefly on Sellow collections, which included 16 species, 11 of them new, all described in detail. In this paper he proposed the division of the genus into two sections, *Eu-aeschynomene* and *Ochopodium*.

The next major treatment of the genus was by Bentham in Martius' "Flora Brasiliensis" (15 (1):56–70. 1859). Even with considerable reduction to synonymy, he presented 24 species of *Aeschynomene*,

eight of them new, with adequate descriptions, keys, and several illustrations. This included most of the then known American species of *Aeschynomene*.

The generic name *Macromiscus* was introduced in 1846 by Turczaninow (Bull. Soc. Nat. Mosc. 19:508. 1846), with *M. brasiliensis* Turcz. assigned to it at that time and *M. glandulosus* Turcz. the following year (op. cit. 20:174. 1847). Bentham, in "Flora Brasiliensis" (loc. cit.), interpreted *M. brasiliensis*, apparently correctly, as a synonym of *Aeschynomene montevidensis* Vog. and used *M. glandulosus* as the basis for *Ae. rostrata* Benth.

Hemsley (Biol. Centrali-Americana 1:270-272. 1879) listed, with brief descriptions and with citations to collections, 17 species of Mexican *Aeschynomene* and three unnamed specimens which were new or unknown to him.

Taubert, in Engler and Prantl's "Die Natürlichen Pflanzenfamilien" (3 (3):319. 1894), stated that there were 50 species of *Aeschynomene* in the whole world. He briefly characterized the two sections of the genus but did not go into detail as to species.

The genus *Climacorachis* was published by Hemsley and Rose (Contr. U. S. Nat. Herb. 8:43. 1903) to accommodate certain Mexican collections. In the present paper, this material is being interpreted as somewhat aberrant species of *Aeschynomene* of the series *Americanae*.

Small (Fl. Miami 90, 200. 1913) proposed the generic name *Secula*, based on *Aeschynomene viscidula* Michx. Later, he also transferred *Ae. histrix* to the genus *Secula*.

From time to time one or more species have been described by various botanists, among them Vellozo, Micheli, Rose, Robinson, Brandege, Jones, Standley, Gleason, Hassler, Grisebach, Small, Sandwith, and others, as cited in the systematic treatment in this paper.

In addition to the floristic works thus far mentioned, there have been numerous regional treatments, published in recent years, that have presented the pertinent species of *Aeschynomene*. Among the regions which have been so treated are the eastern United States (Small, 1933; Fernald, 1950; Gleason, 1952), Arizona (Kearney and Peebles, 1951), México (Standley, 1922; Morton, 1944), Guatemala (Standley and Steyermark, 1946), Costa Rica (Standley, 1937), Panama Canal Zone (Standley, 1928), Cuba (León and Alain, 1951), Jamaica (Fawcett and Rendle, 1920), Venezuela (Pittier, 1944, 1945), Surinam (Amshoff, 1939), Perú (MacBride, 1943), and Argentina (Burkart, 1939).

Economic consideration

The species of *Aeschynomene* have relatively minor economic importance but, as is characteristic of legumes, they contribute to the supply of soil nitrogen by producing root nodules in symbiosis with nitrogen-fixing bacteria. In Java several species occurring as weeds were tested as green manure, but the report (Heyne, Nutt. Plant. Ned. Ind. 783. 1927) "neither condemned nor praised," and apparently the practice has not been established.

The pith from certain species of *Aeschynomene* in South America is used for corks and for stropping knives and razors. In the Old World, particularly the Orient, the pith is said to be used for making artificial flowers and as a cork substitute for helmets, floats for nets, insect-boxes, etc. (Burkill, Dictionary of the Economic Products of the Malay Peninsula, 59. 1935; Don, op. cit. 2:283. 1832). It has also been reported that stem fibers are used to make "rice-paper," but, according to Burkill, "this wants confirmation."

Cattle have been observed to graze various species of *Aeschynomene* and, apparently, the leaves and tender shoots are generally palatable to livestock. None of the species is known to be poisonous. However, lacking the abundance and luxuriant growth of the more commonly utilized legumes, *Aeschynomene* is relatively unimportant as forage.

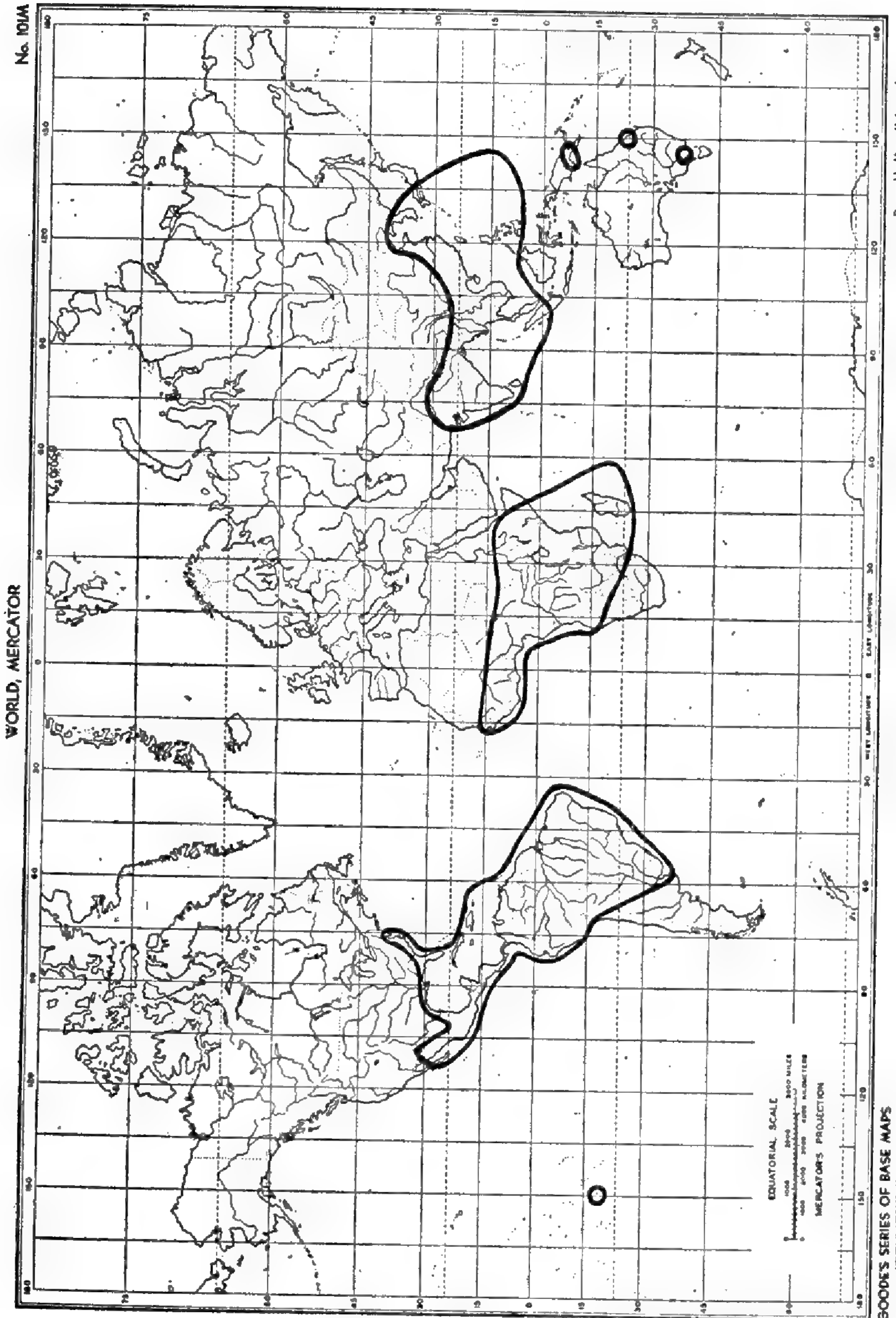
Ordetx Ros (Flora Apicola de la América Tropical, 282. 1952) states that *Aeschynomene americana* is visited by bees in the morning, but not with great interest; they obtain pollen and possibly some nectar. Gentry noted in his collection data for *Ae. petraea* var. *grandiflora* that it was "visited by bees." No other remarks on possible roles as honey plants have been noted.

Several species of the genus have showy flowers, but they seem to have been cultivated only in botanic gardens.

Geographic distribution

Aeschynomene is chiefly a tropical genus (fig. 1), with a few species occurring in warm temperate areas. In America, presumably native, it ranges from about lat. 40° N. to 35° S. along the Atlantic coast, and from lat. 28° N. to 17° S. on the Pacific side. In the Old World the distribution is principally in Africa, southeastern Asia, and the Pacific Islands, apparently including both native species and introduced American weeds.

About one-half of the species are hydrophytes, found in marshes, mud holes, rice paddies, wet meadows, and along stream banks. The others are more xeric, occurring in savanna, caatinga, pine barrens,



No. 1011A

WORLD, MERCATOR

EQUATORIAL SCALE
0 500 1000 1500 2000 MILES
0 500 1000 1500 2000 KILOMETERS
MERCATOR'S PROJECTION

GODDARD'S SERIES OF BASE MAPS
HENRY A. LEPPARD, EDITOR

Prepared by Henry A. Leppard
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FIGURE 1. Geographic distribution of the genus *Aeschynomene*.

oak woods, on rocky hillsides, sandy beaches, or in dry waste places. A number of species are widespread. Several are known only from the type collection.

The species of the section *Aeschynomene* are predominantly hydric, long-lived annuals, and, with few exceptions, are found on relatively young land areas, i. e., areas of late Pleistocene to Recent emergence or deposition, such as the coastal plain of southeastern United States, most of the Antilles, the Yucatán Peninsula of México, and the basins of the Amazon and Paraná rivers of South America.

Within this section, the series have somewhat distinctive distribution patterns, which suggest their areas of origin and paths of migration.

The series *Americanæ* (fig. 2) includes mostly amphibious plants, and some which occur in pine and oak woods or in dry pastures. From the available data there does not appear to be a rigid correlation between species and habitats, the members of the group evidently having somewhat flexible edaphic requirements. Although the group is widespread in tropical America, the greatest diversity of taxa occurs in México. The possibility is suggested that the series originated in the region of the southern Sierra Madre, and then, with Pleistocene emergence of such land as the Yucatán Peninsula and the Antilles, gradually spread to present locations. Today the *Americanæ* seem to be especially abundant in the Caribbean area, where its migration may be facilitated by hurricanes.

The series *Fluminenses* (fig. 3) has been inadequately collected and its range may be greater than the available specimens would indicate. The presently known pattern is interesting: Cuba, Hispaniola, and east-central South America.

The *Montevidenses* (fig. 4), as indicated by the collections to date, are most abundant in South America from eastern Brazil to the vicinity of Buenos Aires, Argentina. The northernmost species of the group, apparently native to the southern edge of the Guiana highlands, has also been collected in a few isolated locations northwestward to Cuba and British Honduras. Because of inadequate collections, it is difficult to know the extent of the native range, or if some of the outlying stations represent introductions.

The *Sensitivæ* (fig. 5), although widespread in tropical America, especially in marshy situations on Recent lands, show greatest diversity along a line from Guatemala to southern Brazil. With the exception of one variety known only from southern Florida, all members of this series are found along this line. Perhaps this was the area of origin of the group, with migration to the present outlying locations occurring in late Pleistocene and Recent time.

The *Indicæ* (fig. 6) are the most widespread. The group extends to both the northern and southern extremes of latitude of the genus'

range in America. The distribution is predominantly coastal, in some cases estuarine, but also inland in swamps or along streams. Relatively few individuals are found in pastures or open woods. In spite of the widespread range of the group as a whole, several of the individual species are definitely localized. For example, one species is known to occur only in estuarine situations between Philadelphia, Pa., and southern Virginia. Another seems to be restricted to northern Argentina. Those taxa more widely ranging tend to be more variable and to intergrade with their neighbors. This is an extremely complex and apparently recent group.

Members of the section *Ochopodium* fall into two groups. One group includes the shrubby species, which compose the series *Pleuronerviae* (fig. 8) and *Scopariae* (fig. 9). They are mesic to subxeric, and are known almost exclusively from older lands, areas which have had a continuous history above sea level since Cretaceous time. Such areas include the Sierras of México and of northern Central America, the massifs of Hispaniola, the Sierra Maestra of Cuba, the Andes from Colombia to Perú, and the highlands of the Guianas and Brazil.

The members of the *Pleuronerviae* are found chiefly from Baja California, Cuba, and Hispaniola to the highlands of Brazil, with relatively little migration to younger areas having taken place. The majority of the species have extremely limited ranges. The *Scopariae* are found from Baja California and the western Sierra Madre of México southward in the mountain areas to Perú, with outliers in the Guiana and Brazilian highlands.

The distribution patterns of these two series are discontinuous. In many cases, what appear to be closely related species are widely separated by areas of erosion, submergence, or uplift. For example, the Amazon river system separates the Andes and the Brazilian and Guiana highlands. Baja California is separated from the Mexican mainland by the trough of the Gulf of California. What are most perplexing are the wide separations in which one of a pair of related species is in southern Brazil and the other in México, or Hispaniola. With the information available to date, it is impossible to know if parallel development is involved or if we are dealing with relicts.

The other group of the section *Ochopodium*, consisting of members of the series *Viscidulae* (fig. 7), is somewhat intermediate in habit and habitat and includes herbaceous perennials, essentially mesophytes. Some of these are found on moist beaches or in sandy pine barrens, others in more or less open thickets, on rocky hillsides, and in pastures. As a group, they seem not to be restricted to lands of any particular age, but some species seem to be distributed predominantly on young lands, others at the margins of older areas.

Distribution data presented in connection with the species descriptions point out exceptions, as well as conformity, to the résumés given above. The distribution patterns are obscured, in some cases, by hydrophytes which can withstand drought and by a few mesophytes which are able to survive periodic inundations or drought. Some patterns have been altered by erosion and diastrophism. Obviously, there has been considerable biotic interference—grazing, burning, and cultivation. Migration apparently has been facilitated by hurricanes and transport of ballast, cattle, and fodder. It is probably more than coincidence that a number of outlying collections of otherwise intraneous species have been made at agricultural experiment stations.

Morphological characteristics

The genus *Aeschynomene* includes both herbaceous and shrubby species, annuals and perennials. The plants may be prostrate to erect, from a few centimeters long to treelike individuals as much as 8 m. tall. None are true vines.

The roots commonly bear bacterial nodules, typical of the family. Usually there is a well developed primary root. In some species the secondary roots form a fibrous mat, especially in sandy soils where the water table is near the surface of the ground. In many of the marsh plants, the roots and lower stems are thickened by aerenchyma tissue.

The stems are essentially terete and finely striate. In some species of the section *Ochopodium*, the young stems are somewhat angular. The surface may be glabrous to densely pubescent, with or without glandular hairs. The shrubby species usually develop gray or brownish bark as they mature.

The stipules are paired and may be persistent or caducous. In the American species of the section *Aeschynomene* they are peltate, appendiculate below the point of attachment. In the section *Ochopodium* they are attached at the base and are not appendiculate. In several species, *Ae. egena* and *Ae. tenuis*, for example, the stipules are obliquely subcordate at the base, suggesting a tendency toward development of an appendage.

Pubescence is basically of two kinds, simple trichomes and multicellular, bulbous-based glandular hairs. One or both kinds may be present. The glandular hairs range from colorless to golden, and may be as much as 3–4 mm. long. The simple pubescence is white or cinereous, appressed to patent, sometimes crispate, the hairs about 1 mm. long, or less. The indument usually appears on very young organs, although glandular hairs, in some cases, do not develop until the plant is nearly mature. In other cases the glandular hairs appear

early and then drop off, leaving only basal scars. Both kinds of pubescence occur in the section *Ochopodium*, but only glandular hairs, well developed or merely incipient, are found in the American § *Aeschynomene*. Verrucose and muricate excrescences that are found on fruits of many species appear to be tissue growth related to abortive glandular development.

The inflorescences are axillary and in some species also terminal. They are basically racemose, sometimes paniculate, sometimes fasciculate, or, rarely, the flowers are solitary. The axis may be straight or flexuose. Bracts and bracteoles, the latter paired and immediately subtending the calyx, are more or less stipule-like and intergrading with them, but are mostly smaller and not appendaged. The peduncles and pedicels are glabrous to pubescent, usually with somewhat more glandular development than the vegetative stems.

The flowers are 5-merous. The calyx, commonly persistent, is bilabiate in the § *Aeschynomene*, the vexillar lip (i. e., opposite the standard petal) 2-parted, the carinal lip (opposite the keel petals) 3-parted. In the section *Ochopodium*, the calyx is campanulate, with five subequal lobes, the carinal lobe frequently slightly longer and narrower than the others.

The corolla is papilionaceous, yellowish, ranging from nearly white to buff or orange, striped, or sometimes completely suffused with red or purple. The color variation appears to be principally environmental, the basic yellow color tempered by anthocyanin.

The petals are commonly clawed; only in a few species are the standards found to be unclawed. The standard blades are variously orbiculate, ovate, cordate, or reniform. They may be entire or ciliolate with bulbous-based glandular hairs. The apex occasionally is retuse or emarginate. In the American § *Aeschynomene* all the petals are glabrous, exclusive of marginal cilia. In the section *Ochopodium*, the standard, with very few exceptions, is pubescent on the outer face, but the wings and keel are glabrous. The wings are about as long as the standard, the blades obliquely spatulate, uniauriculate at the base, the claws attenuate. The keel petals also are approximately as long as the standard, but are falcate, slightly curved or, more often, bent at a 60–90° angle; they are sometimes moderately rostrate.

The leaves are pinnately compound, 5- to about 80-foliolate, odd or even numbered, the leaflets alternate or subopposite. The petioles are about as long as the leaflets, ranging from about 2–40 mm. in length. A positive correlation seems to exist between the lengths of these two leaf parts. In most species the leaf rachis terminates in a mucro, but in a few species of the section *Ochopodium* there are terminal leaflets.

The leaflets are subsessile, pulvinate, sensitive to light and, in most cases, to touch. They are relatively small, the smallest scarcely 2 mm. long and less than 1 mm. wide, the largest about 40 mm. long and 20 mm. wide. All are glabrous in the section *Aeschynomene*, but they may be glabrous to sericeous in the section *Ochopodium*. Most species are minutely glandular-punctate. Margins in either section may be entire or serrulate-denticulate with tuberculate-based glandular hairs. The apex is almost invariably mucronate or mucronulate, and may be retuse, obtuse, or acute. The base may be subcordate to cuneate but commonly is obliquely rounded. Venation is 1-costate in all species except those of the series *Americanæ*, which appear to be 2- to several-costate. The single costa may vary from central in some species to marginal in others. The secondary venation is prominent or obscure, pinnate or reticulate. The leaflets are conduplicate in the bud, except those of marginally costate species in which only half of the blade develops.

The 10 stamens are essentially diadelphous, 5:5. All the filaments are free from about midlength to apex, but below that are united to form a sheath. By anthesis, this sheath splits longitudinally along the lower, or carinal, side. There also is a tendency toward splitting along the upper, or vexillar, side, which results in two phalanges of five stamens each. This occurs commonly in the § *Aeschynomene*, but in the species of the *Ochopodium* group it frequently is delayed, or merely incipient, sometimes the opening forming only at the base. The anthers are dorsifixed, sometimes nearly basifixed. The pollen grains are ellipsoidal, tricolpate, but otherwise unmarked.

The ovaries are 2-18-ovulate or, rarely, 1-ovulate. They are sessile or short-stipitate, glabrous to pubescent, the hairs simple or glandular. The style is glabrous, flexible, about as long as the ovary, the base usually persisting as a cuspidate apex to the fruit. The terminal, stigmatic surface is minutely capitate or penicellate.

The fruits are (1-) 2-18-articulate loment, subsessile to long-stipitate, laterally compressed, sometimes torulose. They may be glabrous to densely pubescent, indehiscent or dehiscent along the lower, or carinal, suture. The margin sometimes separates from the body of the articles. In certain species, especially in the series *Americanæ*, there is a tendency for articulation to fail. Usually the basal article is continuous with the stipe, and the first dehiscence occurs between the basal article and the second article. In some cases, the basal ovule aborts and appears to be part of the stipe, with the dehiscence seeming to occur at the base of the first article. Fruit indument, if present, is composed, in the § *Aeschynomene*, entirely of glandular hairs or, in certain members of the series *Americanæ*, of a puberulence which appears to be incipient glandular hairs. In the

section *Ochopodium*, glandular hairs may be present and also there may be simple pubescence of crispate, spreading, or appressed hairs. There is some variability of pubescence, but in general there is specific constancy.

The seeds are reniform, smooth, sublustrous, light brown to black, with a nearly circular hilum. Martin (Amer. Midl. Nat. 36:513–660. 1946), in a study of internal morphology, found the seeds of *Ae. virginica* to have an axile, slightly bent embryo, some endosperm, and fleshy cotyledons. The development of the embryo of *Ae. indica* has been described by Rau (New Phyt. 50:124–126. 1951).

Histological studies of the Argentine species of *Aeschynomene* have been made by Manganaro (Revista del Museo de la Plata, 27:17–252. 1923).

According to Kawakami (Bot. Mag. Tokyo, 44:319–328. 1930), *Ae. indica* has a chromosome count of $n=20$. Information on other species of *Aeschynomene* is lacking to date. The basic numbers for members of the Hedysareae have been reported by Kawakami (loc. cit.), Darlington and Janaki Ammal (Chromosome Atlas of Cultivated Plants. 1945), and Senn (Biblio. Genetica 12:175–336. 1938) as 7, 8, 9, 10, 11, and 12.

Taxonomic position

Aeschynomene is a genus of the Leguminosae, subfamily Lotoideae (see Rehder, Journ. Arn. Arb. 26:477. 1945), tribe Hedysareae, subtribe Aeschynomeninae.

The tribe Hedysareae—characterized by lomentis, fruits which break at maturity into 1-seeded articles—has been further divided by Taubert (in Engler and Prantl, Die Natürlichen Pflanzenfamilien, 3(3): 309. 1894) into subtribes, with *Aeschynomene* as the typical genus of the Aeschynomeninae. This division was based primarily on the arrangement of the 10 stamens, the filaments being united, separate, or united in part. For example, the Euhedysarinae have a free vexillar stamen, with the remaining nine united into a sheath, or tube. In the Patagoniinae, all the stamens are free except at the base. In the Stylosanthinae, all are united to form a tube.

The Aeschynomeninae are characterized by stamens which are essentially diadelphous, 5:5. The filaments form a tube which tends to split to form two phalanges of five stamens each. The splitting may occur by anthesis, or it may be delayed, or one side only splits open. Whether the break occurs along the carinal or vexillar side, or both, has been used somewhat as a key character, but it is not completely reliable.

The genera in addition to *Aeschynomene* that Taubert placed in the subtribe Aeschynomeninae include: *Nissolia*, *Chaetocalyx*, *Pictetia*,

Brya, *Poiretia*, *Amicia*, *Isodesmia*, *Diphaca*, *Cyclocarpa*, *Soemmeringia*, *Smithia*, *Geissaspis*, and *Discolobium*. Subsequently, five more genera have been described: *Raimondianthus*, *Fiebrigiella*, *Weberbauerella*, *Climacorachis*, and *Balisaea*. In the present paper *Climacorachis* is being reduced to synonymy within the genus *Aeschynomene*.

Taubert separated *Aeschynomene* from the other genera of the subtribe on the basis of such characters as: plants usually herbaceous, seldom shrubs, never vines; bracts small, never concealing the flowers; standard deciduous after flowering, in contrast to the persistent standard of *Soemmeringia*; staminal tube opening along the carinal side, or along the carinal and the vexillar side—in contrast to others which open only along the vexillar side, or remain closed; legumes straight or somewhat curved, not spiral, much longer than the calyx, rather than concealed as in *Smithia*.

Unfortunately, Taubert's key is rather out of date. Not only have new genera been added to the subtribe, but new species have been discovered which, in a number of cases, are exceptions to the genera as previously understood. For example, the numerous shrubby Mexican and Andean species that have been described since the publication of Taubert's work in 1892 belie the statement: "Krauter, selten Sträucher."

Systematic treatment

Aeschynomene

Aeschynomene L. Sp. Pl. 713. 1753, Gen. Pl. ed. 5. 319. 1754.

Gajati Rumph. ex Adans. Fam. 2: 328. 1763.

Macromiscus Turcz. Bull. Soc. Nat. Mosc. 19 (2): 507. 1846.

Ctenodon Baill. Adansonia 9: 236. 1870.

Secula Small, Fl. Miami 90, 200. 1913.

Climacorachis Hemsl. & Rose, Contr. U. S. Nat. Herb. 8:43. 1903.

Herbs to shrubs or small trees; leaves pinnately compound, 5–80-foliolate; stipules peltate, appendiculate below the point of attachment or attached at base, not appendiculate; inflorescences racemose, sometimes paniculate, terminal or axillary; flowers yellowish to red or purplish; calyx and corolla 5-merous; stamens 10, the filaments united into a sheath, open on the carinal side and, in some species, open also on the vexillar side, forming two phalanges of 5 stamens each; fruit a loment, (1–) 2–18-articulate; seeds reniform, light brown to black, smooth, sublustrous, the hilum circular.

The type of the genus is *Aeschynomene aspera* L., a native of India not known to occur in America. Apparently this taxon alone was the basis of the genus, since it is the only one cited in the first four editions of Linnaeus' "Genera Plantarum." It was not until the publication

of the first edition of his "Species Plantarum" (1753) that additional taxa appeared, with the original one given the trivial, or specific, name of *aspera*.

Vogel's division of the genus into two sections is being retained in this paper. In addition, it is believed that further subdivision into species groups, or series, is desirable. Baker (The Leguminosae of Tropical Africa. 1929) placed the species of *Aeschynomene* in series in his key but did not give the series names, descriptions, or typification. Bentham (Flora Brasiliensis 15(1): 1859) suggests species groups by his arrangement in the key, which are compatible with the present treatment.

Five series are recognized here in the section *Aeschynomene* and three in the section *Ochopodium*.

Key to sections and series

- Stipules peltate, appendiculate below the point of attachment; calyx bilabiate, the vexillar lip 2-merous, the carinal lip 3-merous . . . Section I. **Aeschynomene**
 Leaflets 2-several-costate Series 1. **Americanae**
 Leaflets 1-costate.
 Costa obviously excentric Series 2. **Fluminenses**
 Costa essentially central.
 Carinal lip of calyx deeply 3-lobed Series 3. **Montevidenses**
 Carinal lip of calyx entire or shallowly indented.
 Fruit, and often the vegetative parts, blackening on drying; calyx lips entire or nearly so Series 4. **Sensitivae**
 Fruit and vegetative parts turning brown or straw-colored on drying, or remaining green; calyx lips definitely indented Series 5. **Indicae**
 Stipules attached at base, not peltate; calyx campanulate, with five subequal lobes.
 Section II. **Ochopodium**
 Stems prostrate to suberect, herbaceous, rarely suffrutescent; leaflets preponderately obovate; fruits small, the articles 2-5.5 mm. in diameter.
 Series 6. **Viscidulae**
 Stems erect, woody or suffrutescent; leaflets ovate or suborbiculate to oblong or falcate; fruits with articles usually 6-15 mm. long and 4-9 mm. wide, rarely smaller.
 Leaflets oblique, ovate to falcate-oblong, the costa excentric, sometimes marginal; plants virgate or, if shrubby, the costa marginal.
 Series 7. **Pleuronerviae**
 Leaflets essentially symmetrical, suborbiculate to oblong, the costa central; plants mostly shrubby, sometimes suffrutescent . . . Series 8. **Scopariae**

Key to species and varieties

Section I. *Aeschynomene*

Series 1. *Americanae*

- Bracts flabellate (México to Honduras) . . . 1c. *Ae. americana* var. *flabellata*
 Bracts lanceolate to cordate, acute to acuminate.

Ovary and fruit glabrous to puberulent, sometimes with sparse development of glandular hairs, the mature fruit reticulate-veiny near the margins, usually muricate at the center of the articles, definitely articulated.

Fruit glabrous, or with only a slight tendency toward development of puberulence or glandular hairs (chiefly Caribbean and adjacent areas).

1a. *Ae. americana* var. *americana*

Fruit invested with puberulence or a few glandular hairs, or sometimes both (chiefly Caribbean and adjacent areas).

1b. *Ae. americana* var. *glandulosa*

Ovary villous; fruit hispid with yellow glandular hairs about 1 mm. long, the tuberculate bases usually dark; surface of fruit lacking conspicuous venation or murication; articulation between the seeds often weak or lacking. Flowers 10–15 mm. long, the calyx 6–8 mm. long (México: Sinaloa to Guerrero) 2. *Ae. unijuga*

Flowers less than 10 mm. long, the calyx less than 6 mm. long.

Fruit 5–7 mm. wide, the margins essentially entire, articulations mostly lacking (Guatemala) 3. *Ae. guatemalensis*

Fruit less than 5 mm. wide with one margin indented between the seeds, except in very short fruits, the other margin essentially entire; articulations usually distinct, sometimes lacking.

Articulations of fruit lacking or with only an occasional suture forming (México: Jalisco to Michoacán) 4c. *Ae. villosa* var. *mexicana*

Articulations of fruit distinct or with only an occasional suture lacking.

Inflorescences scarcely half as long as the leaves, fasciculate; leaflets mostly 10–15 mm. long; flowers 6–9 mm. long (México to Venezuela) 4b. *Ae. villosa* var. *longifolia*

Inflorescences about as long as the leaves or longer; leaflets usually less than 10 mm. long.

Flowers 3–5 mm. long; leaflets usually about 5 mm. long, or less (Arizona to northern South America and the Caribbean area) 4a. *Ae. villosa* var. *villosa*

Flowers 6–8 mm. long; leaflets mostly more than 5 mm. long (chiefly Caribbean and adjacent areas).

1b. *Ae. americana* var. *glandulosa*

Series 2. *Fluminenses*

Flowers 3–4 mm. long; fruit commonly 2-articulate, 2.5–3 mm. wide (central South America) 5. *Ae. parviflora*

Flowers 7–10 mm. long; fruit commonly 6–8-articulate, 4 mm. wide.

Fruit hispid (South America; Antilles) 6a. *Ae. fluminensis* var. *fluminensis*

Fruit glabrous (Cuba) 6b. *Ae. fluminensis* var. *tuberculata*

Series 3. *Montevidenses*

Fruit 2.5–4 mm. wide, the articles about 3–6 mm. long; flowers 4–12 mm. long.

Flowers 4–6 mm. long; fruit commonly 2-articulate, the stipe 7–10 mm. long (South America; Cuba; British Honduras) 7. *Ae. filosa*

Flowers (6–)8–12 mm. long; fruit commonly 3–5-articulate, the stipe 10–12 mm. long (British Guiana ? and eastern Brazil) 8. *Ae. rostrata*

Fruit about 5 mm. wide, the articles 6–7 mm. long; flowers 13–25 mm. long.

Bracts 10–15 mm. long, 8–10 mm. wide; flowers 20–25 mm. long; leaflets 10–15 mm. long, 4–5 mm. wide (central Paraguay) 9. *Ae. paraguayensis*

Bracts 5–7 mm. long, 3–4 mm. wide; flowers 13–18 mm. long; leaflets 1.5–10 mm. long, 1–3 mm. wide (South America in valley of the Río Paraná and surrounding regions) 10. *Ae. montevidensis*

Series 4. *Sensitivae*

Stipe and basal article of fruit separated by a suture; fruits submoniliform with both margins crenate.

Fruit with articles 7–8 mm. long, 5–6 mm. wide, the stipe 10–15 mm. long; flowers 10–12 mm. long (Florida) . . . 11a. *Ae. pratensis* var. *pratensis*

Fruit with articles 5–6 mm. long, 4–5 mm. wide, the stipe 8–10 mm. long; flowers 8–11 mm. long (chiefly Caribbean area; South America)

11b. *Ae. pratensis* var. *caribaea*

Stipe and basal article continuous, not separated by a suture; fruits with one margin essentially entire, the other entire or crenate.

Flowers 10–20 mm. long.

Fruit with stipe 12–15 mm. long, the articles about 9–10 mm. long, 6 mm. wide; flowers 14–20 mm. long (southern Brazil) 12. *Ae. selloi*

Fruit with stipe less than 12 mm. long, the articles about 5–6 mm. in diameter; flowers 10–14 mm. long (southern México to Nicaragua) . 13. *Ae. deamii*

Flowers 4–9 mm. long.

Fruits commonly 10–14-articulate; flowers 7–9 mm. long (upper Amazon region) 14c. *Ae. sensitiva* var. *amazonica*

Fruits commonly 5–8- (rarely 9- or 10-) articulate; flowers 4–9 mm. long.

Upper stems glabrous to moderately hispid (axes of leaves and inflorescences often hispid on otherwise glabrous specimens); flowers 4–6(–8) mm. long (widespread tropical America)

14a. *Ae. sensitiva* var. *sensitiva*

Upper stems densely glandular-hispid, often the epidermis scarcely visible, the lower stems often glabrate; flowers about 7–9 mm. long (Colombia) 14b. *Ae. sensitiva* var. *hispidula*

Series 5. *Indicae*

Stipe of fruit 12–30 mm. long.

Fruit 4 mm. wide or less (México to Perú; Brazil) 21. *Ae. scabra*

Fruit 4.5–7 mm. wide.

Flowers 10–15 mm. long; leaflets entire or rarely with a few cilia (Atlantic Coast: New Jersey to southern Virginia) 15. *Ae. virginica*

Flowers 16–20 mm. long; leaflets conspicuously denticulate-ciliate (central Paraguay) 23. *Ae. magna*

Stipe of mature fruit less than 12 mm. long.

Leaflets entire, rarely with a few cilia or denticulations.

Plant generally glabrous to sparsely hispid; flowers 4–10 (–11) mm. long.

Flowers 4–7 (–9) mm. long; fruit 2.5–3.5 mm. wide, the stipe 3–4 (–6) mm. long (chiefly Caribbean area and eastern South America) 17a. *Ae. evenia* var. *evenia*

Flowers 8–10(–11) mm. long; fruit 3–5 mm. wide, the stipe (4–) 6–10 mm. long.

Fruit 4–5 mm. wide, commonly 6–10-articulate (rarely 11- or 12-articulate), with one margin crenate, the other entire (southern U. S. coastal plain: North Carolina to Texas; Puerto Rico.) . 16. *Ae. indica*

Fruit 3–4 mm. wide, commonly 12–18-articulate, with both margins subentire (Ecuador; Perú) 18. *Ae. pluriarticulata*

Plant generally hispid; flowers 8–15 mm. long (if plants glabrous, the flowers 10–15 mm. long).

Fruit predominantly slender, 3–3.5 (4) mm. wide, and long-stipitate, the stipe (5–) 10–15 mm. long (some fruits with shorter stipes may also be present) (México to Perú; Brazil) 21. *Ae. scabra*

Fruit 4–7 mm. wide, the stipe 4–10 mm. long (relatively broad and short-stipitate, the occasional narrow-fruited specimens short-stipitate).

Leaflets mostly large, commonly 12–20 mm. long and 4 mm. wide, the largest 30 mm. long and 8 mm. wide; fruit hispid at maturity, not muricate; flowers 8–10 mm. long (widespread American tropics) 20. *Ae. ciliata*

Leaflets commonly 8–10 mm. long and 2–3 mm. wide, rarely as much as 15 mm. long; fruit sparsely hispid to glabrous, usually muricate at maturity; flowers (8–) 10–15 mm. long (widespread American tropics) 19. *Ae. rudis*

Leaflets obviously denticulate or serrulate-ciliate.

Fruit less than 4 mm. wide; flowers 5–6 (–8) mm. long or less (chiefly northern and eastern South America; Antilles; Texas).

17b. *Ae. evenia* var. *serrulata*

Fruit 4 mm. wide or more; flowers 8–15 mm. long.

Upper stems and fruit hispidulous with short hairs 1 mm. long or less (south-central South America) 22. *Ae. denticulata*

Upper stems, and usually fruit, hispid with long yellow hairs about 2–4 mm. long.

Leaflets commonly 12–20 mm. long and 4 mm. wide, the largest 30 mm. long and 8 mm. wide; fruit hispid at maturity, not muricate (widespread American tropics) 20. *Ae. ciliata*

Leaflets commonly 8–10 mm. long and 2–3 mm. wide; fruit sparsely hispid to glabrous at maturity, usually muricate (widespread American tropics) 19. *Ae. rudis*

Section II. *Ochopodium*

Series 6. *Viscidulae*

Fruit 2- or 3- (rarely 4- or 5-) articulate and short-stipitate, the stipe 1–5 mm. long (except in *Ae. acapulcensis*, sometimes 6–7 mm. long, but fruit 2- or 3-articulate).

Articles of fruit 3.5–5.5 mm. in diameter; leaves 5–9-foliolate, the leaflets obovate-cuneate.

Surface of articles densely white-tomentulose and also beset with glandular hairs, rarely eglandular or the terminal articles glabrous, the articles 3.5–4 mm. in diameter; stipe 1–3 mm. long (southern United States coast to northern South America) 24. *Ae. viscidula*

Surface of articles glabrous, the articles 4–5.5 mm. in diameter; stipe 4–5 (–7) mm. long (México) 25. *Ae. acapulcensis*

Articles of fruit 2–3 mm. in diameter; leaves 8–30-foliolate, the leaflets elliptic-obovate to oblong.

Surface of articles crisp-pubescent to subglabrous, and also beset with glandular hairs; stipe 3–4 (–5) mm. long, commonly hispidulous with hairs about 1 mm. long.

Fruit 2- or 3-articulate; leaves 8–12-foliolate (widespread American tropics) 26a. *Ae. brasiliana* var. *brasiliana*

Fruit 4- or 5-articulate; leaves 14–20-foliolate (Venezuela)

26b. *Ae. brasiliana* var. *venezolana*

- Surface of articles pubescent to glabrous but lacking glandular hairs; stipe 1.5–3 mm. long, hispid, the hairs 2–4 mm. long, concentrated at base of first article.
- Articles of fruit about 3 mm. in diameter; flowers 6–9 mm. long (Paraguay and eastward) 27. *Ae. echinus*
- Articles of fruit 2–2.5 mm. in diameter (or, rarely, 3 mm. long); flowers 5–7 mm. long.
- Leaflets 7–12 mm. long, 2–4 mm. wide; stipules 5–15 mm. long, (1–)2–3 mm. wide at base; stems suberect (México to South America).
- 28c. *Ae. histrix* var. *densiflora*
- Leaflets 4–6(–8) mm. long, 1.5–3 mm. wide; stipules 4–5 mm. long, about 1 mm. wide at base; stems usually prostrate.
- Articles of fruit glabrous to moderately crisp-puberulent; stems and leaves moderately pubescent, often glabrate; bracteoles about as long as calyx; flowers 5–6 mm. long (Central and South America).
- 28a. *Ae. histrix* var. *histrix*
- Articles of fruit pubescent, the hairs usually appressed; stems and leaves generally canescent; bracteoles about half as long as calyx; flowers 6–7 mm. long (Florida; Central and South America).
- 28b. *Ae. histrix* var. *incana*
- Fruit 5–9- (infrequently 3- or 4-) articulate and long-stipitate, the stipe commonly 8–15 mm. long (but a few fruits with shorter stipes may also be present; *Ae. podocarpa* and *Ae. warmingii* are below average in number of articles and length of stipe).
- Leaflets predominantly obovate, sometimes subelliptic.
- Articles of fruit 2–2.5 mm. in diameter; leaves commonly 10–16-foliolate (widespread American tropics) 29. *Ae. elegans*
- Articles of fruit 3–4 mm. long, 2.5–3.5 mm. wide; leaves 5–9(–10)-foliolate. Flowers 7–9 mm. long; fruit 6–8-articulate, the stipe 6–14 mm. long (South America) 30. *Ae. falcata*
- Flowers 5–6 mm. long; fruit 4–5-articulate, the stipe (4–)5–8 mm. long (Puerto Rico) 31. *Ae. portoricensis*
- Leaflets oblong to elliptic.
- Stipe of fruit 7–10 mm. long (Colombia; Brazil) 32. *Ae. foliolosa*
- Stipe of fruit 5–7 mm. long.
- Leaflets 3–10 mm. long, 1.5–4 mm. wide (Brazil) 33. *Ae. podocarpa*
- Leaflets 12–30 mm. long, 5–10 mm. wide (Brazil) 34. *Ae. warmingii*

Series 7. *Pleuronerviae*

- Costa of leaflet excentric but not marginal.
- Leaflets (6–)10–20 mm. long, (1.5–)2–7 mm. wide.
- Leaves 5–10-foliolate, the leaflets falcate-ovate, acute (Brazil)
35. *Ae. oroboides*
- Leaves about 20–60-foliolate, the leaflets oblong, obtuse to subacute.
- Inflorescences axillary, shorter than the subtending leaves; fruit 4–5 mm. wide (México to Venezuela) 36. *Ae. fascicularis*
- Inflorescences terminal, and also axillary, longer than the leaves; fruit 3–4 mm. wide.
- Leaflets 3–4 mm. wide, 8–14 mm. long, crisp-pubescent on both surfaces (Brazil) 37. *Ae. racemosa*

Leaflets 1.5–2.5(–3) mm. wide, 6–15 mm. long, appressed-pubescent to glabrous on both surfaces.

Flowers 6–7 mm. long, the calyx about 3 mm. long (Brazil).

38a. *Ae. marginata* var. *marginata*

Flowers 8–12 mm. long, the calyx 4–5 mm. long (Brazil)

38b. *Ae. marginata* var. *grandiflora*

Leaflets about 3–5 mm. long, 1–1.5(–2) mm. wide.

Fruit stipitate, the stipe 4–10 mm. long.

Flowers about 8 mm. long; fruit with stipe 10 mm. long, the articles about 4 mm. in diameter (Cuba) 39. *Ae. tenuis*

Flowers 6–6.5 mm. long; fruit with stipe 4–5 mm. long, the articles 2.5–3.5 mm. in diameter (widespread in Central and tropical South America) 40. *Ae. paniculata*

Fruit sessile, the stipe about 2 mm. long or less. Leaves about 1.5–2.5 cm. long, 15–24-foliolate (eastern Brazil) 41. *Ae. leptostachya*

Leaves about 3–7 cm. long, 20–80-foliolate.

Stipe of fruit about 2 mm. long; flowers 8–10 mm. long (eastern Brazil).

42. *Ae. brevipes*

Stipe of fruit scarcely 1 mm. long; flowers 6–8 mm. long (México).

43. *Ae. pinetorum*

Costa of leaflet marginal.

Flowers less than 10 mm. long; articles of fruit subelliptic to oblong, the length 1.5–2 times the width.

Pubescence subappressed; stipe of fruit 2 mm. long or less (eastern México).

44. *Ae. purpusii*

Pubescence spreading; stipe of fruit 3 mm. long or more (Honduras).

45. *Ae. standleyi*

Flowers about 10 mm. long or longer; articles of fruit suborbiculate.

Stems and leaves silvery-sericeous (Baja California) 46. *Ae. nivea*

Stems and leaves pubescent to glabrate, but less than silvery when mature.

Bracteoles about as long as the calyx (southwestern México).

47. *Ae. compacta*

Bracteoles about half as long as the calyx.

Fruit appressed-pubescent, the stipe 4–5 mm. long (Hispaniola).

48. *Ae. pleuronervia*

Fruit with short, spreading pubescence, sessile (Brazil).

49. *Ae. paucifolia*

Series 8. *Scopariae*

(Mexican and Central American Species)

Flowers 4–7(–8)mm. long, chiefly in many-flowered, terminal panicles, usually with axillary inflorescences also present.

Leaves about 40–80-foliolate, the leaflets consistently narrow, oblong (México: Sinaloa to Colima) 50. *Ae. amorphoides*

Leaves 5–24-foliolate, the leaflets subelliptic to rhombic.

Fruit appressed-pubescent, the stipe 3–6 mm. long; standard glabrous; leaflets varied in shape and size, sometimes rhombic (México: Michoacán, México, Guerrero) 51. *Ae. paucifoliolata*

Fruit crisp- or patent-pubescent, the stipe 6–7 mm. long; standard pubescent on outer face; leaflets consistently subelliptic (México: Michoacán, Morelos, Guerrero) 59b. *Ae. petraea* var. *madrensis*

Flowers 8–20 mm. long, chiefly in few-flowered, axillary racemes.

Stipe of fruit 3 mm. long or less.

Leaflets subsericeous, elliptic-oblong to obovate (México: Baja California).

52. *Ae. vigil*

Leaflets subglabrous, oblong to subelliptic (México: Sinaloa) . 53. *Ae. rosei*

Stipe of fruit 4–15 mm. long.

Articles of fruit glabrous or nearly so, the margins somewhat pubescent in a few cases.

Standard petal glabrous; stipe of fruit 5–6 mm. long (México: Guerrero).

54. *Ae. palmeri*

Standard petal pubescent on the outer face; stipe of fruit 8–12 mm. long.

Fruit 2- or 3-articulate, the stipe 10–12 mm. long (México: Guerrero).

55. *Ae. hintonii*

Fruit commonly 5- or 6-articulate, the stipe 8–10 mm. long (México:

Guerrero) 56. *Ae. langlassei*

Articles of fruit pubescent, sometimes glabrate but the young fruit obviously pubescent.

Fruit appressed-pubescent.

Stipules linear, acuminate, 6–10 mm. long, 1 mm. wide or less; leaflets predominantly oblong-obovate, often as much as 20–35 mm. long (Guatemala to Nicaragua) 57. *Ae. nicaraguensis*

Stipules obliquely ovate, acute, about 5 mm. long, 1.5–3 mm. wide; leaflets orbiculate to oblong, about 15 mm. long or less (México: Sinaloa, Nayarit) 58. *Ae. simulans*

Fruit crisp-pubescent.

Stipe of fruit 8–15 mm. long; flowers 10–15 mm. long (México: Sinaloa, Durango, Nayarit, Jalisco) . . 59c. *Ae. petraea* var. *grandiflora*

Stipe of fruit 5–7 mm. long; flowers (6–) 8–10 mm. long.

Flowers 6–8 mm. long, the calyx 2–3 mm. long (México: Morelos, Michoacán, Guerrero) 59b. *Ae. petraea* var. *madrensis*

Flowers 8–10 mm. long, the calyx 3–4 mm. long (México: Jalisco, México, Colima) 59a. *Ae. petraea* var. *petraea*

(South American species)

Flowers about 20 mm. long (Perú) 60. *Ae. egena*

Flowers 15 mm. long or less.

Articles of fruit glabrous or nearly so, the margin somewhat pubescent in a few cases.

Leaflets 5 mm. wide or less.

Standard glabrous (British Guiana; Brazil) 61. *Ae. interrupta*

Standard pubescent.

Flowers about 10 mm. long; leaves 4–6 cm. long, the leaflets 5–20 mm. long, 3–5 mm. wide (Ecuador; Perú) 62. *Ae. tumbezensis*

Flowers 11–14 mm. long; leaves 1.5–2.5 cm. long, the leaflets 5–8 mm. long, 1.5–2 mm. wide (Brazil) 63. *Ae. martii*

Leaflets predominantly 6–10 mm. wide, with larger or smaller leaflets also present in some cases (Brazil) 64. *Ae. riedeliana*

Articles of fruit pubescent, sometimes glabrate but the young fruit obviously pubescent.

Leaflets 8 mm. long or less, commonly 5–6 mm. long.

Glandular hairs conspicuously present on blades of leaflets (Perú).

65. *Ae. weberbaueri*

Glandular hairs lacking on blades of leaflets (Ecuador; Perú).

66. *Ae. scoparia*

Leaflets predominantly 8–20 mm. long.

Flowers 11–15 mm. long; bracteoles lanceolate, attenuate; fruits (3–) 4–7-articulate (Colombia; Perú; Brazil; Paraguay).

67a. *Ae. mollicula* var. *mollicula*

Flowers 8–10 mm. long; bracteoles ovate, acute; fruits commonly 3-articulate, rarely more.

Stems densely pilose, exclusive of glandular hairs; fruits crisp-pubescent, scarcely glabrescent (Colombia).

67b. *Ae. mollicula* var. *breviflora*

Stems subglabrous to moderately pubescent, exclusive of glandular hairs; fruits subglabrous at maturity (eastern Brazil).

67c. *Ae. mollicula* var. *benthamii*

Section I. *Aeschynomene*

Aeschynomene section *Eu-aeschynomene* Vog. *Linnaea* 12: 81. 1838.

Herbs and shrubs, predominantly hydrophytes; indument, if present, of glandular hairs; stems erect to prostrate; stipules peltate, appendiculate below the point of attachment; leaves about 10–80-foliolate; leaflets more or less oblong, glabrous except for marginal glandular hairs in some species; inflorescences axillary, racemose; calyx obviously bilabiate, the vexillar lip 2-merous, the carinal lip 3-merous; petals sometimes ciliate, otherwise glabrous; seeds dark brown to black.

Aeschynomene aspera L., as type of the genus, automatically becomes the type of section *Aeschynomene*. It was not included in Vogel's original treatment of his section *Eu-aeschynomene*, which was based wholly on Brazilian material.

The description given above pertains to the American species of the section. Several African species, including *Ae. aspera*, while conforming in most characters, exhibit development of glandular hairs on petal surfaces; and a number of the African species with calyxes bilabiate as in the § *Aeschynomene* have unappendaged stipules similar to those of the section *Ochopodium*.

Vogel's designation for this section, *Eu-aeschynomene*, has been corrected to *Aeschynomene* in accordance with the rule, adopted by the Nomenclature Section of the International Botanical Congress held in Paris in 1954, that names of sections of genera containing the type-species should bear the generic name unaltered and that epithets of subdivisions of genera formed by attaching the prefix *Eu-* to the generic name are to be rejected (Stafleu, *Taxon* 3: 63. 1954).

Léonard, in his treatment of *Aeschynomene* of the Belgian Congo (Bull. Jard. Bot. État. Brux. 24: 63. 1954), has cited this taxon as a subgenus rather than as a section.

Series I. *Americanae* Rudd, ser. nov.

Herbae nonnunquam fruticosae, erectae vel prostratae; stipulae infra insertionem productae, striatae, attenuatae, basi eroso-truncatae vel attenuatae; foliola lineari-oblonga, subfalcata, 2-pluri-costata, saepe serrato-ciliata; bracteae bracteolaeque striatae; calyx bilabiatus, labio inferiore semi-trifido et labio superiore emarginato; legumen subsessile, margine inferiore recto, margine superiore crenato vel raro recto.

Herbs, erect to prostrate, sometimes suffrutescent; stipules appendiculate below the point of attachment, striate, the upper portion attenuate, about twice as long as the erose-truncate, or attenuate, lower portion; leaflets linear-oblong, subfalcate, 2-several-costate, the apex and margins usually serrate-ciliate; bracts and bracteoles striate; calyx with emarginate vexillar lip and tridentate carinal lip; fruit subsessile, the stipe glabrous, about 1-2 mm. long, the upper margin entire, the lower crenate or, rarely, entire.

Aeschynomene americana L. is designated as the type of this series.

The genus *Climacorachis* is here transferred to synonymy under *Aeschynomene* and its members included in the series *Americanae*. The three published species are being retained as three separate taxa, two of specific rank, the third reduced to a variety of *Ae. villosa* Poir. The group is unstable. In some individuals there is complete lack of articulation between the seeds; in others, just a well developed tendency, with indentation occurring, but not complete separation into articles. In a few individuals there is essentially normal articulation. There appears to be intergradation to *Ae. villosa* and *Ae. americana*, and, for that reason, maintaining the genus *Climacorachis* does not seem feasible. Morton (Contr. U. S. Nat. Herb. 29:87-116. 1945) has pointed out that the unjointed fruit character would put "the genus out of the tribe Hedysareae. However, it seems likely that it will be found to be an abnormality of some sort, because in other characters the plants are so near to *Aeschynomene americana* as to be scarcely if at all distinguishable."

Jones' reduction of *Climacorachis* to *Mimosa* (Extr. Contr. West. Bot. 18:20-85. 1933) was because "the body of the pod separates from the rim as in *Mimosa*." He believed that "*Climacorachis* Hemsl. & Rose is not distinct enough from the *pubica-pusilla* section of *Mimosa*," apparently ignoring the fact that *Climacorachis* with its papilionaceous flower was not a member of the Mimosoideae.

The frequently flexuous nature of the flowering branches, basis of the name *Climacorachis*, is not uncommon in *Aeschynomene*, and thus is not sufficient grounds for generic segregation.

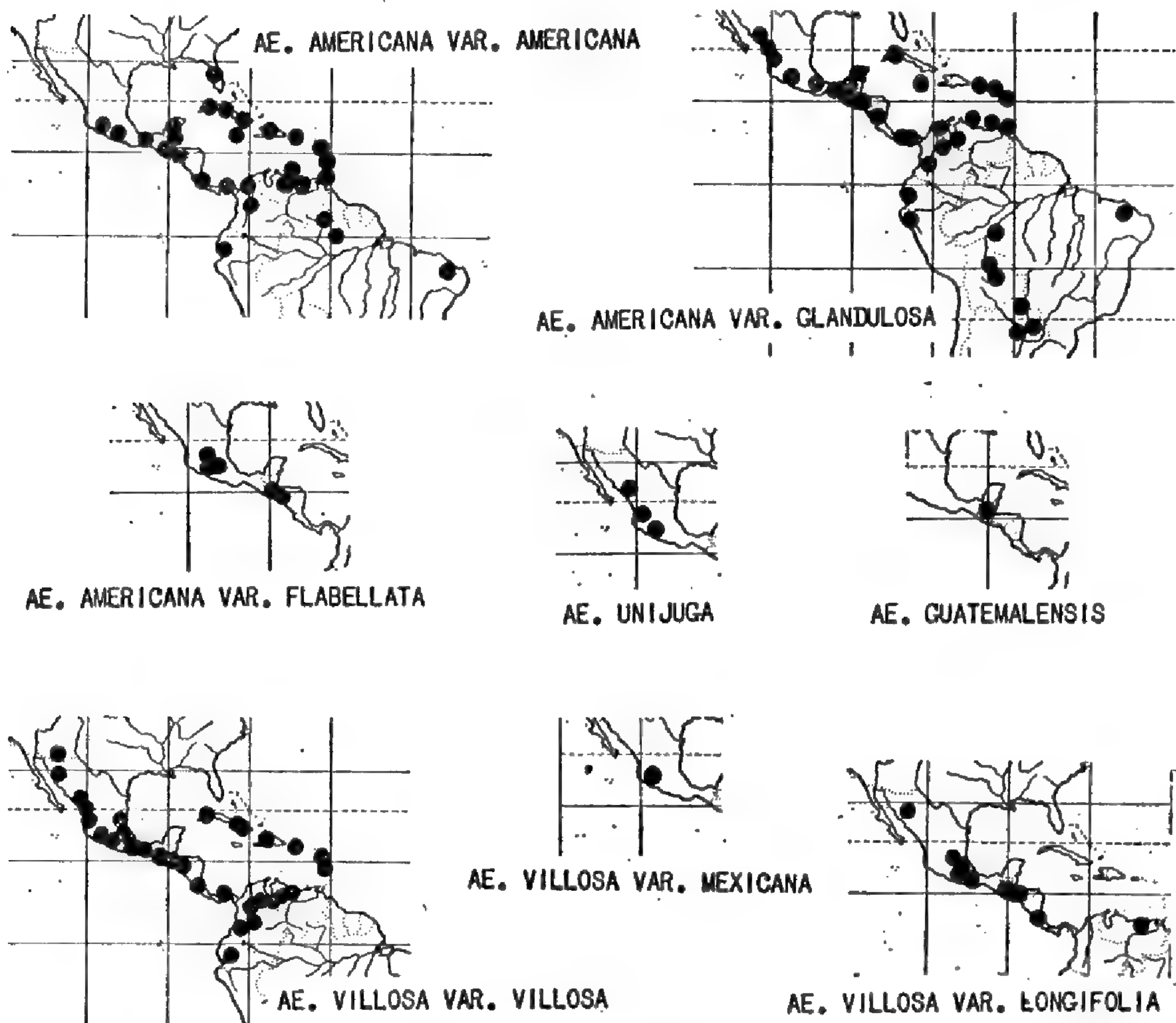


FIGURE 2. Distribution of the *Americanae*.

1. *Aeschynomene americana* L. Sp. Pl. 713. 1753.

Stem to about 2 m. high, usually erect, sometimes weakly so, subglabrous to hispid; stipules glabrous or somewhat hispid at the point of attachment, (5-)10-25 mm. long, 1-4 mm. wide, usually ciliate; leaves 2-7 cm. long, 20-60-foliolate; leaflets 4-15 mm. long, 1-2 mm. wide; inflorescences few-flowered, about as long as the subtending leaves or longer, the axes sometimes flexuous, hispidulous; bracts cordate, acuminate or sometimes truncate-flabelliform, about 2-4 mm. long, 2-3 mm. wide, glabrous, ciliate; bracteoles linear to linear-ovate, 2-4 mm. long, 1-1.5 mm. wide, acute to acuminate, glabrous, serrate-ciliate; flowers 5-10 mm. long; calyx 3-6 mm. long, glabrous to sparsely hispid; petals commonly 5-10 mm. long, clawed, the standard suborbiculate to broadly obcordate, 5-10 mm. wide, often ciliate at the apex, otherwise entire, the wing blades obliquely oblong, 5-8 mm. long, 2 mm. wide, entire or with a few cilia at the apex, the keel blades 4-5 mm. long, 2.5-3.5 mm. wide at the maximum; stamens about 6-8 mm. long; fruit 3-9- (commonly 6-8-) articulate, the articles 2.5-5 mm. wide, 3-6 mm. long, glabrous to puberulent, sometimes with development of glandular hairs on the surface or along the margins,

often verrucose when fully mature, the margins thickened, the venation prominent along the margins; seeds 2–3 mm. long, 1.5–2 mm. wide, dark brown.

1a. *Aeschynomene americana* var. *americana*.

Aeschynomene americana L. Sp. Pl. 713. 1753.

? *Aeschynomene mexicana* Birolì ex Colla, Herb. Pedem. 2: 195. 1834.

Aeschynomene americana var. *depila* Millsp. Field Mus. Publ. Bot. 1: 363. 1898.

Aeschynomene tricholoma Standl. & Steyerl. Field Mus. Publ. Bot. 23: 10. 1943.

The typical variety is characterized by fruits which are glabrous or have only a slight tendency toward development of puberulence or glandular hairs on the surface or along the margins. The stipules are glabrous or nearly so. The bracts are cordate. The flowers commonly are 6–8 mm. long.

TYPE LOCALITY: Jamaica, B. W. I. Type collected by Sloane.

DISTRIBUTION: Predominantly Caribbean and adjacent areas, in wet or moist places at elevations up to about 1,200 m. (fig. 2).

UNITED STATES: FLORIDA: Orange County: Orlando, *Mulvania*, Oct. 1930 (US). Osceola County: St. Cloud, *Mulvania*, Oct. 1930 (NY). Polk County: Loughman, *West*, Nov. 1932 (NY).

MÉXICO: COLIMA: Manzanillo, *Edw. Palmer* 901, in 1890 (Mo, US). GUERRERO: Manchón, *Hinton* 9668 (GH, US). El Calabazal, *Langlassé* 476 (GH, US). OAXACA: Chiltepec, *Martinez-Calderón* 550 (GH, US). CHIAPAS: Between Tuxtla and San Cristóbal, *Nelson* 3116 (GH, US). YUCATÁN: Izamal, *Gaumer* 955 in part (Ch, type of *Ae. americana* var. *depila*, GH, Mo, NY, UC, US). San Anselmo *Gaumer* 2093 (Ch, GH, Mo). Chichankanab, *Gaumer* 2094 (Ch, UC, US).

GUATEMALA: *Heyde* 311 (US). CHIQUIMULA: Between Zacapa and Chiquimula, *Standley* 73714 (Ch, type of *Ae. tricholoma*). Between Ramírez and Cumbre de Chiquimula, *Standley* 74552 (Ch, US). SANTA ROSA: Cerro Redondo, *Heyde & Lux* 6103 in part (Ch, Mo). Guazacapán, *Standley* 79482 (Ch). El Molino, *Standley* 60712 (Ch). La Morenita, *Standley* 78888 (Ch). JUTIAPA: Jutiapa, *Standley* 75481 (Ch). El Tablón, *Standley* 75840 (Ch), 75855 (Ch).

BRITISH HONDURAS: COROZAL: San Antonio, *Semple* 211 (US).

EL SALVADOR: *Renson* 11 (US). AHUACHAPÁN: *Padilla* 539 (US). SONSONATE: Armenia, *Standley* 23494 (GH, US). SAN SALVADOR: *Calderón* 1263 (GH, Mo, NY, US).

COSTA RICA: SAN JOSÉ: El General, *Skutch* 2955 in part (GH, Mo, NY, US). PUNTARENAS: Las Esquinas, *Allen* 6313 (US).

PANAMA: CANAL ZONE: Alajuela, *Killip* 3226 (US).

CUBA: PINAR DEL RÍO: Pinar del Río, *Shafer* 368 (NY). Herradura, *Britton, Britton, Earle, & Gager* 6335 (NY). Coloma, *C. Wright* 1560 in part (US). HABANA: Santiago de las Vegas, *Tracy*, Aug. 12, 1907 (Mo, UC); *van Hermann* 39 (Ch, NY), 39 bis (Ch), 224 (Ch, NY); *Baker*, Aug. 1904 (Ch, GH, US); *Hitchcock*, Mar. 20, 1906 (Ch). Mazorra, *Leon* 457 (NY). Rincón, *Britton & Wilson* 489 (NY). Madruga, *Britton, Britton, & Shafer* 744 (Ch, NY). Rancho Boyeros, *Shafer* 261 (NY). LAS VILLAS: Cieneguito, *Combs* 620 (Ch, GH, Mo, NY). Hanabanilla Falls, *Britton, Earle, & Wilson* 4876 (NY). ORIENTE: *C. Wright* 124 (NY). Cobre, *C. Wright* 124 (Mo). Nouvelle Sophie, *C. Wright* "124 or 125" (GH). Cristo, *Britton, Britton, Cowell, & Shafer* 12891 (NY). Río Canto, *Faris*, Oct. 3, 1925 (NY). Bayate, *Ekman* 2792 (Ch), 6455 (US).

HAITI: NORD-OUEST: Tortue Island, *Leonard & Leonard* 11376 (US), 11587 (NY, US), 14012 (GH, Mo, US). NORD: Bayeux, *Nash* 306 (NY). Pilate, *Leonard* 9606 (US). St. Michel de l'Atalaye, *Leonard* 7040 (Ch, US), 7294 (US), 7364 (UC, US), 7563 (GH, NY, US).

DOMINICAN REPUBLIC: "Sto. Domingo," *von Türckheim* 2561 (Ch, GH, Min, Mo, NY, US). SANTIAGO: Baitoa, *Jiménez* 1813 (US). SANTO DOMINGO: Ciudad Trujillo, *Allard* 13414 (US), 13443 (US), 13837 (US), 14159 (US). PUERTO PLATA: Yasica, *Jiménez* 1705 (US). ESPAILLAT: Moca, *Ekman* H-13178 (US).

JAMAICA: *N. Wilson* 173 (NY). Pleasant Hill to Buff Bay, *Orcutt* 3813 (GH, UC). Port Morant, *Hitchcock*, Dec. 20, 1890 (Mo). Constant Springs, *Hitchcock*, Dec. 10, 1890 (Mo). Lucia, *Hitchcock*, Jan. 3, 1891 (Mo.) Dolphin Head, *Britton* 2295 (NY). Port Antonio, *Hitchcock*, Dec. 1890-Jan. 1891 (Mo).

PUERTO RICO: SAN JUAN: Río Piedras, *Stevenson* 207 in part (Min, US); *Hioram*, Nov. 1912 (NY); *Wetmore* 165 (US). San Antonio, *Goll* 168 (NY, US). Santurce, *Heller* 6365 (Ch, GH, Mo, NY, US), *Heller & Heller* 234 (Ch, NY, US), 598 (Ch, NY, US). Lechería, on Río Piedras, *Goll* 15 (NY, US). Bayamón, *Stevenson* 380 (Min, US). AGUADILLA: Hatillo, *Sintenis* 5560 (Ch, Mo, NY, US). Guajataca, *Sargent* B 5 (US). MAYAGÜEZ: Las Mesas, *Holm*, Apr. 7, 1915 (NY). Quimada, *Goll* 928 (US). PONCE: Between Ponce and Adjuntas, *Heller* 6135 (Ch, GH, NY, Mo, US). Ponce, *Underwood & Griggs* 727 (US). Guaraguao, *Goll* 819 (US). Coamo, *Sintenis* 3064 (US). Between Aibonito and Coamo, *Sintenis* 1990 (UC), 2967 (US). GUAYAMA: Caguas, *Goll* 371 (US). HUMACAO: Vieques Island, *Shafer* 2527 (NY, US).

LESSER ANTILLES: VIRGIN ISLANDS: St. Thomas, *Eggers* 202 (GH), Aug. 1881 (US), July 1883 (NY), in 1887 (NY). GUADELOUPE: *Duss* 1063 in part (Mo, US); *Questel* 4468 (US), 5104 (US). MARTINIQUE: *Sieber (Kohaut)* in 1819-21 (Mo); *Bailey & Bailey* 253 (US), 293 (US); *Stehlé* 2153 (NY). ST. VINCENT: *H. H. & G. W. Smith* 642 (US). BARBADOS: St. John, *Gooding* 82 (NY). GRENADA: Lover's Lane, *Broadway*, Nov. 14, 1908 (GH). Saint Georges, *Broadway*, Jan. 16, 1905 (Ch. GH, NY, US).

CURAÇAO: Santa Cruz, *Britton & Shafer* 3015 (NY, US).

TRINIDAD: Belmont, *McLean*, in 1907 (NY). Manzanilla, *Britton & Britton* 2187 (GH, NY, US). Carapaichaima, *Broadway* 7527 (Mo, US). Las Lomas, *Broadway* 7842 (Mo).

VENEZUELA: MIRANDA: Petare, *Pittier* 11233 (US, Ven); *Ll. Williams* 10566 (Ch). DISTRITO FEDERAL: Sosa, *Tamayo* 766 (Ven). ARAGUA: Maracay, *Cornelio* 10 (US), 13 (NY, Ven); *Lasser* 857 (Ven), 880 (Ven); *Burkart* 16910. (US), 16960 (US). Colonia Tovar, *Fendler* 288 in part (Mo), 1779 (GH, Mo): COJEDES: San Carlos, *Burkart* 16260 (US); *Rudd* 433 (US, Ven). FALCÓN. Pueblo Nuevo, *Tamayo* 898 (US, Ven). LARA: Santa Rosa de Barquisimeto, *Saer* 374 (NY, Ven). Rastrojas, *Aristequieta & Pannier* 1078 (Ven).

COLOMBIA: ATLÁNTICO: Piojó, *Elias* 723 (US). Palmar de Varela, *Dugand* 3131 (US). BOLÍVAR: Turbaco, *Killip & Smith* 14188 (GH, NY, US). Arjona, *Killip & Smith* 14559 in part (Ch, US). Sincé, *Pennell* 3999 (NY). SANTANDER: Puerto Wilches, *Daniel* 1008 (US). ANTIOQUIA: Don Matías, *Barkley* 18.A.231 (US). Medellín, *Archer* 652 (US), 675 (US); *Barkley & Gutiérrez* 1752 (US).

ECUADOR: GUAYAS: Guayaquil, *Haenke* (R); *Asplund* 5692 (R, US).

BRAZIL: RIO BRANCO: Surumú, *Ule* 8156 (K, UC). AMAZONAS: Lago Feio, *Apody*, *Lofgren* 737 (R). CEARÁ: Serra de Baturité, *Eugenio* 686 (US).

LOCAL NAMES: Antejuela (El Salvador); pega pega (Panamá; Puerto Rico); ronté (Haiti); honteuse femelle (Martinique); cujicillo (Venezuela).

There has been some confusion as to the characterization of the typical variety. Sloane's (The Natural History of Jamaica 1:186. 1707) description, which Linnaeus cited, does not state clearly if the fruits are glabrous or pubescent. It refers to "articulated pods, like to those of the precedent," the "precedent" being *Zornia diphylla* (L.) Pers., with more or less hispid fruits. In the illustrative plate, the stem is shown to be hispid, but not the fruits. Willdenow (Sp. Pl. 3:1163. 1802) described the fruits: "lomenti articulis subrotundis distinctis glabris." DeCandolle (Prodr. 2: 320. 1825) stated: "leguminis glabri impunctati." I am indebted to Dr. A. C. Smith, who looked up the type specimen at the British Museum and reported the mature fruits to be glabrous.

Millspaugh, interpreting the typical variety to be setose-hispid, proposed the variety *depila* of *Aeschynomene americana*, based on glabrous-fruited specimens from Yucatán. His variety must revert to synonymy under the present interpretation.

Aeschynomene mexicana Biroli is tentatively placed in synonymy on the basis of its description, particularly "stipulis magnis sulcatis acuminatis denticulatis, foliolis . . . linearibus falcatis . . . , leguminum articulis 5-7 glabris tuberculatis inflatis"

Aeschynomene tricholoma is not considered sufficiently distinct from *Ae. americana* var. *americana* to warrant specific delimitation. Its fruits are slightly larger than average, but almost identical collections have been made in Brazil. The slight development of marginal hairs suggests a tendency toward *Ae. americana* var. *glandulosa*.

There is considerable variation in width of fruits, and there is intergradation throughout the range from the glabrous-fruited typical variety to the puberulent or hispid-fruited variety *glandulosa*. The bracts are uniformly cordate. The flowers commonly are less than 9 mm. long.

1b. *Aeschynomene americana* var. *glandulosa* (Poir.) Rudd, comb. nov.

Aeschynomene glandulosa Poir. in Lam. Encyc. Suppl. 4: 76. 1816.

Aeschynomene guayaquilensis G. Don, Gen. Syst. Gard. Bot. 2: 284. 1832.

This differs from the typical variety in that the fruits are puberulent and/or beset with glandular hairs. The stipules commonly are hispid at the point of attachment. The bracts are cordate. The flowers commonly are 6-8 mm. long.

TYPE LOCALITY: Puerto Rico, "dans les savannes." Type collected by Ledru.

DISTRIBUTION: Predominantly Central American but also widespread in tropical and subtropical America, commonly in wet or moist

places, sometimes on dry hills, at elevations up to about 1,400 m.; in the Old World tropics, apparently introduced (fig. 2).

MÉXICO: *Sessé & Mociño* 1948 in part (Ch). SINALOA: Mazatlán, *Rose, Standley, & Russell* 13655 (NY, US); *Jones* 22504 (Ch, Mo). Culiacán, *Brandege*, Oct. 2, 1904 (GH), Oct. 5, 1904 (UC), Oct. 10, 1904 (US), Oct. 11, 1904 (UC); *Edw. Palmer*, Oct. 25–Nov. 18, 1891 (US). "Culiacan & Copradia," *Brandege*, Sept. 20, 1904 (GH). Los Labrados, *Mexia* 954 (GH, Mo, NY, UC). Imala, *Edw. Palmer* 1740, in 1891, in part (GH, NY). NAYARIT: Ixtlán del Río, *Mexia* 743 (GH, UC). VERA CRUZ: *F. W. Johnson*, Sept 25, 1906 (NY). Zacuapán, *Purpus* 2328 in part (Ch, GH, Mo, NY, UC, US). Misantla, *Purpus* 5885 (UC). Coatzacoalcos, *C. L. Smith* 992 (GH, Mo, NY, US). Camarón, *Purpus* 11088 (NY, US). Orizaba, *Botteri* 664 (NY, US). PUEBLA OR OAXACA: *Liebmann* 4724 (UC). OAXACA: Tuxtepec, *Conzatti* 3743 (US). MICHOACÁN: Hacienda Coahuayula, *Emrick* 93 (Ch). COLIMA: Manzanillo, *Ferris* 6041 (GH). GUERRERO: Atoyac, *Hinton* 10922 (GH, US). Vallecitos, *Hinton* 11604 (GH, US). Between Carrizo and Santo Domingo, *Hinton* 14653 (GH, NY, US). Acapulco, *Edw. Palmer* 102, in 1894–95 (Ch, GH, Mo, NY, UC, US). Taxco, *R. Q. Abbott* 467 (GH). TABASCO: Lomas de San Sebastián, *Rovirosa* 384 (NY, US). CHIAPAS: Escuintla, *Matuda* 53 (Mo, US), 2164 (Ch, GH, NY). CAMPECHE: Tuxpeña, *Lundell* 1114 (Ch, GH, Mo, NY, UC, US). YUCATÁN: *Schott* 863 (Ch). Calotmul, *Gaumer* 955 in part (Mo), 2092 (Ch, GH, Mo, UC, US). Chichancanab, *Gaumer* 2095 (Ch).

GUATEMALA: *Skinner* (GH). ALTA VERAPAZ: Between Sachaj and Sacacac, *Steyermark* 45136 (Ch.). Cobán, *von Türckheim* 8196 (US). Cubilquitz, *von Türckheim* 8506 (Ch, GH, NY, US); *Steyermark* 44360 (Ch.) IZABAL: Los Amates, *Deam* 137 (Ch, GH, Mo, NY, US); *Standley* 24359 (GH, US). Quiriguá, *Standley* 24289 (US). Entre Ríos, *Standley* 72677 (Ch, NY). SAN MARCOS: Malacatán, *Grant* 571 (GH, US). ZACAPA: Between Zacapa and Chiquimula, *Standley* 73836 (Ch). Río Hondo, *Steyermark* 29468 (Ch). CHIQUIMULA: Chiquimula, *Steyermark* 30107 (Ch). Ipala, *Steyermark* 30302a (Ch). Between Zacapa and Chiquimula, *Standley* 73717 (Ch). JALAPA: Jalapa, *Standley* 76404 (Ch). GUATEMALA: Concuá Bridge over Río Motagua, *Standley* 59313 (Ch). Between Guatemala and Fiscal, *Standley* 59714 (Ch), 59777 in part (Ch), 59807 (Ch). Fiscal, *Standley* 59614 (Ch). CHIMALTENANGO: "Antapa," *J. R. Johnston* 1059 (Ch). RETALHULEU: Río Samalá, *Shannon* 561 (US). SUCHITEPÉQUEZ: Finca Mocá, *Skutch* 1499 (Ch, GH, US). Mazatenango, *Bernoulli* 1181 (NY). ESCUINTLA: Escuintla, *J. D. Smith* 2283 (GH, US). AMATITLÁN: Amatitlán, *Morales* 1148 (Ch). SANTA ROSA: Barberena, *Standley* 77790 (Ch). Chupadero, *Heyde & Lux* 4160 (GH, NY, US). Cerro Redondo, *Heyde & Lux* 6103 (Ch). Laguna Los Pinos, below Cerro Redondo, *Steyermark* 52167 (Ch). JUTIAPA: Jutiapa, *Standley* 75271 (Ch), 75394 (Ch), 75642 (Ch). Between Jutiapa and Las Tunas, *Standley* 76285 (Ch).

HONDURAS: ATLÁNTIDA: Tela, *Standley* 53583 (Ch, US), 53639 (Ch, US), 54020 (Ch, US), 55227 (Ch, US). MORAZÁN: El Zamorano, *J. Valerio* 1256 (Ch), 1412 (Ch), 1441 (Ch), 1442 (Ch), 3526 (Ch, US); *Cockrell*, Oct. 14, 1946 (Ch); *Molina* 2663 (Mo); *Swallen* 10983A (US).

BRITISH HONDURAS: STANN CREEK: Stann Creek, *Robertson* (US). All Pines, *Schipp* 666 (Ch, GH, Mo, NY, UC). BELIZE: Near "Manatee lagoon," *Peck* 232 (GH).

EL SALVADOR: AHUACHAPÁN: *Padilla* 472 (US). SONSONATE: Santa Emilia, *Standley* 22033 (GH, US), 22075 (GH, US). LA LIBERTAD: La Libertad, *Standley* 23251 (GH, US). SAN SALVADOR: San Salvador, *Calderón* 56 (Ch, GH, Mo,

NY, US). Tonacatepeque, *Standley* 19526 (GH, US). SAN VICENTE: San Vicente, *Standley* 21165 in part (GH, US). Laguna de Apastepeque, *Fassett* 28335 (US). LA UNIÓN: Laguna de Maquigüe, *Standley* 20967 (US).

NICARAGUA: *Garnier* 3073 (GH). BLUEFIELDS: "Mosquito Coast," *Schramm*, in 1924 (US). CHINANDEGA: Realejo, *Hinds*, probably in 1837, in part (Mo). MANAGUA: Managua, *Chaves* 250 (US). Sierra de Managua, *Garnier* A249 (US). RIVAS: Isla Ometépe, *C. L. Smith*, Jan. 1893 (Mo); *Shimek & C. L. Smith* 42 (US).

COSTA RICA: "Tacares," *M. Valerio* 261 (Ch). GUANACASTE: Nicoya, *Tonduz* 13573 (GH, US). PUNTARENAS: Boruca, *Tonduz* 4708 (US). ALAJUELA: La Palma de San Ramón, *Brenes* 5856 (Ch), 5856a (Ch), 5856b (Ch). "Colline de San Pedro de San Ramón," *Brenes* (432) 4647 (Ch), (473) 4688 (Ch), 5960 (Ch). "Carrillos de Poas," *Brenes* 14336 (Ch), 14611 (Ch), 17236 (Ch). SAN JOSÉ: San José, *Tonduz* 3075 (US); *Standley* 33280 (US). "Route de San José à Guadalupe," *Tonduz* 7284 (Ch, GH, NY, US), 7323 (Ch, GH, NY, US). El General, *Skutch* 2955 in part (US). La Verbena, *Standley* 32206 (US). San Sebastián, *Standley* 32686 (US). CARTAGO: Cartago, *J. J. Cooper* 5756 (Ch, GH, Mo, NY, US). Dulce Nombre, *Standley* 35851 (US).

PANAMÁ: *Seemann* (NY), 486 (GH); *Hayes* 488 (NY), 767 (NY). El Polvorín, *Heriberto* 255 (NY, US). BOCAS DEL TORO: Chiriquí Lagoon, *von Wedel* 1531 (GH, Mo, US), 1616 (GH, Mo). Isla Colón, *von Wedel* 2973 (GH, Mo, NY, US). COCLÉ: Penonomé, *R. S. Williams* 359 (NY, US). Olá, *Pittier* 5092 (NY, US). CANAL ZONE: *Harvey* 5197 (Ch). Darién, *Standley* 31560 (US). Obispo, *Standley* 31780 (US). Gamboa, *Standley* 28325 (US). Between Fort Clayton and Corozal, *Standley* 29059 (US), 29182 (US). Frijoles, *Standley* 27643 (US). Gatún, *Standley* 27268 (US). East Paraíso, *Standley* 30046 (US). Red Tank to Pueblo Nuevo, *Piper* 5190 (US). Island Potrero, Changuinola Valley, *Dunlap* 343 (US). Culebra, *Pittier* 2112 (NY, US). Mt. Hope Cemetery, *Standley* 28847 (US). Summitt, *Standley* 25768 (US), 25776 (US), 26921 (US). Along Las Cruces Trail, *Hunter & Allen* 737 (GH, Mo). Balboa, *Standley* 25518 (US), 25540 (US). Ancón, *Greenman & Greenman* 5048 (Mo). Colón, *Rose* 23997 (GH, NY, US). Fort Randolph, *Standley* 28735 (US). PANAMÁ: Isla Taboga, *Allen* 1283 (GH, Mo, US), 1295 (GH, Mo, US); *Standley* 27110 (US). Cayos Icacos, *I. M. Johnston* 937 (Mo, US). San José Island, *I. M. Johnston* 832 (US), 1201 (US). "Sabanas north of Panama City," *Paul* 593 (US). Panamá, *Standley* 26787 (US), 26865 (US). Matías Hernández, *Pittier* 6871 (NY, US). Between Capira and Potrero, *Dodge & Hunter* 8604 (GH, Mo). Río Indio, *Dodge & Allen* 17378 (GH, Mo). Río Tapia, *Standley* 28066 (US). Río Tocumen, *Standley* 26579 (US), 29477 (US). HERRERA: Chitré, *Allen* 1104 (GH, US). Ocu, *Allen* 4087 (Mo).

CUBA: PINAR DEL RÍO: Guane, *Shafer* 10388 (Mo, NY, US). Los Palacios, *Shafer* 12046 (Ch, Mo, NY, US). HABANA: Santiago de las Vegas, *P. Wilson* 1285 (Ch, GH, US). ORIENTE: "Valle Yumury," *Rugel* 129b (NY).

JAMAICA: Schwallenburgh, *Orcutt* 3951 (Mo, UC). Portland, *Maxon & Killip* 62a (GH, US). Hope, *Harris* 6625 (Ch, NY), 6957 (Ch, NY). Tichfield Peninsula, *Millspaugh* 1887 (Ch, GH). Porus, *Lloyd* 1050 (Ch, Mo). Ewarton, *Alexander Prior*, Dec. 2, 1849 (NY). Pleasant Hill to Buff Bay, *Orcutt* 3815 (GH).

PUERTO RICO: Aguadilla: Maricao, *Sintensis* 374b (GH, US). Mayagüez: Mayagüez, *Sintensis* 374 (GH, US).

LESSER ANTILLES: U. S. VIRGIN ISLANDS: St. Croix, *Mrs. J. J. Ricksecker* 44 (Ch, Min, Mo, US); *A. E. Ricksecker* 133 (Ch, GH, Min, Mo, NY, UC, US); *Rose, Fitch & Russell* 3522 (US). St. Thomas, *Kuntze*, Feb. 1874 (NY). St. John, *Britton & Shafer* 313 (NY, US); *Britton & Shafer* 613 (Ch, NY, US).

BRITISH VIRGIN ISLANDS: Tortola, *Britton & Shafer* 778 (NY, US). Antigua: North Sound, *Box* 1245 (Ch, US). GUADELOUPE: *Duss* 2645 in part (Mo). Montebello, *Questel* 489 (US). Ste. Marguerite, *Questel* 4245 (US). Carbet, *Questel* 2481 (US). Grande Terre, *Stehlé* 1491 (US). Trois-Rivières, *Stehlé* 203 (NY). Baie-Mahault, *Stehlé* 271 (NY). St. Claude, *Stehlé* 1639 (NY).

CURAÇAO: Julianadorp, *Arnoldo* 1820 (US).

TOBAGO: *Eggers* 5940 (NY).

VENEZUELA: Nueva Esparta: Salamanca, *Ginés* 2877 (US). Mérida: Lagunillas, *Jahn* 673 (GH, US, Ven).

COLOMBIA: MAGDALENA: Masinga, *H. H. Smith* 713 (Ch, GH, Mo, NY, UC, US). Luruaco? [as "Luru"], *André* 260 (NY). BOLÍVAR: Cartagena, *Apolinar Ángel* 753 (US). Arjona, *Killip & Smith* 14559 in part (GH, NY). NORTE DE SANTANDER: Santiago, *Araque & Barkley* 18 N. S. 144 (US). Cúcuta, *Garganta* 1077 (Ch). SANTANDER: Barranca Bermeja, *Haught* 1403 (NY, US). CUNDINAMARCA: Jerusalem, *Pérez* 590 (US). Girardot, *Rusby & Pennell* 83 (NY, US). TOLIMA: Espinal, *Apolinar Maria*, July 1928 (US). Armero, *Cuatrecasas* 10506 (Ch, US). HUILA: Natagaima, *Rusby & Pennell* 1166 (NY, US). Villavieja, *S. G. Smith* 1200 (US). ANTIOQUIA: Puerto Berrio, *Pennell* 3759 (GH, NY, US). CALDAS: Chinchiná, *Cuatrecasas* 23085 (US). EL VALLE: Alcalá, *Cuatrecasas* 22856 (US).

ECUADOR: GUAYAS: Guayaquil, *Hitchcock* 19942 (GH, NY, US); *Anthony & Tate* 52 (US); *Asplund* 5718 (US); *Mille* 42 (Ch), in 1929 (Ch). Durán, *Schimpff* 1063 (Mo, US).

PERÚ: PIURA: Las Lomas del Nato, *Ferreya* 5922 (US).

BOLIVIA: BENI: Río Chaparé-Mamoré, *Werdermann* 2259 (Mo). SANTA CRUZ: Buena Vista, *Steinbach* 5521 (Ch, Mo, NY). 5589 (GH).

BRAZIL: CEARÁ: Aracaty, *Gardner* 1542 (K). GUAPORÉ: Porto Velho, *Black & Cordeiro* 52-14584 A (US).

PARAGUAY: "Gran Chaco," Santa Elisa, lat. S. 23°10', *Hassler (T. Rojas)* 2815 (GH, Mo). CONCEPCIÓN: Centurión, *Fiebrig* 4121 (GH). CORDILLERA: San Bernardino, *Hassler* 86 (NY). GUAIRÁ: Villarrica, *Jørgensen* 4619 (Ch, Mo, NY, US).

ARGENTINA: FORMOSA: Guayculec, *Jørgensen* 3220 in part (GH, Mo).

LOCAL NAMES: Pega ropa (Guatemala); golondrina regada (El Salvador); plumón (El Salvador); huevos de rana (Nicaragua); dormilona (Nicaragua); pega pega (Costa Rica, Colombia).

Although I have not seen the type of *Ae. glandulosa* Poir., the description, as well as specimens so determined, indicate fairly clearly the identity of this taxon.

Poiret, in the original description, suggested that this might be a variety of *Ae. americana*, and it is so treated in this paper. It is distinguished from the typical variety by the indument on its fruits. There may be a sparse development of glandular hairs on the fruits or there may be puberulence, which I believe to be incipient glandular development. Occasionally there is intergradation from puberulent to hispid fruits, or to the eglandular condition of typical *Ae. americana*. There is also considerable variation in the size of mature fruits, but it seems impracticable to make any satisfactory delimitations on that basis.

It has not been possible, thus far, to locate the type of *Ae. guayaquilensis*. The description, particularly "leaflets, which are serrated at the apex," indicates the series *Americanae*. The fruits are described as "smooth," which would suggest typical *Ae. americana*. Most specimens of *Ae. americana*, sens. lat., which I have seen from the vicinity of Guayaquil exhibit puberulent fruits but appear smooth to the naked eye. Truly glabrous fruited specimens are the rarities. Don preceded his description of *Ae. guayaquilensis* with a description of *Ae. americana* L., presumably considering the two entities to be different. In the present paper, *Ae. guayaquilensis* is being interpreted as *Ae. americana* var. *glandulosa*.

1c. *Aeschynomene americana* var. *flabellata* Rudd, var. nov.

A varietate typica bracteis flabelliformis et floribus plerumque majusculis differt.

This differs from the typical variety in having truncate, flabelliform bracts and flowers which commonly are 8–10 mm. long. The stipules are glabrous or nearly so. The fruits are glabrous or hispid.

TYPE: In the U. S. National Herbarium, No. 1205701, collected at Tlaxmalac ("bei Taxmalac an Bachrande"), Guerrero, México, Oct. 17, 1904, by C. and E. Seler (No. 4240). Duplicate at GH.

DISTRIBUTION: Central México south to Honduras, in wet or moist places along streams, at edges of fields, and in llanos, at about 800–2,800 m. elevation (fig. 2).

MÉXICO: *Sessé & Mociño* 1947 (Ch). GUANAJUATO: Pénjamo, *Pringle* 2515 (GH). MÉXICO: Naranjo, *Hinton* 1984 (GH, US). Temascaltepec, *Hinton* 2057 (US). Ixtapán, *Hinton* 2234 (NY, US). Rincón del Carmen, *Hinton* 1619 (NY, US). MICHOACÁN: Morelia, *Arsène* 3114 (Mo, NY, US), 6837 (Mo, US). Aguililla, *Hinton* 15243 (GH, NY, US). Between Zitácuaro and Santa Ana, *Hinton* 13287 (GH, US). GUERRERO: Pungarabato, *Hinton* 6654 (US). Parotas, *Hinton* 9503 (Min, US). Quirio, *Hinton* 5992 (GH, Mo). Taxco Viejo, *R. Q. Abbott* 407 (GH).

GUATEMALA: JUTIAPA: Between Agua Blanca and Amatillo, *Steyermark* 30442 (Ch, US).

EL SALVADOR: SAN SALVADOR: *Calderón* 1291 (GH, Mo, NY, US).

HONDURAS: CHOLUTECA: Choluteca, *Standley* 24569 (Ch).

This variety is readily distinguished by its truncate-flabelliform bracts, although, in a few specimens, some gradation toward the typical cordiform shape may be noted. The flowers often are slightly larger than average for the species as a whole. Glandular development varies; vegetative parts as well as the fruits may be glabrous to hispid. Dry specimens mostly exhibit considerable purplish coloration of the bracts, petals, bases of glandular hairs, etc.

2. *Aeschynomene unijuga* (M. E. Jones) Rudd, comb. nov.

Climacorachis fruticosa Hemsl. & Rose, Contr. U. S. Nat. Herb. 8: 44. 1903, non *Ae. fruticosa* Sessé & Moc., 1889, nec *Ae. fruticosa* Rose, 1899.

Mimosa unijuga M. E. Jones, Extracts from Contr. West. Bot. 18: 39. 1933.

Stems to about 2 m. high, erect or occasionally prostrate, hispid to subglabrous; stipules glabrous to hispid, 7–15 mm. long, 1–1.5 mm. wide at maximum; leaves 2–5 cm. long, 20–45-foliolate; leaflets 5–6 mm. long, 1–2 mm. wide, commonly 3-costate; inflorescences few-flowered, the peduncles and pedicels hispid or hispidulous, sometimes flexuose, the bracts lanceolate-ovate to subcordate, about 2–4 mm. long, 1–1.5 mm. wide, acute to acuminate, glabrous to hispidulous, the more glabrous bracts elongate, the more glandular cordate, the bracteoles lanceolate to ovate, about 2–3 mm. long and 1 mm. wide, indued like the bracts; flowers 10–15 mm. long; calyx 6–8 mm. long; standard 10–15 mm. long, the claw 1–4 mm. long, the blade subelliptical, 9–11 mm. long, 8–10 mm. wide, entire; wings about as long as the standard, the blades about 3 mm. wide; keel petals slightly shorter and wider than the others, about 8–10 mm. long, the claws 1–2 mm. long, the blades 7–8 mm. long, 3.5–4 mm. wide; stamens 7–10 mm. long; fruit 6–20 mm. long, 4–5 mm. wide, 3–7-seeded, usually lacking articulations between the seeds, the one edge entire, the other entire or crenate, the margin usually breaking away from the body of the fruit, hispid, the bases of the glandular hairs usually dark, the stipe about 2 mm. long; mature seeds not seen.

TYPE LOCALITY: Oak woods, mountains near Talpa, Jalisco, México, altitude about 1,320–1,500 m. Type collected by Nelson (No. 4038), cited below.

DISTRIBUTION: México, Sinaloa to Guerrero, in pine and oak forests, in mountains, at elevations of about 1,000 to about 1,800 m. (fig. 2).

MÉXICO: SINALOA: Sierra Tacuichamona, *Gentry* 5590 (Mo, NY, UC), 5687 (GH, Mo, NY). "Sierra de Chabarría," *Ortega* 4056 (NY, US). JALISCO: San Sebastián, *Mexia* 1375 (Ch, GH, Mo, NY, UC, US). Talpa de Allende, *Nelson* 4038 (US TYPE); *McVaugh* 14252 (Mich). GUERRERO: "San Antonio Buenos Aires," Montes de Oca, *Hinton* 11670 (GH, US).

In all characteristics *Aeschynomene unijuga* shows relationship with the other members of the series *Americanae*. The frequent flexuose nature of the flowering axes and the lack of articulation of the fruit are not considered sufficient reason for segregation into another genus, *Climacorachis*. Placing this taxon in *Mimosa* was obviously done without consideration of the flower structure.

The largest flowers of the *Americanae* are found in this species. The fruit characters are somewhat unstable; on the same plant, or even the same fruit, there may be both presence and absence of sutures between seeds. In general, this group shows closest kinship to *Ae. villosa*, especially var. *mexicana*.

3. *Aeschynomene guatemalensis* (Standl. & Steyerm.) Rudd, comb. nov.
Climacorachis guatemalensis Standl. & Steyerm. Field Mus. Publ. Bot. 23:
 11. 1943.

Stem about 8 dm. high, erect; stipules about 10–12 mm. long and 1 mm. wide; leaves about 4 cm. long, 30–40-foliolate; leaflets 6–8 mm. long, about 1.5 mm. wide, 3-costate; inflorescences few-flowered, about as long as the leaves or longer, the peduncles and pedicels hispid or hispidulous, the bracts and bracteoles ovate, acuminate, hispid, ciliate, about 3 mm. long and 1 mm. wide; flowers not seen; calyx persistent, 3–4 mm. long, hispid; legume oval-oblong, about 15–20 mm. long, 5–7 mm. wide, 5–7-ovulate, hispid, not articulated, or rarely with an occasional suture forming between the seeds, the margins essentially entire, breaking away from the body of the fruit; seeds 2 mm. long and wide, olivaceous-black (apparently immature).

TYPE LOCALITY: Pine-oak forest, Río Pucal, about 14 km. south of Huehuetenango, Guatemala, at about 1,800 m. altitude. Type collected by Standley (No. 82330).

DISTRIBUTION: Guatemala; known only from the type locality (fig. 2).

GUATEMALA: Huehuetenango: Río Pucal, *Standley* 82370 (Ch).

This species closely resembles *Ae. villosa*, but the fruits are broader and more consistently unjointed. Due to the paucity of material available no change in rank is being made, but the species is being transferred to *Aeschynomene* as are the other species of *Climacorachis*.

4. *Aeschynomene villosa* Poir. in Lam. Encyc. Suppl. 4: 76. 1816.

Stem to about 1 m. long, prostrate to weakly erect, hispid; stipules (5–)10–15 mm. long, 1–1.5 mm. wide, subglabrous, ciliate, usually somewhat hispid at the point of attachment; leaves about 2–7 cm. long, 20–50-foliolate; leaflets 3–15 mm. long, 1–3 mm. wide; inflorescences 3–10-flowered, the peduncles and pedicels hispid like the stem, the bracts cordate, acuminate, 1.5–6 mm. long, 1–2 mm. wide, ciliate, the bracteoles ovate-lanceolate, acute to acuminate, 1–4 mm. long, 0.5–1 mm. wide, ciliate; flowers 3–9 mm. long; calyx 2–4 mm. long, hispid; standard commonly 5–7 mm. long, the claw 1–2 mm. long, the blade suborbiculate, 4–5 mm. in diameter, emarginate, entire; wings about as long as the standard, the blade 1–2 mm. wide; keel about 4–5 mm. long, the claws 1–1.5 mm. long, the blades 3–4 mm. long, 1–2 mm. wide, sometimes ciliate along the free margin; stamens 4–5 mm. long; fruit 3–7- (commonly 4–6-) seeded, the articulations distinct or sometimes lacking, the articles 2.5–3(–4) mm. in diameter, villous-hispid, the tuberculate bases of the hairs often dark, in contrast to the otherwise straw-colored or light brown fruits, the venation inconspicuous, the margins often breaking away from the body of the articles; seeds 2–2.5 mm. long, 1.5–2 mm. wide, blackish.

4a. *Aeschynomene villosa* var. *villosa*.

Aeschynomene villosa Poir. in Lam. Encyc. Suppl. 4: 76. 1816.

? *Aeschynomene hirta* Lag. Nov. Gen. et Spec. 22.1816, non Lam. 1797.

? *Aeschynomene hirsuta* DC. Prodr. 2: 322. 1825.

Aeschynomene glandulosa Bello, Ap. 1: 259. 1881, non Poir. 1816.

Aeschynomene americana var. *villosa* (Poir.) Urb. Symb. Ant. 4: 288. 1905.

Cassia tenuicaulis M. E. Jones, Extracts from Contr. West. Bot. 18: 40. 1933.

Aeschynomene meridana Pittier, Bol. Técn. Minist. Agric. & Cría Serv. Bot. Caracas 5: 40. 1944, without Latin diagnosis.

The typical variety has stems about 2–6 dm. high, usually decumbent; leaflets 4–5 mm. long, 1–1.5 mm. wide, mostly 3-costate; inflorescences open, sometimes paniculate, usually few-flowered, longer than the leaves; flowers 3–5(–7) mm. long; fruits with distinct articulations, or rarely lacking an occasional septum.

TYPE LOCALITY: Savannas, Puerto Rico. Type collected by Ledru.

DISTRIBUTION: Southern Arizona to South America; Antilles; at elevations up to about 2,250 m., usually in dry areas, pine and oak forests, pastures, and sometimes in wet places; also in the Old World tropics, apparently as an introduction (fig. 2).

UNITED STATES: ARIZONA: Santa Cruz County: Ruby, *Kearney & Peebles* 14462 (GH, NY, UC, US); *Darrow & Haskell* 2063 (GH, Mo).

MÉXICO: *Sessé & Mociño* 1943 (Ch), 1944 (Ch), 1948 in part (Ch). SONORA: Sierra Charuco, Río Mayo, *Gentry* 1737 (Ch, GH, Mo). Quiricoba, *Gentry*, Nov. 13, 1933 (Ch). SINALOA: Mazatlán, *Rose, Standley & Russell* 13655a (US); *Ortega* 5091 (US). "Cofradia & Culiacan," *Brandege*, Oct. 21, 1904 (US). Cofradia, *Brandege*, Oct. 21, 1904 (Mo), Oct. 25, 1904 (UC). Cerro Colorado, *Brandege*, Nov. 3, 1904 (UC). Imala, *Edw. Palmer* 1740, in 1891, in part (UC, US). NAYARIT: Acaponeta, *Rose, Standley & Russell* 14287 (GH, NY, US). Ixtlán del Río, *Mexia* 738 (Mo, NY). NAYARIT?: "Vicinity of Jalisco," *Ferris* 5817 (US). JALISCO: Guadalajara, *Edw. Palmer* 491, in 1886 (GH, Mo, NY, US); *Rose & Painter* 7402 (Ch, GH, Mo, NY, US); *Jones* 27219 (Mo, NY, UC, US). Etzatlán, *Barnes & Land* 293a (Ch). VERA CRUZ: Zacuapán, *Purpus*, Oct. 1907 (UC), 2328 in part (Ch, GH, NY). Mirador, *Purpus* 10813 (US). Orizaba, *Müller*, in 1853 (NY); *Bourgeau* 3169 (GH, US); *Botteri* "363, 572" (GH, US). Jalapa, *F. W. Johnson*, Sept. 22, 1906 (US). Papantla, *Schiede & Deppe* 633 (Mo). Tantoyuca, *Ervendberg* 16 (GH). Vera Cruz?: "Enroute from San Luis Potosí to Tampico," *Edw. Palmer* 1050, in 1878–79 (GH, US). PUEBLA: Metlatoyuca, *Goldman* 59 (NY, US). MORELOS: Cuernavaca, *Lemmon & Lemmon* 30 (UC). MÉXICO: Pantoja, *Hinton* 8608 (Ch, GH, NY, US). COLIMA: *Edw. Palmer* 1102, in 1891 (GH, NY, UC, US); *Orcutt* 4546 (Ch). GUERRERO: Acapulco, *Edw. Palmer* 264, in 1894–95 (Ch, GH, Mo, NY, UC, US). El Calabazal, *Langlassé* 455 (GH, US). OAXACA: Huitza, *L. C. Smith* 223, in part (GH, US). CHIAPAS: Sierra de Tonalá, *Purpus* 6634 (Ch, GH, Mo, NY, UC, US). Barranca Honda, *Matuda* 4101 (NY).

GUATEMALA: HUEHUETENANGO: Río Pucal, *Standley* 82367 (Ch). Chiantla, *Standley* 82530 (Ch). IZABAL: "Between Milla 49.5 and Cristina," *Steyermark* 38440 (Ch). EL PROGRESO: Sierra de las Minas, *Steyermark* 43729 (Ch). CHIQUIMULA: Concepción de las Minas, *Steyermark* 30860 (Ch), 30861 (Ch). JALAPA: Cerro Alcoba, *Steyermark* 32501 (Ch). GUATEMALA: Between Guatemala and Fiscal, *Standley* 59777 in part (Ch). CHIMALTENANGO: Chimaltenango,

Standley 59099 (Ch), 79863 (Ch); *J. R. Johnston* 149 (Ch). Along road from Chimaltenango to San Martín Jilotepeque, *Standley* 57942 (Ch). JUTIAPA: Jutiapa, *Standley* 75333 (Ch).

HONDURAS: COMAYAGUA: Siguatepeque, *Standley* 56005 (Ch, US); *Standley & Chacón* 6815a (Ch). MORAZÁN: El Zamorano, *Standley* 14665 (US), 27456 (US). Río El Quebracho, *Standley* 27721 (US). EL PARAÍSO: Güinope, *Valerio* 1728 (Ch). Las Casitas, *Swallen* 11067 (US).

EL SALVADOR: SAN SALVADOR: San Salvador, *Standley* 22434 (GH, US), 22686 (US), 23602 (GH, US); *Calderón* 69 (GH, Mo. NY, US). SAN VICENTE, San Vicente, *Standley* 21165 in part (GH, US).

NICARAGUA: CHINANDEGA: Realejo, *Sinclair*, in 1836–39 (GH); *Sinclair* or *Hinds*, in 1836–39 (Mo). SEGOVIA: *Oersted* 4715 (Ch). Volcán El Viejo, *Oersted* 4716 (Ch).

COSTA RICA: *Brenes* (317a) 5163 (Ch). GUANACASTE: Nicoya, *Tonduz* 13591 (US). SAN JOSÉ: La Uruca, *Biolley* 3214 (US). ALAJUELA: "Colline de San Pedro de San Ramon," *Brenes* (363) 4578 (Ch).

PANAMA: CANAL ZONE: Balboa, *Standley* 25267 (US). Between Fort Clayton and Corozal, *Standley* 29163 (US). PANAMÁ: Río Tocumen, *Standley* 26619 (US), 29399 (US). Matías Hernández, *Standley* 28893 (US). Abalaba, *Killip* 3367 (US).

CUBA: PINAR DEL RÍO: Coloma, *C. Wright* 1590 in part (GH, Mo, NY, US). Bahía Honda, *P. Wilson* 9272 (NY). HABANA: Guanabacoa, *Léon & Hioram* 4713 (NY). Castillo de Atarés, *Ekman* 13296 (GH). CAMAGUEY: Camaguey, *Britton, Britton & Cowell* 13175 (NY). La Gloria, *Shafer* 259 (NY, US). ORIENTE: Sierra de Nipe, *Ekman* 9799 (US). Baracoa, *Shafer* 7690 (NY).

HAITI: NORD: Plaisance, *Leonard* 9262 (GH, NY, UC, US). Marmelade, *Leonard* 8138 (Ch, Mo, US). Dondon, *Leonard* 8732 (US). St. Michel de l'Atalaye, *Leonard* 8503 (US). NORD-OUEST: Port de Paix, *Leonard & Leonard* 12182 (US). OUEST: Petionville, *Ekman* H-2328 (US).

DOMINICAN REPUBLIC: DUARTE: Pimentel, *W. L. Abbott* 651 (US). SANTIAGO: Santiago, *Allard* 14602 (US). San José de las Matas, *Jiménez* 946 (US). Pico del Rubio, *Jiménez* 1071 (US). LA VEGA: Constanza, *Ekman* H-13938 (US). Jarabacoa, *Fuertes* 1667 (GH); *Allard* 14930 (US). Río Yaque, *Fuertes* 1688 (GH, NY, US).

PUERTO RICO: "Inter Aybonito et Algarroba," *Sintenis* 2957 (US). "Sabana llana," *Stevenson* 1263 (Min, US). ARECIBO: Utuado, *Sargent* 3278 (US). MAYAGÜEZ: Mayagüez, *Holm* 63 (Ch, GH, Mo); *Sintenis* 79 (GH, NY, US). Guanica, *Sintenis* 3883 (Ch). Sabana Grande, *Britton & Britton* 9050 (NY). SAN JUAN: Río Piedras, *Heller & Heller* 185 (Ch, NY, US); *J. R. Johnston* 59 (NY). GUAYAMA: Matón-Arriba, *Goll* 455 (NY, US). Cayey, *Kuntze* 410 (NY). Guayama-Cayey road, *Britton, Britton & Earle* 6436 (NY). AGUADILLA: Rincón, *Sintenis* 5525 (US). Aguada, *Sintenis* 5720 (Mo, US). PONCE: Adjuntas, *Britton & Cowell* 1248 (NY); *Britton & Shafer* 2051 (NY). Coama, *Britton, Britton & Brown* 6164 (NY).

LESSER ANTILLES: ST. KITTS: *Britton & Cowell* 650 (NY). MONTSERRAT: *Shafer* 20 (Ch, NY, US). GUADELOUPE: *Duss* 2645 in part (Ch, NY, US), 4163 (NY). MARTINIQUE: *Duss* 1063 in part (NY, US); *Hahn* 828 (UC).

VENEZUELA: ARAGUA: Colonia Tovar, *Fendler* 289 (GH, Mo), 1780 (GH, Mo). COJEDES: "Sabana pantanosa," *Burkart* 16262 (US). TRUJILLO: Cacute, *Burkart* 16837 (US). MÉRIDA: Mérida, *Pittier* 12866 (Ch, Mo, NY, US, Ven); *Lasser* 633 (US, Ven); *Badillo* 642 (Ven), 600 (Ven).

COLOMBIA: NORTE DE SANTANDER: Ocaña, *Schlim* 205 (NY). CUNDINAMARCA: Between Santandercito and El Colegio, *García* 145 (US). Albán, *Pérez*

2396 (US). HUILA: Neiva, *Marulanda-Caicedo* 47A (US). ANTIOQUIA: Titiribí, *Toro* 415 (US). Medellín, *Archer* 26 (US), 676 (NY, US), 1006 (US). Amagá, *Daniel* 4264 (US). EL VALLE: Buenaventura, *Cuatrecasas* 19758 (Ch, US). La Paila, *Holton* 991 (NY). Jamundí, *Bermúdez* 29 (US). Río Bolo, *Dryander* 326 (US). Palmira, *García* 6367 (US). Zarzal, *Pennell, Killip, & Hazen* 8569 (GH, NY, US). Cali, *Lehmann* 3408 (US). CAUCA: Popayán, *Lehmann* 5548 (Ch, GH, US).

COLOMBIA OR ECUADOR?: "Central And.," *Barclay*, in 1836–39 (GH).

ECUADOR: CHIMBORAZO: Huigra, *Camp E-2962* (NY).

LOCAL NAMES: Mesquitito (México); pega-pega (Panamá); hon-teuse femelle (Guadeloupe); zarza dormidera (Colombia).

I have not seen the type of *Ae. villosa* Poir., but from the description, and from specimens so determined, including those cited by Urban as *Ae. americana* var. *villosa*, there seems to be little doubt as to the identity of this taxon. Although Urban placed it in varietal position under *Ae. americana*, I believe this taxon warrants specific status on the basis of the characters indicated in the key and in the description.

Urban cited *Ae. glandulosa* Bello as a synonym of his *Ae. americana* var. *villosa*, which was based on *Ae. villosa* Poir. On his authority, with no evidence to the contrary, it is so treated in this paper.

From the brief and inadequate descriptions, and from old specimens so determined, it is believed that *Ae. hirsuta* DC. and its synonym, *Ae. hirta* Lag., may be equivalents of *Ae. villosa*.

Cassia tenuicaulis also is referable to this taxon. Dr. Lyman Benson of Pomona College has very kindly checked the type and verified the fact that its fruits correspond with those of other specimens from the same locality which I have identified as *Ae. villosa* var. *villosa*.

Material cited by Pittier as *Ae. meridana* is also identified with this taxon.

4b. *Aeschynomene villosa* var. *longifolia* (Micheli) Rudd, comb. nov.

Aeschynomene floribunda Mart. & Gal. Bull. Acad. Brux. 10 (2): 180. 1843.

Aeschynomene americana var. *longifolia* Micheli in Donn. Sm. Bot. Gaz. 20: 284. 1895.

This differs from the typical variety in that the plant tends to be larger and more robust; leaves mostly larger, the leaflets larger, 6–15 mm. long, 2–4 mm. wide, usually 4- or 5-costate; inflorescences shorter than the leaves, fasciculate, 10–15-flowered; flowers mostly 6–9 mm. long.

TYPE LOCALITY: Casillas, Santa Rosa, Guatemala. Lectotype collected by Heyde and Lux (No. 4172), cited below.

DISTRIBUTION: Moist or wet places, in México, Guatemala, Costa Rica, and Venezuela, at about 1,000–2,000 m. elevation (fig. 2).

MÉXICO: CHIHUAHUA: Mápula Mountains, *Pringle* 725 (Ch, GH, Mo, NY, UC, US). Arroyo Hondo, Sierra Charuco, *Gentry* 1799 (Ch, GH, UC, US).

JALISCO?: Cuautla, *Holway* 5220 (US). VERA CRUZ: Orizaba, *Bourgeau* 3277 (GH); *Botteri* 665 (US). MORELOS: Cuernavaca, *Seler & Seler* 4208 (GH, US). MICHOACÁN: Morelia, *Arsène* 3131 (Mo, NY, US), 8579 (Ch, Mo, US, US). Patzcuaro, *Seler & Seler* 1180 (GH, NY). GUERRERO: "Sierra Madre," *Langlassé* 758 (GH, US). Between Pilas and Filo Mayor, Mina, *Hinton* 10747 (UC, US). Manchon, Mina, *Hinton* 9669 (US). OAXACA: "Aux borde des ruisseaux de Juquila et de Yotopeque," *Galeotti* 3158 (F. M. neg. 27927, photo of isotype of *Ae. floribunda* ex G). Huitza, *L. C. Smith* 223 in part (GH).

GUATEMALA: *Heyde* 391 (US). HUEHUETENANGO: Huehuetenango, *Skutch* 1598 (Ch, GH); *Steyermark* 48153 (Ch). ALTA VERAPAZ: Cobán, *von Türckheim* 376 (GH, NY, US). Between Cobán and Carchá, *Standley* 89766 (Ch). Santa Cruz, *Standley* 71035 (Ch). EL PROGRESO: Sierra de las Minas, *Steyermark* 42983 (Ch). JALAPA: Jalapa, *Standley* 76391 (Ch), 77166 (Ch). SACATEPÉQUEZ: Antigua, *Standley* 64668 (Ch). CHIMALTENANGO: "Antapa," *J. R. Johnston* 1058 (Ch). Chimaltenango, *Standley* 59053 (Ch). Between Chimaltenango and San Martín Jilotepeque, *Standley* 64442 (Ch). SANTA ROSA: Casillas, *Heyde & Lux* 4172 (GH, NY, US, LECTOTYPE of *Ae. americana* var. *longifolia*). San Juan Utapa, *Heyde & Lux* 6099 (GH, US). JUTIAPA: Jutiapa, *Standley* 75409 (Ch).

HONDURAS: Morazán: Hoya Grande, *Williams & Merrill* 15723 (Ch).

COSTA RICA: ALAJUELA: San Pedro de San Ramón, *Brenes* 21883 (Ch). SAN JOSÉ: San José, *Standley* 34760 (US).

VENEZUELA: DISTRITO FEDERAL: Caracas, *Pittier* 7392 (US); *Kuntze* 14556 (NY). Between Caracas and La Guaira, *Rose & Rose* 21657 (GH, US). Sosa, *Tamayo* 261 (Ven). ARAGUA: Colonia Tovar, *Fendler* 288 in part (GH, Mo).

As indicated by the characters mentioned in the key, this taxon resembles *Ae. villosa* more than it does *Ae. americana*, and it is believed to be only varietally distinct from that. There is some intergradation to the typical variety but, generally, the shortened inflorescence is quite obvious.

A photograph of an isotype of *Ae. floribunda* shows that species to be indistinguishable from *Ae. villosa* var. *longifolia*, and is therefore placed in synonymy.

Two collections were cited in the original description of *Ae. americana* var. *longifolia* Micheli on which *Ae. villosa* var. *longifolia* is based. In "Flora of Guatemala" (*Standley & Steyermark*, 1946), one collection (*Heyde & Lux* 4172) is referred to as the type, which is apparently the first designation of a lectotype of this variety.

4c. *Aeschynomene villosa* var. *mexicana* (Hemsl. & Rose) Rudd, comb. nov.

Climacorachis mexicana Hemsl. & Rose, *Contr. U. S. Nat. Herb.* 8: 43. 1903, non *Ae. mexicana* Biroli ex Colla, 1834.

Mimosa mexicana M. E. Jones, *Extracts from Contr. West. Bot.* 18: 39. 1933, non *Ae. mexicana* Biroli ex Colla, 1834.

This differs from the typical variety in that the fruits lack articulations, or only rarely develop sutures between the seeds; the flowers are mostly 5–7 mm. long.

TYPE LOCALITY: Sierra Madre west of Bolaños, Jalisco, México. Type collected by Rose (No. 2972), cited below.

DISTRIBUTION: México; Jalisco and Michoacán, in dry soil of mountains (fig. 2).

MÉXICO: JALISCO: Bolaños, *Rose* 2972 (US TYPE). Etzatlán, *Pringle* 8861 (GH, US), 8862 (Ch, US), 11891 (US); *Rose & Painter* 7542 (US). MICHOACÁN: Coalcomán, *Hinton* 12915 (GH, NY, US).

Since the above cited specimens so closely resemble typical *Ae. villosa*, it seems desirable to consider this taxon another variety of that species, and not to place it in a separate genus, certainly not in *Mimosa*.

Series 2. *Fluminenses* Rudd, ser. nov.

Herbae suffruticosae; stipulae infra insertionem productae, acuminatae, basi acutae vel obtusae; foliola oblonga, 1-costata, costa excentrica; inflorescentiae fasciculatae plerumque foliis breviores; calyx bilabiatus, labio superiore integro vel bifido et labio inferiore trilobato; legumen sessile, altero margine recto, altero crenato.

Suffrutescent herbs; stipules appendiculate below the point of attachment; leaflets more or less oblong, with one excentric costa; inflorescences fasciculate, mostly shorter than the leaves; calyx deeply bilabiate, the vexillar lip entire to bifid, the carinal lip trilobate; fruit

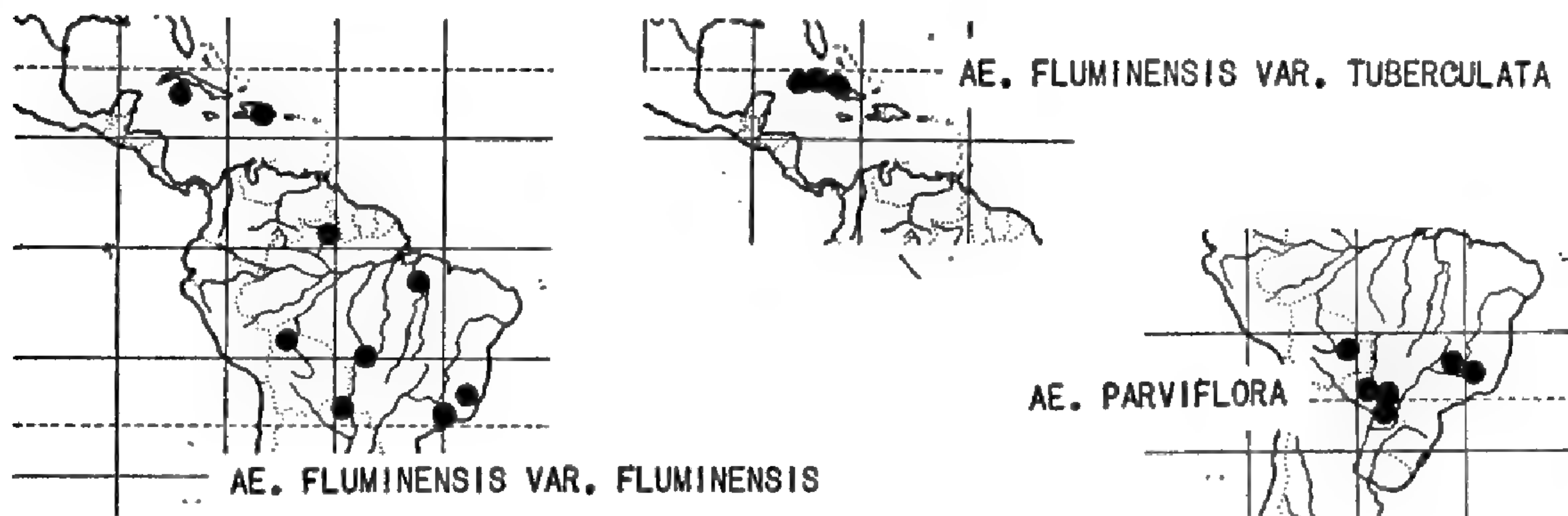


FIGURE 3. Distribution of the *Fluminenses*.

with one margin entire, the other crenate, sessile, the stipe about 1 mm. long.

Aeschynomene fluminensis Vell. is selected as the type of the series.

The *Fluminenses*, with only two known species, appear to be most closely related to the *Americanae*. The fruits of *Ae. fluminensis* are similar to those of *Ae. americana*, and those of *Ae. parviflora* resemble the fruits of *Ae. villosa*. The excentric-veined leaflets suggest the *Americanae*, but differ in having one rather than several costae.

There is also some relationship with the series *Montevidenses* in the distinctly trilobate nature of the carinal lip of the calyx.

5. *Aeschynomene parviflora* Micheli, Vid. Medd. Nat. Foren. Kjøbenh. 66. 1875.

Stem about 1 m. high, glandular-hispidulous to glabrate; stipules about 7 mm. long, subglabrous or moderately hispid, entire, the portion above the point of attachment acuminate, about 5 mm. long, the lower portion about 2 mm. long, acute or truncate; leaves 1–3 cm. long, 12–30-foliolate, the petiole hispidulous, the rachis subglabrous; leaflets oblong, about 5–8 mm. long, 1.5–2 mm. wide; inflorescences few-flowered, the pedicels and peduncles hispidulous, the bracts deltoid-ovate, scarcely 1 mm. long, acuminate to acute, ciliate; flowers 3–4 mm. long; calyx 1.5–2 mm. long; standard about 4 mm. long, spatulate, 2 mm. wide at maximum, glandular-ciliolate along the upper margin; wings about 3.5 mm. long, the claw 1 mm. long, the blade obovate, about 2.5 mm. long and 1.5 mm. wide; keel petals about as long as the wings, slightly arcuate; stamens about 3 mm. long; fruit about 6–9 mm. long, commonly 2- or rarely 3-articulate, the articles about 2 mm. wide, 2.5–3 mm. long, hispidulous, sometimes minutely verrucose; seeds about 1 mm. long and 0.7 mm. wide.

TYPE LOCALITY: Lagôa Santa, Minas Gerais, Brazil. Type collected by Warming (No. 3011), cited below.

DISTRIBUTION: Central and east-central South America, in wet places, at elevations of about 400 m. (fig. 3).

BOLIVIA: SANTA CRUZ: Río Palometilla, *Steinbach* 7995 (Ch, GH, K, Mo, NY).

BRAZIL: MINAS GERAIS: Lagôa Santa, *Warming* 3011 (F. M. neg. 21795 of TYPE ex C). Casa Branca, *Riedel* 769 (NY, US). Carandahy, *Glaziou* 12573 (K, R). Bento Rodrigues, *Ule* 2477 (R).

PARAGUAY: CONCEPCIÓN: Villa Sana, *Fiebrig* 5010 (US). BOQUERÓN?: Gran Chaco, Santa Elisa, *Hassler* 2758 (GH, Mo). CENTRAL?: Lake Ypacaray, *Hassler* 3947 (GH).

As indicated in the key, this species is readily distinguished within the series by its smaller flowers and fruits.

6. *Aeschynomene fluminensis* Vell. Fl. Flum. 310. 1825; Icon. 7: pl. 119. 1835.

Stem up to 4 m. high, glabrous to glandular-hispidulous; stipules 5–10 mm. long, glabrous, ciliolate, often hyaline-margined, striate, the portion above the point of attachment about 4–9 mm. long, acuminate, the lower portion about 1 mm. long, rounded; leaves 6–15 cm. long, 35–50-foliolate, the petiole and rachis glabrous or beset with subglandular hairs; leaflets linear-oblong, about 5–10 mm. long and 1.5–2 mm. wide, entire, sometimes ciliolate, mucronate; inflorescences 1–several-flowered, the pedicels and peduncles glabrous or glandular-

pubescent; bracts caducous, mostly stipule-like, the pair of bracteoles subtending the calyx narrowly ovate, subacute, 2–3 mm. long; flowers 7–10 mm. long; calyx 6–8 mm. long; standard about 7 mm. long, broadly spatulate, the base subcuneate, sparsely clawed, the blade elliptical-ovate, about 6 mm. long, 5 mm. wide at maximum; wings about 8 mm. long, the claw 1 mm. long, the blade oblong, 6–6.5 mm. long, 2–2.5 mm. wide, rounded; keel petals about as long and wide as the wings; stamens about 7 mm. long; fruits commonly 6–8-articulate, the stipe about 1 mm. long, the articles about 5 mm. long and 4 mm. wide, tuberculate, ventricose, glabrous to hispid; seeds about 3 mm. long and 2 mm. wide.

6a. *Aeschynomene fluminensis* var. *fluminensis*.

Aeschynomene fluminensis Vell. Fl. Flum. 310. 1825; Icon. 7, pl. 119. 1835.

Aeschynomene scoparia Splitgerb. Tijdschr. Nat. Gesch. Phys. 9: 109. 1842, non H. B. K. 1824.

The typical variety is characterized by hispid fruits and commonly by considerable pubescence on the stems.

TYPE LOCALITY: "Habitat maritimis ad loca humentia," Rio de Janeiro, Brazil. The type, presumably, is illustrated in table 119, volume 7, of Vellozo's "Icones, Flora Fluminensis."

DISTRIBUTION: Isla de Pinos, Cuba; Hispaniola; and South America, east of the Andes; in wet places at elevations up to about 300 m. (fig. 3).

CUBA: HABANA: Isla de Pinos, *Ekman* 12437 (NY).

DOMINICAN REPUBLIC: SAMANÁ: Sanchez, *Ekman* 14705 (US).

BOLIVIA: BENI: Lake Rogagua, *Rusby* (*Mulford Biol. Expl.*) 826A (US), 1786A in part (NY).

BRAZIL: *Riedel* 924 (Ch, fragment). ESPÍRITU SANTO: Linhares, *Kuhlmann* 205 (US). RIO BRANCO: São Marcos, *Ule* 7787 (NY,US). PARÁ: Jatobá, Rio Tocantins, *Fróes* 27212 (US). MATO GROSSO: Cuyabá, *Malme* 1820 (R). RIO DE JANEIRO: *Riedel* 123 (F. M. neg. 32120 ex W; US).

PARAGUAY: "Chaco, 21° lat.," *Fiebrig* 1457 (K).

LOCAL NAMES: Cortiça (Brazil).

Aeschynomene fluminensis exhibits a more robust growth and distinctly larger flowers and fruits than *Ae. parviflora*, the other species of the series.

The fruits of the typical variety vary from hispid to nearly glabrous, sometimes on the same plant. At least incipient glandular development is apparent. In some cases hairs are present but the basal secretory cells have not developed. *Ekman's* collection No. 12437, from the Isle of Pines, shows considerable reduction of pubescence.

According to *Amshoff* (*Flora of Surinam* 2. 1939), *Ae. scoparia* Splitgerb. is a synonym of *Ae. fluminensis*, presumably of the typical variety.

6b. *Aeschynomene fluminensis* var. *tuberculata* (Griseb.) Rudd, comb. nov.
Aeschynomene tuberculata Griseb. Cat. Pl. Cub. 72. 1866.

This differs from the typical variety in the consistently glabrous nature of the fruits and stems.

TYPE LOCALITY: "Cuba occ.," presumably Pinar del Rfo. Type collected by C. Wright (No. 2305), cited below.

DISTRIBUTION: Known only from the main island of Cuba, in lagoons (fig. 3).

CUBA: PINAR DEL RFO: *C. Wright* 2305 (GH, Mo, NY, US, ISOTYPES). Laguna Jovero, *Shafer* 10842 (NY). Pinar del Rfo, *Ekman* 17879 (US).

LAS VILLAS: Mordozo, *León & Cazañas* 5947 (NY).

Aeschynomene tuberculata appears to differ from typical *Ae. fluminensis* only in the lack of pubescence on fruits and stems. In view of the instability of indument on the latter, it seems more reasonable to consider *Ae. tuberculata* as a glabrous variant of *Ae. fluminensis* rather than to maintain it as a separate species.

Series 3. *Montevidenses* Rudd, ser. nov.

Herbae erectae vel frutices; stipulae frequenter caducae, infra insertionem productae, acuminatae vel acutae, basi acutae vel obtusae; foliola oblonga, obtusa, 1-costata, costa centrali vel fere centrali; calyx bilabiatus, labio superiore emarginato vel bifido et labio inferiore profunde trilobato; legumen stipitatum.

Erect herbs or shrubs; stems glabrous to sparsely glandular-hispid; stipules appendiculate below the point of attachment, usually caducous, glabrous; leaflets oblong-elliptic, obtuse, entire, the base obliquely rounded, the costa essentially central; inflorescences usually 2-4-flowered, the peduncles and pedicels usually glandular-hispidulous, sometimes glabrous, the bracts decreasingly stipule-like toward the apex of the rachis, glabrous; calyx glabrous, deeply bilabiate, the vexillar lip emarginate or 2-lobed, the carinal lip deeply 3-lobed; fruit relatively long-stipitate.

Aeschynomene montevidensis Vog. is designated as the type of the series.

The *Montevidenses* series is readily separable from the preceding two series by its leaflets, which have a single costa, centrally placed. From the two other series of § *Aeschynomene*, the *Sensitivae* and the *Indicae*, it is best recognized by the calyx with its deeply 3-lobed carinal lip.

Turczaninow proposed the genus *Macromiscus*, which he distinguished from *Aeschynomene* on the basis of the stamen tube—with

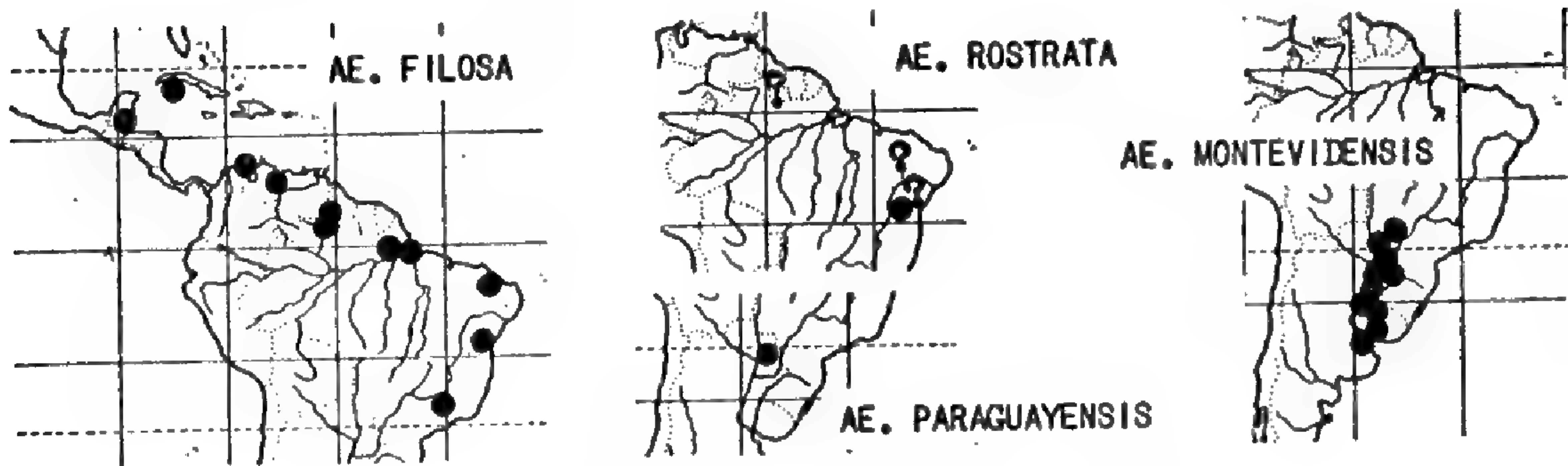


FIGURE 4. Distribution of the *Montevidenses*.

the filaments more or less united, not forming two groups of five stamens each, and the lower lip of the calyx (vexillar lip) undivided: "nec adelphiis duabus pentandris, atque calycis labio inferiore indiviso."

Apparently his acquaintance with the genus *Aeschynomene* was limited since those two conditions are not uncommon and are not usually considered sufficient grounds for generic segregation. The two species ascribed to *Macromiscus* are here included in *Aeschynomene*, in the series *Montevidenses*, one under *Ae. rostrata*, the other as a synonym of *Ae. montevidensis*.

7. *Aeschynomene filosa* Mart. ex Benth. in Mart. Fl. Bras. 15 (pt. 1): 61. 1859.
Aeschynomene tenerrima Robins. Proc. Am. Acad. 49: 503. 1913.
Aeschynomene laxa Gleason, Bull. Torr. Bot. Club 56: 395. 1929.

Stem to about 1 m. high; stipules linear, 8–15 mm. long, entire, the margin usually somewhat hyaline, the portion above the point of attachment 5–10 mm. long, acute to acuminate, the lower portion 3–5 mm. long, acute to erose-truncate; leaves about 4–7 cm. long, mostly 40–65-foliolate, the petiole and rachis glabrous to sparsely glandular-hispidulous; leaflets 3–5 mm. long, 1–1.5 mm. wide; bracts stipule-like but smaller, the bracteoles linear-ovate, acute, about 2 mm. long; flowers 4–6 mm. long; calyx 2–3 mm. long; standard commonly 5 mm. long, spatulate, the narrowed base about 2 mm. long, the blade about 3 mm. in diameter, the apex rounded or emarginate; wings about 5 mm. long, the claw 1 mm. long, the blade about 4 mm. long and 1 mm. wide at maximum; keel petals about the same size as the wings; stamens about 3.5 mm. long; fruit 1–4- (commonly 2-) articulate, moniliform, the stipe 7–10 mm. long, sparsely glandular-hispidulous to glabrous, the articles orbiculate or nearly so, 2.5–3 mm. wide, 3–4 mm. long, subglabrous, somewhat veiny, smooth or slightly verrucose, the margins thickened; seeds 2–2.5 mm. long, 1.5–2 mm. wide, smooth, black.

TYPE LOCALITY: Cachoeira (as "Caxoeira"), Bahia, Brazil. Type collected by Martius, cited below.

DISTRIBUTION: Chiefly in northern and eastern South America; also in Cuba and British Honduras, in swamps (fig. 4).

BRITISH HONDURAS: TOLEDO: Yaccos Lagoon, Peck 900 (GH, TYPE of *Ae. tenerrima*).

CUBA: HABANA: Isla de Pinos, Ekman 12032 (NY).

VENEZUELA: GUÁRICO: El Socorro, Burkart 17203 (US).

COLOMBIA: GOAJIRA: Dawe 556 (US).

BRAZIL: AMAPÁ: Macapá, Fróes & Black 27304 (IAN). RIO BRANCO: Frechal, south of Mount Roraima, Tate 10 (NY, TYPE of *Ae. laxa*). São Marcos, Ule 7783 (K). "Lagoa de Maruay," Luetzelburg 21115 (R). PARÁ: Soure, Black & Camargo 50-8841 (US), Black, & Lobato 50-9138 (IAN). Ilha do Marajó, Black & Engelhard 50-8933 (IAN), Black, Ledoux & Stegemann 52-14429 (US). PIAUÍ: Lagôa Grande, Luetzelburg 1404 (R). CEARÁ: Fortaleza, Drouet 2290 (CH, GH, NY, R, US), 2497 (CH, GH). PARAÍBA: Serra da Borborema, Luetzelburg 12526 (R). BAHIA: Cachoeira, Martius (F. M. neg. 6270, presumably of TYPE ex M). MINAS GERAIS: Santa Terezinha, Macedo 1638 (Mo.) Caraça, Glaziou 12571 (K).

LOCAL NAMES: Catinga de Bode (Brazil).

Aeschynomene filosa is readily distinguished from the other species of the series by its small flowers, fruits, and leaflets. In most specimens the fruits, with their two orbiculate articles, are distinctive. A suture below the first article suggests that one or more basal ovules have aborted and their articles fused to become a part of the stipe.

The type specimens of *Ae. tenerrima* and of *Ae. laxa* are in no way distinct from material of *Ae. filosa*, both of those species being placed in synonymy in this paper. The petal measurements of *Ae. tenerrima* as stated in the original description, "ca. 2-2.5 mm. longis," were obviously based on immature flowers. Mature, persistent calyces on the type specimen are about 3 mm. long, indicating that the mature flowers were 4-6 mm. long.

8. *Aeschynomene rostrata* Benth. in Mart. Fl. Bras. 15 (1): 60. 1859.

Macromiscus glandulosus Turcz. Bull. Soc. Nat. Mosc. 20 (1): 174. 1847, non *Aeschynomene glandulosa* Poir. 1816, nec *Ae. glandulosa* Bello, 1881.

Stem suffrutescent, 1-3 meters high; stipules 4-18 mm. long, the upper portion lanceolate, acuminate, 3-13 mm. long, 1-2 mm. wide, the lower portion rounded or truncate, 1-5 mm. long; leaves 2-4 cm. long, 20-60-foliolate, the petiole and rachis glabrous or sparsely glandular-hispid; leaflets 3-10 mm. long, 1-2 mm. wide, somewhat glaucous; bracts stipule-like to oblong-ovate, the pair subtending the calyx 2-3 mm. long, about 1 mm. wide, obtuse to acute, minutely crenulate; flowers (6?-) 8-12 mm. long (8 lin. fide Bentham); calyx (3.5?-) 5-6 mm. long; standard (6?-) 8-12 mm. long, the claw 1-2 mm. long, the blade suborbiculate, 5-13 mm. in diameter, repand, entire; wings about as long as the standard, the claw 1 mm. long or less,

the blade (3?-) 5 mm. wide; keel slightly shorter than the other petals, arcuate, the blades (2?-) 3-4 mm. wide, the apex somewhat rostrate; stamens 6-12 mm. long; fruit 1-5-articulate, the stipe 10-12 mm. long, glabrous or hispidulous, the articles membranous, 3-4 mm. wide, 4-6 mm. long, glabrous; seeds about 2 mm. wide and 3 mm. long, black (on smaller specimens but not seen on others).

TYPE LOCALITY: Serra da Jacobina, Bahia, Brazil. Type collected by Blanchet (No. 2646), cited below.

DISTRIBUTION: British Guiana ? and eastern Brazil (fig. 4).

?BRITISH GUIANA: Kurasabai savanna, Pakaraima Mountains, *Myers* 2924 (US).

BRAZIL: ? CEARÁ: *Allemão* 353 in part (R). BAHIA: Serra da Jacobina, *Blanchet* 2646 (Ch?; F. M. neg. 2148 of ISOTYPE ex B). ? Joazeiro, *Zehntner* 140 (R).

Originally described as *Macromiscus glandulosus*, Bentham, in reducing that genus to *Aeschynomene*, proposed the species name *rostrata* to avoid homonymy.

There is some doubt in my mind as to the identity of this taxon. I do not know the specimen of the Blanchet collection No. 2646 on which Turczaninow based his original description, nor have I seen the material which Bentham used for his description in "Flora Brasiliensis." I am relying on a photograph of a Blanchet No. 2646 specimen ex Berlin. Another sheet, almost sterile, of the same collection number from Chicago, and originally from the British Museum, appears to be different, possibly *Ae. sensitiva*. The three additional collections which I have tentatively cited agree with the material of the Berlin photograph, except that the flowers are much smaller and the fruits slightly so. They resemble *Ae. filosa* except that the fruit stipes are slightly longer and the elliptical articles lack the thickened margins. I have seen no other material which agrees exactly with the dimensions of the Berlin specimen.

9. *Aeschynomene paraguayensis* Rudd, nom. et stat. nov.

Aeschynomene selloi Vog. forma *scabra* Chod. & Hass. Bull. Herb. Boiss. II. 4: 883. 1904.

Shrub 2-4 m. high; stipules about 20 mm. long, the upper portion ovate, acuminate, about 15 mm. long and 7 mm. wide, the lower portion rounded, about 5 mm. long and 4 mm. wide; leaves 5-6 cm. long, 12-20-foliolate, the petioles and rachises somewhat glandular-hispidulous; leaflets about 10-15 mm. long, 4-5 mm. wide, the principal nerves dark reddish, conspicuous on the lower surface; bracts showy, broadly ovate, about 10-15 mm. long, 8-10 mm. wide, acute, entire to crenate, ciliate; bracteoles elliptic-obovate, obtuse, about 10 mm. long and 5 mm. wide, shallowly crenate, ciliate; flowers about 20-25 mm. long; calyx 8-10 mm. long; standard about 20-25

mm. long, the claw 4–5 mm. long, the blade broadly ovate, rounded, entire, 18–20 mm. long, 20–25 mm. wide at maximum; wings about as long as the standard, the claw 3 mm. long, the blade 18–20 mm. long, 10–12 mm. wide, crenulate, glandular-ciliate; keel about 20 mm. long, the claws 5 mm. long, the blades about 15 mm. long and 6 mm. wide; stamens about 15 mm. long; fruit 6–8-articulate, the stipe about 15 mm. long, sparsely hispidulous, the articles subglabrous, glandular-hispidulous along the margins, about 6 mm. long and 4.5 mm. wide; seeds dark brown, about 3 mm. long and 2 mm. wide.

TYPE LOCALITY: Cordillera de Piribebuy, Paraguay, "in palude." Type collected by Hassler (No. 6694).

DISTRIBUTION: Known only from the type collection (GH, Mo) (fig. 4).

With its large flowers, the largest in this series, *Ae. paraguayensis* is one of the showiest of the American species of *Aeschynomene*. Unfortunately, it is known only from the type collection. The bracts and stipules are conspicuously larger than those of any other species of *Aeschynomene* native to America.

This taxon is believed to warrant specific recognition rather than to remain as a form of *Ae. selloi*. In fact, in this paper the two taxa are placed in different series and are not considered to be closely related.

10. *Aeschynomene montevidensis* Vog. *Linnaea* 12: 83. 1838.

Macromiscus brasiliensis Turcz. *Bull. Soc. Nat. Mosc.* 19(2): 507. 1846.

Aeschynomene montevidensis var. *microphylla* Chod. & Hass. *Bull. Herb. Boiss.* II, 4: 883. 1904.

Shrub 1–3 m. high; stipules 5–15 mm. long, the upper portion lanceolate, acuminate, about 4–12 mm. long, 1–2 mm. wide, the lower portion rounded, subentire, 1–3 mm. long; leaves usually 3–8 cm. long, about 25–70-foliolate, the petiole and rachis glabrous or sparsely glandular-hispid; leaflets 1.5–10 mm. long, 1–3 mm. wide, sometimes lightly glaucous, the principal veins dark reddish, conspicuous on the lower surface; bracts ovate, about 5–7 mm. long, 3–4 mm. wide, acute, entire to subcrenate, sometimes ciliate; bracteoles ovate-oblong, acute, 5–7 mm. long, 2–3 mm. wide, subacute, somewhat crenate and ciliate; flowers 13–18 mm. long; calyx 6–10 mm. long; standard commonly about 17 mm. long, the claw 2 mm. long, the blade ovate-orbiculate, about 15 mm. in diameter, emarginate, repand, entire; wings about 17 mm. long, the claw 3 mm. long, the blade about 14 mm. long and 7 mm. wide, obtuse, the base attenuate, the upper margin crenulate, usually glandular-ciliate; keel petals about 18 mm. long, the claw 3 mm. long, the blade about 15 mm. long and 6 mm. wide at maximum; stamens about 17 mm. long; fruit 3–7-articulate, the upper edge straight or slightly curved, the lower edge crenate, the stipe about 10

mm. long, hispid, the articles about 7 mm. long and 5 mm. wide, glabrous, verrucose; seeds about 4 mm. long and 2 mm. wide, dark brown.

TYPE LOCALITY: Montevideo, Uruguay (as "Brazil"). Type collected by Sellow, cited below.

DISTRIBUTION: Brazil, Paraguay, Uruguay, and Argentina in the region of the Río Paraná, in wet areas (fig. 4).

BRAZIL: Mato Grosso: Campo Grande, *Archer & Gehrt* 30 (US).

URUGUAY: SALTO: Rincón del Dayman, *Osten* 5370 (US). Río NEGRO: San Javier, *Herter* 82859 (US). SORIANO: Mercedes, *Osten* 251 (GH). COLONIA: Río San Juan, *Cabrera* 3217 (NY). SAN JOSÉ: Rincón de Arazati, *Legrand* 494 (Ch). MONTEVIDEO: Montevideo, *Sellow* (F. M. neg. 2150 of TYPE ex B; Ch fragment, GH, Mo).

PARAGUAY: "Sud-Paraguay," *Kuntze*, Sept. 1892 (NY). CONCEPCIÓN: Río Apa, *Hassler* 8125 (GH, Mo). Estrella, *Fiebrig* 4270 (GH). ALTO PARANÁ: Río Paraná, *Fiebrig* 5646 (GH, K, US), 6136 (GH, US). CENTRAL: *Morong* 400 in part (US). Lague, *Morong* 310 (Ch, GH, Mo, NY, US). Ypacaray, *Hassler* 12314 (GH, Mo, US). CORDILLERA: Cordillera de Altos, *Hassler* 400 (NY); *Fiebrig* 210 (Ch, GH, US). GUAIRÁ: Villarrica, *Jørgensen* 3631 (Ch, Mo, NY, US). CAAGUAZU: Igatimí, *Hassler* 4816 (GH). Curuguaty, *Hassler* 4587 (NY ISOTYPE of *Ae. montevidensis* var. *microphylla*).

ARGENTINA: CORRIENTES: La Cruz, *Burkart* 8191 (GH). Mercedes, *Rodrigo* 746 (NY). Goya, *Curran* 218 (US). Near Arroyo Ibicuy, *Pedersen* 829 (US). MISIONES: Santa Ana, *Rodríguez* 768 (Ch). Posadas, *Ekman* 1724 (NY, US), 1725 (Mo). San Javier, *Clos* 2133 (GH). ENTRE RÍOS: Concepción del Uruguay, *Lorentz* 89a (GH). BUENOS AIRES: *Tweedie* (GH). Belgrano, *Barros* 767 (US). Eva Perón [La Plata], *Krapovickas* 2704 (GH, Mo, US); *Dawson* 343 (NY). Punta Lara, *Cabrera* 730 (NY); *Atkinson*, Jan. 1947 (US). Arroyo Tuyuparé, *Scala* 172 (NY), 178 (NY). Isla Santiago, *Cabrera* 1999 (NY). Tigre, *Bartlett* 19271 (US).

This seems to be the most abundantly collected species of the series. As indicated in the key, the dimensions of the fruits and flowers separate *Ae. montevidensis* from *Ae. filosa* and *Ae. rostrata*, and the size of the flowers, bracts, and leaflets separate it from *Ae. paraguayensis*.

The variety *microphylla* does not seem worthy of retention. Although there are microphyllous specimens, there also are specimens which show considerable gradation in size of leaflets. The flowers and fruits of var. *microphylla* appear to be the same as those of typical *Ae. montevidensis*.

Manganaro (Anal. Soc. Cient. Arg. 87:142. 1919) believed that *Ae. bonariensis* represented robust secondary growth of *Ae. montevidensis*. However, a fragment of the type of *Ae. bonariensis*, kindly sent me by Dr. Burkart of San Isidro, Argentina, is referable, I believe, to *Ae. rudis*.

I do not know the type specimen of *Macromiscus brasiliensis*, and its exact source is in doubt. The original description states: "In

Brasilia e collectione mihi ignota." Bentham placed it in synonymy under *Ae. montevidensis*, which, on the basis of the description, appears to be correct.

Series 4. *Sensitivae* Rudd, ser. nov.

Herbae, nonnunquam suffruticosae, erectae, nigrescentes; stipulae saepe caducae, infra insertionem productae, acuminatae vel acutae, basi acutae vel eroso-truncatae; foliola oblonga, obtusa vel subacuta, basi obliqua, supra puncticulata, 1-costata, costa centrali vel fere centrali; calyx bilabiatus, labiis fere integris vel subdenticulatis; legumen stipitatum, fuscum.

Erect herbs, sometimes suffrutescent, blackening on drying; stipules appendiculate below the point of attachment, mostly caducous, the

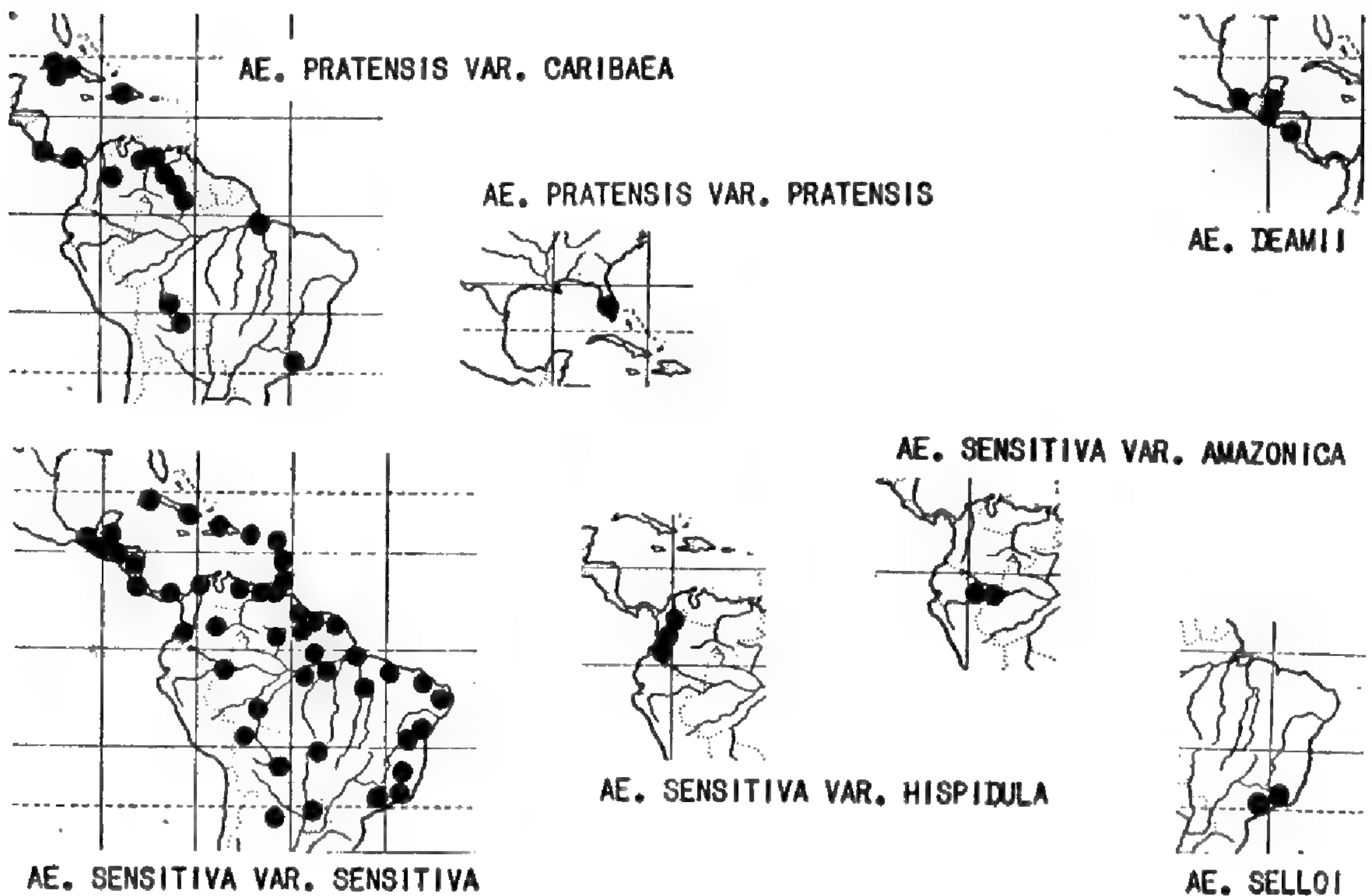


FIGURE 5. Distribution of the *Sensitivae*.

upper portion acute to acuminate, the lower portion acute or erose-truncate; leaflets oblong, obtuse to subacute, the base obliquely rounded, the upper surface minutely punctate, the costa essentially central; inflorescences few-flowered, racemose, axillary; calyx bilabiate, the lips entire or subdenticulate; fruit dark brown or blackish when mature.

Aeschynomene sensitiva Sw. is selected as the type of the series.

11. *Aeschynomene pratensis* Small, Bull. N. Y. Bot. Gard. 3: 423. 1905.

Stem 1-2 meters tall, herbaceous or suffrutescent, glabrous or sparsely hispid; stipules entire, 5-15 mm. long, 1.5-2 mm. wide, at-

tached slightly below the midpoint, the upper portion acuminate, the lower usually truncate, erose; leaves 4–7 cm. long, commonly 20–25-foliolate, the petioles and rachises glabrous or sparingly beset with glandular hairs; leaflets about 5–10 mm. long, 1.5–2.5 mm. wide, the secondary veins inconspicuous; peduncles and pedicels glabrous to hispid; bracts 4–5 mm. long, 1–2 mm. wide, stipule-like, attached slightly below the midpoint, the margin sometimes hyaline, entire, sometimes sparsely ciliate; bracteoles ovate, subacute, 3–4 mm. long, 1.5–2 mm. wide, usually hyaline-margined; flowers 7–12 mm. long; calyx 4–6 mm. long, the vexillar lip subentire to 2-denticulate, the carinal lip 3-denticulate; standard 7–12 mm. long, the claw 2–3 mm. long, the blade suborbiculate, about 6–9 mm. long, 5–9 mm. wide, sparsely ciliate; wings about as long as the standard, the claw 1 mm. long, the blade 6–10 mm. long, 3–4 mm. wide, sometimes ciliate; keel falcate, the claws about 1 mm. long, the blades 6–9 mm. long, 3 mm. wide at maximum; stamens 7–10 mm. long; fruit commonly 5–9-articulate, the stipe 8–15 mm. long, glabrous or sparingly hispid, separated from the basal article by a suture, the articles 5–8 mm. long, 4–6 mm. wide, glabrous or nearly so, reticulate-veiny, verrucose at maturity; margins of fruit usually both crenate, sometimes one margin subentire; seeds 4–5 mm. long, 2.5–3 mm. wide, dark brown.

11a. *Aeschynomene pratensis* var. *pratensis*.

Aeschynomene pratensis Small, Bull. N. Y. Bot. Gard. 3: 423. 1905.

Flowers 10–12 mm. long, the calyx 5–6 mm. long; fruit with stipe 10–15 mm. long, the articles 7–8 mm. long, 5–6 mm. wide.

TYPE LOCALITY: Florida, in Everglades west of Camp Jackson, Dade County. Type collected by Small and Wilson (No. 1960), cited below.

DISTRIBUTION: Known only from the Everglades of Florida (fig. 5).

UNITED STATES: FLORIDA: Dade County: Camp Jackson, *Small & Wilson* 1960 (Ch, NY TYPE). Between Camp Jackson and Long Key, *Small & Carter* 3024 (NY). Long Key, *Small & Carter* 3023 (NY), 3091 (NY). Long Prairie, *Small & Carter* 2564 (NY). Paradise Key, *Britton* 233 (Ch, NY); *Killip* 41210 (US). Monroe County: Flamingo, *Small, Small & DeWinkeler* 11534 (NY).

11b. *Aeschynomene pratensis* var. *caribaea* Rudd, var. nov.

A varietate typica floribus fructibusque minoribus differt.

The flowers and fruit are consistently smaller than those of the typical variety, the flowers 7–10 mm. long, the calyx 4–5 mm. long; the fruit with stipe about 8–10 mm. long, the articles 5–6 mm. long, 4–5 mm. wide.

TYPE: In the U. S. National Herbarium, No. 521919, collected near Nueva Gerona, Isla de Pinos, Cuba, Jan. 19, 1904, by A. H. Curtiss (No. 300). Duplicates at Ch, GH, Mo, NY.

DISTRIBUTION: Chiefly in the Caribbean area and southward to central South America, in wet places; also in the Old World tropics, apparently introduced (fig. 5).

COSTA RICA: PUNTARENAS: Buenos Aires, *M. Valerio* 859 (Ch), 922 (Ch). **SAN JOSÉ:** El General, *Skutch* 2464 (Mo, NY, US).

PANAMÁ: *Seeman* 203 (GH). **COCLÉ:** Aguadulce, *Pittier* 4918 (US). Penonomé, *R. S. Williams* 130 (NY, US). Between Las Margaritas and El Valle, *Woodson, Allen, & Seibert* 1768 (NY, US). **CANAL ZONE:** Between Fort Clayton and Corozal, *Standley* 29092 (US). **PANAMÁ:** Panamá, *Paul* 568 (US); *Standley* 27818 (US). Los Sabanas, *Standley* 25938 (US), 40770 (US); *Heriberto* 296 (US). Chepo, *Pittier* 4549 (US). Nuevo San Francisco, *Standley* 30753 (US). Between Matías Hernández and Juan Díaz, *Standley* 31964 (US). Juan Díaz, *Standley* 30514 (US).

CUBA: *C. Wright* 2304 in part (GH, Mo, US). **PINAR DEL RÍO:** Laguna Jovero, *Shafer* 10839 (Ch, Mo, NY, US); *Killip* 32341 (US). Mantua to Arroyas, *Shafer* 11231 (Mo, NY, US). Herradura, *Britton & Gager* 6933 (NY, US). **HABANA:** Isla de Pinos, *Ekman* 11877 (Ch); *Killip* 42561 (US), 43167 (US); *Alain & Killip* 2096 (US). **MATANZAS:** Itabo, *León, Edmund, & Roca* 9640 (NY). **LAS VILLAS:** Cieneguita, *Combs* 409 (Ch, GH, Mo, NY). Manacas, *León & Cazañas* 5891 (NY).

HAITI: **NORD:** Dondon, *Ekman* H-8280 (US).

DOMINICAN REPUBLIC: **DUARTE:** Villa Riva, Almacén, *W. L. Abbott* 539 (US). **LA VEGA:** Bonao, *Valeur* 384 (Ch, Mo, UC, US). Sierra Prieta, *Jiménez* 1150 (US). Piedra Blanca, *Allard* 14816 (US). **SEIBO:** Higüey, *Taylor* 394 (NY).

VENEZUELA: "Llanos de Venezuela," *Elias* 624 (Ch). **COJEDES:** San Carlos, *Rudd* 366 (US). **BOLÍVAR:** La Paragua, *Killip* 37605 (US). Santa Elena, *Tamayo* 2779 (US). **ANZOÁTEGUI:** Santamé, *Pittier* 15160 (Ven).

COLOMBIA: Boyacá: La Poyata, *Cuatrecasas* 4472 in part (US).

BOLIVIA: **BENI:** Mamoré, *Werdermann* 2214 (Mo). **SANTA CRUZ:** Buena Vista, *Steinbach* 5334 (GH), 5505 (GH, NY).

BRAZIL: **RIO BRANCO:** Rio Cantá, *Black* 51-13847½ (US). Bôa Vista, *Black* 51-14095 (US). **RIO DE JANEIRO:** Belém, *Glaziou* 8631 (K).

This is distinguished from the typical variety by its smaller flowers and fruits. It is distinguished from *Ae. sensitiva* var. *sensitiva*, to which it is apparently closely related, by its slightly larger flowers and by the suture between the stipe and first article. This suture appears to be due to abortion of basal ovules, which have been absorbed by the stipe. The flowers are about the same size as those of *Ae. sensitiva* var. *hispidula*, but the fruit and stem indument are quite different.

12. *Aeschynomene selloi* Vog. Linnaea 12: 82. 1838.

Stem to about 4 m. high, somewhat hispid above, glabrous or glabrate below; stipules 8-15 mm. long, 2-4 mm. wide, the margin subentire, the portion above the point of attachment 6-12 mm. long, acute, the lower portion 2-3 mm. long, acute or erose-truncate; leaves about 3-5 cm. long, 18-30-foliolate, the petiole and rachis subglabrous to glandular-hispidulous; leaflets about 8-12 mm. long, 2-3 mm. wide, the secondary veins inconspicuous or dark reddish; peduncles and

pedicles glabrous to hispidulous; bracts stipule-like, diminishing in length toward the flowers, the uppermost about 5 mm. long, sometimes hispid near the point of attachment; bracteoles ovate, acute, about 4 mm. long and 2 mm. wide; flowers 14–20 mm. long; calyx 8 mm. long, the vexillar lobe entire or obscurely 2-denticulate, the carinal lobe entire or obscurely 3-denticulate; standard commonly about 15 mm long, the claw 2 mm. long, the blade suborbiculate, about 13 mm. long and 10 mm. wide, usually ciliate; wings about 11 mm. long, the claw 1 mm. long, the blade about 10 mm. long and 5 mm. wide, usually ciliate; keel petals falcate, the claw 1–1.5 mm. long, the blade 12–13 mm. long, about 4 mm. wide; stamens about 15 mm. long; fruit almost black when mature, commonly 8–10-articulate, the stipe about 12–15 mm. long, glabrous or sparsely hispid, the articles about 10 mm. long and 6 mm. wide, glabrous or sparsely hispid, the upper margin of fruit nearly straight, the lower margin crenate; seeds 4–5 mm. long, 2–3 mm. wide.

TYPE LOCALITY: Rio de Janeiro, Brazil. Type collected by Sellow, cited below.

DISTRIBUTION: Brazil, Rio de Janeiro and eastern São Paulo (fig. 5).

BRAZIL: RIO DE JANEIRO; *Sellow* (Ch fragment, presumably of TYPE ex B). São Gonçalo, *Glaziou* 8632 (NY, R). Campos, Fazenda Cacomanga, *Sampaio* 8535 (R). SÃO PAULO: Campinas, *Novaes* 247 (US).

LOCAL NAMES: Rolha de garrafa (Brazil).

This species is distinguished from others of the series by its large flowers and its fruits with their relatively long articles.

In "Flora Brasiliensis," Bentham, in citing *Ae. selloi*, included a Martius collection from the Upper Amazon and, apparently, used that as the model for his illustrative plate. However, I believe that to be a separate entity which in this paper is treated as *Ae. sensitiva* var. *amazonica*.

13. *Aeschynomene deamii* Robins. & Bartl. Proc. Amer. Acad. 43: 52. 1907.

Stem about 2–4 m. high, glabrous; stipules about 15 mm. long and 2.5 mm. wide, usually hyaline-margined, the portion above the point of attachment 12 mm. long, acuminate, the lower portion 3 mm. long, truncate-erose; leaves 5–7 cm. long, about 12–20-foliolate, the petiole and rachis glabrous to hispidulous; leaflets commonly 15 mm. long and 3 mm. wide, the largest about 20 mm. long and 4 mm. wide, the lower surface somewhat lighter than the upper, the veins conspicuously dark reddish; bracts stipule-like, decreasing in size toward the flowers, the uppermost about 5 mm. long; bracteoles ovate, acute, about 4 mm. long and 2 mm. wide; peduncles and pedicels glabrous; flowers 8–14 mm. long; calyx about 8 mm. long, the vexillar lip obtuse, entire, the carinal lip acute, entire; standard obovate, not distinctly

clawed, about 10–12 mm. long, 8–10 mm. wide at maximum, entire, rounded or retuse; wings 10–12 mm. long, the claw 3–4 mm. long, the blade 7–8 mm. long, 4–5 mm. wide, entire; keel petals slightly shorter than the other petals, the claw 2–3 mm. long, the blade 6–7 mm. long, 3–4 mm. wide; stamens 10–12 mm. long; fruit commonly 12–14-articulate, the stipe about 5–8 mm. long, glabrous, the articles 5–7 mm. long and wide, glabrous, the upper edge of fruit entire, the lower edge entire or slightly crenate; seeds 4–5 mm. long, about 3 mm. wide, brown.

TYPE LOCALITY: In marsh at base of old fort at outlet of Lake Izabal, San Felipe, Guatemala. Type collected by C. C. Deam (No. 26), cited below.

DISTRIBUTION: Southern México to Nicaragua, in marshes (fig. 5).

MÉXICO: VERA CRUZ: Fortuño, *Ll. Williams* 8489 (Ch), 8943 (Ch). TABASCO: Between Mayito and San Rafael, *Rovirosa* 766 (NY).

GUATEMALA: PETÉN: Uaxactún, *Bartlett* 12351 (Ch, NY, UC). IZABAL: San Felipe, *Deam* 26 (Ch, GH TYPE, Mo, NY, US); *Steyermark* 39599 (Ch). Entre Ríos, *Kuylen*, Feb. 23, 1927 (US).

BRITISH HONDURAS: BELIZE: Northern River, *Gentle* 1365 in part (CH, US). TOLEDO: Río Grande, *Peck* 760 (GH, K).

NICARAGUA: *C. Wright*, in 1853–56 (GH, NY, US). Isla de Ometepe, *Shimek & Smith* 135 (US).

LOCAL NAMES: Chipili, añilillo (México).

The large flowers distinguish *Ae. deamii* from all other species of the series, with the exception of *Ae. selloi*. From that, the fruits with 12–14 quadrate articles are sufficiently different to avoid confusion.

14. *Aeschynomene sensitiva* Sw. Prodr. Veg. Ind. Occ. 107. 1788.

Stem up to about 4 m. high, glabrous or glabrate below, the upper, fruiting branches glabrous to densely hispidulous; stipules 5–20 mm. long, 1.5–5 mm. wide, the margin subentire, the portion above the point of attachment 3–15 mm. long, acute to acuminate, the lower portion 2–6 mm. long, truncate, erose; leaves 2–10 cm. long, 10–40-foliolate, the petiole and rachis hispidulous; leaflets 4–15 mm. long, 1.5–3 mm. wide, rarely with a few marginal hairs, the veins often dark reddish; peduncles and pedicels subglabrous to densely hispidulous; bracts stipule like, entire to ciliate-laciniate, decreasing in size toward the flowers, the smallest about 3–4 mm. long and 1.5 mm. wide; bracteoles ovate, subacute, 1.5–5 mm. long, 1–2 mm. wide, entire, sometimes ciliate; flowers 5–9 mm. long; calyx 4–8 mm. long, usually ciliate, the vexillar lobe emarginate or subdenticulate, the carinal lobe obscurely 3-dentate; standard commonly 6–8 mm. long, the claw 1.5–2 mm. long, the blade suborbiculate, 4.5–6 mm. in diameter, ciliate, sometimes retuse; wings and keel about as long as the standard, the claws 0.5–1 mm. long, the blades 3.5–7 mm. long, 2.5–3.5 mm. wide;

stamens about 5–7 mm. long; fruit 4–12-articulate, the stipe 4–8 mm. long, glabrous or nearly so, the articles 5–7 mm. long, 4–7 mm. wide, glabrous to sparingly hispid, smooth to verrucose, the upper margin of fruit essentially entire, the lower crenate or nearly entire; seeds 3–4 mm. long, 2.5–3 mm. wide, brown.

14a. *Aeschynomene sensitiva* var. *sensitiva*.

Aeschynomene sensitiva Sw. Prodr. Veg. Ind. Occ. 107. 1788.

Aeschynomene sensitiva Beauv. Fl. Owar. 1: 89, t. 53. 1806.

Aeschynomene sulcata H. B. K. Nov. Gen. & Sp. 6: 530. 1824.

Aeschynomene macropoda var. *belvesii* DC. Prodr. 2: 320. 1825.

Aeschynomene honesta Nees & Mart. Nov. Act. Nat. Cur. 12: 32. 1826.

Aeschynomene belvesii attributed to DC. by Kosteletzky in Allg. Med.-pharm. Flora 4: 1285. 1835.

Cassia paramariboensis Miq. Ann. & Mag. Nat. Hist. 11: 15. 1843.

Aeschynomene fistulosa Bello, Anal. Soc. Esp. Hist. Nat. 10: 259. 1881.

Aeschynomene sensitiva forma *paucifoliolata* Chod. & Hass. Bull. Herb. Boiss. II. 4: 883. 1904.

The typical variety is characterized by plants which are glabrous to moderately hispidulous, the upper fruiting portion having the greatest development of glandular hairs; the flowers are 4–8, commonly 5–6, mm. long; the fruits are glabrous to sparsely hispid, usually 5–8- (rarely 10-) articulate.

TYPE LOCALITY: West Indies, no exact locality or collection specified. Figure 2 of plate 149 in Plumier's "Icones" (1693) presumably is based on the type specimen.

DISTRIBUTION: Wet places in the West Indies, southern México, Central and South America, chiefly at low elevations; also in the Old World tropics, apparently as an introduction (fig. 5).

MÉXICO: TABASCO: "Sancti Joannis Baptistoe," *Rovirosa* 466 (NY, US). CHIAPAS: Tapachula, *Fisher* 35266 (Ch, Mo, NY, US).

GUATEMALA: "Eastern portions of Vera Paz and Chiquimula," *Watson* 18 (GH). BAJA VERAPAZ: Salamá, *Kellerman* 6409 (Ch). IZABAL: Jocoló, *Johnson* 1302 (US). Livingston, *von Türckheim* (II 1127) 8665 (US). Río Dulce, *J. D. Smith* 1774 (GH, US). San Felipe, *Steyermark* 39697 (Ch). Puerto Barrios, *Standley* 72136 (Ch), 72191 (Ch). SAN MARCOS: Ayutlá, *Steyermark* 38027 (Ch). ESCUINTLA: Escuintla, *J. R. Johnston* 966 (Ch, NY); *Standley* 89295 (Ch), 89616 (Ch).

HONDURAS: SANTA BÁRBARA: San Pedro Sula, *Thieme* 5213 (Ch, GH, NY, US). COMAYAGUA: Comayagua, *Standley & Chacón* 5976 (Ch). Pito Solo, *J. Valerio* 2938 (Ch, UC). ATLÁNTIDA: Tela, *Standley* 53528 (Ch, US), 53593 (Ch, US), 53707 (Ch, US), 56632 (Ch, US); *van Severén* 28 (US).

BRITISH HONDURAS: STANN CREEK: Stann Creek, *Schipp* 64 (Ch, GH, Mo, NY, UC, US). Sittee River, *Peck* 851 (GH). BELIZE: Jones Lagoon, *Gentle* 1479 (Ch, Mo).

NICARAGUA: JINOTEGA: Jinotega, *Standley* 10589 (Ch). CHONTALES: La Libertad, *Standley* 8883 (Ch), 9125 (Ch).

COSTA RICA: PUNTARENAS: Boca Zacate, *Pittier* 6814 (US). CARTAGO: Río Turrialba, *Stork* 3223 (Ch).

PANAMÁ: CANAL ZONE: Gamboa, *Allen* 1976 (GH, Mo, US). Frijoles, *Piper* 5182 (US). Barro Colorado Island, *Bangham* 505 (Ch); *Kenoyer* 386 (US); *Starry* 256 (Ch); *Shattuck* 624 (Ch); *Bailey & Bailey* 300 (Ch); *Wetmore & Abbe* 215 (Ch, GH); *Woodworth & Vestal* 401 (Ch). Between Corozal and Ancón, *Pittier* 2647 (GH, NY, US). Darien, *Macbride* 2706 (Ch, Mo, US). COLÓN: Chagres, *Fendler* 100 (Mo, US).

CUBA: *C. Wright* 2304 in part (Mo, NY, US). PINAR DEL RÍO: Pinar del Río, *Ekman* 18246 (GH, NY, US). Between Pinar del Río and Coloma, *Britton, Britton, & Cowell* 10077 (NY). Bramales, *Ekman* 10573 (Mo). Mantua to Arroyos, *Shafer* 11231 (Mo). HABANA: *Van Hermann* 224a (Ch). San Pedro, *León* 7202 (NY). ORIENTE: Yara to Manzanillo, *Shafer* 12362 (Ch, Mo, NY, US).

HAITI: NORD: Bayeux, *Ekman* H-2682 (US).

DOMINICAN REPUBLIC: *Jiménez* 1286 (US). SAMANÁ: *Sanchez, W. L. Abbott* 517 (US), 2945 (Ch, GH, US).

PUERTO RICO: SAN JUAN: Río Piedras, *J. R. Johnston* 175 (NY); *Stevenson* 207 in part (US). Bayamon, *Sintenis* 1103 (US). Catano, *Heller* 6414 (Ch, GH, Mo, NY, US). Santurce, *Heller & Heller* 441 (Ch, NY, US); *Otero* 219 (Mo). San Juan, *Heller* 665 (Ch, NY, US). HUMACAO: Naguabo, *Shafer* 3441 (Ch, NY, US). Between Fajardo and Ceibay, *Britton & Shafer* 1516 (NY). GUAYAMA: Between Caguas and Cayey, *Kuntze* 332 (NY). Aybonita, *Sintenis* 2006 (Mo, US). ARECIBO: Between Manatí and Vega Baja, *Underwood & Griggs* 935 (NY, US). Dorado, *Britton, Britton, & Brown* 6672 (NY). AGUADILLA: Lares, *Sintenis* 5897 (US); *Underwood & Griggs* 66 (NY, US). San Sebastian, *Sargent* 243 (US). MAYAGÜEZ: Mayagüez, *Sintenis* 94 (GH, US); *Holm* 208 (Ch, GH, Mo); *Britton* 2374 (Ch, Mo, NY, US); *Heller* 4589 (Ch, GH, Mo, NY, US). Cabo Rojo, *Sintenis* 94b (GH, US).

LESSER ANTILLES: BRITISH VIRGIN ISLANDS: Tortola, *Fishlock* 126 (GH, NY). GUADELOUPE: *Duss* 2655 (Ch, NY, US); *Stehlé* 497 (US); *Questel* 641 (US). DOMINICA: *G. P. Cooper* 67 (Ch, GH, NY, UC, US); *Hodge* 588 (Mo, NY, US), 589 (NY). ST. LUCIA: *Velez* 3314 (US). ST. VINCENT: *Smith & Smith* 217 (GH, NY); *Eggers* 6728 (US); *Morton* 5646 (US). MARTINIQUE: *Duss* 1062 (Ch, Mo, NY, US); *Stehlé* 3526 (NY). GRENADA: *Broadway*, June 16, 1905 (GH, NY), Oct. 6, 1905 (Ch, GH).

TRINIDAD: *Broadway* 2862 (Ch), 2862 bis (Ch). Valencia, *Britton, Britton, & Hazen* 1024 (GH, NY, US). Pitch Lake, *Britton & Freeman* 1056 (GH, NY, US).

TOBAGO: *Broadway* 3667 (Ch).

FRENCH GUIANA: Cayenne, *Leprieur*, in 1835 (R); *Broadway* 156 (GH, NY, US).

SURINAM: *Focke* (GH). *Hostmann* (NY), 705 (Mo). "Poelebautje," *Kegel* 184 (*Martius* 1144) (NY).

BRITISH GUIANA: *Schomburgk* 603 (Ch, US). Vreed-en-Hoop, *Hitchcock* 16728 (GH, NY, US). Georgetown, *Hitchcock* 16640 (GH, NY, US). Bel Air, *Persaud* 319 (Ch). Pomeroon District, *De la Cruz* 3213 (NY, US). Mazaruni River, *Mell & Mell* 219 (NY, US). Karenambo, basin of Rupununi River, *A. C. Smith* 2247 (Ch, NY, US). Demerara, *Parker* (GH).

VENEZUELA: *Stevens*, in 1868 (NY). MIRANDA: Dos Caminos, *Eggers* 13076 (US). Los Chorros, *Pittier* 7044 (GH, US, Ven). Petare, *Pittier* 11220 (GH, NY, US, Ven). DISTRITO FEDERAL: Turmerito, *Pittier* 13540 (Ch, Mo, US, Ven). Caracas, *Pittier* 9441 (GH, NY, US, Ven). ARAGUA: Colonia Tovar, *Fendler* 2212 (GH, Mo). Maracay, *Burkart* 16931 (US). CARABOBO: Puerto Cabello, *Burkart* 16325 (US). SUCRE: Bordones, Bonpland, in 1797 (P TYPE of

Ae. sulcata). AMACURO: Sacupana, *Rusby & Squires* 196 (NY). BOLÍVAR: Tumeremo, *Steyermark* 60967 (Ch, Ven). Ciudad Bolívar, *Bailey & Bailey* 1254 (NY).

COLOMBIA: BOLÍVAR: Montería, *Araque & Barkley* 19.Bo.200 (US). Mangangué, *Pennell* 3953 (GH, Mo, NY, US). Soplaviento, *Killip & Smith* 14574 (Ch, GH, NY, US). Frasuquillo, *Pennell* 4592 (NY, US). Cañabetal, *Pennell* 3867 (NY, US). Tierra Alta, *Pennell* 4679 (NY, US). META: Villavicencio. *Killip* 34373 (US), 34501 (US); *Sprague* 122 (US); *Pennell* 1581 (NY, US). EL VALLE: Isla del Guayabal, *Cuatrecasas* 16192 (Ch, US).

PERÚ: LORETO: Iquitos, *Klug* 329 (Ch, NY, US); *Ll. Williams* 1398 (Ch), 7961 (Ch).

BOLIVIA: BENI: Lake Rogagua, *Cárdenas (Mulford Biol. Expl.)* 1391 (GH, NY); *Rusby (Mulford Biol. Expl.)* 1447 (NY), 1604 (NY), 1786A in part (NY). SANTA CRUZ: Río Palometillas, *Steinbach* 6803 (Ch, Mo, UC). Bañada Surutu, *Steinbach* 7375 (Ch, Mo, UC).

BRAZIL: *Martius* 1146 (NY). RIO BRANCO: Ilha do Frio, *Kuhlmann*, May 1912 (US). AMAZONAS: Uará, *Traill* 133 (GH, NY). PARÁ: "Aramanahy," *Monteiro da Costa* 256 (Ch, US). São João do Araguaia, *Burchell* 8801 (Ch, NY). Santarém, *Spruce*, Nov.—Mar. 1849–50 (GH). Belém, *Burchell* 9487 (NY). Rio Cuminá, *Sampaio* 4964 (R). MARANHÃO: Cândido Mendes, *Froes* 1793 (NY). CEARÁ: Allemão 352 in part (R). Forteleza, *Drouet* 2557 (Ch, GH, Mo, NY, R, US). PARAÍBA: Areia, *Vasconcellos* 218 (US). PERNAMBUCO: *Gardner* 976 (GH, NY). Pombos, *Pickel* 338 (GH). BAHIA: *Blanchet* 1041 (US); *Luetzelburg* 2558 (Ch, R, US). "Rio Grongogy Basin," *Curran* 208 (GH, US). *Salzmann* (Mo, R). Ilheos, *Riedel* 2160 (GH, NY). MINAS GERAIS: Viçosa, *Mexia* 4348 (Ch, GH, Mo, NY, UC, US). Manga, *Macedo* 240 (Mo). Lagôa Santa, *Sampaio* 7535 (R); *L. B. Smith* 6700 (US). MATO GROSSO: *Moore* 1005 (NY). Cuyabá, *Malme* 1548 (Ch, R, US), 1819 (R). RIO DE JANEIRO: *Sellow* (GH); *Riedel* 124 (US); *Glaziou* 4210 (R); *Wilkes Exped.* (GH, NY, US). Mons Corcovado, *Burchell* 1614 (GH, NY). Santana, *Emygdio* 393 (R). Jacarepaguá, *Dusen* 1965 (US). Petrópolis, *Glaziou* 8629 (NY, US). Araruama, *L. B. Smith* 7100 (US). Barra do Pirahy, *Hoehne & Gehrt* (GH). DISTRITO FEDERAL: Guaratyba, *Lutz*, May 1926 (R). GUAPORÉ: Falls of Madeira, *Rusby* 1037 (Ch, GH, Mo, NY, US). RIO GRANDE DO SUL: "Serras-E. de R. G. do Sul," *Vidal*, Jan. 1939 (R), Feb. 1939 (R).

PARAGUAY: Sierra de Amambay, *Hassler (Rojas)* 10753 (Mo). CENTRAL: Asunción, *Morong* 191 (GH, Mo, NY, R, UC, US). Areguá, *Hassler* 911 (NY). Lake Ypacaray, *Hassler* 11764 (GH, Mo, US); *Fiebrig* 52 (Ch). GUAIRA: Villarrica, *Jørgensen* 4205 in part (Ch, US), 4206 (Ch, GH, NY, US). PARAGUARÍ: *Balansa* 3090 (GH).

ARGENTINA: CHACO: Colonia Benítez, *A. G. Schulz* 3265 (US).

LOCAL NAMES: Honteuse mâle (Martinique); sole (British Guiana); corcho lagunero (Venezuela); corticeira, paricasinho, paricazinho (Brazil).

Although *Ae. sensitiva* was not typified in the original description, the Plumier illustration referred to may, presumably, be considered an authentic representation of the species.

The description and illustration of Palisot de Beauvoir's *Ae. sensitiva* indicates that species to be the same as the *Ae. sensitiva* of Swartz, but it is my impression that proposal of a new species was not intended.

Examination of the type of *Ae. sulcata* shows it to be equivalent to typical *Ae. sensitiva*. There are a few glandular hairs along the margins of the fruits, but that is not believed to warrant specific segregation.

Aeschynomene macropoda var. *belvesii* and *Ae. belvesii* were based on *Ae. sensitiva* Beauv. and, therefore, in my opinion are synonyms of *Ae. sensitiva* Sw.

The "Index Kewensis" cites *Ae. honesta* as a synonym of *Ae. sensitiva*, and, on that basis, it is so listed in this paper.

According to Amshoff (Flora of Surinam, 2. 1939), *Cassia paramariboensis* is *Ae. sensitiva* Sw.

The type of *Ae. fistulosa* presumably is not extant, Bello having stated, "mis herbarios reducidos á polilla." However, the epithet *fistulosa* and the description in general suggest *Ae. sensitiva* to me. Excluded as possibilities are *Ae. americana* L. and *Ae. glandulosa* Poir., which Bello lists as also occurring in Puerto Rico.

It does not seem reasonable to segregate forma *paucifoliolata*, characterized by "foliolis 6-13 jugis," since Swartz described typical *Ae. sensitiva* as having "pinnae utrinque 16-20 alternae". I have not seen the type of the form (Hassler 6162) but the two additional collections cited in the original description (Hassler 792 and 911) are identified as typical *Ae. sensitiva*.

14b. *Aeschynomene sensitiva* var. *hispidula* (H. B. K.) Rudd, comb. nov.

Aeschynomene hispidula H. B. K. Nov. Gen. & Sp. 6: 530. 1824.

This differs from the typical variety in having stems densely hispidulous, the tuberculate-based hairs so closely placed on the upper stems that the epidermis is about half to completely obscured; the flowers tend to be larger, 7-9 mm. long; the young fruits are hispid, the older ones usually glabrate.

TYPE LOCALITY: Río Magdalena, near Badillo (as "Badillas"), Santander, Colombia. Type collected by Bonpland (No. 1563), cited below.

DISTRIBUTION: Wet places, Colombia, along the Cauca and Magdalena valleys, at 1,000-1,800 m. elevation (fig. 5).

COLOMBIA: Antioquia: Medellín, *Archer* 462 (NY, US), 681 (US), 745 (US); *Toro* 316 (NY); *Ramírez* 5 (US). **CALDAS:** Armenia, *Pennell, Killip, & Hazen* 8689 (GH, NY, US). **CAUCA:** Popayán, *Yepes* 281 (Ch, US); *Lehmann* 5549 (Ch, GH, US); *Langlassé* 84 (GH, US). **EL VALLE:** Timba, *von Sneidern* 1163 (US). Buga, *Triana* 4219 (NY). **SANTANDER:** Badillo, *Bonpland* 1563 (P TYPE).

LOCAL NAME: Arrejo (Colombia).

These few specimens represent the extreme of glandular development within the species. The tendency can be observed occasionally northward in Central America as far as Guatemala and British Honduras, and eastward into Venezuela. In these regions, however,

the flowers are about the same as those of the typical variety. The condition does not seem to merit specific status and it is doubtful if even varietal recognition is warranted.

Bentham reduced his *Ae. rudis* to *Ae. hispidula*. However, after examining the type specimen of *Ae. hispidula* and a photograph of the type of *Ae. rudis*, I am convinced that they are quite dissimilar.

14c. *Aeschynomene sensitiva* var. *amazonica* Rudd, var. nov.

A varietate typica fructibus longioribus 10–14-articulatis differt.

This differs from the typical variety principally in the 10–14-articulate fruits. The flowers tend to be larger, 7–9 mm. long. The plant as a whole is more robust.

TYPE: In the U. S. National Herbarium, No. 1999025, collected at Nauta, Province of Loreto, Perú, Sept. 24, 1948, by Ramon Ferreyra (No. 5126). Duplicate at USM.

DISTRIBUTION: River banks of Upper Amazon and its tributaries (fig. 5).

COLOMBIA: AMAZONAS: Leticia, *Schultes* 6168 (US), 8205 (US). Solimões, *Jobert & Schwacke* 612 (R).

PERÚ: LORETO: Iquitos, *Ll. Williams* 1343 (Ch).

The Martius collection cited as *Ae. selloi* by Bentham in "Flora Brasiliensis" is probably the same as *Ae. sensitiva* var. *amazonica*. Bentham's plate 12, illustrating *Ae. selloi*, resembles var. *amazonica* as to fruit, character of the stem and petiole, etc., and very likely the Martius collection was used as model for the plate.

Series 5. *Indicae* Rudd, ser. nov.

Herbae nonnunquam suffruticosae, saepe erectae; stipulae infra insertionem productae, acutae vel acuminatae, basi obtusae vel acutae; foliola oblonga, obtusa, margine recto vel nonnunquam ciliato et denticulato vel serrato; costa centralis; venae secundariae inconspicuae; calyx bilabiatus, labio inferiore bifido, labio superiore trifido; legumen stipitatum, altero margine fere recto, altero eadem vel subcrenato.

Herbs, usually erect, rarely decumbent, sometimes suffrutescent; stems glabrous to densely hispid; stipules appendiculate below the point of attachment, the upper portion acute to acuminate, 3–4 times as long as the rounded to acute, auriculate lower portion; leaflets oblong, obtuse, entire or, in a few species, ciliate and minutely dentate or serrate, the base subobliquely rounded, the upper surface minutely punctate, the lower surface often glaucous, the costa central, the secondary veins inconspicuous; inflorescences few-flowered; calyx with the vexillar lip 2-dentate, the carinal lip subequally 3-dentate, the indentations about 1 mm. deep; fruits stipitate, the margins subentire or shallowly indented between the articles.

Aeschynomene indica L. is selected as the type of the series.

15. *Aeschynomene virginica* (L.) B. S. P. Prelim. Cat. N. Y. Pl. 13. 1888.
Hedysarum virginicum L. Sp. Pl. 750. 1753.
Aeschynomene hispida Willd. Sp. Pl. 3: 1163. 1802.
Aeschynomene aspera Muhl. ex Willd. Sp. Pl. 3: 1163. 1802, syn. in lit., non
Ae. aspera L. 1753.

Stem up to nearly 3 m. high, glabrous to hispid; stipules about 10 mm. long, acute at apex and base, entire, sometimes ciliate, often hyaline-margined; leaves about 5–12 cm. long, 30–55-foliolate, the petiole and rachis sparsely hispid; leaflets 10–25 mm. long, about 2–3 mm. wide, entire or rarely with a few tuberculate marginal hairs; peduncles and pedicels hispid; bracts ovate-cordate, about 6 mm. long, 2–3 mm. wide, acuminate, denticulate, sometimes lacinate, ciliate; bracteoles lanceolate-ovate, about 4 mm. long, 2–3 mm. wide, acute, denticulate-ciliate; flowers 10–15 mm. long; calyx 5–7 mm. long; standard commonly 12 mm. long, the claw 2 mm. long, the blade orbiculate, about 10 mm. in diameter, ciliate, emarginate; wings about 10 mm. long, the claw 3 mm. long, the blade about 7 mm. long and 4 mm. wide, sparsely ciliate; keel petals about 10 mm. long, the claw 2 mm. long, the blade about 8 mm. long and 3 mm. wide, entire; stamens about 10–15 mm. long; fruit 3–10- (commonly 6–9-) articulate, the upper edge entire, the lower somewhat crenate, the stipe about 12–25 mm. long, glabrous or somewhat hispid, the articles 4.5–7 mm. in diameter, sparsely hispid, glabrate, usually verrucose; seeds 4.5–6 mm. long, about 3 mm. wide, brown.

TYPE LOCALITY: Wet stream bank of the Rappahannock River, Middlesex County, Va. Syntypes collected by Clayton, Nos. 564 and 614, the latter cited below.

DISTRIBUTION: Tidal marshes, muddy and brackish shores, the middle Atlantic coast of the United States, from New Jersey to Virginia (fig. 6).

UNITED STATES: "America boreali," *Muhlenberg* (photos of two specimens, presumably SYNTYPES of *Ae. hispida*, ex B). NEW JERSEY: Burlington County: Wading River, *Long* 10818 (GH). Camden County: Camden, *Parker*, Sept. 27, 1865 (Ch). Salem County: Pennsville, *Long* 44943 (GH). Atlantic County: Great Egg Harbor River, *Long* 51232 (GH). Cape May County: Cape May River Landing, *Mohr*, Sept. 20, 1894 (US). PENNSYLVANIA: Nortonville, on Delaware River, 6 miles south of Philadelphia, *Crawford*, Sept. 17, 1891 (Ch). Delaware County: Tinicum, *Porter*, *A. H. Smith*, & *Leidy*, Sept. 1865 (NY). DELAWARE: New Castle County: *Commons*, Aug. 1865 (NY). Hollyoak, *Brinton*, Aug. 22, 1888 (UC), Aug. 23, 1888 (NY); *Canby* 1516 (GH), Sept. 1867 (US). Wilmington, *Commons*, Aug. 1873 (NY); *Canby*, July 3, 1878 (Ch, US), Aug. 1878 (Mo, NY); *Tatnall*, Sept. 16, 1887 (GH). MARYLAND: Anne Arundel County: Patuxent marshes, *C. P. Smith* 3196 (GH). Prince Georges County: Nottingham, *Hotchkiss* 7187 (US); McGruder's Landing, *Rudd* 736 (US), 775 (US). Wicomico County: Nanticoke River, *Shreve* 1297 (Min). VIRGINIA: Stafford County:

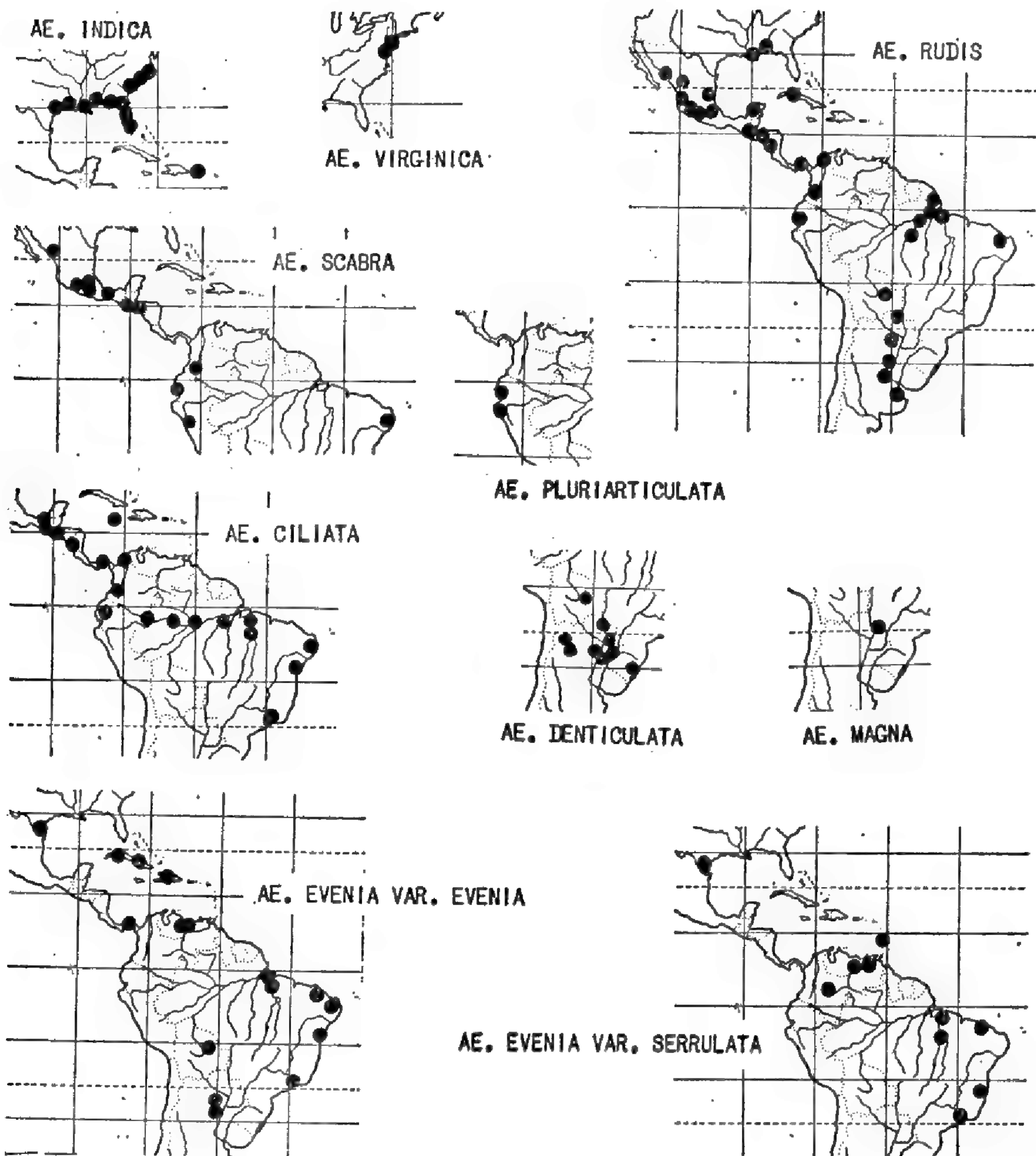


FIGURE 6. Distribution of the *Indicae*.

Brooke, *Hermann* 10412 (GH, NY, US). Essex County?: "Blandfield Wharf," *Tidstrom* 7686 (US). Essex County: Dunnsville, *Fernald & Long* 13358 (GH); Loretto, *Fernald & Long* 13957 (GH). Middlesex County: Rappahannock River, *Clayton* 614 (photo of SYNTYPE ex BM). King William County: King William Courthouse, *Fernald & Long* 11580 (GH), 11581 (GH), 13058 (GH). New Kent County: White House, *Fernald & Long* 11579 (Ch, GH, Mo); Lanexa, *Fernald & Long* 11597 (GH). Charles City County: "Four Oaks," below Harrison Point, *Fernald & Long* 11354 (GH, NY, UC); Chickahominy River, Ferry Point, *Fernald & Long* 11053 (GH); Morris Creek, below Adams Bridge, *Fernald & Long* 11578 (GH, US). James City County: Gordon Creek, *Fernald & Long* 11355 (GH); Back River, opposite Jamestown Island, *Fernald & Long* 11052 (GH, US). Prince George County: Jordan Point, *Fernald & Long* 9343 (GH). Surrey County: Chippokes, *Fernald & Long* 12672 (GH); Hog Island, *Fernald & Long* 12673 (GH). Scotland, *Fernald & Long* 8724 (GH), 9344 (GH), 9580 (GH).

LOCAL NAMES: Sensitive joint-vetch; bastard sensitive plant.

The large, long-stiped fruit, the fairly large flowers, and the essentially entire leaflets enable one to distinguish this rather localized species from its near relatives in the series.

The photograph of Clayton's No. 614, one of the syntypes of *Hedysarum virginicum*, on which *Ae. virginica* is based, readily identifies that species with the collections cited above. Likewise, photographs of two specimens from the Willdenow Herbarium, presumably syntypes of *Ae. hispida*, furnished through the courtesy of the late Dr. R. Pilger of the Botanische Museum, Berlin-Dahlem, indicate that that species is synonymous with *Ae. virginica*.

Collections from almost all parts of the American tropics have been identified and distributed as *Ae. virginica* or *Ae. hispida*. Most consistent has been the inclusion of the specimens from the southern United States ascribed, in this paper, to *Ae. indica*.

Fernald (*Rhodora* 41: 466. 1939) recognized and stated the outstanding differences between "true *Aeschynomene virginica*" and "the plant growing from Texas to southeastern North Carolina and there erroneously passing as *Ae. virginica*." He suggested that the southern species might be *Ae. hispida*, but at that time he was unable to secure type material for comparison.

16. *Aeschynomene indica* L. Sp. Pl. 713. 1753.

Aeschynomene glaberrima Poir. in Lam. Encyc. Suppl. 4: 76. 1816.

Stem to about 2.5 m. high, glabrous to moderately hispid; stipules 10–15 mm. long, 2–3 mm. wide, entire, sometimes ciliate, often hyaline-margined, the upper portion acuminate, the base obtuse, usually notched or erose; leaves about 5–10 cm. long, 50–70-foliolate, the petiole and rachis sparsely hispidulous; leaflets 5–10 mm. long, 1.5–2.5 mm. wide, entire; peduncles and pedicels glabrous to hispidulous; bracts about 5 mm. long, 1–2 mm. wide, ovate, acuminate, subentire to serrate-laciniate; bracteoles lanceolate-ovate, acute, about 2–4 mm. long and 1 mm. wide, subentire; flowers about 8–10, commonly 8–9 mm. long; calyx 4–6 mm. long; standard 8–10 mm. long, the claw 1–2 mm. long, the blade elliptic, about 7–9 mm. long, 4–7 mm. wide, entire or sparsely ciliate, emarginate; wings 6–8 mm. long, the claw 1–2 mm. long, the blade 4–6 mm. long, 1.2–3 mm. wide, rarely ciliate; keel petals about 7–9 mm. long, the claw 1–2 mm. long, the blade 6–7 mm. long, 2–3 mm. wide, entire; stamens about 6–8 mm. long; fruit 5–10-(–12-)articulate, the upper edge essentially straight, the lower edge crenate, the stipe 4–10 mm. long, glabrous, or sparsely hispid, glabrate, sometimes muricate, dark brown when fully mature; seeds 3–4 mm. long, 2–3 mm. wide.

TYPE LOCALITY: Malabar, India. Type specimen unknown but table 18, volume 9, of Rheede's "Hortus Malabaricus" was cited by Linnaeus in the original description and, presumably, represents the type.

DISTRIBUTION: Coastal United States, from North Carolina to Texas, and also, apparently introduced, in Puerto Rico, coastal Asia, Pacific Islands, Australia, and Africa, in wet meadows, marshes, rice fields, etc. (fig. 6).

UNITED STATES: NORTH CAROLINA: Craven County: Bridgeton, *Fox* 3200 (US). New Hanover County: Wilmington, *Uhler* 73 (US). Hyde County: Ocracoke Island, *Kearney* 2250 (US). Brunswick County: West of Wilmington, *Godfrey* 50161 (US). Columbus County: Lake Waccamaw, *Godfrey* 6321 (GH, US). SOUTH CAROLINA: Berkeley County: St. Stephens, *Godfrey* 8207 (Ch, GH, Mo, NY, US). Charleston County: Charleston, *Curtiss*, in 1876 (US); *Moldenke* 136 (Mo, NY). Dorchester County: Summerville, *Gibbes*, Oct. 7-8, 1889 (NY). Jasper County: Coosawhatchie, *Rhoades*, Aug. 1929 (GH). GEORGIA: Sumter County: Americus, *Harper* 518 (Ch, GH, Mo, NY, US). Charlton County: Folkston, *Biltmore Herb.* 218f (US). ALABAMA: Mobile County: Mobile, *Mohr*, Aug. 1878, in part (US). Florida: *Chapman* (Mo, US). "East Florida," *Edw. Palmer* 129, in 1874 (Ch, GH, Mo, US). Duval County: Jacksonville, *Curtiss* 606 (Ch, GH, Mo, NY, UC, US), 4237 (Mo, NY, UC), 5155 (GH, NY, UC, US); *Lighthipe* 499 (Mo, NY); *Hitchcock*, in 1900 (Ch). Suwanee County: *Hitchcock* 344 (Ch). Columbia County: Lake City, *Hitchcock* 345 (Ch). Alachua County: Gainesville, *Garber*, June 1876 (US). Lake County: Eustis, *Nash* 1054 (Ch, GH, Mo, NY, UC, US); *Hitchcock* 346 (Ch), 347 (Ch). Seminole County: Sanford, *Rapp*, Aug. 25, 1926 (NY). Hillsborough County: *Fredholm* 6340 (GH, Mo, US); Tampa, *Godfrey* 50879 (US). Franklin County: Apalachicola, *Chapman* (*Biltmore Herb.* No. 218a) (GH, Mo, NY, US). Dade County: Coconut Grove, *Small* 8818 (GH, NY, US). MISSISSIPPI: *Joor*, Sept. 23, 1891 (Mo). Hinds County: Utica, *Holt* 70 (US). Jackson County: Ocean Springs, *Pollard* 1165 (Ch, GH, Mo, NY, US); Petit Bois Island, *Demaree* 33521 (US); Fontainbleau, *Demaree* 34099 (US). Harrison County: Biloxi, *Tracy* 4338 (US), 4438 (Ch, GH, Mo, NY, US); Gulfport, *Demaree* 33887 (US); Cat Island, *Lloyd & Tracy* 180 (NY). LOUISIANA: Tangipahoa Parish: Robert, *Correll & Correll* 10527 (GH). Plaquemines Parish: South Pass, *Tracy & Lloyd* 193 (Ch, GH, Mo, US). Terrebonne Parish: Houma, *Wurzlów*, Sept. 20, 1913 (NY). Orleans Parish: New Orleans, *Joor*, Oct. 9, 1885 (Mo). Lafayette Parish: Youngsville, *Claycomb*, July 23, 1942 (GH). Calcasieu Parish: Lake Charles, *Mackenzie* 410 (Mo); *Daves*, in 1888 (Ch). TEXAS: Orange County: Mauriceville, *Cory* 50911 (GH). Jefferson County: Beaumont, *Tharp*, Sept. 9, 1937 (GH, UC), 3137 (US); *Cory* 11069 (GH); Sabine Pass, *Cory* 19863 (GH). Harris County: Houston, *Letterman*, in 1880 (Mo). Matagorda County: Bay City, *Fisher*, Aug. 6, 1918 (NY, UC), 147 (US). Nueces County: Flour Bluff, *Cory* 20515 (GH).

PUERTO RICO: AGUADILLA: Añasco, *Sintenis* 5605 (UC, US). MAYAGÜEZ: Guánica, *Sintenis* 3818 (Ch); *Sargent* 529 (US).

Examination of specimens of *Ae. indica* from India and other parts of Asia, of the illustration cited by Linnaeus in his original description

of *Ae. indica*, and of the American specimens listed above reveals no essential differences among that material. Therefore, it is believed that the above cited American collections, mostly distributed as *Ae. virginica* or *Ae. hispida*, are correctly ascribed to *Ae. indica*.

As indicated in the key, the size of the fruit and flowers, the length of the stipe, the entire leaflets, and the moderate indument of the plant are characters by which *Ae. indica* is distinguished from other species of the series. The collections from Puerto Rico are unusually robust. The flowers are 10–11 mm. long, the fruit commonly 10–12-articulate.

As stated in the preface, no attempt is being made to include Old World synonymy in this paper. *Aeschynomene indica* probably has more synonyms, valid and invalid, than any other species of the genus. However, only one, *Ae. glaberrima*, is known to have been based on American material. I have not seen the type of *Ae. glaberrima*, but its collection by Bosc "dans la Caroline" and the description indicate that it is equivalent to *Ae. indica*, as here interpreted.

17. *Aeschynomene evenia* Wright in Sauv. Anal. Acad. Ci. Habana 5: 334. 1868.

Stem to about 1 m. high, sparsely hispidulous, often glabrate; stipules 5–15 mm. long, about 1.5–3 mm. wide, subentire to serrate-ciliate, the upper portion attenuate, 2–3 times as long as the acute to rounded, auriculate lower portion; leaves about 2–4 cm. long, 16–50-foliolate, the petioles and rachises hispidulous; leaflets 2–9 mm. long, 1–2 mm. wide, entire to serrate-ciliate; peduncles and pedicels glabrous to hispidulous; bracts graduating from stipule-like to subcordate, acuminate, lacinate, about 3–5 mm. long, 1.5–2 mm. wide; bracteoles oblong-ovate, acute, 2–3 mm. long, about 1 mm. wide, subentire to denticulate or serrulate; flowers 5–7 (–9) mm. long; calyx 4–5 mm. long; standard averaging about 6 mm. long, the claw scarcely 1 mm. long, the blade about 5 mm. long, 3–4 mm. wide, obovate, somewhat ciliate; wings 5–6 mm. long, the claw 0.5–1 mm. long, the blade 4.5–5 mm. long, about 2 mm. wide; keel petals 6–7 mm. long, the claw 0.5 mm. long, the blade 5.5–6.5 mm. long, about 2 mm. wide; stamens about 6 mm. long; fruit 5–14-articulate, the stipe 3–4 (–6) mm. long, subglabrous to hispidulous, the articles about 2.5–3.5 mm. in diameter, hispidulous, usually glabrate, one margin of the fruit subentire, the other subcrenate; seeds about 2 mm. long and 1.5 mm. wide, brown.

17a. *Aeschynomene evenia* var. *evenia*.

Aeschynomene evenia Wright in Sauv. Anal. Acad. Ci. Habana 5: 334. 1868.

The typical variety includes the more robust specimens of the species, the plants being taller and with 20–50-foliolate leaves. The leaflets are predominantly entire, occasionally with cilia developing on a few leaflets. The base of the stipules is usually acute. The

flowers are mostly 6–7, rarely 8–9, mm. long. The fruits are commonly 10–14-articulate.

TYPE LOCALITY: Chirigota, Pinar del Río, Cuba. Type collected by C. Wright (No. 3531), cited below.

DISTRIBUTION: Chiefly northern and eastern South America, also Cuba and Hispaniola, and scattered from southern Texas to Panamá, in wet or moist places, at low elevations (fig. 6).

UNITED STATES: TEXAS: Nueces County: Corpus Christi, *Nealley*, in 1894 (Ch, Mo). Kleberg County: Riviera, *Tharp*, Sept. 7, 1929 (UC). Kenedy County: Armstrong, *Runyon* 1956 (US). Cameron County: Brownsville, *Runyon* 2859 (US).

PANAMÁ: PANAMÁ: Chepo, *Pittier* 4548 (US).

CUBA: PINAR DEL RÍO: Chirigota, *C. Wright* 3531 (GH, US, ISOTYPES).

HABANA: "Mazorra," *Baker & Abarca* 4213 (NY). Guatao, *León* 8975 (NY).

CAMAGUEY: La Gloria, *Shafer* 107 (NY, US).

HAITI: NORD: Bayeux, *Ekman* H-2616 (US).

DOMINICAN REPUBLIC: "St. Domingo," *Bertero* (Mo). MONTE CRISTI: Guayubín, *W. L. Abbott* 875a (US), 975 (NY, US).

VENEZUELA: GUÁRICO: El Sombrero, *Burkart* 17185 (US). ARAGUA: Maracay, *Burkart* 16903 (US), 16961 (US). CARABOBO: San Joaquín, *Burkart*

16971 (US).

BOLIVIA: "Salinas," *Pearce* (K).

BRAZIL: PARÁ: Magoary, *Huber* 286 (US). Curralinho, *Pires* 1256 (NY, US).

Rio Arari, Ilha do Marajó, *Black, Ledoux, & Stegemann* 52-14360 (IAN).

Soure, *Black & Lobato* 50-9269 (IAN). CEARA: *Allemão* 352 in part (R).

Quixada, *Löfgren* 856 (R). RIO GRANDE DO NORTE: Rio Diamante, *Löfgren*

397 (R). PERNAMBUCO: Tapera, *Pickel* 43 (Ch), Aug. 1930 (Ch, GH, US), Aug.

1931 (Ch, GH, US). BAHIA: Bahia, *Blanchet* 946 (NY). Zoazeiro, *Zehntner*

141 (R). RIO DE JANEIRO: Atafona, *Sampaio* 8908 (R). Araruama, *L. B.*

Smith 7103 (US). Cabo Frio, *L. B. Smith* 6613 (US).

ARGENTINA: SALTA: Orán, *Schreiter* 5365 (US). TUCUMÁN: Chicligasta, "Cochuna," *O'Donell* 7 (GH).

LOCAL NAMES: Cortiça do campo, corticeira (Brazil).

This taxon is distinguished within the series by its slender, usually short-stipitate fruits, its relatively small flowers, and its essentially entire leaflets. The occasional development of cilia on a few leaflets suggests intergradation from the typical variety to var. *serrulata*.

The Texas specimens approach *Ae. indica* in size of plants and in general appearance. However, on the basis of fruit width and number and shape of articles, they are here cited as *Ae. evenia* var. *evenia*.

17b. *Aeschynomene evenia* var. *serrulata* Rudd, var. nov.

A varietate typica plantis utrinque minoribus, foliolis serrato-ciliatis differt.

This variety differs from the typical in that the leaflets are rather consistently serrulate-ciliate and mostly smaller. The plants tend to be shorter, frequently less than 5 dm. high, and are generally more

glandular in all parts than the typical variety. The stipules usually are more rounded at the base. The flowers are about 5–6, rarely 7–8, mm. long. The fruits are commonly 5–8-articulate.

TYPE: In the U. S. National Herbarium, No. 1193123, collected in a pond, San Juan de los Morros, Aragua, Venezuela, Dec. 28, 1923, by H. Pittier (No. 11321). Isotypes at GH, NY, and Ven.

DISTRIBUTION: Chiefly in northern South America, in wet or moist places, at elevations below 500 m. (fig. 6).

UNITED STATES: TEXAS: Dimmit County: Winter Haven, *Reed*, July 17, 1939 (GH).

LESSER ANTILLES: ST. LUCIA: *Bray* (NY); *Walsh*, Sept. 1889 (NY).

VENEZUELA: MONAGAS: San Antonio, *Bond, Gillin, & Brown* 120 (US). BOLÍVAR: Ciudad Bolívar, *Holt & Gehriger* 197 (NY, US).

COLOMBIA: META: La Poyata, *Cuatrecasas* 4472 in part (Ch).

BRAZIL: PARÁ: Belém, *Archer* 7682 (Ch, US); *Silva* 106 (US); *Pires & Black* 623 (US). Marabá, *Fróes & Black* 24710 (US). CEARÁ: Fortaleza, *Drouet* 2293 (Ch, GH, Mo, NY, R, US). Pacatuba, *Allemão* 352 in part (R). BAHIA: Ilheos, *Martius Herb.* 1145 (GH, Mo, NY); *Riedel* 742 in part (NY). RIO DE JANEIRO: São Christovão, *Glaziou* 8628 (K), 8634 in part (R); *Wilkes Exped.* (NY, US). Nietheroy, *Smith & Brade* 2321 (GH, US).

As indicated above, this variety is mostly found in northern and eastern South America, at low elevations. The serrulate-ciliate leaflets, the narrow, short-stipitate fruits, and the small flowers are the most distinctive characters. There apparently is intergradation between this and the typical variety; leaves with entire leaflets sometimes occur on plants with predominantly serrulate leaflets.

18. *Aeschynomene pluriarticulata* G. Don, Gen. Syst. Gard. Bot. 2: 284. 1832.

Stem up to about 1 m. high, glabrous or nearly so; stipules about 10–20 mm. long, entire to serrate-ciliate, the portion above the point of attachment attenuate, more than twice the length of the acute to rounded, auriculate base; petiole glabrous to hispidulous, the hairs diminishing along the rachis; leaves 4–6 cm. long, 20–50-foliolate; leaflets entire, 1.5–2 mm. wide, 5–8 mm. long; peduncles and pedicels hispidulous; bracts graduating from stipule-like to subcordate, acuminate, laciniate, 3–5 mm. long, 2–3 mm. wide; bracteoles lanceolate, acute to acuminate, subentire, about 5 mm. long, 1–1.5 mm. wide; flowers about 8–10 mm. long; calyx 5–7 mm. long; standard commonly 8–9 mm. long, the claw 1 mm. long, the blade 7–8 mm. long, about 5 mm. wide, obovate, entire, retuse; wings about 8 mm. long, the claw 2 mm. long, the blade 6–7 mm. long, 2–3 mm. wide; keel about 8 mm. long, the claws 2 mm. long, the blades 6–7 mm. long, about 2 mm. wide; stamens 8 mm. long; fruit 12–18-articulate, with both margins subentire, the stipe 6–10 mm. long, the articles subquadrate, 3–4 mm. in diameter, sparsely hispidulous, glabrate, sometimes muricate; seeds about 2 mm. long and wide.

TYPE LOCALITY: Guayaquil, Ecuador. Type probably collected by Tafalla, attributed to Ruiz and Pavón.

DISTRIBUTION: Guayas, Ecuador, and Piura, Perú, in swamps and fields at low elevations (fig. 6).

ECUADOR: GUAYAS: Guayaquil, *Haenke* (R). Between Guayaquil and Salinas, *Hitchcock* 20073 (GH, NY, US). Salinas, *Asplund* 5646 (R, US); *Svenson* 11329 (GH, NY, US). Insula de Puná, *Eggers* 14775 (US).

PERÚ: PIURA: Pariñas Valley, *Haught* 158 (Ch, NY, US). Cabo Blanco, *Haught* 261 (NY, US). Nigritos, *Haught* F-163 (Ch). Talara, *Haught* F-62 (Ch).

This species, apparently restricted to the low lands surrounding the Gulf of Guayaquil, is closely related to *Ae. indica* and *Ae. evenia*. It differs from the former in that the fruits are slightly narrower and longer, with both margins essentially entire. It differs from *Ae. evenia* in having larger flowers, and fruits that average slightly wider and longer. The stipules are somewhat larger than those of either *Ae. indica* or *Ae. evenia*.

Svenson (Amer. Journ. Bot. 33: 447. 1946) believes *Ae. pluriarticulata* and *Ae. scabra* to be the same, but I am of the opinion that the two names are referable to two different taxa, as treated in this paper.

19. *Aeschynomene rudis* Benth. Pl. Hartw. 116. 1843.

? *Aeschynomene bonariensis* Spegg. Florul. La Plata in Bol. Ofic. Agr. Ganad. 2: 491. 1902.

Aeschynomene natans Hassler, Bull. Herb. Boiss. II, 7: 7. 1907.

Stem to about 2 m. high, hispid to glabrous; stipules about 7–15 mm. long, 2–3 mm. wide, ciliate, the upper portion acute, 5–12 mm. long, the lower 2–3 mm. long, rounded; leaves 4–10 cm. long, 30–40-foliolate, the petiole and rachis hispidulous; leaflets 6–15 mm., commonly 8–10 mm., long, 2–3 mm. wide, entire or with some tendency toward marginal hairs; bracts subovate, acute, 3–4 mm. long, 1.5–2 mm. wide, ciliate; bracteoles ovate-oblong, acute, 2–3 mm. long, about 1 mm. wide, ciliate; flowers (8–) 10–15 mm. long; calyx 5–8 mm. long; standard commonly about 14 mm. long, the claw 2 mm. long, the blade orbiculate, about 12 mm. in diameter, retuse, ciliate; wings about 10 mm. long, the claw scarcely 1 mm. long, the blade about 9 mm. long, 5–6 mm. wide; keel petals about as long as the wings and 3 mm. wide; stamens about 12 mm. long; fruit 7–12-articulate, the upper edge essentially entire, the lower edge crenate, sometimes subentire, the stipe glabrous, or nearly so, 3–6 (–10) mm. long, the articles 4–6 mm. in diameter, moderately hispid to subglabrous, usually muricate or verrucose at the center; seeds about 3 mm. long and 2 mm. wide.

TYPE LOCALITY: Guayaquil, Ecuador. Type collected by Hartweg (No. 649), cited below.

DISTRIBUTION: In moist or wet places, tropical and warm temperate America, at elevations up to about 1,800 m. (fig. 6).

UNITED STATES: ALABAMA: Mobile, *Mohr*, Aug. 1878 in part (US). LOUISIANA: Catahoula Lake, *Hale*, in 1842 (GH, NY).

MÉXICO: SONORA: Agiobampo, *Edw. Palmer* 775a, in 1890 (US). TAMAUlipas: Altamira, *Le Sueur* 205 (Ch, GH). DURANGO: Durango, *Edw. Palmer* 575, in 1896 (Ch, GH, Mo, NY, UC, US). NAYARIT: Between Mexcaltitlán and Tuxpán, *Mexia* 1018 (Ch, GH, Mo, NY, UC, US). JALISCO: Guadalajara, *Pringle* 5181 (GH). VERA CRUZ: Córdoba, *Bourgeau* 2210 (GH, US). MICHOACÁN: Morelia, *Arsène* 53 (Ch), 3167 (GH, Mo, US). Aquila, Coalcomán, *Hinton* 16106 (US). OAXACA: Between Niltepec and Zanatepec, *Nelson* 2802 (US). CAMPECHE: Tuxpeña, *Lundell* 1266 (Ch, GH, Mo, NY, UC US). Apazote, *Goldman* 497 (US).

GUATEMALA: HUEHUETENANGO: Between Santa Ana Huista and Nentón, *Steyermark* 51388 (Ch). JUTIAPA: Jutiapa, *Stanley* 76339 (Ch). Lago Atescatempa, *Steyermark* 31878 (Ch). Lago Guija, *Steyermark* 31823 (Ch).

HONDURAS: VALLE: San Lorenzo, *J. Valerio* 3434 (Ch). MOROZÁN: El Zamorano, *Stanley* 12348 (Ch).

BRITISH HONDURAS: BELIZE: Northern River, *Gentle* 1365 in part (Mo).

NICARAGUA: GRANADA: Granada, *Grant* 895 (Ch, GH).

PANAMÁ PANAMÁ: Hacienda La Joya, *Dodge, Hunter, Steyermark & Allen* 16913 (GH, Mo, UC). Chepo, *Pittier* 4611 (US).

CUBA: HABANA: Lake Ariquanabo, *León & Bosque* 4202 (NY). Santiago de las Vegas, *Hitchcock*, Mar. 15–20, 1906 (Ch).

COLOMBIA: MAGDALENA: Ciénaga, *H. H. Smith* 273 (Ch, GH, Mo, NY, US). BOLÍVAR: Cartagena, *Heriberto* 292 (US). EL VALLE: Buenaventura, *Killip* 33048 (US). Palmira, *Garcla-Barriga* 6313 (US). Cartago, *Cuatrecasas* 23040 (US).

ECUADOR: GUAYAS: Guayaquil, *Hartweg* 649 (Killip neg. 841 of TYPE ex K); *Spruce* 6334 (K); *Asplund* 5167 (R, US).

BOLIVIA: SANTA CRUZ: Between Roboré and Santiago de Chiquitos, *Cárdenas* 4453 (US).

BRAZIL: AMAPÁ: Lago Bom Nome, *Black & Lobato* 50–9372 (US). Macapá, *Black & Fróes* 51–12269 (IAN); *Fróes & Black* 27191 (IAN), 27198 (IAN). PARÁ: Santarém, *Spruce*, July 1850 (GH, NY). Maicurú, Lago Uruxiacá, *Pires & Silva* 4310 (IAN). Bôa Vista on Tapajós River, *Dahlgren & Sella* 187 (Ch, US). Cachoeira, *S. Wright*, July 17, 1935 (Ch, GH). Marajó, Ilha do Pacoval, *Schwacke* 80 (R). Marajó, Rio Ararí, *Black, Ledoux, & Stegemann* 52–14265 (IAN), 52–14322 (IAN). CEARÁ: Fortaleza, *Drouet* 2702 (Ch, GH). Bahú, *Allemão* 351 in part (R). Tabúa, *Allemão* 351 in part (R).

PARAGUAY: "Chaco, 21° lat," *Fiebrig* 1321 (K). "Santa Elisa, Chaco," *T. Rojas* 2893 (SI); *Hassler (Rojas)* 2773 (GH, Mo, US, ISOTYPES of *Ae. natans*; F. M. neg. 27931 of TYPE ex G).

ARGENTINA: CHACO: Colonia Benítez, *Schulz* 1166 (SI). Las Palmas, *P. Jörgensen* 2696 in part (GH). SANTA FÉ: Rosario, *Morello* 410 (SI). Between San Juan and Adelaida Vieja, *Ragonese* 3299 (SI). BUENOS AIRES: Nuñez, *Burkart* 3630 (SI), 4887 (GH, SI). Tigre, *Hicken*, Apr. 9, 1898 (SI). Barracas, *Venturi* 72 (SI), 75 (UC). Eva Perón [as La Plata], *Spegazzini* Herb. No. 21797 (US, fragment of TYPE of *Ae. bonariensis*). Belgrano, *Parodi* 9892 (GH); *Hicken*, Jan. 15, 1901 (SI).

LOCAL NAMES: Frisolillo (Colombia); cortiça (Brazil).

As indicated in the key, the fairly large flowers and the relatively short-stipitate fruits, glabrous to moderately hispid, serve to distinguish *Ae. rudis* from other species of the series.

There is considerable variation in size of fruit. Perhaps there should be some subspecific categories, but it is difficult to make any convincing delimitations. The northernmost specimens, and a few from Brazil, are the largest, both vegetatively and as to fruit. A few of these large specimens have fruits without murications, and, instead, have margins which are thicker than usual. Most of the collections from the central part of the range have relatively narrow fruit. The Argentine collections have smaller flowers, medium sized fruits, and more than average ciliation of the leaflets. The amount of glandular development varies slightly throughout the range. Least glandular is the type collection of *Ae. natans*, which in all other respects appears to be conspecific with *Ae. rudis*.

The name *Ae. rudis* has frequently been misapplied. Specimens so named have been found chiefly among material classified in this paper as *Ae. scabra* and *Ae. denticulata*. Many collections cited as *Ae. rudis* in this paper have previously been identified as *Ae. hispida* and *Ae. virginica*.

Bentham reduced *Ae. rudis* to synonymy under *Ae. hispidula*. Comparison of the type of *Ae. hispidula* with a photograph of the type of *Ae. rudis*, supplemented by certain observations kindly made for me by Mr. N. Y. Sandwith at Kew, indicates that the two taxa are distinct, the former being treated in this paper as a variety of *Ae. sensitiva*.

Dr. A. Burkart, of San Isidro, Argentina, has graciously sent information concerning *Ae. bonariensis*, including a fragment of the type. He places this species in synonymy with *Ae. sensitiva*, but I have been unable to find a specimen of *Ae. sensitiva* with leaflets as large as those of *Ae. bonariensis*. It appears to me that *Ae. bonariensis* more closely conforms to *Ae. rudis*, as does the Venturi collection No. 75, which was originally distributed as *Ae. bonariensis*.

20. *Aeschynomene ciliata* Vog. Linnaea 12: 84. 1838.

Stem 1–2.5 meters high, hispid with yellow, glandular hairs about 2–4 mm. long; stipules 10–20 mm. long, 3–6 mm. wide, serrulate-ciliate, the upper portion acute, 3–4 times as long as the rounded lower portion; leaves about 5–20, commonly 10–15, cm. long, about 30–40-foliolate, the petiole and rachis hispid; leaflets 10–30 mm. long, 3–8 mm. wide, serrulate-ciliate to subentire; peduncles and pedicels hispid; bracts ovate-subcordate, subacuminate, serrate-ciliate, 4–6 mm. long, 2–3 mm. wide; bracteoles lanceolate-ovate, subacuminate, ciliate,

about 3–4 mm. long, 1–2 mm. wide; flowers about 8–10 mm. long; calyx 5–7 mm. long; standard 8–10 mm. long, reflexed, the claw 2 mm. long, the blade orbiculate, about 5–8 mm. in diameter, serrulate-ciliate, emarginate; wings about 8 mm. long, the claw 3 mm. long, the blade about 5 mm. long and 4 mm. wide, ciliate along the outer margin; keel petals with claws 1.5 mm. long, the blades 5–8 mm. long, about 3 mm. wide, entire; stamens about 8 mm. long; fruit 6–12-, commonly 8–10-, articulate, the margins at maturity entire or nearly so, the stipe 5–10 mm. long, hispid, the articles 3–5 mm. long, 5–7 mm. wide, smooth, not muricate, hispid; seeds 3–4 mm. long, about 2 mm. wide.

TYPE LOCALITY: "Between Rio de Janeiro and Cabo Frio" and "Para" (Belém), Brazil. Syntypes collected by Sellow and by Sieber (No. 13736), the latter cited below.

DISTRIBUTION: Southern México to Ecuador and Brazil, in wet places (fig. 6).

MÉXICO: CHIAPAS: Escuintla, *Matuda* 44 (NY, US), 2121 (Ch, Mo, NY). Acapetahua, *Matuda* 16755 (Ch). TABASCO: Laguna de Curahueso, *Rovirosa* 443 (NY, US). "YUCATAN & TABASCO": *E. P. Johnson* 28 (US).

GUATEMALA: SAN MARCOS: Ayutla, *Steyermark* 38028 (Ch). CHIMALTENANGO?: "L. Pino," *J. R. Johnston* 1846 (Ch). RETALHULEU: Retalhuleu, *Standley* 66706 (Ch). ESCUINTLA: *Aguilar* 1670 (Ch). SANTA ROSA: Sabanetas, *Standley* 60431a (Ch). Cerro Redondo, *Steyermark* 52172 (Ch).

NICARAGUA: GRANADA: Granada, *Baker* (143) 2278 (GH, Mo, NY).

PANAMÁ: CANAL ZONE: Gatún, *Hayes* 184 (NY). Mindi, *Cowell* 173 (NY). Barro Colorado Island, *Bailey & Bailey* 763 (Ch). CANAL ZONE OF COLÓN: Between France Field and Cativál, *Standley* 30270 (US). COLÓN: Chagres, *Fendler* 99 (Ch, GH, Mo, US). PANAMÁ: Matías Hernandez, *Pittier* 6946 (GH, NY, US). Juan Díaz, *Standley* 30516 (US).

JAMAICA: CORNWALL: Lacovia, *Britton* 1498 (NY). Westmoreland, *Purdie* (GH).

COLOMBIA: ATLÁNTICO: Barranquilla, *Elias* 529 (US). BOLÍVAR: Cañabetal, *Pennell* 3868 (Ch, GH, Mo, NY, US). Magangué, *Pennell* 3949 (GH, NY, US). Montería, *Araque & Barkley* 19. Bol. 98 (US). CHOCÓ: Playa de Togo-ramá, *Killip & Cuatrecasas* 39070 (Ch, US). Palmira, *García-Barriga* 6413 (US). EL VALLE: Buenaventura, *Cuatrecasas* 19754 (Ch, US); *Killip* 5513 (GH, US), 5513a (NY), 33017 (Ch, GH, US), 33229 (US). Santa Rosa, Dagua Valley, *Killip* 11560 (GH, NY, US). Córdoba, *Pittier* 576 (US). La Paila, *Holton* 985 (NY), 986 (GH, NY). AMAZONAS: Loretayacu River, *Schultes & Black* 8276 (US), 8480 (US).

ECUADOR: Los Ríos: Río Pita, *Asplund* 5510 (US).

BRAZIL: AMAZONAS: Manáos, *Kuhlmann (Comm. Rondón)* 2021 (R). Tefé, *Pires* 1324 (US). PARÁ: Belém, *Sieber* 13736 (photo of SYNTYPE ex B). Rio Tocantins, Jacundá, *Fróes* 27105 (US). Santarém, *Black & Ledoux* 50–10311 (IAN). PERNAMBUCO: Tapera, *Pickel* (905), Feb. 1931 (Ch, GH, Mo, R, US), 3728 (Ch, GH, NY). BAHIA: *Salzmann* (Mo). RIO DE JANEIRO: Rio de Janeiro, *Riedel* 126 (GH, US); *Wilkes Exped.* (US). Mons Corcovado, *Burchell* 1546

(GH, NY). São Christavão, *Glaziou* 8634 in part (NY). Santana, *Emygdio* 394 (R). Rio Itabapoana, *Sampaio* 1031 (R). DISTRITO FEDERAL: Jacarepaguá, *Vidal*, Mar. 15, 1933 (R).

LOCAL NAMES: Dormideria (Brazil).

This species is conspicuous because of the abundance of long, yellow, glandular hairs on its stems and flowering axes. Most specimens exhibit unusually large leaflets for the series, and for the section; the largest leaflets are about 30 mm. long and 8 mm. wide, usually ciliate.

The fruits are rather distinctive, dark brown when mature, the surface smooth but beset with glandular hairs, the margins essentially entire, the articles slightly wider than long, and the stipe about 5–10 mm. long.

Bentham treated *Ae. ciliata* as a synonym of *Ae. hispida*. However, examination of photographs of types of the two species shows the latter to be the same as *Ae. virginica*, and distinct from *Ae. ciliata*.

Although two collections were cited in the original description, and a lectotype should be designated, I hesitate to do so without seeing the original specimens.

21. *Aeschynomene scabra* G. Don, Gen. Syst. Gard. Bot. 2: 284. 1832.

Stem up to about 3m. high, erect, hispidulous; stipules about 7–15 mm. long, 2–3 mm. wide, serrulate-ciliate, or rarely subentire, the portion above the point of attachment acuminate, about 3 times as long as the subacuminate lower portion; leaves 5–12 cm. long, about 30–55-foliolate, the petiole and rachis hispidulous; leaflets 5–15 mm. long, 1.5–3 mm. wide, entire or rarely denticulate with a few marginal hairs; peduncles and pedicels hispidulous; bracts narrowly ovate to subcordate, about 3–4 mm. long, 1.5–2 mm. wide, acute, ciliate-denticulate or sometimes lacinate; bracteoles ovate-oblong, about 3 mm. long, 2 mm. wide, subacuminate, ciliate-denticulate; flowers 8–11 mm. long; calyx 6–7 mm. long; standard commonly 10 mm. long, the claw 2 mm. long, the blade ovate-elliptic, about 8 mm. long and 5 mm. wide, retuse, ciliate; wings about 9 mm. long, the claw scarcely 1 mm. long, the blade about 8 mm. long, 2–3 mm. wide, somewhat ciliate; keel petals about as long as the wings, curved, the blade about 2 mm. wide; stamens about 10 mm. long; fruit commonly 10–14-articulate, the upper edge essentially entire, the lower edge crenate or subentire, the stipe (5–)10–15 mm. long, often curved, glabrous toward the base, hispidulous toward the first article, the articles 3–4 mm. wide, 3–3.5 mm. long, hispidulous, rarely subglabrous, verrucose or muricate at the center; seed about 2.5 mm. long and 2 mm. wide.

TYPE LOCALITY: "Native of Guayaquil," the collection attributed to Ruiz and Pavón, but probably actually made by Tafalla, cited below.

DISTRIBUTION: México southward to Perú, in wet or moist places up to about 1,300 m.; also in eastern Brazil and Tahiti, probably introduced (fig. 6).

MÉXICO: *Sessé & Mocifio* 1945 (Ch), 1946 (Ch), 1948 bis (Ch). *Haenke* (R). SINALOA: Culiacán, *Brandege*, Oct. 12, 1904 (Ch, UC, US), Nov. 10, 1904 (UC). JALISCO: Magdalena, *Pringle* 4556 (Ch, GH, Min, Mo, NY, UC, US). VERA CRUZ: Córdoba, *Kerber* 67 (US); *Bourgeau* 1860 (GH, K); *Purpus* 426 (Mo, UC, US). *Botteri* 663 (US); *Muller* 145 (Mo, NY); *Bourgeau* 3185 (Ch, GH). MORELOS: Cuernavaca, *Pringle* 9093 (Ch, GH, Mo, US). México: Tejupilco, *Hinton* 1930 (Mo, US), 4957 (Ch, GH, US). GUERRERO: Tlaxmalac (as "Taxmalac"), *Seler & Seler* 4237 (GH, US). Manchón, *Hinton* 9667 (GH, NY, US). Vallecitos, *Hinton* 11662 (GH, NY, US). GUERRERO OR MICHOACÁN: "Baqueta," *Langlassé* 492 (GH, US). Coyuca, *Hinton* 6679 (NY). OAXACA OR CHIAPAS: Between Tapaná and Tonalá, *Nelson* 2864 (GH, US).

GUATEMALA: ZACAPA: Zacapa, *Standley* 72079 (Ch). JALAPA: Jalapa, *Standley* 76387 (Ch). AMATITLÁN: Laguna Amatitlán, *J. D. Smith* 2308 (GH, NY, US). SANTA ROSA: Estanzuela, *Heyde & Lux* 3710 (GH, US). San Juan Utapa, *Heyde & Lux* 6097 (GH, US). JUTIAPA: Jutiapa, *Standley* 76004 (Ch).

HONDURAS: MORAZÁN: Monte Redondo, *Molina* 723 (US). Casa Blanca, *Glassman* 2051 (Ch). Jicarito Marsh, *Glassman* 2185 (Ch). Zamorano, *Standley* 1467 (Ch), 1822 (Ch), 2245 (Ch), 4002 (Ch), 4038 (Ch), 4990 (Ch), 12185 (Ch), 12348 (Ch); *Standley & Molina* 4633 (Ch); *Molina* 1412 (US); *J. Valerio* 52 (Ch), 1060 (Ch), 1067 (Ch), 1255 (Ch); *Swallen* 11158 (US). Yeguaré, *J. Valerio* 297 (Ch). Río de la Orilla, *Morton* 7128 (US). COMAYAGUA: El Banco, *J. Valerio* 2502 (Ch), 2642 (Ch).

EL SALVADOR: AHUACHAPÁN: Ahuachapán, *Standley* 19829 (US).

COLOMBIA: HUILA: La Plata ("Tolima"), *Lehmann* B. T. 1056 (Ch, GH, NY).

ECUADOR: GUAYAS: Guayaquil, *Ruiz & Pavon* (Ch, probably TYPE COLLECTION).

PERÚ: La Libertad: Río Moche, *López-Miranda* 883 (US).

BRAZIL: CEARÁ: *Allemão* 351 in part (R). PERNAMBUCO: Tapera, *Pickel* 3089 (Ch, GH, UC, US).

This species is distinguished by its relatively slender, long-stipitate fruits, usually 10–14-articulate. The plants are moderately hispid, usually more so than *Ae. indica* or *Ae. evenia*, but much less so than *Ae. ciliata*.

The length of the fruit-stipe is usually a good diagnostic character in *Aeschynomene*. In *Ae. scabra*, however, as in a few other species, there is considerable variability of that character. Most of the collections exhibit stipes 10–15 mm. long, but a few are as short as 5 mm. In several cases, moderately long as well as short-stiped fruits occur on the same plant. In some specimens it can be recognized that the longer stipes are due to abortion of ovules toward the base of the ovary.

There is also some variation in fruit width, usually the wider fruits having the shorter stipes.

The above observations lend credence to my interpretation of the species and the type specimen. The "Ruiz and Pavón" sheet, presumably representing the type of *Ae. scabra*, consists of two separate branches. Vegetatively, there is no apparent difference except that one is more robust than the other. The more slender branch bears flowers equivalent to those of the specimens cited above, and fruits which are smooth, narrow, about 3 mm. wide, with stipe about 8 mm. long. The other branch, flowerless, has fruits which are broader, about 4 mm. wide, with shorter stipes, about 5 mm. long, and joints which are "muricated in the center," as characterized in the original description of *Ae. scabra*.

22. *Aeschynomene denticulata* Rudd, sp. nov.

Herba suffruticosa, caulibus hispidulis nonnunquam glabratis; stipulae infra insertionem productae, margine dense denticulato-ciliato; folia 4–6 cm. longa, 24–40-foliolata, petiolis rhachibusque hispidulis; foliola 5–10 mm. longa, 1.5–3 mm. lata, denticulato-ciliata, subtus aliquanto glauca; flores 10–12 mm. longi; legumen 10–14-articulatum, marginibus utrinque subrectis, stipite circiter 7–11 mm. longo, articulis 3–4 mm. longis, 4 mm. latis, hispidulis, saepe medio verrucosis vel muricatis.

Stems up to about 1.5 m. high, hispidulous, sometimes glabrate; stipules 10–15 mm. long, 2–3 mm. wide, the apical portion acuminate, slightly more than twice as long as the acute to obtuse, sometimes erose, basal auricle, the margin closely denticulate-ciliate; leaves 4–6 cm. long, about 25–40-foliolate, the petiole and rachis hispidulous; leaflets 5–10 mm. long, 1.5–3 mm. wide, denticulate-ciliate, the lower surface somewhat glaucous; pedicels and peduncles hispidulous; bracts graduating from stipule-like to subcordate-ovate, about 3–4 mm. long and 2 mm. wide, acute, serrulate, sometimes laciniate, ciliate; bracteoles lanceolate-ovate, acute to obtuse, denticulate-ciliate, about 2–4 mm. long, 1–2 mm. wide; flowers 10–12 mm. long; calyx 7–8 mm. long; standard 10–12 mm. long, the claw 0.5–1 mm. long, the blade ovate-suborbiculate, about 9.5–11 mm. long, 7–10 mm. wide, ciliate; wings about 9–11 mm. long, the claw 1 mm. long, the blade 8–10 mm. long, 3.5–4 mm. wide, ciliate in part; keel about 10–11 mm. long, the claws about 1 mm. long, the blades 9–10 mm. long, 3–3.5 mm. wide; stamens 10–12 mm. long; fruit 10–14-articulate, the margins subentire, the stipe about 7–11 mm. long, the articles 3–4 mm. long, about 4 mm. wide, hispidulous, often verrucose or muricate at the center; seeds about 3 mm. long and 2 mm. wide.

TYPE: In the U. S. National Herbarium, No. 1515226, collected at Abra Grandē, Department of Orán, Salta, Argentina, altitude 750 m., Nov. 17, 1927, by S. Venturi (No. 5604). Duplicates at Ch, GH, K, Mo, UC.

DISTRIBUTION: Chaco region of Bolivia, Paraguay, and Argentina, and eastward into Brazil, in wet places, at elevations up to about 1,200 m. (fig. 6).

BOLIVIA: SANTA CRUZ: Buena Vista, *Steinbach* 5398 (GH, NY).

BRAZIL: RIO GRANDE DO SUL: Pôrto Alegre, *Malme* 679 (R).

PARAGUAY: *Hassler* 1651 (SI). "Chaco, 21° lat.," *Fiebrig* 1321a (K). BOQUERÓN: Palma Chica, *T. Rojas* 7726 (SI). GUAIRÁ: Villarrica, *Jørgensen* 4205 in part (Ch, Mo). CORDILLERA: Tobatí, *Fiebrig* 807 (Ch).

ARGENTINA: SALTA: Cerrillos, *Meyer* 3554 (GH). Coronel Moldes, *Meyer* 3554 (GH). TUCUMÁN: Monteros, *Venturi* 1640 (US). Leales, *Venturi* 709 (GH, SI). Bella Vista, *Venturi* 2791 (US). FORMOSA: Guayculec, *Jørgensen* 3220 in part (Mo, US). CHACO: Las Palmas, *Jørgensen* 2696 in part (Mo, SI, US). Colonia Benitez, *A. G. Schulz* 3017 (US). SANTA FÉ: Reconquista, *Burkart* 5876 (SI); *Job* 770 (Ch, SI). CORRIENTES: La Cruz, *Burkart* 8181 (SI). Ituzaingó, *Speggazzini* 10049 (US). Estancia Santa Teresa, *Pedersen* 109 (US). MISIONES: San Ignacio, *Berti y Escalante* 513 (SI). Posadas, *Ekman* 1721 (Mo, NY); *Burkart* 14040 (US).

This species somewhat resembles *Ae. evenia* and *Ae. pluriarticulata* in fruit characters, but the fruits are longer stipitate and slightly more glandular. The denticulate leaflets are larger, but otherwise resemble those of *Ae. evenia* var. *serrulata*. The flowers of *Ae. denticulata* are considerably larger than those of *Ae. evenia* and *Ae. scabra*.

23. *Aeschynomene magna* Rudd, sp. nov.

Herba suffruticosa, caulibus hispidulis nonnunquam glabratis; stipulae infra insertionem productae, margine dense denticulato-ciliato; folia 5–10 cm. longa, circiter 40–60-foliolata, petiolis rhachibusque hispidulis; foliola 5–10 mm. longa, 2–3 mm. lata, denticulato-ciliata, subtus aliquanto glauca; flores 15–20 mm. longi; legumen 8-articulatum, marginibus utrinque subrectis, stipite 20–30 mm. longo, articulis circiter 6 mm. longis et 5 mm. latis, hispidulis, saepe medio verrucosis vel muricatis.

Stems up to about 1.5 m. high, hispidulous, sometimes glabrate; stipules 10–15 mm. long, 2–3 mm. wide, the apical portion acuminate, slightly more than twice as long as the acute, basal auricle, the margin closely denticulate-ciliate; leaves 5–10 cm. long, about 40–60-foliolate, the petiole and rachis hispidulous; leaflets 5–10 mm. long, 2–3 mm. wide, denticulate-ciliate, the lower surface somewhat glaucous; pedicels and peduncles hispidulous; bracts subcordate-ovate, about 4 mm. long and 2 mm. wide, acute, serrulate, ciliate; bracteoles lanceolate-ovate, acute to obtuse, denticulate-ciliate, about 4–4.5 mm. long, 1.5–2 mm. wide; flowers 15–20 mm. long; calyx about 10 mm.

long; standard 15–20 mm. long, erect or somewhat reflexed, the claw about 1–1.5 mm. long, the blade ovate-suborbiculate, 14–18.5 mm. long, 13–14 mm. wide, ciliate; wings about 15–16 mm. long, the claw 1 mm. long, the blade 14–15 mm. long, 3.5–7 mm. wide, ciliate in part; keel about 15 mm. long, the claws 1 mm. long, the blades about 14 mm. long, 5–6 mm. wide; stamens 15–20 mm. long; fruit about 8-articulate, the margins subentire, the stipe 20–30 mm. long, the articles about 6 mm. long and 5 mm. wide, hispidulous, somewhat verrucose or muricate at the center; seeds about 4 mm. long and 2 mm. wide.

TYPE: In the Gray Herbarium, collected at Centurion, between the Río Apa and the Río Aquidaban, Concepción, Paraguay, Nov. 8, 1908, by K. Fiebrig (No. 4059).

DISTRIBUTION: KNOWN only from the Department of Concepción, Paraguay (fig. 6).

PARAGUAY: CONCEPCIÓN: Estrella, *Fiebrig* 4340 (US).

This species exhibits the largest flowers of the series. They are equaled in size only by those of *Ae. paraguayensis*, and approached by those of *Ae. montevidensis*, both of the series *Montevidenses*, and natives of the same general region as *Ae. magna*.

Section II. Ochopodium

Aeschynomene section *Ochopodium* Vog. *Linnaea* 12: 86. 1838.

Aeschynomene subgenus *Ochopodium* (Vog.) J. Léonard, *Bull. Jard. Bot. État. Brux.* 24: 84. 1954.

Herbs or shrubs; indument of glandular hairs or simple pubescence, or the plants sometimes glabrous; stems erect to prostrate; stipules striate, subcordate to lanceolate, attached at the base, not peltate; leaves 5–80-foliolate; leaflets oblong to orbiculate, ovate to obovate, glabrous to densely pubescent, with or without marginal glandular hairs; inflorescences axillary and sometimes terminal, racemose, sometimes paniculate; calyx campanulate with five subequal lobes; standard petal pubescent on the outer face in all but a few species, the other petals glabrous; seeds light brown to black, smooth, sublustrous.

In the absence of previous typification, *Aeschynomene falcata* (Poir.) DC. is here designated as type of the section *Ochopodium*. This species was included by Vogel in his original treatment of the section and is, apparently, correctly recognized today. It falls into my series *Viscidulae*, species No. 30.

Series 6. *Viscidulae* Rudd, ser. nov.

Herbae prostratae vel suberectae, nonnumquam suffruticosae; stipulae non productae; foliola imprimis obovata, 1-costata, costa

centrali vel fere centrali; flores fructusque pro sectione *Ochopodio* plerumque inter minores.

Herbs, sometimes suffrutescent; stems prostrate to suberect; stipules attached at the base, not appendiculate; leaves 5–32-foliolate; leaflets preponderately obovate, the costa central or nearly so, the secondary venation reticulate; flowers relatively small, less than 10 mm. long; fruit either long or short-stipitate, the upper margin entire, the lower crenate, the articles mostly less than 5 mm. in diameter.

The type of the series is here designated as *Ae. viscidula* Michx.

24. *Aeschynomene viscidula* Michx. Fl. Bor. Am. 2: 74. 1803, non *Ae. viscidula* Roxb. ex Willd. 1809.

Aeschynomene prostrata Poir. in Lam. Encycl. Suppl. 4:76. 1816.

Secula viscidula (Michx.) Small, Fl. Miami 90, 200. 1913.

Aeschynomene eriocarpa Standl. & Steyerl. Field Mus. Publ. Bot. 23:9. 1943.

Stems prostrate to about 1 m. long, viscidulous-pubescent with glandular hairs and also crisp-pubescent; stipules deltoid-ovate, acute, 2–4 mm. long, 1.5–2 mm. wide, hispidulous to subglabrous, ciliate; leaves to about 2.5 cm. long, 5–9-foliolate, the petiole and rachis pubescent like the stem; leaflets 4–10 mm. long, 3–7 mm. wide, obliquely obovate-cuneate, ciliate-denticulate, mucronulate, the costa subcentral, the upper surface pubescent, reticulate; inflorescences 1–8-flowered, frequently longer than the subtending leaves, the peduncles and pedicels pubescent like the stem; bracts stipule-like, decreasing in size toward the flowers, the bracteoles ovate, about 2 mm. long and 1 mm. wide; flowers 5–7 mm. long; calyx 2.5–3.5 mm. long, hispidulous, ciliate; standard about 6 mm. long, the claw 1–1.5 mm. long, the blade orbicular, about 5 mm. in diameter, pubescent on the outer face, retuse, entire; wings about the same length as the standard, the blade about 2 mm. wide; keel falcate, the claws about 3 mm. long, the blades 2.5–3 mm. long, about 2 mm. wide; stamens about 6 mm. long; legume commonly 2- or 3-(rarely 4- or 5-) articulate, the stipe 1–3 mm. long, subglabrous, the articles 3.5–4 mm. in diameter, densely white-tomentulose and commonly beset with glandular hairs, or rarely the terminal articles glabrous; seeds 2.5–3 mm. long, about 2 mm. wide.

TYPE LOCALITY: "Habitat in arenosis insulae Cumberland et Florida," United States. Type presumably was collected by Michaux but neither specimen nor exact locality was cited.

DISTRIBUTION: In sand, upland oak woods, and high pine lands of southern United States, and in tropical America southward to Brazil, at elevations to about 1,800 m. (fig. 7).

UNITED STATES: GEORGIA: Charlton County: Traders Hill, *Harper* 1498 (Mo, NY, US). **FLORIDA:** *Chapman* (Ch, GH, Mo, NY, US). *Buckley* (GH). Volusia County: Spring Garden, *Rugel* 176 (Ch, GH, Mo, NY, US). Polk

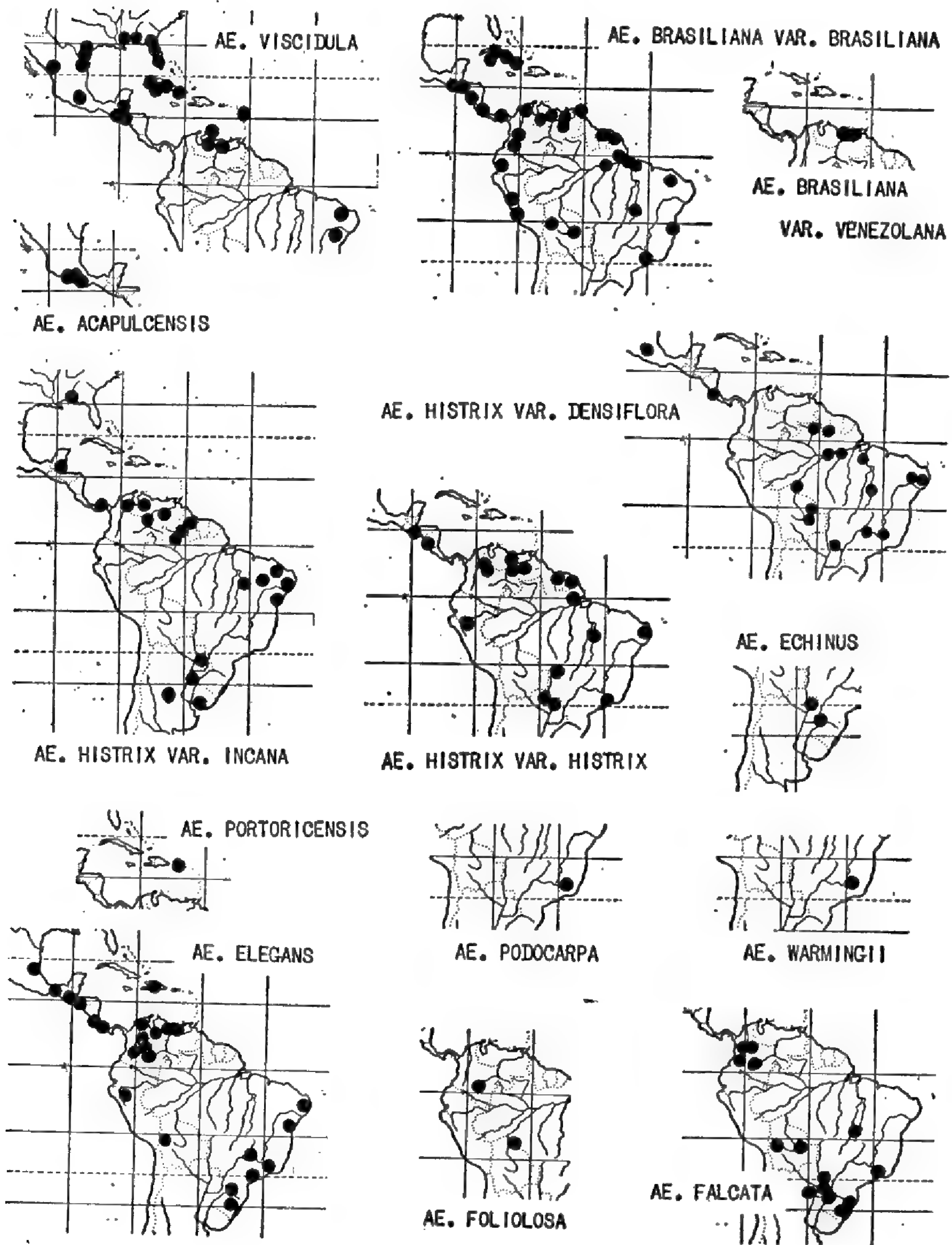


FIGURE 7. Distribution of the *Viscidulae*.

County: Davenport, *McFarlin* 6243 (UC); Kissinger Spring, *McFarlin* 5568 (Ch). Duval County: Jacksonville, *Curtiss* 607 (Ch, GH, Min, Mo, NY, UC, US), 4236 (US), 4238 (Mo, UC), 4239 (NY), 4901 (GH, Min, NY, UC, US); St. Nicholas, *Lighthipe* 227 (NY). Sumter County: Wildwood, *Webber* 2 (Mo). Lake County: Eustis, *Nash* 593 (GH, Mo, NY, UC, US), 1847 (NY, US); *Hitchcock* 341 (Ch), 342 (Ch); *Biltmore Herb.* No. 226a (NY). Hernando County: Hernando, *Degener* 5179 (NY). Orange County: *Fredholm* 5348 (GH). Lake Brantley, *Lewton*, June 21, 1894 (NY); Clarcona, *Pieters* 89 (US); Orlando, *O'Neill*, Aug. 12, 1929 (US). Columbia County: Lake City, *Rolfs* 104 (Ch, Mo);

Hitchcock 343 (Ch). Putnam County: Johnson, *Barnhart* 2183 (NY). Brevard County: *Fredholm* 5960 (GH, US). San Antonio, *Schulz* 417 (US). Alachua County: Archer, *Quaintance* 1167 (Ch); High Springs, *Wiegand & Manning* 1580 (GH); Gainesville, *Murrill*, June 1, 1937 (Mo). Hillsborough County: Tampa, *Leeds*, Oct. 12, 1892 (Ch); *O'Neill & Blanton* 6767 (Ch); *Garber*, in 1877 (US); Sutherland, *Barnhart* 2762 (Ch, Min, NY). Levy County: Cedar Key, *Edw. Palmer* 128, in 1874 (Ch, Mo, US); *Garber*, Apr. 1876 (Ch, NY, US); Rosewood, *Garber*, June 1876 (Ch). Lee County: Fort Myers, *Hitchcock* 51 (Ch, GH, Min, Mo, NY, US). Highlands County: Lake Placid, *McFarlin* 11116 (GH). Dade County: Ross Hammock, *Small, Mosier, & Small* 6510 (NY, US); Ross-Costello Hammock, *Small, Mosier, & Small* 6563 (GH, NY); Miami, *Small, Mosier, & Small* 6429 (Mo, NY); Cutler, *Small, Mosier, & Small* 6735 (NY); between Cutler and Cocoanut Grove, *Small & Wilson* 1589 (NY); *Small & Carter* 741 (NY). Escambia County: Pensacola, *Brinker* 221 (Mo); along Escambia Bay, *Biltmore Herb.* No. 226b (NY). Franklin County: St. Vincent Island, *Chapman*, in 1868 (Mo). MISSISSIPPI: Jackson County: Horn Island, *Tracy* 6460 (Ch, GH, Min, Mo, NY, US); *Mohr*, Aug. 1878 (US); Harrison County: Between Gulfport and Long Beach, *Joor*, Sept. 19, 1891 (Mo); Mississippi City, *Demaree* 30686 (US); Ship Island, *Tracy, Earle, & Underwood*, June 1896 (NY, US); Cat Island, *Tracy & Lloyd* 174 (Ch, GH, Min, Mo, NY, US). TEXAS: Nueces County: Corpus Christi Bay, *Tharp*, in 1928 (Mo, UC); Flour Bluff, *Cory* 20512 (GH); Padre Island, *Tharp* 4716 (US). Bexar County: *Parks* 5075 (GH). Atascosa County: Pleasanton, *E. J. Palmer* 9774 (Mo). Wilson County: Terrell Hill, *Cory* 15080 (GH). Medina County: Devine, *Tharp*, June 24, 1941 (GH, Mo, NY, US). Brooks County: Encino, *Whitehouse* 44284 (GH). San Patricio County: Aransas Pass, *Cory* 20362 (GH).

MÉXICO: TAMAULIPAS: Matamoros, *Berlandier* 990 (GH, Mo). Between Matamoros and San Patricio, *Berlandier* 2420 (GH, Mo, US). Between Matamoros and Goliad, *Berlandier* 3137 (Ch, GH, Mo, NY). OAXACA: Oaxaca, *Pringle* 5627 (GH, US). Valle de Oaxaca, *Liebmann* 4712 (Ch, fragm. ex C). SINALOA: Culiacán, Cerro Colorado, *Brandegee*, Nov. 5, 1904 (UC).

GUATEMALA: HUEHUETENANGO: Between San Ildefonso and Cuilco, *Steyermark* 50750 (Ch). ZACAPA: Santa Rosalía, *Steyermark* 29313 (Ch, TYPE of *Ae. eriocarpa*). JUTIAPA: Jutiapa, *Standley* 75101 (Ch), 75406 (Ch), 76194 (Ch).

BRITISH HONDURAS: BELIZE: Big Fall, *Lundell* 4400 (Ch).

EL SALVADOR: SANTA ANA: Chalchuapa, *Calderón* 1039 (NY, US).

CUBA: PINAR DEL RÍO: Laguna Jovero, *Shafer* 10711 (Ch, Mo, NY, US), 10991 (NY). Between Pinar del Río and Coloma, *Britton, Britton, & Cowell* 10091 (NY). Between Candelaria and Artemisia, *Wilson* 1741 (NY). Guane, *León & Roca* 6968 (NY). Cortés, *Britton & Cowell* 10001 (NY, US). Chirigota, *León & Roca* 7470 (NY). HABANA: Isla de Pinos, *Britton, Wilson & Selby* 14472 (NY); *Britton, Britton, & Wilson* 15099 (Ch, GH, Mo, NY, US); *Marie-Victorin & Alain* 123 (GH); *Killip* 42894 (US), 43115 (US). LAS VILLAS: Gara, *León* 1298 (NY). Saneti-Spíritus, *León* 5360 (NY); Cienequita, *Combs* 408 (Ch, GH, Mo, US). ORIENTE (?): "In Cuba Orientali in 1859, 1860," *C. Wright* (Mo), 123 in part (NY, US).

LESSER ANTILLES: GUADELOUPE: *Duss* 3923 (Ch, GH, Mo, NY, US). CURAÇAO: *Boldingh* 5215 (NY). Macao to Playa Grande, *Britton & Shafer* 3041 (NY). *Pareira, Arnoldo* 1843 (US).

VENEZUELA: LARA: Barquisimeto, *Burkart* 17131 (US). GUARICO: Between El Socorro and Pariaguán, *Burkart* 17220 (US).

BRAZIL: CEARÁ: Quixadá, *Drouet* 2428 (Ch, GH, US). BAHIA: Joazeiro, *Zehntner* 42 (R), 135 (R), 807 (R).

This species is readily distinguished by its short-stipitate, densely white-tomentulose fruits with articles 3.5–4 mm. in diameter. Herbarium specimens usually have a considerable amount of sand adhering to them, attesting to the viscid nature of the plants.

There is some instability of fruit indument; the glandular hairs occasionally fail to develop, or the tomentum may be lacking from the terminal one or two joints of otherwise normal fruits. These aberrances, when they occur, are often consistent over the entire plant. Specimens from Texas, northern México, Guadeloupe, and Curaçao have been observed with partially glabrous fruits.

Aeschynomene prostrata, based on *Ae. viscidula* Michx., was proposed by Poiret because of homonymy with Willdenow's *Ae. viscidula*. However, the latter apparently was merely an unpublished herbarium name until 1809 and thus became the illegitimate later homonym.

The type specimen of *Ae. eriocarpa* appears to be an individual of *Ae. viscidula* whose fruits show no development of glandular hairs, a condition which occurs occasionally throughout the range of the species. Another name is therefore added to the synonymy.

Small included *Ae. viscidula* in his genus *Secula*, which in this paper is placed in synonymy under *Aeschynomene*. The calyx and corolla characters on which Small based his generic separation are not believed critical enough to warrant such treatment.

25. *Aeschynomene acapulcensis* Rose, Contr. U. S. Nat. Herb. 5: 191. 1899.
Aeschynomene picachensis Brandeg. Univ. Calif. Publ. Bot. 6: 181. 1915.

Stems prostrate, to about 8 dm. long, crisp-pubescent to glabrous, sometimes also hispidulous; stipules subovate, acute to acuminate, 2–4 mm. long, 1.5–2 mm. wide at base, subglabrous to sparsely hispidulous, entire, sometimes ciliolate; leaves 5–7-foliolate, the petiole and rachis pubescent like the stems; leaflets obovate-cuneate, 5–15 mm. long, 3–7 mm. wide at maximum, obtuse, mucronulate, entire or glandular-denticulate, the upper surface glabrous, the lower appressed-pubescent, subglabrous to reticulate; inflorescences few-flowered, longer than the subtending leaves; peduncles and pedicels with indument like the stems; bracts ovate, acute, 1.5–2 mm. long, 1–1.5 mm. wide, subglabrous to pubescent, the bracteoles similar but 2–3 mm. long, about 1 mm. wide; flowers about 7 mm. long; calyx 3 mm. long, subglabrous to pubescent; standard about 7 mm. long, the claw 1 mm. long, the blade suborbiculate, about 6 mm. in diameter, entire, retuse, the outer face pubescent to subglabrous; wings 6–6.5 mm. long, the claw about 1 mm. long, the blade about 5 mm. long, 2.5–3 mm. wide; keel falcate, 7–8 mm. long, the claw 1 mm. long, the blade 6–7 mm. long, about 1.5 mm. wide; stamens about 7 mm. long; fruit commonly 2- or 3-articulate, the stipe 4–5 (–7) mm. long, glabrous or

hispid, sometimes glabrate, the articles 4–5.5 mm. in diameter, glabrous; seeds about 3 mm. long, 1.5–2 mm. wide, dark brown.

TYPE LOCALITY: Acapulco, Guerrero, México. Type collected by Edw. Palmer (No. 126, between October 1894 and March 1895), cited below.

DISTRIBUTION: México, Guerrero to Oaxaca (fig. 7).

MÉXICO: GUERRERO: Acapulco, *Edw. Palmer* 126 in 1894–95 (CH, GH, Mo, NY, UC, US TYPE). OAXACA: "Cerro de Picacho," *Purpus* 7162 (Ch, GH, Mo, NY, UC TYPE of *Ae. picachensis*, US). "S. Augustin," *Liebmann* 4710 (Ch, UC, US).

The relatively large, glabrous fruits, with stipes 4–7 mm. long, serve to distinguish this species from others of the series.

Although specimens of the three collections cited are not identical, they do not seem to possess significant differences. Considerable range of stipe length can be observed on each plant. Since there is some variability of glandular development on the vegetative parts in most species of the genus, the fact that type material of *Ae. picachensis* exhibits an abundance of glandular hairs, which are lacking on the other two collections cited, does not seem to be of specific importance, and that species is here reduced to synonymy.

Aeschynomene acapulcensis rather resembles *Ae. viscidula* except that the latter has more glandular development in general and its fruits are much more pubescent and longer stipitate.

Material distributed as the Old World species *Ae. micrantha* (Poir.) DC. also appears to be very similar. However, I have not seen the type of *Ae. micrantha* so am not able to state the relationship with any degree of certainty.

26. *Aeschynomene brasiliana* (Poir.) DC. Prodr. 2: 322. 1825.

Prostrate or decumbent herb; stems to about 1 m. long, glandular-hispidulous and also crisp-pubescent; stipules ovate, acuminate, 3–4 mm. long, about 1 mm. wide at base, glandular-hispidulous, ciliolate; petiole and rachis with indument like the stem; leaves 2–3 cm. long, 8–22-foliolate; leaflets obovate-elliptic to oblong, 5–15 mm. long, 3–8 mm. wide, obtuse, mucronulate, ciliate-denticulate, the upper surface sparsely pubescent or sometimes glabrous, the lower surface sparsely pubescent, reticulate; inflorescences usually 2–4 times the length of the subtending leaf, 1–8-flowered, the pedicels and peduncles pubescent like the stem; bracts broadly ovate, acute, 1–2 mm. long, 1–1.5 mm. wide, hispidulous; bracteoles ovate, acute, 2–2.5 mm. long, about 1 mm. wide; flowers 5–8 mm. long; calyx 1.5–3 mm. long, hispidulous, ciliolate; petals yellow; standard about 6 mm. long, the claw 1–1.5 mm. long, the blade suborbiculate, about 5 mm. in diameter, pubescent on the outer face, retuse; wings and keel about

as long as the standard, the wing blades about 2 mm. wide, the keel blades 1.5 mm. wide; stamens about 6 mm. long; legume 2-5-articulate, the stipe 3-5 mm. long, hispid, rarely subglabrous, the articles 2.5-3 mm. long, 2-3 mm. wide, moderately crisp-pubescent and also glandular hispidulous, occasionally 1 or more articles subglabrous; seeds about 2 mm. long, 1-1.5 mm. wide, dark brown.

26a. *Aeschynomene brasiliana* var. *brasiliana*.

Aeschynomene brasiliana (Poir.) DC. Prodr. 2: 322. 1825.

Cassia biflora Mill. Gard. Dict. ed. 8, No. 14. 1768, non L. 1753.

Hedysarum brasilianum Poir. in Lam. Encycl. 6: 448. 1804.

Cassia houstoniana Collad. Hist. Nat. Med. Cass. 132. 1816.

Aeschynomene paucijuga DC. Prodr. 2: 321. 1825.

Aeschynomene paucijuga var. *subscabra* DC. Prodr. 2: 321. 1825.

Hedysarum hirtum Vell. Fl. Flum. 319. 1825; Icon. 7: tab. 151. 1835.

Aeschynomene brasiliana β Vog. Linnaea 12: 90. 1838.

Aeschynomene biflora (Mill.) Fawc. & Rendle, Fl. Jam. 4: 27. 1920.

Aeschynomene guaricana Pittier, Bol. Teen. Minist. Agric. & Cría, Serv. Bot. Caracas 5: 41. 1944, without Latin diagnosis.

The typical variety characteristically has 2- or 3-, rarely 4-jointed fruits, with stipes 3-4 mm. long, and leaves 8-13-foliolate, the leaflets predominantly obovate.

TYPE LOCALITY: Rio de Janeiro, Brazil. Type collected by Commerson, cited below.

DISTRIBUTION: Widespread in tropical America, along roadsides, in brushland, savanna, and open pine-oak woods, at elevations up to about 3,000 m. (fig. 7).

MÉXICO: Jalisco: Tonilita, *Orcutt* 6479 (US).

GUATEMALA: CHIQUIMULA: Quezaltepeque, *Steyermark* 31199 (Ch), 31374 (Ch). JALAPA: Between Monjas and Jalapa, *Steyermark* 32214 (Ch, GH). GUATEMALA: Between Guatemala and Fiscal, *Standley* 59682 (Ch). Jacaltenanjo, *Nelson* 3572 (Ch, US). ESCUINTLA: Along Río Guacalate, *Standley* 58239 (Ch), 89383 (Ch).

HONDURAS: COMAYAGUA: Comayagua, *Standley & Chacón* 5821 (Ch). OLANCHE: Trail from Catacamas to Loma Pelona, *Standley* 18196 (Ch). MORAZÁN: San Antonio de Oriente, *J. Valerio* 672 (Ch), 1471 (Ch). Vicinity of El Zamorano, *Standley* 205 (Ch), 1088 (Ch); *Swallen* 10827 (US). Santa Inéz, *J. Valerio* 1529 (Ch). Santa Clara Creek, *Williams & Molina* 10643 (Ch, Mo). Las Mesas, *Swallen* 11262 (US). El Jicarito, *Standley* 28244 (US). EL PARAÍSO: Las Casitas, *Standley, Williams, & Allen* 540 (Ch). Ojo de Agua, *Standley* 4711a (Ch). Quebrada de Dantas, *Standley, Williams, & Molina* 1262 (Ch). Road to Yuscarán, *Swallen* 11355 (US). Río Choluteca, Yuscarán, *Swallen* 10856 (US). Near Río San Francisco, *Swallen* 11207 (US), 11209 (US). El Limonal, *Standley* 28919 (US).

EL SALVADOR: SANTA ANA: Santa Ana, *Standley* 19706 (GH, NY, US), 20438 (GH, US).

NICARAGUA: MASAYA: Masaya, *Baker* 199 (GH, Mo, NY, UC), 694 (US). GRANADA: Granada, *Grant* 750 (GH), 874 (GH).

COSTA RICA: ALAJUELA: Maderal de San Mateo, *Brenes* 3678 (Ch). PUNTA-RENAS: El General, *Skutch* 2946 (GH, Mo, NY, US). Térraba, *Tonduz* 3806 (US). Buenos Aires, *Tonduz* 4990 (US), 4994 (US).

PANAMÁ: PANAMÁ: Taboga Island, *Standley* 28022 (US). Matías Hernández, *Pittier* 6908 (US). Between Las Sabanas and Matías Hernández, *Standley* 31866 (US). Between Matías Hernández and Juan Días, *Standley* 32083 (US). Panamá, *Standley* 26806 (US), 27724 (US), 29747 (US). CANAL ZONE: Balboa, *Standley* 25275 (US), 25586 (US), 26442 (US), 29295 (US). Between Fort Clayton and Corozal, *Standley* 29111 (US). Corozal, *Standley* 27369 (US). Summit, *Standley* 30069 (US). Ancón Hill, *Standley* 25153 (US). Cerro Gordo, *Standley* 26042 (US). Between Red Tank and Pueblo Nuevo, *Piper* 5189 (Ch, US).

CUBA: HABANA: Isla de Pinos, *Alain & Killip* 2081 (US), 2160 (US); *Killip & Swetland* 41633 (US); *Killip* 42537 (US), 42934 (US). LAS VILLAS: Sancti Spiritus, *Luna* 922 (NY). ORIENTE: C. Wright 123 in part (GH, NY, Mo). Daiquirí, *Ekman* 8341 (NY). Between Firmeza and Gran Piedra, *Shafer* 8937 (NY). CAMAGÜEY: Camagüey, *Britton, Britton, & Cowell* 13156 (NY, US). La Gloria, *Shafer* 554a (Ch, NY, US). El Cobre, *Britton, Cowell, & Shafer* 12863 (NY, US).

TRINIDAD: *Crueger* 1006 (US); *Fendler* 294 (US); *Broadway* 7804 (Mo), (*Trin. Herb.*) 3699 (NY). O'Meara Savanna, *Britton & Britton* 2508 (GH, NY, US). St. Joseph Savanna, *Britton, Hazen, & Broadway* 975 (NY).

FRENCH GUIANA: Iles du Salut, *Sagot* 133 (US). Cayenne, *Perrottet*, in 1819 (F. M. neg. 6959, of TYPE of *Ae. paucijuga* ex G); *Broadway* 153 (NY, US), 460 (GH, NY), 636 (NY).

SURINAM: *Hostmann* 637a (Mo); *Focke* 670 (GH).

VENEZUELA: ANZOÁTEGUI: Los Caños, Río Carí, *Pittier* 14482 (Ven). DISTRITO FEDERAL: Turmerito, *Pittier* 13607 (Mo). Las Barrancas, *Tamayo* 1475 (Ven). ARAGUA: Colonia Tovar, *Fendler* 1781 (GH, Mo). Between San Juan de las Morros and Uberito, *Pittier* 11324 (US, Ven). CARABOBO: Valencia, *Pittier* 9422 (US). COJEDES: San Carlos, *Rudd* 332 (US). TRUJILLO: Escuque, *Pittier* 13149 (Ch, Mo, NY, US, Ven). BOLÍVAR: Between Santa Rosalía and Río Orocopicha, *Killip* 37649 (US). Upata, *Steyermark* 57530 (Ch, Ven).

COLOMBIA: MAGDALENA: Santa Marta, *H. H. Smith* 708 in part (Ch, GH, Mo, NY, UC, US). CUNDINAMARCA: Nocaíma, *Uribe* 1594 (US). TOLIMA: Chicoral, *Haught* 6371 (US). Honda, *Pennell* 3595 (GH, Mo, NY, US). Amero, *García-Barriga* 7515 (US). Espinal, *Apolinar-María*, July 1928 (US). HUILA: Villavieja, *S. G. Smith* 1264 (US). Neiva, *Rusby & Pennell* 461 (NY), 1087 (GH, NY, US), 1114 (NY); *Marulanda-Caicedo* 48A (US). CAUCA: El Tambo, *Idrobo & Fernández* 75 in part (US). El Bordo, *García-Barriga* 4492 (US). San Francisco, *Andre* 2854 (Ch, NY).

ECUADOR: Los Ríos: Between Quevado and Naranjal, *Mexia* 6665 (Ch).

PERÚ: *Mathews* 1579 (GH). Cusco: Patio de Illapani, *Bues*, May 15, 1930 (Ch, US). JUNÍN: La Merced, *Macbride* 5483 (Ch).

BOLIVIA: LA PAZ: San Carlos, Mapiri, *Buchtien* 791 (Mo). Coripata, *Bang* 2082 in part (Ch, GH, Mo, NY). Sorata, *Rusby* 1036 (NY). SANTA CRUZ: Buena Vista, *Steinbach* 7046 (Ch).

BRAZIL: AMAPÁ: Macapá, *Fróes & Black* 27136 (IAN). PARÁ: Monte Alegre, *Ducke* 16065 (US). Santarém, *Spruce*, Mar. 1850 (GH, NY). Belém (as Pará), *Burchell* 9647 (NY); *Spruce*, Jul.-Aug. 1849 (NY). Marajó, *Jobert & Schwacke* 158 (R). Vigia, *Fróes* 27864 (IAN); *Black, Ledoux, & Accioly* 52-14196 (IAN). CEARÁ: Allemão 354 in part (R). BAHIA: Ilheos, *Riedel* 134 (US). GOYAZ: Goyaz, *Burchell* 7094-2 (GH, NY). Between Pôrto Real and São João de

Araguaia, *Burchell* 8907 (GH, NY). RIO DE JANEIRO; *Commerson* (Ch, fragment, presumably of TYPE ex P); *Sampaio* 2974 (R); *Sousa Britto* 14 (R).

LOCAL NAME: Pega pega (Panamá).

This species usually is readily distinguishable by its short-stipitate fruits, which are puberulent and also beset with glandular hairs. The amount of indument on the fruits is, however, somewhat variable. The glandular hairs occasionally fail to develop. The puberulence may be crispate or appressed, sometimes both on the same plant. In several specimens some articles, or even whole fruits, may be glabrous.

The number of articles, usually 2 or 3 in the typical variety, is fairly constant on a given plant, although sometimes 2- and 3-articulate fruits are found on the same specimen. Several collections have been observed to have an occasional 4-articulate fruit, indicating a tendency toward variety *venezolana*, but since these specimens have fruits which are predominantly 2- or 3-articulate and leaflets which are obovate rather than oblong, they are cited here as representing variety *brasiliانا*.

That the fruits are, incipiently, more than 3-articulate is suggested by the presence of an undeveloped basal article and usually one or two aborted articles between the matured articles.

Aeschynomene brasiliانا, based on *Hedysarum brasilianum*, appears to be the oldest legitimate name for this taxon. Fawcett and Rendle (*Flora of Jamaica* 4: 28. 1920) cited a specimen of *Cassia biflora* Mill., presumably the type, as being equivalent to *Ae. brasiliانا*. Because of the priority of the specific name *biflora*, they published the new combination *Ae. biflora*, overlooking the fact that *Cassia biflora* Mill. was a later homonym of *Cassia biflora* L. and therefore illegitimate when published. Colladon apparently recognized the homonymy although not the misdetermination as to genus, and proposed *Cassia houstoniana*, based on *C. biflora* Mill.

As indicated by a photograph of the type and by the description, *Ae. paucijuga* was distinguished by its relatively few leaflets, "4-5-jugis," and its glabrous fruits; its variety *subscabra* was distinguished by the short, scabrous pubescence of its fruits. Since these conditions are not uncommon in *Ae. brasiliانا*, and other characters are essentially the same, *Ae. paucijuga*, in this paper, is being treated as a synonym of *Ae. brasiliانا*.

Velloso's illustration of *Hedysarum hirtum* appears to be based on material of *Ae. brasiliانا* and, following a tentative disposition made by Bentham, that species is also reduced to synonymy under *Ae. brasiliانا*.

In *Ae. brasiliانا* var. β , characterized by "legumine pubescente non viscoso," it is suspected that Vogel had at hand some of the aber-

rant material with little or no development of glandular hairs on the joints of the fruits.

A specimen cited by Pittier as *Ae. guaricana* is slightly depauperate but not significantly different from characteristic material of *Ae. brasiliiana*, adding another name to the synonymy of the latter species.

26b. *Aeschynomene brasiliiana* var. *venezolana* Rudd, var. nov.

A varietate typica fructibus 4-5-articulatis stipitibus 4-5 mm. longis, foliis 14-20-foliolatis, foliolis oblongis differt.

This variety differs from the typical one in that the fruits are 4- or 5-jointed, with stipes 4-5 mm. long; the leaves are 14-20-foliolate, the leaflets predominantly oblong.

TYPE: In the Herbario Nacional de Venezuela, Ministerio de Agricultura y Cría, No. 3775, collected near Petare, Miranda, Venezuela, Nov. 11, 1923, by H. Pittier (No. 11233a). Duplicate at US.

VENEZUELA: SUCRE: Los Altos, *Tamayo* 2157 (US, Ven). **MIRANDA:** Los Teques, *Pittier* 11621 (NY, US, Ven). **DISTRITO FEDERAL:** Between La Guaira and Caracas, *Kuntze* 1338 (NY).

This variety is known only from a few specimens collected in northern Venezuela (fig. 7). The fact, though, that there is a tendency toward 4-articulate fruits in some of the collections cited as var. *brasiliiana* suggests that additional specimens might be found in a wider area of the general range of the species.

27. *Aeschynomene echinus* Vog. Linnaea 12: 92. 1838.

Aeschynomene brasiliiana (Poir.) DC. forma *multijuga* Chod. & Hass. Bull. Herb. Boiss. II. 4: 882. 1904.

Stems prostrate to suberect, somewhat frutescent, about 1 m. long, usually canescent and also hispid with yellowish glandular hairs 2-4 mm. long, sometimes glabrate toward the base; stipules lanceolate, 3-8 mm. long, 1-1.5 mm. wide at base, sparsely hispid, usually with an apical cilium; leaves 20-30-foliolate; leaflets elliptic to oblong, 3-10 mm. long, 2-2.5 mm. wide, acute, the upper surface glabrous or nearly so, the lower surface appressed-pubescent, entire or sparsely denticulate-ciliate; inflorescences axillary, about as long as the subtending leaves or slightly longer; bracts and bracteoles ovate, acute, hispid, about 1.5-3 mm. long, 1-1.5 mm. wide; flowers 7-9 mm. long; calyx about 3 mm. long; standard 7-9 mm. long, the claw 1-3 mm. long, the blade suborbiculate, 5-6 mm. in diameter; wings 5-8 mm. long, the claw 1-2 mm. long, the blade 4-6 mm. long, 2-3 mm. wide; keel about as long as the wings, the blades about 1 mm. wide; stamens 6-8 mm. long; fruit 2-articulate, with a third, aborted article discernible at the base, the stipe 2-3 mm. long, hispid with yellowish hairs 2-4 mm. long, concentrated at the base of the first

article, otherwise glabrous, the articles about 3 mm. in diameter, crisp-pubescent; seeds about 2.5 mm. long and 1.5 mm. wide, black.

TYPE LOCALITY: "Braz. merid.," probably between São Paulo, Brazil, and Montevideo, Uruguay. Type collected by Sellow.

DISTRIBUTION: Paraguay and eastward, in savannas (fig. 7).

PARAGUAY: CONCEPCIÓN: Centurión, *Fiebrig* 4387 (GH, US). Apa, *Hassler* 11021 (Ch, GH, US). CAAZAPÁ: Arroyo Carimbatay, *Hassler* 5814 (GH, Mo, ISOTYPES of *Ae. brasiliiana* forma *multijuga*).

ARGENTINA: MISIONES: "On the Paraná, 26°–27° S. lat.," *Parodi* 100 (K). San Ignacio, *Burkart* 15344 (US).

Although I have not seen the type of *Ae. echinus*, I believe, on the basis of the original description, that the above cited specimens, including the type material of *Ae. brasiliiana* forma *multijuga*, represent that species.

As indicated in the key, *Ae. echinus* differs from *Ae. histrix* chiefly in its larger flowers and fruits.

29. *Aeschynomene histrix* Poir. in Lam. Encycl. Suppl. 4: 77. 1816.

Stems to about 1 m. long, prostrate to suberect, moderately pubescent and also hispid with yellowish glandular hairs 2–4 mm. long, sometimes glabrate toward the base; stipules lanceolate, acuminate, 4–10 (–15) mm. long, 1–3 mm. wide at base, subglabrous to hispid; leaves about 16–30-foliolate; leaflets oblong-elliptic, rarely somewhat obovate, 4–12 mm. long, 1.5–4 mm. wide, obtuse to acute, entire or sparsely denticulate-ciliate, the upper surface pubescent to glabrous, the lower surface pubescent; inflorescence axillary, about 4–15-flowered, usually congested, much shorter than the subtending leaves, occasionally lax and longer than the leaves; bracts and bracteoles ovate, acute, 1–3 mm. long, 1 mm. wide or less, hispid; flowers about 5–7 mm. long; calyx 2–3 mm. long; standard 5–7 mm. long, the claw 1–1.5 mm. long, the blade suborbiculate, about 4–6 mm. in diameter; wings and keel about as long as the standard, the wing blades about 2 mm. wide, the keel blades about 1 mm. wide; stamens 5–6 mm. long; fruit 2-articulate, with a third, basal article usually undeveloped, rarely 3-articulate, the stipe 1.5–2 mm. long, hispid with yellowish hairs 2–4 mm. long concentrated at the base of the first article, but otherwise glabrous, the articles 2–2.5 mm. in diameter, rarely about 3 mm. long and 2.5 mm. wide, glabrous to moderately pubescent; seeds 1.5–2 mm. long, 1–1.5 mm. wide, black.

29a. *Aeschynomene histrix* var. *histrix*.

Aeschynomene histrix Poir. in Lam. Encyc. Suppl. 4: 77. 1816.

? *Aeschynomene cassioides* Desv. in Ham. Prod. Pl. Ind. Occ. 51. 1825.

Aeschynomene conferta Benth. Ann. Nat. Hist. 3: 433. 1839.

Aeschynomene mucronulata Benth. Hook. Journ. Bot. 2: 56. 1840.

Aeschynomene hystrix var. *mucronulata* Benth. in Mart. Fl. Bras. 15(1): 69. 1859.

Secula hystrix (Poir.) Small, Man. Southeast Fl. 728. 1933.

Aeschynomene pineticola Standl. & Wms. Ceiba 1: 79. 1950.

The typical variety commonly has prostrate, moderately pubescent stems; stipules 4–5 mm. long, about 1 mm. wide; leaves about 16–20-foliolate; leaflets 4–6 (–8) mm. long, 1–2 mm. wide; bracteoles about as long as the calyx; flowers 5–6 mm. long; fruits with glabrous to sparingly pubescent articles, the hairs usually crispate.

TYPE LOCALITY: Cayenne, French Guiana. Type collected by Martin.

DISTRIBUTION: Central and South America, in savanna, fields, pine woods, rocky hillsides, and waste places, at elevations up to about 1,400 m. (fig. 7).

GUATEMALA: CHIQUIMULA: Quezaltepeque, Steyermark 31376 (Ch).

HONDURAS: Morazán: Between El Zamorano and San Antonio de Oriente, Standley 12657 (Ch, TYPE of *Ae. pineticola*).

EL SALVADOR: SANTA ANA: Chalchuapa, Calderón 1038 (GH, NY, US).

NICARAGUA: CHINANDEGA: El Viejo, Oersted 67 (K).

FRENCH GUIANA: Cayenne, Leprieur, in 1835 (GH).

SURINAM: Hostmann 1074 (Mo). Saron, Kegel 1281 (NY). "Forests of Zandery," Samuels 473 (GH). Zanderij I, Maguire & Stahel 23731 (Ch, Mo, NY, US). Zanderij II, Maguire & Stahel 25041 (Ch, NY, US). Sectie Oeëst, Pulle 185 (Mo).

BRITISH GUIANA: Schomburgk 187 (Ch, GH, US, ISOTYPES of *Ae. conferta*), 822 (F. M. neg. 27929, of ISOTYPE of *Ae. mucronulata*, ex G); Jenman 3741 (NY).

VENEZUELA: Warming 82 (US). ANZOÁTEGUI: Los Caños, Río Carí, Pittier 14471 (Ven). GUÁRICO: El Socorro, Burkart 17215 (US). BOLÍVAR: Between Upata and Río Caroní, Steyermark 57623 (Ch, Ven). Between Santa Rosalía and Río Orocopicha, Killip 37651 (US, Ven). Sabanas de Tumeremo, Tamayo 2663 (Ven).

COLOMBIA: Mutis 4923 (US). SANTANDER: Bucaramanga, Araque & Barkley 285 (US). BOYACÁ: Esmeralda, Cuatrecasas 3853 (Ch). Matabubosa, Cuatrecasas 4248 (Ch, US).

PERÚ: SAN MARTÍN: Tarapoto, Ll. Williams 5846 (Ch).

BRAZIL: AMAPÁ: Macapá, Froés & Black 27396 (IAN). RIO BLANCO: Rio Agua Bôa, Black 51–13076 (IAN). PARÁ: Marajó, Huber, July 1, 1902 (US). PERNAMBUCO: Prazeres, Pickel 1035 in part (GH, R). Tapera, Pickel 3695 in part (Ch). GOYAZ: Carolina, Pires & Black 2362 (US). BAHIA: Ilheos, Riedel 742 in part (NY). MATO GROSSO: Cuyaba, Malme 3242 (R).

PARAGUAY: "Gran Chaco: Santa Elisa lat. 23° 10'," Hassler (by T. Rojas) 2757 (GH). CONCEPCIÓN: Estrella, Fiebrig 5220 (GH, US). PARAGUARÍ: Ybytymi, Hauthal 24 (NY).

This specific name was originally published as *histris*, but subsequently has been spelled *hystrix* by most authors. Following Art. 82 of the International Code of Botanical Nomenclature (1952) concerning orthographic variants, *histris* is used in this paper.

The species sens. lat. is polymorphic. Typical *Ae. histrix*, according to the original description, has glabrous fruits. On many plants there is no trace of pubescence on the surface of the articles; others have fruits with the basal article pubescent and the apical article glabrous. Others are pubescent when young, glabrate toward maturity. In this treatment, the concept of typical *Ae. histrix* is extended to include numerous pubescent specimens.

Aeschynomene cassioides is here tentatively placed in synonymy, following Bentham in "Flora Brasiliensis."

Examination of isotypes of *Ae. conferta* reveals no significant differences from material of typical *Ae. histrix*. The fruits are moderately pubescent, crisp-pubescent on two specimens, and more or less appressed-pubescent on the other. All show a tendency toward glabrescence. Bentham, himself, reduced the species to synonymy under *Ae. histrix*.

A photograph of an isotype of *Ae. mucronulata* shows a plant specimen not too dissimilar to be included in the typical variety of *Ae. histrix*. The subglabrous legumes mentioned in the original description of *Ae. mucronulata* would also permit inclusion in *Ae. histrix* var. *histrix*.

As mentioned in the discussion of *Ae. viscidula*, in this paper, Small's genus *Secula*, in which he also placed *Ae. histrix*, seems to be unnecessary.

Aeschynomene pineticola is based on a specimen which corresponds exactly to the description of typical *Ae. histrix* and is almost indistinguishable from the Leprieur collection from the type locality. Reduction to synonymy under *Ae. histrix* var. *histrix* seems to be in order.

28b. *Aeschynomene histrix* var. *incana* (Vog.) Benth. in Mart. Fl. Bras. 15 (1): 69. 1859 (as *Ae. hystrix* var. *incana*).

Aeschynomene puberula DC. Prodr. 2: 321. 1825.

Aeschynomene incana Vog. Linnaea 12: 90. 1838, non G. F. W. Mey. ex DC. 1825, as synonym.

The variety *incana* is similar to the typical variety in general habit and size, but the stems and leaves are canescent, often densely so, and the leaflets tend to average slightly smaller. The bracteoles usually are about half as long as the calyx, the flowers 6–7 mm. long, the fruits commonly appressed-pubescent, rarely subglabrous or crisp-pubescent.

TYPE LOCALITY: Montevideo, Uruguay. Type collected by Sellow.

DISTRIBUTION: Principally in South America, a few occurrences in Central America, and one collection from Florida, in habitats similar to those of the typical variety (fig. 7).

UNITED STATES: FLORIDA: Escambia County: Pensacola, *Curtiss*, in 1885 (NY).

BRITISH HONDURAS: STANN CREEK: All Pines, *Schipp* 628 (Ch, GH, Mo, NY, UC). BELIZE: Manatee Lagoon, *Peck* 285 (GH). TOLEDO: Monkey River, *Gentle* 4188 (GH, Mo, NY).

PANAMÁ: *Seeman* 216 (GH, NY). COCLÉ: Aguadulce, *Pittier* 4863 (GH, NY, US). Penomoné, *R. S. Williams* 102 (NY, US).

BRITISH GUIANA: "Sand ck., Rupununi River," *For. Dept. British Guiana* WB-22 (NY), WB-114 (NY).

VENEZUELA: *Stevens*, in 1868 (NY). TRUJILLO: Valera, *Burkart* 16881 (US). ZULIA: Mene Grande, *Pittier* 10571 (GH, NY, US, Ven). Perijá, *Tejera* 152 (US). BOLÍVAR: Morichal Santa Isabel, *Cardona* 650 (US, Ven). Ciudad Bolívar, *Bailey & Bailey* 1347 (US).

COLOMBIA: MAGDALENA: La Jagua, *Haught* 2271 (US). VICHADA: Puerto Carreño, *Cuatrecasas* 4044 (Ch, US).

BRAZIL: *Sellow* (Ch, fragment, presumably of TYPE of *Ae. incana*, ex B). RIO BRANCO: Frechal, south of Mount Roraima, *Tate* 30 (NY). Surumú, *Ule* 8154 (US). Igarapé Amim, *Luetzelburg* 20565 (R). São Marcos, *Luetzelburg* 21948 (R). Bôa Vista, *Black* 51-12602 (US), 51-13726 (US). PIAUI: Oeiras, *Gardner* 2095 (GH, NY). São Pedro de Alacantara, *Jobert & Schwacke* 1175 (R). CEARÁ: *Allemão* 354 in part (R). ALAGÔAS: Rio San Francisco, *Gardner* 1271 (GH, NY). BAHIA: Muritiba, *Blanchet*, in 1841 (NY). GOYAZ: Between Conceição and Natividade, *Burchell* 8169 (GH).

URUGUAY: SAN JOSÉ: Santa Lucía, *Osten* 22169 (GH).

PARAGUAY: Concepción: Estrella, *Fiebrig* 5220 (GH). Caraguatay: "Corros de Tobatí," *Fiebrig* 678 (Ch, GH).

ARGENTINA: CÓRDOBA: *Hieronymus*, Jan. 4, 1877 (NY, US). La Reducción, *Burkart* 7348 (Ch), 7357 (GH). Alta Gracia, *Hunziker* 708 (US). CORRIENTES: Estancia Santa Teresa, *Pedersen* 106 (US). "America merid.," (F. M. neg. 6960, of TYPE of *Ae. puberula* ex G).

Although the extremes are readily recognized, there is considerable intergradation which often makes it difficult to delimit var. *incana* from the other varieties, particularly var. *histris*. Because of that, it is believed more satisfactory to follow Bentham's reduction of *Ae. incana* to a variety of *Ae. histris* than to maintain it as a separate species.

It is interesting to note that elongation of the peduncle, forming an inflorescence longer than the subtending leaf, while unusual, is seen most frequently in specimens of var. *incana*. And the one specimen exhibiting 3-articulate fruits is Curtiss' collection of var. *incana* from Florida.

A photograph of the type of *Ae. puberula* shows that species to be essentially the same as *Ae. histris*, apparently corresponding to var. *incana*.

23c. *Aeschynomene histris* var. *densiflora* (Benth.) Rudd, comb. nov.

Aeschynomene densiflora Benth. in Hook. Journ. Bot. 2: 56. 1840.

The plants of var. *densiflora* are usually suffrutescent, suberect, and moderately pubescent. The stipules are 5-10(-15) mm. long, 2-3 mm. wide. The leaves are about 20-30-foliolate, the leaflets

oblong, 7–12 mm. long, 2–4 mm. wide. The flowers are 5–6 mm. long; the articles of the fruits range from glabrous to pubescent.

TYPE LOCALITY: British Guiana, in savanna. Type collected by Schomburgk (No. 846), cited below.

DISTRIBUTION: México to South America, in habitats similar to those of the typical variety (fig. 7).

MÉXICO: MÉXICO: Chorrera, *Hinton* 4582 (US).

COSTA RICA: PUNTARENAS: Boruca, *Tonduz* 4557 in part (US).

BRITISH GUIANA: *Schomburgk* 846 (US ISOTYPE).

BOLIVIA: SANTA CRUZ: Buena Vista, *Steinbach* 5402 (Ch, NY). *Velasco, Kuntze*, July 1892 (NY, US).

BRAZIL: RIO BRANCO: São Marcos, *Ule* 7785 (UC); *Black* 51–13250 (US). Bôa Vista, *Black* 51–12999 (US). AMAZONAS: Parintins, *Traill* 135 (GH).

GUAPORÉ: Falls of Madeira, *Rusby* 1038 (Ch, NY, US). PARÁ: Santarém, *Spruce*, Nov.–Mar., 1849–50 (GH, NY). Faro, *Ducke*, Feb. 19, 1910 (US).

Cameta, *Ducke* (R). CEARÁ: Crato, *Löfgren* 658 (R). PERNAMBUCO: Tapera, *Pickel* 1035 in part (GH, US), 3695 in part (GH, NY). BAHIA: *Salzmann* (R).

MINAS GERAIS: Campina Verde, *Macedo* 1717 (Mo). Serra do Inficionado, *Glaziou* 12575 (R). GOYAZ: Pôrto Real, *Burchell* 8754 (GH, NY). MATO GROSSO: Cuyabá, *Hoehne (Comissão Rondon)* 4806 (R), 4883 (R), 4884 (R).

PARAGUAY: AMAMBAY?: Sierra de Amambay, *Hassler* 10955 (GH).

This taxon was first given specific status by Bentham and then reduced by him, in "Flora Brasiliensis" (15 (1):69. 1859), to synonymy under *Ae. histrix*. However, since it is readily distinguished from typical *Ae. histrix* by its more robust habit and larger leaves and stipules, it is believed that it should have varietal recognition. But, since its flowers and fruits are essentially the same as those of *Ae. histrix* var. *histrix* and there appears to be some intergradation with the other varieties, specific rank is not warranted.

29. *Aeschynomene elegans* Schl. & Cham. *Linnaea* 5: 583. 1830.

Aeschynomene tecta Vog. *Linnaea* 12: 87. 1838.

Aeschynomene gracilis Vog. *Linnaea* 12: 89. 1838, non *Ae. gracilis* Miq. 1844.

Aeschynomene falcata Vog. var. *plurijuga* Benth. in *Mart. Fl. Bras.* 15 (1): 68. 1859.

Aeschynomene falcata Vog. var. *elegans* (Schl. & Cham.) O. Ktze. *Rev. Gen.* 1: 158. 1891.

Aeschynomene falcata Vog. var. *elegans* (Schl. & Cham.) O. Ktze. forma *glabrior* O. Ktze. *Rev. Gen.* 1: 158. 1891.

Aeschynomene arenicola Brandeg. *Univ. Calif. Publ. Bot.* 10: 408. 1924.

Stems decumbent, to about 1 m. long, pubescent and also glandular-hispidulous; stipules 4–7 mm. long, about 1 mm. wide at base, lanceolate, acuminate, ciliate, subglabrous to sparsely hispidulous; leaves (7–)10–16-foliolate; leaflets obovate to subelliptic, about 8–15 mm. long, 4–9 mm. wide, obtuse, mucronate, entire, the upper surface sparsely pubescent to glabrous, the lower moderately pubescent; inflorescences commonly 2–7-flowered, longer than the subtending leaves, the pedicels and peduncles with indument like the stem, the

bracts and bracteoles 0.5–1.5 mm. long, 0.5–1 mm. wide, ovate, acute, ciliate, flowers about 7 mm. long; calyx 2–3 mm. long, subglabrous, ciliolate; standard about 7 mm. long, the claw 1 mm. long, the blade elliptical-orbiculate, about 6 mm. long, 4–6 mm. wide, entire, pubescent on the outer face; wings about 6 mm. long, the claw 1 mm. long, the blade about 5 mm. long and 2 mm. wide; keel about as long as the standard, the blades 1.5–2 mm. wide; stamens about 6 mm. long; fruit submoniliform, curved or straight, 5–9- (commonly 6–8-) articulate, the stipe (8–)10–15 mm. long, glabrous or somewhat hispidulous, the articles obliquely suborbiculate, 2–2.5 mm. in diameter, crisp-pubescent, often slightly glabrate, the margins often separating from the body of the article; seeds about 1.8–2 mm. long, 1–1.5 mm. wide, dark brown.

TYPE LOCALITY: Hacienda de la Laguna, Jalapa, Vera Cruz, México. Type collected by Schiede and Deppe, cited below.

DISTRIBUTION: Widespread in tropical America, in pine-oak woods, on rocky slopes, in moist grasslands and fields, at elevations up to about 7,600 m. (fig. 7).

MÉXICO: *Müller*, in 1853 (NY). VERA CRUZ: Hacienda de la Laguna, Jalapa, *Schiede & Deppe* (F. M. neg. 27926, of ISOTYPE ex G); *Rose & Hough* 4300 (GH, NY, US). "Zacuapan, Fortin," *Purpus* 1899 (Ch, GH, Mo, NY, UC, US). Zacuapán, *Purpus*, Sept. 1908 (UC), 10819 (Mo, NY, US). CHIAPAS: Hacienda Monserrate, *Purpus* 9148 (GH, Mo, NY, UC TYPE of *Ae. arenicola*, US). Between San Gerónimo and El Retiro, *Hernández* X-614 (GH).

GUATEMALA: HUEHUETENANGO: Cerro Victoria, *Steyermark* 49584 (Ch). ALTA VERAPAZ: Cobán, *von Türckheim* II 2038 (Ch, GH, NY, US); *Standley* 71462 (Ch). IZABAL: Quiriguá, *Standley* 23930 (GH, US), 72361 (Ch). Los Amates, *Kellerman* 7555 (NY). JALAPA: Jalapa, *Standley* 76532 (Ch), 77478 (Ch). GUATEMALA: Guatemala, *Tonduz* 840 (US). SACATEPÉQUEZ: Antigua, *Standley* 58610 (Ch), 61690 (Ch, US). SUCHITEPÉQUEZ: Finca Mocá, *Skutch* 1465 (Ch, GH). ESCUINTLA: Along Río Guacalate, *Standley* 58226 (Ch). JUTIAPA: Jutiapa, *Standley* 74853 (Ch), 75395 (Ch), 75579 (Ch).

HONDURAS: Morazán: Río Yeguaré, *J. Valerio* 831 (Ch). El Zamorano, *Standley* 313 (Ch), 316 (Ch), 3898 (Ch), 12259 (Ch); *J. Valerio* 3088 (Ch); *Swallen* 10816 (US), 10994 (US). Las Mesas, *Swallen* 10790 (US), 11415 (US). Mt. Uyuca, *Swallen* 11182 (US). San Antonio del Oriente, *Swallen* 10964 (US), 10974 (US). Suyapa, *Swallen* 11283 (US). Joya Grande, *Standley & Molina* 4530 (Ch). EL PARAÍSO: Güinope, *J. Valerio* 1729 (Ch). Cumbre, *Standley, Williams, Molina, & Padilla* 2094 (Ch).

EL SALVADOR: Finca San Nicolás, *Calderón* 1767 (GH, US).

COSTA RICA: PUNTARENAS: Boruca, *Tonduz* 4557 in part (US). SAN JOSÉ: San José, *M. Valerio* 1143 (Ch). CARTAGO: Cerro de la Carpintera, *Standley* 35480 (US). NAVARRITO, *Torres* 207 (US). Cóncevas, *Lankester* 312 (Ch). Alajuela: "Camino entre la carretera Alajuela-Grecia y el Tajo del Río Rosales," *Brenes* 17476 (Ch.) "Carretera Alajuela-Grecia entre los ríos Pilas y Tacares," *Brenes* (28) 17308 (Ch.) "Colinas de San Pedro de San Ramón," *Brenes* (618) 4833 (Ch), 6450 (Ch). San Ramón, *Brenes* (183) 5027 (Ch).

PANAMA: CHIRIQUÍ: El Boquete, *Terry* 1263 (Ch, GH, US); *Maurice* 726 (US).

DOMINICAN REPUBLIC: SANTA DOMINGO: Ciudad Trujillo, *Allard* 14254 (US).

VENEZUELA: MIRANDA: Los Teques, *Pittier* 11599 (US, Ven). Turmerito, *Burkart* 16196 (US). DISTRITO FEDERAL: Caracas, *Pittier* 7292 (US, Ven), 9762 (GH, NY, US); *Cornelio* 39 (Ven), 605 (Ch); *Kuntze*, in 1874 (NY TYPE of *Ae. falcata* var. *elegans* forma *glabrior*). ARAGUA: Colonia Tovar, *Fendler* 287 (GH, Mo). El Parque Nacional Rancho Grande, *J. García* 167 (Ven). MÉRIDA: Tabay, *Gehriger* 518 (Ch, NY, US, Ven). Bailadores, *Tamayo* 2422 (Ven).

COLOMBIA: MAGDALENA: Minca, *H. H. Smith* 708 in part (NY). NORTE DE SANTANDER: Between Chinácota and La Esmeralda, *Killip & Smith* 20912 (GH, NY, US). CUNDINAMARCA: Between Santandercito and El Colegio, *García-Barriga* 138 (US). Quetame, *Pennell* 1734 (GH, Mo, NY, US). Icononzo, *Pennell* 2785 (US). META: Villavicencio, *Apollinar-María*, Dec. 1928 (US). TOLIMA: Líbano, *Pennell* 3337 (GH, Mo, NY, US). ANTIOQUIA: Cocorná, *Daniel* 1187 (US). San Antonio, *Daniel* 528 (US). Medellín, *Archer* 758 (US); *Toro* 369 (NY), 1327 (NY). Río Negro, *Archer* 279 (US). EL VALLE: Timba, *von Sneidern* 1166 (NY, US). Buga, *Galvis*, Sept. 1939 (US). Cali, *Bermúdez & Barkley* 17.C.877 (Ch, US). Palmira, *Pennell & Killip* 6012 (GH, NY, US). Lomitas, *Pennell* 5464 (GH, NY, US). Jamundí, *Bermúdez* 23 in part (US).

PERÚ: *Mathews* 3272 (GH).

BOLIVIA: LA PAZ: Yanacachi, *Buchtein* 211 (US). Guanai, *Rusby* 1035 (GH, NY, US). Coripati, *Bang* 2082 in part (NY, R, US). Coroico, *Buchtein* 6122 (US). Apolo, *R. S. Williams* 186 in part (NY, US). Millihuaya, *Buchtein* 4107 (Ch, GH, Mo, NY).

BRAZIL: *Warming* (US). *Gardner* 3682 (GH). *Sellow* (N. Y. neg. n. s. 2291, presumably of ISOTYPE of *Ae. gracilis* Vog., ex K). RIO DE JANEIRO: *Riedel* 125 (US); *Gardner* 25 (NY); *Burchell* 1773 (GH). Tijuca, *Ule*, Sept. 1899 (R). Copacabana, *Jobert & Schwacke*, in 1887 (R). Campo Belo, *Sampaio* 4654 (R). São Christavão, *Glaziou* 6503 (R). MINAS GERAIS: *Claussen* 757 (US). Belo Horizonte, *Mello Barreto* 5777 (R), 5778 (Ch) 6576 (Ch, US), 10360 (R). Caete, *Mello Barreto* 5778 (Ch). Uberaba, *Regnell* II 88 (US). Caldas, *Regnell* II 88 (Ch, R). Turvo, *Hoehne & Gehrt* 17491 (GH). Conceição, *Sampaio* 6800 (R). Sitio, *Sampaio* 142 (R). Jaboticatubas, *L. B. Smith* 6775 (US). GOYAZ: *Gardner* 3682 (GH, NY). PERNAMBUCO: Tapera, *Pickel* 3049 (Ch, GH, US). SÃO PAULO: Campinas, *Krug & Zagatto* 2260 (US). Butantan, *Hoehne* 86 (NY). "Taubaté et Mugo," *Riedel* 1559 (GH, US). BAHIA: Bahia, *Blanchet*, in 1831 (GH, NY); *Salzmann* (GH, Mo, R). SANTA CATARINA: Between Capetinga and Chapeco, *Reitz* 4314 (US). RIO GRANDE DO SUL: Bom Jesus, *Rambo* 35024 in part (Mo).

BRAZIL?; URUGUAY?; ARGENTINA?: "Banda Oriental," *Tweedie*, in 1837 (K).

LOCAL NAMES: Pega-pega (Costa Rica, Colombia); dormidera (Panamá); adormidera (Colombia).

As indicated in the key, the rather slender, moniliform, small-jointed, long-stipitate fruits and the leaves, which are commonly 10–16-foliolate, serve to distinguish *Ae. elegans* from other species in the series.

Aeschynomene tecta is believed to be synonymous with *Ae. elegans*, on the basis of the original description, especially the stipe measurement of 7 lines, and the leaves with 7–10 pairs of leaflets.

Examination of the type specimen of *Ae. arenicola* clearly shows that species also to be the same as *Ae. elegans*.

The specimen annotated by Kuntze as *Ae. falcata* var. *elegans* forma *glabrior* is essentially identical with the collections of *Ae. elegans* cited in this paper. The designation of forma *glabrior* was in contrast to an unpublished form with short-stipitate, hispid fruits that is cited as *Ae. brasiliiana* var. *venezolana* in this paper.

Aeschynomene gracilis Vog. is here placed in synonymy with *Ae. elegans* on the basis of a photographic negative of a specimen, presumably an isotype, rather than with *Ae. falcata* as was done by Bentham. Although in the original description the stated width and length of articles is two lines, which is nearer *Ae. falcata* than *Ae. elegans*, the number of leaflets is given as 4–6 pairs, a characteristic number for *Ae. elegans*. Only rarely can one find an 8-foliolate leaf on a specimen of *Ae. falcata*, and apparently never a greater number. It would seem that an error in measuring fruits as small as these would be more likely than a miscount of the number of leaflets.

30. *Aeschynomene falcata* (Poir.) DC. Prodr. 2: 322. 1825.

Hedysarum falcatum Poir. in Lam. Encycl. Meth. Bot. 6: 448. 1804.

Hedysarum diffusum Vell. Fl. Flum. 320. 1825; 7, tab. 155. 1835.

Aeschynomene falcata (Poir.) DC. var. *paucijuga* Benth. in Mart. Fl. Bras. 15 (1): 67. 1859.

Aeschynomene apoloana Rusby, Bull. N. Y. Bot. Gard. 6: 511. 1910.

Stems decumbent, to about 6 dm. long, pubescent and sometimes also hispidulous; stipules lanceolate, acuminate, 5–8 mm. long, 1–1.5 mm. wide at base, subglabrous to hispidulous, ciliolate; leaves 5–7 (–8) -foliolate, the petiole and rachis pubescent like the stem; leaflets obovate-elliptic, about 6–10 mm. long, 3–4 mm. wide, obtuse, mucronate, pubescent on both surfaces, the base often oblique, entire; inflorescences usually with only 1 or 2 flowers developing, longer than the subtending leaves, the peduncles and pedicels hispidulous, the bracts and bracteoles subovate, acuminate, 1–2 mm. long, about 1 mm. wide, pubescent, ciliolate; flowers 7–9 mm. long; calyx 3–4 mm. long, pubescent, ciliate; standard 7–9 mm. long, the claw about 1 mm. long, the blade orbiculate, 6–7 mm. in diameter, entire, the outer face puberulent; wings about 7 mm. long, the claw 1 mm. long, the blade about 6 mm. long, 1.5–2 mm. wide at maximum; keel 7–8 mm. long, the claws 1 mm. long, the blades 6–7 mm. long, about 2 mm. wide; stamens about 8 mm. long; legume usually falcate, 6–8-articulate, the stipe 6–14, commonly 8–10, mm. long, with spreading, glandular hairs, 1.5–2 mm. long, the articles 3–4 mm. long, 2.5–3.5 mm. wide, puberulent with crispate or appressed hairs, sometimes also sparsely hispidulous, the body of the articles tending to break away from the margins; seeds about 2 mm. long and 1.5 mm. wide, dark brown.

TYPE LOCALITY: Rio de Janeiro, Brazil. Type collected by Commerson, cited below.

DISTRIBUTION: Northwestern and east-central South America, on rocky hillsides, in savannas, and in fields, at elevations to about 1,800 m. (fig. 7).

COLOMBIA: Santander: Bucaramanga, *Killip & Smith* 16345 (GH, NY, US). CUNDINAMARCA: Icononzo, *Pennell* 2785 (Ch, GH, Mo, NY, US). Nilo, *Pérez* 514 (US). META: San Martín, *Hermann* 11206 (US). TOLIMA: Honda, *Pennell* 3570 (GH, Mo, NY, US), 3595a (US). Mariquita, *Pennell* 3653 A (NY). Chicoral, *Haught* 6274 (US). Gualandry, *Pérez & Cuatrecasas* 6494 (US). Quebrada de los Ángeles, *Rusby & Pennell* 295 (NY). Natagaima, *Rusby & Pennell* 1146 (NY). HUILA: Neiva, *Rusby & Pennell* 1085 (NY). ANTIOQUIA: Bello, *Archer* 336 (NY, US). Medellín, *Daniel* 499 (US). EL VALLE: Cartago, *Cuatrecasas* 22960 (US). Cali, *Bermúdez*, Feb. 1941 (US); *Soto-Herrera* 933 (US); *Killip & Lehmann* 39794 (US). Jamundí, *Bermúdez* 23 in part (US).

BOLIVIA: *Bang* 2820 (NY). LA PAZ: Milluhuaya, *Buchtien* 4106 (GH, Mo, US). San José, *R. S. Williams* 389 (NY). Apolo, *R. S. Williams* 25 (NY TYPE of *Ae. apoloana*, US). SANTA CRUZ: Buena Vista, *Steinbach* 5283 (Ch, GH, NY), 6692 (Ch, GH, Mo). Yapacani, *Kuntze*, June 1892 (NY).

BRAZIL: MINAS GERAIS: Jaragua, *Macedo* 1724 (Mo). São Sebastião de Paraíso, *Teodoro* 3936 (GH). GOYAZ: *Gardner* 3682 (NY). RIO DE JANEIRO: *Commerson* (Ch, fragment, presumably from TYPE ex P; *Killip* neg. 425, TYPE ex P). *Vellozo* (illustration based on type of *Hedysarum diffusum*). SÃO PAULO: Mogy das Cruzes, *Schwacke*, Apr. 19, 1889 (R). PARANÁ: Serrinha, *Jönsson* 1090a (GH, Mo). Ponta Grosso, *Dusen* 2435 (R), 2546 (R). Pôrto Amazonas, *Gurgel*, Dec. 17, 1929 (R, US). Araucaria, *Santos*, Feb. 1914 (R). SANTA CATARINA: Curitybanos, *Müller* 92 (R). RIO GRANDE DO SUL: Pôrto Alegre, *Tweedie*, in 1837 (K). Viamão, *Rambo* 46876 (US). Rio Pardo, *Archer* 4412 (US). São Leopoldo, *Eugenio* 542 (NY), 1877 (GH); *Henz* 35534 (Mo).

PARAGUAY: "Central Paraguay," *Morong* 778 (US). CONCEPCIÓN: Estrella, *Fiebrig* 4330 (GH). CARAQUATAY: Cordillera de Altos, *Fiebrig* 653 (Ch, GH). Cerros de Tobatí, *Hassler* 6360 (GH, Mo). GUAIRÁ: Villarrica, *Jørgensen* 3595 (Mo, NY), 7595 (Ch, GH). CAAGUAZÚ: Igatimí, *Hassler* 4806 (GH). PARAGUARI: Caballero, *Morong* 400 in part (NY).

ARGENTINA: FORMOSA: Colonia Clorinda, *Venturi* 9144 (US). CHACO: Fontana, *A. G. Schultz* (US). MISIONES: Loreto, *Montes* 2487 (US); *Burkart* 15219 (US). Posadas, *Ekman* 1722 (Mo, NY); *Burkart* 14188 (US), 15236 (US).

As indicated in the key, *Ae. falcata*, which typifies the section *Ochopodium*, is characterized by leaves with a small number of obovate leaflets and by fruits with relatively long stipes and numerous articles.

There is some variability of stipe length and the puberulence of the fruit may be crispate, as is the type, or appressed, as seemingly is more common. Rarely, there is a sparse development of glandular hairs. These variations, however, do not seem to justify delimitation of the aberrant specimens.

Originally placed in the genus *Hedysarum* by Poiret, this species was subsequently transferred to *Aeschynomene* by DeCandolle. *Vellozo's H. diffusum*, as illustrated in his "Flora Fluminensis," is apparently the same as *Ae. falcata*.

Bentham proposed three varieties of *Ae. falcata*, one, var. *paucijuga*, corresponding to the typical variety and therefore synonymous with the species as here interpreted. His other two varieties are not retained as such in this paper. Incidentally, as pointed out by Burkart (1939), plate 14 in "Flora Brasiliensis" is erroneously labeled as *Ae. falcata*. Actually, it illustrates typical *Ae. brasiliana*.

Examination of the type material of *Ae. apoloana* does not reveal sufficient difference to warrant separation from *Ae. falcata*. Fruits of one plant, of the four observed, show some development of glandular hairs, but, as mentioned above, the aberrance does not seem to be significant in this case.

31. *Aeschynomene portoricensis* Urb. Symb. Antill. 1: 325. 1899.

Stems prostrate, to about 5 dm. long, moderately subappressed-pubescent and also sparsely beset with glandular hairs, glabrate toward base; stipules lanceolate, acute to acuminate, 2-4 mm. long, 1 mm. or less at base, subglabrous, ciliate; petiole and rachis pubescent like the stem; leaves 5-10-foliolate; leaflets predominantly obovate, 3-8 mm. long, 2-4 mm. wide, entire, the apex rounded, mucronate, the base asymmetrically rounded to subcordate, the upper surface appressed-pubescent to subglabrous, the lower appressed-pubescent, reticulate; inflorescences commonly 2-4-flowered, slightly longer than the subtending leaf; peduncles and pedicels with pubescence like the stems; bracts and bracteoles ovate, acute, subglabrous, 1 mm. long or less, about 0.5 mm. wide; flowers 5-6 mm. long; calyx 2-2.5 mm. long, subglabrous; standard 5-6 mm. long, the claw about 1 mm. long, the blade orbiculate, 4-5 mm. in diameter, entire; wings about as long as the standard, the blade about 1.5-2 mm. wide; keel petals arcuate, about 5 mm. long, the claws 1.5 mm. long, the blades about 3.5 mm. long and 1.5 mm. wide; stamens 5-6 mm. long; fruit 3-6- (commonly 4- or 5-) articulate, falcate, the stipe (4-) 5-8 mm. long, subglabrous or with a few glandular hairs, the articles about 3 mm. in diameter, crisp-pubescent; seeds about 2.5 mm. long and 1.5 mm. wide, dark brown.

TYPE LOCALITY: Maricao, Aguadilla, and Laguna Tortuguero, near Manatí, Arecibo, Puerto Rico. Syntypes collected by Sintenis (No. 4889 in flower, and No. 6657 in fruit), the latter cited below.

DISTRIBUTION: Puerto Rico, in open places (fig. 7).

PUERTO RICO: Martín Piño, *Stevenson & Johnston* 1310 (US). AGUADILLA: Sardinia, *Britton & Britton* 8698 (NY). ARECIBO: Laguna Tortuguero, *Sintenis* 6657 (Ch, GH, Mo, NY, US, SYNTYPE collections); *Britton & Britton* 7953 (NY). Dorado, *Britton, Britton, & Brown* 6645 (Ch, NY, US); *Britton & Britton* 8991 (NY). SAN JUAN: Santurce, *Britton & Cowell* 1467 (Ch, GH, NY, US); *Heller & Heller* 22 (Ch, NY, US); *Hess* 5703 (NY). Río Piedras, *J. R. Johnston* 520 (NY). MAYAGÜEZ: Mayagüez, *Britton & Hess* 2815 (Ch, NY, US). PONCE: Coamo, *Horne* 9119 (NY). GUAYAMA: Aibonito, *Britton, Britton, & Brown* 5875 (NY).

This apparently endemic species suggests both *Ae. falcata* and *Ae. elegans*, from which it differs in having smaller flowers and fruits with fewer but larger articles and a slightly shorter stipe. The leaflets are usually more numerous than those of *Ae. falcata*, but fewer than those of *Ae. elegans*.

At present, without seeing or knowing the status of the specimens studied by Urban, I hesitate to designate a lectotype. It would be my preference, if possible, to select as type the collection in fruit (*Sintenis* 6657) rather than the collection in flower (*Sintenis* 4889).

32. *Aeschynomene foliolosa* Rudd, sp. nov.

Herba suffruticosa, suberecta, *Ae. falcata* affinis sed imprimis foliis 20-foliolatis, foliolis oblongo-ellipticis differt.

Stems suffrutescent, suberect, to about 1 m. high, appressed-pubescent to glabrate; stipules lanceolate, acuminate, 4–12 mm. long, about 1.5 mm. wide, sparsely pubescent, ciliate; leaves about 20-foliolate; leaflets oblong-elliptic, 5–15 mm. long, 3–4 mm. wide, subacute to obtuse, mucronulate, entire, pubescent on both surfaces; inflorescences axillary and terminal, racemose and paniculate, commonly much longer than the subtending leaves; bracts and bracteoles ovate, acute, 1–3 mm. long, 0.5–1 mm. wide, sparsely pubescent; flowers 7–10 mm. long; calyx 3–5 mm. long, sparsely pubescent; standard 7–10 mm. long, the claw 1–1.5 mm. long, the blade suborbiculate, 6–7.5 mm. in diameter, the outer face pubescent; wings and keel about as long as the standard, the wing blade 2–3.5 mm. wide, the keel blades about 1.5–2 mm. wide; stamens about 7 mm. long; fruit moniliform, 4–6-articulate, the stipe 7–10 mm. long, finely pubescent to subglabrous, the articles 3–4 mm. long, about 3 mm. wide, moderately subappressed-pubescent; seeds about 2 mm. long and 1.5 mm. wide, brown.

TYPE: In the U. S. National Herbarium, No. 1797059, collected in savanna, San José del Guaviare, Vaupés, Colombia, altitude 270 m., Nov. 12, 1939, by J. Cuatrecasas (No. 7697), isotype at Ch.

DISTRIBUTION: Known only from the vicinity of the type in Colombia and from Guaporé, Brazil (fig. 7).

COLOMBIA: VAUPÉS: Mesa de la Lindosa, *Idrobo & Schultes* 664 (US).

BRAZIL: GUAPORÉ: Serra da Paca Nova, *Rondon (Comm. Rondon* 6801) 2009 (R).

This species apparently is the only one of the series that exhibits paniculate, terminal inflorescences. It suggests *Ae. paniculata* but is readily distinguished by its broader leaflets. In fruit and flower characters it is essentially the same as *Ae. falcata* but, whereas the latter has leaves with 5–8 obovate leaflets, *Ae. foliolosa* has 16–20-

foliolate leaves, with oblong-elliptical leaflets. *Ae. podocarpa*, while similar to *Ae. foliolosa* in leaf characters, differs in its fruits with shorter stipes and fewer articles.

33. *Aeschynomene podocarpa* Vog. *Linnaea* 12: 89. 1838.

Aeschynomene podocarpa β Vog. *Linnaea* 12: 89. 1838.

Aeschynomene falcata var. γ *multijuga* Benth. in *Mart. Fl. Bras.* 15 (1): 68. 1859.

Stems suffrutescent, prostrate to suberect, to about 5 dm. high, hispid; stipules about 6–7 mm. long, 1–2 mm. wide at base, lanceolate, acuminate, ciliate, hispidulous; leaves (10–) 20–32-foliolate; leaflets elliptic, about 3–10 mm. long, 1.5–5 mm. wide subacute, entire, sometimes closely ciliate, sparsely pubescent on both surfaces; inflorescences usually 3–5-flowered, about as long as the subtending leaves, the pedicels and peduncles hispidulous; bracts ovate to subcordate, acute, 2–3 mm. long, 1–2 mm. wide; bracteoles 2.5–4 mm. long, about 1 mm. wide, ovate-elliptic, acute, hispidulous; flowers about 7 mm. long; calyx about 3 mm. long, hispidulous; standard about 7 mm. long, the claw 2 mm. long, the blade orbiculate, about 5 mm. in diameter; wings about as long as the standard, the blade spatulate, about 3 mm. wide; keel with claws about 1.5 mm. long, the blades about 5 mm. long and 1.5 mm. wide; stamens about 6 mm. long; fruit 3–5-articulate, the stipe 5–7 mm. long, hispidulous, the articles 3–4 mm. long, about 3 mm. wide, crisp-puberulent to glabrate; seeds 3–3.5 mm. long, about 2 mm. wide, black.

TYPE LOCALITY: "Brasil. merid." Type collected by Sellow, cited below.

DISTRIBUTION: Known only from southeastern Brazil (fig. 7).

BRAZIL: *Sellow* (Ch, fragment, presumably of TYPE ex B). MINAS GERAIS: Serra Itambé, *Sellow* (NY, probably ISOTYPE of var. β). Serra da Lapa, *Riedel* 943 (NY).

It has been difficult to place this species in the key because of the variable, yet scanty, material available.

On the basis of the *Sellow* material cited above, it appears that var. β differs from the typical variety in minor degree only, in details such as leaf size, habit of stem, and development of glandular hairs, and that maintenance of separate status is not justified.

Since Bentham based his *Ae. falcata* var. γ *multijuga* on *Ae. podocarpa* var. β Vog., that name also falls into synonymy under *Ae. podocarpa*, according to the present treatment.

34. *Aeschynomene warmingii* Micheli, *Vid. Medd. Nat. Foren. Kjøbenhavn* 68. 1875.

Stem prostrate or suberect, to about 5 dm. long, puberulent and also hispidulous; stipules lanceolate, acuminate, 5–7 mm. long, about 2 mm. wide at base, hispidulous; leaves 5–7-foliolate, and rachis and

petioles pubescent like the stem; leaflets elliptic-oblong, acute, 12–30 mm. long, 5–10 mm. wide, the upper and lower surfaces sparsely pubescent, the margins entire but closely ciliate; inflorescences few-flowered, about as long as the subtending leaf; peduncles and pedicles pubescent; bracts and bracteoles ovate, acute, about 2 mm. long, 1 mm. wide, sparsely hispidulous; flowers probably about 6–7 mm. long (mature flowers not seen); calyx about 3 mm. long; stamens about 6 mm. long; fruit 3- or 4-articulate, the stipe about 5–7 mm. long (or more?), the articles about 3 mm. in diameter, pubescent (fide Micheli); seeds not seen.

TYPE LOCALITY: Lagôa Santa, Minas Gerais, Brazil. Type collected by Warming, cited below.

DISTRIBUTION: Known only from the type collection.

BRAZIL: MINAS GERAIS: Lagôa Santa, *Warming* (F. M. neg 2155 of ISOTYPE ex B: Ch fragment of ISOTYPE ex B).

This species is inadequately known and it is difficult to place it in the key. From the one collection, it appears to be intermediate between the species having short-stipitate, few-articulate fruits and those with long-stipitate, multiarticulate fruits.

Series 7. *Pleuronerviae* Rudd, ser. nov.

Frutices vel herbae suffruticosae, erectae; stipulae non productae; foliola 1-costata, costa excentrici, saepe marginali; flores fructusque pro sectione *Ochopodio* plerumque inter mediocres.

Shrubs or suffrutescent perennials; stems erect, somewhat angled when young, terete when older; leaflets with excentric, often marginal, costae, the secondary venation usually prominent, reticulate, sometimes pinnate; inflorescences racemose, sometimes fasciculate, sometimes paniculate, axillary, and, in some species, also terminal; petals of some species drying to a chocolate brown color rather than the usual yellowish or purple

Aeschynomene pleuronervia DC. is designated as the type of this series.

35. *Aeschynomene oroboides* Benth. in Mart. Fl. Bras. 15 (1): 64. 1859.

Ctenodon weddellianum Baill. Adansonia 9: 237. 1870.

Suffrutescent perennial with numerous shoots arising from a thick woody base; stems 2–3 dm. high, cinereous-pubescent when young, sometimes glabrate toward base; stipules lanceolate-ovate, acuminate, 6–8 mm. long, about 3 mm. wide at base, pubescent; leaves 5–20-foliolate; leaflets falcate-ovate, about 10–20 mm. long, 5–7 mm. wide, acute, entire, the lower surface pubescent, the upper surface pubescent to subglabrous, the venation quasi-palmate with several secondary veins arising near the base of the leaflet, almost as prominent as the

excentric costa; inflorescences axillary, mostly longer than the subtending leaves, the floral axes pubescent like the stems, the bracts ovate, acute, about 2 mm. long and 1 mm. wide, pubescent; flowers 12–15 mm. long; calyx 5–6 mm. long, somewhat pubescent; petals drying to a chocolate brown color; standard about 12 mm. long, the claw 3 mm. long, the blade suborbiculate, about 9 mm. long and 10 mm. wide; wings and keel about 11 mm. long, the wing blades about 5 mm. wide, the keel blades about 2.5 mm wide; stamens 10 mm. long; fruit 3–6-articulate, the stipe 2–4 mm. long, the articles about 6 mm. long and 4 mm. wide, pubescent; mature seeds not seen.

TYPE LOCALITY: Southeastern Mato Grosso and southern Goyaz, Brazil. Type not designated in the original description.

DISTRIBUTION: Mato Grosso and Goyaz, Brazil (fig. 8).

BRAZIL: MATO GROSSO: *Moore* 194 (NY). Rio Pardo, *Riedel* 502 (Ch, fragment, presumably of SYNTYPE; F. M. neg. 2151 ex B). Corrego do Moreiras, *Kuhlmann* 353 (R), 354 (R). Braço, Rio Arinas, *Baldwin* 3023 (US), 3072 (US).

The fairly sizable, falcate-ovate leaflets give this species a distinctive appearance, and it is not readily confused with other species of *Aeschynomene*. However, the differences are not sufficient to justify Baillon's placing it in a separate genus. The characters he gives for his genus *Ctenodon* are essentially those of the section *Ochopodium* of *Aeschynomene*, his major distinction being that the fruits of *Ochopodium* are glabrous and those of *Ctenodon* are pubescent. Actually, pubescent fruits are more common than glabrous fruits in the *Ochopodium* section of *Aeschynomene*.

The Weddell collection (No. 2771), which typifies *Ctenodon weddellianum*, is probably the same as the Weddell collection that Bentham cites, without number, as *Ae. oroboides*. On the basis of the description, it is believed that *C. weddellianum* is synonymous with *Ae. oroboides*.

Bentham did not designate a type in the original description; and, until I have seen his material at Kew, I hesitate to select any one specimen as the type. The Riedel specimen (No. 502) cited above is presumably a part of the collection referred to by Bentham and thus is at least syntype material.

36. *Aeschynomene fascicularis* Schlecht. and Cham. *Linnaea* 5: 584. 1830.

? *Aeschynomene fruticosa* Sessé and Mociño, *Plantae Novae Hispania, in La Naturaleza*, II, 1 app.: 122. 1889, non Rose, 1899.

Aeschynomene oligantha Micheli, *Mem. Soc. Phys. Hist. Nat. Genève* 34: 256. 1903.

Aeschynomene sciaphila Pittier, *Bol. Tecn. Minist. Agric. y Cría, Serv. Bot. Caracas* 5: 41. 1944, without Latin diagnosis.

Shrub 1–2 m. tall; stem appressed-pubescent, rarely patent-pubescent, glabrate with age; stipules about 5–8 mm. long, 1 mm. wide at

base, linear, acuminate, strigillose or subglabrous; leaves about 40–50-foliolate; leaflets 10–20 mm. long, 2–5 mm. wide, oblong, entire, obtuse to subacute, the base rounded, the upper surface glabrous or nearly so, the lower surface pubescent with appressed hairs, especially along costa and margin, the costa excentric but not marginal; inflorescences axillary, racemose-fasciculate, shorter than the subtending leaves; peduncles and pedicels strigillose and also hispidulous; bracts ovate-acute to lanceolate-acuminate, 2–4 mm. long, about 1 mm. wide at base, appressed-pubescent; flowers 8–15 mm. long, calyx 4–5 mm. long, strigillose; petals drying to chocolate brown; standard 8–15 mm. long, commonly 10–12 mm. long, the claw 2 mm. long, the blade 8–10 mm. long, 6–7 mm. wide, elliptic, entire; wings and keel about as long as the standard, the wing blades about 3 mm. wide, the keel blades about 1 mm. wide; stamens 8–9 mm. long; fruit 3–5-articulate, the stipe 3–4 mm. long, the articles about 6–8 mm. long, 4–5 mm. wide, reticulate, lightly appressed-pubescent or, rarely, the pubescence somewhat crispate; seeds 3–5 mm. long, 1.5–2 mm. wide, light brown.

TYPE LOCALITY: "Inter la Laguna Verde et Actopan" [Vera Cruz?], México. Type collected by Martens.

DISTRIBUTION: Sonora, México, southward to Colombia and northern Venezuela, on shaded slopes, in brushland and thickets, at elevations up to about 2,250 m. (fig. 8).

MÉXICO: *Sessé & Mociño* 1940 (Ch), 1941 (Ch), 1942 (Ch). *Haenke* 1543 (NY). SONORA: Alamos, *Rose, Standley, & Russell* 12734 (GH, NY, US); *Gentry* 4821 (Mo, NY). Agiobampo, *Edw. Palmer* 808, in 1890 (GH, NY, US). CHIHUAHUA: *Batopilas, Edw. Palmer* 178 in 1885 (GH, US); *Goldman* 242 (GH, US). Guasaremos, Río Mayo, *Gentry* 1838 (Ch, Mo). Almaden, *Le Sueur* 1354 (Ch). SINALOA: Culiacán, *Brandegge*, Sept. 22, 1904 (GH, UC, US); *Ortega* 6588 (GH, US). Imala, *Edw. Palmer* 1668, in 1891 (GH, NY, UC, US); *Gentry* 4938 (Mo, NY). DURANGO: Tamazula, *Ortega* 4393 (US), 4422 (US). ZACATECAS: San Juan Capistrano, *Rose* 2482 (GH, US). JALISCO: Bolaños, *Rose* 2937 (GH, US). Guadalajara, *Pringle* 2996 (GH), 3832 (Ch, GH, Min, Mo, NY, UC, US), 11399 (Ch, GH, US); *Rose & Painter* 7394 (GH, NY, US). Barranca de Portillo, *Barnes & Land* 230 (Ch). VERA CRUZ: Rancho Remudadero, *Purpus* 14328 (Ch), 16269 (Ch), 16353 (Ch). GUERRERO: "Mata de Dios" *Langlassé* 431 (GH, US, ISOTYPES of *Ae. oligantha*). Campeche: Aposote, *Goldman* 496 (US). Tuxpeña, *Lundell* 1340 (Ch). YUCATÁN: Enán, *Gaumer* 23282 (Ch, GH, Mo, NY, US). San Anselmo, *Gaumer* 1808 (Ch, GH, Mo, NY), 1819 (Ch). Izamal, *Gaumer* 495 (Ch, Mo, NY, US), 511 (Ch); *Greenman* 477 (Ch), 480 (Ch, GH). "South Kancabconot," *Gaumer* 23614 (Ch, GH, US). Uxmal, *Schott* 864 (US). Tekax, *Gaumer* 1126 (Ch, GH, Mo). Mayapán, *Seler & Seler* 3873 (Ch, GH). Between Ticul and Tabí, *Seler & Seler* 3905 (Ch). Chichén-Itzá, *Lundell & Lundell* 7340 (Ch, US). Mérida, *Schott* 276 (Ch). Chichancanab, *Gaumer* 1529 (Ch). Peto, *Steere* 2275 (Ch).

GUATEMALA: PETÉN: La Libertad, *Lundell* 3413 (Ch, US). ZACAPA: Zacapa, *Standley* 74194 (Ch). Between Zacapa and Chiquimula, *Standley* 73773 (Ch). Río Hondo, *Standley* 74022 (Ch, Mo). Estanzuela, *Steyermark* 29071 (Ch).

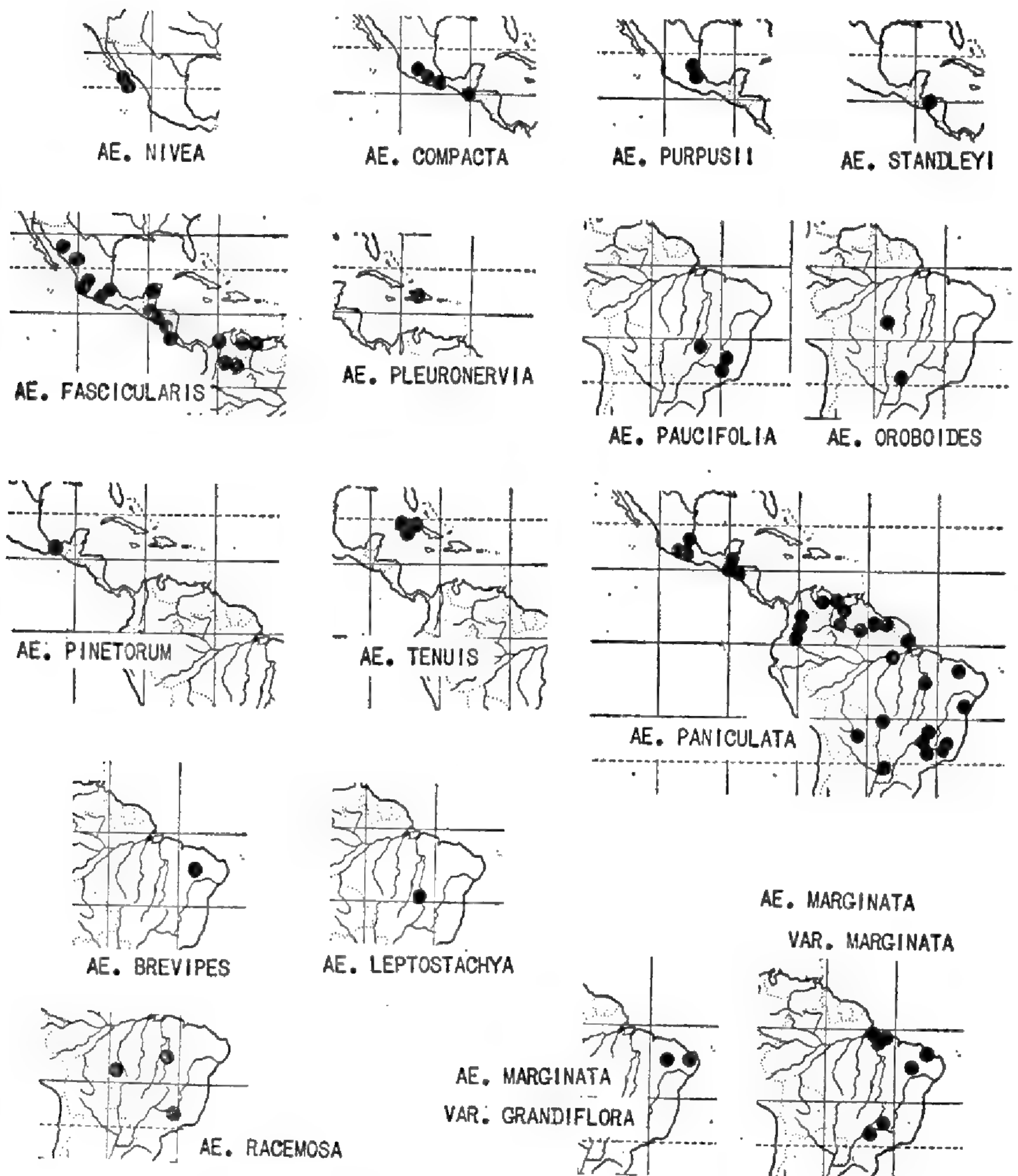


FIGURE 8. Distribution of the *Pleuronerviae*.

CHIQUIMULA: Between Chiquimula and Zacapa, *Standley* 74520 (Ch). El Rincón, *Standley* 74724 (Ch). JUTIAPA: Jutiapa, *Standley* 75195 (Ch), 75653 (Ch), 76136 (Ch). Ovejero, *Standley* 77614 (Ch).

HONDURAS: MORAZÁN: Between Jicarito and Quebrada de la Pita, *Molina* 1552 (Mo). Zamorano, *J. Valerio* 1411 (Ch). EL PARAÍSO: Río Choluteca, Yuscarán, *Swallen* 10872 (US); *Standley* 28946 (US).

EL SALVADOR: SANTA ANA: Metapán, *Standley & Padilla* 3145 (Ch), 3208a (Ch). SAN VICENTE: San Vicente, *Standley* 21689 (GH, Mo, NY, US). LA UNIÓN: La Unión, *Standley* 20666 (GH, NY, US).

NICARAGUA: MANAGUA: Sierra de Managua, *Garnier* 48 (Ch).

COSTA RICA: GUANACASTE: Nicoya, *Tonduz* 13560 (US).

VENEZUELA: TRUJILLO: Valera, *Pittier* 10734 (GH, NY, US). GUARICO: El Socorro, *Burkart* 17367 (US).

COLOMBIA: MAGDALENA: Bonda, *H. H. Smith* 270 (Ch, GH, NY, US). Codazzi, *Haught* 3823 (Ch, US). Cerrejón, *Haught* 6579 (US). ATLÁNTICO: Tubará, *Elias* 946 (US). Megua, *Elias* 1358 (Ch, US). Usiacurí, *Araque & Barkley* 19.At.074 (US). BOLÍVAR: Tierrabomba Island, *Killip & Smith* 14139 (Ch, GH, NY, US). Cartagena, *Heriberto* 225 (US); *Schott* (Ch). Turbaco, *Heriberto* 439 (US); *Killip & Smith* 14204 (GH, NY, US). Torrecilla, *Killip & Smith* 14274 (GH, NY, US). BOYACÁ: Boavita, *Cuatrecasas* 1940 (Ch). CUNDINAMARCA: Nilo, *Pérez* 571 (US). Tocaima, *Pérez* 2546 (US). HUILA: Villavieja, *Mason* 13982 (US).

LOCAL NAMES: Popotillo (México).

The numerous, oblong, excentric leaflets of this species are sufficiently distinctive to prevent confusion with others of the genus. I have not seen the type of *Ae. fascicularis*, but the original description, and the many specimens so identified previously, leave little doubt that the species is being correctly interpreted.

Sessé and Mociño published only one new species of *Aeschynomene*, *Ae. fruticosa*. By comparison of their specimens against the description, it is believed that their species is synonymous with *Ae. fascicularis*.

The two isotypes of *Ae. oligantha* that I have seen appear to be somewhat delicate specimens of *Ae. fascicularis*.

Pittier's No. 10734, although representing for the flora of Venezuela a new species which he named *Ae. sciaphila*, is identical with *Ae. fascicularis*.

37. *Aeschynomene racemosa* Vog. *Linnaea* 12: 92. 1838.

Stem erect, suffrutescent, about 5 dm. high, subglabrous or sparsely glandular hispidulous; stipules lanceolate, acuminate, 7–8 mm. long, about 2.5 mm. broad at base, subglabrous; leaves 5–10 cm. long, 20–40-foliolate, the petiole and rachis moderately pubescent, the petiole also sparsely hispidulous toward the base; leaflets oblong, obtuse, 8–14 mm. long, 3–4 mm. wide, crisp-pubescent on both surfaces, the costa slightly excentric, the inflorescences as much as 30 cm. long, many-flowered, terminal or axillary, the peduncles and pedicels hispidulous, the bracts caducous, ovate, subacute, about 1 mm. long and wide, subglabrous, ciliolate, the bracteoles essentially like the bracts but about 2 mm. long and 1 mm. wide; flowers about 7–10 mm. long; calyx 3.5–4 mm. long, subglabrous, ciliolate; standard 7–10 mm. long, the claw about 2.5 mm. long, the blade suborbiculate, 4.5–7.5 mm. in diameter; wings and keel about as long as the standard, the wings about 2 mm. wide, the keel about 1.5 mm. wide; stamens about 7 mm. long; fruit 3–6-articulate, the stipe about 3 mm. long, glabrous, the articles semi-orbiculate, about 5 mm. long and 3 mm. wide, crisp-pubescent, somewhat rugose; mature seeds not seen.

TYPE LOCALITY: Santo Antonio do Monte, Minas Gerais, Brazil. Type collected by Sellow.

DISTRIBUTION: South-central Brazil (fig. 8).

BRAZIL: GOYAS: Rio Tocantins, between Pôrto Real and São João de Araguaia, *Burchell* 8844 (GH). MATO GROSSO: Juruena, *Hoehne* 37 (*Comm. Rondon* 1871) (R).

The specimens cited above are so identified on the basis of the original description of *Ae. racemosa*. This species is readily distinguished from others of the series by its relatively large, membranous leaflets.

38. *Aeschynomene marginata* Benth. in Mart. Fl. Bras. 15 (1): 66. 1859.

Stem erect, suffrutescent, about 1 m. high, appressed-pubescent, glabrate; stipules lanceolate, acuminate, 5–6 mm. long, 1–1.5 mm. wide at base; subglabrous; leaves 3–5 cm. long, 20–50-foliolate; leaflets oblong to oblanceolate, obtuse, 5–15 mm. long, 1–3 mm. wide, the upper surface subglabrous, the lower surface sparsely appressed-pubescent, the costa but slightly excentric, the secondary veins essentially pinnate; inflorescences terminal or axillary, few-flowered, the floral axes subglabrous, with a few glandular hairs; bracts ovate-flabelliform, obtuse, about 1 mm. long, the bracteoles subacute, 1.5–2 mm. long; flowers 6–12 mm. long; calyx 3–5 mm. long; standard 6–12 mm. long, the claw 1.5–2 mm. long, the blade suborbiculate, retuse, about 5–10 mm. in diameter; wings and keel about as long as the standard, the wing blades about 2 mm. wide, the keel blades about 1.5 mm. wide; stamens 7–12 mm. long; fruit 3–5-articulate, the stipe glabrous, 1–5 mm. long, longest when the lower ovules abort, the articles semi-orbiculate, 5–6 mm. long, 3–4 mm. wide, torose, foveolate when fully mature, sparsely appressed-pubescent; seeds about 4 mm. long, 3–3.5 mm. wide, brown.

38a. *Aeschynomene marginata* var. *marginata*.

Aeschynomene marginata Benth. in Mart. Fl. Bras. 15 (1): 66. 1859.

The typical variety is characterized by flowers 6–7 mm. long, the calyx about 3 mm. long, the corolla 6–7 mm. long, and leaflets about 5–8 mm. long, 1–2 mm. wide.

TYPE LOCALITY: In sandy woods near Oeiras, Piauí, and in sandy hills near Aracaty, Ceará, Brazil. Syntypes collected by Gardner (Nos. 2098 and 1543, the former cited below).

DISTRIBUTION: Eastern Brazil, in sandy places.

BRAZIL: PIAUÍ: Oeiras, *Gardner* 2098 (SYNTYPE collection, GH, NY, F. M. neg. 2149 ex B). CEARÁ: *Allemão* 353 in part (R). MINAS GERAIS: "In campo siccis," *Riedel* 897 (NY, US). Uberaba, *Regnell* III. 416 (US). SÃO PAULO: Between Franca and Rio Grande (as "Rio Paraná"), *Riedel* 2393 (US). PARÁ: Ilha do Mosqueiro, *Killip & Smith* 30397 (GH, NY, US). Salinas, *Ducke* 1681 (NY, R, US). Soure, *Black* 48–3604 (IAN). Salvaterra, *Black* 48–3489 (IAN). Vigia, *Fróes* 27869 (US).

The thickened margin of the legumes that inspired the specific name is characteristic of immature fruits but not of the torose, mature fruits. The type material that I have seen, Gardner's No. 2098, includes only immature fruits. I have not seen Gardner's No. 1543 and so refrain, at this time, from designating a lectotype.

38b. *Aeschynomene marginata* var. *grandiflora* Benth. in Mart. Fl. Bras. 15(1):67. 1859.

This differs from the typical variety in that the flowers are larger, the calyx about 4–5 mm. long, the corolla 8–12 mm. long, and the leaflets about 5–15 mm. long, 2–3 mm. wide.

TYPE LOCALITY: A dry rocky place, near Oeiras, Piauí, Brazil. Type collected by Gardner (No. 2099), cited below.

DISTRIBUTION: Eastern Brazil, in rocky places.

BRAZIL: CEARÁ: *Allemão* 350 in part (R). RIO GRANDE DO NORTE: Rio Diamante, *Löfgren* 405 (R). PIAUÍ: Oeiras, *Gardner* 2099 (GH, NY, ISOTYPES).

This variety, as indicated above, seems to differ from the typical one chiefly in size of flowers and leaflets and in habitat, being found in rocky rather than sandy locations.

39. *Aeschynomene tenuis* Griseb. Cat. Pl. Cub. 72. 1866.

Perennial herb with one or more slender stems arising from a woody root; stems 1–5 dm. high, subglabrous with only occasional white, appressed hairs; stipules 1–2 mm. long, about 1 mm. wide, deltoid-subcordate, acute, entire, subglabrous; leaves 1–2 cm. long, 8–25-foliolate, relatively few in number, usually 2–4 to a stem, the internodes 4–10 cm. long; leaflets linear-oblong, 3–5 mm. long, 1.5–2 mm. wide, acute, the upper surface glabrous, the lower surface sparsely pubescent with appressed white hairs, reticulations prominent, the costa submarginal; inflorescences terminal, usually 3–5-flowered, the peduncles and pedicels hispidulous, the bracts and bracteoles stipule-like but slightly smaller, sometimes subovate, usually ciliate; flowers about 8 mm. long; calyx 2–3 mm. long, lightly pubescent; standard about 8 mm. long, the claw 2 mm. long, the blade reniform, about 6 mm. long and 8 mm. wide, emarginate; wings and keel about as long as the standard, the wing blades about 4 mm. wide, the keel blades about 2 mm. wide; stamens about 8 mm. long; fruit commonly 2–4-articulate, the stipe about 10 mm. long, glabrous, the articles suborbiculate, about 4 mm. in diameter, glabrous or sparsely pubescent with white, appressed hairs; seeds about 3 mm. long and 2 mm. wide, dark brown.

TYPE LOCALITY: "Vuedabajo," "Cuba Occ." Type collected by C. Wright (No. 2306), cited below.

DISTRIBUTION: Western half of Cuba, including Isla de Pinos, in sandy pinelands, palm barrens, and savannas (fig. 8).

CUBA: "Vuedabajo," "Cuba occ.," *C. Wright* 2306 (ISOTYPES, GH, Mo, NY, US.) PINAR DEL RÍO: Laguna Jovero, *Shafer* 10692 (Ch, Mo, NY, US). Guane, *Shafer* 10505 (NY). Herradura, *Earle* 641 (Ch, NY); *Britton, Britton, Earle, & Gager* 6451 (NY, US). Herradura to Paso Real, *Shafer* 11732 (NY). Pinar del Río, *Wm. Palmer & Riley* 48 (NY), 449 (US); *Shafer* 287 (NY); *Britton, Britton, & Gager* 7086 (NY). Between Pinar del Río and Coloma, *Britton, Britton, & Cowell* 10067 (NY). Los Palacios, *León & Roca* 7382 (NY). Río Guao, *Britton, Britton, & Cowell* 10118 (NY). LA HABANA: Isla de Pinos, *Curtiss* 241 (Ch, GH, Mo, NY, Min, US); *Taylor* 121 (Ch, GH, NY, US); *Britton, Britton, & Wilson* 14347 (GH, Mo, NY, US); *Britton, Wilson, & Selby* 14347 (Ch); *Jennings* 19 (GH, NY, US), 248 (GH, US); *Wm. Palmer & Riley* 1111 (NY, US); *Killip* 41300 (US), 41615 (US), 42552 (US), 42686 (US), 42763 (US), 42946 (US); *Alain & Killip* 2139 (US). LAS VILAS: Manacas, *Howard* 5535 (GH, NY); *León & Cazanás* 5817 (NY).

This species, apparently endemic to western Cuba, is readily recognized by its slender stems, bearing terminal inflorescences and a few widely spaced leaves. The subcordate stipules and the leaflets with excentric costae are also rather distinctive.

40. *Aeschynomene paniculata* Willd. ex Vog. *Linnaea* 12: 95. 1838.

Aeschynomene laevis Mart. & Gal. *Acad. Brux.* 10 (2): 180. 1843.

Aeschynomene hedysaroides Mart. & Gal. *Acad. Brux.* 10 (2): 181. 1843.

Aeschynomene gracilis Miq. *Linnaea* 18: 566. 1844, non *Ae. gracilis* Vog. 1838.

Stem erect, suffrutescent, to about 2.5 m. tall, glabrous or sparsely pubescent with white, subappressed hairs; stipules lanceolate, acuminate, 3–6 (–10) mm. long, 1–2 mm. wide at base, glabrous; leaves as much as 8 cm. long, 50–60-foliolate, the petiole and rachis strigillose and also sparingly beset with glandular hairs; leaflets oblong, obtuse, 2–5 mm. long, 1–1.5 mm. wide, the upper surface glabrous, the lower surface strigillose, the costa slightly excentric, the secondary venation essentially pinnate; inflorescences terminal, sometimes also axillary, many-flowered, the peduncles and pedicels subglabrous, sometimes glandular, the bracts and bracteoles deltoid-ovate, 1–2 mm. long, about 1 mm. wide; flowers 6–6.5 mm. long; calyx 2–3 mm. long; standard commonly 6.5 mm. long, the claw 1.5 mm. long, the blade orbiculate-cordate, about 5 mm. in diameter, retuse; wings and keel about as long as the standard, the wing blades 2 mm. wide, the keel blades 1.5 mm. wide; stamens about 6 mm. long; fruit moniliform, 4–6 articulate, the stipe 4–5 mm. long, glabrous, a suture at the base of the first of the article, the articles suborbiculate 2.5–3.5 in diameter, sparsely pubescent, often glabrate; seeds about 2.5 mm. long and 1.5 mm. wide, smooth, dark brown.

TYPE LOCALITY: "In Brasil. merid. ad Bahia." Type collected by Sellow, cited below.

DISTRIBUTION: On rocky, brushy slopes, in meadows, open woods and savannas, at elevations up to about 1,500 m., in southern México, Central America, northern and eastern South America (fig. 8).

MÉXICO: VERA CRUZ: Zacuapán, *Purpus* 1898 (Ch, GH, Mo, NY, UC, US), 10854 (US), 10875 (US), 13004 (Ch), Nov. 1907 (UC), Apr. 1933 (Ch). MÉXICO: Pantoja, Temascaltepeque, *Hinton* 5044 (Ch, GH, NY, US). GUERRERO: Vallecitos, Montes de Oca, *Hinton* 11396 (GH, NY, US). Acapulco, *Palmer* 283 in 1894-95 (US). OAXACA: "Cordillera," *Galeotti* 3184 (F. M. neg. 27928, presumably of the TYPE of *Ae. hedysaroides*, ex G).

GUATEMALA: IZABAL: Quiriguá, *Standley* 72263 (Ch). ZACAPA: Santa Rosalía, *Steyermark* 29007 (Ch). CHIQUIMULA: Quezaltepeque, *Steyermark* 31268 (Ch). Concepción de las Minas, *Steyermark* 30864 (Ch). Chiquimula, *Steyermark* 30190 (Ch). JUTIAPA: Jutiapa, *Standley* 74931 (Ch), 75330 (Ch), 75611 (Ch), 76172 (Ch), 76333 (Ch).

BRITISH HONDURAS: TOLEDO: Monkey River, *Gentle* 3884 (Mo, NY). EL CAYO: Mountain Pine Ridge, *Lundell* 6886 (GH, NY, US); *Bartlett* 11784 (Ch). Yaccos Lagoon, *Peck* 684 (GH). BELIZE: "Maskall Pine Ridge," *Gentle* 975 (Mo, NY). Manatee Lagoon, *Peck* 363 (GH). STANN CREEK: All Pines, *Schipp* 660 (Ch, GH, Mo, NY, UC).

EL SALVADOR: SANTA ANA: Santa Ana, *Standley* 20426 (US). San Sebastián, *Calderón* 1211 (GH, US). Chalchuapa, *Calderón* 1043 (NY, US).

HONDURAS: MORAZÁN: El Zamorano, *Standley* 854 (Ch); *Williams & Molina* 10568 (Ch, Mo); *Swallen* 10997 (US), 11374 (US). Camino San Antonio, *J. Valerio* 1391 (Ch). SANTA BÁRBARA: San Pedro Sula, *Thieme* 5217 (GH, US). EL PARAÍSO: Quebrado del Muro, *Swallen* 11337 (US).

SURINAM: *Hostmann* 820a (Mo). Berlijn, *Focke* 966 (GH, ISOTYPE of *Ae. gracilis* Miq.). Corantijn River, *Pulle* 500 (US). Paramaribo, *L. B. Smith* 7125 (US).

BRITISH GUIANA: Isherton, Rupununi River, *A. C. Smith* 2459 (Ch, Mo, NY, US). Sand Creek, Rupununi River, *Forestry Dept. Brit. Guiana* WB 19 (NY). Ituni-Waruni savannas, Berbice or Demerara, *Abraham* 88 (NY). Berbice, *Schomburgk* 181 (GH, US).

VENEZUELA: *Stevens*, in 1868 (NY). ANZOÁTEGUI: Río Cañi, *Garroni* 69 (US, Ven). ARAGUA: Colonia Tovar, *Fendler* 1791 (GH, Mo, NY). TRUJILLO: La Cuchilla, *Burkart* 16885 (US). BOLÍVAR: Between Río Pao and El Cristo, *Killip* 37245 (US). El Cristo, *Cardona* 1004 (US, Ven). Between Ciudad Bolívar and Río Caroní, *Steyermark* 57611 (Ch, Ven).

COLOMBIA: *Mutis* 4925 (US). SANTANDER: Bucaramanga, *Killip & Smith* 16337 (GH, NY, US); *Araque & Barkley* 270 (US). CUNDINAMARCA: Melgar, *Pennell* 2908 (NY). TOLIMA: El Convenio, *Pennell* 3511 (GH, NY, US). HUILA: Neiva, *Rusby & Pennell* 1089 (NY, US).

BOLIVIA: SANTA CRUZ: Buena Vista, *Steinbach* 5280 (Ch, Mo, NY), 6960 (Ch, GH, Mo, UC).

BRAZIL: *Sieber?* (*Hoffmansegg*) (F. M. neg. 2242 ex B). RIO BRANCO: São Marcos, *Ule* 7784 (K, US); *Luetzelburg* 21945 (R). Surumú, *Ule* 8157 (UC, US). Igarapé Pitomba, *Luetzelburg* 21371 (R). Bôa Vista, *Black* 51-12497 (US), 51-12622 (US). AMAZONAS? Camarão, *Luetzelburg* 21128 (US). AMAPÁ: Amapá, *Baldwin* 4081 (US). PARÁ: Santarém, *Spruce*, in 1849-50 (GH, NY); *Black & Ledoux* 50-10259 (IAN). Velha Pobre, *Ducke*, June 6, 1919 (US). MARANHÃO:

Carolina, *Pires & Black* 1989 (IAN). CEARÁ: *Allemão* 353 in part (R). BAHIA: *Sellow* (Ch, fragment, presumably of TYPE, ex B). *Salzmann* (Mo, R). Cuyabá, *Riedel* 832 (US). MINAS GERAIS: Corinto, *Mexia* 5676 (GH, Mo, NY, UC, US). Belo Horizonte, *Sampaio* 7317 (R); *Williams & Assis* 6413 (US); *Mello Barreto* 5781 (Ch), 10351 (R). Sabara, *Neto*, in 1862 (R); *Hoehne (Comm. Rondon)* 6727 (R). Ituiutaba, *Macedo* 2296 (US). Jaboticatubas, *L. B. Smith* 6774 (US). São Sebastião do Paraíso, *Teodoro* 4931 (GH). GOYAS: Pôrto Real (Pôrto Nacional), *Burchell* 8641 (GH, NY). Between Cavalcante and Conceição, *Burchell* 8050 (GH). Saia Velha, *Glaziou* 20923 (R). MATO GROSSO: Cuyabá, *Malme* 1350 (R); *Hoehne (Comm. Rondon)* 4569 (R). SÃO PAULO: Franca, *Riedel* 2393 (NY); *Gehrt* 4022 (GH).

PARAGUAY: AMAMBAY?: "Sierra de Amambay," *Hassler* 12017 (GH). CONCEPCIÓN: Upper Río Apa, *Hassler* 8128 (GH, Mo). Between Río Apa and Río Aquidabán, *Fiebrig* 5109 (GH).

LOCAL NAMES: Lengua de pájaro (El Salvador).

The numerous slender, moniliform fruits, borne on panicles about half as high as the entire plant, give this species a distinctive appearance. Vegetatively, it is very similar to *Ae. marginata*, but the latter has considerably larger flowers and fruits and less conspicuous inflorescences.

Examination of an isotype of *Ae. gracilis* Miq. and of a photograph of the type of *Ae. hedyaroides* shows those two species to be synonymous with *Ae. paniculata*. According to the original description, *Ae. laevis* differs from *Ae. hedyaroides* in length of stipules and pubescence of stems. Since size of fruit was not given as a factor, it is believed that *Ae. laevis* also is a synonym of *Ae. paniculata*.

41. *Aeschynomene leptostachya* Benth. in Mart. Fl. Bras. 15 (1): 65. 1859.

Suffrutescent herb; stems slender, 3–4 dm. high, pilose to glabrous; stipules deltoid-subcordate, acute, about 1 mm. long, 0.5–1 mm. wide, subglabrous; leaves 1.5–2.5 cm. long, 15–24-foliolate; leaflets oblong, 3–5 mm. long, 1–1.5 mm. wide, acute, mucronate, oblique, entire, the upper surface glabrous or subglabrous, the lower surface subglabrous or lightly appressed-pubescent, reticulate-veiny, the costa excentric but not marginal; inflorescences axillary or terminal, longer than the subtending leaves, pedicels appressed-pubescent; bracts ovate, obtuse, 1–1.5 mm. long, subglabrous, ciliate; mature flowers not seen, probably about 6–7 mm. long; calyx 3–4 mm. long; ovary sessile, 2-ovulate (fide Bentham); fruit not seen but probably sessile.

TYPE LOCALITY: Near Salinas, Goyaz, Brazil. Type collected by Weddell (No. 2113), cited below.

DISTRIBUTION: Known only from the type collection (fig. 8).

BRAZIL: GOYAS: Salinas, *Weddell* 2113 (K, TYPE).

This species, known only from the type collection, is dubiously separable from *Ae. brevipes*, another inadequately known species. Additional collections must be available before the relationship can be established with certainty.

42. *Aeschynomene brevipes* Benth. in Mart. Fl. Bras. 15 (1): 66. 1859.
? *Aeschynomene brevipes* var. *uliginosa* Benth. in Mart. Fl. Bras. 15 (1): 66.
1859.

Suffrutescent herb; stems slender, nearly 1 m. high, pilose, glabrate; stipules deltoid-lanceolate, acute to acuminate, 3.5–4 mm. long, about 1 mm. wide at base, subglabrous; leaves to about 7 cm. long, about 40–80-foliolate, the rachis lightly pubescent with subappressed hairs; leaflets oblong, 3–5 mm. long, about 1 mm. wide, acute, entire, the upper surface glabrous, the lower surface sparingly pubescent with subappressed hairs, the costa excentric; inflorescences terminal or axillary, few-flowered; pedicels pubescent like the stems; bracts and bracteoles ovate, obtuse, about 1–1.5 mm. long, 0.5–1 mm. wide, subglabrous, sometimes ciliate; flowers about 8–10 mm. long; calyx 4–5 mm. long, sparsely pubescent, ciliolate; standard about 8 mm. long, the claw 2.5 mm. long, the blade broadly obcordate, about 5.5 mm. long and 8 mm. wide; wings and keel about as long as the standard, the wing blades about 3.5 mm. wide, the keel blades about 2.5 mm. wide; stamens about 8 mm. long; fruit with stipe about 2 mm. long, 2–4-articulate, the articles semi-orbiculate, about 5 mm. long and 3 mm. wide, pubescent with subappressed hairs; seeds about 3 mm. long and 2 mm. wide, brown.

TYPE LOCALITY: Oeiras, Piauí, Brazil. Syntypes collected by Gardner (No. 2097) and by Martius, cited below.

DISTRIBUTION: Piauí, northern Bahia, and possibly also Maranhão (fig. 8).

BRAZIL: PIAUÍ: Oeiras, Gardner 2097 (GH, SYNTYPE collection); Martius (F. M. neg. 6269 of SYNTYPE ex M); Jobert & Schwacke 1074 (R). BAHIA: Serra da Tiririca, Zehntner, May 11, 1912 (US).

This species is doubtfully distinct from *Ae. leptostachya*, another Brazilian species, and from *Ae. pinetorum*, a Mexican species. The paucity of material available prevents an evaluation of the range of variability of these three species, and, for the present, they will be maintained separately. If they are truly native species, separation of the Mexican from the Brazilian species, at least, seems reasonable.

The status of var. *uliginosa*, from "Maranhão," was apparently somewhat doubtful to Bentham, its author, as indicated by his query at the close of the original description: "An species propria?" However, the distinctions do not seem convincing, and, although I have not seen the type of var. *uliginosa*, I am tentatively placing it in synonymy under typical *Ae. brevipes*. Another possibility is that it may be the same as typical *Ae. marginata*. Several specimens that I have cited as the latter had been previously determined by others as *Ae. brevipes* var. *uliginosa*.

43. *Aeschynomene pinetorum* Brandeg. Univ. Calif. Publ. Bot. 10: 408. 1924.
Aeschynomene chiapensis Brandeg. Univ. Calif. Publ. Bot. 10: 407. 1924.

Suffrutescent perennial; stems mostly virgate, to about 6 dm. high, glabrous to strigillose; stipules deltoid-lanceolate, acute to acuminate, 1–3 mm. long, about 1 mm. wide at base, somewhat pubescent, usually ciliate; leaves 3–5 cm. long, 20–80-foliolate, commonly 30–40-foliolate, the rachis sparsely pubescent with subappressed white hairs; leaflets about 3–5 mm. long, 1–1.5 mm. wide, obtuse to subacute, cuspidate to retuse, entire, the upper surface glabrous, the lower surface sparsely strigillose, the costa slightly excentric; inflorescences terminal or axillary, the axes usually hispidulous; bracts and bracteoles deltoid-ovate, subglabrous, ciliate, about 0.5–1 mm. long and 1 mm. wide at base; flowers about 6–8 mm. long; calyx 2–4 mm. long, finely pubescent, ciliate; standard about 6 mm. long, the claw 1.5 mm. long, the blade broadly obcordate, about 4.5 mm. long and 6.5 mm. wide; wings and keel about as long as the standard, the wing blades about 3 mm. wide, the keel blades about 2 mm. wide; stamens about 6 mm. long; fruit 2–5-articulate, subsessile, the stipe about 1 mm. long or less, the articles 4–5 mm. long, 2–3 mm. wide, moderately white-pubescent; seeds about 2 mm. long and 1.5 mm. wide, brown.

TYPE LOCALITY: Hacienda Monserrate, Chiapas, México. Type collected by Purpus (No. 9064), cited below.

DISTRIBUTION: Oaxaca and Chiapas, México, at elevations up to about 450 m. (fig. 8).

MÉXICO: OAXACA: San Juan Guichocovi, *Nelson* 2737 (US). Between Guichocovi and Laguna, *Nelson* 2751 (US). Santa Efigenia, *Nelson* 2851 (US). Rincón Antonio, *Orcutt* 3262 (Ch). Hacienda de Mazatlán, *Liebmann* 4726 (Ch). CHIAPAS: Sierra de Tonalá, *Seler & Seler* 2051 (GH); *Purpus* 6635 [cited by *Brandeg* as 6625] (Ch, GH, Mo, NY, UC, US). Hacienda Monserrate, *Purpus* 9064 (Ch, GH, Mo, NY, UC TYPE, US), 9147 (Ch, GH, Mo, NY, UC TYPE of *Ae. chiapensis*, US).

There appear to be no essential differences between material designated as *Ae. pinetorum* and *Ae. chiapensis*, but obviously at least two plant specimens were involved in the latter. The type of *Ae. pinetorum* is a plant with dark green, virgate stems and relatively small leaflets. The type sheet of *Ae. chiapensis* includes material identical with the type of *Ae. pinetorum* as well as one plant with thicker, brownish-barked main stems, light green secondary branches, and with larger, more rounded leaflets. The isotypes of *Ae. chiapensis* are similar to this latter plant. The differences possibly reflect habitat variations, although such data are not available.

In combining *Ae. chiapensis* with *Ae. pinetorum*, the latter specific epithet has been retained chiefly because it has been more widely used.

Several collections have been so designated, whereas the name *Ae. chiapensis* has apparently been applied only to the type collection.

As indicated in the discussion of *Ae. brevipes*, there is a great similarity between that inadequately known species and *Ae. pinetorum*. The wide geographic separation of the two species is one of the chief factors in maintaining them separately, assuming that they are correctly interpreted as natives, respectively, of Brazil and México.

44. *Aeschynomene purpusii* Brandeg. Zoe 5: 247. 1908.

Shrub, probably about 1–2 m. high; stem white-sericeous when young, glabrate, with grayish brown bark when older; stipules 3–4 mm. long, about 1 mm. wide, lanceolate, acuminate, sericeous to subglabrous; leaves about 18–25-foliolate, the petioles and rachis subappressed-pubescent; leaflets about 4–14 mm. long, 2–3.5 mm. wide, oblong, subfalcate, semicordate, the costa marginal, the upper surface glabrous, the lower surface sparsely pubescent; inflorescences axillary, fasciculate, 2–7-flowered, the pedicels sericeous; bracts deltoid-ovate, acute, about 1 mm. long, 0.5–1 mm. wide at base, sericeous; flowers about 7 mm. long; calyx 2–3 mm. long, pubescent; petals drying to a chocolate brown color; standard about 7 mm. long, the claw 1.5 mm. long, the blade orbiculate, about 5.5 mm. in diameter, entire; wings and keel about as long as the standard, the wing blades about 2 mm. wide, the keel blades about 1.5 mm. wide; stamens about 7 mm. long; fruit 2–5-articulate, the stipe 2 mm. long or less, glabrous, the articles elliptic, about 7 mm. long and 5 mm. wide, reticulate-veiny, sparsely appressed-pubescent; seeds 3.5–4 mm. long, about 2.5 mm. wide, light brown.

TYPE LOCALITY: Zacuapán, Vera Cruz, México. Type collected by Purpus (No. 1904), cited below.

DISTRIBUTION: Known only from the general region of the type collection (fig. 8).

MÉXICO: "Potrero de Consoquitla," Liebman 4727 (Ch, UC). **VERA CRUZ:** Zacuapán, Purpus 1904 (Ch, GH, Mo, NY, UC TYPE, US). Barranca de Santa María, Zacuapán, Purpus 1904 (UC). Barranca de Panoya, Purpus 8384 (UC). Rancho Remudadero, Purpus 14305 (Ch). "La Palmilla," Purpus 16409 (Ch).

The marginally costate leaflets serve to separate *Ae. purpusii* from most other species of the genus and to place it near *Ae. compacta*, also from México, and *Ae. standleyi* from Honduras. Perhaps with more collections available the differences between these three species will be found to be of less significance. However, for the present, they will be maintained separately, *Ae. purpusii* being distinguished by its generally larger and less numerous leaflets, smaller flowers, shorter bracteoles, and more oblong fruits.

The original description gives 2 mm. as the length of the flowers. That must have been a misprint, as the flowers of the type collection are about 7 mm. long. I have found no statement as to the height of the plants of *Ae. purpusii*, nor are any of the specimens sufficiently complete. On the basis of comparison with related species, I am estimating them to be 1 to 2 m. high.

45. *Aeschynomene standleyi* A. Molina, Ceiba 3: 92. 1952.

Erect shrub, 1–2 m. high; stems densely patent-pubescent when young, glabrate, brownish barked when older; stipules linear-attenuate, 5–7 mm. long, about 1 mm. wide at base, sparingly pubescent; leaves about 20–70-foliolate; leaflets linear-oblong, subfalcate, about 5–9 mm. long, 1.5–2 mm. wide, the upper surface sparsely pubescent to subglabrous, the lower surfaces moderately pubescent, the costa marginal; inflorescences axillary, fasciculate, few-flowered, shorter than the subtending leaves, the pedicels finely pubescent and also hispidulous, the bracts ovate-oblong, 1–3 mm. long, 0.5–1 mm. wide, acute, sparsely pubescent; complete flowers not seen, but on the basis of persistent stamens probably about 7–8 mm. long, calyx 3–4 mm. long, pubescent; stamens 7–8 mm. long; fruit 2–5-articulate, the stipe about 3 mm. long, glabrous, the articles suboblong, 9–13 mm. long, about 4 mm. wide, sparsely pubescent to subglabrous; seeds not seen.

TYPE LOCALITY: Las Mesas, Morazán, Honduras. Type collected by Molina (No. 1708a).

DISTRIBUTION: Known only from Honduras, in savannas, forested ravines, and rocky hillsides, at elevations of 600–900 m. (fig. 8).

HONDURAS: EL PARAÍSO: Quebrada El Muro, between Las Mesas and Yuscarón, *Molina* 1664 (Ch, US); *Standley* 14926 (Ch, US).

This species is rather similar to the Mexican species *Ae. purpusii* and *Ae. compacta*. As indicated in the key, it differs from the former in pubescence and in length of stipe, and from the latter in the size of flowers and width of fruit.

Although I have not yet seen the type of *Ae. standleyi*, the two collections available to me are cited in the original description and are doubtless authentic representations of the species.

46. *Aeschynomene nivea* Brandeg. Proc. Calif. Acad. II, 2: 150. 1889.

Shrub, 1–3 m. tall; stem silvery-sericeous; stipules linear, acuminate, 4–5 mm. long, about 0.5 wide at base, sericeous; leaves as much as 8 cm. long, about 30–60-foliolate; leaflets obliquely linear-oblong, subfalcate, about 4–10 mm. long, 1–2 mm. wide, entire, acute, sericeous, the costa marginal; pedicels sericeous and also hispidulous; bracts and bracteoles deltoid, acute, 1.5–2 mm. long, about 1 mm.

wide at base; flowers about 10–13 mm. long; calyx about 5 mm. long, sericeous and ciliate; petals drying to a chocolate brown color; standard commonly about 10 mm. long, the claw 2 mm. long, the blade orbiculate, about 8 mm. in diameter, entire, retuse; wings and keel about as long as the standard, the wing blades about 4 mm. wide, the keel blades about 2 mm. wide; stamens 8–10 mm. long; fruit 1–3-articulate, the stipe 5–6 mm. long, the articles 7–10 mm. long, about 5 mm. wide, sericeous, reticulate-veiny; seeds 5–6 mm. long, about 3 mm. wide, light brown.

TYPE LOCALITY: La Purísima, Baja California, México. Type collected by Brandegee, Feb. 12, 1889, cited below.

DISTRIBUTION: Known only from Distrito del Sur, Baja California, México, in washes, on flood plains and rocky, arid slopes, at altitudes up to about 600 m. (fig. 8).

MÉXICO: BAJA CALIFORNIA: 20 miles east of San Ignacio, *Nelson & Goldman* 7226 (US), Arroyo de San José de Magdalena, *Wiggins* 11382 (UC, US). 14 miles south of Mulége, *Shreve* 7088 (US). Southern end of Bahía de la Concepción, *Wiggins* 11430 (UC, US). Bahía San Nicolás, *Johnston* 3713 (GH, NY, UC, US). La Purísima, Feb. 12, 1889, *Brandegee* (GH, NY, UC TYPE, US). Sierra Giganta, Rancho Primera Agua, *Gentry* 3704 (Mo, UC). "Above Point Escondido," *Gentry* 3748 (Mo). Arroyo del Cajón de Tecomaja, *Carter & Kellogg* 2907 (US). "From Cerro Colorado to Rodríguez," *Nelson & Goldman* 7329 (Ch, US). La Paz, *Palmer* 110, in 1890 (GH, NY, US); *Brandegee*, Oct. 17, 1899 (Ch, NY); Oct. 27, 1899 (Ch, UC); *Jones* 24254 (Ch, Mo). Todos Santos, *Brandegee* 141 (GH, UC). Punta Lobos, *Carter, Alexander, & Kellogg* 2299 (UC, US). "Cape Region" in 1893, *Brandegee* (NY, UC). Isla Carmen, *Palmer* 818 in 1890 (US). Isla del Espíritu Santo, *Collins, Kearney, & Kempton* 128 (US).

This species, with its silvery-sericeous indument, fairly large flowers, and numerous small, subfalcate leaflets with marginal costae, is both showy and distinctive. It is one of the two species of *Aeschynomene* known to occur in Lower California and apparently is an endemic. The other species, *Ae. vigil*, has much broader leaflets and is not likely to be confused with *Ae. nivea*.

47. *Aeschynomene compacta* Rose, Contr. U. S. Nat. Herb. 5: 191. 1899.

Aeschynomene oaxacana Brandeg. Univ. Calif. Publ. Bot. 6: 181. 1915.

Shrub 1–3 m. high; stem white-sericeous when young, glabrate, brown barked with age; stipules 3–5 mm. long, about 1 mm. wide at base, linear-lanceolate, acuminate, sericeous to subglabrous; leaves commonly 20–40-foliolate; leaflets oblong, subfalcate, 4–10 mm. long, 1–2 mm. wide, acute, the upper surface subglabrous to moderately pubescent, the lower surface pubescent, the costa marginal; inflorescences axillary, fasciculate, usually 2- or 3-flowered, the pedicels sericeous, the bracts lanceolate, acute, sericeous, about 4 mm. long; flowers about 10 mm. long; calyx about 4 mm. long, sericeous, often glabrate; petals drying to a chocolate brown color; standard about 10

mm. long, the claw about 2 mm. long, the blade suborbiculate, 7–8 mm. in diameter, retuse; wings and keel about as long as the standard, the wing blades about 3 mm. wide, the keel blades about 1.5 mm. wide; stamens about 10 mm. long; legume 1–3-articulate, the stipe about 5 mm. long, the articles 5–8 mm long, 4–5 mm. wide, reticulate-veiny, pubescent; mature seeds not observed.

TYPE LOCALITY: Dry bluffs, Tomellín Canyon, Parián, Oaxaca, México. Type collected by Pringle (No. 5645), cited below.

DISTRIBUTION: Southern México and Guatemala, on dry bluffs, calcareous hills, and mountain slopes, at altitudes up to about 1,650 m. (fig. 8).

MÉXICO: *Haenke* 1279 (Ch), 1613 (Ch). PUEBLA: "Matamoros," *Rose & Hough* 4702 (US). Tehuacán, *Liebmann* 4725 (Ch, US); *Pringle* 8580 (Ch, GH, Min, Mo, NY, UC, US); *Rose & Hay* 5853 (US); *Rose, Painter, & Rose* 10014 (US); *Rose & Rose* 11238 (GH, NY, US). San Luis Tultitlanapa, *Purpus* 3507 (UC), June 1908 (UC). MICHOACÁN: Mal Paso, Huetamo, *Hinton* 7872 (Ch, GH, NY, US). GUERRERO: Between Tuxpam and Taxmalar, *Seler & Seler* 4228 (GH). OAXACA: Cuesta de Ejutla, Naraltepec, *L. C. Smith* 452 (GH, US). Parián, *Pringle* 5645 (GH, UC, US TYPE). Rancho de Calderón, *L. C. Smith* 102 (GH, US). San Gerónimo, *Doyle* 37 (US); *Mell* 2201 (NY). Cerro de Picacho, *Purpus* 7179 (Ch, GH, Mo, NY, UC TYPE of *Ae. oaxacana*, US). Between Juchitán and Chivela, *Nelson* 2630 (GH, US). CHIAPAS: Comitán, *Matuda* 5677 (Ch), 15683 (Ch); *Carlson* 1950 (US).

GUATEMALA: ZACAPA: Río Hondo, *Steyermark* 29500 (Ch).

This shrubby species, with marginally costate leaflets, closely resembles *Ae. purpusii*, from Vera Cruz, and is in some cases only slightly less sericeous than *Ae. nivea*, of Baja California. Apparently it stands intermediate between the two species, not only geographically but also in its characteristics. Its flowers are generally smaller than those of *Ae. nivea* and larger than those of *Ae. purpusii*. The fruit stipe is longer than in *Ae. purpusii* but about equal to that of *Ae. nivea*. The lanceolate bracteoles of *Ae. compacta* about equal the calyx in length, in contrast to the relatively short bracteoles of the other two species.

Examination of the type of *Ae. oaxacana* shows it to be identical with *Ae. compacta*.

48. *Aeschynomene pleuronervia* DC. Prodr. 2: 321. 1825.

Smithia domingensis Balb. ex DC. Prodr. 2: 321. 1825, nomen in synonymy.

Aeschynomene aurea Leonard, Journ. Wash. Acad. Sci. 17: 67. 1927.

Suffrutescent perennial with numerous slender shoots arising from a woody root, the stems to about 5.5 dm. high, sparingly pubescent, with appressed or subappressed white hairs; stipules deltoid-lanceolate, acute to acuminate, about 3 mm. long and 1 mm. wide, subglabrous, ciliate; leaves mostly 20–40-foliolate, the rachis white-pubescent; leaflets 5–6 mm. long. 1.5–2.5 mm. wide, semicordate, obtuse, the

costa marginal, the upper surface glabrous, the lower surface sparingly pubescent with subappressed hairs; inflorescences terminal and axillary, few-flowered, the peduncles and pedicles strigillose and also somewhat hispidulous; bracts and bracteoles deltoid-ovate, acute, 1–3 mm. long, about 1 mm. wide, sparsely pubescent; flowers about 10 mm. long; calyx 4–5 mm. long, sparsely pubescent, ciliate; petals drying to a chocolate brown color; standard 10 mm. long, the claw 2 mm. long, the blade ovate-orbiculate, about 8 mm. in diameter, retuse; wings and keel about as long as the standard, the wing blades about 4 mm. wide, the keel blades about 2.5 mm. wide; stamens about 8 mm. long; fruit 3–5-articulate, the stipe about 5 mm. long, the articles about 5 mm. long and 4 mm. wide, appressed-pubescent, reticulate-veiny; mature seeds not seen.

TYPE LOCALITY: "Santo Domingo." Type collected by Bertero, cited below.

DISTRIBUTION: Known only from Hispaniola, at elevations up to about 1,500 m. (fig. 8).

HAITI: NORD-OUEST: Bassin Bleu, *Leonard & Leonard* 15185 (Mo, NY, US). NORD: St. Michel de l'Atalaye, *Leonard* 7421 (US). ARTIBONITE: Ennery, *Leonard* 8818 (GH, US TYPE of *Ae. aurea*). OUEST: Thomazeau, *Ekman* H-1005 (US). Port au Prince, *Leonard & Leonard* 15738 (GH, UC, US). Morne l'Hôpital, *Holdridge* 998 (US).

DOMINICAN REPUBLIC: "Santa Domingo," *Bertero* in 1819–1820 (Mo, probably TYPE collection; F. M. neg. 33436 of TYPE ex G).

This species, apparently endemic to the island of Hispaniola, is readily identified by its semicordate, marginally costate leaflets and its loment with stipes about 5 mm. long.

In aspect, it somewhat resembles *Ae. tenuis* of Cuba, but that species has longer-stiped fruits and leaflets with excentric but not marginal costae. The Brazilian species *Ae. paucifolia*, except for its sessile fruits, seems to be most similar to *Ae. pleuronervia*.

Smithia domingensis apparently was only an unpublished herbarium name which DeCandolle cited in his original description.

The type of *Ae. aurea* shows that species to be undoubtedly the same as *Ae. pleuronervia*, as noted by Urban (*Repert. Spec. Nov. Regni. Veg.* 24: 13. 1927).

49. *Aeschynomene paucifolia* Vog. *Linnaea* 12: 94. 1838.

? *Aeschynomene nana* Glaziou, *Bull. Soc. France* 53. Mem. 3b: 132. 1906.

Suffrutescent perennial with numerous slender shoots arising from a woody root; stems to about 5 dm. high, appressed-pubescent when young, glabrate with age; stipules lanceolate, attenuate, about 3–5 mm. long, pubescent, glabrate; leaves 1–10 cm. long, 30–60-foliolate, the rachis somewhat pubescent; leaflets about 5 mm. long, 1–2 mm. wide, semicordate, acute, the costa marginal, the upper surface

glabrous, the lower surface appressed-pubescent to glabrate; inflorescences terminal or axillary, the floral axes strigillose and also somewhat hispidulous, the bracts and bracteoles ovate, acute, pubescent, 1–2 mm. long, about 1 mm. wide, entire or glandular-ciliate; flowers 10–12 mm. long; calyx 3–4 mm. long, pubescent, ciliate; petals drying to a chocolate brown color; standard commonly 10 mm. long, the claw 2 mm. long, the blade orbiculate, about 8 mm. in diameter, retuse; wings and keel about as long as the standard, the wing blades about 4 mm. wide, the keel blades about 2.5 mm. wide; stamens 10 mm. long; fruit 2–5-articulate, subsessile, the stipe about 2 mm. long, or less, although sometimes seeming to be longer due to abortion of the basal ovules and failure of the lower articles to attain normal width, the normal articles about 6.5 mm. long and 6 mm. wide, pilose; mature seeds not seen.

TYPE LOCALITY: "Ad S. Antonio do Monte," Minas Gerais, Brazil. Type collected by Sellow, cited below.

DISTRIBUTION: Highlands of southeastern Brazil, in grasslands (fig. 8).

BRAZIL: MINAS GERAIS: "S. do Galheiro" [near "San Antonio do Monte"], Sellow (F. M. neg. 2152, presumably of TYPE ex B). Between "S. Anna dos Alegres and Rio S. Francisco," Riedel 2926 (GH). Lagôa Santa, Riedel 722 (US); Hoehne (Comm. Rondon) 6615 (R); Warming 3017 (Ch, US). Santa Luzia, Mello Barretto 6052 (Ch). Brejo das Almas, Markgraf 3280 (R); Jaboticatubas, Mello Barretto 10355 (R); L. B. Smith 6934 (US). GOYAZ: Between Rio dos Velhos and Rio Paranahyba, Riedel 4268 (US). Between Catalão and Goyaz, Burchell 5741 (GH), 6061–2 (GH). Between "As Brancas and Rio Roncador," Glaziou 20921 (Ch, NY, F. M. neg. 27930 of ISOTYPE of *Ae. nana* ex G).

As indicated by the specific name, the leaves of this species are commonly rather widely spaced. The semicordate leaflets in particular, and other characters in general, are very similar to those of *Ae. pleuronervia* of Hispaniola. The chief difference is in the stipitate fruits of *Ae. pleuronervia* and the subsessile fruits of *Ae. paucifolia*.

Material of *Ae. nana* suggests specimens of *Ae. paucifolia* which might have suffered burning or close grazing and then resumed growth. The stems are short and numerous, about 1–2 dm. high, and the leaves are closely spaced. The flowers and fruits appear to be essentially the same as those of typical *Ae. paucifolia*. Tentatively, the two species are here placed in synonymy.

Series 8. Scopariae Rudd, ser. nov.

Arbores parvae, frutices, vel herbae suffruticosae; caulis erectus, teres, nonnunquam cum cortice cinereo vel fusco, caulibus immaturis nonnihil angulatis; stipulae non productae; foliola integra, costa centrali; inflorescentiae racemosae vel paniculatae, nonnunquam

fasciculatae, axillares vel terminales; flores fructusque pro sectione *Ochopodio* plerumque inter majores.

Small trees, shrubs, or suffrutescent perennials; stems erect, terete or somewhat angled when young, terete and sometimes developing gray or brownish bark when older; stipules attached at the base, not appendiculate; leaflets entire, essentially symmetrical although the base may be obliquely rounded or subcordate, the costae central, the secondary venation mostly reticulate, moderately prominent; inflorescences racemose, sometimes paniculate, sometimes fasciculate, axillary, and in some cases also terminal; flowers and fruits mostly larger than average for the section.

The type of the series is here designated as *Ae. scoparia* H. B. K.

50. *Aeschynomene amorphoides* (Wats.) Rose ex Robins. Proc. Amer. Acad. 29: 315. 1894.

Brya (?) *amorphoides* Wats. Proc. Amer. Acad. 22: 406. 1887.

Aeschynomene bracteolaris Riley, Kew Bull. 1923: 115. 1923.

Aeschynomene guadalajarana M. E. Jones, Contr. West. Bot. 18: 46. 1933.

Shrub or small tree up to about 8 m. high; stems canescent when young, glabrous, gray-barked when older; stipules linear, attenuate, 8–12 mm. long, 1–1.5 mm. wide at base, lightly pubescent; leaves about 5–8 cm. long, 40–80-foliolate, the petiole and rachis pubescent; leaflets oblong, obtuse to subacute, 5–17 mm. long, 2–3.5 mm. wide, the mucro 1.5–2 mm. long, the upper surface pubescent to subglabrous, the lower surface pubescent; inflorescences axillary or terminal panicles, the axes pubescent like the stem, the bracts and bracteoles ovate, obtuse, about 1 mm. long, 0.5–1 mm. wide, pubescent, ciliate; flowers 4–6 mm. long; calyx 2–3 mm. long, subglabrous, ciliate; standard commonly about 5 mm. long, the claw 1 mm. long, the blade suborbiculate, about 4 mm. in diameter, glabrous; wings and keel about as long as the standard, their blades 1.5–2 mm. wide; stamens about 5 mm. long; fruit 1–2.5 cm. long, 2–3 articulate, the stipe about 3 mm. long, the articles (6–) 9–10 mm. long, about 5 mm. wide, pubescent to subglabrous; seeds about 5 mm. long and 3 mm. wide, dark brown.

TYPE LOCALITY: Tequila, Jalisco, México. Type collected by Edward Palmer (No. 414 in 1886), cited below.

DISTRIBUTION: México, from Sinaloa south to Colima, in rocky canyons of mountain foothills up to about 1,000 m. (fig. 9).

MÉXICO: *Sessè & Mociño* 1938 (Ch), 1948 ter (Ch). SINALOA: *Ortega* 4853 (US). Las Mesas, *Gentry* 6656 (GH, Mo, NY, US). Imala, *Edw. Palmer* 1702 in 1891 (GH, NY, UC, US). Cerro Colorado, Culiacán, *Brandege*, Oct. 28, 1904 (GH, UC, US); *Gentry* 5114 (GH, Mo, NY, UC). La Noria, *Mexia* 141 (Mo, UC). Santa Fe, *Ortega* 4666 (US). Mazatlán, *Ortega* 6397 (GH, US). "San Ignacio: El Coacoyal, *Gonzalez*" [*Ortega*] 586 (N. Y. neg. n. s. 2277 of TYPE of *Ae. bracteolaris* ex K). Los Labrados, *Mexia* 943 (Ch, GH, Mo, NY, UC, US). NAYARIT: Tepic, *Mexia* 660 (Ch, GH, Min, Mo, NY, UC, US). La Barranca, *Jones* 23052

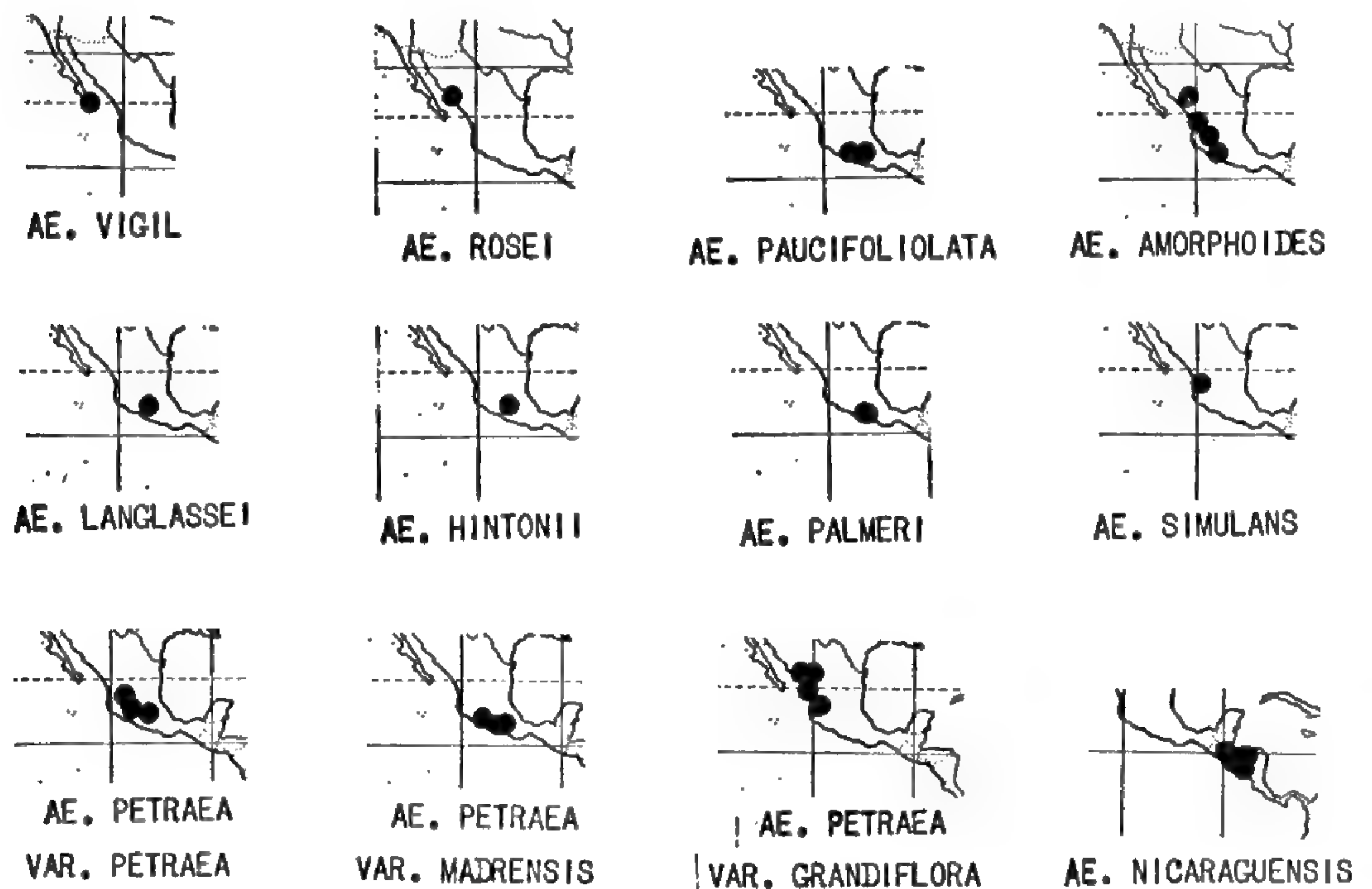


FIGURE 9. Distribution of the *Scopariae*: Mexican and Central American taxa.

(CH). Ixtlán, *Jones* 23055 (NY). JALISCO: Tequila, *Edw. Palmer* 414, in 1886 (GH TYPE, NY, US); *Pringle* 4613 (Ch, GH, Min, Mo, NY, UC, US). La Venta, *Reko* 4441 (US). Bolaños, *Rose* 2859 (GH, US), 2859a (GH, Mo, NY, US). COLIMA: Manzanillo, *Edw. Palmer* 903, in 1890 (GH, Mo, NY, UC, US); *Ferris* 6037 (Ch, US); *Orcutt* 4502 (Ch).

LOCAL NAMES: Yerba del pajarito (Nayarit); trucha (Sinaloa); bara prieta (Sinaloa).

Aeschynomene amorphoides, with its relatively large panicles of small flowers and its leaves with numerous, narrowly oblong, long-mucronate leaflets, is one of the most distinctive species of the genus. First tentatively placed in the genus *Brya*, it was later transferred to *Aeschynomene*, where it correctly belongs.

From the original description and from a photographic negative of the type of *Ae. bracteolaris*, it seems certain that that species is the same as *Ae. amorphoides*.

Morton (Contr. U. S. Nat. Herb. 29:100. 1945) has examined the type of *Ae. guadalajarana* and identified it as *Ae. amorphoides*. I have seen the second number cited by Jones, his 23052, and it undoubtedly is a specimen of *Ae. amorphoides*.

51. *Aeschynomene paucifoliolata* Micheli, Mem. Soc. Phys. Genève 34: 256. pl. 9. 1903.

Shrub about 3 m. tall; stems slender, strigillose, hispidulous when young, the older stems glabrous, gray-barked; stipules linear-subulate, 5–10 mm. long, scarcely 1 mm. wide, subglabrous, entire; leaves 5–20-foliolate; leaflets extremely variable in size and shape, sub-elliptic to rhombic, ovate to oblong, obtuse, the base cuneate or

rounded, the smallest about 5 mm. long and 2 mm. wide, the largest 40 mm. long, 28 mm. wide at maximum, the terminal leaflet sometimes rhombic and twice as large as the lateral, subelliptic leaflets, the upper surface appressed-pubescent to glabrate, the lower surface slightly more pubescent than the upper; inflorescences terminal and axillary, mostly paniculate, many-flowered, the axes strigillose, the bracts deltoid-ovate, the largest about 1 mm. long and 0.5 mm. wide; flowers 5–7(–8) mm. long; calyx 2–3 mm. long, subglabrous or appressed-pubescent, ciliolate; standard commonly 6 mm. long, the claw 1 mm. long, the blade obovate, about 5 mm. long and 5 mm. wide at maximum, glabrous on outer face; wings and keel about as long as the standard, the wing blades about 2 mm. wide, the keel blades about 1 mm. wide; stamens about 6 mm. long; fruit 2–4-articulate, the stipe 3–6 mm. long, appressed-pubescent, the articles about 10 mm. long and 6 mm. wide, sparsely appressed-pubescent, sometimes glabrate, reticulate-veiny; seeds 5–6 mm. long, 3–4 mm. wide, light brown.

TYPE LOCALITY: El Calabazal, Guerrero, México, in rocky, granitic soil, 200 m. altitude. Type collected by Langlassé (No. 474), cited below.

DISTRIBUTION: México, from Michoacán to Guerrero, on rocky hillsides, llanos, in woods, at elevations up to about 200 m. (fig. 9).

MÉXICO: MÉXICO: Temascaltepec, *Hinton* 1764 (US), 1997 (NY, US), 4784 (Ch, GH, US), 7059 (NY, US). MICHOACÁN: Coalcomán, *Hinton* 16060 (US), 16163 (US). GUERRERO: El Calabazal, *Langlassé* 474 (GH, US, ISOTYPES). Acapulco, *Beechey*, in 1827–28 (K). *Edw. Palmer* 106 in 1894–95 (GH). Cutzamala, *Hinton* 6708 (Ch, GH, Mo, NY, US). Coyuca, *Hinton* 6938 (Ch, GH, US).

Standley (Contr. U. S. Nat. Herb. 23: 491. 1922) treated *Ae. paucifoliolata* as a synonym of *Ae. palmeri*, but Sandwith (Hook. Icon. Pl. 35: sub pl. 3448. 1943) has pointed out, correctly I believe, that such reduction is unjustified. *Aeschynomene palmeri* has somewhat larger flowers, apparently only in axillary racemes, fruits with larger and less numerous articles and generally less indument.

The small flowers of *Ae. paucifoliolata*, in paniculate inflorescences, are most similar to those of *Ae. amorphoides*. The leaflets, however, are very different. Instead of being uniformly narrowly oblong as in *Ae. amorphoides*, they exhibit considerable variability of shape, size, and number. Specimens with the large rhombic leaflets are especially distinctive.

52. *Aeschynomene vigil* Brandege, Proc. Cal. Acad. II. 3: 128. 1891.

Shrub 1–3 m. tall; stem white-sericeous when young, glabrate, gray-barked with age; stipules about 3–5 mm. long and 1 mm. wide, lanceolate, acuminate, subsericeous; leaves 8–14-foliolate; leaflets

elliptic-oblong to obovate, obtuse, 8–15 mm. long, 4–8 mm. wide, subsericeous; inflorescences axillary, fasciculate, few-flowered, the pedicels subsericeous, sometimes also sparsely hispidulous; bracts and bracteoles ovate-lanceolate, acute, 1–2 mm. long, sericeous; flowers 8–10 mm. long; calyx 4–5 mm. long, pubescent; standard 8–10 mm. long, the claw about 2 mm. long, the blade suborbiculate, about 7 mm. long and 6 mm. wide, retuse; wings and keel about as long as the standard, the wing blades 3–5 mm. wide, the keel blades about 1.5 mm. wide; stamens about 9 mm. long; fruit 2- or 3-articulate, the stipe 1–3 mm. long, pubescent, the articles 5–7 mm. long, 5–6 mm. wide, moderately appressed-pubescent, reticulate-veiny; seeds about 5 mm. long and 3 mm. wide, light brown.

TYPE LOCALITY: San José del Cabo, Baja California, México. Type collected by Brandegee (No. 142), cited below.

DISTRIBUTION: Known only from the southern tip of Baja California, México, at elevations up to about 150 m. (fig. 9).

MÉXICO: BAJA CALIFORNIA: San José del Cabo, *Brandegee* 142 (GH, UC TYPE), Mar. 17, 1892, 1892 (UC), Sept. 23, 1893 (NY), Oct. 24, 1902 (UC, US); *Rose* 16461 (US); *Jones* 24053 (Ch, Mo, NY, UC). "West coast Cape region," *Brandegee*, Sept. 23, 1893 (US). "From El Cajón to El Saccatón," *Nelson & Goldman* 7365 (GH, US).

Aeschynomene vigil exhibits considerable white-sericeous pubescence, characteristic of *Ae. nivea* and many other plants of Lower California. Its broader, elliptic-oblong to obovate leaflets with essentially central costae readily distinguish it from *Ae. nivea*, which has narrow, marginally-costate leaflets.

The petals of *Ae. vigil* tend to discolor to a dark purplish-brown, similar to the color changes that occur in several species of the *Pleuronerviae* but are not customary in the *Scopariae*.

The short fruit-stipe easily distinguishes this species from others of the series except *Ae. rosei*, and from that the denser pubescence differentiates it.

53. *Aeschynomene rosei* Morton, *Contr. U. S. Nat. Herb.* 29: 84. 1944.

Aeschynomene fruticosa Rose, *Contr. U. S. Nat. Herb.* 5: 192. 1899, non Sessé and Mociño. 1889.

Shrub, to about 1.5 m. high; stems appressed-pubescent when young, glabrate, gray-barked when older; stipules lanceolate, attenuate, 2–4 mm. long, 0.5–1 mm. wide at base, pubescent; leaves 7–12-foliolate; leaflets 8–15 mm. long, 3–6 mm. wide, oblong to subelliptic, obtuse, subglabrous; inflorescences axillary, fasciculate, few-flowered, the bracts and bracteoles ovate, acute, 1–2 mm. long, about 1 mm. wide, lightly pubescent; flowers 8–9 mm. long; calyx 5–6 mm. long, sparsely pubescent; standard 8–9 mm. long, the claw 2 mm. long, the blade cordate, 6–7 mm. in diameter; wings and keel about as long as

the standard, the wing blades about 3 mm. wide, the keel blades about 1.5 mm. wide; stamens about 8 mm. long; fruit 3-articulate, subsessile, the stipe 1–2 mm. long, glabrous, the articles 7–8 mm. long, 5–6 mm. wide, the apical joint strigillose, the pubescence decreasing toward the subglabrous basal joint; mature seeds not seen.

TYPE LOCALITY: On stony hills near Topolobampa, Sinaloa, México. Type collected by Edw. Palmer (No. 204 in 1897), cited below.

DISTRIBUTION: Known only from the type collection (fig. 9).

MÉXICO: Sinaloa: Topolobampa, *Edw. Palmer* 204 in 1897 (UC, US TYPE).

This collection, the northernmost of the series, most resembles in general aspect the rather glabrous South American species, *Ae. tumbezensis*, *Ae. egena*, and *Ae. interrupta*. However, in more technical characters of the flowers, stipe length, etc., it appears to be closely related to the pubescent *Ae. vigil* from across the Gulf of California in Lower California.

As indicated above, this taxon was first described as *Ae. fruticosa* Rose, but, because that name was a later homonym of *Ae. fruticosa* Sessé and Mociño, Morton proposed the specific name *rosei*.

54. *Aeschynomene palmeri* Rose, *Contr. U. S. Nat. Herb.* 5: 192. 1899.

Shrub about 2 m. tall; stems subglabrous when young, becoming gray-barked when older; stipules linear-attenuate, about 5–7 mm. long, scarcely 1 mm. wide, subglabrous, entire; leaves 7–13-foliolate; leaflets variable in size and shape, elliptic to oblong or slightly obovate, acute to retuse, the largest about 25 mm. long and 15 mm. wide, the smallest 10 mm. long and 4 mm. wide, entire, subglabrous; inflorescences axillary, racemose, the axes finely appressed-pubescent and also beset with glandular hairs, the bracts linear-ovate, acute, 1–2 mm. long, 0.5–1 mm. wide, subglabrous, ciliolate; flowers 8–10 mm. long; calyx 3–4 mm. long, subglabrous, ciliolate; standard commonly about 10 mm. long, the claw 2 mm. long, the blade orbiculate, about 8 mm. in diameter, entire, retuse, glabrous; the wings and keel about 8.5 mm. long, the claws 1.5 mm. long, the blades about 7 mm. long and 3 mm. wide; stamens about 8.5 mm. long; legume 1–3- (usually only 1-) articulate, the stipe about 5–6 mm. long, subglabrous, the articles about 15 mm. long and 7 mm. wide, glabrous except for a few hairs along the margins; seeds about 6 mm. long and 3.5 mm. wide, brown.

TYPE LOCALITY: Acapulco, Guerrero, México. Type collected by Edw. Palmer (No. 106a in 1894–95 in part), cited below.

DISTRIBUTION: Known only from Guerrero, México (fig. 9).

MÉXICO: GUERRERO: Acapulco, *Edw. Palmer* 106a in 1894–95 in part (GH, US TYPE); *Langman* 3323 (NA), 3338 (NA). Galeana, *Hinton* 14604 (US).

Aeschynomene palmeri is another of the few species within the series which exhibits a glabrous standard petal, in contrast to the more common condition of well developed pubescence on the outer face. The fairly large, subglabrous leaflets and fruits also are distinctive.

In general appearance it most suggests *Ae. hintonii*, from the same region, but the latter has somewhat more obovate leaflets, pubescent standard petals, and, in some cases, terminal, paniculate inflorescences that so far have not been observed in the specimens of *Ae. palmeri*.

Unfortunately, the type of this species is one element of a mixed collection. In addition to the material cited above, other specimens of Palmer's No. 106a collected in 1894-95 are *Diphysa occidentalis*. A Gray Herbarium sheet of Palmer's No. 106 includes two twigs of *Ae. paucifoliolata* and one of *Ae. palmeri*, the latter presumably an isotype, equivalent to No. 106a.

55. *Aeschynomene hintonii* Sandw. Hook. Icon. Pl. 35: pl. 3448. 1943, published as *hintoni*.

Shrub 1-2 m. high; stems subglabrous when young, becoming brownish gray-barked when older; stipules linear-deltoid, 2-4 mm. long, about 2 mm. wide at base, acute, subglabrous, ciliate; leaves 2-4 cm. long, 5-6-foliolate, the petioles glandular-hispidulous; leaflets obovate-elliptic, somewhat variable in size, the smallest about 4 mm. long and 3 mm. wide, the largest about 20 mm. long and 17 mm. wide, subglabrous, entire, the apex rounded; inflorescences axillary or terminal, racemose, few-flowered; bracts and bracteoles deltoid-ovate, 1-2 mm. long, 1-1.5 mm. wide, acute, ciliate; pedicels and peduncles glandular-hispidulous and also somewhat crisp-pubescent; flowers 8-10 mm. long; calyx 3-4 mm. long, subglabrous, ciliate; standard 8-10 mm. long, the claw about 1.5 mm. long, the blade orbiculate, about 8 mm. in diameter, entire, retuse, pubescent on the outer face; wings and keel about as long as the standard, the wing blades about 4 mm. wide, the keel blades about 3 mm. wide; stamens 8-10 mm. long; fruit 1-3-articulate, the stipe 10-12 mm. long, glandular-hispidulous, the articles about 12 mm. long and 9 mm. wide, glabrous, reticulate-veiny; seeds about 6 mm. long and 3.5 mm. wide, brown.

TYPE LOCALITY: Placeres, Coyuca district, Guerrero, México. Type collected by Hinton (No. 6104), cited below.

DISTRIBUTION: Known only from northern Guerrero, México, in woods and on dry hills at elevations up to about 400 m. (fig. 9).

MÉXICO: GUERRERO: Los Placeres, *Hinton* 6104 (US ISOTYPE), 11247 (GH). Between Los Placeres and Cigarillo, *Hinton* 10644 (GH, US).

This species is very similar to *Ae. palmeri*, differing chiefly in having fruits with longer stipes, flowers with standards which are pubescent on the outer face, and leaflets which tend to be smaller and more obovate.

Originally published as "*hintoni*," the specific name is here changed to *hintonii*, following Recommendation 82C (b) of the International Code of Botanical Nomenclature (1952).

56. *Aeschynomene langlassei* Micheli ex Rudd, sp. nov.

Frutex, caulibus subglabris, cortice griseo; stipulae non productae; folia 12–16-foliolata, foliolis elliptico-oblongis, foliolo ultimo plerumque obovato-cuneato; inflorescentiae terminales vel axillares, paniculatae vel racemosae, floribus circiter 10 mm. longis; legumen 5- vel 6-articulatum, utrinque sinuatum, stipite 8–10 mm. longo, mediocriter adpresso-pubescente etiam hispiduloso, articulis suborbiculatis, 5–6 mm. longis latisque, glabris vel margine sparsim pubescente.

Shrub about 1.5 m. high; stems subglabrous, grayish-barked when older; stipules deltoid, acuminate, about 1 mm. long, 1 mm. wide or less, subglabrous; leaves 12–16-foliolate, the petioles and rachis sparsely pubescent; leaflets elliptic-oblong, 5–15 mm. long, 4–8 mm. wide, subglabrous, reticulate, the terminal leaflet usually obovate-cuneate, obtuse to retuse; inflorescences terminal or axillary, paniculate or racemose; peduncles and pedicels pubescent and also sparsely hispidulous with glandular hairs; bracts and bracteoles deltoid-ovate, acute to obtuse, scarcely 1 mm. long and 1 mm. wide, pubescent; flowers about 10 mm. long; calyx about 4.5 mm. long, subglabrous, ciliate; standard about 10 mm. long, the claw about 2 mm. long, the blade broadly ovate, about 8 mm. long, 10 mm. wide at maximum, emarginate, subcordate at base, entire, the outer face pubescent; wings about as long as the standard, the claw 3 mm. long, the blade about 7 mm. long and 3.5 mm. wide; the keel about 11 mm. long, the claws 3 mm. long, the blades about 8 mm. long and 2.5 mm. wide; stamens about 11 mm. long; fruit commonly 5- or 6-articulate, somewhat moniliform, the stipe 8–10 mm. long, moderately appressed-pubescent and also hispidulous, the articles suborbiculate, 5–6 mm. in diameter, glabrous or with sparse marginal pubescence; seeds about 3 mm. long and 2 mm. wide, dark brown.

TYPE: In the U. S. National Herbarium, No. 385558, collected in the Sierra Madre, State of Guerrero, México, altitude 1,200 m., February 1899, by E. Langlassé (No. 847). Duplicate at GH.

DISTRIBUTION: Known only from the type collection (fig. 9).

This collection was given the herbarium name *Ae. langlassei* by Micheli but, before his name was published, he apparently was convinced that it was the same as *Ae. simulans*, and so cited it in his "Leguminosae Langlasseanae" (Mem. Soc. Phys. Hist. Nat. Genève 34:257. 1903). Since I believe that these two elements are distinct, I am now validating the specific name *Ae. langlassei*, as originally applied by Micheli.

With its nearly glabrous fruits and leaflets, this species suggests *Ae. palmeri* and *Ae. hintonii*. The several small articles, rather than 1-3 large articles as in those two species, give the fruits of *Ae. langlassei* a rather distinctive, moniliform appearance. It differs from *Ae. simulans* in fruit characters, the articles being glabrous and more numerous and the stipes somewhat longer.

Fully mature fruits may have articles slightly larger than those (5-6 mm. diameter) described above. The type material appears to have been collected in a submature condition.

57. *Aeschynomene nicaraguensis* (Oerst.) Standl. Tropical Woods 34: 41. 1933.

Brya nicaraguensis Oerst. Vid. Medd. Nat. Foren. Kjøbenhavn 13. 1853.

Aeschynomene calderoniana Standl. Journ. Wash. Acad. Sci. 14: 93. 1924.

Shrub or small tree, 2-4 m. high; stem pubescent when young, glabrate, with grayish bark when older; stipules linear, acuminate, 6-10 mm. long, scarcely 1 mm. wide, subglabrous; leaves 5-10 cm. long, about 8-18-foliolate, the petiole and rachis pubescent; leaflets elliptic-oblong, the apical leaflets usually obovate, 10-35 mm. long, 5-12 mm. wide, obtuse, subglabrous; inflorescences axillary or terminal racemose or paniculate, the axes pubescent, the bracts ovate, acute to obtuse, 1-2 mm. long, 0.5-1 mm. wide, pubescent; flowers 8-10 mm. long; calyx about 3.5-5 mm. long, pubescent to subglabrous; standard commonly about 9 mm. long, the claw 2 mm. long, the blade about 7 mm. long, 8-10 mm. wide; wings and keel about the same length as the standard, the wing blades 3-4 mm. wide, the keel blades 1.5-2 mm. wide; stamens about 9 mm. long; fruit 2- or 3-articulate, the stipe 5-7 mm. long, appressed-pubescent, the articles 12-15 mm. long, 7-8 mm. wide, moderately appressed-pubescent, sometimes glabrate; seeds 5-6 mm. long, 3-3.5 mm. wide, light brown.

TYPE LOCALITY: El Viejo, Nicaragua. Type collected by Oersted (No. 4701), cited below.

DISTRIBUTION: Guatemala to Nicaragua, in oak-pine forest areas, at elevations of about 400-1,700 m. (fig. 9).

GUATEMALA: CHIQUIMULA: Concepción de las Minas, *Steyermark* 31117 (Ch).

HONDURAS: COMAYAGUA: Comayagua, *Standley & Chacón* 5738 (Ch). MORAZÁN: El Zamorano, *Standley* 830 (Ch), 1036 (Ch), 1338 (Ch), 4353 (Ch); *J. Valerio* 3554 (UC). Quebrada de Santa Clara, *Standley & Williams* 1562 (Ch, US). Santa Clara, *J. Valerio* 3787 (UC, US); *Williams & Molina* 10570 (Ch, Mo,

UC). Camino San Antonio, *J. Valerio* 1359 (Ch). Pozo del Tacuazán, *Molina* 679 (UC, US). Mount Uyuca, *Swallen* 10894 (US). EL PARAÍSO: Las Casitas, *Williams & Molina* 11540 (Ch, Mo). Galeras, *Standley* 15598 (US).

EL SALVADOR: CHALATENANGO: Cerro El Roblar, *Calderón* 2470 (Ch). SANTA ANA: Santa Ana, *Standley* 20367 (GH, NY, US TYPE of *Ae. calderoniana*). Metapán, *Standley & Padilla* 3145a (Ch.).

NICARAGUA: NUEVA SEGOVIA: *Oersted* 4702 (Ch, fragment ex C). CHINANDEGA: El Viejo, *Oersted* 4701 (Ch, fragment of TYPE ex C). MADRIZ: Somoto, *Williams & Molina* 12297 (Ch, Mo, UC).

This is the only species of the series which has been found in Central America exclusive of México. The articles of the fruit are large and moderately pubescent; the stipules are linear. Although color is not too stable a character, specimens of *Ae. nicaraguensis* commonly exhibit large, dark green, but not blackish, leaflets, and the petals are usually longitudinally striped with purple.

This species was first ascribed to the genus *Brya* and later independently described as an *Aeschynomene*; Standley then recognized the similarity of the material involved and published the combination *Ae. nicaraguensis*.

58. *Aeschynomene simulans* Rose, Contr. U. S. Nat. Herb. 5: 192. 1899.

Suffrutescent perennial, about 3 dm. high; stems appressed-pubescent to subglabrous; stipules obliquely ovate, entire, acute, about 5 mm. long, 1.5–2.5 mm. wide, subglabrous; leaves about 12–16-foliate; leaflets orbiculate to oblong, 10–15 mm. long, 4–10 mm. wide, obtuse, rounded or subcordate at base, the upper surface glabrous, the lower surface finely appressed-pubescent, reticulate; inflorescences terminal or axillary, racemose or paniculate; bracts and bracteoles 1–1.5 mm. long, about 1 mm. wide, subovate, obtuse, subglabrous; flowers 8–10 mm. long: calyx 3–4 mm. long, subglabrous, ciliolate; standard 8–10 mm. long, obovate, not distinctly clawed, 9 mm. wide at maximum, pubescent on the outer face, entire, emarginate, the base cuneate; wings and keel commonly about 9.5 mm. long, the claws 1.5 mm. long, the wing blades 3.5 mm. wide at maximum, the keel blades about 1.5 mm. wide; stamens about 8 mm. long; fruit 2- or 3-articulate, the stipe about 6 mm. long, the articles 6–7 mm. in diameter (submature), thinly appressed-pubescent, glabrescent; mature seeds not observed.

TYPE LOCALITY: Between Rosario and Colomas, Sinaloa, México. Lectotype collected by Rose (No. 1616), cited below.

DISTRIBUTION: México, southern Sinaloa and Nayarit (fig. 9).

MÉXICO: SINALOA: Between Rosario and Colomas, *Rose* 1616 (GH, US LECTOTYPE). NAYARIT: Acaponeta, *Rose* 1487 (US).

As Rose said in the original description, "This species is near, perhaps too near, *Ae. petraea* Robins., but differs in coming from the low, hot coastal plain of the west coast, while *Ae. petraea* comes from much

higher elevations; it also has a very different pubescence, larger leaflets, smaller bracts and flowers, glabrous calyx, etc." The most obvious difference is in the pubescence, exclusive of the glandular hairs, of the fruit and inflorescence. All the material of *Ae. petraea* seems to have spreading, often crispate, pubescence but the two collections of *Ae. simulans* exhibit appressed hairs.

Vegetatively, *Ae. simulans* most resembles *Ae. petraea* var. *grandiflora*, but differs in having smaller flowers more like those of typical *Ae. petraea*. Apparently it is a near relative of that species. For the present, with so little data, it is believed preferable to maintain the status quo, with *Ae. simulans* as an independent species.

The two collections, *Rose* 1487 and *Rose* 1616, were cited as syntypes in the original description. Since there is slightly more material of the latter number, it seems desirable to designate *Rose* 1616 as the lectotype.

59. *Aeschynomene petraea* Robins. Proc. Amer. Acad. 27: 166. 1892.

Shrub or suffrutescent perennial, 1–4 m. high; stems pubescent when young, sometimes with glandular development, glabrate, often with grayish bark when mature; stipules obliquely lanceolate to ovate, acute, subcordate at base, about 5–10 mm. long, 2–4 mm. wide, pubescent, ciliate; leaves extremely variable, 5–15 cm. long, 6–40-foliolate, the petiole and rachis subglabrous to densely pubescent; leaflets elliptic to oblong, the smallest about 4 mm. long and 2 mm. wide, the largest 25 mm. long, 12 mm. wide, obtuse to subacute, entire, the larger leaflets tending to be subglabrous above and lightly pubescent on the lower surface, the smaller leaflets usually densely pubescent on both surfaces; inflorescences terminal or axillary, often paniculate; bracts subovate, acute to obtuse, 0.5–5 mm. long, 1–2 mm. wide, pubescent, sometimes with glandular hairs as much as 1–3 mm. long; flowers 6–15 mm. long; calyx 2–8 mm. long, pubescent, ciliate; standard 6–15 mm. long, the claw 1–3 mm. long, the blade orbiculate, 5–12 mm. in diameter, retuse, entire, pubescent on the outer face; wings and keel about as long as the standard, the wing blades 2–5 mm. wide, the keel blades 6–15 mm. long, 1.5–2 mm. wide; fruit 2–5, usually 2- or 3-articulate, the stipe 6–15 mm. long, pubescent, the articles moderately crisp-pubescent, about 8–12 mm. long, 5–9 mm. wide; seeds 4–6 mm. long, 2–3.5 mm. wide, dark brown.

59a. *Aeschynomene petraea* var. *petraea*.

Aeschynomene petraea Robins. Proc. Amer. Acad. 27: 166. 1892.

Leaves 15–40-foliolate, the leaflets about 4–10 mm. long, 2–5 mm. wide, densely pubescent to subglabrous; flowers 8–10 mm. long; fruit with stipe 6–7 mm. long and articles about 8–10 mm. long, 5–8 mm. wide.

TYPE LOCALITY: Rocky hills near Guadalajara, Jalisco, México. Type collected by Pringle (No. 5147), cited below.

DISTRIBUTION: México, the Sierra Madre of Jalisco, Colima, and México, at elevations of about 750 to 1,500 m. (fig. 9).

MÉXICO: "Sierra Madre," Seemann, probably 2189 (GH). **JALISCO:** Guadalajara, Pringle 5147 (GH TYPE). Zapotlán, Pringle 4386 (Ch, GH, Min, Mo, NY, UC, US). Tuxpan, Jones 597 (US); Purpus 518 (UC, US). **MÉXICO:** Temascaltepec, Hinton 457 (GH). **COLIMA:** Edw. Palmer 1153 in 1891 (GH, US).

The variable nature of *Ae. petraea* var. *petraea* is indicated by its dual appearance in the key. It is more or less intermediate between the extremes of the southern, small-flowered variety *madrensis* and the northern, large-flowered variety *grandiflora*. Its leaflets tend to be smaller than the species' average.

Most of the collections of this variety appear to be suffrutescent shoots from a woody root, perhaps regrowth after grazing or burning. The original description refers to the species as an annual. However, I believe that, given the opportunity, the plants would be shrubby.

59b. *Aeschynomene petraea* var. *madrensis* (Micheli) Rudd, comb. nov.

Aeschynomene madrensis Micheli, Mem. Soc. Phys. Genève 34: 255, pl. 8. 1903.

Aeschynomene pringlei Rose, Contr. U. S. Nat. Herb. 8: 312. 1905.

Leaves 6–24-foliolate, the leaflets about 5–15 mm. long, 3–8 mm. wide, the upper surface pubescent to glabrate, the lower pubescent; flowers about 5–8 mm. long; fruit with stipe 5–7 mm. long, the articles 8–12 mm. long, 5–7 mm. wide.

TYPE LOCALITY: "Sierra Madre, versant oriental" [vicinity of Río Coyuquilla], Guerrero, México, at 1,500 m. elevation. Type collected by Langlassé (No. 865), cited below.

DISTRIBUTION: México, Sierra Madre of Morelos, Michoacán, and Guerrero, in llanos and oak forests, at elevations of about 1,000 to 1,500 m. (fig. 9).

MÉXICO: **MORELOS:** Jojutla, Pringle 8709 (Ch, GH, Min, Mo, NY, UC, US TYPE of *Ae. pringlei*). **MICHOACÁN:** Coalcomán, Hinton 12950 (GH, NY, US), 13804 (GH). **GUERRERO:** "Sierra Madre," Langlassé 865 (GH, US, ISOTYPES). Taxco, R. Q. Abbott 79 (GH). Mesa Quisle, Mina, Hinton 11332 (GH, NY, US). Manchón, Mina, Hinton 11332 (GH, NY, US).

This variety is based on *Ae. madrensis*, which Standley (Contr. U. S. Nat. Herb. 23: 491. 1922) placed in synonymy under *Ae. petraea*. Occurring at the southern extreme of the species' known range, it is separable from the typical and other varieties by its smaller flowers, sometimes suggesting those of *Ae. paucifoliolata*. In other respects it falls well within the limits of the species.

Comparison of *Ae. pringlei* with *Ae. madrensis* reveals no important differences and the two are here placed in synonymy.

59c. *Aeschynomene petraea* var. *grandiflora* Rudd, var. nov.

Aeschynomene glomerata M. E. Jones, Contr. West. Bot. 15: 139. 1929.

A varietate typica floribus fructibusque majoribus differt.

Leaves about 12–40-foliolate, the leaflets mostly 10–25 mm. long, 4–10 mm. wide, moderately pubescent to subglabrous; flowers (8–) 10–15 mm. long; fruit with stipe 7–15 mm. long, the articles 10–12 mm. long, 7–9 mm. wide.

TYPE: In the U. S. National Herbarium, No. 360251, collected near Chacala, Durango, México, Feb. 23, 1899, by E. A. Goldman (No. 329). Duplicate at NY.

DISTRIBUTION: México, in Sinaloa and Durango, south to Jalisco, on rocky, grassy, oak slopes and in pine forest, at elevations up to about 1,800 m. (fig. 9).

MÉXICO: SINALOA: *Ortega*, in 1921 (US). Mazatlán, *Ortega* 5099 (US). Cerro Colorado, *Gentry* 5115 (Ch, GH, Mo, NY, UC, US). DURANGO: San Ramón, *Edw. Palmer* 129 in 1906 (US). NAYARIT: Acaponeta, *Jones* 23025 (Ch, GH fragment, UC photo of TYPE of *Ae. glomerata* ex Pom). JALISCO: San Sebastián, *Mexia* 1648 (US). Between Mascota and San Sebastián, *Nelson* 4058 (US). Talpa de Allende, *Nelson* 4033 (US). Ameca, *McVaugh* (Mich).

The large flowers and fruits of this group of specimens from the northern part of the species' range are distinctive. However, the differences seem to be in degree rather than in character, and it is believed that varietal status under *Ae. petraea* is correct.

The Jones collection from Nayarit was given specific status as *Ae. glomerata*, admittedly "near to *Ae. petraea*," and considered a synonym of *Ae. petraea* by Morton (Contr. U. S. Nat. Herb. 29: 100. 1945). I believe it to be a somewhat depauperate-flowered specimen of *Ae. petraea* var. *grandiflora*. There appears to have been some disturbance of growth in the floral axes of the material examined. The large, subglabrous leaflets, about twice the size of those found in typical *Ae. petraea*, correspond to those of the var. *grandiflora*.

60. *Aeschynomene egena* (Macbr.) Rudd, comb. nov.

Aeschynomene mollicula H. B. K. var. *egena* Macbr. Field Mus. Publ. Bot. 13: 443. 1943.

Shrub about 1 m. high; stems glabrous; stipules lanceolate-ovate, acute to acuminate, somewhat falcate or obliquely subcordate, 6–8 mm. long, 2–4 mm. wide at base, glabrous; leaves 4–5 cm. long, 10–20-foliolate; leaflets oblong-elliptic, obtuse, about 5–12 mm. long, 3–5 mm. wide, glabrous; inflorescences racemose, axillary, few-flowered, the axes glabrous or subglabrous, the bracts and bracteoles subcordate, acute, about 3 mm. long and 2 mm. wide, glabrous; flowers about 20 mm. long; calyx 6–8 mm. long, glabrous; standard about 20 mm. long, the claw about 5 mm. long, the blade suborbiculate,

about 15 mm. long and 13 mm. wide, entire; wings and keel about as long as the standard, the claws 3 mm. long, the blades about 17 mm. long, the wing blades about 5.5 mm. wide, the keel blades about 4 mm. wide; stamens 18–20 mm. long; fruit 5- or 6-articulate, the stipe about 15 mm. long, glabrous, the articles about 6 mm. long and 4 mm. wide (or possibly larger), somewhat pubescent along margin, otherwise glabrous; mature fruit and seeds not seen.

TYPE LOCALITY: Mountains between Tabaconas and Marañon rivers, Department of Cajamarca, Jáen, Perú, at 1,000–1,200 m. elevation. Type collected by Weberbauer (No. 6176), cited below.

DISTRIBUTION: Known only from the type collection (fig. 10).

PERÚ: CAJAMARCA: Between Ríos Tabaconas and Marañon, *Weberbauer* 6176 (Ch, GH TYPE, NY, US).

It is believed that this taxon merits specific status. The subglabrous, 5- or 6-articulate fruits with stipes about 15 mm. long are distinctive, and the flowers are by far the largest of the section *Ochopodium*. Unfortunately, it is thus far known from the type collection only.

61. *Aeschynomene interrupta* Benth. in Hook. Journ. Bot. 2: 56. 1840.

Shrub 1–3 m. tall; stems appressed-pubescent and also glandular-hispidulous when young, glabrate, with grayish brown bark when older; stipules deltoid, acute to acuminate, 2–4 mm. long, 1–2 mm. wide at base, pubescent to subglabrous; leaves 2–4 cm. long, 7–16-foliolate; leaflets oblong-elliptic, about 6–10 mm. long, 2.5–4 mm. wide, obtuse to subacute, entire, the upper surface glabrous, the lower surface subglabrous or thinly pubescent; inflorescences axillary, racemose, few-flowered, the bracts and bracteoles ovate, obtuse, about 1 mm. long, 0.5–1 m. wide, sparsely pubescent; flowers about 10–12 mm. long; calyx 3–4 mm. long, subglabrous; standard glabrous, about 10 mm. long, the claw 2 mm. long, the blade broadly cordate, about 8 mm. long and 10 mm. wide, sometimes retuse; wings and keel about as long as the standard, the wing blades 4.5–5 mm. wide, the keel blades about 1.5 mm. wide; fruit 1–3-articulate, the stipe 6–8 mm. long, the articles about 10 mm. long and 6 mm. wide, glabrous; seeds about 6 mm. long and 3 mm. wide, dark brown.

TYPE LOCALITY: "Rio Branco, British Guiana." Type collected by Schomburgk (No. 803), cited below.

DISTRIBUTION: Known only from the general region of the type collection, on inundated land along rivers, in gallery woods, and in fields (fig. 10).

BRITISH GUIANA: "Rio Branco," *Schomburgk* 803 (F. M. neg. 2147 ex B, Ch, fragment ex B, GH, US, ISOTYPES).

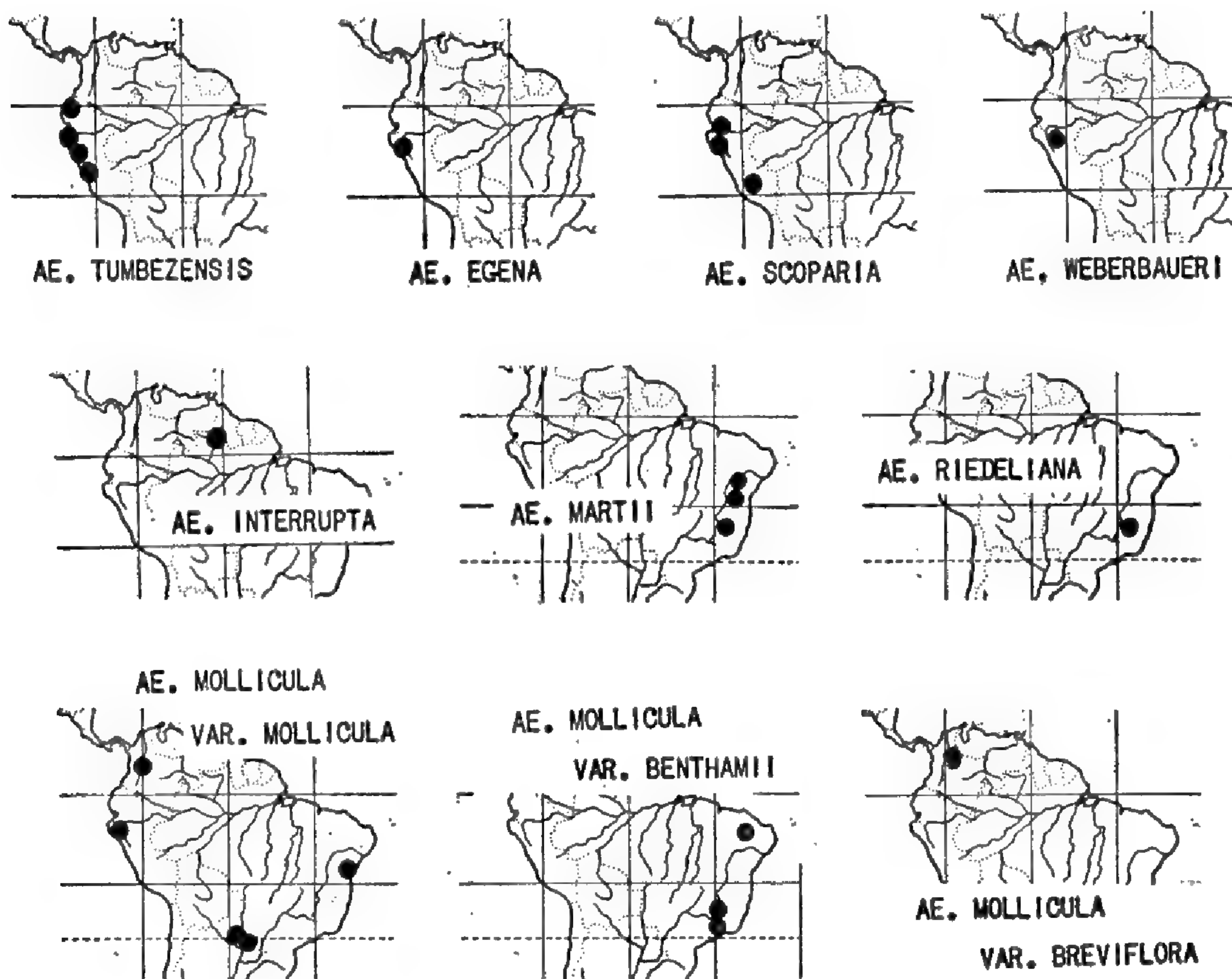


FIGURE 10. Distribution of the *Scopariae*: South American taxa.

BRAZIL: RIO BRANCO: Rio Cauamé, *Ducke* 1312 (NY, R, US), 35479 (US); *Kuhlmann* 3231 (US). São Marcos, *Luetzelburg* 20489 (R), 20490 (R), 20530 (R). Serra de Xiriry, *Luetzelburg* 20527 (R). Igarapé Agua Bôa, *Black* 51-13139 (US).

As indicated in the key, this species, apparently localized in the Rio Branco region of Brazil and British Guiana, is similar to another rather glabrous species, *Ae. tumbezensis* of Perú and Ecuador, but is distinguished from it most readily by its smaller fruit and deltoid stipules.

62. *Aeschynomene tumbezensis* Macbr. Field Mus. Publ. Bot. 8:101. 1930.

Shrub 1-3 m. tall; stem pubescent when young, glabrate, with grayish brown bark when older, sometimes also glandular-hispidulous; stipules lanceolate, acuminate, about 4-8 mm. long and 1 mm. wide, white-pubescent when young, glabrate, sparsely ciliate; leaves about 4-6 cm. long, 12-20-foliolate; leaflets oblong, 5-20 mm. long, 3-5 mm. wide, commonly about 10 mm. long and 3.5 mm. wide, thinly appressed-pubescent on both surfaces, entire, obtuse; inflorescences racemose, axillary, few-flowered; peduncles and pedicels strigillose or sometimes patent-pubescent and also hispidulous; bracts ovate, acute, 1-2 mm. long, about 1 mm. wide, subglabrous to moderately pubescent; flowers about 10 mm. long; calyx about 3 mm. long,

glabrous, ciliate; standard about 10 mm. long, the claw 3 mm. long, the blade suborbiculate-cordate, 7–8 mm. long, 8–10 mm. wide, entire, retuse, pubescent on the outer face; wings and keel about as long as the standard, the wing blades about 5 mm. wide, the keel blades about 2 mm. wide; stamens about 10 mm. long; legume 2–4-articulate, the stipe hispidulous, 8–10 mm. long, the articles about 10 mm. long and 8 mm. wide, glabrous, sometimes ciliate, reticulate-veiny; seeds about 4 mm. long and 2.5 mm. wide, brown.

TYPE LOCALITY: Tumbes, Perú, in mountains east of Hacienda Chicama, in deciduous brushwood, at 400–500 m. altitude. Type collected by Weberbauer (No. 7669), cited below.

DISTRIBUTION: Ecuador and Perú, at elevations up to about 2,000 m., in shrub land (fig. 10).

ECUADOR: MANABÍ: Bahía, *Mille* 1118 (Ch). Between La Salina and Chone,, *Acosta-Solis* 10630 (Ch). **GUAYAS:** "Cerro of Lantana," *Jameson* 586 (US). Between Guayaquil and Salinas, *Hitchcock* 20024 (GH, NY, US).

PERÚ: TUMBES: Chicama, *Weberbauer* 7669 (Ch TYPE). Between Zorritos and Tumbes, *Weberbauer* 7746 (Ch). PIURA: Cana Dulce watercourse, *Haught* F. 87 (Ch), 177 (Ch, NY, US). LA LIBERTAD: Quirripe-Membrillar, *López-Miranda* 926 (US). LIMA: *Pavón* 36 (Ch, fragment ex P). Santa Eulalia valley, *Goodspeed & Stork* 11478 (GH, Mo, UC). Valley of Río Rimac, *Goodspeed & Metcalf* 30218 (Mo, UC, US). Surco, *Soukup* 3743 (US). Chosica, *Ferreyra* 583 (US). Between Lima and Oroya, *Ferreyra* 1371 (US), 5326 (US).

Aeschynomene tumbezensis is characterized by the large, glabrous, flat-jointed fruits, possibly the largest of any South American species of this series. It somewhat resembles *Ae. egena* but has smaller flowers, and the fruits have shorter stipes.

It almost certainly was material of this species which Bentham referred to in his description of *Ae. platycarpa* when he stated "habitat in Columbiae et Peruviae" However, no collections were cited from the Andes and a Riedel specimen from Brazil is considered the type.

Since I am convinced that the Andean and the Brazilian material represent two distinct taxa, I am reinstating Macbride's name *Ae. tumbezensis* for the former, which he himself reduced to synonymy under *Ae. platycarpa* (*Field Mus. Bot. Pub.* 13 (3): 443. 1943), and I am proposing a new epithet, *benthamii*, for the latter, which is being designated as *Ae. mollicula* var. *benthamii*.

63. *Aeschynomene martii* Benth. in *Mart. Fl. Bras.* 15 (1): 62. 1859.

Shrub about 2 m. tall; stems canescent when young, glabrate, brownish-barked when older; stipules deltoid-lanceolate, acuminate, 3–4 mm. long, 1–1.5 mm. wide at base, pubescent; leaves 1.5–2.5 cm. long, 15–30-foliolate; leaflets oblong, obtuse, 5–8 mm. long, 1.5–2 mm. wide, the upper surface subglabrous, the lower sparsely appressed-

pubescent to glabrous, prominently reticulate; inflorescences axillary, fasciculate, few-flowered, the bracts and bracteoles deltoid-ovate, acute, about 1 mm. long, 0.5–1 mm. wide, appressed-pubescent; flowers 11–14 mm. long; calyx 4–5 mm. long, sparsely pubescent, ciliolate; standard averaging about 12 mm. long, the claw 3 mm. long, the blade suborbiculate, retuse, about 9 mm. long and 10 mm. wide, pubescent on the outer face; wings and keel about as long as the standard, the wing blades about 4 mm. wide, the keel blades about 3.5 mm. wide; stamens about 12 mm. long; ovary about 5 mm. long, 3-ovulate, appressed-pubescent along the margins, otherwise glabrous, the stipe about 4 mm. long; mature fruit and seeds not seen.

TYPE LOCALITIES: In caatinga near Joazeiro, Bahia, and Serro Frio, Minas Gerais, Brazil. Syntypes collected by Martius.

DISTRIBUTION: Bahia and northern Minas Gerais, according to Bentham (fig. 10).

BRAZIL: BAHIA: Tamburi, *Ule* 7278 (K).

Although I have not seen either of the syntypes, I have seen a more recent specimen, which apparently is an authentic representation of the species. It was collected in the general region of the type collections and corresponds almost exactly with Bentham's original description and illustration in "Flora Brasiliensis".

This species is similar to *Ae. scoparia*, but differs most conspicuously in having longer, more glabrous leaflets and larger flowers.

64. *Aeschynomene riedeliana* Taub. *Flora* 72: 424. 1889.

Aeschynomene tijucensis Taub. ex Glaziou, *Bull. Soc. Bot. France*, Mem. 3b: 132. 1906.

Shrub about 1 m. high; stems densely patent-pubescent and also hispidulous; stipules lanceolate, acuminate, 5–6 mm. long, about 2 mm. wide at base, hispidulous; leaves about 7–15 cm. long, 25–36-foliolate; leaflets suborbiculate-elliptic, 6–18 mm. long, 5–12 mm. wide, obtuse to emarginate, the base subcordate, the upper and lower surfaces glabrous to moderately pubescent; inflorescences axillary, racemose, few-flowered, the axes pubescent and hispidulous, the bracts and bracteoles ovate-lanceolate, acute, about 2 mm. long and 1 mm. wide, hispidulous, ciliolate; flowers 8–10 mm. long; calyx 4–5 mm. long, ciliolate; petals 8–10 mm. long, clawed, the standard blade about 8 mm. wide, emarginate, pubescent on the outer face, the keel claws 2.5 mm. long; fruit 1–3-articulate, the stipe 6–8 mm. long, glabrous, the articles 5–7 mm. long, about 5 mm. wide, glabrous or nearly so, reticulate-veiny; seeds about 3 mm. long and 2.5 mm. wide, brown.

TYPE LOCALITY: Diamantina, Minas Gerais, Brazil, in gravel. Type collected by Riedel (No. 1223), cited below.

DISTRIBUTION: Known only from the general vicinity of the type collection.

BRAZIL: MINAS GERAIS: Diamantina, Riedel, Dec. 18, 1824 [annotated as "*Ae. tejucensis* Taub. n. sp.; probably = No. 1223"] (N. Y. neg. n. s. 2296 of ISOTYPE ex K; F. M. neg. 2154, presumably of TYPE EX B); Glaziou 19027 (Ch fragment ex P, R).

This species is rather distinctive because of its numerous subglabrous, suborbiculate leaflets and its fruits, which are among the smallest of the series.

Collected by Riedel at "Tijuco," correctly spelled Tejuco and now known as Diamantina, it was given the herbarium name of *Ae. tejucensis* by Taubert, i. e., a sheet collected by Riedel on Dec. 18, 1824, was so labeled. Later, Taubert published *Ae. riedeliana*, based on Riedel's collection No. 1223 of December 1824 but with no mention of the name *tejucensis*. A comparison of the description of *Ae. riedeliana* with a photograph of *Ae. tejucensis* and the fact that the sheet at Kew has both specific names convince me that these taxa are actually based on the same collection.

In 1906, Glaziou reported one of his collections to be "*Ae. tijucensis* Taub. n. sp. in herb. Berol., Kew, etc." Adding to this a minimum of Latin description, he thus validated Taubert's earlier unpublished species. Fortunately, it was by then a synonym of *Ae. riedeliana*, already legitimately published, and there need be no great concern for the orthographic problem of *tijucensis* vs. *tejucensis* or whether the Glaziou specimen rather than the Riedel specimen is more accurately designated and should be considered the type of *Ae. tijucensis*.

65. *Aeschynomene weberbaueri* Ulbr. Bot. Jahrb. 37: 554. 1906.

Shrub about 5 dm. tall; stems densely pilose and also glandular-hispidulous; stipules linear-lanceolate, about 5–10 mm. long, 1–2 mm. wide at base, densely pubescent; leaves 2–3 cm. long, 20–35-foliolate; leaflets oblong, acute, 4–6 mm. long, 1–2 mm. wide, densely pubescent and also ciliate with glandular hairs; inflorescences axillary, racemose, usually longer than the subtending leaves, the pedicels pubescent like the stems, the bracts lanceolate-ovate, acute, about 3 mm. long, 1–2 mm. wide, densely pubescent like the stipules and leaflets; flowers 10–12 mm. long; calyx 3–4 mm. long, pubescent; standard commonly about 12 mm. long, the claw 2.5 mm. long, the blade subcordate about 9.5 mm. long, 8–9 mm. wide; wings and keel about as long as the standard, the wing blades 5–6 mm. wide, the keel blades

1.5–2.5 mm. wide; stamens about 12 mm. long; fruit 3- or 4-articulate, the stipe 6–8 mm. long, glandular-hispidulous, the articles about 5 mm. long and 4 mm. wide, pubescent; seeds about 4.5 mm. long and 3 mm. wide, dark brown.

TYPE LOCALITY: East side of the Marañon valley, near Balsas Department of Amazonas, Perú. Type collected by Weberbauer (No. 4274), cited below.

DISTRIBUTION: Known only from the type locality (fig. 10).

PERÚ: AMAZONAS: Balsas, *Weberbauer* 4274 (Ch, fragment of **TYPE** ex B; F. M. neg. 2156 of **TYPE** ex B; USM); *Evinger & Hodge* 509 (US).

This species, known only from the type locality, suggests *Ae. scoparia* with excessive glandular development. However, *Ae. weberbaueri* differs in several characters, including larger flowers, large bracts, and somewhat wider and more pubescent fruits.

66. *Aeschynomene scoparia* H. B. K. Nov. Gen. & Sp. 6: 532. 1824.

Shrub 0.5–1.5 m. tall; stem silvery-sericeous when young, sometime also glandular, glabrate, brownish barked when older; stipules 5–10 (–10) mm. long, 1–2 mm. wide at base, lanceolate, attenuate, sericeous; leaves 1–3.5 cm. long, 15–30-foliolate; leaflets oblong, 2–6 mm. long, 1.5–2 mm. wide, sericeous to subglabrous on both surfaces, entire, obtuse, the base rounded to subcordate, the reticulations prominent on the less pubescent specimens; inflorescences axillary, racemose, the peduncles and pedicels sericeous and sometimes also beset with glandular hairs, the bracts and bracteoles obtuse to acute, 1–2 mm. long, about 1 mm. wide, sericeous, sometimes ciliate; flowers 8–11 mm. long; calyx 3–5 mm. long, sericeous or nearly so; standard 8–11 mm. long, the claw 2–4 mm. long, the blade cordate to reniform, about 6 mm. long, 8–9 mm. wide, entire, retuse, the outer face pubescent; wings and keel about as long as the standard, the wing blade 4–5 mm. wide at maximum, the keel blades about 2 mm. wide; stamens 7–10 mm. long; legume 2- or 3-articulate, the stipe (3–) 8–10 mm. long, the articles about 5 mm. long, 3.5–4 mm. wide, appressed-pubescent to glabrate; seeds about 4 mm. long and 2 mm. wide, dark brown.

TYPE LOCALITY: Near Huancabamba (as “Guanacabamba”) Piura, Perú. Type collected by Humboldt and Bonpland (No. 3543), cited below.

DISTRIBUTION: Andes of Ecuador and Perú, at elevations of about 1,700–2,600 m. (fig. 10).

ECUADOR: LOJA: Between Loja and San Pedro, *Rose, Pachano, & Rose* 23349 (GH, NY, US). Between San Pedro and Colaisaca, *Townsend* A. 76 (US).

PERÚ: PIURA: Huancabamba, *Humboldt & Bonpland* 3543 (Ch, fragment of **TYPE** ex P; Killip neg. 726 of **TYPE** ex P; F. M. neg. 2243 of **ISOTYPE** ex B); *Weberbauer* 6071 (GH). **CAJAMARCA:** Santa Cruz, *Weberbauer* 4118 (USM). Shumaya

Weberbauer 6276 (Ch, GH). Yamaluc, *Ferreya* 8449 (US). ANCASH: Río Tachachaca below Pampas, *Weberbauer* 7018 (GH, USM). HUANCABELICA: Río Mantaro below Colcabamba, *Weberbauer* 6458 (GH, USM). APÚRIMAC: Abancay, *Weberbauer* 5910 (GH, US); *Vargas* 458 (Ch), 1989 (GH).

This species shows certain relationships with *Ae. weberbaueri* and with *Ae. mollicula*, particularly with varieties *breviflora* and *benthamii* of the latter. It has small leaflets and fruits similar to those of the former, but with less indument and glandular development. Its flowers closely resemble those of the shorter flowered varieties of *Ae. mollicula*, but the latter have longer leaflets and fruits with more or less spreading pubescence, in contrast to the appressed pubescence of *Ae. scoparia*. The flowers are conspicuously shorter and less showy than those of either *Ae. weberbaueri* or typical *Ae. mollicula*.

7. *Aeschynomene mollicula* H. B. K. Nov. Gen. & Sp. 6: 532. 1824.

Shrub or suffrutescent perennial, 1–2 m. high; stems densely sericeous or pilose to subglabrous, sometimes also hispid; stipules lanceolate, attenuate, 5–8 mm. long, 1–2 mm. wide at base, pubescent, sometimes glandular; leaves 3–6 cm. long, 18–40-foliolate, the axes pubescent like the stems; leaflets oblong, 8–15 mm. long, 1.5–4 mm. wide, obtuse to subacute, the base obliquely rounded to subcordate, the upper surface subglabrous to sericeous, the lower surface moderately pubescent to sericeous; inflorescences axillary, racemose or fasciculate, few-flowered; peduncles and pedicels pubescent like the stems, the bracts and bracteoles lanceolate to ovate, attenuate to acute, 1–4 mm. long, 0.5–1 mm. wide, pubescent; flowers 8–15 mm. long; calyx 3–6 mm. long, pubescent; standard 8–15 mm. long, the claw 2–3 mm. long, the blade suborbiculate to cordate, 6–12 mm. long, 10–14 mm. wide, entire, retuse, the outer face pubescent; wings and keel about as long as the standard, the wing blades 3–6 mm. wide, the keel blades 2–4 mm. wide at maximum; stamens 8–15 mm. long; fruit 3–7-articulate, the stipe about 4–6 mm. long, pubescent, sometimes glandular, glabrous toward the base, the articles 4–7 mm. in diameter, crisp-pubescent, sometimes glabrate; seeds 2–3 mm. long, about 2 mm. wide, brown.

a. *Aeschynomene mollicula* var. *mollicula*.

Aeschynomene mollicula H. B. K. Nov. Gen. & Sp. 6: 532. 1824.

Aeschynomene pauciflora Vog. Linnaea 12: 93. 1838.

Stems and floral axes with sericeous indument; leaves 20–40-foliolate, the leaflets subacute, subglabrous to moderately pubescent; bracts and bracteoles lanceolate, attenuate, 3–4 mm. long; flowers 11–15 mm. long, the calyx about 6 mm. long; fruit commonly 4–6-articulate, moderately pubescent at maturity.

TYPE LOCALITY: "Inter Paramo de Yamoca et villam Colasey, alt 750 hex. (Provincia Jaen de Bracamoros)," Perú. Type collected by Humboldt and Bonpland (No. 3586), cited below.

DISTRIBUTION: Colombia, Perú, Paraguay, and Brazil, at elevation of about 350–600 m. (fig. 10).

COLOMBIA: CUNDINAMARCA: Girardot, *Rusby & Pennell* 136 (GH, Mo, NY, US). Apulo, *Killip, Dugand, & Jaramillo* 38144 (Ch, US). Tocaima, *García Barriga* 13408 (US).

PERÚ: CAJAMARCA: Between the "Paramo de Yamoca" and "Colasey," *Humboldt & Bonpland* 3586 (Ch fragment of **TYPE** ex P; F. M. neg. 2241 of **ISOTYPE** ex B). Perico, *Raimondi* 9267 (USM).

BRAZIL: BAHIA: *Blanchet* 2401 (NY).

PARAGUAY: "Gran Chaco: Santa Elisa lat. S. 23°10'." *Hassler (Rojas)* 281 (K). **CONCEPCIÓN:** Estrella, *Fiebrig* 4342 (GH).

As indicated above, the typical variety of *Ae. mollicula* is most readily distinguished by its relatively large, often showy flowers, and the appressed, sericeous indument of the young stems. The slender acuminate bracts and bracteoles seem to furnish a reliable diagnostic character and, in general, the leaves are made up of more numerous leaflets.

Although the specimens cited are from rather scattered geographical locations, examination shows them to be essentially identical. A photograph of the type of *Ae. pauciflora* indicates the Brazilian species to be synonymous with *Ae. mollicula*, first known from Perú. In this case, as in many others, it appears that the lacunae in the distribution record reflect lack of collection and not necessarily lack of occurrence.

67b. *Aeschynomene mollicula* var. *breviflora* Rudd, var. nov.

A varietate typica floribus minoribus, bracteis bracteolisque ovatis acutis, fructibus 3-articulatis differt.

Stems and floral axes with pilose indument; leaves 18–24-foliolate, the leaflets predominantly obtuse, sericeous; bracts and bracteoles ovate, acute, 2–3 mm. long; flowers 8–10 mm. long, the calyx 3–4 mm. long; fruit commonly 3-articulate, rarely more, moderately pubescent at maturity.

TYPE: In the U. S. National Herbarium, No. 1355882, collected between Chinácota and La Esmeralda, Norte de Santander, Colombia, Mar. 19, 1927, by E. P. Killip and A. C. Smith (No. 20921). Duplicates at GH, NY.

DISTRIBUTION: Colombia, northern Cordillera Oriental, from Norte de Santander to Cundinamarca, at elevations of 400–1,800 m. (fig. 10).

COLOMBIA: SANTANDER: Between El Jaboncilla and Suratá, *Killip & Smith* 16455 (GH, NY, US). Bucaramanga, *Killip & Smith* 16278 (US). **CUNDINAMARCA:** Between Fusagasugá and Pandi, *Pennell* 2736 (GH, NY, US).

As indicated above and in the key, this variety differs from the typical one in several characters, most conspicuously in having smaller flowers.

67c. *Aeschynomene mollicula* var. *benthamii* Rudd, nom. et stat. nov.

Aeschynomene platycarpa Benth. in Mart. Fl. Bras. 15 (1): 63. 1859, non Michx. 1803, nec Raf. 1817.

Stems and floral axes subglabrous to moderately pubescent, sometimes also glandular-hispid; leaves 20–40-foliolate, the leaflets obtuse to subacute, sparsely pubescent to subglabrous; bracts and bracteoles ovate, acute, 1–2.5 mm. long, 0.5–1 mm. wide; flowers about 8–10 mm. long, the calyx 3–4 mm. long; fruit commonly 3-articulate, subglabrous at maturity.

TYPE LOCALITY: Near the Jequitinhonha River, Minas Gerais, Brazil. Type collected by Riedel (No. 591), cited below.

DISTRIBUTION: Eastern Brazil, in shady, rocky places (fig. 10).

BRAZIL: CEARÁ: *Allemão* 350 in part (R). Pacatuba, *Allemão* 350 in part (R). Cedro, *Löfgren* 1091 (R). MINAS GERAIS: Jequitinhonha River, *Riedel* 591 (Killip neg. 540 of TYPE ex K); Diamantina (as "Tejuco"), *Riedel* 1251 (F. M. neg. 2153 ex B; US). RIO DE JANEIRO: São Christovão, *Glaziou* 10506 (K).

Bentham's *Ae. platycarpa* was a later homonym of *Ae. platycarpa* Michx. and, hence, illegitimate when published. There has been confusion as to the limitations of this taxon, since, in addition to the Brazilian collections, which include the type, Bentham stated in the original description: "Habitat in Columbiae et Peruviae pluribus locis." The Andean and the Brazilian specimens almost certainly represent two elements, the former probably *Ae. tumbezensis*, or possibly *Ae. mollicula* var. *mollicula*, and the Brazilian collections represent what is here designated as *Ae. mollicula* var. *benthamii*.

The Brazilian material is distinguished most readily from *Ae. tumbezensis* by its smaller, more numerous leaflets, smaller flowers, and fruits with shorter stipes and smaller, pubescent articles.

It is separated from typical *Ae. mollicula* by its smaller flowers and ovate bracts and bracteoles, as is also var. *breviflora*. From the latter it is distinguished by the rather sparse pubescence of its stems, exclusive of glandular hairs, and the almost glabrous mature fruits.

There is some difference in amount of glandular development among the specimens cited above—the Riedel collections show very little, the Glaziou sheet and others, considerable—but I believe that all represent the same taxon.

Excluded and doubtful taxa

Aeschynomene aristata Jacq. Pl. Rar. Hort. Schoenb. 2: 59. 1797=*Pictetia aculeata* (Vahl) Urb. Symb. Ant. 2: 294. 1900.

Aeschynomene bispinosa Jacq. Ic. Pl. Rar. 3: 13. 1792=*Sesbania bispinosa* (Jacq.) Spreng. ex Steud. Nom. ed. 2, 2: 572. 1841.

Aeschynomene brasila Schrank, Denkschr. Bot. Ges. Regensb. 2: 63. 1822.

A specimen of this entity has not been available and the description is inadequate to make a determination. Bentham does not refer to it in "Flora Brasiliensis" (15(1): 56-70. 1859).

Aeschynomene cassioides Ruiz and Pav. ex G. Don, as synonym=*Sesbania cassioides* G. Don, Gen. Syst. Gard. Bot. 2: 240. 1832.

Aeschynomene coarctata DC. ex Seckt, Flora Cordobensis 297. 1930, nomen nudum.

This species name was published without a description and there seems to be no way of knowing to what element it referred. Burkart (Darwiniana 3: 158. 1939) also has been unable to place it.

Aeschynomene coccinea L. f. Suppl. 330. 1781=*Sesbania grandiflora* (L. f.) Pers. Syn. Pl. 2: 316. 1807.

Aeschynomene crepitans Jacq. Fragm. Bot. 37, tab. 42, fig. 2. 1809.

Neither the illustration nor the description, based on a fruit "cum solo titulo arboris & sine specimine sicco," is sufficient to identify this entity with certainty. It seems most likely to be a member of the Mimosoideae.

Aeschynomene dentata Lag. Gen. & Sp. Nov. 22. 1816=*Adesmia muricata* (Jacq.) DC. var. *dentata* (Lag.) Benth. in Mart. Fl. Bras. 15(1): 54. 1859.

Aeschynomene divisa Nees & Mart. Nov. Act. Nat. Cur. 12: 31. 1826.

This is synonymous with *Ae. americana* according to the Kew Index (1: 50. 1893). However, the dipetalous standard that characterizes this species is apparently an abnormality not known to occur consistently in any one element of the genus, and the name would be rejected according to Art. 77 of the International Code of Botanical Nomenclature (1952).

Aeschynomene emerus Aubl. Pl. Guian. 2: 775. 1775=*Sesbania emerus* (Aubl.) Urban, Fedde Repert. Sp. Nov. 16: 149. 1919.

Aeschynomene equidiadelpha Larranaga, Escritos D. A. Larranaga 2: 234 (as *Eschynomenes oquidiadelpha*), 490 (as *oquidiadelpha*). 1923.

Only the description is available and it is inadequate for placing this taxon. Perhaps it is referable to *Ae. montevidensis*.

Aeschynomene falcata var. *glabra* Micheli, Bull. Herb. Boiss. 6, App. 1: 33. 1898. This may be a glabrous variation of *Ae. falcata*, but on the basis of the description alone, without access to the type, it is impossible to be certain of its identity.

Aeschynomene falcata var. δ *microphylla* Chod. & Hass. Bull. Herb. Boiss. II, 4: 882. 1904.

The type has not been available, and from the description alone it is difficult to be certain whether this taxon is really a variety of *Ae. falcata* or, perhaps, *Ae. histris*.

Aeschynomene falcata β *plurijuga* Benth. in Mart. Fl. Bras. 15 (1): 68. 1859.

This variety is inadequately typified, being based on what I believe to be two dissimilar species.

Aeschynomene frutescens (L.) Poir. in Lam. Encyc. 4: 451. 1797 = *Lespedeza capitata* Michx. Fl. Bor. Am. 2: 71. 1803.

Aeschynomene grandiflora L. Sp. Pl. ed. 2, 2: 1050. 1763 = *Sesbania grandiflora* (L.) Pers. Syn. 2: 316. 1807.

Aeschynomene herbacea Aubl. Pl. Guian. 2: 775. 1775.

The illustration to which this species is referred appears to be *Neptunia prostrata* (Lam.) Baillon, Bull. Soc. Linn. Paris 1: 356. 1883.

Aeschynomene hispidula Lag. Gen. & Sp. Nov. 22. 1816 = *Adesmia muricata* var. *hispidula* Macbr. Field Mus. Publ. Bot. 13: 406. 1943.

Aeschynomene incana G. F. W. Mey. ex DC. Prodr. 2: 332. 1825 = *Desmodium canum* (Gmel.) Schinz & Thellung, Mém. Soc. Neuchât. Sci. Nat. 5: 371. 1913.

Aeschynomene latifolia Spreng. Syst. Veg. 2: 322. 1826 = *Adesmia latifolia* (Spreng.) Vog. Linnaea 12: 74. 1838.

Aeschynomene latisiliquosa Hill ex Steud. Nom. ed. 2, 1: 31. 1840 = *Chaetocalyx latisiliqua* (Desv.) Macbr. Field Mus. Publ. Bot. 13: 446. 1943.

Aeschynomene littoralis Vog. Linnaea 12: 96. 1838.

This entity was not given a formal description as were others in the same paper. However, reference to the illustration of *Hedysarum hirtum* Vell., with the observation "sed legumine sessili," suggests that this might be *Ae. viscidula* Michx.

Aeschynomene longifolia Cav. Ic. 4: 8. 1797 = *Daubentoniopsis longifolia* (Cav.) Rydb. Am. Journ. Bot. 10: 497. 1923.

Aeschynomene longifolia Orteg. Hort. Matr. Dec. 70. 1800 = *Daubentoniopsis longifolia* (Cav.) Rydb. Am. Journ. Bot. 10: 497. 1923.

Aeschynomene martiusii Steud. Nom. ed. 2, 1: 31. 1840 = *Ae. brasila* Schrank, Denkschr. Bot. Ges. Regensb. 2: 63. 1822.

This species is based on *Ae. brasila*, which is inadequately described and cannot be identified.

Aeschynomene microphylla Desv. ex DC. Prodr. 2: 322. 1825.

The description of this species seems to relate to *Aeschynomene*, but a leaf fragment, ex Ch, which I have seen, is unlike any other material of the genus with which I am familiar, and I am unable to place it satisfactorily.

Aeschynomene mimosoides Willd. ex Sch. & Cham. Linnaea 5: 584. 1830.

From the description only, without access to the type, it is impossible to identify the species.

Aeschynomene miniata Orteg. Hort. Matr. Dec. 28. 1800 = *Daubentonia punicea* (Cav.) DC. Mém. Leg. 286. 1825.

Aeschynomene monadelpha Larrañaga, Escritos D. A. Larrañaga 2: 234 (as *Aeschynomene*), 490. 1923.

Only the description is available, and it is inadequate for identifying this species.

Aeschynomene monosperma Desv. Mém. Soc. Linn. Par. 4: 328. 1826.

No specimens were cited and the description is inadequate to identify this species positively. It may be referable to *Ae. histrix*.

Aeschynomene onobrychifolia Desv. Mém. Soc. Linn. Par. 4: 327. 1826 = *Adesmia bicolor* (Poir.) DC. Prodr. 2: 319. 1825.

Aeschynomene papposa Lag. Gen. & Sp. Nov. 23. 1816 = *Adesmia papposa* (Lag.) DC. Ann. Sc. Nat. Par. 4: 95. 1825.

Aeschynomene patagonica Hort. ex Steud. Nom. ed. 2, 1: 31. 1840, as synonym = *Adesmia muricata* (Jacq.) DC. Ann. Sci. Nat. Par. 4: 95. 1825.

Aeschynomene picta Cav. Ic. 4: 7. 1797 = *Sesbania sesban* (L.) Merr. Philipp. Jour. Sci. Bot. 7: 235. 1912.

- Aeschynomene pimpinellaefolia*** Desv. Mém. Soc. Linn. Par. 4: 327. 1826=
Adesmia muricata var. *pimpinellifolia* (Poir.) Burkart, Darw. 3: 326. 1939.
- Aeschynomene platycarpa*** Michx. Fl. Bor. Am. 2: 75. 1803=*Glottidium vesicarium* (Jacq.) Harper, Bull. Torr. Bot. Club 28: 472. 1901.
- Aeschynomene sesban*** Jacq. Collect. ad Bot. 2: 283. 1788=*Sesbania bispinosa* (Jacq.) Spreng. ex Steud. Nom. ed. 2, 2: 572. 1841.
- Aeschynomene sesban*** L. Sp. Pl. 714. 1753=*Sesbania sesban* (L.) Merr. Philipp. Journ. Sci. Bot. 7: 235. 1912.
- Aeschynomene spicata*** Poir. in Lam. Encyc. 4: 452. 1797=*Desmodium canum* (Gmel.) Schinz & Thellung, Mém. Soc. Neuchât. Sci. Nat. 5: 371. 1913.
- Aeschynomene ternata*** Spreng. ex DC. Prodr. 2: 314. 1825=*Pictetia spinifolia* (Desv.) Urb. var. *ternata* (DC.) Urb. Symb. Ant. 2: 296. 1900.
- Aeschynomene triflora*** Poir. in Lam. Encyc. 4: 451. 1797=*Desmodium triflorum* (L.) DC. Prodr. 2: 334. 1825.
- Aeschynomene trisperma*** Klotzsch in Schomb. Faun. & Fl. Guy. 1103. 1848.
This may be *Aeschynomene brasiliensis* (Poir.) DC., which commonly has 3-articulate, 3-seeded fruits. The description, otherwise, is inadequate for positive identification of this taxon.
- Aeschynomene versicolor*** Wender. Bot. Zeit. 1: 346. 1843.
This species was based on cultivated plants grown from seed which had been sent from México and from Abyssinia. "Beide waren identisch." The description suggests *Ae. americana*, but, actually, there is no certainty as to specific or generic identification.
- Aeschynomene virgata*** Cav. Ic. 3: 47. 1797=*Daubentonia virgata* (Cav.) Rydb. N. Amer. Fl. 24: 208. 1924.
- Mantodda*** Adans. Fam. 2: 508. 1763.
Neither the illustration nor the description of the plant on which this genus was based can with certainty be identified with any known species of *Aeschynomene*, although the Kew Index (1: 50. 1893) does place it in synonymy with *Aeschynomene*.
- Rochea*** Scop. Introd. 296. 1777.
This genus was based on *Mantodda* and therefore is equally indefinite.
- Segurola*** Larrañaga, Escritos D. A. Larrañaga. Atlas, pt. 1. pl. 93. 1927.
This genus was published without a diagnosis, but with illustrations of the flower and fruit that appear to be based on a specimen of *Aeschynomene montevidensis* Vog. However, since another item, "segurola chañal, sp. nov." appears to be an *Adesmia*, it is impossible to know the limits of this genus.

New taxa, new names, and new combinations

- Aeschynomene*, series *Americanae* Rudd, ser. nov.
Aeschynomene, series *Fluminenses* Rudd, ser. nov.
Aeschynomene, series *Indicae* Rudd, ser. nov.
Aeschynomene, series *Montevidenses* Rudd, ser. nov.
Aeschynomene, series *Pleuronerviae* Rudd, ser. nov.
Aeschynomene, series *Scopariae* Rudd, ser. nov.
Aeschynomene, series *Sensitivae* Rudd, ser. nov.
Aeschynomene, series *Viscidulae* Rudd, ser. nov.
Aeschynomene americana var. *flabellata* Rudd, var. nov.
Aeschynomene americana var. *glandulosa* (Poir.) Rudd, comb. et stat. nov.
Aeschynomene brasiliiana var. *venezolana* Rudd, var. nov.
Aeschynomene denticulata Rudd sp. nov.
Aeschynomene egena (Macbr.) Rudd, comb. et stat. nov.
Aeschynomene evenia var. *serrulata* Rudd, var. nov.
Aeschynomene fluminensis var. *tuberculata* (Griseb.) Rudd, comb. et stat. nov.
Aeschynomene foliolosa Rudd, sp. nov.
Aeschynomene guatemalensis (Standl. & Steyerl.) Rudd, comb. nov.
Aeschynomene histrix var. *densiflora* (Benth.) Rudd, comb. et stat. nov.
Aeschynomene langlassei Micheli ex Rudd, sp. nov.
Aeschynomene magna Rudd, sp. nov.
Aeschynomene mollicula var. *benthamii* Rudd, nom. et stat. nov.
Aeschynomene mollicula var. *breviflora* Rudd, var. nov.
Aeschynomene paraguayensis Rudd, nom. et stat. nov.
Aeschynomene petraea var. *grandiflora* Rudd, var. nov.
Aeschynomene petraea var. *madrensis* (Micheli) Rudd, comb. et stat. nov.
Aeschynomene pratensis var. *caribaea* Rudd, var. nov.
Aeschynomene sensitiva var. *amazonica* Rudd, var. nov.
Aeschynomene sensitiva var. *hispidula* (H. B. K.) Rudd, comb. et stat. nov.
Aeschynomene unijuga (M. E. Jones) Rudd, comb. nov.
Aeschynomene villosa var. *longifolia* (Micheli) Rudd, comb. nov.
Aeschynomene villosa var. *mexicana* (Hemsl. & Rose) Rudd, comb. et stat. nov.

Collections of *Aeschynomene* cited

(The numbers associated with the specimens are, in most cases, those of the collectors. Some may be herbarium numbers and are so indicated if the fact is known)

ABBOTT, R. Q.

79. *petraea* var. *madrensis*
 407. *americana* var. *flabellata*
 467. *americana* var. *glandulosa*

ABBOTT, W. L.

517. *sensitiva* var. *sensitiva*
 539. *pratensis* var. *caribaea*
 651. *villosa* var. *villosa*
 875a. *evenia* var. *evenia*
 975. *evenia* var. *evenia*
 2945. *sensitiva* var. *sensitiva*

ABRAHAM, A. A.

88. *paniculata*

ACOSTA SOLIS, M.

10630. *tumbezensis*

AGUILAR, J. I.

1670. *ciliata*

ALAIN, BRO., AND KILLIP, E. P.

2081. *brasiliiana* var. *brasiliiana*
 2096. *pratensis* var. *caribaea*
 2139. *tenuis*
 2160. *brasiliiana* var. *brasiliiana*

ALLARD, H. A.

13414. americana var. americana
 13443. americana var. americana
 13837. americana var. americana
 14159. americana var. americana
 14254. elegans
 14602. villosa var. villosa
 14816. pratensis var. caribaea
 14930. villosa var. villosa

ALLEMÃO, BRO.

- 350, in part. marginata var. grandiflora
 in part. mollicula var. benthamii
 351, in part. rudis
 in part. scabra
 352, in part. evenia var. evenia
 in part. evenia var. serrulata
 in part. sensitiva var. sensitiva
 353, in part. marginata var. marginata
 in part. paniculata
 in part. rostrata
 354, in part. brasiliana var. brasiliana
 in part. histrix var. incana

ALLEN, P. H.

1104. americana var. glandulosa
 1283. americana var. glandulosa
 1295. americana var. glandulosa
 1976. sensitiva var. sensitiva
 4087. americana var. glandulosa
 6313. americana var. americana

ANDRÉ, E.

260. americana var. glandulosa
 2854. brasiliana var. brasiliana

ANTHONY, H. E., AND TATE, G. H.

52. americana var. glandulosa

APOLLINAR ÁNGEL, BRO.

753. americana var. glandulosa

APOLLINAR MARÍA, BRO.

- s. n. americana var. glandulosa
 s. n. brasiliana var. brasiliana
 s. n. elegans

ARAQUE M., J., AND BARKLEY, F. A.

270. paniculata
 285. histrix var. histrix
 18. N. S. 144. americana var. glandulosa
 19. At. 074. fascicularis
 19. Bo. 198. ciliata
 19. Bo. 200. sensitiva var. sensitiva

ARCHER, W. A.

26. villosa var. villosa
 279. elegans
 336. falcata
 462. sensitiva var. hispidula
 652. americana var. americana
 675. americana var. americana
 676. villosa var. villosa
 681. sensitiva var. hispidula
 745. sensitiva var. hispidula
 758. elegans
 1006. villosa var. villosa
 4412. falcata
 7682. evenia var. serrulata

ARCHER, W. A., AND GEHRT, A.

30. montevidensis

ARISTEGUIETA, L., AND PANNIER, F.

1078. americana var. americana

ARNOLDO, BRO. M.

1820. americana var. glandulosa
 1843. viscidula

ARSÉNE, BRO. G.

3114. americana var. flabellata
 3131. villosa var. longifolia
 3167. rudis
 6837. americana var. flabellata
 8579. villosa var. longifolia

ASPLUND, E.

5167. rudis
 5510. ciliata
 5646. pluriarticulata
 5692. americana var. americana
 5718. americana var. glandulosa

ATKINSON, I. VON R. DE

- 19291 (S. I. No.) montevidensis

BADILLO, V. M.

600. villosa var. villosa
 642. villosa var. villosa

BAILEY, L. H., AND BAILEY, E. Z.

253. americana var. americana
 293. americana var. americana
 300. sensitiva var. sensitiva
 763. ciliata
 1254. sensitiva var. sensitiva
 1347. histrix var. incana

BAKER, C. F.

- 143 (2278). *ciliata*
 199. *brasiliana* var. *brasiliana*
 694. *brasiliana* var. *brasiliana*
 s. n. *americana* var. *americana*

BAKER, C. F., AND ABARCA V., M.

4213. *evenia* var. *evenia*

BALANSA, B.

3090. *sensitiva* var. *sensitiva*

BALDWIN, J. T., JR.

3023. *oroboides*
 3072. *oroboides*
 4081. *paniculata*

BANG, M.

- 2082, in part. *brasiliana* var. *brasiliana*;
 in part. *elegans*
 2820. *falcata*

BANGHAM, W. N.

505. *sensitiva* var. *sensitiva*

BARCLAY, G.

- s. n. *villosa* var. *villosa*

BARKLEY, F. A.

- 18.A.231. *americana* var. *americana*

BARKLEY, F. A., AND GUTIERREZ V., G.

1752. *americana* var. *americana*

BARNES, C. R., AND LAND, W. J. G.

230. *fascicularis*
 293a. *villosa* var. *villosa*

BARNHART, J. H.

2183. *viscidula*
 2762. *viscidula*

BARROS, M.

767. *montevidensis*

BARTLETT, H. H.

11784. *paniculata*
 12351. *deamii*
 19271. *montevidensis*

BEECHEY, F. W.

- s. n. *paucifoliolata*

BERLANDIER, J. L.

990. *viscidula*
 2420. *viscidula*
 3137. *viscidula*

BERMÚDEZ G., L. A.

- 23, in part. *elegans*
 in part. *falcata*
 29. *villosa* var. *villosa*

BERMÚDEZ G., L. A., AND BARKLEY, F. A.

- 17.C.877. *elegans*

BERNOULLI, G.

1181. *americana* var. *glandulosa*

BERTERO, C. G.

- s. n. *evenia* var. *evenia*
 s. n. *pleuronervia*

BERTI Y ESCALENTE

513. *denticulata*

BILTMORE HERBARIUM

- 218a. *indica*
 218f. *indica*
 226a. *viscidula*
 226b. *viscidula*

BIOLLEY FIL, P.

3214. *villosa* var. *villosa*

BLACK, G. A., ET AL

- 48-2212. *sensitiva* var. *sensitiva*
 48-3489. *marginata* var. *marginata*
 48-3604. *marginata* var. *marginata*
 50-8841. *filosa*
 50-8933. *filosa*
 50-8962. *rudis*
 50-9138. *filosa*
 50-9217. *sensitiva* var. *sensitiva*
 50-9269. *evenia* var. *evenia*
 50-9372. *rudis*
 50-10259. *paniculata*
 50-10311. *ciliata*
 51-12269. *rudis*
 51-12497. *paniculata*
 51-12602. *histris* var. *incana*
 51-12622. *paniculata*
 51-12999. *histris* var. *densiflora*
 51-13076. *histris* var. *histris*

BLACK, G. A., ET AL—Continued

- 51-13139. interrupta
 51-13250. histrix var. densiflora
 51-13726. histrix var. incana
 51-13847½. pratensis var. caribaea
 51-14095. pratensis var. caribaea
 52-14196. brasiliiana var. brasiliiana
 52-14265. rudis
 52-14322. rudis
 52-14360. evenia var. evenia
 52-14398. pratensis var. caribaea
 52-14429. filosa
 52-14584A. americana var. glandulosa

BLANCHET, J. S.

946. evenia var. evenia
 1041. sensitiva var. sensitiva
 2401. mollicula var. mollicula
 2646. rostrata
 s. n. elegans
 s. n. histrix var. incana

BOLDINGH, I.

5215. viscidula

BOND, F. E.; GILLIN, T. S.; AND
BROWN, S.

120. evenia var. serrulata

BONPLAND, A.

1563. sensitiva var. hispidula
 s. n. sensitiva var. sensitiva

BOTTERI, M.

- 363, 572. villosa var. villosa
 663. scabra
 664. americana var. glandulosa
 665. villosa var. longifolia

BOURGEAU, E.

1860. scabra
 2210. rudis
 3169. villosa var. villosa
 3185. scabra
 3277. villosa var. longifolia

Box, H. E.

1245. americana var. glandulosa

BRANDEGEE, T. S.

141. nivea
 142. vigil
 s. n. americana var. glandulosa

- s. n. amorphoides
 s. n. fascicularis
 s. n. nivea
 s. n. scabra
 s. n. vigil
 s. n. villosa var. villosa
 s. n. viscidula

BRAY

- s. n. evenia var. serrulata

BRENES, A. M. (Herbarium)

3678. Brasiliiana var. brasiliiana
 4578 (363). villosa var. villosa
 4647 (432). americana var. glandulosa
 4688 (473). americana var. glandulosa
 4833 (618). elegans
 5027 (183). elegans
 5163a (317a). villosa var. villosa
 5856. americana var. glandulosa
 5856a. americana var. glandulosa
 5856b. americana var. glandulosa
 5960. americana var. glandulosa
 6450. elegans
 14336. americana var. glandulosa
 14611. americana var. glandulosa
 17236. americana var. glandulosa
 17308 (28). elegans
 17476 (15). elegans

BRINKER, R.

221. viscidula

BRINTON, J. B.

- s. n. virginica

BRITTON, N. L., ET AL

233. pratensis var. pratensis
 313. americana var. glandulosa
 489. americana var. americana
 613. americana var. glandulosa
 650. villosa var. villosa
 744. americana var. americana
 778. americana var. glandulosa
 975. brasiliiana var. brasiliiana
 1024. sensitiva var. sensitiva
 1056. sensitiva var. sensitiva
 1248. villosa var. villosa
 1467. portoricensis
 1498. ciliata
 1516. sensitiva var. sensitiva
 2051. villosa var. villosa

BRITTON, N. L., ET AL—Continued

2187. americana var. americana
 2295. americana var. americana
 2374. sensitiva var. sensitiva
 2508. brasiliana var. brasiliana
 2815. portoricensis
 3015. americana var. americana
 3041. viscidula
 4876. americana var. americana
 5875. portoricensis
 6164. villosa var. villosa
 6335. americana var. americana
 6436. villosa var. villosa
 6451. tenuis
 6645. portoricensis
 6672. sensitiva var. sensitiva
 6933. pratensis var. caribaea
 7086. tenuis
 7953. portoricensis
 8698. portoricensis
 8991. portoricensis
 9050. villosa var. villosa
 10001. viscidula
 10067. tenuis
 10077. sensitiva var. sensitiva
 10091. viscidula
 10118. tenuis
 12863. brasiliana var. brasiliana
 12891. americana var. americana
 13156. brasiliana var. brasiliana
 13175. villosa var. villosa
 14347. tenuis
 14472. viscidula
 15099. viscidula

BROADWAY, W. E. (Trinidad
 Herbarium)

140. americana var. americana
 153. brasiliana var. brasiliana
 156. sensitiva var. sensitiva
 460. brasiliana var. brasiliana
 636. brasiliana var. brasiliana
 2862. sensitiva var. sensitiva
 2862 bis. sensitiva var. sensitiva
 3667. sensitiva var. sensitiva
 3699. brasiliana var. brasiliana
 7527. americana var. americana
 7804. brasiliana var. brasiliana
 7842. americana var. americana
 s. n. americana var. americana
 s. n. sensitiva var. sensitiva

BUCHTIEN, O.

211. elegans
 791. brasiliana var. brasiliana
 4106, in part. elegans
 in part. falcata
 4107. elegans
 6122. elegans

BUCKLEY, S. B.

- s. n. viscidula

BUES, C.

- s. n. brasiliana var. brasiliana

BURCHELL, W. J.

1546. ciliata
 1614. sensitiva var. sensitiva
 1773. elegans
 5741. paucifolia
 6061-2. paucifolia
 7094-2. brasiliana var. brasiliana
 8050. paniculata
 8169. histrix var. incana
 8641. paniculata
 8754. histrix var. densiflora
 8801. sensitiva var. sensitiva
 8844. racemosa
 8907. brasiliana var. brasiliana
 9487. sensitiva var. sensitiva
 9647. brasiliana var. brasiliana

BURKART, A.

3630. rudis
 4887. rudis
 5876. denticulata
 7348. histrix var. incana
 7357. histrix var. incana
 8181. denticulata
 8191. montevidensis
 14040. denticulata
 14188. falcata
 15219. falcata
 15236. falcata
 15344. echinus
 16196. elegans
 16260. americana var. americana
 16262. villosa var. villosa
 16325. sensitiva var. sensitiva
 16837. villosa var. villosa
 16881. histrix var. incana
 16885. paniculata
 16903. evenia var. evenia

- BURKART, A.—Continued
16910. *americana* var. *americana*
 16931. *sensitiva* var. *sensitiva*
 16960. *americana* var. *americana*
 16961. *evenia* var. *evenia*
 16971. *evenia* var. *evenia*
 17131. *viscidula*
 17185. *evenia* var. *evenia*
 17203. *filosa*
 17215. *histris* var. *histris*
 17220. *viscidula*
 17367. *fascicularis*
- CABRERA, A. L.
730. *montevidensis*
 1999. *montevidensis*
 3217. *montevidensis*
- CALDERÓN, S.
56. *americana* var. *glandulosa*
 69. *villosa* var. *villosa*
 1038. *histris* var. *histris*
 1039. *viscidula*
 1043. *paniculata*
 1211. *paniculata*
 1263. *americana* var. *americana*
 1291. *americana* var. *flabellata*
 1767. *elegans*
 2470. *nicaraguensis*
- CAMP, W. H.
- E-2962. *villosa* var. *villosa*
- CANBY, W. M.
1516. *virginica*
 s. n. *virginica*
- CÁRDENAS, M.
1391. *sensitiva* var. *sensitiva*
 4453. *rudis*
- CARDONA, F.
650. *histris* var. *incana*
 1004. *paniculata*
- CARLSON, M. C.
1950. *compacta*
- CARTER, A., ET AL
2299. *nivea*
 2907. *nivea*
- CHAPMAN, A. W.
- s. n. *indica*
 s. n. *viscidula*
- CHAVES, D.
250. *americana* var. *glandulosa*
- CLAUSSEN, P.
757. *elegans*
- CLAYCOMB, G. B.
- s. n. *indica*
- CLAYTON, J.
614. *virginica*
- CLOS, E. C.
2133. *montevidensis*
- COCKRELL, T. D. A.
- s. n. *americana* var. *glandulosa*
- COLLINS, G. N.; KEARNEY, T. H.; AND
 KEMPTON, J. H.
128. *nivea*
- COMBS, R.
408. *viscidula*
 409. *pratensis* var. *caribaea*
 620. *americana* var. *americana*
- COMMERSON, P.
- s. n. *brasiliensis* var. *brasiliensis*
 s. n. *falcata*
- COMMONS, A.
- s. n. *virginica*
- CONZATTI, C.
3743. *americana* var. *glandulosa*
- COOPER, G. P., III
67. *sensitiva* var. *sensitiva*
- COOPER, J. J. (J. D. Smith Herbarium)
5756. *americana* var. *glandulosa*
- CORNELIO (VOGL), PADRE
10. *americana* var. *americana*
 39. *elegans*
 43. *americana* var. *americana*
 605. *elegans*

CORRELL, D. S., AND CORRELL, H. B.

10527. *indica*

CORY, V. L.

11069. *indica*

15080. *viscidula*

19863. *indica*

20362. *viscidula*

20512. *viscidula*

20515. *indica*

50911. *indica*

COWELL, J. F.

173. *ciliata*

CRAWFORD, J.

s. n. *virginica*

CRUEGER H. (Trinidad Herbarium)

1006. *brasiliana* var. *brasiliana*

CUATRECASAS, J.

1940. *fascicularis*

3853. *histris* var. *histris*

4044. *histris* var. *incana*

4248. *histris* var. *histris*

4472. in part. *evenia* var. *serrulata*
in part. *pratensis* var. *caribaea*

7697. *foliolosa*

10506. *americana* var. *glandulosa*

16192. *sensitiva* var. *sensitiva*

19754. *ciliata*

19758. *villosa* var. *villosa*

22856. *americana* var. *glandulosa*

22960. *falcata*

23040. *rudis*

23085. *americana* var. *glandulosa*

CURRAN, H. M.

208. *sensitiva* var. *sensitiva*

218. *montevidensis*

CURTISS, A. H.

241. *tenuis*

300. *pratensis* var. *caribaea*

606. *indica*

607. *viscidula*

4236. *viscidula*

4237. *indica*

4238. *viscidula*

4239. *viscidula*

4901. *viscidula*

5155. *indica*

s. n. *histris* var. *incana*

s. n. *indica*

DAHLGREN, B. E., AND SELLA, E.

187. *rudis*

DANIEL, BRO.

499. *falcata*

528. *elegans*

1008. *americana* var. *americana*

1187. *elegans*

4264. *villosa* var. *villosa*

DARROW, R. A., AND HASKELL, H. S.

2063. *villosa* var. *villosa*

DAVES, W. W.

s. n. *indica*

DAWE, M. T.

556. *filosa*

DAWSON, G.

343. *montevidensis*

DEAM, C. C.

26. *deamii*

137. *americana* var. *glandulosa*

DEGENER, O.

5179. *viscidula*

DE LA CRUZ, J. S.

3213. *sensitiva* var. *sensitiva*

DEMAREE, D.

30686. *viscidula*

33521. *indica*

33887. *indica*

34099. *indica*

DODGE, C. W., ET AL

8604. *americana* var. *glandulosa*

16913. *rudis*

17378. *americana* var. *glandulosa*

DOYLE, C. B.

37. *compacta*

DROUET, F.

2290. *filosa*
 2293. *evenia* var. *serrulata*
 2428. *viscidula*
 2497. *filosa*
 2557. *sensitiva* var. *sensitiva*
 2702. *rudis*

DRYANDER, FRAU E.

326. *villosa* var. *villosa*

DUCKE, A.

1312. *interrupta*
 1681. *marginata* var. *marginata*
 16065 (Herb. No.). *brasiliana* var. *brasiliana*
 35479 (Herb. No.) *interrupta*
 s. n. *histrix* var. *densiflora*
 s. n. *paniculata*

DUGAND, A.

3131. *americana* var. *americana*

DUNLAP, V. C.

343. *americana* var. *glandulosa*

DUSÉN, P.

1965. *sensitiva* var. *sensitiva*
 2435. *falcata*
 2546. *falcata*

DUSS, PÉRE

1062. *sensitiva* var. *sensitiva*
 1063, in part. *americana* var. *americana*
 in part. *villosa* var. *villosa*
 2645, in part. *americana* var. *glandulosa*
 in part. *villosa* var. *villosa*
 2655. *sensitiva* var. *sensitiva*
 3923. *viscidula*
 4163. *villosa* var. *villosa*

EARLE, F. S.

641. *tenuis*

EGGERS, H. F. A.

202. *americana* var. *americana*
 5940. *americana* var. *glandulosa*
 6728. *sensitiva* var. *sensitiva*
 13076. *sensitiva* var. *sensitiva*
 14775. *pluriarticulata*
 s. n. *americana* var. *americana*

EKMAN, E. L.

1721. *denticulata*
 1722. *falcata*
 1724. *montevidensis*
 1725. *montevidensis*
 2792. *americana* var. *americana*
 6455. *americana* var. *americana*
 8341. *brasiliana* var. *brasiliana*
 9799. *villosa* var. *villosa*
 10573. *sensitiva* var. *sensitiva*
 11877. *pratensis* var. *caribaea*
 12032. *filosa*
 12437. *fluminensis* var. *fluminensis*
 13296. *villosa* var. *villosa*
 14705. *fluminensis* var. *fluminensis*
 17879. *fluminensis* var. *tuberculata*
 18246. *sensitiva* var. *sensitiva*
 H. 1005. *pleuronervia*
 H. 2328. *villosa* var. *villosa*
 H. 2616. *evenia* var. *evenia*
 H. 2682. *sensitiva* var. *sensitiva*
 H. 8280. *pratensis* var. *caribaea*
 H. 13178. *americana* var. *americana*
 H. 13938. *villosa* var. *villosa*

ELIAS, BRO.

529. *ciliata*
 624. *pratensis* var. *caribaea*
 723. *americana* var. *americana*
 946. *fascicularis*
 1358. *fascicularis*

EMRICK, G. M.

93. *americana* var. *glandulosa*

EMYGDIO, L.

393. *sensitiva* var. *sensitiva*
 394. *ciliata*

ERVENDBERG, L. C.

16. *villosa* var. *villosa*

EUGENIO (LEITE), PADRE J.

542. *falcata*
 686. *americana* var. *americana*
 1877. *falcata*

EVINGER, E. L., AND HODGE, W. H.

509. *weberbaueri*

FARIS, J. A.

s. n. americana var. americana

FASSETT, N. C.

28335. americana var. glandulosa

FENDLER, A.

99. ciliata
 100. sensitiva var. sensitiva
 287. elegans
 288, in part. americana var. americana
 in part. villosa var. longifolia
 289. villosa var. villosa
 294. brasiliana var. brasiliana
 1779. americana var. americana
 1780. villosa var. villosa
 1781. brasiliana var. brasiliana
 1791. paniculata
 2212. sensitiva var. sensitiva

FERGUSON, A. M.

s. n. viscidula

FERNALD, M. L., AND LONG, B.

8724. virginica
 9343. virginica
 9344. virginica
 9580. virginica
 11052. virginica
 11053. virginica
 11354. virginica
 11355. virginica
 11578. virginica
 11579. virginica
 11580. virginica
 11581. virginica
 11597. virginica
 12672. virginica
 12673. virginica
 13058. virginica
 13358. virginica
 13957. virginica

FERREYRA, R.

583. tumbezensis
 1371. tumbezensis
 5126. sensitiva var. amazonica
 5326. tumbezensis
 5922. americana var. glandulosa
 8449. scoparia

FERRIS, R. S.

5817. villosa var. villosa
 6037. amorphoides
 6041. americana var. glandulosa

FIEBRIG, K.

52. sensitiva var. sensitiva
 210. montevidensis
 653. falcata
 678. histrix var. incana
 807. denticulata
 1321. rudis
 1321a. denticulata
 1442. sensitiva var. sensitiva
 1457. fluminensis var. fluminensis
 4059. magna
 4121. americana var. glandulosa
 4270. montevidensis
 4330. falcata
 4340. magna
 4342. mollicula var. mollicula
 4387. echinus
 5010. parviflora
 5109. paniculata
 5220. histrix var. histrix
 5646. montevidensis
 6136. montevidensis

FISHER, G. L.

147. indica
 35266. sensitiva var. sensitiva

FISHLOCK, W. C.

126. sensitiva var. sensitiva

FOCKE, H. C.

670. brasiliana var. brasiliana
 966. paniculata
 s. n. sensitiva var. sensitiva

FOREST DEPARTMENT OF BRITISH
 GUIANA

WB-19. paniculata
 WB-22. histrix var. incana
 WB-114. histrix var. incana

FOX, W. B.

3200. indica

FREDHOLM, A.

5348. viscidula
 5960. viscidula
 6340. indica

FRÓES, R. L., ET AL

1793. *sensitiva* var. *sensitiva*
 24710. *evenia* var. *serrulata*
 27105. *ciliata*
 27121. *fluminensis* var. *fluminensis*
 27136. *brasiliansa* var. *brasiliansa*
 27191. *rudis*
 27198. *rudis*
 27304. *filosa*
 27396. *histris* var. *histris*
 27864. *brasiliansa* var. *brasiliansa*
 27869. *marginata* var. *marginata*

FUERTES, PADRE M.

1667. *villosa* var. *villosa*
 1688. *villosa* var. *villosa*

GALEOTTI, H.

3158. *villosa* var. *longifolia*
 3184. *paniculata*

GALVIS V., A.

- s. n. *elegans*

GARBER, A. P.

- s. n. *indica*
 s. n. *viscidula*

GARCÍA-BARRIGA, H.

138. *elegans*
 145. *villosa* var. *villosa*
 4492. *brasiliansa* var. *brasiliansa*
 6313. *rudis*
 6367. *villosa* var. *villosa*
 6413. *ciliata*
 7515. *brasiliansa* var. *brasiliansa*
 13408. *mollicula* var. *mollicula*

GARCÍA, J.

167. *elegans*

GARDNER, G.

25. *elegans*
 976. *sensitiva* var. *sensitiva*
 1271. *histris* var. *incana*
 1542. *americana* var. *glandulosa*
 2095. *histris* var. *incana*
 2097. *brevipes*
 2098. *marginata* var. *marginata*
 2099. *marginata* var. *grandiflora*
 3682. *elegans*

GARGANTA FÁBREGA, M. DE

1077. *americana* var. *glandulosa*

GARNIER, BRO. ANTONIO

48. *fascicularis*
 A. 249. *americana* var. *glandulosa*
 3073. *americana* var. *glandulosa*

GARRONI, P.

69. *paniculata*

GAUMER, G. F.

495. *fascicularis*
 511. *fascicularis*
 955, in part. *americana* var. *americana*
 in part. *americana* var. *glandulosa*
 1126. *fascicularis*
 1529. *fascicularis*
 1808. *fascicularis*
 1819. *fascicularis*
 2092. *americana* var. *glandulosa*
 2093. *americana* var. *americana*
 2094. *americana* var. *americana*
 2095. *americana* var. *glandulosa*
 23282. *fascicularis*
 23614. *fascicularis*

GEHRIGER, W.

518. *elegans*

GEHRT, G.

4022. *paniculata*

GENTLE, P. H.

975. *paniculata*
 1365, in part. *deamii*
 in part. *rudis*
 1479. *sensitiva* var. *sensitiva*
 3884. *paniculata*
 4188. *histris* var. *incana*

GENTRY, H. S.

1737. *villosa* var. *villosa*
 1799. *villosa* var. *longifolia*
 1838. *fascicularis*
 3704. *nivea*
 3748. *nivea*
 4821. *fascicularis*
 4938. *fascicularis*
 5114. *amorphoides*
 5115. *petraea* var. *grandiflora*
 5590. *unijuga*
 5687. *unijuga*

GENTRY, H., S.—Continued

6656. *armorhoides*
s. n. *villosa* var. *villosa*

GIBBES, L. R.

s. n. *indica*

GINÉS, BRO.

2877. *americana* var. *glandulosa*

GLASSMAN, S. F.

2051. *scabra*
2185. *scabra*

GLAZIOU, A. F. M.

4210. *sensitiva* var. *sensitiva*
6503. *elegans*
8628. *evenia* var. *serrulata*
8629. *sensitiva* var. *sensitiva*
8630. *sensitiva* var. *sensitiva*
8631. *pratensis* var. *caribaea*
8632. *selloi*
8634. *ciliata*
10506. *mollicula* var. *benthamii*
12571. *filosa*
12573. *parviflora*
12575. *histris* var. *densiflora*
19027. *riedeliana*
20921. *paucifolia*
20923. *paniculata*

GODFREY, R. K.

6321. *indica*
8207. *indica*
50161. *indica*
50879. *indica*

GOLDMAN, E. A.

59. *villosa* var. *villosa*
242. *fascicularis*
329. *petraea* var. *grandiflora*
496. *fascicularis*
497. *rudis*

GOLL, G. P.

15. *americana* var. *americana*
168. *americana* var. *americana*
371. *americana* var. *americana*
455. *villosa* var. *villosa*
819. *americana* var. *americana*
928. *americana* var. *americana*

GONZÁLEZ (see ORTEGA)

GOODING, E. G. B.

82. *americana* var. *americana*

GOODSPEED, T. H., ET AL.

11478. *tumbezensis*
30218. *tumbezensis*

GRANT, V.

571. *americana* var. *glandulosa*
750. *brasiliiana* var. *brasiliiana*
874. *brasiliiana* var. *brasiliiana*
895. *rudis*

GREENMAN, J. M.

477. *fascicularis*
480. *fascicularis*
5048. *americana* var. *glandulosa*

GURGEL, J. T. A.

s. n. *falcata*

HAENKE, T.

1279. *compacta*
1543. *fascicularis*
1613. *compacta*
s. n. *americana* var. *americana*
s. n. *pluriarticulata*
s. n. *scabra*

HAHN, L.

828. *villosa* var. *villosa*

HALE, J.

s. n. *rudis*

HARPER, R. M.

518. *indica*
1498. *viscidula*

HARRIS, W.

6625. *americana* var. *glandulosa*
6957. *americana* var. *glandulosa*

HARTWEG, T.

649. *rudis*

HARVEY, D. R.

5197. *americana* var. *glandulosa*

HASSLER, E. (including T. ROJAS)

86. *americana* var. *glandulosa*
400. *montevicensis*
792. *sensitiva* var. *sensitiva*

HASSLER, E. (including T. ROJAS)—Con.

911. *sensitiva* var. *sensitiva*
 1651. *denticulata*
 2757. *histris* var. *histris*
 2758. *parviflora*
 2773. *rudis*
 2815. *americana* var. *glandulosa*
 2816. *mollicula* var. *mollicula*
 2893. *rudis*
 3947. *parviflora*
 4587. *montevidensis*
 4806. *falcata*
 4816. *montevidensis*
 5814. *echinus*
 6360. *falcata*
 6694. *paraguayensis*
 7726. *denticulata*
 8125. *montevidensis*
 8128. *paniculata*
 10753. *sensitiva* var. *sensitiva*
 10955. *histris* var. *densiflora*
 11021. *echinus*
 11764. *sensitiva* var. *sensitiva*
 12017. *paniculata*
 12314. *montevidensis*

HAUGHT, O.

- F-62. *pluriarticulata*
 F-87. *tumbezensis*
 F-163. *pluriarticulata*
 158. *pluriarticulata*
 177. *tumbezensis*
 261. *pluriarticulata*
 1403. *americana* var. *glandulosa*
 2271. *histris* var. *incana*
 3823. *fascicularis*
 6274. *falcata*
 6371. *brasiliensis* var. *brasiliensis*
 6579. *fascicularis*

HAUTHAL

24. *histris* var. *histris*

HAYES, S.

184. *ciliata*
 488. *americana* var. *glandulosa*
 767. *americana* var. *glandulosa*

HELLER, A. A. (some with MRS. HELLER)

22. *portoricensis*
 185. *villosa* var. *villosa*
 234. *americana* var. *americana*

441. *sensitiva* var. *sensitiva*
 598. *americana* var. *americana*
 665. *sensitiva* var. *sensitiva*
 4589. *sensitiva* var. *sensitiva*
 6135. *americana* var. *americana*
 6365. *americana* var. *americana*
 6414. *sensitiva* var. *sensitiva*

HENZ, E.

35534. *falcata*

HERIBERTO, BRO.

225. *fascicularis*
 255. *americana* var. *glandulosa*
 292. *rudis*
 296. *pratensis* var. *caribaea*
 439. *fascicularis*

HERMANN, F. J.

10412. *virginica*
 11206. *falcata*
 11283. *sensitiva* var. *sensitiva*

HERNANDEZ X., E.

- X-614. *elegans*

HERTER, W. G.

82859. *montevidensis*

HESS, W. E.

5703. *portoricensis*

HEYDE, E. T.

311. *americana* var. *americana*
 391. *villosa* var. *longifolia*
 HEYDE, E. T., AND LUX, E. (J. D. Smith Herbarium)
 3710. *scabra*
 4160. *americana* var. *glandulosa*
 4172. *villosa* var. *longifolia*
 6097. *scabra*
 6099. *villosa* var. *longifolia*
 6103, in part. *americana* var. *americana*
 in part. *americana* var. *glandulosa*

HICKEN, C. M.

- s. n. *rudis*

HIERONYMUS, G.

- s. n. *histris* var. *incana*

HINDS, R. B., or SINCLAIR, A.

- s. n. *villosa* var. *villosa*

HINTON, G. B., ET AL

457. petraea var. petraea
 1619. americana var. flabellata
 1764. paucifoliolata
 1930. scabra
 1984. americana var. flabellata
 1997. paucifoliolata
 2057. americana var. flabellata
 2234. americana var. flabellata
 4582. histrix var. densiflora
 4784. paucifoliolata
 4957. scabra
 5044. paniculata
 5992. americana var. flabellata
 6104. hintonii
 6654. americana var. flabellata
 6679. scabra
 6708. paucifoliolata
 6938. paucifoliolata
 7059. paucifoliolata
 7872. compacta
 8608. villosa var. villosa
 9503. americana var. flabellata
 9667. scabra
 9668. americana var. americana
 9669. villosa var. longifolia
 10395. petraea var. madrensis
 10644. hintonii
 10747. villosa var. longifolia
 10922. americana var. glandulosa
 11247. hintonii
 11332. petraea var. madrensis
 11396. paniculata
 11604. americana var. glandulosa
 11662. scabra
 11670. unijuga
 12915. villosa var. villosa
 12950. petraea var. madrensis
 13287. americana var. flabellata
 13804. petraea var. madrensis
 14604. palmeri
 14653. americana var. glandulosa
 15243. americana var. flabellata
 16060. paucifoliolata
 16106. rudis
 16163. paucifoliolata

HIORAM, BRO.

- s. n. americana var. americana

HITCHCOCK, A. S.

51. viscidula
 341. viscidula

342. viscidula
 343. viscidula
 344. indica
 345. indica
 346. indica
 347. indica
 16640. sensitiva var. sensitiva
 16728. sensitiva var. sensitiva
 19942. americana var. glandulosa
 20024. tumbezensis
 20073. pluriarticulata
 s. n. americana var. americana
 s. n. indica
 s. n. rudis
 s. n. viscidula

HODGE, W. H.

588. sensitiva var. sensitiva
 589. sensitiva var. sensitiva

HOEHNE, F. C. (including Comissão RONDON in part)

86. elegans
 375 (1871). racemosa
 4569. paniculata
 4806. histrix var. densiflora
 4883. histrix var. densiflora
 4884. histrix var. densiflora
 6615. paucifolia
 6727. paniculata

HOEHNE, F. C., AND GEHRT, A.

17348. sensitiva var. sensitiva
 17491. elegans

HOLDRIDGE, L. R.

998. pleuronervia

HOLM, T.

63. villosa var. villosa
 208. sensitiva var. sensitiva
 s. n. americana var. americana

HOLT, E. G.

70. indica

HOLT, E. G., AND GEHRIGER, W.

197. evenia var. serrulata

HOLTON, I. F.

985. ciliata
 986. ciliata
 991. villosa^p var. villosa

- HOLWAY, E. W. D.
5220. villosa var. longifolia
- HORNE, F. W.
9119. portoricensis
- HOSTMANN, F. W.
637a. brasiliana var. brasiliana
705. sensitiva var. sensitiva
820a. paniculata
1074. histrix var. histrix
s. n. sensitiva var. sensitiva
- HOTCHKISS, N.
7187. virginica
- HOWARD, R. A.
5535. tenuis
- HUBER, J.
286. evenia var. evenia
s. n. histrix var. histrix
- HUMBOLDT, A., AND BONPLAND, A.
3543. scoparia
3546. mollicula var. mollicula
- HUNTER, A. A., AND ALLEN, P. H.
737. americana var. glandulosa
- HUNZIKER, A. T.
708. histrix var. incana
- IDROBO, J. M., ET AL
75, in part. brasiliana var. brasiliana
664. foliolosa
- JAHN, A.
673. americana var. glandulosa
- JAMESON, W.
586. tumbezensis
- JENMAN, G. S.
3741. histrix var. histrix
- JENNINGS, O. E.
19. tenuis
248. tenuis
- JIMÉNEZ, J. DE J.
946. villosa var. villosa
1071. villosa var. villosa
1150. pratensis var. caribaea
1286. sensitiva var. sensitiva
1705. americana var. americana
1813. americana var. americana
- JOB, M. M.
770. denticulata
- JOBERT, C., AND Schwacke, C. A. W.
158. brasiliana var. brasiliana
612. sensitiva var. amazonica
1074. brevipes
1175. histrix var. incana
- JOHNSON, E. P.
s. n. ciliata
- JOHNSON, F. W.
s. n. americana var. glandulosa
s. n. villosa var. villosa
- JOHNSON, H.
1302. sensitiva var. sensitiva
- JOHNSTON, I. M.
832. americana var. glandulosa
937. americana var. glandulosa
1201. americana var. glandulosa
3713. nivea
- JOHNSTON, J. R.
59. villosa var. villosa
149. villosa var. villosa
175. sensitiva var. sensitiva
520. portoricensis
966. sensitiva var. sensitiva
1059. americana var. glandulosa
1486. ciliata
- JONES, M. E.
597. petraea var. petraea
22504. americana var. glandulosa
23025. petraea var. grandiflora
23052. amorphoides
24053. vigil
24254. nivea
72219. villosa var. villosa

	JÖNSSON, G.	14559, in part. americana var. americana.
090a. falcata		in part. americana var. glandulosa.
	JOOR, J. F.	14574. sensitiva var. sensitiva
. n. indica		16278. mollicula var. breviflora
. n. viscidula		16337. paniculata
	JÖRGENSEN, P.	16345. falcata
2696, in part. denticulata		16455. mollicula var. breviflora
in part. rudis		20912. elegans
3220, in part. americana var. glandulosa		20921. mollicula var. breviflora
in part. denticulata		30397. marginata var. marginata
3595. falcata		32341. pratensis var. caribaea
3631. montevidensis		33017. ciliata
4205, in part. denticulata		33048. rudis
in part. sensitiva var. sensitiva		33229. ciliata
4206. sensitiva var. sensitiva		34373. sensitiva var. sensitiva
4619. americana var. glandulosa		34501. sensitiva var. sensitiva
7595. falcata		37245. paniculata
	KEARNEY, T. H.	37605. pratensis var. caribaea
		37649. brasiliana var. brasiliana
2250. indica		27651. histrix var. histrix
	KEARNEY, T. H., AND PEEBLES, R. H.	38144. mollicula var. mollicula
4462. villosa var. villosa		39070. ciliata
	KEGEL, H.	39794. falcata
84 (Martius 1144). sensitiva var. sensitiva		41210. pratensis var. pratensis
1281. histrix var. histrix		41300. tenuis
	KELLERMAN, W. A.	41615. tenuis
3409. sensitiva var. sensitiva		41633. brasiliana var. brasiliana
7555. elegans		42537. brasiliana var. brasiliana
	KENOYER, L. A.	42552. tenuis
386. sensitiva var. sensitiva		42561. pratensis var. caribaea
	KERBER, E.	42686. tenuis
57. scabra		42763. tenuis
	KILLIP, E. P., ET AL	42894. viscidula
3367. villosa var. villosa		42934. brasiliana var. brasiliana
5513. ciliata		42946. tenuis
5513a. ciliata		43115. viscidula
11560. ciliata		43167. pratensis var. caribaea
14139. fascicularis		KLUG, G.
14188. americana var. americana		329. sensitiva var. sensitiva
14204. fascicularis		KRAPOVICKAS, A.
14274. fascicularis		2704. montevidensis
		KRUG, H., AND ZAGATTO, O.
		2260. elegans
		KUHLMANN, J. G. (some herbarium numbers)
		205. fluminensis var. fluminensis
		353. oroboides

KUHLMANN, J. G. (some herbarium numbers)—Continued

354. oroboides
2021. ciliata
2983. sensitiva var. sensitiva
3231. interrupta

KUNTZE, O.

332. sensitiva var. sensitiva
410. villosa var. villosa
1338. brasiliana var. venezolana
14556. villosa var. longifolia
s. n. americana var. glandulosa
s. n. elegans
s. n. falcata
s. n. histrix var. densiflora
s. n. montevidensis

KUYLEN, H.

s. n. deamii

LANGLASSÉ, E.

84. sensitiva var. hispidula
431. fascicularis
455. villosa var. villosa
474. paucifoliolata
476. americana var. americana
492. scabra
758. villosa var. longifolia
847. langlassei
865. petraea var. madrensis

LANGMAN, I. K.

3323. palmeri
3338. palmeri

LANKASTER, C. H.

312. elegans

LASSER, T.

633. villosa var. villosa
857. americana var. americana
880. americana var. americana

LEEDS, B. F.

s. n. viscidula

LEGRAND, C. D.

494. montevidensis

LEHMANN, F. C.

B. T. 1056. scabra
3408. villosa var. villosa
5548. villosa var. villosa
5549. sensitiva var. hispidula

LEITE (see EUGENIO)

LEMMON, MR. AND MRS. J. G.

30. villosa var. villosa

LEÓN, BRO., ET AL

457. americana var. americana
1298. viscidula
4202. rudis
4713. villosa var. villosa
5360. viscidula
5817. tenuis
5891. pratensis var. caribaea
5947. fluminensis var. tuberculata
6968. viscidula
7202. sensitiva var. sensitiva
7382. tenuis
7470. viscidula
8975. evenia var. evenia
9640. pratensis var. caribaea

LEONARD, E. C. (including with G. M. LEONARD)

7040. americana var. americana
7294. americana var. americana
7364. americana var. americana
7421. pleuronervia
7563. americana var. americana
8138. villosa var. villosa
8503. villosa var. villosa
8732. villosa var. villosa
8818. pleuronervia
9262. villosa var. villosa
9606. americana var. americana
11376. americana var. americana
11587. americana var. americana
12182. villosa var. villosa
14012. americana var. americana
15185. pleuronervia
15738. pleuronervia

LEPRIEUR

s. n. histrix var. histrix
s. n. sensitiva var. sensitiva

LE SUEUR, H.

205. rudis
1354. fascicularis

LETTERMAN, G. W.

- s. n. indica

LEWTON, F. L.

- s. n. viscidula

LIEBMANN, F. M.

4710. acapulcensis
4712. viscidula
4724. americana var. glandulosa
4725. compacta
4726. pinetorum
4727. purpusii

LIGHTHIPE, L. H.

227. viscidula
499. indica

LLOYD (F. E. ?)

1050. americana var. glandulosa

LLOYD, F. E., and TRACY, S. M.

180. indica
193. indica

LÖFGREN, A.

397. evenia var. evenia
405. marginata var. grandiflora
658. histrix var. densiflora
737. americana var. americana
856. evenia var. evenia
1091. mollicula var. benthamii

LONG, B.

10818. virginica
44943. virginica
51232. virginica

LÓPEZ-Miranda, A.

883. scabra
926. tumbezensis

LORENTZ, P.

- 89a. montevidensis

LUETZELBURG, P. VON

1404. filosa
2558. sensitiva var. sensitiva
12526. filosa
20489. interrupta
20490. interrupta
20527. interrupta
20530. interrupta
21115. filosa
21128. paniculata
21371. paniculata
21945. paniculata
21948. histrix var. incana

LUNA, A.

922. brasiliana var. brasiliana

LUNDELL, C. L. (including with
A. A. LUNDELL)

1114. americana var. glandulosa
1266. rudis
1340. fascicularis
3413. fascicularis
4400. viscidula
6886. paniculata
7340. fascicularis

LUTZ, B.

- s. n. sensitiva var. sensitiva

MACBRIDE, J. F.

2706. sensitiva var. sensitiva
5483. brasiliana var. brasiliana

MACEDO, A.

240. sensitiva var. sensitiva
1638. filosa
1717. histrix var. densiflora
1724. falcata
2296. paniculata

MACKENZIE, K. K.

410. indica

MAGUIRE, B., AND STAHEL, G.

23731. histrix var. histrix
25041. histrix var. histrix

MALME, G. O.

679. denticulata
1350. paniculata

- MALME, G. O.—Continued
1548. *sensitiva* var. *sensitiva*
 1819. *sensitiva* var. *sensitiva*
 1820. *fluminensis* var. *fluminensis*
 3242. *histris* var. *histris*
- MARIE-VICTORIN, BRO., AND ALAIN, BRO.
123. *viscidula*
- MARKGRAF, F. (with A. C. BRADE AND MELLO-BARRETO)
- 3280 (Brade & Mello-Barreto No. 12089)
paucifolia
- MARTÍNEZ-CALDERÓN, G.
550. *americana* var. *americana*
- MARTIUS, K. F. P. VON (Herbarium)
1114. *sensitiva* var. *sensitiva*
 1145. *evenia* var. *serrulata*
 1146. *sensitiva* var. *sensitiva*
 s. n. *brevipes*
 s. n. *filosa*
- MARULANDA-CAICEDO, L.
- 47.A. *villosa* var. *villosa*
 48.A. *brasiliiana* var. *brasiliiana*
- MASON, H. L.
13982. *fascicularis*
- MATTHEWS, A.
1579. *brasiliiana* var. *brasiliiana*
 3272. *elegans*
- MATUDA, E.
44. *ciliata*
 53. *americana* var. *glandulosa*
 2121. *ciliata*
 2164. *americana* var. *glandulosa*
 4101. *villosa* var. *villosa*
 5677. *compacta*
 15683. *compacta*
 16755. *ciliata*
- MAURICE, BRO.
726. *elegans*
- MAXON, W. R., AND KILLIP, E. P.
- 62a. *americana* var. *glandulosa*
- McFARLIN, J. B.
5568. *viscidula*
 6243. *viscidula*
 11116. *viscidula*
- McLEAN (J. P. ?)
- s. n. *americana* var. *americana*
- McVAUGH, R.
12168. *petraea* var. *grandiflora*
 14252. *unijuga*
- MELL, C. D. (including with R. C. MELL)
219. *sensitiva* var. *sensitiva*
 2201. *compacta*
- MELLO-BARRETO, H. L.
5777. *elegans*
 5778. *elegans*
 5781. *paniculata*
 6052. *paucifolia*
 6576. *elegans*
 10351. *paniculata*
 10355. *paucifolia*
 10360. *elegans*
- MEXIA, Y.
141. *amorphoides*
 660. *amorphoides*
 738. *villosa* var. *villosa*
 743. *americana* var. *glandulosa*
 943. *amorphoides*
 954. *americana* var. *glandulosa*
 1018. *rudis*
 1375. *unijuga*
 1648. *petraea* var. *grandiflora*
 4348. *sensitiva* var. *sensitiva*
 5676. *paniculata*
 6665. *brasiliiana* var. *brasiliiana*
- MEYER, T.
3554. *denticulata*
- MILLE, L.
42. *americana* var. *glandulosa*
 1118. *tumbezensis*
 s. n. *americana* var. *glandulosa*
- MILLSPAUGH, C. F.
1887. *americana* var. *glandulosa*

MOHR, C.

s. n. indica
s. n. rudis
s. n. virginica
s. n. viscidula

MOLDENKE, H. N.

136. indica

MOLINA R., A.

679. nicaraguensis
723. scabra
1412. scabra
1552. fascicularis
1664. standleyi
2663. americana var. glandulosa

MONTEIRO DA COSTA, R. C.

256. sensitiva var. sensitiva

MONTES, J. E.

2487. falcata

MOORE, S.

194. oroboides
1005. sensitiva var. sensitiva

MORELLO, J.

410. rudis

MORALES R., J.

1148. americana var. glandulosa

MORONG, T.

191. sensitiva var. sensitiva
310. montevidensis
400, in part. falcata
in part. montevidensis
778. falcata

MORTON, C. V.

5646. sensitiva var. sensitiva
7128. scabra

MÜLLER, F.

92. falcata
145. scabra
s. n. elegans
s. n. villosa var. villosa

MULVANIA, M.

s. n. americana var. americana

MURRILL, W. A.

s. n. viscidula

MUTIS, J. C.

4923. histrix var. histrix
4925. paniculata

MYERS, J. G.

2924. rostrata

NASH, G. V.

306. americana var. americana
593. viscidula
1054. indica
1847. viscidula

NEALLEY, G. C.

s. n. evenia var. evenia

NELSON, E. W.

2630. compacta
2737. pinetorum
2751. pinetorum
2802. rudis
2851. pinetorum
2864. scabra
3116. americana var. americana
3572. brasiliiana var. brasiliiana
4033. petraea var. grandiflora
4038. unijuga
4058. petraea var. grandiflora

NELSON, E. W., AND GOLDMAN, E. A.

7226. nivea
7329. nivea
7365. vigil

NETO, L.

s. n. paniculata

NOVAES, J. DE C.

247. selloi

O'DONELL, C. A.

7. evenia var. evenia

PEARCE, R.

n. evenia var. evenia

PECK, M. E.

32. americana var. glandulosa
35. histrix var. incana
33. paniculata
34. paniculata
30. deamii
31. sensitiva var. sensitiva
30. filosa

PEDERSEN, T. M.

36. histrix var. incana
39. denticulata
39. montevidensis

PENNELL, F. W., ET AL

81. sensitiva var. sensitiva
34. elegans
36. mollicula var. breviflora
85. falcata
308. paniculata
37. elegans
11. paniculata
70. falcata
95. brasiliiana var. brasiliiana
95a. falcata.
53a. falcata
59. americana var. glandulosa
37. sensitiva var. sensitiva
38. ciliata
49. ciliata
53. sensitiva var. sensitiva
99. americana var. americana
92. sensitiva var. sensitiva
79. sensitiva var. sensitiva
34. elegans
12. elegans
59. villosa var. villosa
39. sensitiva var. hispidula

PEREZ-ARBELÁEZ, E. (some herbarium numbers?)

4. falcata
1. fascicularis
9. americana var. glandulosa
6. villosa var. villosa
6. fascicularis

PÉREZ-A., E., AND CUATRECASAS, J.

4. falcata

PERROTTET, G. S.

s. n. brasiliiana var. brasiliiana

PERSAUD, A. C.

319. sensitiva var. sensitiva

PICKEL, B.

43. evenia var. evenia
338. sensitiva var. sensitiva
905. ciliata
1035, in part. histrix var. densiflora
in part. histrix var. histrix
3049. elegans
3089. scabra
3695, in part. histrix var. densiflora
in part. histrix var. histrix
3728. ciliata
s. n. evenia var. evenia

PIETERS, A. J.

89. viscidula

PIPER, C. V.

5182. sensitiva var. sensitiva
5189. brasiliiana var. brasiliiana
5190. americana var. glandulosa

PIRES, J. MURÇA, ET AL

140. sensitiva var. sensitiva
623. evenia var. serrulata
1256. evenia var. evenia
1324. ciliata
1989. paniculata
2362. histrix var. histrix
4310. rudis

PITTIER, H.

576. ciliata
838. sensitiva var. hispidula
2112. americana var. glandulosa
2647. sensitiva var. sensitiva
4548. evenia var. evenia
4549. pratensis var. caribaea
4611. rudis
4863. histrix var. incana
4918. pratensis var. caribaea
5092. americana var. glandulosa
6814. sensitiva var. sensitiva
6871. americana var. glandulosa
6908. brasiliiana var. brasiliiana
6946. ciliata
7044. sensitiva var. sensitiva

PITTIER, H.—Continued

7292. *elegans*
 7392. *villosa* var. *longifolia*
 9422. *brasiana* var. *brasiana*
 9441. *sensitiva* var. *sensitiva*
 9762. *elegans*
 10571. *histris* var. *incana*
 10734. *fascicularis*
 11220. *sensitiva* var. *sensitiva*
 11233. *americana* var. *americana*
 11233a. *brasiana* var. *venezolana*
 11321. *evenia* var. *serrulata*
 11324. *brasiana* var. *brasiana*
 11599. *elegans*
 11621. *brasiana* var. *venezolana*
 12866. *villosa* var. *villosa*
 13149. *brasiana* var. *brasiana*
 13540. *sensitiva* var. *sensitiva*
 13607. *brasiana* var. *brasiana*
 14471. *histris* var. *histris*
 14482. *brasiana* var. *brasiana*
 15160. *pratensis* var. *caribaea*

POLLARD, C. L.

1165. *indica*

PORTER, T. C.; SMITH, A. H.; AND
LEIDY, J.

- s. n. *virginica*

PRINGLE, C. G.

725. *villosa* var. *longifolia*
 2515. *americana* var. *flabellata*
 2996. *fascicularis*
 3832. *fascicularis*
 4386. *petraea* var. *petraea*
 4556. *scabra*
 4613. *amorphoides*
 5147. *petraea* var. *petraea*
 5181. *rudis*
 5627. *viscidula*
 5645. *compacta*
 8580. *compacta*
 8709. *petraea* var. *madrensis*
 8861. *villosa* var. *mexicana*
 8862. *villosa* var. *mexicana*
 9093. *scabra*
 11399. *fascicularis*
 11891. *villosa* var. *mexicana*

PRIOR, R. C. ALEXANDER

- s. n. *americana* var. *glandulosa*

PULLE, A. A.

185. *histris* var. *histris*
 500. *paniculata*

PURDIE, W.

- s. n. *ciliata*

PURPUS, C. A.

426. *scabra*
 518. *petraea* var. *petraea*
 1898. *paniculata*
 1899. *elegans*
 1904.' *purpusii*
 1904-1, *purpusii*
 2328, in part. *americana* var. *glandulosa*
 in part. *villosa* var. *villosa*
 3507. *compacta*
 5885. *americana* var. *glandulosa*
 6634. *villosa* var. *villosa*
 6635. *pinetorum*
 7162. *acapulcensis*
 7179. *compacta*
 8384. *purpusii*
 9064. *pinetorum*
 9147. *pinetorum*
 9148. *elegans*
 10813. *villosa* var. *villosa*
 10819. *elegans*
 10854. *paniculata*
 10875. *paniculata*
 11088. *americana* var. *glandulosa*
 13004. *paniculata*
 14305. *purpusii*
 14328. *fascicularis*
 16269. *fascicularis*
 16353. *fascicularis*
 16409. *purpusii*
 s. n. *compacta*
 s. n. *elegans*
 s. n. *paniculata*
 s. n. *villosa* var. *villosa*

QUAINTANCE, A. L.

1167. *viscidula*

QUESTEL, A.

489. *americana* var. *glandulosa*
 641. *sensitiva* var. *sensitiva*
 2481. *americana* var. *glandulosa*
 4245. *americana* var. *glandulosa*
 4468. *americana* var. *americana*
 5104. *americana* var. *americana*

- RAIMONDI, A.
9267. *mollicula* var. *mollicula*
- RAGONESE, A. E.
3299. *rudis*
- RAMBO, B.
35024, in part. *elegans*
in part. *falcata*
46876. *falcata*
- RAMIREZ, R.
5. *sensitiva* var. *hispidula*
- RAPP, S.
s. n. *indica*
- REED, H. R.
s. n. *evenia* var. *serrulata*
- REGNELL, A. F.
II.88. *elegans*
III.416. *marginata* var. *marginata*
- REITZ, R.
4314. *elegans*
- REKO, B. P.
4441. *amorphoides*
- RENSON, C.
11. *americana* var. *americana*
- RHOADES, W.
s. n. *indica*
- RICKSECKER, A. E.
133. *americana* var. *glandulosa*
- RICKSECKER, MRS. J. J.
44. *americana* var. *glandulosa*
- RIEDEL, L.
123. *fluminensis* var. *fluminensis*
124. *sensitiva* var. *sensitiva*
125. *elegans*
126. *ciliata*
134. *brasiliana* var. *brasiliana*
502. *oroboides*
591. *mollicula* var. *benthamii*
722. *paucifolia*
742. in part. *evenia* var. *serrulata*
in part. *histris* var. *histris*
769. *parviflora*
832. *paniculata*
897. *marginata* var. *marginata*
924. *fluminensis* var. *fluminensis*
943. *podocarpa*
1223. *riedeliana*
1251. *mollicula* var. *benthamii*
1559. *elegans*
2160. *sensitiva* var. *sensitiva*
2393. *paniculata*
2926. *paucifolia*
4268. *paucifolia*
- ROBERTSON, J.
s. n. *americana* var. *glandulosa*
- RODRIGO, A. P.
746. *montevidensis*
- RODRÍGUEZ
768. *montevidensis*
- ROJAS, T. (see HASSLER)
- ROLFS, P. H.
104. *viscidula*
- RONDON, CORONEL (COMISSÃO RONDON)
2009 (6801). *foliolosa*
- ROSE, J. N., ET AL
1487. *simulans*
1616. *simulans*
2482. *fascicularis*
2859. *amorphoides*
2859a. *amorphoides*
2937. *fascicularis*
2972. *villosa* var. *mexicana*
3522. *americana* var. *glandulosa*
4300. *elegans*
4702. *compacta*
5853. *compacta*
7394. *fascicularis*
7402. *villosa* var. *villosa*
7542. *villosa* var. *mexicana*
10014. *compacta*
11238. *compacta*
12734. *fascicularis*
13655. *americana* var. *glandulosa*
13655a. *villosa* var. *villosa*
14287. *villosa* var. *villosa*
16461. *vigil*
21657. *villosa* var. *longifolia*

- ROSE, J. N., ET AL—Continued
23349. scoparia
23997. americana var. glandulosa
- ROVIROSA, J. N. (herbarium numbers?)
384. americana var. glandulosa
443. ciliata
446. sensitiva var. sensitiva
766. deamii
- RUDD, V. E.
332. brasiliiana var. brasiliiana
366. pratensis var. caribaea
433. americana var. americana
736. virginica
775. virginica
- RUGEL, F.
- 129b. americana var. glandulosa
176. viscidula
- RUIZ, H., AND PAVON, J.
- s. n. scabra
- RUNYON, R.
1956. evenia var. evenia
2859. evenia var. evenia
- RUSBY, H. H.
826. A. fluminensis var. fluminensis
1035. elegans
1036. brasiliiana var. brasiliiana
1037. sensitiva var. sensitiva
1038. histrix var. densiflora
1447. sensitiva var. sensitiva
1604. sensitiva var. sensitiva
1786. A. fluminensis var. fluminensis
- RUSBY, H. H., AND PENNELL, F. W.
83. americana var. glandulosa
136. mollicula var. mollicula
295. falcata
461. brasiliiana var. brasiliiana
1085. falcata
1087. brasiliiana var. brasiliiana
1089. paniculata
1114. brasiliiana var. brasiliiana
1146. falcata
1166. americana var. glandulosa
- RUSBY, H. H., AND SQUIRES, R. W.
196. sensitiva var. sensitiva
- SAER
374. americana var. americana
- SAGOT, P.
133. brasiliiana var. brasiliiana
- SALZMANN, P.
- s. n. ciliata
s. n. elegans
s. n. histrix var. densiflora
s. n. paniculata
s. n. sensitiva var. sensitiva
- SAMPAIO, A. J. DE
142. elegans
1031. ciliata
2974. brasiliiana var. brasiliiana
4654. elegans
4964. sensitiva var. sensitiva
6800. elegans
7317. paniculata
7535. sensitiva var. sensitiva
8535. selloi
8908. evenia var. evenia
- SAMUELS, J. A.
473. histrix var. histrix
- SANTOS, N.
- s. n. falcata
- SARGENT, F. H.
- B.5. americana var. americana
243. sensitiva var. sensitiva
529. indica
3278. villosa var. villosa
- SCALA, A. C.
172. montevidensis
178. montevidensis
187. montevidensis
- SCHIEDE, C. J. W., AND DEPPE, F.
633. villosa var. villosa
s. n. elegans
- SCHIMPF, H. J. F.
1063. americana var. glandulosa
- SCHIPP, W. A.
64. sensitiva var. sensitiva
628. histrix var. incana
660. paniculata
666. americana var. glandulosa

SCHLIM, L.

205. villosa var. villosa

SCHOMBURGK, R.

181. paniculata
187. histrix var. histrix
603. sensitiva var. sensitiva
803. interrupta
822. histrix var. histrix
846. histrix var. densiflora

SCHOTT, A. C. V. (herbarium numbers?)

276. fascicularis
863. americana var. glandulosa
864. fascicularis
s. n. fascicularis

SCHRAMM, F. E.

s. n. americana var. glandulosa

SCHREITER, R.

5365. evenia var. evenia

SCHULTES, R. E., ET AL.

6168. sensitiva var. amazonica
8205. sensitiva var. amazonica
8276. ciliata
8480. ciliata

SCHULZ, A. G.

1150. falcata
1166. rudis
3017. denticulata
3265. sensitiva var. sensitiva

SCHULZ, E. D.

417. viscidula

SCHWACKE, C. A. W. (see also JOBERT)

80. rudis
s. n. elegans
s. n. falcata

SEEMANN, B. C.

203. pratensis var. caribaea
216. histrix var. incana
486. americana var. glandulosa
2189. petraea var. petraea
s. n. americana var. glandulosa

SELER, C., AND SELER, E.

1180. villosa var. longifolia
2051. pinetorum

3873. fascicularis
3905. fascicularis
4208. villosa var. longifolia
4228. compacta
4237. scabra
4240. americana var. flabellata

SELLOW, F.

s. n. elegans
s. n. histrix var. incana
s. n. montevidensis
s. n. paniculata
s. n. paucifolia
s. n. podocarpa
s. n. selloi
s. n. sensitiva var. sensitiva

SEMPLE, A. T.

211. americana var. americana

SESSÉ, M., AND MOCIÑO, J. M.

1938. amorphoides
1940. fascicularis
1941. fascicularis
1942. fascicularis
1943. villosa var. villosa
1944. villosa var. villosa
1945. scabra
1946. scabra
1947. americana var. flabellata
1948, in part. americana var. glandulosa
in part. villosa var. villosa
1948 bis. scabra
1948 ter. amorphoides

SHAFER, J. A.

20. villosa var. villosa
107. evenia var. evenia
259. villosa var. villosa
261. americana var. americana
287. tenuis
368. americana var. americana
554a. brasiliana var. brasiliana
2527. americana var. americana
3441. sensitiva var. sensitiva
7690. villosa var. villosa
8937. brasiliana var. brasiliana
10388. americana var. glandulosa
10505. tenuis
10692. tenuis
10711. viscidula

SHAFER, J. A.—Continued

10839. *pratensis* var. *caribaea*
 10842. *fluminensis* var. *tuberculata*
 10991. *viscidula*
 11231. *pratensis* var. *caribaea*
 11732. *tenuis*
 12046. *americana* var. *glandulosa*
 12362. *sensitiva* var. *sensitiva*

SHANNON, W. C.

561. *americana* var. *glandulosa*

SHATTUCK, O.

624. *sensitiva* var. *sensitiva*

SHIMEK, B., AND SMITH, C. L.

42. *fascicularis*
 135. *deamii*

SHREVE, F.

1297. *virginica*
 7088. *nivea*

SIEBER, F. W.

- s. n. (Kohaut). *americana* var. *americana*
 13736 (Herb. No.). *ciliata*

SILVA, A.

106. *evenia* var. *evenia*

SINCLAIR, A.

- s. n. *villosa* var. *villosa*

SINTENIS, P.

79. *villosa* var. *villosa*
 94. *sensitiva* var. *sensitiva*
 94b. *sensitiva* var. *sensitiva*
 374. *americana* var. *glandulosa*
 374b. *americana* var. *glandulosa*
 1103. *sensitiva* var. *sensitiva*
 1990. *americana* var. *americana*
 2006. *sensitiva* var. *sensitiva*
 2957. *villosa* var. *villosa*
 2967. *americana* var. *americana*
 3064. *americana* var. *americana*
 3818. *indica*
 3883. *villosa* var. *villosa*
 5525. *villosa* var. *villosa*
 5560. *americana* var. *americana*

5605. *indica*
 5720. *villosa* var. *villosa*
 5897. *sensitiva* var. *sensitiva*
 6657. *portoricensis*

SKINNER, G. U.

- s. n. *americana* var. *glandulosa*

SKUTCH, A. F.

1465. *elegans*
 1499. *americana* var. *glandulosa*
 1598. *villosa* var. *longifolia*
 2464. *pratensis* var. *caribaea*
 2946. *brasiliiana* var. *brasiliiana*
 2955, in part. *americana* var. *americana*
 in part. *americana* var. *glandulosa*

SMALL, J. K., ET AL

741. *viscidula*
 1589. *viscidula*
 1960. *pratensis* var. *pratensis*
 2564. *pratensis* var. *pratensis*
 3023. *pratensis* var. *pratensis*
 3024. *pratensis* var. *pratensis*
 3091. *pratensis* var. *pratensis*
 6429. *viscidula*
 6510. *viscidula*
 6563. *viscidula*
 6735. *viscidula*
 8818. *indica*
 11534. *pratensis* var. *pratensis*

SMITH, A. C.

2247. *sensitiva* var. *sensitiva*
 2459. *paniculata*

SMITH, C. L.

992. *americana* var. *glandulosa*
 s. n. *americana* var. *glandulosa*

SMITH, C. P.

3196. *virginica*

SMITH, H. H. (including with G. W. SMITH)

217. *sensitiva* var. *sensitiva*
 270. *fascicularis*
 273. *rudis*
 642. *americana* var. *americana*
 708, in part. *brasiliiana* var. *brasiliiana*
 in part. *elegans*
 713. *americana* var. *glandulosa*

SMITH, J. D.

774. *sensitiva* var. *sensitiva*
 283. *americana* var. *glandulosa*
 308. *scabra*

SMITH, L. B., ET AL.

321. *evenia* var. *serrulata*
 313. *evenia* var. *evenia*
 700. *sensitiva* var. *sensitiva*
 774. *paniculata*
 775. *elegans*
 100. *sensitiva* var. *sensitiva*
 125. *paniculata*
 103. *evenia* var. *evenia*
 934. *paucifolia*

SMITH, L. C.

02. *compacta*
 23, in part. *villosa* var. *longifolia*
 in part. *villosa* var. *villosa*
 52. *compacta*

SMITH, S. G.

200. *americana* var. *glandulosa*
 264. *brasiliansa* var. *brasiliansa*

SNEIDERN, K. VON

163. *sensitiva* var. *hispidula*
 166. *elegans*

SOTO H., G.

33. *falcata*

SOUKUP, J.

743. *tumbezensis*

SOUSA BRITTO

4. *brasiliansa* var. *brasiliansa*

SPEGAZZINI, R. A.

0049. *denticulata*

SPRAGUE, T. A.

22. *sensitiva* var. *sensitiva*

SPRUCE, R.

334. *rudis*
 n. *brasiliansa* var. *brasiliansa*
 n. *histris* var. *densiflora*
 n. *paniculata*
 n. *rudis*
 n. *sensitiva* var. *sensitiva*

STANDLEY, P. C., ET AL

(First series, 1921-1941)

19526. *americana* var. *glandulosa*
 19706. *brasiliansa* var. *brasiliansa*
 19829. *scabra*
 20367. *nicaraguensis*
 20426. *paniculata*
 20438. *brasiliansa* var. *brasiliansa*
 20666. *fascicularis*
 20967. *americana* var. *glandulosa*
 21165, in part. *americana* var. *glandu-*
losa
 in part. *villosa* var. *villosa*
 21689. *fascicularis*
 22033. *americana* var. *glandulosa*
 22075. *americana* var. *glandulosa*
 22434. *villosa* var. *villosa*
 22686. *villosa* var. *villosa*
 23251. *americana* var. *glandulosa*
 23494. *americana* var. *americana*
 23602. *villosa* var. *villosa*
 23930. *elegans*
 24289. *americana* var. *glandulosa*
 24359. *americana* var. *glandulosa*
 25153. *brasiliansa* var. *brasiliansa*
 25267. *villosa* var. *villosa*
 25275. *brasiliansa* var. *brasiliansa*
 25405. *americana* var. *glandulosa*
 25518. *americana* var. *glandulosa*
 25540. *americana* var. *glandulosa*
 25586. *brasiliansa* var. *brasiliansa*
 25768. *americana* var. *glandulosa*
 25776. *americana* var. *glandulosa*
 25938. *pratensis* var. *caribaea*
 26042. *brasiliansa* var. *brasiliansa*
 26442. *brasiliansa* var. *brasiliansa*
 26579. *americana* var. *glandulosa*
 26619. *villosa* var. *villosa*
 26787. *americana* var. *glandulosa*
 26806. *brasiliansa* var. *brasiliansa*
 26865. *americana* var. *glandulosa*
 26921. *americana* var. *glandulosa*
 27110. *americana* var. *glandulosa*
 27268. *americana* var. *glandulosa*
 27369. *brasiliansa* var. *brasiliansa*
 27643. *americana* var. *glandulosa*
 27724. *brasiliansa* var. *brasiliansa*
 27818. *pratensis* var. *caribaea*
 28022. *brasiliansa* var. *brasiliansa*
 28066. *americana* var. *glandulosa*
 28325. *americana* var. *glandulosa*
 28735. *americana* var. *glandulosa*

STANDLEY, P. C., ET AL—Continued

- 77166. villosa var. longifolia
- 77478. elegans
- 77614. fascicularis
- 77790. americana var. glandulosa
- 78888. americana var. americana
- 79482. americana var. americana
- 79863. villosa var. villosa
- 82367. villosa var. villosa
- 82370. guatemalensis
- 82530. villosa var. villosa
- 89295. sensitiva var. sensitiva
- 89383. brasiliana var. brasiliana
- 89616. sensitiva var. sensitiva
- 89766. villosa var. longifolia

(Second series, 1947—)

- 205. brasiliana var. brasiliana
- 313. elegans
- 316. elegans
- 540. brasiliana var. brasiliana
- 830. nicaraguensis
- 854. paniculata
- 1036. nicaraguensis
- 1088. brasiliana var. brasiliana
- 1262. brasiliana var. brasiliana
- 1338. nicaraguensis
- 1467. scabra
- 1562. nicaraguensis
- 1822. scabra
- 2094. elegans
- 2245. scabra
- 3145. fascicularis
- 3145a. nicaraguensis
- 3208a. fascicularis
- 3898. elegans
- 4002. scabra
- 4038. scabra
- 4353. nicaraguensis
- 4530. elegans
- 4633. scabra
- 4711a. brasiliana var. brasiliana
- 4990. scabra
- 5738. nicaraguensis
- 5821. brasiliana var. brasiliana
- 5976. sensitiva var. sensitiva
- 6815a. villosa var. villosa
- 8883. sensitiva var. sensitiva
- 9125. sensitiva var. sensitiva
- 10589. sensitiva var. sensitiva
- 12185. scabra
- 12259. elegans
- 12348. scabra

- 12657. histrix var. histrix
- 14665. villosa var. villosa
- 14926. standleyi
- 15598. nicaraguensis
- 18196. brasiliana var. brasiliana
- 24569. americana var. flabellata
- 27456. villosa var. villosa
- 27718. americana var. glandulosa
- 27721. villosa var. villosa
- 28244. brasiliana var. brasiliana
- 28919. brasiliana var. brasiliana
- 28946. fascicularis

STARRY, D. E.

- 256. sensitiva var. sensitiva

STEERE, W. C.

- 2275. fascicularis

STEHLÉ, H.

- 203. americana var. glandulosa
- 271. americana var. glandulosa
- 497. sensitiva var. sensitiva
- 1491. americana var. glandulosa
- 1639. americana var. glandulosa
- 2153. americana var. americana
- 3526. sensitiva var. sensitiva

STEINBACH, J.

- 5280. paniculata
- 5283. falcata
- 5334. pratensis var. caribaea
- 5398. denticulata
- 5402. histrix var. densiflora
- 5505. pratensis var. caribaea
- 5521. americana var. glandulosa
- 5589. americana var. glandulosa
- 6692. falcata
- 6803. sensitiva var. sensitiva
- 6960. paniculata
- 7046. brasiliana var. brasiliana
- 7375. sensitiva var. sensitiva
- 7995. parviflora

STEVENS, E. P.

- s. n. histrix var. incana
- s. n. paniculata
- s. n. sensitiva var. sensitiva

STEVENSON, J. A. (including with J. R. JOHNSTON)

- 207, in part. americana var. americana
- in part. sensitiva var. sensitiva

STEVENSON, J. A. (including with J. R. JOHNSTON)—Continued

380. *americana* var. *americana*
1263. *villosa* var. *villosa*
1310. *portoricensis*

STEYERMARK, J. A.

29007. *paniculata*
29071. *fascicularis*
29313. *viscidula*
29468. *americana* var. *glandulosa*
29500. *compacta*
30107. *americana* var. *glandulosa*
30190. *paniculata*
30302a. *americana* var. *glandulosa*
30442. *americana* var. *flabellata*
30860. *villosa* var. *villosa*
30861. *villosa* var. *villosa*
30864. *paniculata*
31117. *nicaraguensis*
31199. *brasiliansa* var. *brasiliansa*
31268. *paniculata*
31370. *histris* var. *histris*
31374. *brasiliansa* var. *brasiliansa*
31376. *histris* var. *histris*
31823. *rudis*
31878. *rudis*
32214. *brasiliansa* var. *brasiliansa*
32501. *villosa* var. *villosa*
38027. *sensitiva* var. *sensitiva*
38028. *ciliata*
38440. *villosa* var. *villosa*
39599. *deamii*
39697. *sensitiva* var. *sensitiva*
42983. *villosa* var. *longifolia*
43729. *villosa* var. *villosa*
44360. *americana* var. *glandulosa*
45136. *americana* var. *glandulosa*
48153. *villosa* var. *longifolia*
49584. *elegans*
50750. *viscidula*
51388. *rudis*
52167. *americana* var. *glandulosa*
52172. *ciliata*
57530. *brasiliansa* var. *brasiliansa*
57611. *paniculata*
57623. *histris* var. *histris*
60967. *sensitiva* var. *sensitiva*

STORK, H. E.

3223. *sensitiva* var. *sensitiva*

SVENSON, H. K.

11329. *pluriarticulata*

SWALLEN, J. R.

10790. *elegans*
10816. *elegans*
10827. *brasiliansa* var. *brasiliansa*
10856. *brasiliansa* var. *brasiliansa*
10872. *fascicularis*
10894. *nicaraguensis*
10964. *elegans*
10974. *elegans*
10983. *scabra*
10983a. *americana* var. *glandulosa*
10994. *elegans*
10997. *paniculata*
11067. *villosa* var. *villosa*
11158. *scabra*
11182. *elegans*
11207. *brasiliansa* var. *brasiliansa*
11209. *brasiliansa* var. *brasiliansa*
11262. *brasiliansa* var. *brasiliansa*
11283. *elegans*
11337. *paniculata*
11355. *brasiliansa* var. *brasiliansa*
11374. *paniculata*
11415. *elegans*

TAMAYO, F.

261. *villosa* var. *longifolia*
766. *americana* var. *americana*
898. *americana* var. *americana*
1475. *brasiliansa* var. *brasiliansa*
2157. *brasiliansa* var. *venezolana*
2422. *elegans*
2663. *histris* var. *histris*
2779. *pratensis* var. *caribaea*

TATE, G. H. H.

10. *filosa*
30. *histris* var. *incana*

TATNALL, E.

- s. n. *virginica*

TAYLOR, A. A.

121. *tenuis*

TAYLOR, N.

394. *pratensis* var. *caribaea*

TEJERA, E.

152. *histris* var. *incana*

TEODORO, BRO.

3936. *falcata*
4931. *paniculata*

TERRY, MRS. R. A.

1263. *elegans*

THARP, B. C.

3137. *indica*
4716. *viscidula*
s. n. *evenia* var. *evenia*
s. n. *indica*
s. n. *viscidula*

THIEME, C.

5213. *sensitiva* var. *sensitiva*
5217. *paniculata*

TIDESTROM, I.

7686. *virginica*

TONDUZ, A. (Some Herbarium Pittier numbers)

840. *elegans*
3075. *americana* var. *glandulosa*
3806. *brasiliiana* var. *brasiliiana*
4557, in part. *elegans*
in part. *histris* var. *densiflora*
4708. *americana* var. *glandulosa*
4990. *brasiliiana* var. *brasiliiana*
4994. *brasiliiana* var. *brasiliiana*
7284. *americana* var. *glandulosa*
7323. *americana* var. *glandulosa*
13560. *fascicularis*
13573. *americana* var. *glandulosa*
13591. *villosa* var. *villosa*

TORO, R. A.

316. *sensitiva* var. *hispidula*
369. *elegans*
415. *villosa* var. *villosa*
1327. *elegans*

TORRES-ROJAS, R.

207. *elegans*

TOWNSEND, C. H. T.

- A. 76. *scoparia*

TRACY, S. M., ET AL

174. *viscidula*
193. *indica*
4338. *indica*

4438. *indica*
6460. *viscidula*
s. n. *americana* var. *americana*
s. n. *viscidula*

TRAILL, J. W. H.

133. *sensitiva*
135. *histris* var. *densiflora*

TRIANA, J.

4219. *sensitiva* var. *hispidula*

TÜRCKHEIM, H. VON

376. *villosa* var. *longifolia*
2561. *americana* var. *americana*
8196. *americana* var. *glandulosa*
8506. (II 865). *americana* var. *glandulosa*
8665. (II 1127). *sensitiva* var. *sensitiva*
II 2038. *elegans*

TWEEDIE, J.

- s. n. *elegans*
s. n. *falcata*
s. n. *montevidensis*

UHLER, F. M.

73. *indica*

ULE, E.

2477. *parviflora*
7278. *martii*
7783. *filosa*
7784. *paniculata*
7785. *histris* var. *densiflora*
7787. *fluminensis* var. *fluminensis*
8154. *histris* var. *incana*
8156. *americana* var. *americana*
8157. *paniculata*
s. n. *elegans*

UNDERWOOD, L. M.

- s. n. *viscidula*

UNDERWOOD, L. M., AND GRIGGS, R. F.

66. *sensitiva* var. *sensitiva*
935. *sensitiva* var. *sensitiva*

URIBE-URIBE, L.

1594. *brasiliiana* var. *brasiliiana*

VALERIO R., J.

52. scabra
 297. scabra
 672. brasiliana var. brasiliana
 831. elegans
 1060. scabra
 1067. scabra
 1255. scabra
 1256. americana var. glandulosa
 1359. nicaraguensis
 1391. paniculata
 1411. fascicularis
 1412. americana var. glandulosa
 1441. americana var. glandulosa
 1442. americana var. glandulosa
 1471. brasiliana var. brasiliana
 1529. brasiliana var. brasiliana
 1728. villosa var. villosa
 1729. elegans
 2502. scabra
 2642. scabra
 2938. sensitiva var. sensitiva
 3088. elegans
 3434. rudis
 3526. americana var. glandulosa
 3554. nicaraguensis
 3787. nicaraguensis

VALERIO, M.

261. americana var. glandulosa
 859. pratensis var. caribaea
 922. pratensis var. caribaea
 1143. elegans

VALEUR, E. J.

384. pratensis var. caribaea

VAN HERMANN, H. A.

39. americana var. americana
 39 bis. americana var. americana
 224. americana var. americana
 224a. sensitiva var. sensitiva

VAN SEVERÉN, A.

28. sensitiva var. sensitiva

VARGAS C., C.

458. scoparia
 1989. scoparia

VASCONCELLOS, J.

218. sensitiva var. sensitiva

VELEZ, I.

3314. sensitiva var. sensitiva

VENTURI, S.

72. rudis
 75. rudis
 709. denticulata
 1640. denticulata
 2791. denticulata
 5604. denticulata
 9144. falcata

VIDAL, J.

- s. n. ciliata
 s. n. sensitiva var. sensitiva

WALSH, J. J.

- s. n. evenia var. serrulata

WARMING, E.

82. histrix var. histrix
 3011. parviflora
 3017. paucifolia
 s. n. elegans
 s. n. warmingii

WATSON, S.

18. sensitiva var. sensitiva

WEBBER, H. J.

2. viscidula

WEBERBAUER, A.

4118. scoparia
 4274. weberbaueri
 5910. scoparia
 6071. scoparia
 6176. egena
 6276. scoparia
 6458. scoparia
 7018. scoparia
 7669. tumbezensis
 7746. tumbezensis

WEDDELL, H. A.

2113. leptostachya

WEDEL, H. VON

1531. americana var. glandulosa
 1616. americana var. glandulosa
 2973. americana var. glandulosa

WERDERMANN, E.

2214. *pratensis* var. *caribaea*
2259. *americana* var. *glandulosa*

WEST, E.

- s. n. *americana* var. *americana*

WETMORE, A.

165. *americana* var. *americana*

WETMORE, R. H., AND ABBE, E. C.

215. *sensitiva* var. *sensitiva*

WHITEHOUSE, E.

44284. *viscidula*

WIEGAND, K. M., AND MANNING, W. E.

1580. *viscidula*

WIGGINS, I. L.

11382. *nivea*
11430. *nivea*

WILKES EXPEDITION

- s. n. *ciliata*
s. n. *evenia* var. *serrulata*
s. n. *sensitiva* var. *sensitiva*

WILLIAMS, LL.

1343. *sensitiva* var. *amazonica*
1398. *sensitiva* var. *sensitiva*
5846. *histris* var. *histris*
7961. *sensitiva* var. *sensitiva*
8489. *deamii*
8943. *deamii*
10566. *americana* var. *americana*

WILLIAMS, L. O., ET AL.

6413. *paniculata*
10568. *paniculata*
10570. *nicaraguensis*
10643. *brasiliana* var. *brasiliana*
11540. *nicaraguensis*
12297. *nicaraguensis*
15723. *villosa* var. *longifolia*

WILLIAMS, R. S.

25. *falcata*
102. *histris* var. *incana*
130. *pratensis* var. *caribaea*
186. *elegans*
359. *americana* var. *glandulosa*
389. *falcata*

WILSON, N.

173. *americana* var. *americana*

WILSON, P.

1285. *americana* var. *glandulosa*
1741. *viscidula*
9272. *villosa* var. *villosa*

WOODSON, R. E., JR.; ALLEN, P. H.;
AND SEIBERT, R. J.

1768. *pratensis* var. *caribaea*

WOODWORTH, R. H., AND VESTAL, P. A.

401. *sensitiva* var. *sensitiva*

WRIGHT, C.

- 123, in part. *brasiliana* var. *brasiliana*
in part. *viscidula*
124. *americana* var. *americana*
1590, in part. *americana* var. *americana*
in part. *villosa* var. *villosa* \odot
2304, in part. *pratensis* var. *caribaea*
in part. *sensitiva* var. *sensitiva*
2305. *fluminensis* var. *tuberculata*
2306. *tenuis*
3531. *evenia* var. *evenia*
s. n. *deamii*
s. n. *viscidula*

WRIGHT, S.

- s. n. *rudis*

WURZLOW, E. C.

- s. n. *indica*

YEPES A., S.

281. *sensitiva* var. *hispidula*

ZEHNTNER

42. *viscidula*
135. *viscidula*
140. *rostrata*
141. *evenia* var. *evenia*
807. *viscidula*
s. n. *brevipes*

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CONTRIBUTIONS
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A REVISION OF THE
GENUS NISSOLIA

By VELVA E. RUDD



BULLETIN OF THE UNITED STATES NATIONAL MUSEUM
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A REVISION OF THE GENUS *NISSOLIA*

BY VELVA E. RUDD

Introduction

Nissolia is a genus of papilionaceous legumes characterized by jointed fruits, or loment, with the terminal article expanded, flat, and winglike. The plants are slender vines, more or less woody climbers or, in one species, prostrate herbs. The genus is known only from the New World, from southern Arizona and Texas southward to Argentina and Paraguay.

Some 65 species have been ascribed to *Nissolia*, most of which have since been transferred to other genera. The present paper retains 12 species, one of which is divided into two varieties. Eleven taxa have been reduced to synonymy and 42 are excluded from the genus or cannot be placed satisfactorily.

In addition to the material at the U. S. National Museum (US), specimens from herbaria of the following institutions have been consulted: Arnold Arboretum (A), Gray Herbarium of Harvard University (GH), U. S. National Arboretum (NA), New York Botanical Garden (NY), Philadelphia Academy of Natural Sciences (Ph), University of California at Berkeley (UC), Instituto Botánico, Ministerio de Agricultura y Cría, Caracas (Ven). Thanks are due the curators who made such material available. Abbreviations of herbarium names are those of the Index Herbariorum (Lanjouw and Stafleu, ed. 2, 1954).

The maps presented in this paper are based on Goode Base Maps No. 201 HCW, copyright 1938 by the University of Chicago, and are used by permission of the University of Chicago Press.

Historical consideration

The name *Nissolia*, in honor of William Nissole, a French botanist (1647–1735), was originally used by Tournefort (Inst. Rei Herb. 656. 1700) to segregate one species from *Lathyrus*, which he designated as *Nissolia vulgaris*.

Linnaeus did not recognize that generic separation, however. In the first edition of his "Species Plantarum" (729. 1753), as well as in subsequent editions, he cited that same taxon as *Lathyrus nissolia*.

Miller (Gard. Dict. ed 4, 1754), following Tournefort, validated the genus *Nissolia*, and included three species, *N. vulgaris*, *N. orientalis*, and *N. americana*. The first two are now placed in *Lathyrus*, and the other in *Rhynchosia*. Actually, Miller's specific names in this 1754 edition may be rejected as illegitimate because he did not consistently employ the Linnaean system of binary nomenclature. In his eighth edition (1768), where he first consistently used binomials, Miller referred his species of *Nissolia* to *Lathyrus*.

A second genus *Nissolia* was published by Jacquin (Enum. Pl. Carib. 7. 1760). It was based on two species—*N. fruticosa*, now considered the type of the genus, and *N. arborea*, later transferred to the genus *Machaerium*.

Because the name *Nissolia* Jacq. was a later homonym of *Nissolia* Mill., it was proposed for conservation (Kew Bull. 1935: 440. 1935). The proposal was accepted by the Special Committee for Phanerogamae and Pteridophyta appointed by the 6th International Botanical Congress, Amsterdam (1935), and *Nissolia* Jacq. was added to the list of Nomina Generica Conservanda (Kew Bull. 1940: 106. 1940).

In the second edition of his "Species Plantarum" (992. 1763), Linnaeus adopted Jacquin's *Nissolia*, with its two species.

Four additional species of *Nissolia*—*N. quinata* Aubl., *N. punctata* Poir., *N. reticulata* Poir., and *N. ferruginea* Willd.—were published before 1807, when Persoon introduced his genus *Machaerium* (Syn. Pl. 2: 276. 1807), based on these latter species. The two earlier species, *N. fruticosa* and *N. arborea*, he retained in *Nissolia*.

The next noteworthy consideration of *Nissolia* Jacq. was by de Candolle (Mem. Legum. 6: 269–273. 1825; Prodr. 2: 257–259. 1825). He preferred to maintain *Machaerium* as a section of the genus *Nissolia* until the species should be better known. For *N. fruticosa* and two new species, *N. hirsuta* and *N. racemosa*, he proposed the section *Nissolaria*. *Nissolia arborea* and *N. glabrata* he placed in another section, *Gomezium*. Five species "non satis notae" he left unplaced. His treatment included a total of 17 species ascribed to *Nissolia*.

Vellozo (Fl. Flum. 295–299. 1825; Icon. 7: pls. 75–88. 1835) published descriptions and illustrations of 14 new species of *Nissolia*, but all have subsequently been transferred to other genera.

Vogel (Linnaea 11: 177–204. 1837) returned *Nissolia* and *Machaerium* to the status of separate genera, and believed that *N. arborea* and *N. glabrata* belonged to *Machaerium*.

During the next 60 years 16 new species were assigned to *Nissolia*, only six of which remain in the genus as interpreted today. By 1899, when Rose published his "Synopsis of the North American Species of *Nissolia*" (Contr. U. S. Nat. Herb. 5: 157-163. 1899), references to some 50 species were to be found in the botanical literature. By excluding those species transferred to other genera, reducing three species to synonymy within *Nissolia*, and adding six new species, Rose's treatment included only 12 species for the entire genus, plus two items that he was unable to place.

Standley, in his "Trees and Shrubs of Mexico" (Contr. U. S. Nat. Herb. 23: 487-489. 1922), gave a rather complete resumé of *Nissolia*. His interpretation of the species differs somewhat from Rose's but is more in accord with this present treatment.

Five species of *Nissolia* have been published since 1899, two by Sandwith, and one by J. Donnell Smith. Another taxon published by Smith, *Machaerium verapazense* Donn. Sm., has been recognized as identical with typical *Nissolia fruticosa* Jacq. A new genus, *Pseudomachaerium* Hassler, with one species, *P. rojasianum*, is referable to *Nissolia fruticosa* var. *guatemalensis*.

Economic consideration

The species of *Nissolia* seem never to form an important or conspicuous element of the vegetation, and scarce mention has been made of their economic uses.

In El Salvador, *Nissolia fruticosa* Jacq., known locally as "hierba del tamagás," is said to be used as an antidote for bite of the "tamagás," a snake (Standley & Calderon, Pl. Salv., 115. 1927; data on label of plant specimen, *Standley* No. 19123).

Nissolia fruticosa has also been listed among the fish-poison plants (Greshoff, Med. Lands Pl. 29: 53. 1900; Pittier, M. A. C. Serv. Bot. Bol. Tecn. 5: 35. 1944) but apparently it is little used.

Geographical distribution

Nissolia is an American tropical and warm temperate genus ranging from southern Arizona and Texas southward to Argentina and Paraguay (fig. 1). It has not been reported from the Antilles nor from eastern South America. The greatest diversity of taxa is in México, where all the known species are represented.

Available collection data indicate that the species all are mesophytes with rather similar ecological requirements and tolerances. Mostly the plants are cited as climbing on trees or clambering over

shrubs. The habitats mentioned suggest moist and open locations such as edges of woods, banks of gulleys, roadsides, forested hills and forested bluffs, lower slopes of mountains, bases of north-facing cliffs, chaparral slopes of canyons, arroyo margins, sandy valley floors, moist swales, or stream sides.

As indicated by the maps and locality citations in connection with the species descriptions in this paper, one species, *Nissolia fruticosa*, is wide ranging, from México to Argentina and Paraguay. The other

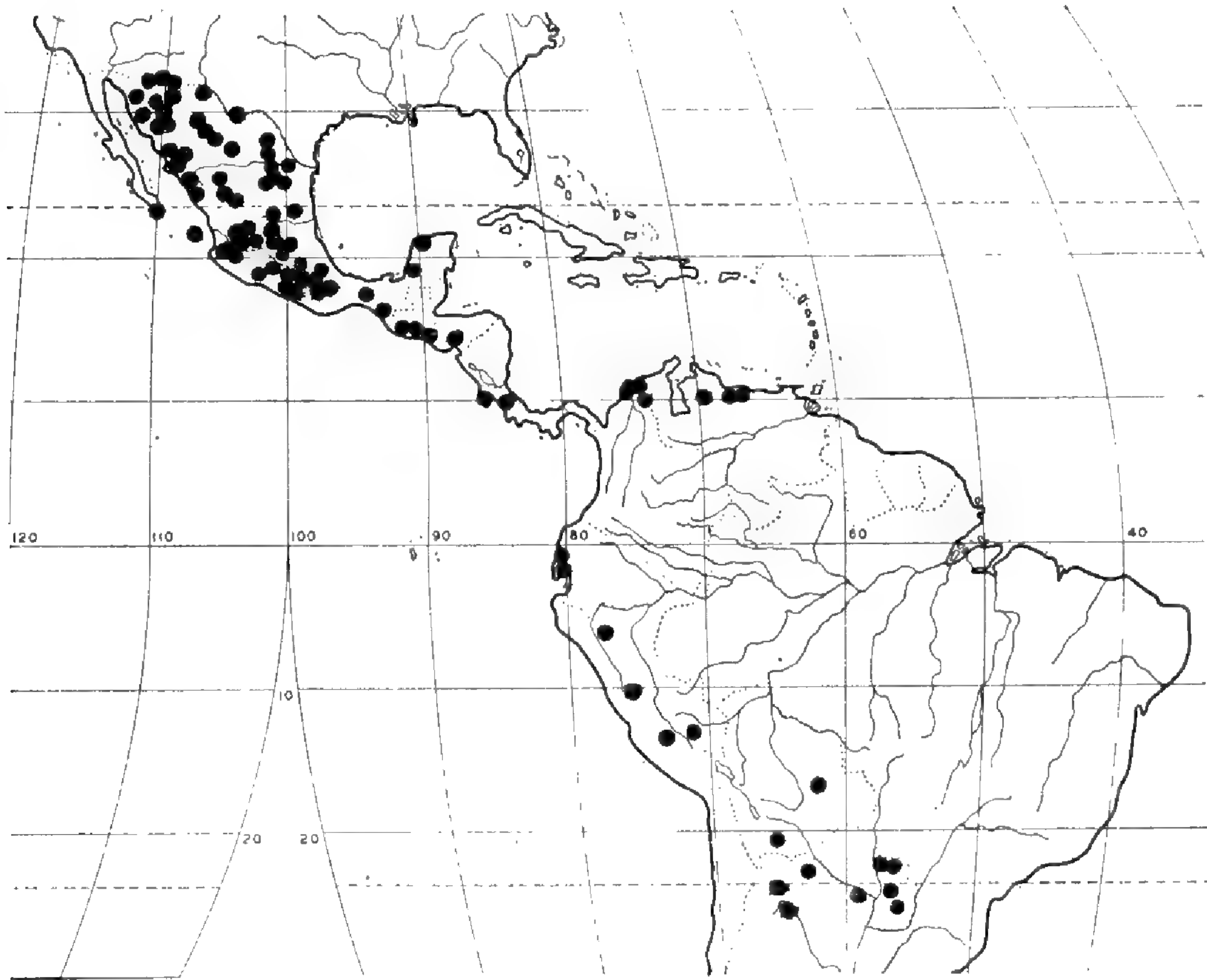


FIGURE 1.—Geographical distribution of the genus *Nissolia*.

species of *Nissolia* are known only from México or just across the border in southern Arizona or Texas. A few species are known solely from very limited areas.

Morphological characters

With the exception of *Nissolia wislizenii*, which is prostrate in habit, the species of *Nissolia* are all perennial climbing vines, sometimes several meters long. The stems, usually numerous from a woody root, are herbaceous, becoming woody with age, subterete, striate, about 1–3 mm. in diameter. The surface may be glabrous or pubescent with more or less crispate, white hairs, and may be beset with yellowish, glandular setae.

Stipules are paired, attached at the base, deltoid to lanceate, acute to attenuate, glabrous or pubescent, entire or glandular-denticulate. Stipels are lacking. Bud scales are deltoid, subglabrous to tomentulose.

The leaves are pinnately 5-foliolate, or, in *Nissolia platycalyx*, sometimes 7-foliolate. The axis, glabrous to pubescent, essentially like the stem, is about 2–10 cm. long, with the petiole comprising one-half to three-fourths the total length. The leaflets are elliptic to orbicular, obovate to obcordate, or subrhombic, ranging in diameter from about 5 to 50 mm. The margin is entire in all species. The apex is mucronulate and obtuse to acute, or retuse. The base commonly is rounded but may be cuneate, truncate, or subcordate. The surfaces are micropunctulate, glabrous to densely pubescent. The venation is pinnate, the costa and a few secondary veins obvious, the others inconspicuous. The petiolules are pulvinate, about 1–2 mm. long.

The inflorescences are axillary and, in most species, fasciculate. In others, the peduncle is elongated, producing a raceme or panicle. Sometimes the flowering branches are leafless, and with closely spaced fascicles present the appearance of elongated racemes. The bracts and stipules intergrade, the latter usually being slightly longer and more attenuate. Bracteoles, the pair of small bracts subtending the calyx, have been observed only in *N. wislizenii*, and there only occasionally. In all species there is an articulation at the base of the calyx. The bracteoles, if present, occur immediately below that line and usually remain on the pedicel after the flowers or fruits are shed. The axis, like the stem, may be glabrous to pubescent, sometimes beset with glandular setae. The length and pubescence of the pedicels are approximately constant for most species, and are somewhat useful diagnostic characters.

The flowers are relatively small. Measured from the articulation at the base of the calyx to the apex of the standard petal, they range from a minimum of 4 mm. long in *Nissolia hirsuta* to a maximum of 20 mm. long in *N. platycalyx*.

The calyx is campanulate with five subequal lobes or truncate with the five nerves extended as subulate teeth. The tube may be glabrous or pubescent, and in some species glandular setae are present. The basal portion of the tube, about 0.5–1 mm. long, is abruptly narrowed to essentially the diameter of the pedicel and within it all the floral parts appear to be more or less adnate.

The corolla is papilionaceous, usually yellowish, occasionally almost white, sometimes purplish or pinkish. Collection data are too scanty to indicate specific constancy. The standard, or vexillum, is the longest petal. It is spatulate, usually with a well developed claw; the blade is pubescent on the outer face. The keel and wings are

nearly as long as the standard, commonly less than 1 mm. shorter. They are clawed and glabrous or pubescent. Although the total flower length is a useful character, the petals otherwise are not particularly useful or convenient for species identification.

There are 10 stamens, subequal, about as long as the keel. The filaments are free from the apex to about midlength, but below that they are united, forming a sheath that splits along the vexillar side as the fruit begins to develop. In many flowers one of the end filaments appears to be less firmly united than all the others, which suggests a tendency toward a diadelphous 9:1 arrangement. The anthers are dorsified and ellipsoidal, the longest scarcely 1 mm. long.

The ovaries are 2-4-ovulate or, less commonly, 1-ovulate; they are sessile or short-stipitate, glabrous in at least one species, pubescent in most. The style is glabrous, the stigma capitate.

The fruits are samara-like, 2-5-articulate loment with the terminal joint sterile, flat, and winglike. Venation is usually prominent, with longitudinal costae and secondary reticulations. The fruit of most species is crisp-pubescent, and usually somewhat glabrate; one species has glabrous fruit, and a few are beset with glandular setae.

The seeds are reniform, sublustrous, reddish brown, laterally compressed, with a small circular hilum. The inside of the pod is villous and a few hairs usually adhere to the seed coat.

Apparently no chromosome counts of *Nissolia* have been published.

Taxonomic position

Nissolia is a genus of papilionaceous legumes, placed in the tribe Hedysareae because of its more or less jointed fruits. Taubert (in Engler and Prantl, *Die Natürlichen Pflanzenfamilien* 3(3): 309. 1894) included *Nissolia* in his subtribe Aeschynomeneae, a group characterized by stamens with filaments united to form a sheath or in two phalanges 5:5. The other genera of this subtribe are: *Aeschynomene*, *Amicia*, *Balisaea*, *Brya*, *Chaetocalyx*, *Climacorachis* (= *Aeschynomene*), *Cyclocarpa*, *Diphaca*, *Discolobium*, *Fiebrigiella*, *Geissaspis*, *Isodesmia*, *Pictetia*, *Poiretia*, *Pseudomachaerium* (= *Nissolia*), *Raimondianthus*, *Smithia*, *Soemmeringia*, and *Weberbauerella*.

Nissolia, unique because of its loment with a sterile, flattened, winglike terminal article, is most closely related to *Chaetocalyx*, whose fruits have articles all essentially equal. There appears to be intergradation through *Nissolia wislizenii* (originally published as *Chaetocalyx wislizenii*), a species with the terminal article flat and sterile but scarcely larger than the fertile, basal articles. Several species of *Nissolia* have the calyx beset with glandular setae as is customary in *Chaetocalyx*. Vegetatively the two genera are essentially identical.

Systematic treatment

Nissolia

Nissolia Jacq. Enum. Pl. Carib. 7. 1760, nom. conserv., non *Nissolia* [Tourn.] Mill. 1754.

Pseudomachaerium Hassler, Bull. Herb. Boiss. II, 7: 1. 1907.

Climbing or prostrate vines, herbaceous or somewhat woody; leaves pinnately compound, 5- (or rarely 7-) foliolate; stipules lanceate to deltoid-ovate, attached at the base; inflorescences axillary, fasciculate or racemose, sometimes paniculate; flowers 5-merous; calyx campanulate with five subequal teeth or lobes; petals papilionaceous, usually yellowish, sometimes white or purplish; stamens 10, the filaments united to form a sheath, which, at maturity, splits along the vexillar side; fruit a samara-like, 2-5-articulate loment, the terminal article sterile, flat, and winglike; seeds reniform, laterally compressed, sublustrous, reddish brown, the hilum small, circular.

The type of the genus is *Nissolia fruticosa* Jacq. Of the two species cited by Jacquin in the original description of *Nissolia*, *N. fruticosa* alone remains in the genus. The other species, *N. arborea*, has been transferred to *Machaerium*.

In this paper, both in the key and in the text, the taxa are arranged in what I believe to be approximately a natural sequence; *N. wislizenii* is at one extreme, *N. fruticosa* at the other, and the intermediate species are placed with what seem to be their next of kin. Allowance must be made for the probability that evolutionary development within the genus has been reticulate rather than lineal.

There is no one good distinguishing character for separating all the species. A few species are essentially unique in at least one feature, which aids in their recognition. For example, *Nissolia wislizenii* has but slight development of the sterile, terminal fruit article, and has leaflets that usually fold when disturbed; *N. laxior* has broad stipules, although in other respects it may be very similar to *N. schottii* and *N. montana*; *N. fruticosa* has an elongated fruit stipe; *N. setosa* has attenuate, glandular-tipped calyx teeth. However, for identification of material in various stages of maturity, it is most satisfactory to utilize different combinations of characters such as flower length, calyx length and the ratio of length of calyx tube and calyx teeth, fruit stipe length, glandular development, and type of inflorescence.

Key to species and varieties

Terminal article of fruit scarcely larger than the fertile articles; stems prostrate; leaflets usually conduplicate when dry, the axis usually recurved (southern Arizona; southward in México to Jalisco and Hidalgo) . . . **I. N. wislizenii**

Terminal article of fruit expanded, conspicuously larger than the fertile articles; stems climbing; leaflets usually drying or wilting without folding, the axis essentially straight.

Stipe of fruit exceeded by the calyx, about 1–2.5(–4) mm. long; inflorescences fasciculate, usually without elongation of the axis (conspicuous exception is *N. hintonii* with racemes or panicles); flowers 4–20 mm. long.

Calyx teeth terminating in attenuate, glandular setae 1–2 mm. long; calyx tube not setose (México: Baja California) **2. *N. setosa***

Calyx teeth not terminating in attenuate setae, or the setae much less than 1 mm. long.

Fruit, and usually the calyx, beset with numerous, glandular setae.

Stems commonly densely white-pubescent, with moderate or no development of glandular setae; flowers (8–)10–12 mm. long; inflorescences fasciculate (México: Sonora and Sinaloa, Coahuila to Puebla).

3. *N. platycarpa*

Stems conspicuously beset with glandular setae, otherwise glabrous; flowers 12–15 mm. long; inflorescences elongated, racemose or paniculate (south-central México: México and Guerrero).

4. *N. hintonii*

Fruit glabrous to pubescent but lacking glandular setae; calyx usually without setae.

Flowers 14–20 mm. long; calyx tube 4.5–6 mm. long, 4–5 mm. in diameter (southwest Texas and northeast México) . . . **5. *N. platycalyx***

Flowers less than 14 mm. long; calyx tube about 4 mm. long, or less.

Stipules broadly lanceate, (1.5–)2–3 mm. wide at the base (southwest México: Jalisco to Guerrero) **6. *N. laxior***

Stipules lanceate, about 1 mm. wide at base or less.

Tube of calyx (2–)2.5–4 mm. long, 2–4 mm. in diameter; calyx teeth 1–4 mm. long.

Calyx, pedicels, leaflets, and rachis of leaf glabrous or but sparingly pubescent, exclusive of glandular setae; leaflets thin, mostly membranous.

Teeth of calyx (2–)3–4 mm. long; flowers (8–)10–12 mm. long; inflorescences fasciculate, 1–8-flowered, the pedicels 6–10 mm. long (southern Arizona and northwestern México).

7. *N. schottii*

Teeth of calyx 1–2 mm. long; flowers 11–13 mm. long; inflorescences fasciculate or sometimes racemose, 1–18-flowered, the pedicels 6–13 mm. long (México: Guerrero).

8. *N. montana*

Calyx, pedicels, and rachis of leaves pubescent, the leaflets mostly thickened, often pubescent, especially along the margins and nerves (México: Chihuahua to Puebla) . . . **9. *N. pringlei***

Tube of calyx 1–2 mm. long, about 1.5 mm. in diameter; calyx teeth 0.5–1.5(–2) mm. long.

Flowers 7–10 mm. long; calyx 3.5–5 mm. long; fruit and calyx glabrous or nearly so (México: Guerrero) . **10. *N. leiogyne***

Flowers 4–7.5 mm. long; calyx 2–2.5 mm. long; fruit and calyx pubescent (México: Sonora and Chihuahua to Oaxaca).

11. *N. hirsuta*

Stipe of fruit exceeding the calyx, about 3–6 mm. long; inflorescences sometimes fasciculate, commonly racemose or paniculate with considerable elongation of the axis; flowers 5–10 mm. long.

Flowers 5–8 mm. long; calyx teeth about 0.5 mm. long or less (México to Venezuela) **12a. *N. fruticosa* var. *fruticosa***

Flowers 8–10 mm. long; calyx teeth 0.5–1 mm. long (Guatemala to north-western Argentina and Paraguay).

12b. *N. fruticosa* var. *guatemalensis*.

1. *Nissolia wislizenii* (A. Gray) A. Gray, Journ. Linn. Soc. 5: 25. 1861, as *N. wislizeni*.

Chaetocalyx wislizeni A. Gray, Pl. Wright. 1: 51. 1852.

Prostrate herb, the stems moderately white-pubescent and also sparsely beset with yellowish, glandular setae; stipules lanceate to deltoid-ovate, acute to acuminate, commonly 5–7 mm. long, 1–2.5 mm. wide, pubescent to subglabrous, entire or glandular-denticulate; leaves 0.5–5 (commonly 2–4) cm. long; leaflets essentially orbicular or sometimes elliptic, 4–20 mm. in diameter, obtuse to emarginate, mucronulate, the base obtuse to subcordate, the upper surface glabrous, the lower moderately pubescent to subglabrous; inflorescences fasciculate, 1–5-flowered, the pedicels 3–15 mm. long, pubescent; flowers (8–)10–15 mm. long, the standard straight or scarcely recurved; calyx pubescent and setose, (3–)4–5 mm. long, the tube (2–)3–4 mm. long, about 3 mm. in diameter, the teeth deltoid-subulate, about 1 mm. long; fruit commonly 2–4 cm. long, 2–5 articulate, pubescent to subglabrous, the stipe 1–2 mm. long, the fertile articles about 7–10 mm. long, 3–7 mm. wide, the terminal, sterile article flat and winglike but scarcely broader than the fertile articles; seeds about 5 mm. long and 3 mm. broad.

TYPE LOCALITY: Sacramento, Chihuahua, México. Type collected by Wislizenus (No. 151), cited below.

DISTRIBUTION: Southern Arizona and southward in México to Jalisco and Hidalgo (fig. 2).

UNITED STATES

ARIZONA: Cochise County: "San Pedro River, Mexican boundary line," *International Boundary Commission (Mearns)* 1549 (US). "Johnston's Ranch, 11 m. east of San Pedro River," *International Boundary Commission (Merton)* 1706 (US). Naco, *Harrison* 8261 (US). Huachuca Mountains, *Lemmon* 2668 (Ph, UC, US).

MÉXICO

SONORA: San Pedro, *Hartman* 870 (GH).

CHIHUAHUA: Sacramento, *Wislizenus* 151 (GH TYPE). Ciudad Juárez, *Wright* 1007 (GH, NY, US). Chihuahua, *Pringle* 618 (GH, NY, Ph, US). Cañón de las Varas, *Shreve* 9048 (GH, NA, UC). "Santa Clara Canyon," *LeSueur* 722 (GH).

DURANGO: *Rose* 2278 (GH, US), 2298 (GH, US). Durango, *Fisher* 44177 (GH, NY). Otinapa, *Palmer* 371 in 1906 (GH, NY, UC, US). Jaral, *Schumann* 188 (US).

ZACATECAS: Near Monte Escobedo, *Rose* 2651 (GH, US). Sombrerete, *Gentry* 8473 (US).

SAN LUIS POTOSÍ: *Parry & Palmer* 133 in 1878 (GH, Ph, US); *Palmer*, "July 21 and Aug. 1898" (US); *Schaffner* 592 (NY, US). San Miguelito, *Schaffner*

793 (GH, Ph). San Rafael, *Schaffner* 794 (GH, Ph). Charcas, *Lundell* 5385 (US), 5459 (US).

JALISCO: Guadalajara, *Pringle* 5482 (GH).

QUERÉTARO: San Juan del Río, *Rose, Painter, & Rose* 9533 (GH, NY, US).

HIDALGO: Dublán, near Tula, *Pringle* 9639 (US).

This species seems to be the only one of the genus with a prostrate habit. The slightly recurved axis of the leaflet and the tendency of the leaflets to fold when disturbed makes herbarium specimens of *N. wislizenii* rather distinctive. In fruit the species is easily recognized by the slight development of the sterile, terminal article, in contrast to the enlarged wing of all the other species. Illustrations of the fruit and flowers are given by Torrey (*Bot. Mex. Bound. pl. 18. 1859*) and by Rose (*Contr. U. S. Nat. Herb. 5: 158, fig. 17. 1899*).

The specific name, originally published as "*wislizeni*," is here changed to *wislizenii*, following Recommendation 82C (b) of the International Code of Botanical Nomenclature (1952).

2. *Nissolia setosa* Brandegees, *Proc. Calif. Acad. ser. 2, 3: 127. 1891.*

Twining vine, the stems sparingly pubescent; stipules lanceate, 3–5 mm. long, about 1 mm. wide at base, acute, subglabrous or pubescent, especially along the margins; leaves 2–5 cm. long; leaflets, elliptic to orbicular, about 7–25 mm. long, 5–18 mm. wide, obtuse or retuse, mucronulate, the base obtuse, the upper surface glabrous, the lower glabrous or nearly so; inflorescences fasciculate, 1–5-flowered, the pedicels 4–7 mm. long, subglabrous; flowers (9–)10–13 mm. long, the standard slightly recurved; calyx 6–7 mm. long, sometimes ciliate, otherwise glabrous or sparingly pubescent, the tube 2.5–3.5 mm. long, 2.5–3 mm. in diameter, the teeth deltoid-subulate, 3–4 mm. long, each terminating in an attenuate, glandular seta 1–2 mm. long; fruit 1.5–2.5 cm. long, 2- or 3-articulate, pubescent and also beset with glandular setae, the stipe less than 1 mm. long, the fertile articles about 5–10 mm. long and 3 mm. wide, the terminal, sterile article 10–15 mm. long, 5–6 mm. wide; seeds about 4 mm. long and 2 mm. wide.

TYPE LOCALITY: San Pedro, Baja California, México. Type collected by Brandegees (No. 140), cited below.

DISTRIBUTION: Known only from southern Baja California (fig. 2).
MÉXICO

Baja California: San Pedro, *Brandegees* 140 (GH, Ph, UC TYPE, US). Todos Santos, *Brandegees*, Oct. 22, 1893 (UC). About 10 miles south of La Paz, *Hammerly* 239 (US).

This is the only species of *Nissolia* known from Lower California. It is unique in having its calyx teeth tipped with attenuate, glandular setae. Other species may have a slight suggestion of glandular points on the calyx teeth, but these points are never so long nor so pronounced. Rose reduced *N. setosa* to synonymy under *N. schottii*, but I believe

those two species to be distinct. It seems to me that *N. wislizenii* and *N. platycarpa* are more closely related to *N. setosa*.

In the original description, Brandegee gives the flower length of *N. setosa* as 4 mm. That must be a misprint for 9 mm. The type

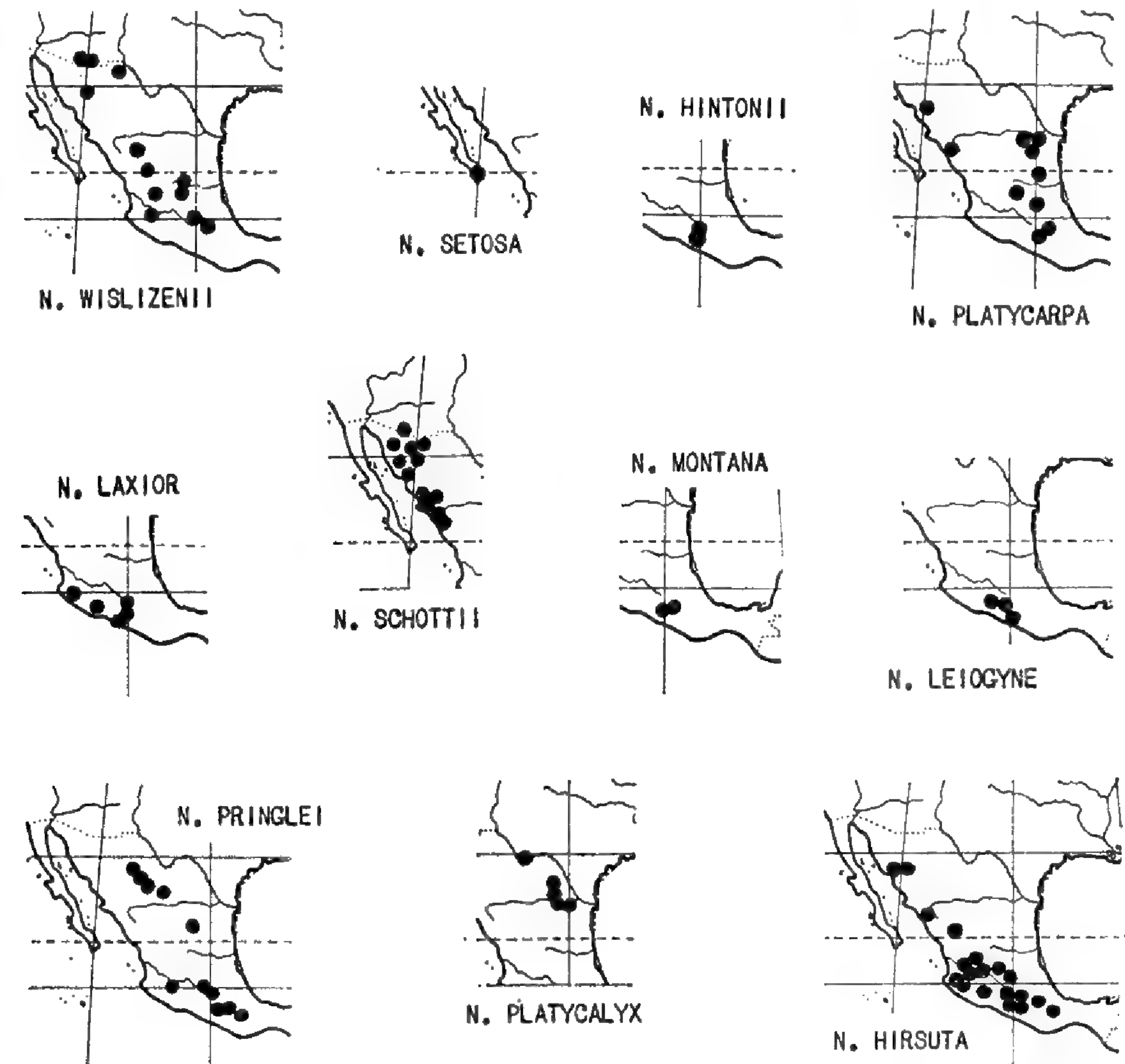


FIGURE 2.—Geographical distribution of *Nissolia hintonii*, *N. hirsuta*, *N. laxior*, *N. leiogyne*, *N. montana*, *N. platycalyx*, *N. platycarpa*, *N. pringlei*, *N. schottii*, *N. setosa*, and *N. wislizenii*.

specimen has one shriveled flower, about 9 mm. long, and other collections show the mature flowers commonly to be about 10–13 mm. long.

3. *Nissolia platycarpa* Benth. in Mart. Fl. Bras. 15 (1): 77. 1859.

Nissolia dodgei Rose, Contr. U. S. Nat. Herb. 5: 161, fig. 23. 1899.

Scandent vine, the stems densely white-pubescent, usually glabrescent, sometimes with a few glandular setae; stipules lanceate, attenuate, entire or glandular-denticulate, 2.5–5 mm. long, 0.5–1.5 mm. wide at base, the upper surface glabrous or subglabrous, the lower surface pubescent; leaves 1.5–8 cm. long; leaflets elliptic to orbicular, 5–45 mm. long, 4–40 mm. wide, acute, obtuse, or retuse, mucronulate, the base obtuse, the upper surface moderately pubescent to glabrous, the lower surface densely pubescent to subglabrous; inflorescences

fasciculate, 1-8-flowered, the pedicels 5-12 mm. long, pubescent, sometimes beset with a few glandular hairs; flowers (8-)10-12 mm. long, the standard somewhat recurved; calyx 6-7 mm. long, the tube 2-3 mm. long, 2-3 mm. in diameter, pubescent along the margin, otherwise pubescent or subglabrous, beset with glandular setae, the teeth subulate or deltoid-subulate, 2-4 mm. long; fruit 1.5-3.5 cm. long, 2-5-articulate, white-velutinous when young, somewhat glabrescent, beset with a few yellowish, glandular setae, the stipe 0.5-2.5 mm. long, the fertile articles 5-7 mm. long, 5-6 mm. wide, the terminal, sterile article about 10 mm. long, 5-10 mm. wide; seeds about 3 mm. long and 2 mm. wide.

TYPE LOCALITY: Zimapán, Hidalgo, México. Type collected by Coulter, cited below.

DISTRIBUTION: México, along the Sierra Madre Oriental from Coahuila to Puebla and Vera Cruz and in Sonora and Sinaloa (fig. 2).

MÉXICO

SONORA: Cañón Guadalupe, Río Mayo, *Gentry* 1382 (GH, NY, UC).

COAHUILA: Saltillo, *Palmer* 248 in 1880 in part (GH, US). Cañón Bocatoche, *Muller* 3117 (NA, UC).

NUEVO LEÓN: Monterrey, *Dodge* 131 (US TYPE of *N. dodgei*); *Pringle* 11813 (GH, US).

TAMAULIPAS: Miquihuana, *Stanford, Retherford, & Northcraft* 785 (NY, UC).

SINALOA: Cofradía, *Brandege*, Oct. 29, 1904 (UC, US). Cuesta de Ratamoza, *Gentry* 5383 (GH, NA, NY). Capadero, Sierra Tacuichamona, *Gentry* 5627 (GH, NA, NY).

SAN LUIS POTOSÍ: Aguaje de Gareía, *Sohns* 1501 (US).

HIDALGO: Zimapán, *Coulter* (sketch from TYPE ex K).

VERA CRUZ: Orizaba, *Botteri* 771 (GH).

PUEBLA: Matamoros, *Miranda* 2168 (GH).

The fruits of *N. platycarpa* are the most densely white-pubescent of all the species and are beset with glandular setae. The stems also are rather conspicuously white-pubescent, especially when young. The leaflets are extremely variable in size.

The collections cited from Sonora and Sinaloa were at first believed to represent a new taxon, but scrutiny of submature fruit reveals a few, weak glandular hairs, and it appears that the material may be referable to *N. platycarpa*.

Comparison of the type of *N. dodgei* with a sketch made from the type of *N. platycarpa* shows the two taxa to be the same.

4. *Nissolia hintonii* Sandw. in Hook. Icon. Pl. 33: pl. 3248. 1934, as *N. hintoni*.

Twining vine, the stems conspicuously beset with glandular setae, otherwise glabrous; stipules lanceate to ovate, glandular-denticulate, acuminate, 5-9 mm. long, 1-2 mm. wide; leaves about 4-8 cm. long, glandular-setose toward the base of the petiole; leaflets orbicular to elliptic, or sometimes obovate, 10-60 mm. long, 6-35 mm. wide,

obtuse, sometimes retuse, mucronate, the base rounded, glabrous on both surfaces; inflorescences racemose, sometimes paniculate, many-flowered, the peduncles and sometimes the pedicels conspicuously setose, the pedicels 6–11 mm. long; flowers 12–15 mm. long, the standard slightly recurved; calyx 6–7 mm. long, the tube about 4 mm. long, 4–5 mm. in diameter, ciliate and beset with a few glandular setae, otherwise glabrous, the teeth subulate, 2–3 mm. long; fruit 3–4.3 cm. long, 2- or 3-articulate, pubescent, somewhat glabrate, the lower portion beset with glandular setae, the stipe 1.5–2.5 mm. long, the fertile articles 5–10 mm. long, 4–8 mm. wide, the terminal, sterile article 15–20 mm. long, 10–15 mm. broad; seeds about 6 mm. long and 4 mm. wide.

TYPE LOCALITY: Carboneras, Temascaltepec, México. Type collected by Hinton (No. 2334); isotypes cited below.

DISTRIBUTION: México: México and northern Guerrero (fig. 2).

MÉXICO

MÉXICO: Carboneras, *Hinton* 2334 (ISOTYPES: NY, US), 5603 (GH, NY, US). Volcán, *Hinton* 2213 (GH). Bejucos, *Hinton* 2520 (GH, NY, US). Ixtapán, *Hinton* 2922 (GH, NY, US). "San Lucas del Maiz," *Hinton* 3335 (NY, US). Rincón, *Hinton* 5075 (NY, US). Tejupileco, *Hinton* 7086 (GH, NY, US). Temascaltepec, *Hinton* 7189 (GH, US).

GUERRERO: "Sierra Madre del Sur, north of Río Balsas, Temisco, Barranca de la Guacamaya," *Mexia* 8848 (GH, NY, UC, US).

The most conspicuous feature of this species is the setose inflorescence, which is usually a long raceme or panicle. The flowers are fairly large for the genus and the leaflets often are large.

5. *Nissolia platycalyx* S. Wats. Proc. Am. Acad. 17: 344. 1882.

Climbing vine, the stems moderately crisp-pubescent, glabrate; stipules lanceate, 3–5 mm. long, 0.5–1 mm. wide, entire, pubescent to subglabrous; leaves 4–7 cm. long; leaflets elliptic, 5–25 mm. long, 4–15 mm. wide, glabrous or nearly so, obtuse, mucronulate, the base obtuse; inflorescences 1–4-flowered, the pedicels 6–8 mm. long, pubescent; flowers 14–20 mm. long, the standard essentially straight; calyx 6.5–10 mm. long, the tube 4.5–6 mm. long, 4–5 mm. in diameter, pubescent to subglabrous, the teeth subulate, 1.5–4.5 mm. long; fruit 3–4 cm. long, 2–4-articulate, pubescent when young, subglabrous at maturity, the stipe about 4 mm. long, the fertile articles 5–7 mm. long, about 5 mm. wide, the terminal, sterile article 2–3 cm. long and about 1 cm. wide; seeds about 5 mm. long and 3 mm. wide.

TYPE LOCALITY: Mountains, 6 miles east of Saltillo, Coahuila, México. Type collected by Palmer (No. 248 in part), cited below.

DISTRIBUTION: Southwest Texas and northeast México (fig. 2).

UNITED STATES

TEXAS: Brewster County: Chisos Mountains, *Ferris & Duncan* 2762 (NY,US); *Marsh* 175 (GH).

TEXAS? [region of the Chisos Mountains]: "Santa Rosa, Coahuila," *Mexican Boundary Survey (Parry)* 253 (NY). "Mt. Carmel Nov. 8th," *Mexican Boundary Survey (Bigelow)* 253 (NY). "Last camp on Rio [illegible; appears to be "from el"] Oct. 30th," *Mexican Boundary Survey (Bigelow)* 253 (NY).

MÉXICO

COAHUILA: Saltillo, *Palmer* 248 in 1880 in part (GH TYPE, Ph,US). Cañon del Pajarito, *Muller* 3175 (NA,UC). Sierra de la Paila, *Hinton* 16532 (GH, NY, US).

NUEVO LEÓN: Alamar, *Mueller & Mueller* 629 (A), 639 (A).

Local name: "Vetchling" (Texas).

Nissolia platycalyx has the largest flowers of the genus; when the species is in fruit, the persistent, large calyx serves to identify it. It apparently is the only member of the genus in which 7-foliolate, as well as 5-foliolate, leaves are to be found.

The collections of the Mexican Boundary Survey, cited above, were reported as *Chaetocalyx wislizeni* by Torrey in his report of the Survey (56. 1859).

6. *Nissolia laxior* (Robins.) Rose, *Contr. U. S. Nat. Herb.* 5: 162, *fig. 25.* 1899.
Nissolia confertiflora var. *laxior* Robins. *Proc. Amer. Acad.* 29: 315. 1894.

Climbing vine, the stems crisp-pubescent, glabrate, usually beset with glandular setae; stipules broadly lanceate, acute to acuminate, entire or sometimes glandular-denticulate, about 7–10 mm. long, (1.5–) 2–3 mm. wide at base, the upper surface subglabrous, the lower surface pubescent, usually densely white-tomentose, especially toward the apex; leaves 5–10 cm. long: leaflets ovate to elliptic, 15–50 mm. long, 10–25 mm. wide, acute to obtuse, mucronulate, the base obtuse, the upper surface subglabrous, the lower moderately crisp-pubescent to subglabrous; inflorescences fasciculate, about 8–20-flowered, the pedicels 8–13 mm. long; flowers 9–11 mm. long, the standard straight or slightly recurved; calyx 6–7 mm. long, subglabrous to pubescent, especially along the margin, sometimes beset with glandular setae, the tube 2.5–3 mm. long, 2.5–3 mm. in diameter, the teeth subulate, 3–4 mm. long; mature fruit and seed not seen.

TYPE LOCALITY: "Barranca of Beltran," Jalisco, México. Type collected by Pringle (No. 4379), cited below.

DISTRIBUTION: Southwestern México, from Jalisco to México and Guerrero (fig. 2).

MÉXICO

JALISCO: "Barranca of Beltran" [near Platanar], *Pringle* 4379 (GH TYPE of *N. confertiflora* var. *laxior*, NY, Ph, UC, US).

QUERÉTARO: San Juan del Río, *Rose, Painter, & Rose* 9531 (NY, US).

MÉXICO: Tejupilco, *Hinton* 771 (NY, US). Temascaltepec, *Hinton* 4028 (GH).

MICHOACÁN: Coalcomán, *Hinton* 13886 (GH, NY, Ph, US).

GUERRERO: Galeana, *Hinton* 14369 (US).

The broadly lanceate stipules, 2–3 mm. wide at the base, usually tomentulose beneath, serve as ready identification for this species. In general, *N. laxior* appears to be closely related to *N. schottii*, *N. montana*, and *N. pringlei* rather than to *N. confertiflora* (= *N. hirsuta*), to which it was originally referred.

7. *Nissolia schottii* (Torr.) A. Gray, Journ. Linn. Soc. 5: 26. 1861.

Chaetocalyx schottii Torr. Bot. Mex. Bound. 56, pl. 18. 1859.

Scandent vine, the stems moderately crisp-pubescent to subglabrous, occasionally glandular-setose; buds often densely tomentose; stipules lanceate, attenuate or acute, entire, pubescent, about 3–5 mm. long, 0.5–1 mm. wide at base; leaves 3–8 cm. long; leaflets elliptic to subrhombic, 5–35 mm. long, 3–25 mm. wide, acute to obtuse, mucronulate, the base obtuse, subglabrous on both surfaces; inflorescences axillary, fasciculate, 1–8-flowered, the pedicels 6–10 mm. long, glabrous to sparsely pubescent, sometimes setose; flowers (8–) 10–12 mm. long, the standard straight or but slightly recurved; calyx 5–7 mm. long, usually pubescent along the margin, otherwise glabrous or lightly pubescent, sometimes with a few glandular setae, the tube (2–) 3–4 mm. long, 2–3 mm. in diameter, the teeth subulate, 2–4 mm. long; fruit 2–3 cm. long, pubescent when young, subglabrous at maturity, 2–4-articulate, the stipe 1–2 mm. long, the fertile articles 4–6 mm. long, 4–5 mm. wide, the terminal, sterile article 10–15 mm. long, 6–10 mm. wide; seeds about 3 mm. long, 2–2.5 mm. wide.

TYPE LOCALITY: "Sierra Verde, Arroyo de los Samotas, Sonora." Type collected by Schott (No. 253a), cited below.

DISTRIBUTION: Southern Arizona and northwestern México (fig. 2).

UNITED STATES

ARIZONA: Pima County: Tucson, Wootton, July 21, 1911 (US); Bartram 371 (US), 372 (Ph); Rose, Standley, & Russell 15180 (US). Sabino Canyon, Kearney & Peebles 10323 (US); Jones, Aug. 20, 1903 (US). Sells, Peebles, Harrison, & Kearney 2743 (US); Clark 11180 (GH). Baboquivari Canyon, King & Loomis 3258 (US); Peebles, Harrison, & Kearney 2760 (US); Peebles & Swingle 7923 (NA, NY); Kearney & Peebles 14927 (NY). Baboquivari Mountains, Peebles 8967 (US); Harrison 6821 (NY); Jones 24931 (GH, UC); Gilman 114 (NA). Santa Catalina Mountains, Pringle, Aug. 3, 1881 (GH).

MÉXICO

SONORA: "Sierra Verde, Arroyo de las Samotas," Mexican Boundary Survey (Schott) 253a (GH, NY TYPE of *Chaetocalyx schottii*). Altar, Pringle, Aug. 26, 1884 (NY, US). Magdalena, Rose, Standley, & Russell 15130 (US). Ber-ruga, Wiggins 6021 (US). Pozo Serna, Wiggins 6038 (US). Cumpas, Wiggins 7430 (A, US). Tajitos, Wiggins 8300A (US). Cañón de Bavispe, White 3268 (GH, Ph); Phillips 543 (GH). Río Bavispe near Colonia Oaxaca, White 734 (GH). Los Arrieros, Wiggins & Rollins 242 (NY, UC, US). Colorado, Wiggins & Rollins 307 (NY, UC, US). Guaymas, Palmer 170 in 1887 (GH, NY, UC, US); Gentry 4713 (NA, NY). Alamos, Palmer 638 in 1890 (GH, US); Rose, Standley, & Russell 12971 (NY, US).

Cañón de las Estacas, *White* 3033 (GH), 3075 (GH, NA). Cañón del Agua Amargo, *White* 3587 (GH). Valle de Teras, near La Angostura, *White* 3557 (GH). Colonia Morelos, *White* 4524 (GH). Cañón de Santa Rosa, near Bavispe, *White* 354 (GH). Fronteras, *White* 3886 (GH).

CHIHUAHUA: "Hacienda San Jose, 25 m. S. of Batopilas," *Palmer* 57 in 1885 (GH, US). "Hacienda San Miguel near Batopilas," *Palmer* 113 in 1885 (GH, US). Guasaremos, Río Mayo, *Gentry* 2382 (GH, UC, US).

SINALOA: El Fuerte, *Rose, Standley, & Russell* 13495 (NY, US). Mocorito, *Collins & Kempton* 61 (US). Culiacán, *Brandege*, Sept. 7, 1904. (GH, UC, US). El Pozole, *Ortega* 5564 (US). San Blas, *Jones* 22878 (UC).

The subglabrous calyx with its long teeth is one of the easily recognized features of this species. A few specimens of *N. schottii* have glandular setae on the calyx and a few have some pubescence approaching that of *N. pringlei*.

The well developed wing of the fruit serves to distinguish *N. schottii* from *N. wislizenii*, which has a similar geographic range. The fruit is rather variable in shape, sometimes straight, sometimes falcate. The wing tip varies from rounded to acuminate but that seems not to be of diagnostic significance.

8. *Nissolia montana* Rose, Contr. U. S. Nat. Herb. 8: 48. 1903.

Climbing vine, the stems pubescent to subglabrous, sometimes with a few glandular setae; stipules lanceate, attenuate, entire, about 4–6 mm. long, scarcely 1 mm. wide at the base, moderately pubescent on both surfaces; leaves 2–8 cm. long; leaflets elliptic to suborbicular, 10–50 mm. long, 6–35 mm. wide, obtuse, mucronulate, the base obtuse, subglabrous on both surfaces; inflorescences fasciculate, or sometimes with a slight elongation of the axis, 1–18-flowered, the pedicels 6–13 mm. long, essentially glabrous; flowers 11–13 mm. long, the standard but slightly recurved; calyx 4–5 mm. long, the tube about 3 mm. long, 3–4 mm. in diameter, ciliate but otherwise glabrous, the teeth subulate, 1–2 mm. long; fruit 2.5–3.5 cm. long, 2- or 3-articulate, moderately pubescent, the stipe 1–3 mm. long, the fertile articles 6–8 mm. long, about 8 mm. wide, the terminal, sterile article 15–20 mm. long, about 10 mm. wide; seeds 3–4 mm. long, 2–2.5 mm. wide.

TYPE LOCALITY: Mountains near Iguala, Guerrero, México. Type collected by Pringle (No. 9259), cited below.

DISTRIBUTION: Known only from Guerrero, México (fig. 2).

MÉXICO

GUERRERO: Iguala, *Pringle* 9259 (GH, US TYPE), 10329 in part (GH, Ph, NY, UC, US); *Holway* 43 (US), 57 (US). San Antonio, Montes de Oca, *Hinton* 11675 (US).

This species most resembles *N. laxior* and *N. schottii*. It is distinguished from both by flowers that average slightly larger and by short calyx teeth. *Nissolia montana* has the narrow stipules characteristic

of *N. schottii* and the inflorescences with longer pedicels and more numerous flowers, as is customary in *N. laxior*.

Apparently a number of sheets of *Pringle* 30329 were distributed, all with a mixture of material—flowers of *N. montana* and fruits of *N. fruticosa*.

9. *Nissolia pringlei* Rose, Contr. U. S. Nat. Herb. 5: 159, fig. 20. 1899.

Nissolia diversifolia Rose, Contr. U. S. Nat. Herb. 5: 160, fig. 21. 1899.

Nissolia multiflora Rose, Contr. U. S. Nat. Herb. 5: 161, fig. 24. 1899, in part.

Climbing vine, the stems pubescent, somewhat glabrescent, sometimes sparsely beset with glandular setae; stipules lanceate, attenuate, entire or glandular-denticulate, pubescent, 3–5 mm. long, 1 mm. wide or less; leaves 2–6 cm. long; leaflets elliptic to orbicular, 7–30 mm. long, 5–15 mm. wide, acute to obtuse, mucronulate, the base rounded to subcordate, the lower surface pubescent to subglabrous, the upper surface glabrous or subglabrous; inflorescences fasciculate, 4–many-flowered, the pedicels pubescent, 6–10 mm. long; flowers 8–12 mm. long, the standard recurved; calyx 4–6 mm. long, pubescent, occasionally glandular-setose, the tube 2.5–4 mm. long, 2.5–3 mm. in diameter, the teeth 1.5–2.5 mm. long; fruit 2–3 cm. long, 2–5-articulate, pubescent, somewhat glabrescent, the stipe 1–2 mm. long, the fertile articles 5–7 mm. long, 4–7 mm. wide, the terminal, sterile article 8–15 mm. long, 5–10 mm. wide; seeds 3–3.5 mm. long, 2–2.5 mm. wide.

TYPE LOCALITY: Santa Eulalia Mountains, Chihuahua, México. Type collected by Pringle (No. 324), cited below.

DISTRIBUTION: México: Chihuahua to Puebla (fig. 2).

MÉXICO

CHIHUAHUA: Santa Eulalia Mountains, *Pringle* 324 (GH, NY, Ph, US TYPE).

Camargo, *Johnston* 7918 (GH). Jiménez, *Shreve* 8864 (NA, US).

COAHUILA: Santa Elena mines, *Stewart* 232 (GH).

ZACATECAS: Cedros, *Kirkwood* 77 (GH); *Lloyd* 122 (US).

JALISCO: La Venta, *Lemmon & Lemmon* in 1905 (UC). Lago de Chapala, *Lemmon & Lemmon* 16 (UC).

QUERÉTARO: San Juan del Río, *Rose, Painter, & Rose* 9532 (GH, NY, US).

Between San Juan del Río and Cadereyta, *Rose, Painter, & Rose* 9689 (US).

Querétaro, *Altamirano* 1600 (US); *Rose & Rose* 11155 in part (GH, US).

PUEBLA: *Purpus* 5589 (UC). Tehuacán, *Pringle* 6693 (GH, NY, UC, US TYPE of *N. diversifolia*). Puebla, *Arsène* 1883 (US), 2054 (A, GH, NY, US), (*Nicholas*) 5453 (US), (*Nicholas*) 5464 (US); *Nicholas*, Oct. 10, 1909 (US). San Luis Tultitlanapa, *Purpus* 3199 (GH, NY, UC, US). Matamoros, *Rose & Hough* 4693 (US). "Cerro de Baxtla," *Purpus*, July 1907 (UC).

MORELOS: Jojutla, *Pringle* 8662 (GH, NY, UC, US).

The larger-flowered, less pubescent specimens of *N. pringlei* approach *N. schottii* in appearance, while the smaller-flowered, more pubescent specimens suggest *N. hirsuta*, but there is such intergradation that no satisfactory distinction can be made. The type material

of *N. diversifolia* is somewhat intermediate and, I believe, referable to *N. pringlei*. This follows Standley's treatment in his "Trees and Shrubs of Mexico" (1922).

Most of the material of *Pringle* 6064, from Oaxaca, distributed as *N. multiflora*, is actually *N. hirsuta*. However, the type sheet, at US, is a mixture of *N. pringlei* and *N. hirsuta*, and Rose's description of *N. multiflora* includes characters of both elements. The name *Nissolia multiflora* is, therefore, to be rejected according to Article 76 of the International Code of Botanical Nomenclature (1952).

10. *Nissolia leiogyne* Sandw. Kew Bull. 1937: 302. 1937.

Climbing vine, the stems moderately pubescent to glabrous; stipules lanceate, attenuate, about 2–4 mm. long and 0.5 mm. wide, subglabrous, entire; leaves 2–7 cm. long; leaflets obcordate, obovate, or suborbicular, 5–30 mm. long, 5–20 mm. wide, obtuse or retuse, mucronulate, rounded or cuneate at the base, glabrous or subglabrous; inflorescences fasciculate or the axis sometimes slightly elongated, 1–15-flowered, the pedicels 5–7 mm. long, glabrous; flowers 7–10 mm. long, the standard slightly recurved; calyx 3.5–5 mm. long, glabrous or nearly so, the tube about 2 mm. long and 1.5 mm. in diameter, the teeth subulate, 1–1.5 mm. long; fruit 2.5–3 cm. long, 2- (rarely 3-) articulate, glabrous or nearly so, the stipe 2–3 mm. long, the fertile articles 5–7 mm. long, about 5 mm. wide, the terminal, sterile article about 15 mm. long, 6–8 mm. wide; seeds about 2 mm. long and 1.5 mm. wide.

TYPE LOCALITY: In a barranca, Santa Bárbara, Coyuca, Guerrero, México. Type collected by Hinton (No. 6291); isotypes cited below.

DISTRIBUTION: Known only from the State of Guerrero, México (fig. 2).

MÉXICO

GUERRERO: Santa Bárbara, Coyuca, *Hinton* 6291 (ISOTYPES: A, GH, NY, US).

Between Coyuca and Chacamerito, *Hinton* 6616 (A, NY, US). Tario,

Coyuca, *Hinton* 7861 (A, NY, US). "El Calabazal," *Langlassé* 473 (GH, US).

Acapulco, *Palmer* 7 in 1894–95 (A, GH, NY, UC, US).

Nissolia leiogyne is characterized by fruits that are glabrous or nearly so. Its nearest relative probably is *N. schottii*, but the flowers of *N. leiogyne* are somewhat smaller, and the leaflets, frequently obcordate or obovate, are rather distinctive.

11. *Nissolia hirsuta* DC. Prodr. 2: 257. 1825.

Nissolia confertiflora S. Wats. Proc. Am. Acad. 21: 424. 1886.

Nissolia multiflora Rose, Contr. U. S. Nat. Herb. 5: 161, fig. 24. 1899, in part.

Climbing vine, the stems crisp-pubescent, sometimes glabrate, sometimes with a few glandular setae; stipules lanceate, acuminate, 3–5 mm. long, about 1 mm. wide or less, entire or glandular-denticu-

late, moderately pubescent; leaves 3–10 cm. long; leaflets elliptic, 10–50 mm. long, 10–35 mm. wide, densely pubescent to subglabrous, obtuse to acute, mucronate, the base acute or truncate; inflorescences fasciculate, many-flowered, the pedicels 2–6 (–8) mm. long, pubescent; flowers 4–7.5 mm. long, the standard recurved, sometimes as much as 90°; calyx crisp-pubescent to subglabrous, 2–2.5 mm. long, the tube about 1.5 mm. long and 1.5 mm. in diameter, the teeth subulate, 0.5–1.5 mm. long; fruit 2–4 cm. long, 2–4-articulate, pubescent, somewhat glabrescent, the stipe 1–2 mm. long, the fertile articles 5–7 mm. long, 4–5 mm. wide, the terminal, sterile article 10–15 mm. long, 7–10 mm. wide; seeds about 4 mm. long and 2.5 mm. wide.

TYPE LOCALITY: Near Guanajuato. Type collected by Née, photo cited below.

DISTRIBUTION: México, from Sonora and Chihuahua southward to Oaxaca (fig. 2).

MÉXICO

SONORA: Arroyo Gochico, Río Mayo, *Gentry* 1649 (GH, NY, UC, US).

CHIHUAHUA: "Hacienda San Jose, 25 m. S. of Batopilas," *Palmer* 42 in 1885 (GH TYPE of *N. confertiflora*, NY, Ph, US).

SINALOA: *Ortega* 6362 (US). Culiacán, *Palmer* 1496 in 1891 (GH, NY, US); *Brandege*, Oct. 30, 1904 (GH, UC, US).

DURANGO: *Rose* 2301 (GH, US).

ZACATECAS: San Juan Capistrano, *Rose* 3541 (US).

JALISCO: Colotlán, *Rose* 2813 (GH, US). Guadalajara, *Rose & Painter* 7382 (US); *Pringle* 5421 (GH), 9767 (GH, NY, US); *Holway* 542 (NY), 5039 (US). Cautla, *Holway* 9 (US), 5230 (US). Sayula, *Holway* 5127 (US); *Reko* 4509 (US). Tequila, *Palmer* 388 in 1886 (GH, NY, US). Bolaños, *Rose* 2852 (US). Between Atequiza and Chapala, *Rose & Painter* (GH, US). Chapala, *Holway* 3450 (GH). Etzatlan, *Rose & Painter* 7538 (US).

GUANAJUATO: *Née* (Field Museum negative 6943, photo presumably of TYPE ex G); *Dugés* in 1891 (US); *Rose & Hough* 4838 (US).

QUERÉTARO: Querétaro, *Rose & Rose* 11155 in part (NY, US); *Kuntze* 23468 (NY); *Arsène (Agniel* 32) 10307 (US), (*Agniel*) 10435 (US).

PUEBLA: Tehuacán, *Rose & Hay* 5918 (NY, US); *Rose, Painter, & Rose* 9878 (US). "El Riego, plains," *Purpus*, July 1905 (UC). "El Riego, rocks," *Purpus* 1189 (GH, NY, UC). Santa Lucía, *Purpus*, May 1908 (UC).

MORELOS: Cuernavaca, *Pringle* 6395 (GH, NY, Ph, UC, US); *Rose & Painter* 6914 (US), 6978 (GH, NY, US); *Rose, Painter, & Rose* 10200 (US); *Rose & Rose* 11076 (NY, US). Yautepec, *Pringle* 11346 (GH, US); *Rose, Painter, & Rose* 8534 (NY, US). Xochiltepec, *Lyonnet* 2176 (US).

MÉXICO: Chorrera, Temascaltepec, *Hinton* 1197 (NY, US). Luvianos, *Hinton* 4319 (US). Ixtopán de la Sal, *Matuda* 27090 (NY).

MICHOACÁN: Morelia, *Arsène* 5716 (NY, US).

GUERRERO: Iguala, *Rose, Painter, & Rose* 9297 (GH, NY, US); *Pringle* 10393 (GH, US). Querendas, Coyuca, *Hinton* 6280 (GH, US). Pungarabato, *Hinton* 6692 (GH, US). Taxco, *Abbott* 297 (GH), 326 (GH).

OAXACA: "Santa Catarina del Rio," *L. C. Smith* (GH). Santa Catarina, *Rusby* 72 (NY, US). Tomellín Cañón, *Pringle* 7467 (GH, US). Between Mitla and Oaxaca, *Rose & Rose* 11289 (NY, US). Monte Albán, *Pringle* 6064 in part (GH, NY, Ph, UC, US TYPE of *N. multiflora*).

The smallest flowers of the genus are to be found on specimens of *Nissolia hirsuta*, but, in general, they are about equal to those of typical *N. fruticosa*. It is sometimes difficult to tell those two species apart when mature inflorescences or fruit are lacking. In fruit, the short stipe, 1–2 mm. long, shorter than the calyx, distinguishes *N. hirsuta* from *N. fruticosa*, which has fruit stipe 3–6 mm. long, exceeding the calyx. Flowers of *N. hirsuta* may be as much as 7 mm. long, suggesting a transition to *N. pringlei*.

Nissolia multiflora, listed in synonymy in part, is a name to be rejected, according to Article 76 of the International Code of Botanical Nomenclature (1952), since it is based on two elements. The type specimen, Pringle 6064 at US, is mostly *N. hirsuta*, with some material of *N. pringlei*. From Rose's original description of *N. multiflora* and from his key to species of *Nissolia*, it is obvious that characters both of *N. hirsuta* and of *N. pringlei* were utilized. All the isotypes of *N. multiflora* that I have seen are entirely *N. hirsuta*.

12. *Nissolia fruticosa* Jacq. Enum. Pl. Carib. 27. 1760.

Scandent vine; stems pubescent, glabrate; stipules deltoid-lanceolate, attenuate, entire, about 2–6 mm. long, 1–2 mm. wide at base, pubescent; leaves commonly 6–8 cm. long; leaflets elliptic to ovate, commonly 30–80 mm. long, 20–50 mm. wide, acute, the base obtuse, the upper surface moderately pubescent to subglabrous, the lower surface moderately pubescent; inflorescence racemose, sometimes paniculate, rarely fasciculate, many-flowered, the pedicles 2–8 mm. long, pubescent to subglabrous; flowers 5–10 mm. long, the standard recurved; calyx pubescent, rarely subglabrous, 2–4 mm. long, the tube 2–3 mm. long, 2–3 mm. in diameter, the teeth subulate, 0.3–1 mm. long; fruit 3–4 cm. long, pubescent, often glabrate, 3–6-articulate, the stipe 3–6 mm. long, the fertile articles about 3–4 mm. long, 3–4(–5) mm. wide, the terminal, sterile article about 20 mm. long, 10–15 mm. wide; seeds about 4.5 mm. long and 2 mm. wide.

12a. *Nissolia fruticosa* var. *fruticosa*.

Nissolia fruticosa Jacq. Enum Pl. Carib. 27. 1760.

Nissolia racemosa DC. Prodr. 2: 257. 1825.

Nissolia polysperma Bert. ex DC. Prodr. 2: 257. 1825, nomen in synon. under *N. racemosa*.

Nissolia nelsoni Rose, Contr. U. S. Nat. Herb. 5: 162, fig. 26. 1899.

Machaerium verapazense Donn. Sm. Bot. Gaz. 40: 2. 1905.

Nissolia costaricensis Donn. Sm. in Coult. Bot. Gaz. 44: 108. 1907.

Typical variety characterized by small flowers, 5–8 mm. long, with calyx teeth about 0.5 mm. long or less; inflorescences commonly racemose, frequently paniculate, but rarely fasciculate.

TYPE LOCALITY: Cartagena, Colombia. Type presumably collected by Jacquin; photo cited below.

DISTRIBUTION: México to Venezuela (fig. 3).

MÉXICO

SINALOA: San Ignacio, *Narvaez-Montes & Salazar* 633 (US). Capule, *Ortega* 6068 (US). Culiacán, *Brandege*, Oct. 22, 1904 (UC). Yervacito, near Culiacán, *Brandege*, Sept. 26, 1904 (UC).

SAN LUIS POTOSÍ: Los Caños, *Palmer* 271 in 1902 (GH, NY, US). Tamasopo Cañón, *Pringle* 3647 (GH).

NAYARIT: Isla María Madre, *Ferris* 5588 (US).

JALISCO: Cuautla, *Holway* 10 (US); *Kuntze* 23538 (NY).

VERA CRUZ: Córdoba, *Seaton* 398 (GH, US); *Bourgeau* 1477 (GH); *Fisher* 35293 (NY, US). Acazonica, *Purpus* 8579 (GH, NY, UC, US). Camarón, *Purpus* 11083 (US). Rancho Remudadero, *Purpus* 14246 (A). Zacuapán, *Purpus* 15306 (US), 16000 (A). Atoyac, *Kerber* 132 (US).

PUEBLA: San Luis Tultitlanapa, *Purpus* 3200 (GH, NY, UC, US).

MORELOS: Cuernavaca, *Rose & Hough* 4424 (US); *Rose, Painter, & Rose* 10199 (US).

MICHOACÁN: Naranjillo, *Hinton* 12682 (US).

GUERRERO: "El Calabazal," *Langlassé* 472 (US). "Cutzmala-Rancho," Coyuca, *Hinton* 6709 (GH). *Hinton* 8163 (GH, NY, US), "Campo Morado-Otatlan," Mina, *Hinton* 14486 (GH, NY, US). Balsas, *Halbinger* 25 (GH).

OAXACA: Oaxaca, *Nelson* 1266 (US TYPE of *N. nelsoni*); *Pringle* 4640 (A, GH, NY, Ph, UC, US); *Rose & Hough* 4612 (NY, US); *Conzatti & Gonzalez* 36 (US). Macuilzóchil, *Conzatti* 1457 (NY, US). "Calderon San Juan del Estado," *L. C. Smith* 28 (GH).

CHIAPAS: Tuxtla, *Nelson* 3086 (GH, US). Cerro Obando *Matuda* 3950 (A, GH, NY, US). Escuintla, *Matuda* 559 (US). Between Mazapa and Motozintla, *Matuda* 4874 (NY, US). Cerro Melé, *Matuda* 4587 (NY).

CAMPECHE: Tuxpeña, *Lundell* 933 (NY, UC, US).

YUCATAN: *Gaumer* 24262 (GH, US), 24322 (GH, NY). Izamal, *Gaumer* 884 (Ph, UC), 886 (US). Calotmul, *Gaumer* 2018 (GH). Suitún, *Gaumer* 23427 (GH, NY). Mérida, *Souza-Novelo* 128 (NA).

GUATEMALA

SANTA ROSA: Estanzuela, *Heyde & Lux* 3715 in part (US). Casillas, *Heyde & Lux* 4459 (GH, NY, US).

ALTA VERAPAZ: Cubilquitz, *von Türckheim* 8508 (US TYPE of *Machaerium verapazense*).

HONDURAS

MORAZÁN: Along Río Choluteca, near Tegucigalpa, *Williams & Molina* 10494 (A, Ph, UC). Between Tegucigalpa and Suyapa, *Molina* 1459 (GH).

EL SALVADOR

SAN SALVADOR: San Salvador, *Calderón* 141 (GH, NY, US), 141AB (GH, NY, US); *Standley* 19123 (GH, NY, US).

SANTA ANA: Santa Ana, *Standley* 20439 (GH, NY, US).

COSTA RICA

ALAJUELA: Surubres, *Biolley* 7088 (US TYPE of *N. costaricensis*) San Ramón, *A. Smith* P2320 (UC).

PUNTARENAS: Nicoya, *Tonduz* [*Herb. Pittier*] 13535 (NY, US).

SAN JOSÉ: Alajuelita, *Pittier* 9664 (NY, US).

VENEZUELA

MIRANDA: Los Moriches, *Pittier* 11959 (NY, Ph, US, Ven). La Envidia, *Pittier* 8375 (GH, US, Ven).

DISTRITO FEDERAL: Caracas, *Pittier* 7391 (GH, US, Ven); *Tamayo* 1428 (UC, US, Ven); *Ll. Williams* 10594 (Ven), 10594a (Ven).

ARAGUA: Between El Limón and El Sombrero, *Archer* 3009 (NA, US). Colonia Tovar, *Fendler* 194 (GH, NY, US).

CARABOBO: Valencia, *Pittier* 8693 (GH, NY, US, Ven).

LARA: Barquisimeto, *Saer* 384 (Ven).

COLOMBIA

MAGDALENA: Santa Marta, *Bertero* (Field Museum negative 33427, photo of TYPE of *N. racemosa* ex G). Bonda, *H. H. Smith* 280 (A, GH, NY, Ph, UC, US). Valledupar, *Haught* 4397 (US). Cerrejón, *Haught* 6714 (NY, UC, US). Codazzi, *Haught* 3784 (US). Riohacha, *Haught* 4479 (US).

BOLÍVAR: Cartagena, *Jacquin* (Killip negative 629, photo of TYPE ex BM); *Heriberto* 160 (US). La Popa, *Killip & Smith* 14086 (A, GH, NY, US). Torrecilla, near Turbaco, *Killip & Smith* 14422 (A, GH, NY, US). Arjona, *Killip & Smith* 14509 (A, GH, NY, US). Soplaviento, *Killip & Smith* 14623 (A, GH, NY, US).

Local names: "Box-ak" (Yucatán, México); "riatilla" [or "reatilla"?] (Sinaloa, México); "hierba del tamagás" (El Salvador); "gallito" (Honduras).

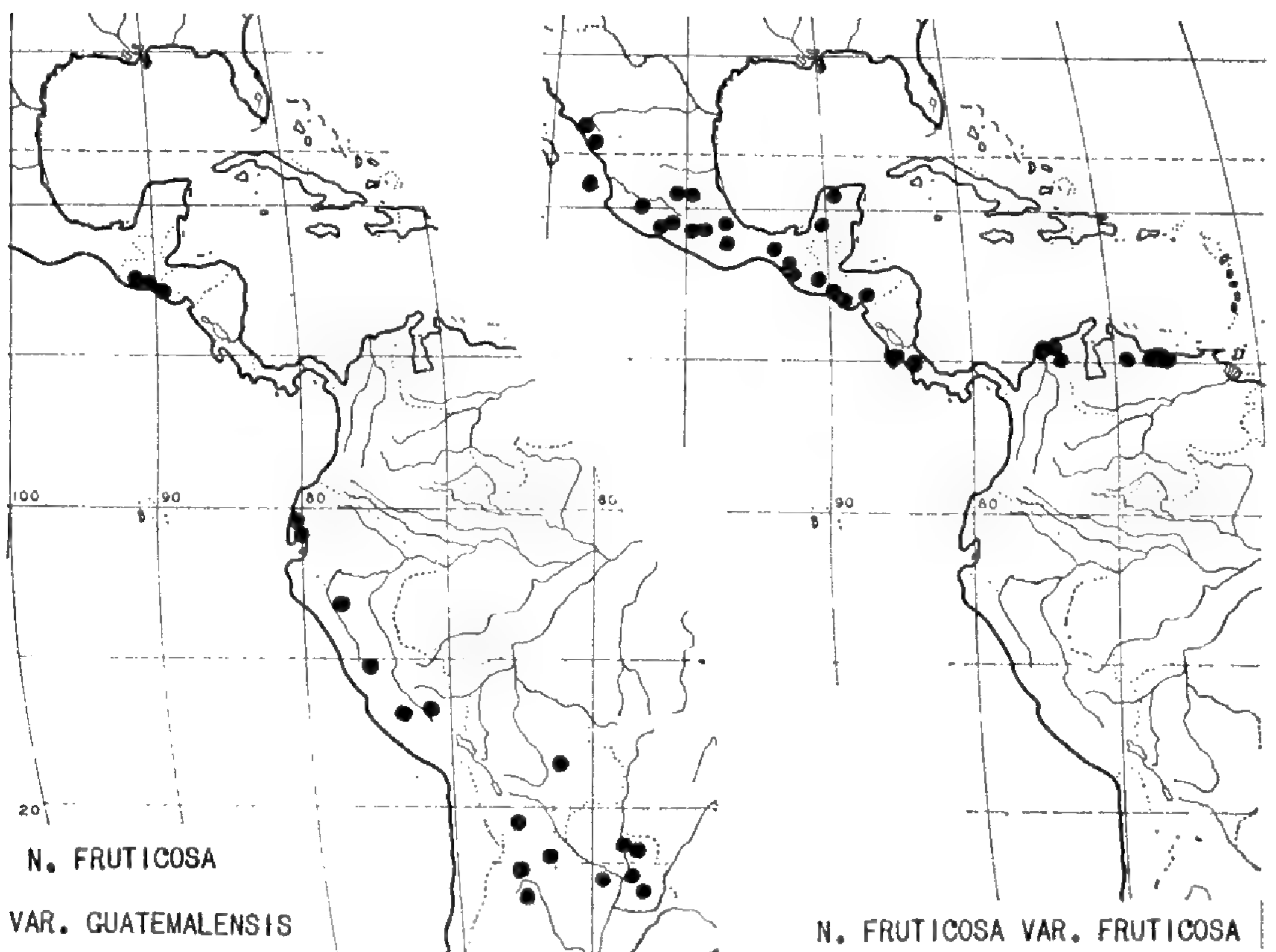


FIGURE 3.—Geographical distribution of *Nissolia fruticosa*.

The loment with stipe exceeding the calyx readily distinguish *Nissolia fruticosa* from other species of the genus. As mentioned above, the typical variety has smaller flowers than var. *guatemalensis*, the calyx teeth are obsolete or rather inconspicuous, and the inflorescences are commonly racemose, often paniculate. A few specimens from Central America and from Colombia show characters transitional to var. *guatemalensis*.

Examination of photographs of the types of *N. fruticosa* and *N. racemosa* and of the type specimens of *N. nelsoni*, *N. costaricensis*, and *Machaerium verapazense* shows all five taxa to be essentially identical. Accordingly, they are placed in synonymy under the oldest name, *Nissolia fruticosa* Jacq.

There are three Mexican collections that may belong to this species, possibly as another variety, but which I have not placed: *Ortega* 6362 and *Stork & Horton* 8603, from Sinaloa, and *Hinton* 14546, from Guerrero. All have small flowers, in fascicles, suggesting *N. fruticosa* or *N. hirsuta*. The glabrous nature of the calyx, pedicels, and the small leaflets suggests *N. leiogyne*. I have seen no mature fruit. A few immature fruits of the Hinton collection appear to have elongating stipes, characteristic of *N. fruticosa*. However, such evidence can be misleading, and it seems best to reserve judgment until mature fruits are available.

12b. *Nissolia fruticosa* var. *guatemalensis* (Rose) Rudd, comb. et stat. nov.

Nissolia guatemalensis Rose, Contr. U. S. Nat. Herb. 5: 162. 1899.

Pseudomachaerium rojasianum Hassler, Bull. Herb. Boiss. II, 7: 2. 1907.

Flowers about 8–10 mm. long, the calyx teeth 0.5–1 mm. long; inflorescences commonly racemose but not infrequently fasciculate.

TYPE LOCALITY: Near Escuintla, Guatemala. Type collected by Hayes, cited below.

DISTRIBUTION: Central America, in Guatemala and El Salvador, and in South America from Ecuador to Paraguay (fig. 3).

GUATEMALA

ESCUINTLA: Near Escuintla, *Hayes*, Nov. 1860 (GH TYPE, US fragment).

SANTA ROSA: Cuajiniquilpa, *Heyde & Lux* 6112 (GH, NY, US).

EL SALVADOR

AHUACHAPÁN: Ahuachapán, *Standley* 19948 (GH, NY, US).

SAN SALVADOR: San Salvador, *Standley* 19641 (GH, US).

ECUADOR

MANABÍ: El Recreo, *Eggers* 15767 (US).

GUAYAS: Guayaquil, *Anthony & Tate* 47 (US).

PERÚ

SAN MARTÍN: Juan Jui, *Klug* 4320 (A, NY, UC, US).

JUNÍN: Río Mantaro, *Weberbauer* 6555 (GH, NY, US). La Merced, *Macbride* 5434 (US).

AYACUCHO: Kimpitiriki, *Killip & Smith* 22940 (NY, US).

CUZCO: Echarate, *Stork, Horton, & Vargas* 10480 (NA, UC).

BOLIVIA

SANTA CRUZ: Incahuasi, Cordillera, *Cárdenas* 4720 (US).

Río Piray, *Steinbach* 7459 (GH, NY, Ph, UC).

TARIJA: Tarija, *Fiebrig* 2673 (A, GH, US).

PARAGUAY: "Alto Parana," *Fiebrig* 6041 (GH, US).

CENTRAL: Lago Ypacaray, *Hassler* 12526 (A, GH, NY, UC, US), 12526a (A, GH, NY, UC, US).

GUAIRÁ: Villarrica, *Jørgensen* 4194 (GH). Cordillera de Villarrica, *Hassler* 8619 (NY SYNTYPE of *Pseudomachaerium rojasianum*), 8619a (NY SYNTYPE of *P. rojasianum*).

CONCEPCIÓN: San Luis de la Sierra, *Fiebrig* 4458 (GH).

ARGENTINA

JUJUY: Jujuy, *Bartlett* 20281 (GH, US).

SALTA: Candelaria, *Venturi* 3713 (US). Mojotoro, *Meyer* 3566 (GH). Embarcación, *West* 8435 (GH, UC).

TUCUMÁN: *Tweedie* 2628 (GH). Tafi Viejo, *Venturi* 146 (US). Cerro del Campo, Burruyaco, *Venturi* 10364 (A). Yerba Buena, *Lillo* 12053 (GH).

FORMOSA: Guayculec, *Jørgensen* 3214 (GH, US).

The specimens referred to var. *guatemalensis* are somewhat larger flowered than those of typical *N. fruticosa*. The largest flowers are from Perú and Ecuador. There is a transition to smaller flowers, with shorter calyx teeth, and some of the material from Argentina is very similar to *N. fruticosa* var. *fruticosa*. In Colombia and in Central America a few specimens designated as var. *fruticosa* approach var. *guatemalensis*.

Because of this intergradation, with no satisfactory delimitation, Rose's taxon *guatemalensis* is reduced from specific to varietal status.

The syntypes of *Pseudomachaerium rojasianum* are essentially identical with specimens of *Nissolia* from Paraguay, all of which have been assigned to *N. fruticosa* var. *guatemalensis*. Hassler's genus and species both revert to synonymy.

Excluded and doubtful taxa

Nissolia aculeata (Raddi) DC. Prodr. 2: 258. 1825=**Machaerium aculeatum** Raddi.

Nissolia aculeata Spreng. Syst. 3: 190. 1826=**Machaerium berteroniana** (Steud.) Urb.

Nissolia aculeata Vell. Fl. Flum. 296. 1825; Icon. 7: pl. 79. 1835=**Machaerium vellozianum** Benth.

Nissolia aculeata Willd. ex. Vog. Linnaea 11: 194. 1837=**Machaerium humboldtianum** Vog.

Nissolia acuminata (H. B. K.) DC. Prodr. 2: 258. 1825=**Machaerium acuminatum** H. B. K.

Nissolia acuminata Vell. This apparently was a misprint in the Kew Index for *N. uncinata*.

Nissolia americana Mill. Gard. Dict. ed. 4. 1754=**Rhynchosia americana** (Mill.) Metz.

Nissolia arborea Jacq. Enum. Pl. Carib. 27. 1760=**Machaerium arboreum** (Jacq.) Vog.

Nissolia arrabidae Steud. Nom. ed. 2, 2: 196. 1841=**Machaerium vellozianum** Benth.

Nissolia berteroniana Steud. Nom. ed. 2, 2: 196. 1841=**Machaerium berteroniana** (Steud.) Urb.

Nissolia bicallosa Vog. Linnaea 11: 178. 1837. The description is inadequate for identification of this taxon, and I have not seen the type, which presumably is at Berlin.

- Nissolia debilis* Vell. Fl. Flum. 297. 1825; Icon. 7: pl. 81. 1835=**Machaerium debile** (Vell.) Stellfeld
- Nissolia declinata* Vell. Fl. Flum. 296. 1825; Icon. 7: pl. 77. 1835=**Machaerium declinatum** (Vell.) Stellfeld
- Nissolia diadelpha* DC. Prodr. 2: 258. 1825=**Machaerium quinata** (Aubl.) Sandw.
- Nissolia dubia* Poir. in Lam. Encyc. Suppl. 4: 99. 1816. The description is inadequate for identification. *Nissolia*, as now interpreted, is not known to occur in Cayenne, the type locality of this taxon.
- Nissolia ferruginea* Willd. Sp. Pl. 3 (2): 900. 1802=**Machaerium quinata** (Aubl.) Sandw.
- Nissolia firma* Vell. Fl. Flum. 297. 1825; Icon. 7: pl. 83. 1835=**Machaerium firmum** (Vell.) Benth.
- Nissolia fruticosa* Jacq. sensu H. B. K. Nov. Gen. Amer. 6: 504. 1824. This may be *N. hirsuta* DC. or *N. fruticosa* Jacq., but it is impossible to make positive identification without seeing the type.
- Nissolia fruticosa* Vell. Fl. Flum. 298. 1825; Icon. 7: pl. 86. 1835=**Machaerium fruticosum** (Vell.) Hoehne
- Nissolia glabrata* Link, Enum. Hort. Berol. 2: 221. 1809=**Machaerium arboreum** (Jacq.) Vog.
- Nissolia hirta* Vell. Fl. Flum. 296. 1825; Icon. 7: pl. 78. 1835=**Machaerium hirtum** (Vell.) Stellfeld
- Nissolia incorruptibilis* Vell. Fl. Flum. 297. 1825; Icon. 7: pl. 82. 1835=**Machaerium incorruptibile** (Vell.) Allem.
- Nissolia lanceolata* Vell. Fl. Flum. 299. 1825; Icon. 7: pl. 87. 1835=**Machaerium lanceolatum** (Vell.) Macbr.
- Nissolia legalis* Vell. Fl. Flum. 298. 1825; Icon. 7: pl. 84. 1835=**Machaerium legale** (Vell.) Benth.
- Nissolia leiophylla* DC. Prodr. 2: 258. 1825=**Machaerium leiophyllum** (DC.) Benth.
- Nissolia microptera* Poir. in Lam. Encyc. Suppl. 4: 98. 1816=**Machaerium micropterum** (Poir.) Benth.
- Nissolia nyctitans* Vell. Fl. Flum. 295. 1825; Icon. 7: pl. 75. 1835=**Machaerium nictitans** (Vell.) Benth.
- Nissolia orientalis* Mill. Gard. Dict. ed. 4. 1754=**Lathyrus amphicarpos** L.
The name *Nissolia orientalis* is illegitimate because Miller did not use binary nomenclature consistently in that publication.
- Nissolia parviflora* Moench. Meth. 140. 1794=**Lathyrus inconspicuus** L.
- Nissolia polyphylla* Poir. in Lam. Encyc. Suppl. 4: 98. 1816=**Machaerium polyphyllum** (Poir.) Benth.
- Nissolia punctata* Poir. in Lam. Ill. pl. 600, fig. 1. 1794; Encycl. 4: 492. 1797=**Machaerium punctatum** Pers.
- Nissolia quinata* Aubl. 2: 743, pl. 297. 1775=**Machaerium quinata** (Aubl.) Sandw.
- Nissolia reticulata* Poir. in Lam. Ill. pl. 600, fig. 2. 1794. Encycl. 4: 492. 1797=**Machaerium reticulatum** Pers.
- Nissolia reticulata* Vell. Fl. Flum. 299. 1825; Icon. 7: pl. 88. 1835=**Pterocarpus violaceus** (Aubl.) Vog.
- Nissolia retusa* Willd. Enum. Hort. Berol. 2: 742. 1809=**Machaerium?** One must see the type of this species to place it. According to the original description, this taxon has four pairs of leaflets, a character that would seem to exclude its being a *Nissolia*. DeCandolle listed it among his "species non satis notae."

- Nissolia robiniaefolia* DC. Prodr. 2: 258. 1825=*Machaerium robiniaefolium* (DC.) Vog.
Nissolia robusta Vell. Fl. Flum. 298. 1825; Icon. 7: pl. 85. 1835=*Centrolobium robustum* (Vell.) Mart. ex Benth.
Nissolia scandens Kön. ex Spreng. Syst. 3: 191. 1826. This taxon with "foliis pinnatis 2 jugis," from "Ind. or." is not likely to be a *Nissolia*. On the basis of description alone, I cannot place it.
Nissolia spinosa Vell. Fl. Flum. 296. 1825; Icon. 7: pl. 80. 1835=*Machaerium spinosum* (Vell.) Benth.
Nissolia stipitata DC. Ann. Sci. Nat. 4: 99. 1825=*Machaerium stipitatum* (DC.) Vog.
Nissolia uncinata Vell. Fl. Flum. 295. 1825; Icon. 7: pl. 76. 1835=*Machaerium uncinatum* (Vell.) Benth.
Nissolia uniflora Moench. Meth. 140. 1794=*Lathyrus nissolia* L.
Nissolia vulgaris [Tourn.] Mill. Gard. Dict. ed. 4. 1754=*Lathyrus nissolia* L.
 The name *Nissolia vulgaris* is illegitimate, since Miller did not consistently use binary nomenclature in that publication.

Collections of *Nissolia* cited

ABBOTT, R. Q.	BIGELOW, J. M.
297. <i>hirsuta</i>	(MEXICAN BOUNDARY SURVEY)
326. <i>hirsuta</i>	253. <i>platycalyx</i>
AGNIEL, BRO. (SEE ARSÈNE)	BIOLLEY, P.
ALTAMIRANO, F.	7088. <i>fruticosa</i> var. <i>fruticosa</i>
1600. <i>pringlei</i>	BOTTERI, M.
ANTHONY, H. E., AND TATE, G. H. H	771. <i>platycarpa</i>
47. <i>fruticosa</i> var. <i>guatemalensis</i>	BOURGEAU, E.
ARCHER, W. A.	1477. <i>fruticosa</i> var. <i>fruticosa</i>
3009. <i>fruticosa</i> var. <i>fruticosa</i>	BRANDEGEE, T. S.
ARSÈNE, BRO. G.	140. <i>setosa</i>
1883. <i>pringlei</i>	s. n. <i>fruticosa</i> var. <i>fruticosa</i>
2054. <i>pringlei</i>	s. n. <i>hirsuta</i>
5453 (Nicholas). <i>pringlei</i>	s. n. <i>platycarpa</i>
5464 (Nicolas). <i>pringlei</i>	s. n. <i>schottii</i>
5716. <i>hirsuta</i>	s. n. <i>setosa</i>
10307 (Agniel 32). <i>hirsuta</i>	CALDERÓN, S.
10435 (Agniel). <i>hirsuta</i>	141. <i>fruticosa</i> var. <i>fruticosa</i>
BARTLETT, H. H.	141AB. <i>fruticosa</i> var. <i>fruticosa</i>
20281. <i>fruticosa</i> var. <i>guatemalensis</i>	CÁRDENAS, M.
BARTRAM, E. B.	4720. <i>fruticosa</i> var. <i>guatemalensis</i>
371. <i>schottii</i>	CLARK, O. M.
372. <i>schottii</i>	11180. <i>schottii</i>
BERTERO, C. G.	COLLINS, G. N. AND KEMPTON, J. H.
s. n. <i>fruticosa</i> var. <i>fruticosa</i>	61. <i>schottii</i>

CONZATTI, C. (AND WITH V. GONZALEZ)

36. fruticosa var. fruticosa
1457. fruticosa var. fruticosa

DODGE, C. K.

131. platycarpa

DUGÉS, A.

- s. n. hirsuta

EGGERS, H. F. A.

15767. fruticosa var. guatemalensis

FENDLER, A.

194. fruticosa var. fruticosa

FERRIS, R. S. (AND WITH C. D. DUNCAN)

2762. platycarpa
5588. fruticosa var. fruticosa

FIEBRIG, K.

2673. fruticosa var. guatemalensis
4458. fruticosa var. guatemalensis
6041. fruticosa var. guatemalensis

FISHER, G. L.

35293. fruticosa var. fruticosa
44177. wislizenii

GAUMER, G. F.

884. fruticosa var. fruticosa
886. fruticosa var. fruticosa
2018. fruticosa var. fruticosa
23427. fruticosa var. fruticosa
24262. fruticosa var. fruticosa
24322. fruticosa var. fruticosa

GENTRY, H. S.

1382. platycarpa?
1649. hirsuta
2382. schottii
4713. schottii
5383. platycarpa?
5627. platycarpa?
8473. wislizenii

GILMAN, M. F.

114. schottii

HALBINGER, C.

25. fruticosa var. fruticosa

HAMMERLY, B. J.

239. setosa

HARRISON, G. J.

6821. schottii
8261. wislizenii

HARTMAN, C. V.

870. wislizenii

HASSLER, E.

8619. fruticosa var. guatemalensis
8619a. fruticosa var. guatemalensis
12526. fruticosa var. guatemalensis
12526a. fruticosa var. guatemalensis

HAUGHT, O.

3784. fruticosa var. fruticosa
4397. fruticosa var. fruticosa
4479. fruticosa var. fruticosa
6714. fruticosa var. fruticosa

HAYES, S.

- s. n. fruticosa var. guatemalensis

HERIBERTO, BRO.

160. fruticosa var. fruticosa

HEYDE, E. T., AND LUX, E.

- 3715 in part. fruticosa var. fruticosa
4459. fruticosa var. fruticosa
6112. fruticosa var. guatemalensis

HINTON, G. B.

771. laxior
1197. hirsuta
2213. hintonii
2334. hintonii
2520. hintonii
2922. hintonii
3335. hintonii
4028. laxior
4319. hirsuta
5075. hintonii
5603. hintonii
6280. hirsuta
6291. leiogyne
6616. leiogyne
6692. hirsuta
6709. fruticosa var. fruticosa
7086. hintonii

HINTON, G. B.—Continued

7189. *hintonii*
 7861. *leiogyne*
 8163. *fruticosa* var. *fruticosa*
 11675. *montana*
 12682. *fruticosa* var. *fruticosa*
 13886. *laxior*
 14369. *laxior*
 14546. *fruticosa* var. ?
 14486. *fruticosa* var. *fruticosa*
 16532. *platycalyx*

HOLWAY, E. W. D.

9. *hirsuta*
 10. *fruticosa* var. *fruticosa*
 43. *montana*
 57. *montana*
 542. *hirsuta*
 3450. *hirsuta*
 5039. *hirsuta*
 5127. *hirsuta*
 5230. *hirsuta*

INTERNATIONAL BOUNDARY
COMMISSION

- 1549 (Mearns). *wislizenii*
 1706 (Merton). *wislizenii*

JOHNSTON, I. M.

7918. *pringlei*

JONES, M. E.

22878. *schottii*
 24931. *schottii*
 s. n. *schottii*

JÖRGENSEN, P.

3214. *fruticosa* var. *guatemalensis*
 4194. *fruticosa* var. *guatemalensis*

KEARNEY, T. H., AND PEEBLES, R. H.

10323. *schottii*
 14927. *schottii*

KERBER, E.

132. *fruticosa* var. *fruticosa*

KILLIP, E. P., AND SMITH, A. C.

14086. *fruticosa* var. *fruticosa*
 14422. *fruticosa* var. *fruticosa*
 14509. *fruticosa* var. *fruticosa*
 14623. *fruticosa* var. *fruticosa*
 22940. *fruticosa* var. *guatemalensis*

KING, C. J., AND LOOMIS, H.

3258. *schottii*

KIRKWOOD, J. E.

77. *pringlei*

KLUG, G.

4320. *fruticosa* var. *guatemalensis*

KUNTZE, O.

23468. *hirsuta*
 23538. *fruticosa* var. *fruticosa*

LANGLASSÉ, E.

472. *fruticosa* var. *fruticosa*
 473. *leiogyne*

LEMMON, J. G. (AND WITH MRS.
LEMMON)

16. *pringlei*
 2668. *wislizenii*
 s. n. *pringlei*

LESUEUR, H.

722. *wislizenii*

LILLO, M.

12053. *fruticosa* var. *guatemalensis*

LLOYD, F. E.

122. *pringlei*.

LUNDELL, C. L.

933. *fruticosa* var. *fruticosa*
 5385. *wislizenii*
 5459. *wislizenii*

LYONNET, E.

2176. *hirsuta*

MACBRIDE, J. F.

5434. *fruticosa* var. *guatemalensis*

MARSH, E.

175. *platycalyx*

MATUDA, E.

599. *fruticosa* var. *fruticosa*
 3950. *fruticosa* var. *fruticosa*
 4587. *fruticosa* var. *fruticosa*
 4874. *fruticosa* var. *fruticosa*
 27090. *hirsuta*

MEARNS, E. A.

(INTERNATIONAL BOUNDARY COMMISSION)

1549. wislizenii

MERTON, E. C.

(INTERNATIONAL BOUNDARY COMMISSION)

1706. wislizenii

MEXIA, Y.

8848. hintonii

MEXICAN BOUNDARY SURVEY

253 (Bigelow). platycalyx

253 (Parry). platycalyx

253a (Schott). schottii

MEYER, C.

3566. fruticosa var. guatemalensis

MIRANDA, F.

2168. platycarpa

MOLINA R., A.

1459. fruticosa var. fruticosa

MUELLER C. H., AND MUELLER. M. Y.
(SEE MULLER)

Muller, C. H.

629. platycalyx

639. platycalyx

3117. platycarpa

3175. platycalyx

NARVAEZ-MONTES, M., AND
SALAZAR, A. E.

633. fruticosa var. fruticosa

NÉE, L.

s. n. hirsuta

NELSON, E. W.

1266. fruticosa var. fruticosa

3086. fruticosa var. fruticosa

NICHOLAS, BRO. (SEE ALSO ARSÈNE)

s. n. pringlei

ORTEGA, J. G.

5564. schottii

6068. fruticosa var. fruticosa

6362. fruticosa var.?

PALMER, E.

7 in 1894-95. leiogyne

42 in 1885. hirsuta

57 in 1885. schottii

113 in 1885. schottii

170 in 1887. schottii

248 in 1880, in part. platycalyx

in part. platycarpa

271 in 1902. fruticosa var. fruticosa

371 in 1906. wislizenii

388 in 1886. hirsuta

638 in 1890. schottii

1496 in 1891. hirsuta

s. n. in 1898. wislizenii

PARRY, C. C. (MEXICAN BOUNDARY
SURVEY)

253. platycalyx

PARRY, C. C., AND PALMER, E.

133. wislizenii

PEEBLES, R. H., ET AL.

2743. schottii

2760. schottii

7923. schottii

8967. schottii

PHILLIPS, E. A.

543. schottii

PITTIER, H.

7391. fruticosa var. fruticosa

8375. fruticosa var. fruticosa

8693. fruticosa var. fruticosa

9664. fruticosa var. fruticosa

11959. fruticosa var. fruticosa

PRINGLE, C. G.

324. pringlei

618. wislizenii

3647. fruticosa var. fruticosa

4379. laxior

4640. fruticosa var. fruticosa

5421. hirsuta

5482. wislizenii

6064, in part. hirsuta

in part. pringlei

6395. hirsuta

6693. pringlei

7467. hirsuta

8662. pringlei

PRINGLE, C. G.—Continued

9259. montana
 9639. wislizenii
 9767. hirsuta
 10329, in part. fruticosa var. fruticosa
 in part. montana
 10393. hirsuta
 11346. hirsuta
 11813. platycarpa
 s. n. schottii

PURPUS, C. A.

1189. hirsuta
 3199. pringlei
 3200. fruticosa var. fruticosa
 5589. pringlei
 8579. fruticosa var. fruticosa
 11083. fruticosa var. fruticosa
 14246. fruticosa var. fruticosa
 15306. fruticosa var. fruticosa
 16000. fruticosa var. fruticosa
 s. n. hirsuta
 s. n. pringlei

REKO, B. P.

4509. hirsuta

ROSE, J. N., ET AL.

2278. wislizenii
 2298. wislizenii
 2301. hirsuta
 2651. wislizenii
 2813. hirsuta
 2852. hirsuta
 3541. hirsuta
 4424. fruticosa var. fruticosa
 4612. fruticosa var. fruticosa
 4693. pringlei
 4838. hirsuta
 5918. hirsuta
 6914. hirsuta
 6978. hirsuta
 7382. hirsuta
 7538. hirsuta
 7612. hirsuta
 8534. hirsuta
 9297. hirsuta
 9531. laxior
 9532, in part. pringlei
 in part. wislizenii
 9533. wislizenii
 9689. pringlei

ROSE, J. N., ET AL.—Continued

9878. hirsuta
 10199. fruticosa var. fruticosa
 10200. hirsuta
 11076. hirsuta
 11155, in part. hirsuta
 in part. pringlei
 11289. hirsuta
 12971. schottii
 13495. schottii
 15130. schottii
 15180. schottii

RUSBY, H. H.

72. hirsuta

SAER, J.

384. fruticosa var. fruticosa

SCHAFFNER, J. G.

592. wislizenii
 793. wislizenii
 794. wislizenii

SCHOTT, A. (MEXICAN BOUNDARY
SURVEY)

- 253a. schottii

SCHUMANN, W.

- s. n. wislizenii

SEATON, H. E.

398. fruticosa var. fruticosa

SHREVE, F.

8864. pringlei
 9048. wislizenii

SMITH, A.

- P2320. fruticosa var. fruticosa

SMITH, H. H.

280. fruticosa var. fruticosa

SMITH, L. C.

28. fruticosa var. fruticosa
 959. hirsuta

SOHNS, E. R.

1501. platycarpa

SOUZA-NOVELO, N.

128. fruticosa var. fruticosa

STANDLEY, P. C.

19123. fruticosa var. fruticosa
 19641. fruticosa var. guatemalensis
 19948. fruticosa var. guatemalensis
 20439. fruticosa var. fruticosa

STANFORD, L. R.; RETHERFORD, K. L.,
AND NORTHCRAFT, R. D.

785. platycarpa

STEINBACH, J.

7459. fruticosa var. guatemalensis

STEWART, R. M.

232. pringlei

STORK, H. E., AND HORTON, O. B.
(AND WITH C. VARGAS)

8603. fruticosa var.?
 10480. fruticosa var. guatemalensis

TAMAYO, F.

1428. fruticosa var. fruticosa

TONDUZ, A.

- 13535 (Herb. Pittier). fruticosa var.
 fruticosa

TWEEDIE, J.

2628. fruticosa var. guatemalensis

VENTURI, S.

146. fruticosa var. guatemalensis
 3713. fruticosa var. guatemalensis
 10364. fruticosa var. guatemalensis

WEBERBAUER, A.

6555. fruticosa var. guatemalensis

WEST, J.

8435. fruticosa var. guatemalensis

WHITE, S. S.

534. schottii
 734. schottii
 3033. schottii
 3075. schottii
 3268. schottii
 3557. schottii
 3587. schottii
 3886. schottii
 4524. schottii

WIGGINS, I. L.

6021. schottii
 6038. schottii
 7430. schottii
 8300A. schottii

WIGGINS, I. L., AND ROLLINS, R. C.

242. schottii
 307. schottii

WILLIAMS, LL.

10594. fruticosa var. fruticosa
 10594a. fruticosa var. fruticosa

WILLIAMS, L. O., AND MOLINA R., A.

10494. fruticosa var. fruticosa

WISLIZENUS, A.

151. wislizenii

WOOTON, E. O.

- s. n. schottii

WRIGHT, C.

1007. wislizenii

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CONTRIBUTIONS
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VOLUME 32, PART 3

A REVISION OF THE
GENUS CHAETOCALYX

By VELVA E. RUDD



BULLETIN OF THE UNITED STATES NATIONAL MUSEUM
SMITHSONIAN INSTITUTION
Washington : 1958

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A REVISION OF THE GENUS CHAETOCALYX

BY VELVA E. RUDD

Introduction

Chaetocalyx is a genus of papilionaceous legumes. Its name is derived from a frequently occurring characteristic—the calyx beset with glandular setae. The plants are twining vines with slender, herbaceous, or somewhat woody stems. The fruits are loments, narrow and elongated in most species, shorter and flattened in others. The range is limited to the western hemisphere, from southern Mexico to the Antilles and South America.

There has been no general monograph of *Chaetocalyx*, the treatments which have been on a limited regional basis, with resulting misinterpretations of specific limits and publication of superfluous names. It has been virtually impossible to make satisfactory determinations of collections submitted for examination.

About 25 species have been attributed to the genus. In this paper the number of recognized species has been reduced to eleven, including the addition of one new species from Peru and the transfer of *Chaetocalyx* of two genera, *Raimondianthus* and *Isodesmia*.

In addition to material at the U. S. National Herbarium (US), specimens from the following herbaria have been consulted: Arnold Arboretum (A); British Museum (BM); Chicago Natural History Museum (formerly Field Museum) (F); Gray Herbarium of Harvard University (GH); Royal Botanic Gardens, Kew (K); University of Michigan (Mich); U. S. National Arboretum (NA); New York Botanical Garden (NY); Muséum d'Histoire Naturelle, Paris (P); Herbarium Anchieta, Colégio Anchieta, Porto Alegre, Brazil (PACA); Academy of Natural Sciences, Philadelphia (Ph); Jardim Botânico do Rio de Janeiro (RB); Herbario San Marcos, Museo de Historia Natural, Lima, Peru (USM); Instituto Botánico, Ministerio de Agricultura y Cría, Caracas, Venezuela (Ven). The writer is grateful to the curators of those institutions for making such material available. Abbreviations of herbarium names are those of the Index Herbariorum (Vanjour and Stafleu, ed. 2, 1954).

The citations of "F. M. neg." refer to Field Museum negatives of a series of photographs taken in European herbaria by J. F. Macbride.

The maps presented in this paper are based on Goode Base Map No. 101 M, copyright 1939 by the University of Chicago, and are used by permission of the University of Chicago Press.

Historical consideration

The genus *Chaetocalyx* was established by de Candolle in 1822 (Mém. Leg. 6:262, 1825; Prodr. 2:243, 1825) and assigned by him to the tribe Loteae of the Leguminosae. It segregated two species previously assigned to *Glycine*—*vincentina* and *pubescens*. The name *Chaetocalyx* was given because of a common characteristic of the genus (although not unique to it), that of the calyx beset with glandular setae.

The following year Sprengel (Syst. Veg. 3:245, 1826) published a new genus, *Bönninghausia*, also based on *Glycine vincentina*. Later Urban (Symb. Antill. 2:292, 1900) recognized that this taxon was referable to Linnaeus' *Coronilla scandens* (Sp. Pl. 2:743, 1753), and that the correct name of the type of the genus should be *Chaetocalyx scandens* (L.) Urb.

The genus *Planarium* was initiated by Desvaux (Ann. Sci. Nat. 9:416, 1826), based on his *Poiretia latisiliqua*, which he originally had based on *Hedysarum latisiliquum* Juss. ex Poir. (in Lam. Encyclop. Meth. Bot. 6:432, 1804). In 1865, Bentham (in Benth. and Hook. Gen. Pl. 1:513, 1865) placed *Planarium* with *Chaetocalyx* but did not cite the two genera as synonyms, nor did he mention the specific name *latisiliquum*. Hemsley, however, did make the combination *Chaetocalyx latisiliqua* (Biol. Cent. 1:268, 1880), which he attributed to Bentham.

Another new genus, *Rhadinocarpus*, subsequently reduced to synonymy under *Chaetocalyx*, was described by Vogel in connection with his treatment of Brazilian Hedysareae (Linnaea 12:108–111, 1838). Bentham (in Mart. Fl. Bras. 15(1):74–76, 1859) transferred Vogel's *R. brasiliensis* and *R. acutifolius* to *Chaetocalyx*, and added four new species; *C. parviflora*; *C. latifolia*; *C. hebecarpa*, with three varieties; and *C. polyphylla*.

Gardner (in Hook. Lond. Journ. Bot. 2:339, 1843) published *Isodesmia*, with one species, *tomentosa*. Bentham (in Mart. Fl. Bras. 15(1):71, 1859) added a second species, *blanchetiana*. The latter species appears to be distinct, but the former, the type of the genus, is identical with *Chaetocalyx polyphylla* Benth. Assigning this material to *Chaetocalyx* seems to be correct.

Raimondianthus, a monotypic genus established by Harms (Notizblatt 10:387, 1928), differs but slightly from the two species of *Isodesmia* and should be treated as congeneric. In the present paper it also is transferred to *Chaetocalyx*.

Some 17 additional species of *Chaetocalyx* have been published during the past century. Two of these, *C. wislizenii* A. Gray (Pl. Wright. 1:51. 1852) and *C. schottii* Torr. (Bot. Mex. Bound. 56. 1859) have been transferred to *Nissolia*. The most sizable contribution is the work of Pittier (Bol. Soc. Venez. Cienc. Nat. 6:185–192. 1940) with six new species. Other authors with one or two new taxa include Gray (*in* U. S. Expl. Exped. 1:423. 1854), Taubert (Flora 72(n.s. 47): 425. 1889), Harms (Fedde Rep. Spec. Nov. 17:132. 1921), Blake (Contr. U. S. Nat. Herb. 20:523. 1924), Standley (Field Mus. Pub. Bot. 8:14. 1930; 12:410. 1936), Burkart (Darwiniana 3:165. 1939), and Lundell (Contrib. Univ. Mich. 6:26. 1941).

Economic consideration

Chaetocalyx is a relatively inconspicuous and unimportant element of the vegetation. There is scant mention of usefulness, and there seem to be no records of its being considered noxious.

Schipp has noted on a collection of *Chaetocalyx brasiliensis* from British Honduras (*Schipp* No. 1330), "small vine and one of the best I have seen as a cover crop, forming carpets of foliage . . . Rare."

Mexia recorded that *Chaetocalyx latisiliqua* (*Mexia* No. 8463), "chupa-chupa," in the province of Esmeraldas, Ecuador, was "common locally. Leaf used bruised for skin eruptions."

Geographic distribution

Chaetocalyx is known only from the New World. It ranges (fig. 1) from southern Mexico into the Antilles, through Central America and South America to Peru, northern Argentina, southern Brazil, and Uruguay, at elevations up to about 2,000 meters.

The species occur in more or less mesic habitats such as stream banks, at the edge of woods, along roadsides, on hillsides, and, less commonly, in dry places or in dense forest shade.

Morphological characters

The species of *Chaetocalyx* apparently are all twining vines. The stems are herbaceous or slightly woody, slender, subterete, striate, about 1–4 mm. in diameter. The surface may be glabrous to densely pubescent with simple hairs, and may or may not be beset with yellowish, bulbous-based glandular setae. One species, *C. nigricans*, is generally nigrescent on drying.

Stipules are paired, attached at the base, deltoid or deltoid-ovate to lanceate, acute to attenuate, entire to setose-ciliate or laciniate. Stipels are lacking.

The leaves are imparipinnate, 5–17-foliolate. The rachis, glabrous to pubescent like the stems, is about 2–12.5 cm. long, with the petiole comprising about one-half to two-thirds the total length. The leaflets are oblong, elliptical, ovate, or obovate, ranging in length from 10–80 mm. and in width from about 5–50 mm. The margin is entire in all

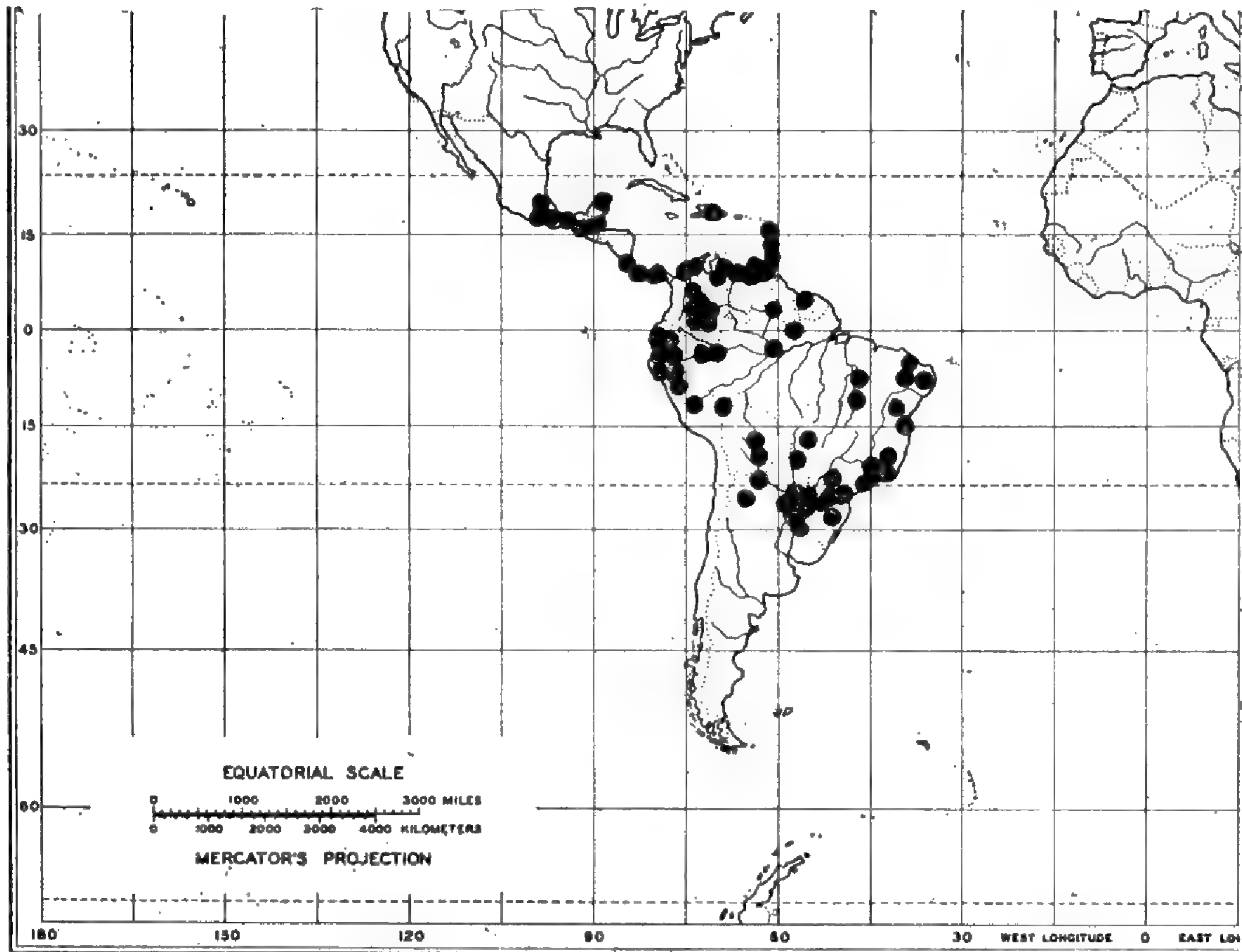


FIGURE 1.—Geographic distribution of the genus *Chaetocalyx*.

species. The apex is mucronulate and acute to obtuse or, in some species, retuse. The base is rounded, cuneate, or subcordate. The surfaces, sometimes discoloured, may be glabrous to pubescent, sometimes micropunctulate. The venation is pinnate, the costa and a few secondary veins obvious, the others inconspicuous. The petioles are somewhat pulvinate, about 1–2 mm. long.

Vegetatively, much of the material of *Chaetocalyx* is virtually indistinguishable from specimens of *Nissolia*.

The inflorescences are axillary or terminal, in racemes, panicles, fascicles, or the flowers sometimes are solitary. The bracts and stipules intergrade, the former being slightly smaller. The flowering axis, like the stem, may be glabrous to pubescent, sometimes beset with glandular setae. The peduncles and pedicels are too variable in length to be useful as diagnostic characters.

The flowers are moderate in size, ranging from about 12 mm. to 30 mm. in length. Measurements are from the base of the calyx to the apex of the standard petal.

The calyx is campanulate with five subequal lobes or teeth. The tube may be glabrous to densely pubescent, with or without glandular setae. In some species it is essentially symmetrical, in others, gibbous. The basal portion of the tube, about 1 mm. long, is abruptly narrowed to essentially the diameter of the pedicel, and within it all the floral parts appear to be more or less adnate. An articulation commonly develops at the base of the tube.

The corolla is papilionaceous and yellowish. The standard petal is pubescent on the outer face in some species, glabrous in others. It is spatulate, clawed, and slightly longer than the keel and wings. The shape of the standard blade, which varies but little, seems not to be a particularly useful nor convenient diagnostic character.

The ten stamens are subequal, about as long as the keel. The filaments, glabrous or somewhat pubescent, are free from the apex to about midlength, but below that are united to form a sheath that splits along the vexillar side and sometimes also the carinal side, as the fruit develops. The anthers are dorsifixed, ellipsoidal, the largest but slightly over 1 mm. long.

The ovaries commonly are 6–16-ovulate, sessile or stipitate, glabrous to densely pubescent. The style is glabrous, the stigma capitate.

The fruits are elongate loment, 6–16-articulate. In some species they are laterally compressed, reticulate-striate, in others subterete and longitudinally striate. The surface may be glabrous to pubescent, with or without glandular setae. There sometimes is variation of vestiture on different areas of the same fruit, rendering degree of pubescence as of limited diagnostic value.

The seeds are sublustrous, smooth, reddish brown, elongate, 2.5–6 mm. long, and about 1–2 mm. wide, somewhat compressed. Mature fruits and seed of a few species have not been available for observation.

Apparently no chromosome counts of *Chaetocalyx* have been published.

Taxonomic position

Chaetocalyx is a genus of papilionaceous legumes, closely related to *Nissolia*. Originally placed in the tribe Loteae by de Candolle (Mem. Leg. 6:262. 1825), it was included in the Hedysareae by subsequent authors. Taubert (*in* Engler & Prantl, Die Natürlichen Pflanzenfamilien 3(3):316. 1894) placed it in his subtribe Aeschynomeninae, a group characterized by stamens united to form a sheath, which later splits along one side, or along two sides, forming two phalanges of five stamens each. The other genera of this subtribe are *Aeschynomene*,

Amicia, *Balisaea*, *Brya*, *Climacorachis* (= *Aeschynomene*), *Cyclocarpa*, *Diphaca*, *Discolobium*, *Fiebrigiella*, *Geissaspis*, *Isodesmia* (= *Chaetocalyx*), *Nissolia*, *Pictetia*, *Poiretia*, *Pseudomachaerium* (= *Nissolia*), *Raimondianthus* (= *Chaetocalyx*), *Smithia*, *Soemmeringia*, and *Weberbauerella*.

Chaetocalyx is most readily distinguished by its climbing habit, its imparipinnate leaves, and, in most species, by its elongate loment. The articles of the loment are uniform in size rather than with a terminal, expanded, winglike article as in *Nissolia*. Setae on the calyx, basis of the generic name, are not always present in *Chaetocalyx* and are sometimes to be found in other genera.

Systematic treatment

Chaetocalyx

Chaetocalyx DC. Mém. Leg. 6:262. 1825; Prodr. 2:243. 1825.

Bönninghausia Spreng. Syst. Veg. 3:245. 1826.

Planarium Desv. Ann. Sc. Nat. 9:416. 1826.

Rhadinocarpus Vog. Linnaea 12:108. 1838.

Isodesmia Gardn. in Hook. Lond. Journ. Bot. 2:339. 1843.

Raimondianthus Harms, Notizblatt 10:387. 1928.

Twining vines, herbaceous or somewhat woody; leaves imparipinnate, 5–17-foliolate; stipules deltoid or deltoid-ovate to lanceate, attached at the base; inflorescences axillary or terminal, the flowers in racemes, panicles, fascicles, or solitary; flowers 5-merous; calyx campanulate with five subequal teeth or lobes, the tube gibbous or symmetrical; corolla papilionaceous, yellowish, sometimes with red or violet; stamens 10, the filaments united to form a sheath that later splits, commonly along the vexillar side; fruit a 6–16-articulate loment, elongate, compressed to subterete; seeds reniform-rod shaped, sublustrous, reddish brown.

The type of the genus is *Chaetocalyx vincentina* (Ker.) DC., based on *Glycine vincentina* Ker., and now identified by an older specific name, *C. scandens* (L.) Urb.

Key to species, based on flowering material

Standard petal glabrous or mostly so.

Calyx tube essentially symmetrical, 3–4 mm. in diameter.

Flowers 22–25 mm. long; standard mostly glabrous, but pubescent toward the base; calyx tomentulose, the teeth attenuate, 2–5 mm. long (Peru).

1. ***C. weberbaueri***

Flowers 15–25 mm. long; standard essentially glabrous; calyx pubescent to subglabrous, sometimes glandular-setose, the teeth deltoid, 1–2.5 mm. long (Costa Rica to Ecuador) 5. ***C. latisiliqua***

Calyx tube gibbous, 4–5 mm. in diameter.

Plant drying blackish (southeastern Brazil; northeastern Argentina; Uruguay).

6. ***C. nigricans***

Plant drying green or brownish.

Teeth of calyx (2-) 4-6 mm. long; standard commonly pubescent but rarely glabrous; leaves 5-foliolate, the leaflets elliptical, obtuse to subacute, pubescent (Bolivia; southeastern Brazil) **7. C. longiflora**

Teeth of calyx 1-3 mm. long; standard usually glabrous, rarely pubescent; leaves 5-11-foliolate, the leaflets elliptical, suborbicular, or obovate, obtuse to truncate-emarginate (southern Mexico to northern Argentina, Paraguay, and southern Brazil) **9. C. brasiliensis**

Standard petal pubescent on the outer face.

Calyx tube gibbous, 4-5 mm. in diameter.

Stems, leaf and floral axes fulvous-pubescent; stamens with filaments pubescent at least at the base.

Calyx teeth deltoid, 0.5-2 mm. long.

Leaves 5-7-foliolate (Peru) **2. C. platycarpa**

Leaves 11-17-foliolate (Brazil) **3. C. tomentosa**

Calyx teeth oblong-lanceate, 2-5 mm. long (Brazil) . **4. C. blanchetiana**

Stems, leaf and floral axes glabrous or whitish to stramineous-pubescent; stamens with glabrous filaments.

Leaflets obtuse or emarginate to subacute, the surfaces pubescent.

Leaves 5-11-foliolate, the leaflets elliptical, suborbicular, or obovate, obtuse to truncate-emarginate; calyx teeth 1-3 mm. long (southern Mexico to northern Argentina, Paraguay, and southern Brazil).
9. C. brasiliensis

Leaves 5-foliolate, the leaflets elliptical, obtuse to subacute; calyx teeth (2-) 4-6 mm. long (Bolivia; southeastern Brazil) . **7. C. longiflora**

Leaflets acute to acuminate, the surfaces glabrous to sparsely pubescent (southern Brazil) **8. C. acutifolia**

Calyx tube symmetrical or sometimes gibbous, 2.5-3.5 mm. in diameter.

Tube of calyx somewhat gibbous, truncate, the teeth subulate, 1-2 mm. long (Peru) **10. C. klugii**

Tube of calyx essentially symmetrical, the teeth lanceate-deltoid, usually attenuate, 2-7 mm. long.

Leaflets glabrous; calyx glabrous or nearly so, except for glandular setae and marginal cilia (Antilles; northern Venezuela; northern Colombia).

11a. C. scandens var. **scandens**

Leaflets densely pubescent to subglabrous; calyx pubescent (southern Mexico; Antilles; Venezuela; Colombia; eastern Brazil).

11b. C. scandens var. **pubescens**

Key to species, based on fruiting material

(Two Peruvian species, *C. klugii* and *C. weberbaueri*, are excluded from the key because the fruits are not known.)

Legume strongly compressed, 5-20 mm. broad.

Fruit sessile; stems, leaf, and floral axis fulvous-pubescent.

Leaves 5-7-foliolate; fruit [submature] about 20 mm. broad, 6-articulate (Peru) **2. C. platycarpa**

Leaves 7-17-foliolate; fruit 5-10 mm. broad.

Fruit mostly 10-14-articulate; leaves 7-9-foliolate (Brazil).

4. C. blanchetiana

Fruit mostly 6-8-articulate; leaves 11-17-foliolate (Brazil).

3. C. tomentosa

- Fruit stipitate; stems, leaf and floral axis whitish to stramineous-pubescent glabrous.
- Stipe of fruit 5-7 mm. long; articles of fruit 7-10 mm. wide, 4-5 mm. long; calyx tube essentially symmetrical; plant green or brownish when dry (Costa Rica to Ecuador) **5. *C. latisiliqua***
- Stipe of fruit 10-15 mm. long; articles of fruit 6-7 mm. wide, 6-10 mm. long; calyx tube gibbous; plant blackish when dry (southeastern Brazil, northeastern Argentina; Uruguay) **6. *C. nigricarpa***
- Legume subterete to slightly compressed, 1.5-4 mm. broad.
- Calyx tube gibbous, 4-5 mm. in diameter; fruit stipitate, 2-4 mm. broad.
- Fruit somewhat compressed, the stipe about 6-12 mm. long; calyx teeth attenuate, (2-) 4-6 mm. long.
- Leaflets obtuse to subacute, the surfaces pubescent; articles of fruit 3 mm. broad, 7-10 mm. long (Bolivia; southern Brazil).
7. *C. longifolia*
- Leaflets acute to acuminate, the surfaces glabrous to sparsely pubescent; articles of fruit [submature] about 2-2.5 mm. broad and 12-17 mm. long (southern Brazil) **8. *C. acutifolia***
- Fruit subterete, the stipe 5-8 mm. long; calyx teeth deltoid, 1-3 mm. long (southern Mexico to northern Argentina, Paraguay, and Brazil).
9. *C. brasiliensis*
- Calyx tube essentially symmetrical, 2.5-3.5 mm. in diameter; fruit sessile, 1.5-2 mm. broad.
- Leaflets glabrous; calyx glabrous or nearly so, except for glandular setae and marginal cilia (Antilles; northern Venezuela; northern Colombia).
11a. *C. scandens* var. *scandens*
- Leaflets densely pubescent to subglabrous; calyx pubescent (southern Mexico; Antilles; Venezuela; Colombia; eastern Brazil).
11b. *C. scandens* var. *pubescens*

1. *Chaetocalyx weberbaueri* Harms, Fedde Rep. Spec. Nov. 17:132. 1921. FIGURE 1

Stems, leaf rachis, and floral axis sordid-tomentulose and setose with yellowish, glandular hairs, the stems glabrescent; stipules 7-10 mm. long, about 2 mm. wide at the base, lanceate, attenuate, entire, tomentulose; leaves 5-foliolate, the rachis 3-10 cm. long; leaflets elliptical to obovate, 15-70 mm. long, 10-50 mm. wide, obtuse, mucronulate, entire, the base rounded or cuneate, the upper surface glabrous, the lower surface subglabrous or moderately pubescent, especially along the veins and margin; inflorescences axillary, few flowered fascicles or short racemes, exceeded by the subtending leaves; the bracts ovate-lanceate, acuminate, often laciniate, 1-2.5 mm. wide at the base, tomentulose, the pedicels about 10 mm. long; flowers 22-25 mm. long; standard petal slightly pubescent toward the base but otherwise glabrous; calyx campanulate, essentially symmetrical, 7-10 mm. long, tomentulose, sometimes setose, the tube 4-6 mm. long, 3.5-4 mm. in diameter, the teeth lanceate, attenuate, 2-5 mm. long; stamens with glabrous filaments; ovary sessile, elongate, con-

pressed, densely tomentulose, about 8–10-ovulate; mature fruit not seen.

TYPE LOCALITY: Palambra, Province of Huancabamba, Department of Piura, Peru, at 1,000–1,200 meters, in evergreen brush. Type collected by A. Weberbauer (No. 6020), cited below.

DISTRIBUTION: Known only from Department of Piura, Peru.

PERU

PIURA: Palambra, *Weberbauer* 6020 (F, F. M. neg. 2137 of TYPE ex B, GH, US). Canchaque, *Ferreyra* 10901 (US).

This is a distinctive but little known species. The sordid-tomentulose indument seems to be unique. The more or less symmetrical

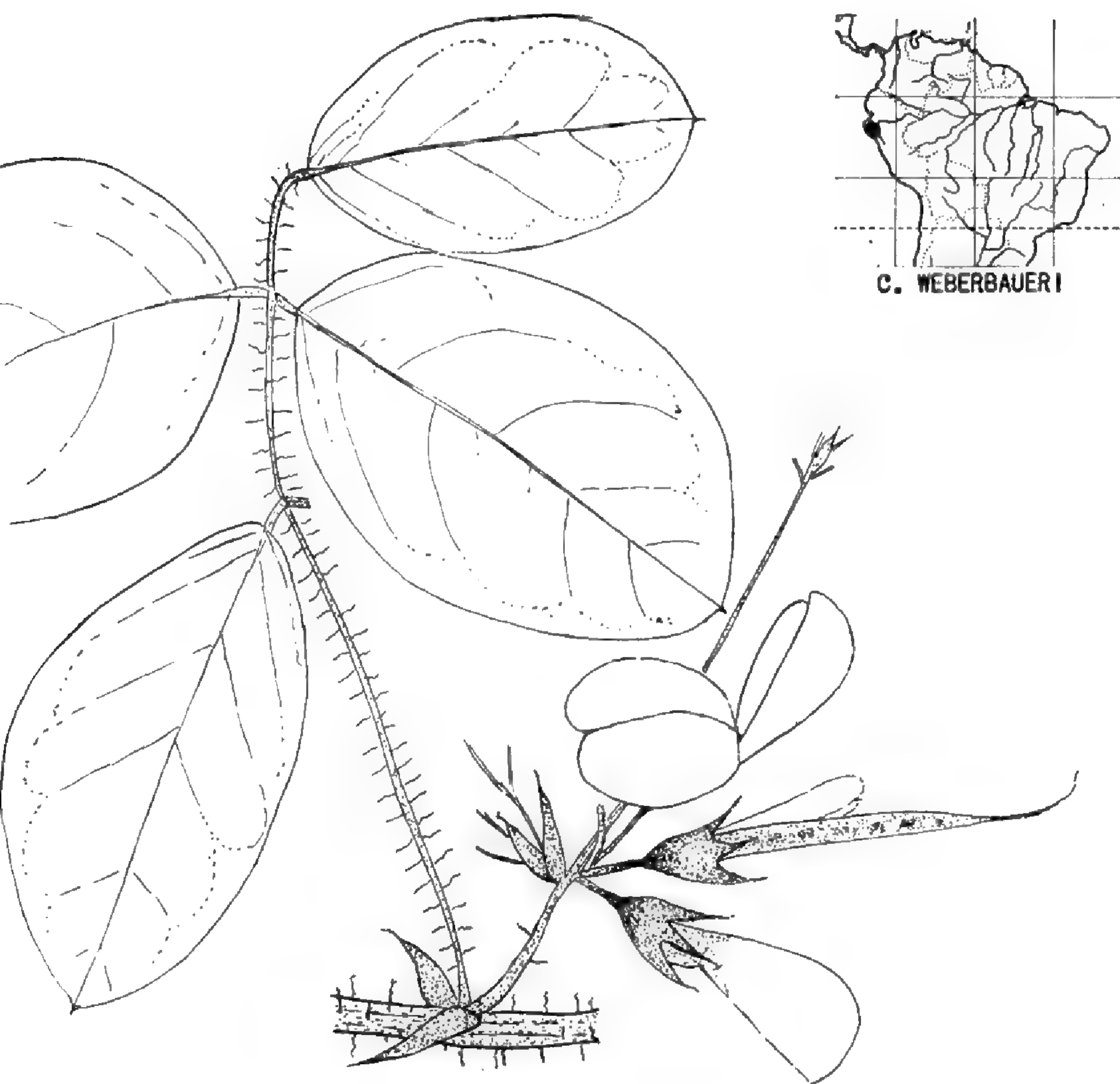


FIGURE 2.—*Chaetocalyx weberbaueri*. Natural size.

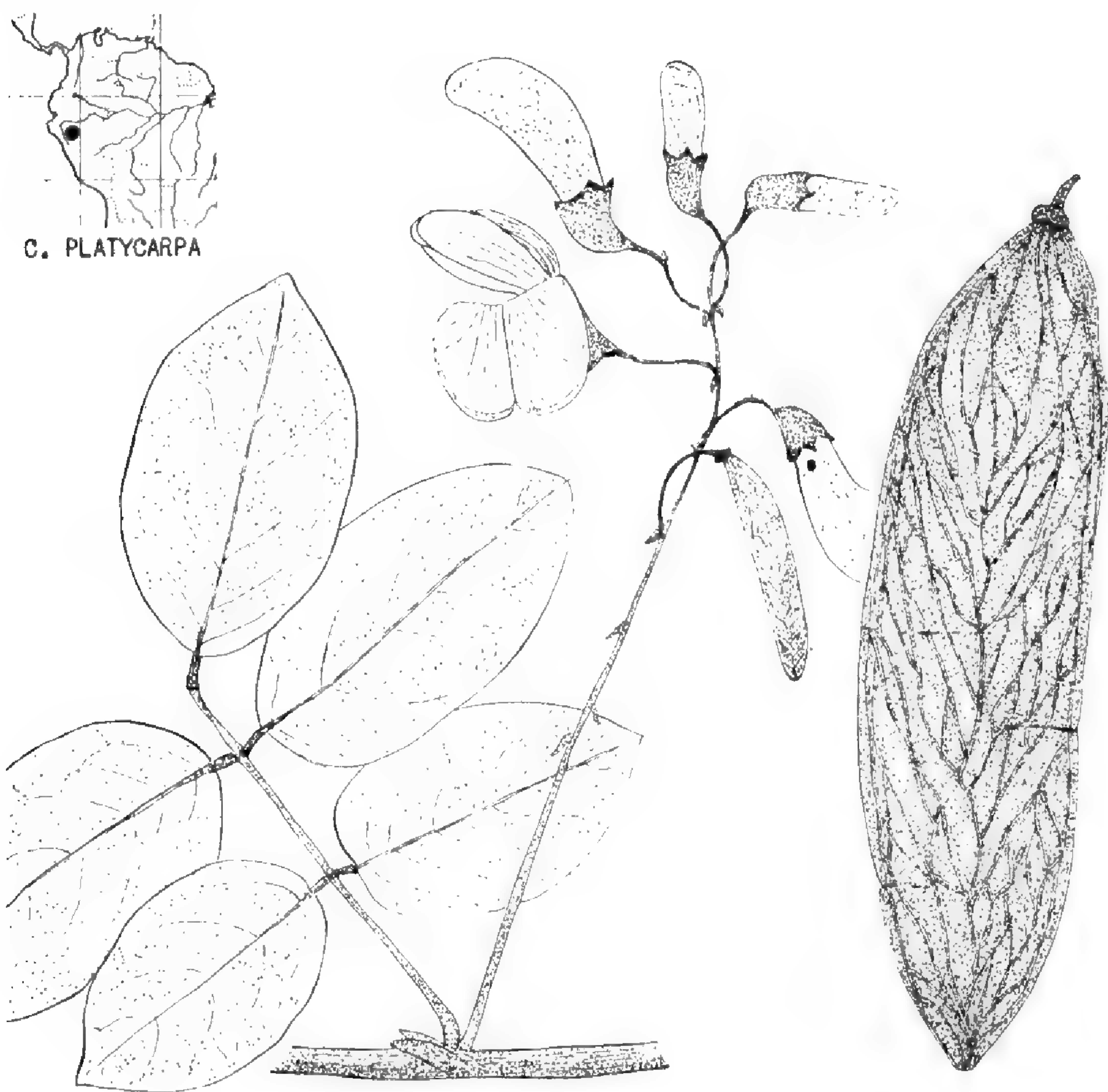
lyx tube suggests relationship to *C. latisiliqua* except that in *C. weberbaueri* the teeth are much longer and more attenuate. Mature fruit has not been seen but the ovary and immature fruit are compressed and possibly develop into fruit somewhat similar to that of *C. latisiliqua*.

2. *Chaetocalyx platycarpa* (Harms) Rudd, comb. nov.

FIGURE

Raimondianthus platycarpus Harms, Notizblatt 10:387. 1928.

Stems, leaf rachis, and floral axis fulvous-velutinous; stipules deltoid, attenuate-acute, entire, densely velutinous, about 5 mm. long and 2 mm. broad at the base; leaves 5-foliolate (or 7-foliolate fide Harms), the rachis 3–10 cm. long; leaflets oblong-ovate, 15–40 mm. long, 7–25 mm. wide, entire, acute to obtuse, mucronulate, the base rounded or sometimes subcordate, the surfaces pubescent, the upper surface darker than the lower, nitid and somewhat glabrescent.

FIGURE 3.—*Chaetocalyx platycarpa*. Natural size.

inflorescences axillary or terminal, paniculate, usually longer than the subtending leaves, the bracts stipule-like but mostly smaller and less attenuate, the pedicels 7–13 mm. long; flowers 20–24 mm. long, standard petal pubescent on the outer face; calyx campanulate, gibbous, pubescent, 7–8 mm. long, the tube 6–7 mm. long, 4–5 mm. in diameter, the teeth deltoid, acute, 0.5–1.5 mm. long; stamens with pubescent filaments; fruit sessile, oblong, acute, compressed, velutinous to subglabrous, obliquely reticulate-striate, about 6-seeded, 7–

cm. long and about 2 cm. wide (submature); mature fruit and seed not seen.

TYPE LOCALITY: Tambillo, Province of Cutervo, Department of Cajamarca, Peru. Type collected by A. Raimondi (No. 6714), cited below.

DISTRIBUTION: Known only from the type locality.

PERU

CAJAMARCA: Tambillo, *Raimondi* 4096 (USM), 6714 (F. M. neg. 2138 of **LECTO-TYPE** ex B; F); *Jelski* 216 (US).

This taxon, the basis of the genus *Raimondianthus*, is being transferred to *Chaetocalyx*. The flowers, immature fruits, and indument are essentially indistinguishable from those of *C. tomentosa* from Brazil. Mature fruits, unfortunately, are not known from either species. The most obvious difference between these two little-known taxa is in the leaf structure, *C. platycarpa* being 5- or 7-foliolate, and *C. tomentosa* 11–17-foliolate. In the widespread species *C. brasiliensis*, however, a variation in number of leaflets, 5–11, is not considered to be significant. Lacking intermediate examples, and because of the geographic distance between the two type localities, *C. platycarpa* and *C. tomentosa* are being maintained as separate species, but in the same genus.

In the original description of *Raimondianthus platycarpus*, Harms cited four collections by Raimondi (3514, 4078, 4144, 6714), with no designation as to type. Because photographs of *Raimondi* 6714 at Berlin have been widely distributed and there is material of that collection available at Chicago, it is designated as lectotype. Presumably the specimen at Berlin is no longer extant and the type is merely represented by the Field Museum photograph (F. M. neg. 2138).

3. *Chaetocalyx tomentosa* (Gardn.) Rudd, comb. nov. FIGURE 4
Coronilla hirsuta Vell. Fl. Flum. Text 311. 1825; Icon. 7: pl. 122. 1835. non DC. Prodr. 2:310. 1825.

Isodesmia tomentosa Gardn. in Hook. Lond. Journ. Bot. 2:340. 1843.

Chaetocalyx polyphylla Benth. in Mart. Fl. Bras. 15(1):76. 1859.

Stems, leaf rachis, and floral axis fulvous-pubescent and also beset with a few glandular setae; stipules lanceate, attenuate, entire, densely pubescent, 4–7 mm. long and about 1–2.5 mm. broad at base; leaves 11–17-foliolate, the rachis 5–12 cm. long; leaflets elliptic-oblong to obovate, 10–40 mm. long, 5–20 mm. wide, entire, obtuse or retuse, mucronulate, the base rounded to cuneate, the surfaces pubescent; inflorescences axillary or terminal, usually few-flowered, the bracts stipule-like but smaller and less attenuate, the pedicels about 10 mm.

long; flowers 24–30 mm. long; standard petal pubescent on the outer face; calyx campanulate, gibbous, 8–10 mm. long, pubescent, sometimes with a few glandular setae, the tube 7–8 mm. long and about 5 mm. in diameter, the teeth deltoid, acute, 1–2 mm. long; stamens with pubescent filaments; fruit [submature] sessile, oblong, acute at

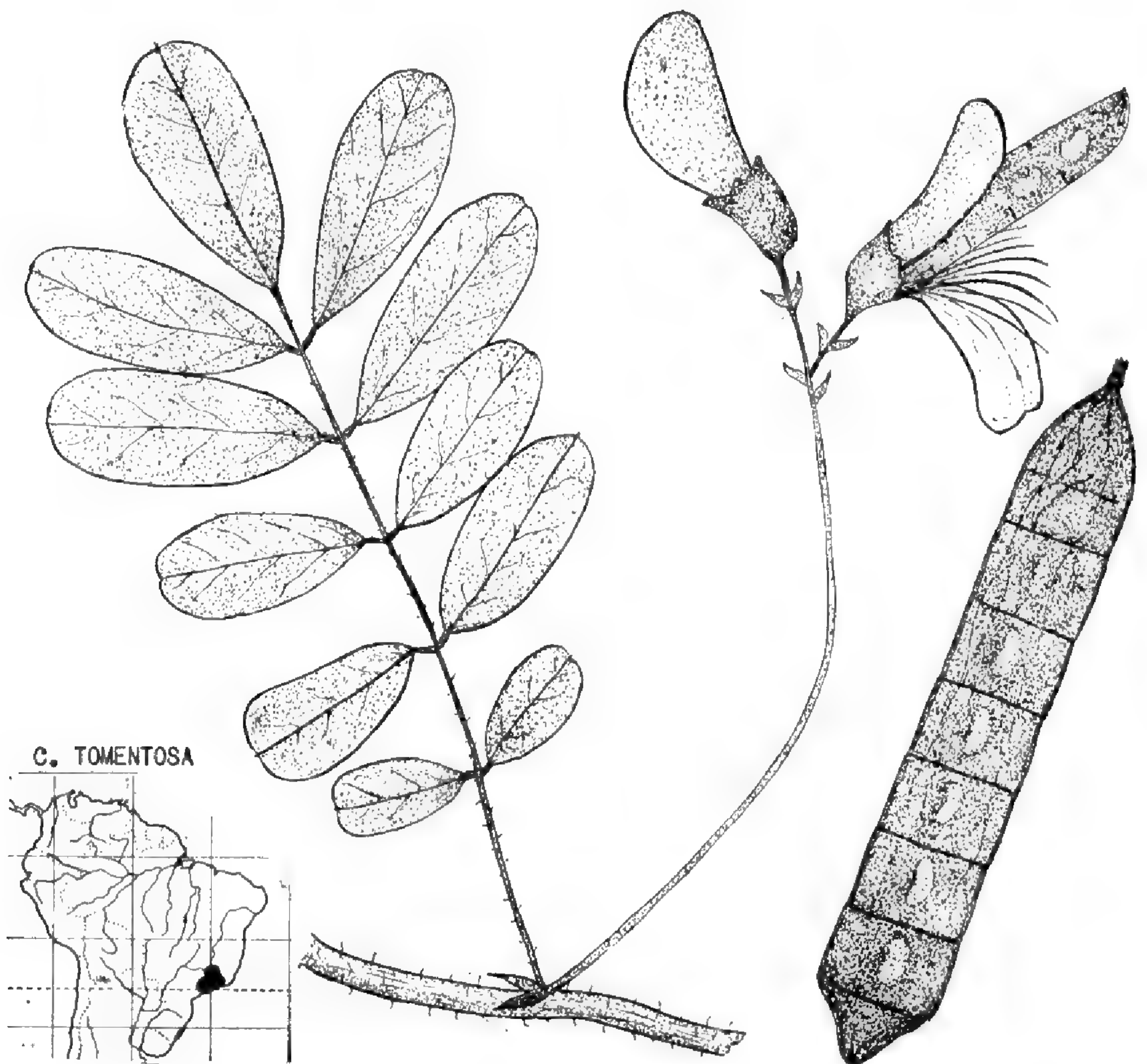


FIGURE 4.—*Chaetocalyx tomentosa*. Natural size.

base and apex, compressed, velutinous, obliquely reticulate-striate, 6–8-articulate, the articles 7–10 mm. long and 5–10 mm. wide; mature fruit and seed not seen.

TYPE LOCALITY: Near Imbuhy, Serra dos Orgãos, Rio de Janeiro, Brazil. Type collected by G. Gardner (No. 350), cited below.

DISTRIBUTION: Minas Gerais and Rio de Janeiro, Brazil.

BRAZIL

Minas Gerais: "Fazenda de Jeronima," *St. Hilaire* Cat. B', No. 1071 (P TYPE of *C. polyphylla*, fragm. F).

Rio de Janeiro: Near Imbuhy, Serra dos Orgãos, *Gardner* 350 (BM, photo of LECTOTYPE of *Isodesmia tomentosa*; K). Petropolis, á Santo-Antonio, *Glaziou* 5813 (K). Itatiaia, Maromba, *Barros* 679 (RB).

This species appears to be closely related to *C. platycarpa* from northern Peru. The flowers of the two species are essentially identical. Specimens of fully mature fruit are lacking but submature material indicates that the fruits of *C. tomentosa* might be about one-half as broad as those of *C. platycarpa*. The most convenient basis of distinction, in addition to the geographic location is the leaflet number; the leaves of *C. tomentosa* are 11–17-foliolate, and those of *C. platycarpa* are 5- or 7-foliolate.

Another closely related species is *C. blanchetiana*, which is recognized by its slightly longer calyx lobes and by having fewer leaflets than *C. tomentosa*.

These three species, *C. tomentosa* and *C. blanchetiana* (both originally assigned to *Isodesmia*) and *C. platycarpa* (the type of *Raimondianthus*) are very similar and should be together, in whatever genus. In my opinion, they are correctly placed in *Chaetocalyx*.

Examination of the illustration of *Coronilla hirsuta* Vell. and of type material of *Isodesmia tomentosa* and *Chaetocalyx polyphylla* shows that the three taxa are identical. The oldest specific name is *hirsuta* but that is rejected under Article 64(2) of the International Code of Botanical Nomenclature (1956): "When the same new name is simultaneously published for more than one taxon, the first author who adopts it in one sense, rejecting the other, or provides another name for one of these taxa must be followed". In the absence of exact data we must assume that publication of *Coronilla hirsuta* DC. and *C. hirsuta* Vell. was simultaneous. The subsequent history of *C. hirsuta* DC. is vague. After being included among "Species dubiae" and having cited in synonymy: "*Coronilla argentea* Burm! cap 22 et verosim. Thunb. fl. cap. 592?", the name *C. hirsuta* DC. apparently has been ignored—neither adopted nor rejected. *Coronilla hirsuta* Vell., on the other hand, was provided with a new name. Bentham (Fl. Bras. 15(1):71. 1859) cited it as a synonym of *Isodesmia tomentosa* Gardn. In transferring this taxon to *Chaetocalyx*, it appears that the correct specific name should be *tomentosa*.

4. ***Chaetocalyx blanchetiana*** (Benth.) Rudd, comb. nov.

FIGURE 5

Isodesmia blanchetiana Benth. in Mart. Fl. Bras. 15(1):71. 1859

Stems, leaf rachis, and floral axis fulvous-pubescent and also beset with glandular setae; stipules lanceate, acute to attenuate, entire, sometimes glandular ciliate, tomentose, about 4–6 mm. long and 2 mm. broad at the base; leaves 7–9-foliolate, the rachis about 6–8 cm. long; leaflets elliptic to orbiculate, 10–35 mm. long, 10–20 mm. wide, entire, obtuse or emarginate, mucronulate, the base rounded, the upper surface pubescent to subglabrous, the lower surface pubescent; inflorescences axillary or terminal, few-flowered, the bracts stipule-like, the pedicels 10–15 mm. long; flowers 22–27 mm. long; standard

petal pubescent on the outer face; calyx campanulate, gibbous, 8–12 mm. long, tomentose and setose, the tube 5–7 mm. long and about 5 mm. in diameter, the teeth 2–5 mm. long, oblong-lanceate, acute; stamens with pubescent filaments; fruit sessile, compressed,

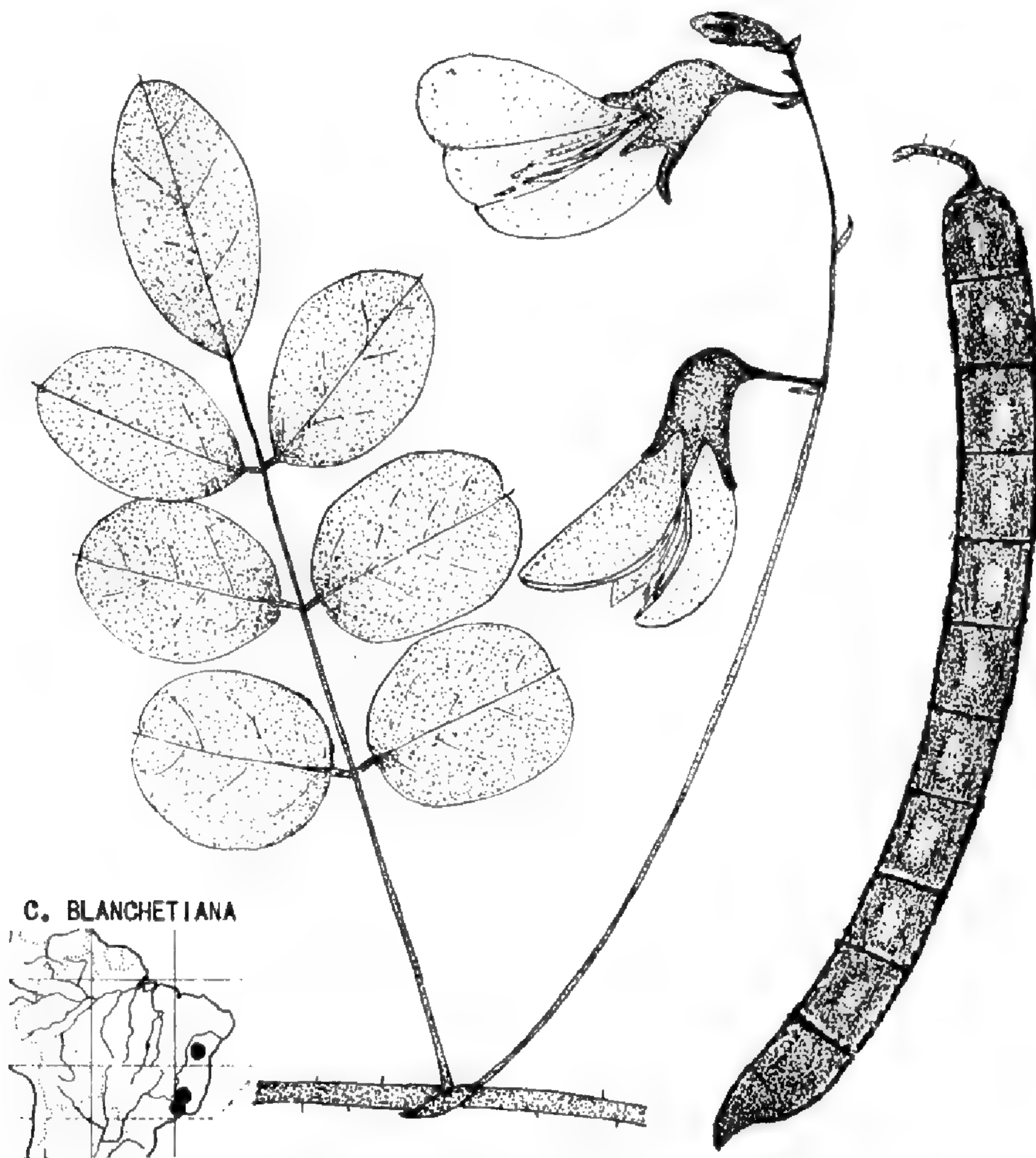


FIGURE 5.—*Chaetocalyx blanchetiana*. Natural size.

pubescent, obliquely reticulate-striate, the margins somewhat thickened, about 10–14-articulate, the articles 7–8 mm. long and 8 mm. wide; mature seed not seen.

TYPE LOCALITY: Serra do Açuruá, Bahia, Brazil. Type collected by J. S. Blanchet (No. 2892), cited below.

DISTRIBUTION: Eastern Brazil.

BRAZIL

BAHIA: Serra do Açuruá, Blanchet 2892 (K LECTOTYPE of *Isodesmia blanchetiana*, F. M. neg. 2132 of isotype ex B).

MINAS GERAIS: Campos do Caraça, Glaziou 13704 (K).

RIO DE JANEIRO: Petropolis, à Santo Antonio, Glaziou 13702 (K).

This species, originally assigned to *Isodesmia*, is closely related to the preceding two species—*C. tomentosa*, the type of *Isodesmia*, and *C. platycarpa*, the type of *Raimondianthus*—but it differs from them in having longer calyx lobes. The fruits are less than one-half as broad as those of *C. platycarpa*, and the leaves have fewer leaflets than those of *C. tomentosa*. In addition to these three species, relatively broad, compressed fruits are also found in *C. latisiliqua* and probably in *C. weberbaueri*.

Pubescence on the petals is a character shared with several species, but that same type of pubescence extending up the filaments seems to be peculiar to *C. blanchetiana*, *C. tomentosa*, and *C. platycarpa*.

5. ***Chaetocalyx latisiliqua*** (Poir.) Benth. ex Hemsl. Biol. Cent. Amer. 1:268. 1880. FIGURE 6

Hedysarum latisiliquum Juss. ex Poir. in Lam. Encycl. 6:432. 1804.

Poiretia latisiliqua (Poir.) Desv. Journ. Bot. 1:122. 1813.

Planarium latisiliquum (Poir.) Desv. Ann. Sci. Nat. 9:416. 1826.

Aeschynomene latisiliquosa Hill ex Steud. Nom. ed. 2, 1:31. 1840, nomen in synonymy.

Stems, leaf rachis, and floral axes sordid-pubescent to subglabrous and usually beset with glandular setae, the pubescence patent or finely crispate; stipules deltoid-ovate to lanceate, attenuate, entire or setose-denticulate, 3–10 mm. long, 1–3 mm. broad at the base, pubescent, sometimes beset with glandular setae; leaves 5-foliolate, the axis about 4–10 cm. long; leaflets 10–50 mm. long, 6–35 mm. wide, oblong-elliptic or slightly obovate, entire, obtuse, mucronulate, the base rounded or cuneate, the surfaces finely pubescent, usually discolorous, the lower surface whitish, the upper green; inflorescences racemose, sometimes paniculate, sometimes fasciculate, the bracts stipule-like but slightly smaller, the pedicels 6–12 mm. long; flowers 15–25 mm. long; standard petal glabrous or with a mere trace of pubescence near the base; calyx campanulate, essentially symmetrical, 5–6 mm. long, pubescent to subglabrous, sometimes beset with glandular setae, the tube 4–5 mm. long, 3–4 mm. in diameter, the teeth deltoid, acute, 1–2.5 mm. long, usually ciliate; filaments glabrous; fruit compressed, linear, 60–80 mm. long, 7–10 mm. wide, finely pubescent to subglabrous, longitudinally striate along the margins but the center of the articles usually reticulate-striate, about 12–15-articulate, the stipe 5–7 mm. long, the articles 4–5 mm. long, 7–10 mm. wide; seeds reddish brown, smooth, 2.5–3 mm. long and about 1.5 mm. wide.

TYPE LOCALITY: Probably Ecuador, the type collected by J. de Jussieu and cited from Peru.

DISTRIBUTION: Costa Rica to Ecuador, in thickets, on brushy slopes, and along roadsides.

COSTA RICA

GUANACASTE: Boca de Culebra, *Pittier* 12086 (US).

LIMÓN: "Bord du río Zent," *Pittier*, Herb. No. 16069 (GH, NY, US).

SAN JOSÉ: El General, *Skutch* 2424 (Mich, NY, US).

NO EXACT LOCALITY: "Sur les rives de l'Amoura à Shirores-Talamanca,"
Tonduz 9350 (F, US).

PANAMA

BOCAS DEL TORO: Almirante, *Cooper* 88 (F, NY, US).

CANAL ZONE: Changuinola Valley, *Dunlap* 369 (US), 400 (F, US). Empire, *Hayes* 513 (K), Feb. 2, 1862 (BM). Between Empire and Mandinga, *Piper* 5155 (US), 5165 (US). Culebra, *Pittier* 2212 (NY, US). Balboa, *Standley* 27158 (US), 32153 (US). Darién, *Standley* 31592 (US). Gamboa, *Standley* 28322 (US), 28452 (US). Summit, *Standley* 25812 (US), 29540 (US).

Between Farfan Beach and Palo Seco, *Hunter & Allen* 435 (GH).

PANAMÁ: Matías Hernández, *Pittier* 6898 (NY, US).

NO EXACT LOCALITY: *Seemann* 457 (BM, GH, K).

COLOMBIA

BOLÍVAR: Boca Verde, Río Sinú, *Pennell* 4242 (NY, US).

NO EXACT LOCALITY: *Purdie* (NY).

ECUADOR:

ESMERALDAS: "Parroquia de Concepción, Island in Río Santiago, Playa Rica, *Mexia* 8463 (F, GH, NA, NY, US). Atacames, *Barclay* 746 (BM, K).

MANABÍ: El Recreo, *Eggers* 15050 (F, GH, K, US). Jipijapa, *Haught* 3398 (F, US).

GUAYAS: Guayaquil, *Schimpff* 1097 (US). Chongón, *Asplund* 7682 (US). Milagro, *Hitchcock* 20247 (NY, US). Teresita, near Bucay, *Hitchcock* 20509 (GH, NY, US). Tenguel, *Holmgren* 23 (US).

BOLÍVAR: Balzapamba, *André* 4038 (F, GH, K, NY).

CHIMBORAZO: Río Chanchan, *Spruce* 5968 (K, NY).

SANTIAGO-ZAMORA: "Seipa," *André* 4223 (K).

LOCAL NAME: Chupa-chupa (Ecuador).

The generic placement of this species has been rather unstable. Nomenclaturally, all the combinations are traceable to *Hedysarum latisiliquum*, an herbarium name ascribed by Jussieu and validated by Poiret. Desvaux transferred the taxon to *Poiretia* but later used it as the basis of a new genus, *Planarium*. Steudel presented it in various combinations, "*Aeschynomene latisiliquosa* Hill. *Poiretia latisiliqua*"; "*Hedysarum latisiliquum* Poir. *Planarium latisiliquum*"; "*Poiretia latisiliquosa* Desv. *Planarium latisiliquum*." The use of the epithets *latisiliquum* and *latisiliquosa* seems to be inconsistent, and, fortunately, not of significance.

Bentham apparently was the first to recognize the relationship to *Chaetocalyx* (*in* Benth. & Hook., Gen. Plant. 1:513. 1865), but did not actually transfer the species. The combination *Chaetocalyx latisiliqua* was published by Hemsley, although attributed to Bentham. Macbride apparently overlooked the earlier papers when he published *Chaetocalyx latisiliqua* (Desv.) Macbr. (Field Mus. Pub. Bot. 13(3):446. 1943).

The flat fruits of this species, with longitudinal striae along the margins and being more or less reticulate-striate in the center of the articles, are distinctive and apparently intermediate between the

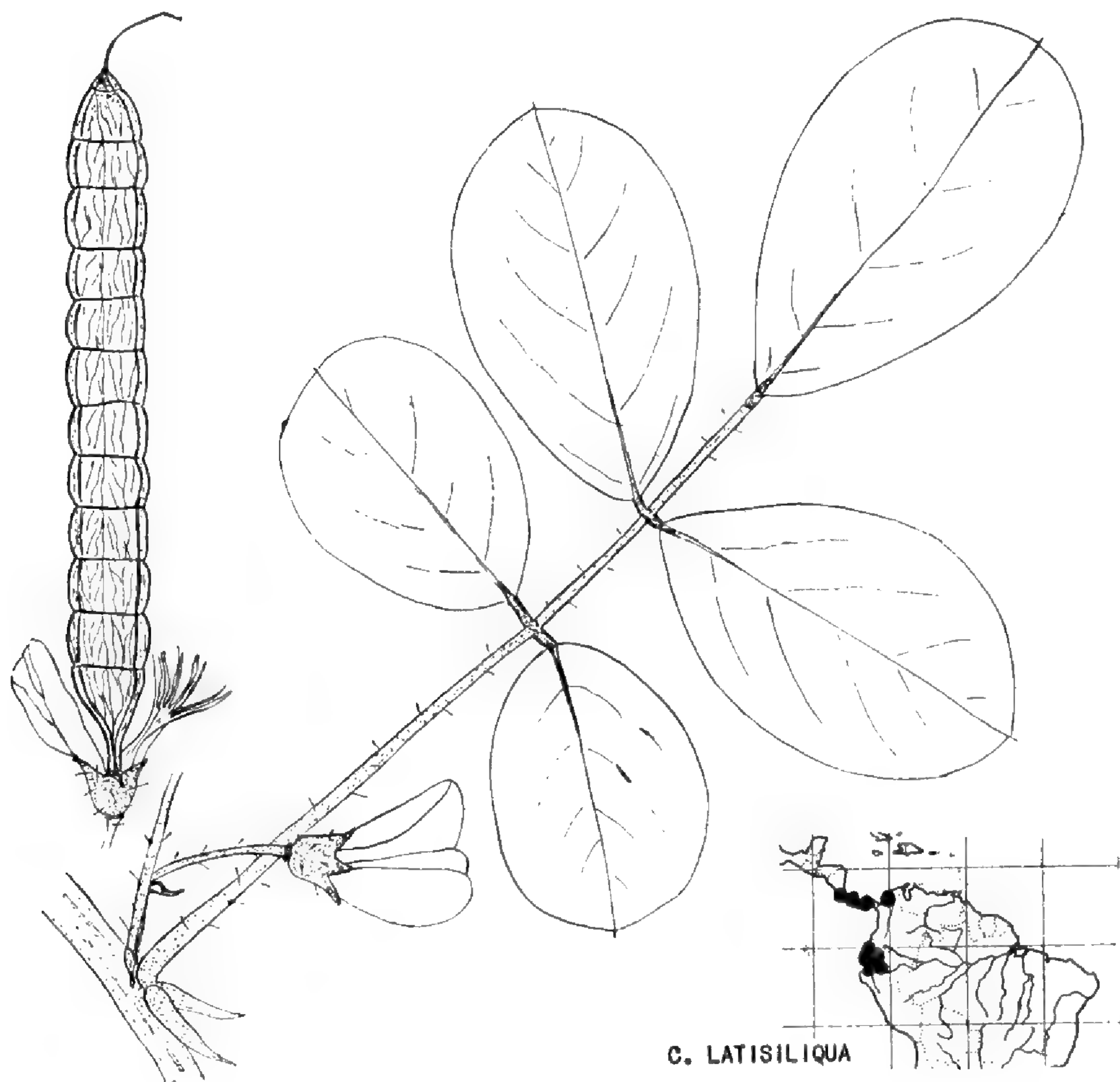


FIGURE 6.—*Chaetocalyx latisiliqua*. Natural size.

wider, flat, reticulate fruits of *C. platycarpa* and the slightly narrower, longitudinally striate fruits of *C. nigricans* and *C. longiflora*.

6. *Chaetocalyx nigricans* Burkart, Darwinian 3:160, figs. 6a, 7a, tab. 6. 1939.

FIGURE 7

Plant generally nigrescent; stems, leaf rachis, and floral axes moderately sordid-pubescent to subglabrous, with scarce development of glandular hairs; stipules lanceate, attenuate, entire, about 4–5 mm. long, 1–1.5 mm. wide at the base, pubescent to subglabrous; leaves 5-foliolate, the axis 2–9 cm. long; leaflets 10–35 mm. long, 5–20 mm. wide, elliptic, the terminal leaflet sometimes obovate, entire, obtuse, mucronulate, the base rounded to cuneate, the surfaces subglabrous; inflorescences racemose or fasciculate, few-flowered, the bracts

stipule-like but usually smaller, the pedicels 10–35 mm. long; flowers 20–30 mm. long; standard petal glabrous except for marginal cilia, or slightly pubescent toward the base; calyx campanulate, gibbous, 8–10 mm. long, lightly pubescent to subglabrous, beset with a few glandular setae, the tube 7–8 mm. long, 4–5 mm. in diameter, the teeth about 2 mm. long, deltoid, acute to attenuate, usually ciliate and pubescent

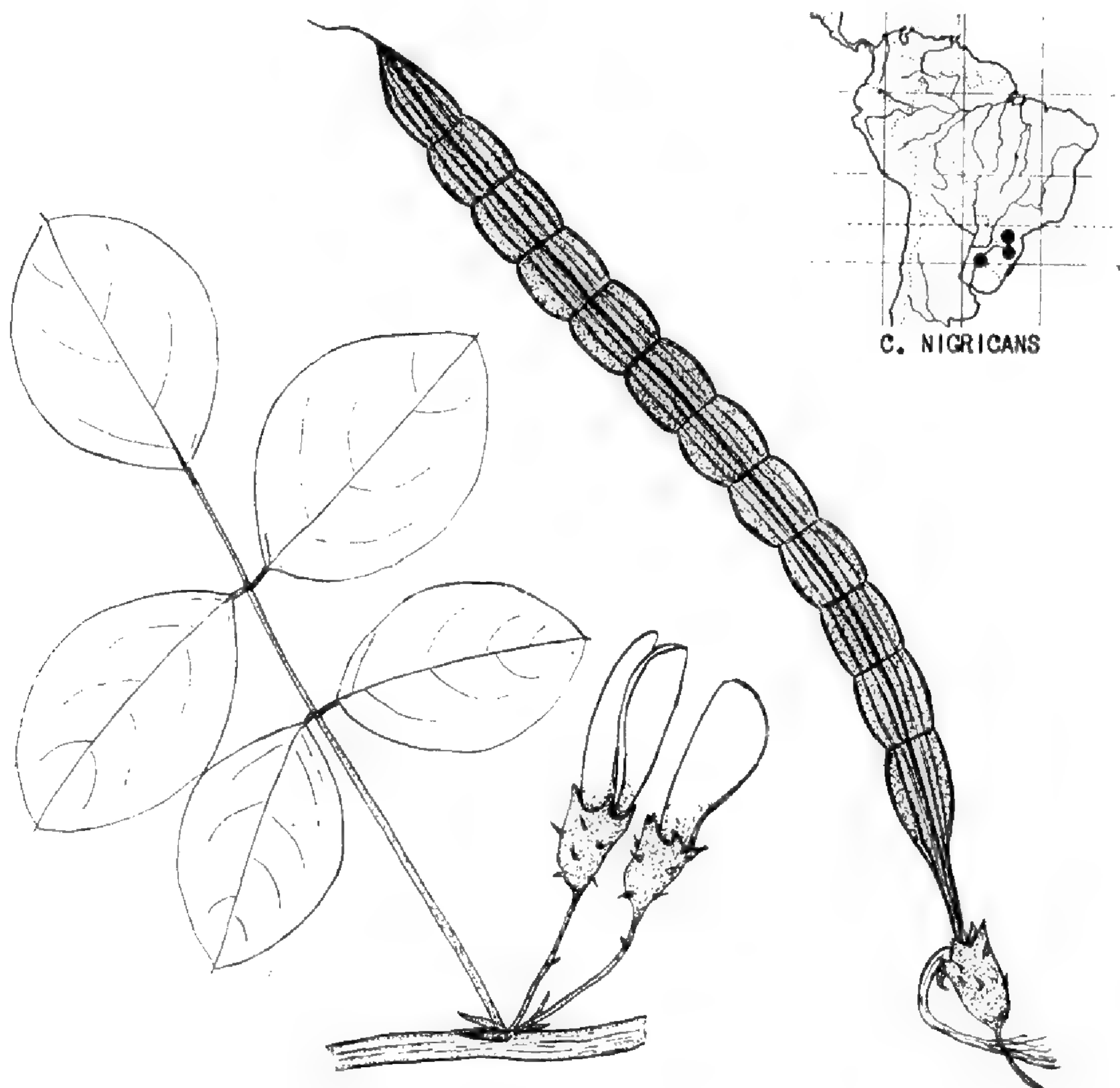


FIGURE 7.—*Chaetocalyx nigricans*. Natural size.

on the inner surface; filaments glabrous; fruit compressed, linear, 9.5–12 cm. long, 6–7 mm. wide, moderately pubescent to subglabrous, longitudinally striate with about 7–12 ribs on each valve, the midrib the most prominent, about 8–11-articulate, the stipe 10–15 mm. long, the articles 6–10 mm. long, 6–7 mm. wide; seeds about 5 mm. long and 1.5 mm. wide, reddish brown.

TYPE LOCALITY: In woods along the Río Uruguay, La Cruz, Province of Corrientes, Argentina. Type collected by A. Burkart (No. 8197), cited below.

DISTRIBUTION: Northeastern Argentina, southeastern Brazil, and Uruguay (fide Burkart).

BRAZIL

PARANÁ: Between Therezinha and Prudentópolis, *Dusén* 11272 (US).

SANTA CATARINA: *Müller* 216 (K). Itapiranga, *Rambo* 1400 (PACA).

ARGENTINA

Corrientes: La Cruz, *Burkart* 8197 (GH Isotype).

This seems to be the only species of *Chaetocalyx* that turns blackish on drying. The flowers are similar to those of *C. brasiliensis*. The flat fruits resemble those of *C. longiflora* but are distinguished by slightly greater width and by longer stipes.

7. *Chaetocalyx longiflora* A. Gray in U. S. Expl. Exped. 1:423. 1854 (as *C. longiflorus*), non sensu Benth. ined. FIGURE 8

Chaetocalyx hebecarpa Benth. in Mart. Fl. Bras. 15(1):76. 1859.

Chaetocalyx hebecarpa var. *oblongifolia* Benth. in Mart. Fl. Bras. 15(1):76. 1859.

Chaetocalyx hebecarpa var. *mollis* Benth. in Mart. Fl. Bras. 15(1):76. 1859.

Chaetocalyx glaziovii Taub. Flora 72(n. s. 47):425. 1889.

Stems, leaf rachis, and floral axis sordid to stramineous-pubescent, and sometimes beset with glandular setae; stipules deltoid-lanceate to ovate, acute to attenuate, entire or lacinate, 4–5 mm. long, 1–2 mm. wide at the base, pubescent; leaves 5-foliolate, the rachis 3–8 cm. long; leaflets elliptic, 15–50 mm. long, 10–25 mm. wide, entire, obtuse or subacute, mucronulate, the base subcuneate to subcordate, the surfaces pubescent; inflorescences axillary, few-flowered, fasciculate or racemose, the bracts stipule-like, the pedicels 15–35 mm. long; flowers 20–28 mm. long; standard petal commonly pubescent on the outer face, sometimes subglabrous; calyx campanulate, gibbous, pubescent, 10–11 mm. long, the tube subtruncate, about 6 mm. long, 4–5 mm. in diameter, the teeth attenuate, (2–)4–6 mm. long; stamens with glabrous filaments; fruit somewhat compressed, linear, about 10 cm. long, 3–4 mm. wide, pubescent to subglabrous, sometimes with a few glandular setae, longitudinally striate; stipitate, the stipe about 6–10 mm. long; 7–10-articulate, the articles 7–10 mm. long, 3–4 mm. wide; seed about 6 mm. long and 2 mm. wide, reddish brown.

TYPE LOCALITY: Rio de Janeiro, Brazil. Type collected by the U. S. Exploring Expedition under the command of Capt. C. Wilkes, cited below.

DISTRIBUTION: Southeastern Brazil and Bolivia.

BOLIVIA

SANTA CRUZ: Cerro de la Cruz, *Kuntze*, May 1892 (F, NY, US).

BRAZIL:

MINAS GERAIS: Cachoeira do Campo, *Claussen* 196 (K SYNTYPE of *C. hebecarpa*). "Inter Cabo d'Agosto et Cocaës et Rio da Onça," *Martius Herb.* 1175 (F. M. neg. 6271 of SYNTYPE of *C. hebecarpa* ex M). *Caldas, Regnell* III.417 (K). Campos do Caraça, *Glaziou* 13703 (F. M. neg. 2133 of TYPE of *C. glaziovii* ex B; K). Bento Pires, near Bello Horizonte, *Williams & Assis* 6161 (GH). Estação de Barreiro, Bello Horizonte, *Williams & Assis* 7129 (GH, US). Capoeira, Serra do Taquaril, Bello

Horizonte, *Magalhães* 3255 (US). Diamantina, *Mexia* 5835 (BM, F, GH, Mich, NA, NY, Ph, US). Caeté, Serra da Piedade, *Mello-Barreto* 5703 (F). Gaia, *Mello-Barreto* 5704 (F). Florestal, Pará de Minas, *Gouvea*, May 28, 1936 (F).

RIO DE JANEIRO: *Wilkes Exped.* (US TYPE.)

SÃO PAULO: Salto do Itú, *Hoehne*, S. P. 3307 (BM, GH). Campinas, *Novaes* 258 (US).

PARANÁ: Capão Grande, *Dusén* 16881 (F, GH, Ph). Rio das Cinzas, *Dusén* 16821 (GH).

This species is characterized by flowers with a pubescent standard, a subtruncate calyx tube with attenuate teeth, and leaflets that are pubescent on both surfaces. Fruiting specimens are distinctive; the loment is somewhat compressed and apparently intermediate

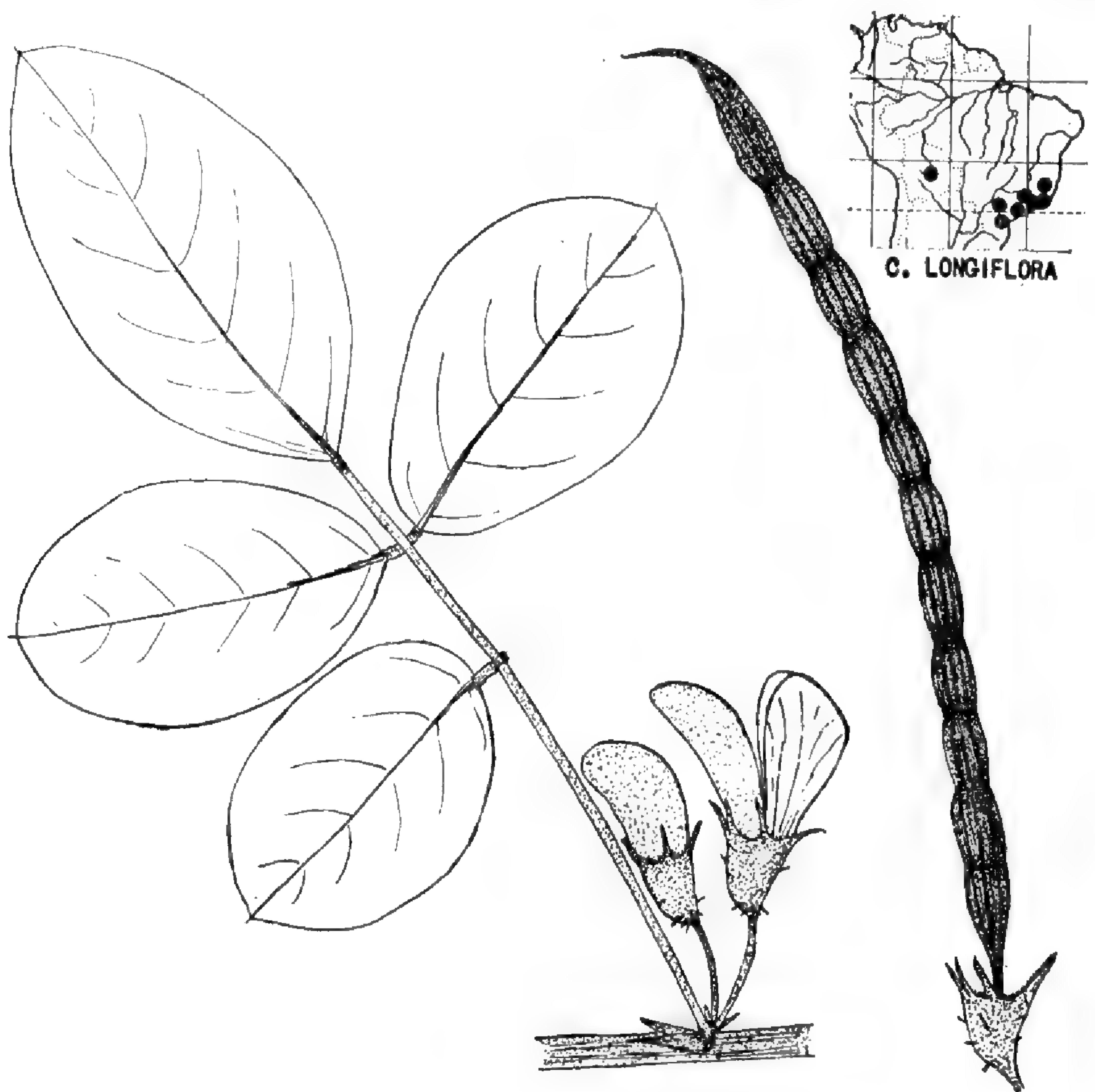


FIGURE 8.—*Chaetocalyx longiflora*. Natural size.

between those of *C. nigricans*, which are slightly broader and more compressed, and those of *C. brasiliensis*, which are narrower and subterete.

Gray's description of *C. longiflora* is brief, but most of the salient points are included. It is implied that the species resembles *C.*

vincentina (i. e., typical *C. scandens*) but that the five leaflets are slightly smaller and are pubescent on both sides. The size of the leaflets is not critical, but the pubescence is characteristic. A good diagnostic character is provided by the calyx, "a truncate orifice . . . bearing the setaceous teeth, which are almost as long as the campanulate tube."

Gray published the specific name of this taxon as "*longiflorus*." In this paper "*longiflora*" is being used to bring the gender into conformity with classical Greek usage observed by de Candolle, Bentham, and other authors who treated *Chaetocalyx* as feminine.

The name *Chaetocalyx longiflora* A. Gray has priority over the commonly used *C. hebecarpa* Benth. It was applied to a specimen collected by the Wilkes Expedition, using as a basis an unpublished herbarium name of Bentham's. The material annotated by Bentham as *C. longiflora* was subsequently recognized as referable to *Rhadinocarpus acutifolia* Vog., or *Chaetocalyx acutifolia* (Vog.) Benth.

The Wilkes specimen designated by Gray as *C. longiflorus* Benth. seems to be identical with typical *Chaetocalyx hebecarpa* Benth., rather than with *C. acutifolia*. It becomes, therefore, the type of a new species, *C. longiflora* A. Gray, with *C. hebecarpa* as a later synonym, rather than a validation of Bentham's unpublished name.

The additional varieties of *C. hebecarpa*, var. *oblongifolia* and var. *mollis*, seem not to be sufficiently distinctive to warrant segregation.

Type material of *C. glaziovii* appears to represent a robust specimen of *C. longiflora*, and the species are therefore placed in synonymy.

8. *Chaetocalyx acutifolia* (Vog.) Benth. *in* Mart. Fl. Bras. 15(1):75. 1859.

FIGURE 9

Rhadinocarpus acutifolius Vog. *Linnaea* 12:111. 1838.

Stems, leaf rachis, and floral axes stramineous-pubescent to subglabrous and also moderately beset with glandular setae; stipules lanceate, attenuate, entire, about 5 mm. long and 1–2 mm. broad at the base, pubescent; leaves 5-foliolate, the rachis 3–6 cm. long; leaflets ovate to oblong-elliptic, 20–50 mm. long, 10–20 mm. wide, entire, acute to acuminate, mucronulate, the base cuneate to subcordate, the surfaces glabrous to sparsely pubescent; inflorescences axillary, fasciculate, few-flowered, the bracts stipule-like but smaller, the pedicels 10–15 mm. long; flowers 22–26 mm. long; standard petal pubescent on the outer face; calyx campanulate, gibbous, pubescent and glandular-setose, 10–11 mm. long, the tube about 7 mm. long and 5 mm. in diameter, pubescent within, the teeth attenuate, 3–4 mm. long; filaments glabrous, fruit (submature) somewhat compressed, linear, about 12–16 cm. long, 2 mm. wide, pubescent to subglabrous,

longitudinally striate with about 5 or 6 major ribs on each valve, about 10-articulate, the stipe about 10 mm. long, the articles about 12-17 mm. long and 2-2.5 mm. wide; mature fruit and seed not seen.

TYPE LOCALITY: "In Brasil. merid.," probably near Rio de Janeiro. Type collected by Sellow, cited below.

DISTRIBUTION: Known only from the vicinity of the type collection.

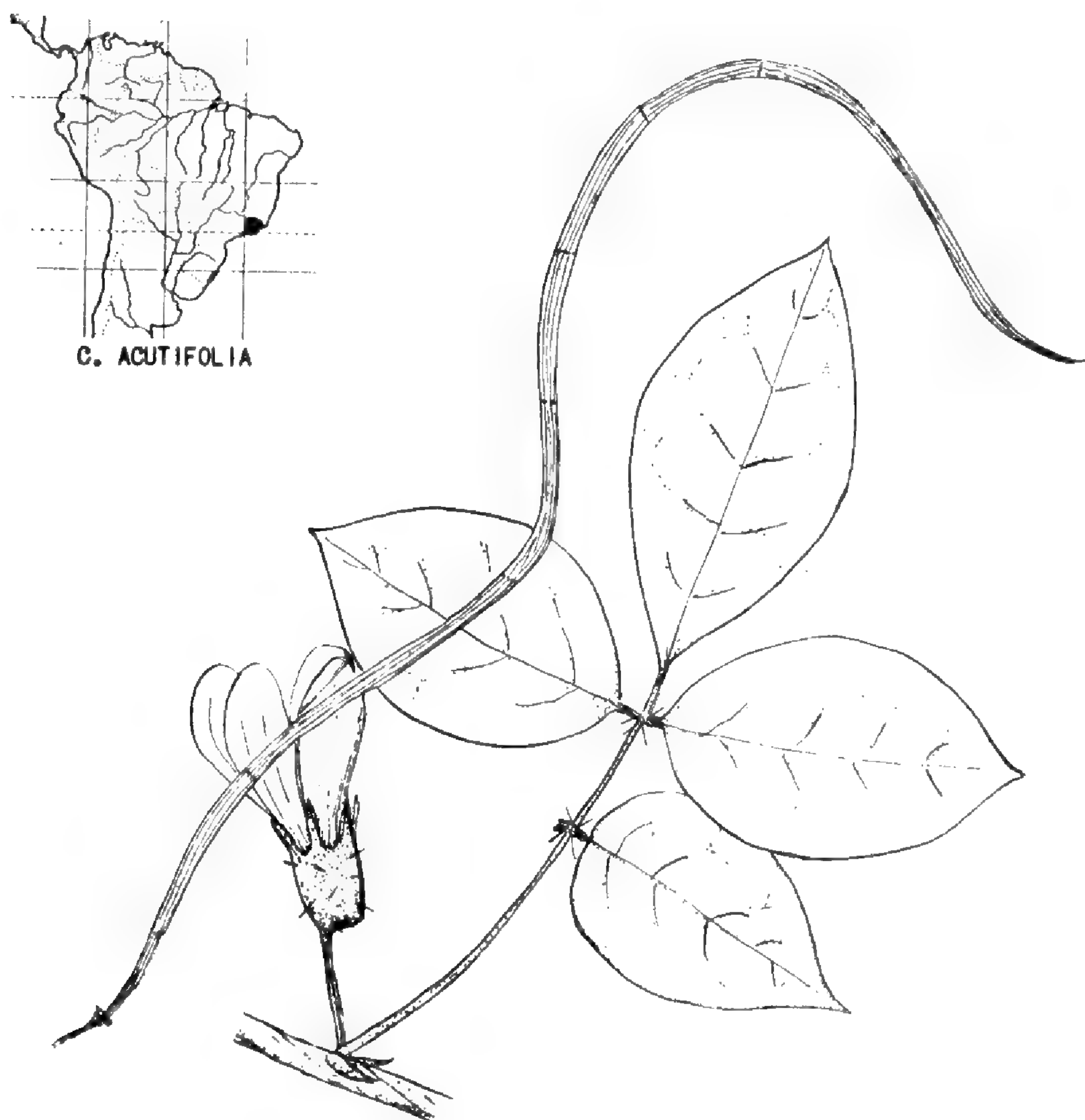


FIGURE 9.—*Chaetocalyx acutifolia*. Natural size.

BRAZIL

RIO DE JANEIRO: *Sellow* (fragment, presumably of TYPE, F); *Luschnath* (K); *Pohl* (K); *Schott* (F. M. neg. 32121 ex W; fragment F, NY); *Riedel* 139 (BM). Distrito Federal, Morro do Sacopan, *Apparicio* [*Duarte*] & *Rizzini* 27 (US). Corcovado, *Kuhlmann*, RB Herb. No. 852 (RB).

This taxon was the basis of the herbarium name *Chaetocalyx longiflora*, subsequently recognized as being referable to Vogel's *Rhadinocarpus acutifolius*, and cited by Bentham as *Chaetocalyx acutifolius*.

Gray adopted and published the name "*Chaetocalyx longiflorus* Benth.," applying it to a specimen collected by the Wilkes Expedi-

tion. I am not, however, accepting his determination of the two entities as identical, but am treating them as two species.

The fruit of *C. acutifolia* seems to be distinctive. In the submature material observed, the transverse sutures are not perfectly defined, but it appears that the articles are about 12–17 mm. long, in contrast to the 7–10 mm. articles of other, related species.

9. *Chaetocalyx brasiliensis* (Vog.) Benth. in Mart. Fl. Bras. 15(1):75. 1859.

FIGURE 10

Rhadinocarpus brasiliensis Vog. Linnaea 12:110. 1838.

Chaetocalyx latifolia Benth. in Mart. 15(1):75. 1859.

Chaetocalyx ilheotica Taub. Flora 72(n.s. 47):425. 1889.

Chaetocalyx belizensis Standl. Field. Mus. Pub. Bot. 12:410. 1936.

Chaetocalyx latifolia var. *setulifera* Burkart, Darwiniana 3:165, figs 6d, 7c. 1939.

Chaetocalyx matudai Lundell, Contrib. Univ. Mich. Herb. 6:25. 1941.

Stems, leaf rachis, and floral axes moderately pubescent, sometimes setose, the stems usually glabrate; stipules 5–10 mm. long, 1–2 mm. wide at the base, deltoid-lanceate, attenuate, entire or setose-ciliate, moderately pubescent to subglabrous; leaves 5–11-foliolate, the rachis about 3–11 cm. long; leaflets 10–40 mm. long, 6–30 mm. wide, elliptical or suborbicular to obovate, obtuse to truncate-emarginate, mucronulate, the base rounded, the surfaces moderately pubescent to glabrous; flowers 15–30 mm. long, axillary, solitary or in few-flowered fascicles, or in short racemes; bracts ovate-deltoid, acuminate, often lacinate, usually setose, moderately pubescent to subglabrous, 1–2 mm. broad at the base; pedicels about 10 mm. long; standard glabrous or rarely pubescent; calyx campanulate, gibbous, 8–10 mm. long, ciliate and usually setose but otherwise subglabrous, the tube truncate, 5–8 mm. long, 4–4.5 mm. in diameter, the teeth deltoid to subulate, 1–3 mm. long; filaments glabrous; fruit subterete, longitudinally striate with 5–10 major ridges on each valve, glabrous or pilose, sometimes beset with glandular setae, 12–18 cm. long, 2.5–3 mm. in diameter, 12–16-articulate, the articles 8–15 mm. long, the stipe 5–8 mm. long; seeds dark reddish brown, 5–6 mm. long, 1.5–2 mm. in diameter.

TYPE LOCALITY: "Inter Campos et Victoria," Espirito Santo or Rio de Janeiro, Brazil. Type collected by Sellow.

DISTRIBUTION: Southern Mexico, southward and eastward to Paraguay and southern Brazil.

MEXICO

VERA CRUZ: Fortuña, L. Williams 8890 (F).

OAXACA: Chiltepec, Martínez-Calderón 256 (A, US).

TABASCO: Teapa, Linden 737 (GH, K). "Prope Pantheum Sancti Joannis Baptistae," Rovirosa Herb. 115 (Ph, US).

CHIAPAS: Escuintla, Matuda 834 (Mich TYPE of *C. matudai*, US).

GUATEMALA

ALTA VERAPAZ: Cubilgüitz, von Türckheim 7741 (GH, NY, US); Steyermark 44359 (F, US). Río Ievolay, Steyermark 44746 (F).

IZABAL: Quiriguá, *Standley* 24590 (US).

SAN MARCOS: Río Cabús, near Malacatán, *Standley* 68869 (F).

BRITISH HONDURAS

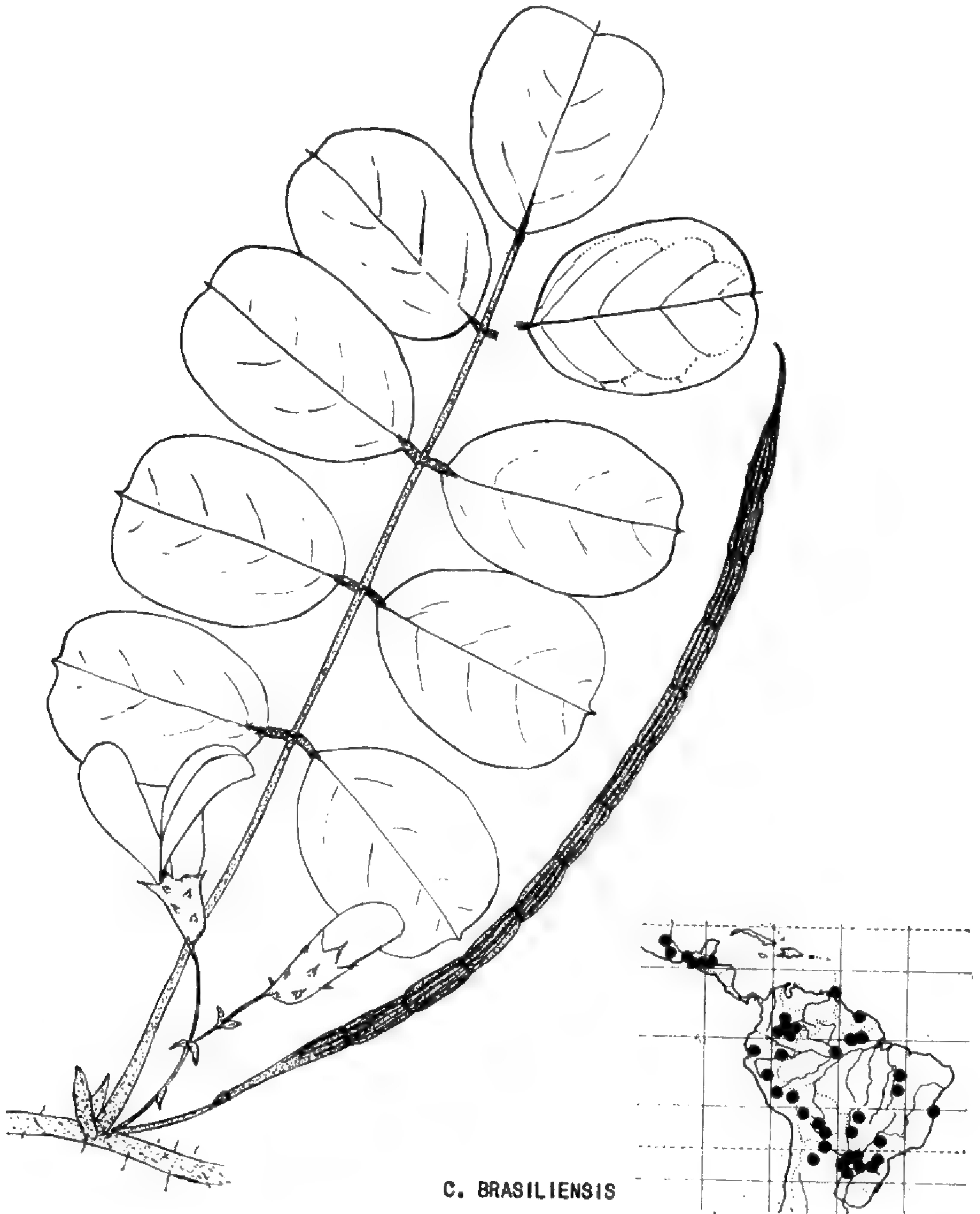
NO EXACT LOCALITY: "Temash River," *Schipp* 1330 (A, F TYPE of *C. belizensis*, GH, Mich, NY).

TRINIDAD

NO EXACT LOCALITY: *Crüger* 171 (K).

SURINAM

NO EXACT LOCALITY: *Hostmann* 165 (BM, K, NY).



C. BRASILIENSIS

FIGURE 10.—*Chaetocalyx brasiliensis*. Natural size.

COLOMBIA

BOYACÁ: Peñon de Pita, *André* 452 (K, NY).

META: Villavicencio, *Cuatrecasas* 4720 (US).

VICHADA: Amanabel, *Perez-Arbeláez, Araque-Molina, & Barkley* 18.Vi.104 (US).

VAUPÉS: Amanavén, *Romero* 1241 (US).

CAQUETÁ: Mocoa, *Sprague* 399 (K, US).

ECUADOR

GUAYAS: Naranjito, *Camp E-3618* (F, NY, US).

PERU

SAN MARTÍN: Juanjui, Alto Río Huallaga, *Klug* 4361 (A, F, NY, US).

LORETO: Iquitos, *Killip & Smith* 27336 (NY, US). Yurimaguas, *Spruce* 3897 (K).

JUNÍN: Río Pinedo, north of La Merced, *Killip & Smith* 23581 (NY, US).

MADRE DE DIOS: Río Acre, Seringal Auristella, *Ule* 9452 (F, K).

NO EXACT LOCALITY: *Ruiz & Pavon* 2137 (F).

BOLIVIA

LA PAZ: Between Guanay and Tipuani, *Bang* 1348 (F, GH, Mich, NY, Ph, US). Guanay, *Rusby* 2398 (F, Mich, NY). Yuri, *R. S. Williams* 254 (NY, US). San Carlos, *Buchtien* 1782 (NY, US).

SANTA CRUZ: Río Yapacani, *Kuntze*, June 1892 (NY, US). Camiri, *Cárdenas* 4703 (US). Río Palometillas, Sara, *Steinbach* 7330 (GH).

BRAZIL

AMAZONAS: "S. Antonio, R. Madeira," *Traill* 131 (K). "Ad oram meridionalem flum. Amazonum, ad ostium flum. Solimoes," *Spruce* 1638 (GH). Manaquery, *Spruce* 1638 (K).

PARÁ: Rio Branco de Obidas, *Ducke*, MG Herb. No 17128 (RB, US). Monte Alegre, Rio Maicurú, *Froes* 30228 (US).

MARANHÃO: Carolina, Ilha dos Botes, *Pires & Black* 2068 (NY), 2072 (K, NY).

BAHIA: Ilheos, *Riedel* 252 (F. M. neg. 2134 of TYPE of *C. ilheotica* ex B, K).

MINAS GERAIS: São Lourenço, Ituiutaba, *Macedo* 1783 (US). Santa Terezinha, Ituiutaba, *Macedo* 1799 (NY).

GOIÁS: Arrayas, *Gardner* 3671 (BM, K TYPE of *C. latifolia*, F. M. neg. 2135 ex B).

MATTO GROSSO: Corumbá, *D. Smith* 50 (K). Cuyabá, *Malme (Regnell* II.1894 (GH).

PARANÁ: Ivahy, *Tessmann* 6079 (A, K, RB).

SANTA CATARINA: Nova Teutonia, *Plaumann* 363 (RB).

PARAGUAY

CENTRAL: Asunción, *Balansa* 1555 (K). "Villa-Occidental," *Balansa* 1555a (K). "In regione Cordillerae centralis," *Hassler* 6201 (BM, NY). "Paraguaria septentrionalis," *Hassler* 7564 (BM, NY). Lago Yparacay, *Hassler* 11538 (BM, F, GH, NY, US), 12613 (BM, GH, US).

CORDILLERA: Cordillera de Altos, *Fiebrig* 946 (BM, F, GH, K).

GUAIRA: Villarrica, *Jørgensen* 4194 (NY, Ph, US). Tapytá, *Jørgensen* 4194a (F, US).

NO EXACT LOCALITY: "Alto Paraná," *Fiebrig* 6147 (BM, GH, K, US).

ARGENTINA

SALTA: Río Tartagal, *Schreiter* 11060 (GH). Las Tabillas, *Schreiter* 11061 (F).

TUCUMÁN: Tucumán, *Sprenger* 69 (K).

FORMOSA: Formosa, *Jørgensen* 3108 (US).

CORRIENTES: Paso de la Patria, *Meyer* 2125 (GH). Estancia "Las Tres Marias," Río Paraná, Empedrado, *Pedersen* 2769 (US).

MISSIONES: La Mina-San Juan, *Montes* 2199 (GH).

This taxon is characterized by subterete lomentis 2.5–3 mm. in diameter, flowers with glabrous standard and gibbous calyx, and leaves with 5, 7, 9, or 11 leaflets, commonly obovate, truncate, emarginate.

There is some variation in pubescence, in flower size, and in leaflet shape and number. *Chaetocalyx latifolia* is generally glabrous and the leaves 5-foliolate; *C. ilheotica* has flowers slightly longer than those of average *C. brasiliensis*; *C. belizensis* has 9-foliolate leaves; the fruits of *C. matudai* are setose; at least one collection from Peru and one from Mexico has a pubescent standard; a few specimens from Paraguay, northeastern Argentina, and southeastern Brazil have pubescent leaflets and longer calyx teeth, suggesting some relationship to *C. longiflora*. I do not believe, however, that specific segregation is warranted on the basis of these criteria, and at this time, with limited collections, I prefer to include all the above cited material in *C. brasiliensis*.

10. *Chaetocalyx klugii* Rudd, sp. nov.

FIGURE 13

Herba volubilis; folia impari-pinnata, foliolis 5, ovatis, acuminatis, subglabris; flores 15–20 mm. longi, in racemulos vel fasciculos axillares dispositi; vexillum pubescens; calyx campanulatus, 5–7 mm. longus, tubo leviter gibboso, truncato, 4–5 mm. longo, 3–5 mm. in diametro, glabro praeter ciliato, dentibus subulatis, 1–2 mm. longis; ovarium sessile, elongatum, compressum, glabrum praeter marginibus pubescentibus; legumen maturem tamen non vidi.

Stems, leaf rachis, and floral axis glabrous to sparsely sordidly pubescent, sometimes setose; stipules deltoid-attenuate, 2–3 mm. long, about 1.5 mm. broad at the base, entire or ciliate, subglabrous; leaves 5-foliolate, the rachis about 5–12.5 cm. long; leaflets 30–80 mm. long, 15–35 mm. wide, ovate, acuminate, mucronulate, the base rounded to cuneate, ciliate but otherwise the surfaces glabrous or nearly so; inflorescences axillary, many-flowered, fasciculate or short racemose, the bracts stipule-like but smaller, the pedicels 5–10 mm. long; flowers 15–20 mm. long; standard petal pubescent on the outer face; calyx 5–7 mm. long, campanulate, somewhat gibbous, the tube 4–5 mm. long, 3–3.5 mm. in diameter, truncate, pubescent along the margin, otherwise glabrous, the teeth subulate, 1–2 mm. long; stamens with glabrous filaments; ovary sessile, elongate, compressed, pubescent along the margins but otherwise glabrous, about 7-ovulate; mature fruit and seed not seen.

TYPE: In the U. S. National Herbarium, No. 1457495, collected at Balsapuerto, Loreto, Peru, June 1933, by G. Klug (No. 3114). (Duplicates at A, F, GH, and NY.)



FIGURE 11.—*Chaetocalyx klugii*. Natural size.

DISTRIBUTION: Known only from the type locality.

This collection has been annotated as *Nissolia* and as *Chaetocalyx*. Mature fruits are lacking, so that the presence of a terminal wing as in *Nissolia*, or absence as in *Chaetocalyx*, cannot positively be determined. On the basis of flower and vegetative characters the two genera are not separable. The ovary and very young fruits suggest relationship to *Chaetocalyx latisiliqua* and *C. weberbaueri*, the calyx to *C. brasiliensis* and *Nissolia* spp., and the leaves to *C. acutifolia* and certain collections of *Nissolia fruticosa*, especially from Costa Rica. There seem to be no other collections or published taxa that exactly match this material. The addition of a new species of *Chaetocalyx* named for the collector, G. Klug, is believed to be justifiable.

11. *Chaetocalyx scandens* (L.) Urb. Symb. Antill. 2:292. 1900.

Stems, leaf rachis, and floral axis glabrous to densely pubescent, and usually beset with glandular setae; stipules deltoid to lanceate, 2–5 mm. long, 1–2 mm. wide at the base, acute to attenuate, entire to glandular-denticulate or laciniate, glabrous to pubescent; leaves 5-foliolate, the rachis 2–10 cm. long; leaflets 10–50 mm. long, 5–25 mm. wide, elliptical to obovate, obtuse or retuse, mucronulate, rounded to cuneate at the base, glabrous to densely pubescent; inflorescences axillary, racemose, often fasciculate, or the flowers solitary, the bracts stipule-like but usually slightly smaller, the pedicels 8–30 mm. long; flowers 12–22 mm. long; standard petal pubescent on the outer face; calyx campanulate, essentially symmetrical, 6–10 mm. long, glabrous to pubescent, usually beset with a few glandular setae, the tube 3–8 mm. long, 3–4 mm. in diameter, the teeth lanceate or deltoid-acute, sometimes subulate, rarely obtuse, usually unequal in length, the two teeth opposite the standard 3–7 mm. long, the others 2–5 mm. long; filaments glabrous; fruit subterete, attenuate, sessile, about 7–12-articulate, longitudinally striate, pubescent to subglabrous, sometimes glandular-setose, the articles about 8–10 mm. long, 1–2 mm. in diameter; seeds dark reddish brown, 5–6 mm. long and about 1 mm. in diameter.

11a. *Chaetocalyx scandens* var. *scandens*.

FIGURE 12

Coronilla scandens L. Sp. Pl. 2:743. 1753.

Glycine vincentina Ker. Bot. Reg. Pl. 799. 1824

Glycine andersoni Hort. ex Ker. nomen in synonym. l. c.

Chaetocalyx vincentina DC. Prodr. 2:243. 1825.

Bönninghausia vincentina Spreng. Syst. 3:245. 1826.

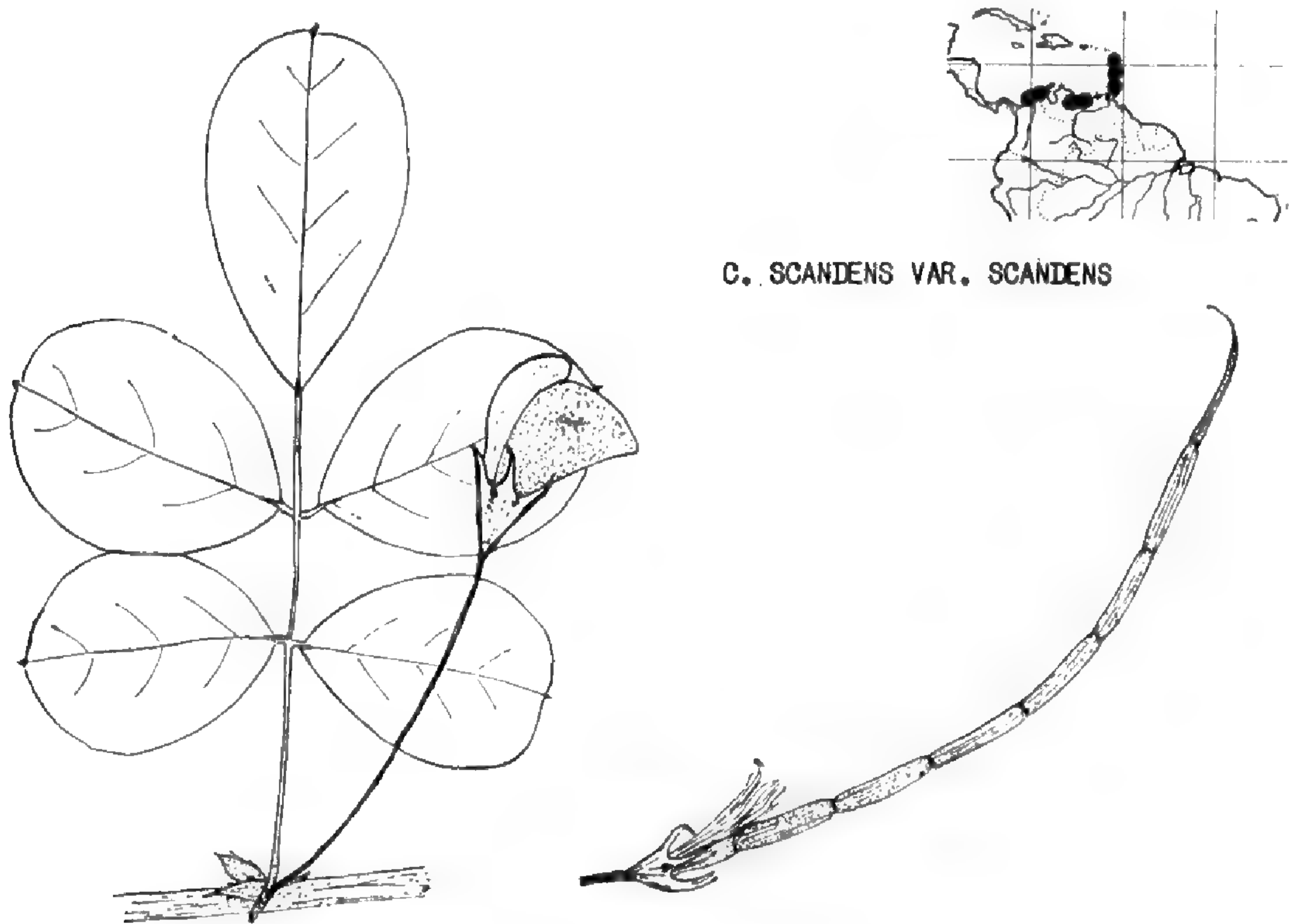
Chaetocalyx scandens (L.) Urb. Symb. Antill. 2:292. 1900.

Chaetocalyx retusa Blake, Contr. U. S. Nat. Herb. 20:523. 1924.

Chaetocalyx tenuipedicellata Pittier, Bol. Soc. Venez. Cienc. Nat. 6:190. 1940.

Plant generally glabrous to moderately pubescent; leaflets glabrous or nearly so, obovate to elliptical, obtuse to retuse; calyx glabrous except for glandular setae and marginal cilia.

TYPE LOCALITY: Presumably the Antilles, no exact locality specified, the type represented by pl. 107, fig. 3 in Plumier, *Plantarum Americanarum*, ed. Burm. 1755–1760.



C. SCANDENS VAR. SCANDENS

FIGURE 12.—*Chaetocalyx scandens* var. *scandens*.

DISTRIBUTION: Antilles, northern Venezuela, and northern Colombia.

LESSER ANTILLES

GUADELOUPE: *Duss* 2660 (NY, US), 3003 (NY, US); *Stehlé* 624 (US).

DOMINICA: *Imray* 21² (K), 367 (K).

MARTINIQUE: *Hahn* 1191 (BM, GH); *Duss* 1067 (NY), 4461 (NY); *Stehlé & Stehlé* 4583 (F).

ST. LUCIA: *Box* 1985 (BM).

ST. VINCENT: *Guilding* (K); *H. H. & G. W. Smith* 1176 (K, NY).

BEQUIA: *Eggers* 7041 (US). *H. H. Smith (Joseph)* B262 (GH).

GRENADA: *Eggers* 6423 (US); *Vélez* 3209 (US); *Broadway* 414 (K), Dec. 22, 1904 (NY), Mar. 20, 1905 (GH), Mar. 27, 1905 (F), Dec. 1, 1905 (F).

VENEZUELA

DISTRITO FEDERAL: Between La Guaira and Caracas, *Fendler* 291a (K).

ARAGUA: Colonia Tovar, *Fendler* 292 in part (GH, K). Carmen, *Ll. Williams* 10398 (F, Ven TYPE of *C. tenuipedicellata*).

CARABOBO: Guaremales, *Pittier* 8879 (GH, NY, US TYPE of *C. retusa*).

COLOMBIA

MAGDALENA: Bonda, *H. H. Smith* 679 (A, BM, F, GH, US).

ATLANTICO: Between Baranoa and Polonuevo, *Dugand & Jaramillo* 2818 (US).

The extremely slender, subterete fruits, 1–2 mm. in diameter, characterize this species. Specimens with essentially glabrous leaves and calyx are referable to the typical variety.

Urban apparently was the first to relate *Chaetocalyx vincentina* to *Coronilla scandens* and to publish the combination *Chaetocalyx scandens*. On his authority and with no contrary evidence, I am accepting *Chaetocalyx scandens* as the correct name for this taxon.

11b. *Chaetocalyx scandens* var. *pubescens* (DC.) Rudd, comb. et stat. nov.

FIGURE 13

Chaetocalyx pubescens DC. Prodr. 2:243. 1825; Mem. Leg. 6:262. 1825.

Glycine pubescens Bert. ex DC. Prodr. 2:243. 1825, nomen in synonym.

Rhadinocarpus multiflorus Vog. Linnaea 12:108. 1838.

Chaetocalyx parviflora Benth. in Mart. Fl. Bras. 15(1):74. 1859.

Chaetocalyx vestita Standl. Field Mus. Pub. Bot. 8:14. 1930.

Chaetocalyx paucifolia Pittier, Bol. Soc. Venez. Cienc. Nat. 6:185. 1940.

Chaetocalyx magniflora Pittier, Bol. Soc. Venez. Cienc. Nat. 6:186. 1940.

Chaetocalyx perglandulosa Pittier, Bol. Soc. Venez. Cienc. Nat. 6:187. 1940.

Chaetocalyx nigrescens Pittier, Bol. Soc. Venez. Cienc. Nat. 6:188. 1940.

Chaetocalyx fissa Pittier, Bol. Soc. Venez. Cienc. Nat. 6:189. 1940.

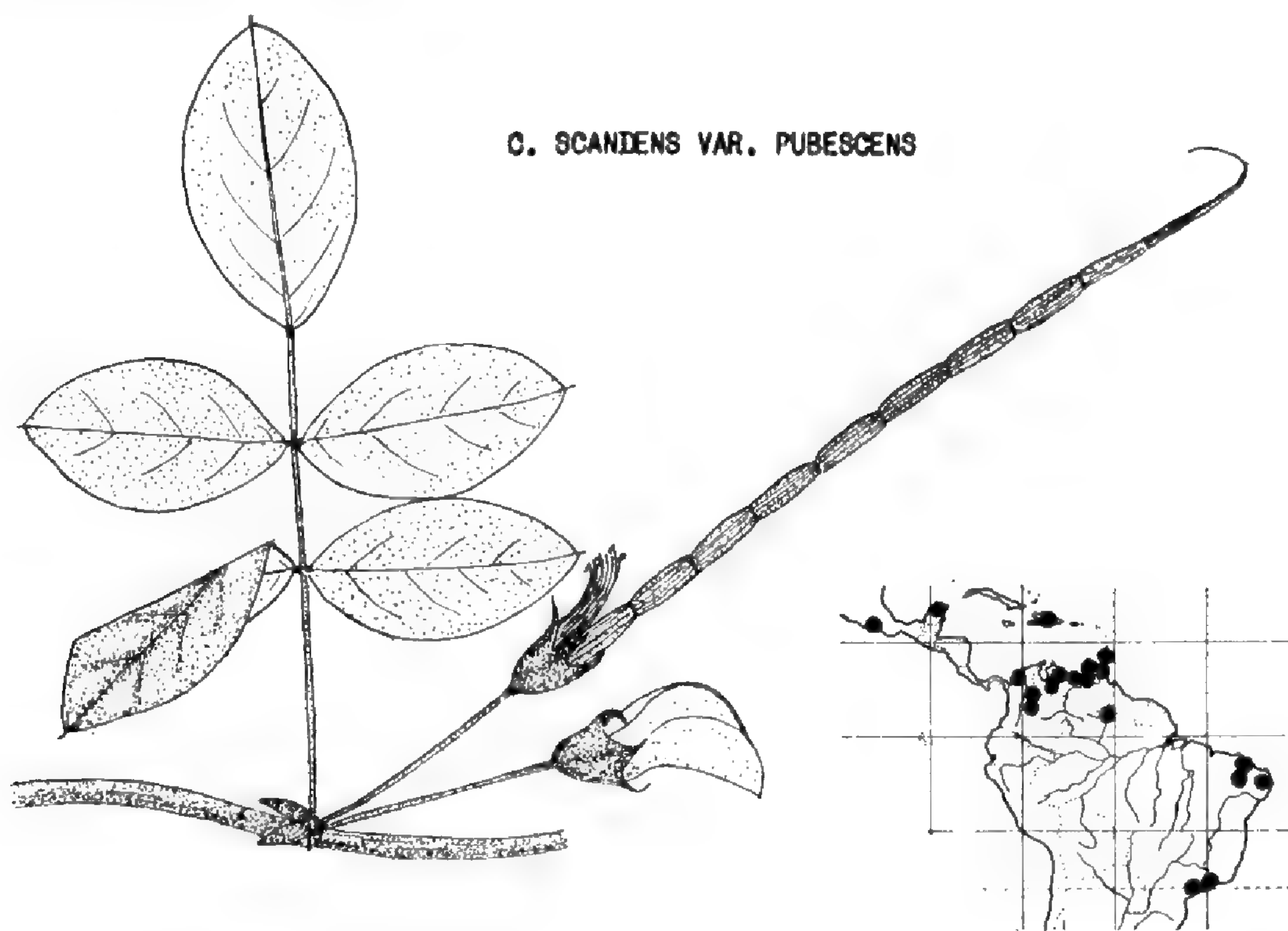


FIGURE 13.—*Chaetocalyx scandens* var. *pubescens*.

Plant generally pubescent; leaflets densely pubescent to subglabrous on one or both surfaces, elliptical to obovate, obtuse or occasionally retuse; calyx pubescent.

TYPE LOCALITY: "Santo-Domingo." Type collected by Bertero, cited below.

DISTRIBUTION: Southern Mexico, Antilles, Venezuela, Colombia, and eastern Brazil.

MEXICO

GUERRERO: Acapulco, *Palmer* 280 in 1894 (US).

YUCATAN: *Gaumer* 24117 (F, US). Buena Vista Xbac, *Gaumer* 1077 (F, GH, Mich, NY, US). Xnocac, *Gaumer* 23509 (F TYPE of *C. vestita*, GH, NY, US). Yot Tzonot, *Gaumer* 1336 (F). San Anselmo, *Gaumer* 2165 (F, GH).

DOMINICAN REPUBLIC

NO EXACT LOCALITY: *Bertero* (F. M. Neg. 33425 of TYPE of *C. pubescens* ex G).

SANTIAGO: Valle de Cibao, *Ekman* 15968 (US).

LESSER ANTILLES

ST. VINCENTS: *H. H. & G. W. Smith*, March 1890 (NY).

MUSTIQUE: *G. W. Smith* G. 91 (K).

CANNOUAN: *H. H. & G. W. Smith* C. 27 (BM).

VENEZUELA

NUEVA ESPARTA: El Valle, *Miller & Johnston* 259 (BM, F, GH, K, NY, US).

Tacarigua, *Ginés* 2555 (US). Guayamurí, *Ginés* (US), 2534 (US).

SUCRE: Cristóbal Colón, *Broadway* 252 (GH, NY, US).

ANZOÁTEGUI: Santa Rosa, *Pittier* 14606 (US, Ven).

MIRANDA: Guarenas, *Pittier* 11264 (US, Ven). Los Mariches, *Pittier* 11960 (NY, US, Ven).

MIRANDA OF DISTRITO FEDERAL: Between Antímano and Los Teques, *Arteaga* 2 (Ven).

MIRANDA, DISTRITO FEDERAL, OF ARAGUA: "Caracas; La Victoria," *Fendler* 292a (K).

DISTRITO FEDERAL: Galipán, *Moritz* 14 (K). San José del Avila, *Vogl* (Ven), Caracas, *Pittier* 6152 (US). Cerros de Camurí Grande, *Pittier* 13037 (NY, US, Ven [TYPE of *C. fissa*]). Between Antímano and Las Adjuntas, *Pittier* 12255 (NY, US, Ven TYPE of *C. nigrescens*). Antímano, *Pittier* 12457 (NY, US, Ven TYPE of *C. paucifolia*, erroneously cited as No. 12357); *Archer* 2992 (NA, US), 3043 (NA, US). Hacienda Sosa, *Tamayo* 486 (Ven), 704 (Ven). Catia de la Mar, *Tamayo* 625 (Ven TYPE of *C. per glandulosa*). Las Barrancas, *Tamayo* 1312 (F, US, Ven). Caraballeda, *Steyermark* 62938 (F). Between Sabana Grande and Baruta, *Ll. Williams* 10594 (F).

ARAGUA: Colonia Tovar, *Fendler* 291 (K), 292 in part (K).

CARABOBO: El Palito, near Puerto Cabello, *Pittier* 9080 (GH, NY, US).

LARA: Between Humocaro Bajo and Los Aposentos, *Steyermark* 55207 (F).

TRUJILLO: Valera, *Pittier* 10773 (GH, NY, US, Ven TYPE of *C. magniflora*). Between Valera and Monte Carmelo, *Bellard*, Aug. 1923 (US).

COLOMBIA

ATLÁNTICO: Barranquilla, *Elias* 1592 (F); *Torregroza, Araque-Molina, & Barkley* 18. At. 507 (US). Los Pendales, *Dugand & Jaramillo* 4146 (US).

SANTANDER: Bucaramanga, *Killip & Smith* 16301 (GH, NY, US).

CUNDINAMARCA: Nariño, *Pérez-Arbeláez* 404 (US). Tocaima, *Triana* in 1851-1857 (BM).

BRAZIL

RIO BRANCO: Rio Cotinga, *Maguire & Maguire* 40242 (US).

CEARÁ: Crato, *Gardner* 1560 (BM, K LECTOTYPE of *C. parviflora*). Between Fortaleza and Crato, *Apparicio Duarte* 1263 (US). Baturité, *Ducke*, MG Herb. No. 1174 (RB).

PARAIBA: Areia, Moraes [*Vasconcellos*] 908 (NY, US).

PERNAMBUCO: Gravatá, Campos Porto 945 (RB). Campo do Criação do Rio Branco, Ramalho 34 (RB).

RIO DE JANEIRO: Sellow (BM, F fragm. F. M. neg. 2136 ex B, K SYNTYPE of *C. parviflora*); Riedel 135 (BM, US).

SÃO PAULO: Serra da Bocaina, Glaziou 10507 (K), 10508 (K).

LOCAL NAMES: Cipó babão, (Pernambuco, Brazil); rama amarela (Paraíba, Brazil).

This variety is dubiously separable from the typical material solely on the basis of pubescence of the plant in general, and especially the calyx and leaves. The flowers and fruits otherwise are essentially indistinguishable in all specimens examined. There may be variation from glabrous to pubescent joints on the same fruit, so that particular character has no diagnostic value.

The type of *C. pubescens*, on which this variety is based, is an extremely pubescent specimen, and it is not difficult to appreciate de Candolle's opinion that it was specifically distinct from the glabrous *C. vincentina* (= *C. scandens* var. *scandens*). Most of the material originally cited as *C. vestita* likewise is densely pubescent. *Chaetocalyx parviflora* has slightly longer, more patent hairs than most specimens. The remaining species, described from Venezuela and Colombia, represent all the intermediate degrees of pubescence. The arbitrary distinction of pubescent from glabrous material is chiefly a matter of convenience; no other line of separation seems to be practicable.

Excluded taxa

Chaetocalyx wislizeni A. Gray = *Nissolia wislizenii* (A. Gray) A. Gray.

Chaetocalyx schottii Torr. = *Nissolia schottii* (Torr.) A. Gray.

New taxa and new combinations

Chaetocalyx blanchetiana (Benth) Rudd, comb. nov.

Chaetocalyx klugii Rudd, sp. nov.

Chaetocalyx platycarpa (Harms) Rudd, comb. nov.

Chaetocalyx scandens var. *pubescens* (DC.) Rudd, comb. et stat. nov.

Chaetocalyx tomentosa (Gardn.) Rudd, comb. nov.

Collections of *Chaetocalyx* cited

ANDRÉ, E. F.	ARTEAGA, O.
452. brasiliensis	2. scandens var. pubescens
4038. latisiliqua	
4223. latisiliqua	ASPLUND, E.
APPARICIO (SEE DUARTE)	7682. latisiliqua
ARCHER, W. A.	BALANSA, B.
2992. scandens var. pubescens	1555. brasiliensis
3043. scandens var. pubescens	1555a. brasiliensis

- BANG, M.
1348. *brasiliensis*
- BARCLAY, G.
746. *latisiliqua*
- BARROS, W. D.
679. *tomentosa*
- BELLARD, E. P. DE
s. n. *scandens* var. *pubescens*
- BLANCHET, J. S.
2892. *blanchetiana*
- BOX, H. E.
1985. *scandens* var. *scandens*
- BROADWAY, W. E.
252. *scandens* var. *pubescens*
414. *scandens* var. *scandens*
s. n. *scandens* var. *scandens*
- BUCHTIEN, O.
1782. *brasiliensis*
- BURKART, A.
8197. *nigricans*
- CAMP, W. H.
E-3618. *brasiliensis*
- CAMPOS PORTO, P.
945. *scandens* var. *pubescens*
- CÁRDENAS, M.
4703. *brasiliensis*
- CLAUSSEN, P.
196. *longiflora*
- COOPER, G. P.
88. *latisiliqua*
- CRÜGER, H.
171. *brasiliensis*
- CUATRECASAS, J.
4720. *brasiliensis*
- DUARTE, APPARICIO PEREIRA
1263. *scandens* var. *pubescens*
- [DUARTE], APPARICIO P., AND RIZZINI, C. T.
27. *acutifolia*
- DUCKE, A.
(MG Herb. No.)
1174. *scandens* var. *pubescens*
17128. *brasiliensis*
- DUGAND, A., AND JARAMILLO, R.
2818. *scandens* var. *scandens*
4146. *scandens* var. *pubescens*
- DUNLAP, V. C.
369. *latisiliqua*
400. *latisiliqua*
- DUSÉN, P.
11272. *nigricans*
16821. *longiflora*
16881. *longiflora*
- DUSS, PÈRE
1067. *scandens* var. *scandens*
2660. *scandens* var. *scandens*
3003. *scandens* var. *scandens*
4461. *scandens* var. *scandens*
- EGGERS, H. F.
6423. *scandens* var. *scandens*
7041. *scandens* var. *scandens*
15050. *latisiliqua*
- EKMAN, E. L.
15968. *scandens* var. *pubescens*
- ELIAS, BRO.
1592. *scandens* var. *pubescens*
- EUGENIO, BRO. JOSÉ
638. *scandens* var. *pubescens*
- FENDLER, A.
291. *scandens* var. *pubescens*
291a. *scandens* var. *scandens*
292. *scandens* var. *scandens*
292a. *scandens* var. *pubescens*
- FERREYRA, R.
10901. *weberbaueri*

- FIEBRIG, K.
946. brasiliensis
6147. brasiliensis
- FROES, R. L.
30228. brasiliensis
- GARDNER, G.
350. tomentosa
1560. scandens var. pubescens
3671. brasiliensis
- GAUMER, G. F.
1077. scandens var. pubescens
1336. scandens var. pubescens
2165. scandens var. pubescens
23509. scandens var. pubescens
24117. scandens var. pubescens
- GINÉS, BRO.
2530. scandens var. pubescens
2534. scandens var. pubescens
2555. scandens var. pubescens
- GLAZIOU, A. F. M.
5813. tomentosa
10507. scandens var. pubescens
10508. scandens var. pubescens
13702. blanchetiana
13703. longiflora
13704. blanchetiana
- GOUVEA, J. M. S. DE
- s. n. longiflora
- GUILDING, L.
- s. n. scandens var. scandens
- HAHN, M.
1191. scandens var. scandens
- HASSLER, E.
6201. brasiliensis
7564. brasiliensis
11538. brasiliensis
12613. brasiliensis
- HAUGHT, O.
3398. latisiliqua
- HAYES, S.
513. latisiliqua
s. n. latisiliqua
- HITCHCOCK, A. S.
20247. latisiliqua
20509. latisiliqua
- HOEHNE, F. C.
- S. P. 3307. longiflora
- HOLMGREN, I.
23. latisiliqua
- HOSTMANN, F. W.
165. brasiliensis
- HUNTER, A. A., AND ALLEN, P. H.
435. latisiliqua
- IMRAY, J.
- 21². scandens var. scandens
367. scandens var. scandens
- JELSKI, C. DE
216. platycarpa
- JÖRGENSEN, P.
3108. brasiliensis
4194. brasiliensis
4194a. brasiliensis
- JOSEPH, D. (SEE H. H. SMITH)
- KILLIP, E. P., AND SMITH, A. C.
16301. scandens var. pubescens
23581. brasiliensis
27336. brasiliensis
- KLUG, G.
3114. klugii
4361. brasiliensis
- KUHLMANN, J. G.
(RB Herb. No.)
852. acutifolia
- KUNTZE, O.
- s. n. brasiliensis
s. n. longiflora
- LINDEN, J. J.
737. brasiliensis
- LUSCHNATH, B.
- s. n. acutifolia

MACEDO, A.

1783. brasiliensis
1799. brasiliensis

MAGALHÃES, M.

3255. longiflora

MAGUIRE, B., AND MAGUIRE, C. K.

40242. scandens var. pubescens

MALME, G. O.

- Regnell II.1894. brasiliensis

MARTÍNEZ-CALDERÓN, G.

256. brasiliensis

MARTIUS, K. F. P. VON
(Herb. No.)

1175. longiflora

MATUDA, E.

834. brasiliensis

MELLO-BARRETO, F.

5703. longiflora
5704. longiflora

MEXIA, Y.

5835. longiflora
8463. latisiliqua

MEYER, T.

2125. brasiliensis

MILLER, O. O., AND JOHNSTON, J. O.

259. scandens var. pubescens

MONTES, J. E.

2199. brasiliensis

MORAES [VASCONCELLOS], J. C. DE

908. scandens var. pubescens

MORITZ, J.

14. scandens var. pubescens

MÜLLER, F.

216. nigricans

NOVAES, J. DE C.

258. longiflora

PALMER, E.

- 280 in 1894. scandens var. pubescens

PENNELL, F. W.

4242. latisiliqua

PÉREZ-ARBELÁEZ, E., ET AL

404. scandens var. pubescens
18. Vi. 104. brasiliensis

PEDERSEN, T. M.

2769. brasiliensis

PIPER, C. V.

5155. latisiliqua
5165. latisiliqua

PIRES, J. M., AND BLACK, G. A.

2068. brasiliensis
2072. brasiliensis

PITTIER, H.

2212. latisiliqua
6152. scandens var. pubescens
6898. latisiliqua
8879. scandens var. scandens
9080. scandens var. pubescens
10773. scandens var. pubescens
11264. scandens var. pubescens
11960. scandens var. pubescens
12086. latisiliqua
12255. scandens var. pubescens
12457. scandens var. pubescens
13037. scandens var. pubescens
14606. scandens var. pubescens
16069. [Herb. No.] latisiliqua

PLAUMANN, F.

363. brasiliensis

POHL, J. E.

- s. n. acutifolia

PURDIE, W.

- s. n. latisiliqua

RAIMONDI, A.

4096. platycarpa
6714. platycarpa

RAMALHO, L.

34. scandens var. pubescens

- RAMBO, B.
1400. nigricans
- REGNELL, A. F.
III.417. longiflora
- RIEDEL, L.
135. scandens var. pubescens
139. acutifolia
252. brasiliensis
- ROMERO C., R.
1241. brasiliensis
1242. brasiliensis
- ROVIROSA, J. N.
(Herb. No.)
115. brasiliensis
- RUIZ, H., AND PAVON, J.
2137. brasiliensis
- RUSBY, H. H.
2398. brasiliensis
- SAINT-HILAIRE, A. DE
B', No. 1071. tomentosa
- SCHIMPF, H. J. F.
1097. latisiliqua
- SCHIPP, W. A.
1330. brasiliensis
- SCHOTT, A. C. V.
s. n. acutifolia
- SCHREITER, R.
11060. brasiliensis
11061. brasiliensis
- SEEMANN, B. C.
457. latisiliqua
- SELLOW, F.
s. n. scandens var. pubescens
s. n. acutifolia
- SKUTCH, A. F.
2424. latisiliqua
- SMITH, D.
50. brasiliensis
- SMITH, G. W.
G. 91. scandens var. pubescens
SMITH, H. H., AND WITH SMITH, G. W.
C. 27. scandens var. pubescens
B. 262. (Joseph). scandens var. scandens
679. scandens var. scandens
1176. scandens var. scandens
s. n. scandens var. pubescens
- SPRAGUE, T. A.
399. brasiliensis
- SPRENGER, C.
69. brasiliensis
- SPRUCE, R.
1638. brasiliensis
3897. brasiliensis
5968. latisiliqua
- STANDLEY, P. C.
24590. brasiliensis
25812. latisiliqua
27158. latisiliqua
28322. latisiliqua
28452. latisiliqua
29540. latisiliqua
31592. latisiliqua
32153. latisiliqua
68869. brasiliensis
- STEHLÉ, H., AND WITH STEHLÉ, M.
624. scandens var. scandens
4583. scandens var. scandens
- STEINBACH, I.
7330. brasiliensis
- STEYERMARK, J.
44359. brasiliensis
44746. brasiliensis
55207. scandens var. pubescens
62938. scandens var. pubescens
- TAMAYO, F.
486. scandens var. pubescens
625. scandens var. pubescens
704. scandens var. pubescens
1312. scandens var. pubescens
- TESSMANN, G.
6079. brasiliensis

TONDUZ, A.

9350. latisiliqua

TORREGROZA, M., ET AL.

18. At. 507. scandens var. pubescens

TRAILL, J. W. H.

131. brasiliensis

TRIANA, J.

s. n. scandens var. pubescens

TÜRCKHEIM, H. VON

7741. brasiliensis

ULE, E.

9452. brasiliensis

VASCONCELLOS (SEE MORAES)

VELEZ, I.

3209. scandens var. scandens

VOGL, C. (PADRE CORNELIO)

s. n. scandens var. pubescens

WEBERBAUER, A.

6020. weberbaueri

WILKES EXPEDITION

s. n. longiflora

WILLIAMS, LL.

8890. brasiliensis

10398. scandens var. scandens

10594. scandens var. pubescens

WILLIAMS, L. O., AND ASSIS, V.

6161. longiflora

7129. longiflora

WILLIAMS, R. S.

254. brasiliensis

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THE GENUS *DUSSIA* (LEGUMINOSAE)

By VELVA E. RUDD



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THE GENUS *DUSSIA* (LEGUMINOSAE)

By VELVA E. RUDD

Introduction

Dussia is a little known genus of American tropical rain-forest trees of the family Leguminosae, named in honor of Père A. Duss, a French botanist who collected the type material in the Lesser Antilles. The trees, usually tall with broad buttressed bases, are rare, and few herbarium specimens are available, owing to the difficulty of making collections from such large trees.

In this paper, the first general treatment of the group, ten species are recognized, including one described as new. The delimitation of taxa is of necessity tentative because of inadequate material. One species is thus far known only from sterile specimens and another is unknown as to fruit. This premature study was undertaken in an attempt to clarify certain nomenclatural problems involving other genera, particularly *Ormosia*, currently being revised. It is hoped that, by indicating the lacunae in our knowledge, further collection of specimens and data might be inspired.

In addition to material at the U.S. National Herbarium (US), specimens have been examined from the following herbaria, here cited with their abbreviations: Arnold Arboretum of Harvard University (A); Chicago Natural History Museum (F); Gray Herbarium of Harvard University (GH); Institute of Jamaica (IJ); Royal Botanic Gardens, Kew (K); Herbario Nacional de México (MEXU); Missouri Botanical Garden (MO); New York Botanical Garden (NY); Botanical Museum and Herbarium, Utrecht (U); Forest Service Herbarium, U.S. Department of Agriculture (USFS); Instituto Botánico, Caracas (VEN). The writer is grateful to the curators of these institutions for making such material available.

The citations of "F.M. Neg." refer to Field Museum [now Chicago Natural History Museum] negatives of a series of photographs taken in European herbaria by J. F. Macbride during 1929 to 1939.

The maps presented in this paper are based on Goode Base Maps No. 101 M, copyright by the University of Chicago Press.

The majority of the illustrations were prepared by Mrs. Martha H. Niepold.

Historical Consideration

The genus *Dussia* was established by Krug and Urban and applied to collections made by Père A. Duss in the Antillean islands of Martinique and Guadeloupe. The first publication of the name apparently was by Duss, himself, in "Légumineuses de la Martinique" (Com. Rend. Cong. Sc. Cath. (7) 241: 1891). This paper was essentially an annotated checklist, without sufficient data to validate new taxa. "*Dussia martinicensis* Krug et Urban" was characterized merely as an "arbre de taille moyenne," and one collection from Martinique was cited.

Taubert's treatment of the Leguminosae for Engler and Prantl's "Die natürlichen Pflanzenfamilien" (3, Abt. 3:193. 1892) included a brief description in German, with the one species noted, *Dussia martinicensis* Kr. & Urb. A long specific description, in French, with citation of collections, was presented in Duss' "Flore phanérogamique des Antilles françaises" (Ann. Inst. Colon. Marseille 3:223-225. 1897). Urban, one of the authors of the new taxon, finally (Symb. Ant. 1:318-320. 1899) published full generic and specific description in Latin.

Harms (Repert. Sp. Nov. 19:291-294. 1924) described two new species of *Dussia*, *D. cayennensis*, from French Guiana, and *D. lehmannii*, from Colombia. He also transferred to *Dussia* two species from other genera, *D. mexicana* from *Ormosia mexicana* Standl., and *D. micranthera*, a Brazilian species, from *Vexillifera micranthera* Ducke.

Two years later, Harms (Notizbl. Bot. Gard. Berlin 9:972. 1926) published *Dussia tessmannii*, based on Peruvian material, and in 1928 (Repert. Sp. Nov. 24:212. 1928) he transferred the Costa Rican *Diploctropis macrophyllata* Donn. Sm. to *Dussia macrophyllata*, bringing to seven the total number of species assigned to *Dussia*.

Four more species of *Dussia*, *D. sanguinea* Urb. & Ekm., from Haiti (Arkiv. Bot. 24A(4):9. 1931), *D. grandifrons* I. M. Johnst. from Guatemala (Journ. Arn. Arb. 19:118. 1938), *D. cuscatlanica* (Standl.) Standl. & Steyerl., from El Salvador (Field Mus. Pub. Bot. 22:341. 1940), based on *Cassia cuscatlanica* Standl., and *D. coriacea* Pierce, from Venezuela (Bull. Torr. Bot. Club 69:590. 1942), brought the total to eleven species.

In 1939, Amshoff (Meded. Bot. Mus. Utrecht 52:50. 1939) observed that *Geoffroya discolor* Benth. and *Dussia cayennensis* Harms were based on what apparently were duplicates of the same collection *Martin* s.n. at Paris and Kew, and *Martin* 1819 at Berlin. She made the combination *Dussia discolor* (Benth.) Amsh., reducing both *D. cayennensis* Harms and *D. micranthera* (Ducke) Harms to synonymy.

Dussia coriacea Pierce, a Venezuelan species, was next added to the literature (Bull. Torrey Bot. Club 69:590. 1942), followed two years later by *D. avilensis* (Pittier) Pittier (Bol. Téc. Caracas 5:16. 1944), synonym in part. The complications of this situation are discussed further in connection with the species involved.

The present paper introduces one new species, from Peru.

Economic Consideration

According to Record and Hess (Timbers of the New World, 264. 1943), "the timber of *Dussia* is not utilized except in Salvador where it is said to be of some local importance for lumber . . . so far as is known, suitable only for common interior carpentry and construction; apparently too rare to be utilized extensively."

Standley (Journ. Wash. Acad. Sci. 13:441. 1923), in connection with his original description of *Cashalia cuscatlanica* Standl. [= *Dussia cuscatlanica* (Standl.) Standl. & Steyerem.] states that "this tree is well known in Salvador, under the vernacular name of *cashal*. It is said to be an important lumber tree."

Describing another new species from Panamá, *Cashalia panamensis* Standl. [= *Dussia macrophyllata* (Donn. Sm.) Harms], Standley (Field Mus. Publ. Bot. 4:213. 1929) quotes the collector's notes "the bark has a red sap, which is used as a purgative. The red 'skin' of the fruit is used as a febrifuge, and is sold for this purpose in the native drug shops." Allen, referring to wood of the same species in Costa Rica (The Rain Forests of Golfo Dulce, 197. 1956), states that it is not used locally."

Geographic Distribution

Dussia is an element of the American tropical rain forest, thus far known from restricted areas in the Antilles and southern Mexico southward to central Peru and the Amazon basin of Brazil (fig. 1). The present distribution of the genus suggests a former much more widespread range, probably in Cretaceous or Tertiary time, with subsequent reduction of area and separation of populations due to geologic and physiographic changes.

Each of the ten species of *Dussia* is essentially endemic. One of the most distinctive, *D. lehmannii*, is known only from a limited area along the Pacific coast of Colombia, where it may be a floristic relic of the old Colombian, or Chocó, borderland that is believed to have extended considerably farther out into the Pacific Ocean (Schuchert. Historical Geology of the Antillean-Caribbean Region, 635-639. 1935).

Dussia macrophyllata, the species that appears to be most closely related to *D. lehmannii*, occurs in southern Costa Rica and western Panamá, possibly as a relic from the northern end of the same Chocó borderland (Schuchert, 553).

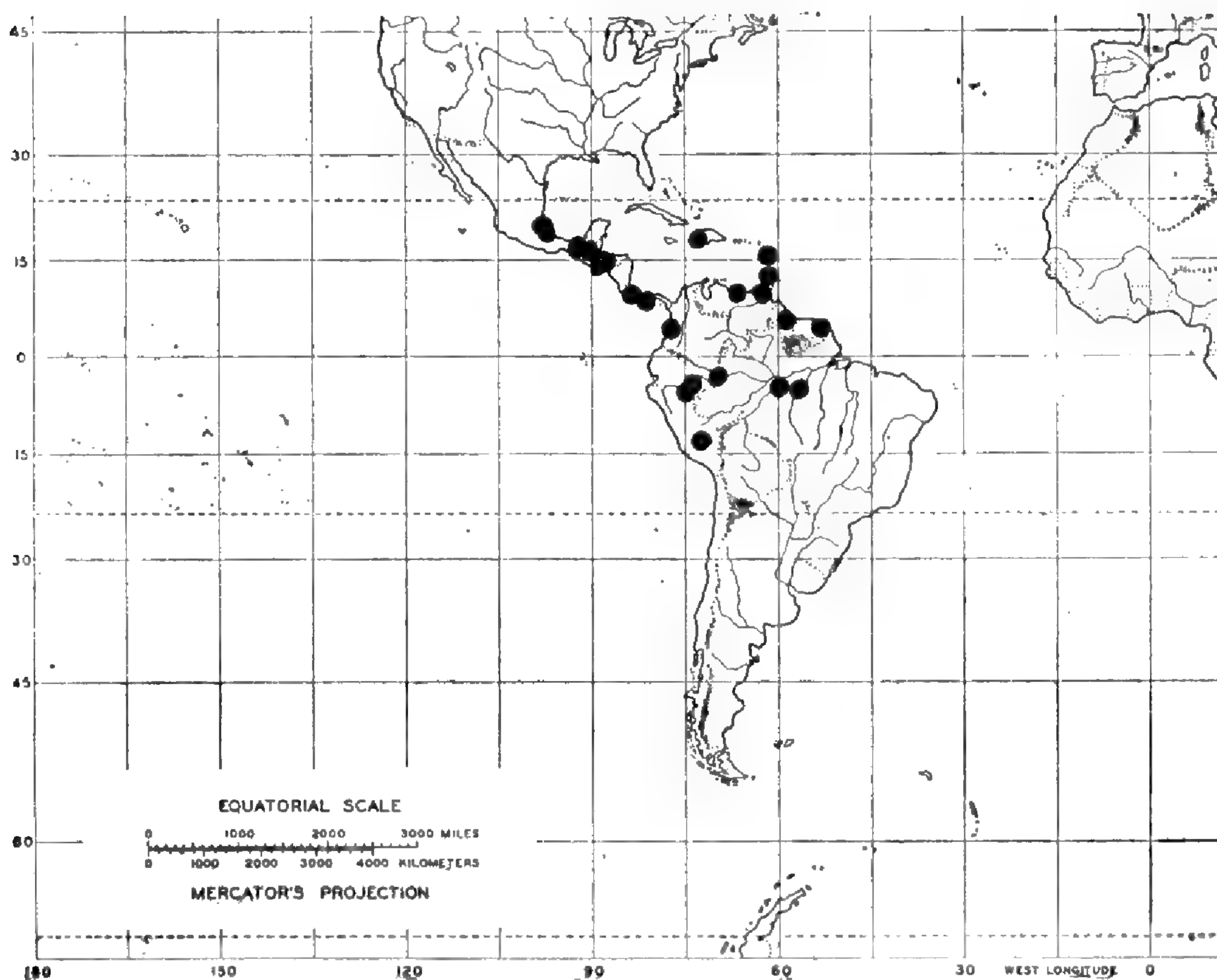


FIGURE 1.—Geographic distribution of collections of *Dussia*.

Another species, *D. coriacea*, is known only from El Avila, above Caracas, Venezuela, with its nearest relatives, *D. foxii*, in Peru, and *D. martinicensis*, in the Lesser Antilles. A common area of origin is suggested.

Dussia sanguinea, of uncertain affinities because it is known only from sterile material, is apparently restricted to the Massif de la Hotte region of southwestern Haiti.

Dussia tessmannii and *D. discolor*, showing decreasing resemblance respectively, to *D. lehmannii*, occur eastward along the Amazon basin and along the coastal area of the Guianas. No collections have been reported from the intervening area of the Guayana Shield.

What may be the youngest species of the group, *D. mexicana* and *D. cuscatlanica*, are found in Central America and southern Mexico, possibly having arrived there by way of the Antilles.

On the basis of the scanty available data, I hazard the conjecture that the genus *Dussia* developed on the Chocó borderland and gradually advanced eastward, along two major migration routes. On

route may have been along the periphery of the Guayana Highland, the other into the Caribbean area, perhaps in a counterclockwise direction to Central America.

The geological facts and surmises as summarized by Schuchert (1935), Woodring (Bull. Geol. Soc. Amer. 65:719–732. 1954), and Jenks, ed. (Geol. Soc. Amer. Memoir 65. 1956) seem neither to confirm nor completely to preclude such possibilities.

Morphological Characters

The species of *Dussia* are trees, tall, growing to as much as 50 meters high and 1 meter in diameter, straight-trunked, with high crowns and buttressed bases. The bark is smooth and gray. Blood red sap is found in various parts of the plant, especially in the bark, fruit, and leaves of most specimens. According to Record and Hess (Timbers of the New World, 264. 1943), heartwood is "absent or not distinguishable from the creamy yellow sapwood; parenchyma markings distinct. Luster low. Odorless and tasteless. Of medium density, tough and strong; texture coarse; grain fairly straight." Bark scented of "Haiari" (*Lonchocarpus*) is mentioned by Fanshawe on a label of *Dussia discolor* from British Guiana (*Fanshawe Field No.* 2097).

The young stems are essentially terete, sometimes striate or slightly angular, puberulent to tomentose, glabrate with age. Stipules are lacking or reduced to minute tufts of hairs.

The leaves normally are imparipinnate, with as few as 5 leaflets in some species and as many as 25 in *D. cuscatlanica*. The leaf axis ranges from 8 to 100 cm. long, including petiole of 2.5 to 17 cm. long. The leaflets are alternate to subopposite, estipellate. The petiolules are 3–15 mm. long and 1–5 mm. in diameter. The blades are coriaceous or subcoriaceous, 2–35 cm. long, 1.5–15 cm. broad. The terminal leaflets mostly are obovate; the laterals may be obovate, elliptic, oblong, or ovate. The margin is entire, the apex obtuse to acuminate, the base obtuse to subcordate, often oblique. The upper surface is subnitid, glabrous or nearly so at maturity. The lower surface is pubescent with straight or crispate, simple or septate hairs, or, sometimes, the hairs are no more than papillae. The venation of the leaflets is fairly distinctive and often conspicuous because of the red sap that darkens on drying. The secondary veins are essentially parallel and straight, but arcuate near the leaflet margin. The number of veins and the angles at which they join the midvein seem to show some specific correlation. The tertiary veins are approximately parallel and at right angles to the secondary veins, a characteristic useful in recognizing sterile specimens of the genus.

The flowers are 15–25 mm. long, borne in racemose, pseudoterminal inflorescences 10–30 cm. long. The axes, bracts, bracteoles, and calyx are fulvous or ferruginous pubescent. The pedicels are 4–10 mm. long. The bracts and bracteoles furnish characters useful in specific distinction. The bracts vary from about 5–15 mm. long and may be linear, lanceolate, ovate, or rhombic, with the margin entire, or erose-dentate, and the apex acute to acuminate. The paired bracteoles at the base of the calyx are in most species similar to the bracts, but smaller. In *Dussia macroprophyllata*, however, the proportions are reversed and the bracteoles are conspicuously larger than the bracts.

The calyx is campanulate, somewhat oblique, with five subequal, deltoid teeth or lobes. The corolla is papilionaceous. The petals are pink to lilac or purple, sometimes with greenish or white markings. The outer face of the vexillum is pubescent with white hairs, and the other petals usually have some pubescence.

The ten stamens are subequal in length and are basally attached to the calyx tube. The filaments are separate to the base or there may be some adhesion toward the base, forming groups of two to four stamens. The anthers are small, about 0.5 mm. long, dorsifixed. Both Taubert and Urban mention andromonoecious flowers in *Dussia martinicensis*. There is too little material available to be certain, but it appears that it might be an abnormal condition.

The gynoecium is pubescent, brevistipitate or sessile, 1–5-ovulate. The style is pubescent to within about 2–5 mm. of the apex. The stigma is small and apical. The fruit is ellipsoidal, compressed laterally, commonly 1- or 2-seeded, dehiscent, with the margins of the valves usually rolling inward, coriaceous, densely orange-velutinous. There is some specific difference in size, especially in the width of the valves. The length is in part dependent on the number of seeds, a 2-seeded fruit being nearly twice as long as a single-seeded fruit. The few seeds available for study range in size from 2.5 to 4.5 cm. long and 1.5 to 2.5 cm. in diameter. They are approximately cylindrical in shape, with one end truncate, the other acute. The testa is dark when dry but is reported as red when fresh. The hilum is linear and lateral near one end of the seed.

The preceding summary of gross morphological characters is of necessity based on inadequate material. The leaves and inflorescences are borne so high on the trees that they are recognized with difficulty and rarely collected. The fruits are unknown in two species, the flowers in one, and the complete leaf from another.

Chromosome counts and chemical analyses of *Dussia* apparently have not been made.

Taxonomic Position

The earliest published species of *Dussia*, *D. discolor* (Benth.) Benth., was originally placed by Bentham in the genus *Geoffroya*, of the tribe Dalbergieae. No particular justification was given. Taubert, who validated the genus *Dussia* based on the description and opinion of Urban, included it in the tribe Sophoreae, a classification followed by most subsequent authors. Four species since transferred to *Dussia* were originally ascribed to other genera of the Sophoreae, *Armosia*, *Diplostropis*, and *Vexillifera*. Standley considered his genus *Cashalia*, now placed in synonymy under *Dussia*, "to be closely related to *Toumatea* (*Swartzia*) . . .," a genus usually placed in the subfamily Caesalpinoideae.

Until there is additional data to warrant revision of the generic and tribal relationships of the papilionoid Leguminosae, it is convenient to retain *Dussia* as a member of the tribe Sophoreae, which is characterized by stamens with the filaments separate to the base. The stamens of *Dussia* are somewhat atypical in that there is some tendency toward adhesion at the base, usually in groups of two to four filaments, with the vexillar filament sometimes separate. Perhaps the genus will be found to be more closely related to the Dalbergieae than to the Sophoreae.

Systematic Treatment

Dussia

Dussia Krug and Urban ex Taubert in Engler and Prantl, Natürl. Pflanzenfam. 3, Abt. 3:193. 1892.

Vexillifera Ducke, Arch. Jard. Bot. Rio de Janeiro 3:139. 1922.

Cashalia Standley, Journ. Wash. Acad. Sci. 13:440. 1923.

Trees; leaves alternate, imparipinnate, 5–25-foliolate, the leaflets ternate to subopposite; stipules and stipels lacking; flowers 15–25 cm. long, in racemose, pseudoterminal inflorescences; calyx campanulate, somewhat oblique, with 5 subequal deltoid teeth or lobes; corolla papilionaceous, pink to purple, sometimes with greenish or white markings, the outer surface of the vexillum pubescent; stamens 10, subequal, the filaments essentially separate to the base, or with some adhesion near the base in groups of two to four, the anthers small and dorsifixed; gynoeceum 1–5-ovulate, pubescent, brevistipitate or subsessile, the style pubescent except near apex, the stigma small, apical; fruit orange-velutinous, ellipsoidal, compressed laterally, 2-valved, dehiscent, commonly 1- or 2-seeded; seeds red, approximately cylindrical, acute at one end, truncate at the other, the hilum small, lateral.

The following key is admittedly less than satisfactory. It has been almost impossible to construct what might be a useful tool for identification of unnamed material rather than a mere summary of characters.

Key to species

Leaves 5-9-foliolate, the leaflets predominantly elliptic to ovate or obovate; fruit 2-3 cm. broad (not known in *D. foxii*).

Bracts and bracteoles mostly erose-margined, relatively large, 6-12 × 3-10 mm.; leaves 5-9-foliolate; fruit 2-2.5 cm. broad.

Lower surface of leaflets crisp-pubescent; leaves 7-9-foliolate; bracts smaller than the bracteoles, 7-10 mm. long, 4-7 mm. broad, the bracteoles 9-12 × 8-9 mm.; fruit about 2.5 cm. broad (southern Costa Rica and western Panamá) **5. *D. macrophylla***

Lower surface of leaflets subglabrous to moderately pubescent with hairs minute, subappressed, or reduced to papillae; leaves 5-7-foliolate; bracts larger than the bracteoles, 10-12 mm. long, 8-10 mm. broad, the bracteoles about 6 × 3-5 mm.; fruit 2-2.5 mm. broad (Colombia).

6. *D. lehmannii*

Bracts and bracteoles entire, relatively small, 3-9 × 1.5-5 mm.; leaves 5-foliolate; fruit 2.5-3 cm. broad (not known in *D. foxii*).

Leaflets with apex obtuse; pubescence of leaves and inflorescence fulvous (Venezuela) **7. *D. coriaceum***

Leaflets with apex acute; pubescence of leaves and inflorescence ferruginous (Peru) **8. *D. foxii***

Leaves 7-25-foliolate, the leaflets predominantly oblong to oblong-ovate; fruit 2.5-5.5 cm. broad (not known in *D. sanguinea*).

Bracts mostly exceeding the calyx, 12-20 mm. long, 7-10 mm. broad, the bracteoles about as long as the calyx (or, at least, half as long); fruit 3-5 cm. broad, the valves not curling when dry; leaves 13-17-foliolate (upper Amazon region of Peru and Brazil) **9. *D. tessmannii***

Bracts mostly as long as the calyx or shorter, 4-10 mm. long, 0.5-5 mm. broad, the bracteoles shorter than the calyx; fruit 2.5-5.5 cm. broad, the valves curling when dry; leaves 7-25-foliolate.

Lower surface of mature leaflets uniformly crisp-pubescent.

Leaflets 7-13, obtuse to acute, the secondary veins forming approximately 50°-55° angles with the midvein; bracts deltoid to broadly lanceolate, acute or acuminate, 5-10 mm. long, 1.5-5 mm. broad, the bracteoles lanceolate to rhombic, acute, 2-9 mm. long, 1.5-5 mm. broad; fruit 4-5.5 cm. broad (Lesser Antilles and northeastern Venezuela).

1. *D. martinicensis*

Leaflets 11-17, acute to acuminate, the secondary veins forming 60°-65° angles with the midvein; flowers and fruit not known (Haiti).

2. *D. sanguinea*

Lower surface of mature leaflets with hairs subpatent, sometimes minutely papilliform, and sometimes crispate along the major veins.

Leaflets (7-)9-13, the lower surface pallid-pubescent with hairs subpatent to minutely papilliform; flowers 15-18 mm. long; fruit 3-4.5 cm. broad (French Guiana, British Guiana, and lower Amazon region of Brazil) **10. *D. discolor***

Leaflets 9-25, the lower surface fulvous-pubescent with hairs subpatent or sometimes crispate along the major veins; flowers (15-)18-25 mm. long; fruit 2.5-3.5 cm. broad.

Leaves 9-13-foliolate, the axis 15-40 cm. long, the leaflets ovate to oblong or obovate, obtuse or sometimes acute to breviacuminate, 3-26 cm. long, 2-10 cm. broad; bracts lanceolate, entire, acute to acuminate, 5-9 mm. long, 0.5-2 mm. broad, the bracteoles lanceolate, obtuse to acute, 3-4 mm. long, 0.5-1 mm. broad (Veracruz, Mexico).

3. *D. mexicana*

Leaves 11-25-foliolate, the axis 30-100 cm. long, the leaflets predominantly oblong, acuminate, 7-35 cm. long, 2.5-9 cm. broad; bracts tridentate to rhombic or lanceolate, entire or erose, acuminate, 5-10 mm. long, 2-4 mm. broad, the bracteoles obovate, entire or dentate, acuminate, 5-7 mm. long, 2-3 mm. broad (Chiapas, Mexico to Costa Rica) **4. *D. cuscatlanica***

1. *Dussia martinicensis* Kr. & Urb. ex Taubert in Engl. & Prantl. Natürl. Pflanzenfam. 3, Abt. 3:193. 1892; ex Duss, Com. Rend. Sc. Cath. (7) 241. 1891, nomen; in Duss Fl. Ant. Franc. (Ann. Inst. Colon. Marseille 3:224) 224. 1897; in Urb. Symb. Ant. 1:319. 1899. FIGURE 2

Tree, 10-20 m. high; young stems ferrugino- to fulvo-tomentose glabrate; leaves 7-13-foliolate, the axis about 12-25 cm. long, ferrugino- to fulvo-tomentose, the petiole about 4-12 cm. long, the "pairs" of leaflets 3-6 cm. apart, the petiolules 3-5 mm. long, 1.5-2 mm. in diameter, the blades coriaceous, 4-15 cm. long, 3-8 cm. broad, oblong, elliptic, or ovate, the terminal leaflet sometimes obovate, the apex obtuse to acute, the base obtuse or subcordate, sometimes oblique, the upper surface glabrous, the lower surface tightly and minutely crisp-pubescent, the secondary veins 10-15 pairs, forming angles of about 50°-55° with the midvein; inflorescence with axes fulvo- to ferrugino-tomentose; bracts entire, deltoid to lanceolate, 5-10 mm. long, 1.5-5 mm. broad, acute to acuminate, the bracteoles broadly lanceolate to rhombic, 2-9 × 1.5-5 mm., acute; flowers 15-25 mm. long; calyx 8-15 mm. long, the tube 5-9 mm. long, the teeth 3-6 mm. long; petals lilac, usually dark, sometimes almost white; fruit 1- or 2-seeded, ellipsoidal, somewhat compressed, 8-11.5 cm. long, 4-5.5 cm. broad, dehiscent, the valves rolling inward when dry, coriaceous, verruculose, minutely crisp-pubescent with orange-colored hairs; seed reddish, cylindrical, 2.5-4.5 cm. long, 1.5-2 cm. in diameter, acute at one end, truncate at the other, the hilum lateral, near the truncate end, about 5 mm. long, 1-1.5 mm. broad.

TYPE LOCALITY: Bois de Fonds, St. Denis, Martinique. Type collected by A. Duss (No. 1072), cited below.

DISTRIBUTION: Lesser Antilles, and northeastern Venezuela, in forest, at elevations of about 280-850 meters.

LESSER ANTILLES: MARTINIQUE: Bois de Fond, St. Denis, *Duss* 1072 (NY, US, isotypes). Morne Rouge, *Duss* s.n. (F). GUADELOUPE: Rivière Noir et Rouge, *Duss* 3757 (F, NY, US). ST. VINCENT: *H. H. & G. W. Smith*, s.n. (NY)

VENEZUELA: SUCRE: Cerro Patao, Peninsula de Paria, *Steyermark & Agostini* 91191 (US).

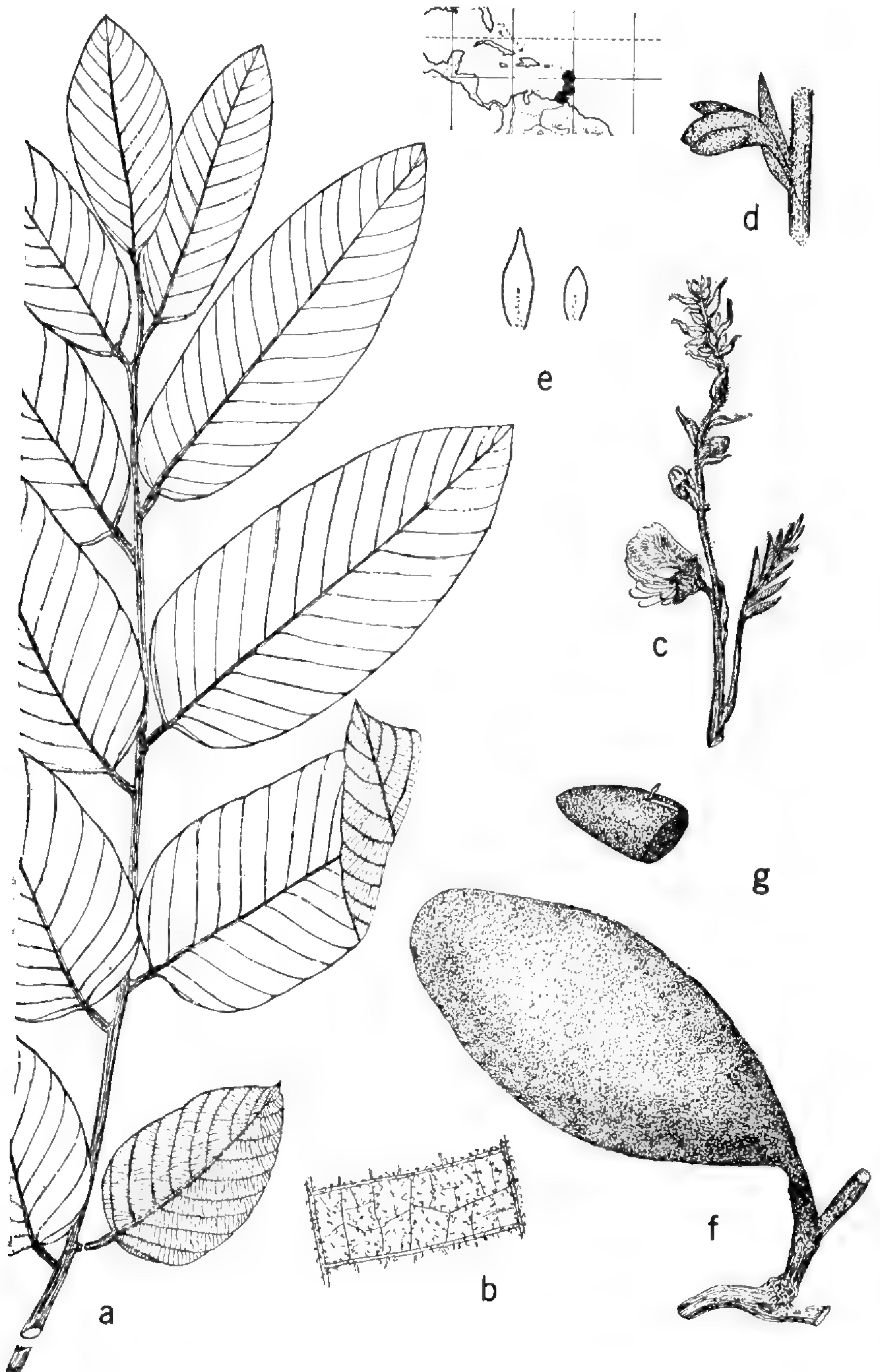


FIGURE 2.—*Dussia martinicensis*: a, leaf, $\times \frac{1}{2}$; b, portion of leaflet lower surface showing crispate pubescence, $\times 5$; c, portion of inflorescence, $\times \frac{1}{2}$; d, flower bud with bract and bractlet, $\times 1$; e, bract (larger) and bractlet, $\times 1$; f, fruit, $\times \frac{1}{2}$; g, seed, $\times \frac{1}{2}$.

Local names: Bois-gamelle (Martinique); caconnier blanc (Guadeloupe).

Urban also cites a collection by Ramage from Dominica, locally called "pommier," which I have not seen.

This species is the type of the genus. It is known only from a few localities in the Lesser Antilles and the Paria Peninsula of Venezuela, unless *D. sanguinea*, represented only by sterile material from Haiti, will be found to be conspecific. The available herbarium collections of *D. martinicensis* do include both flowers and fruits, but there is too little material to indicate what the range of characters might be.

The crispate pubescence on the lower surface of the leaflets is most like that found in *D. coriacea*, *D. foxii*, and *D. sanguinea*. The number and shape of the leaflets suggests *D. mexicana* and *D. discolor*. The fruit is similar to that in *D. coriacea*, *D. discolor*, and *D. cuscatlanica*. The bracts are of the general shape of those of *D. mexicana*, *D. discolor*, *D. coriacea*, and *D. foxii*.

In résumé, *Dussia martinicensis* appears to be intermediate, both in morphological characters and geographic position, between the species of northern South America and Mexico.

2. *Dussia sanguinea* Urb. & Ekm. Arkiv. Bot. 24 A (4): 9. 1931. **FIGURE 3**

Tree, to about 50 m. tall; young stems fulvo- to ferrugino-puberulent; leaves 11-17-foliolate, the axis about 10-20 cm. long, the petiole 6-10 cm. long, the "pairs" of leaflets 1-3.5 cm. apart, the petiolules 4-5 mm. long, 1-2 mm. thick, the blades coriaceous, 2-8 cm. long, 1.5-3 cm. broad, ovate to oblong, the terminal leaflet usually obovate, the apex acute to breviacuminate, the base obtuse, the upper surface glabrous, the lower minutely and densely crisp-pubescent and also papillose-farinose, the secondary veins about 15 pairs forming angles of 60°-65° with the midvein; inflorescence, flowers, and fruit not known.

TYPE LOCALITY: "Massif de la Hotte in parte occidentali prope Les Roseaux ad Nan-Patates in sylvis cr. 1000 m. alt." Type collected by E. L. Ekman (No. H. 10709), cited below.

DISTRIBUTION: Known only from southwest Haiti.

HAITI: SUD: Roseaux-Nan Patates, Massif de la Hotte, *Ekman* H. 10709 (IJ, NY, isotypes). Formond, *Ekman* H. 7569 (IJ). Rochelois, *Ekman* H. 7928 (IJ).

According to Ekman, this species is "non rara," yet it is known only from his three sterile collections. Superficially, the leaves, with numerous, acuminate leaflets suggest *Dussia cuscatlanica*. The pubescence on the lower surface of the leaflets is crispate, resembling that of *D. martinicensis*. Collection of flowers and fruit is necessary before the correct position of *D. sanguinea* can be established.

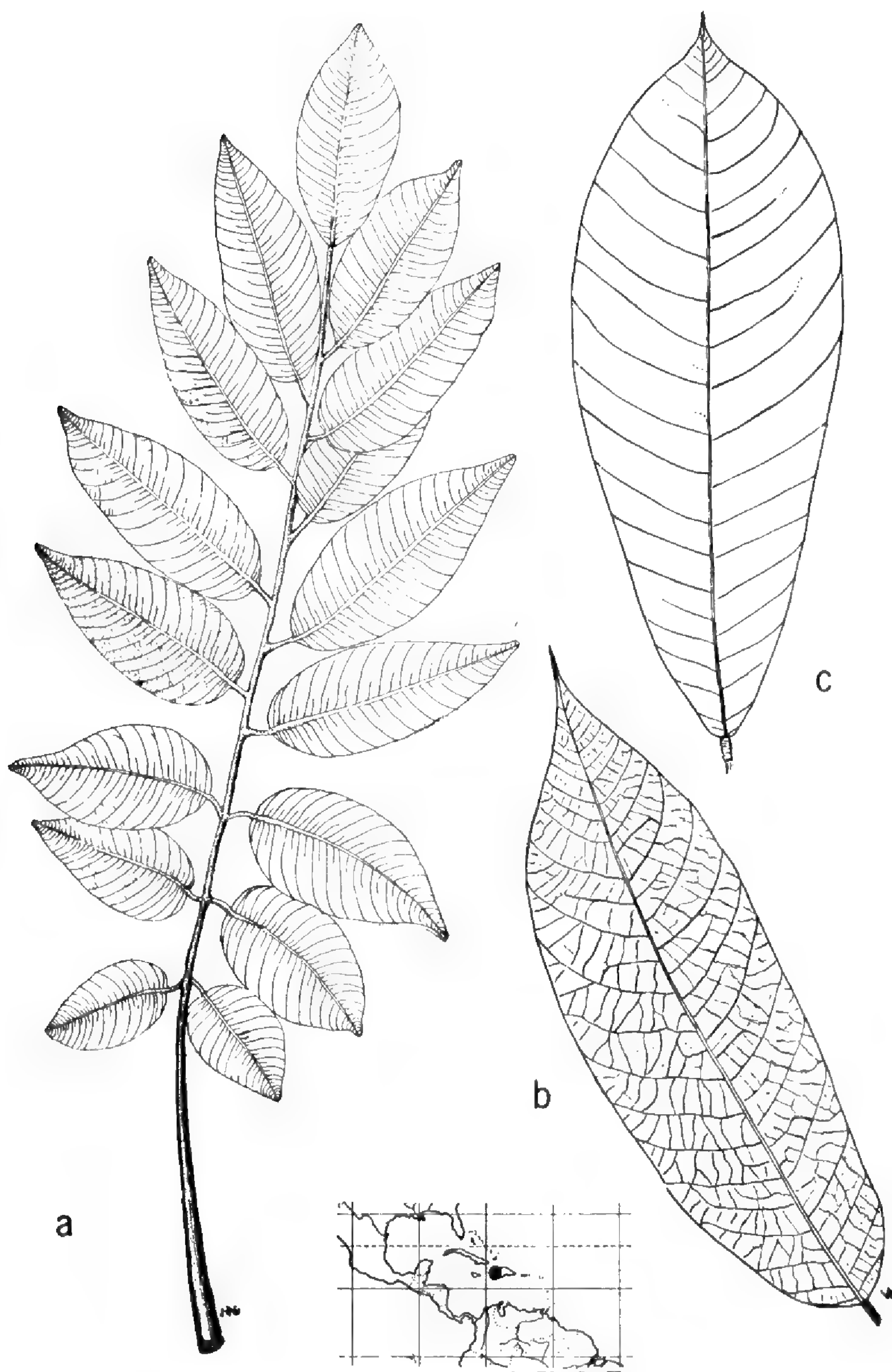


FIGURE 3.—*Dussia sanguinea*: *a*, leaf, *Ekman* H.10709; *b* and *c*, leaflets, *Ekman* H.7569, all $\times \frac{1}{2}$.

3. *Dussia mexicana* (Standl.) Harms, Repert. Sp. Nov. 19: 294. 1924.

FIGURE 4

Ormosia mexicana Standl. Contrib. U.S. Nat. Herb. 23: 436. 1922.

Tree, to about 30 m. tall; young stems fulvo- or ferrugino-tomentose, glabrate; leaves 9–13-foliolate, the axis 15–40 cm. long, the petiole 6–11 cm. long, the “pairs” of leaflets 2–4 cm. apart, the petiolules

—7 mm. long, 1–2 mm. in diameter, the blades subcoriaceous, 3–26 cm. long, 2–10 cm. broad, ovate to oblong, the terminal leaflet usually ovate, the apex predominantly obtuse, acute, or sometimes brevicuminate, the base obtuse to subcordate, often oblique, the upper

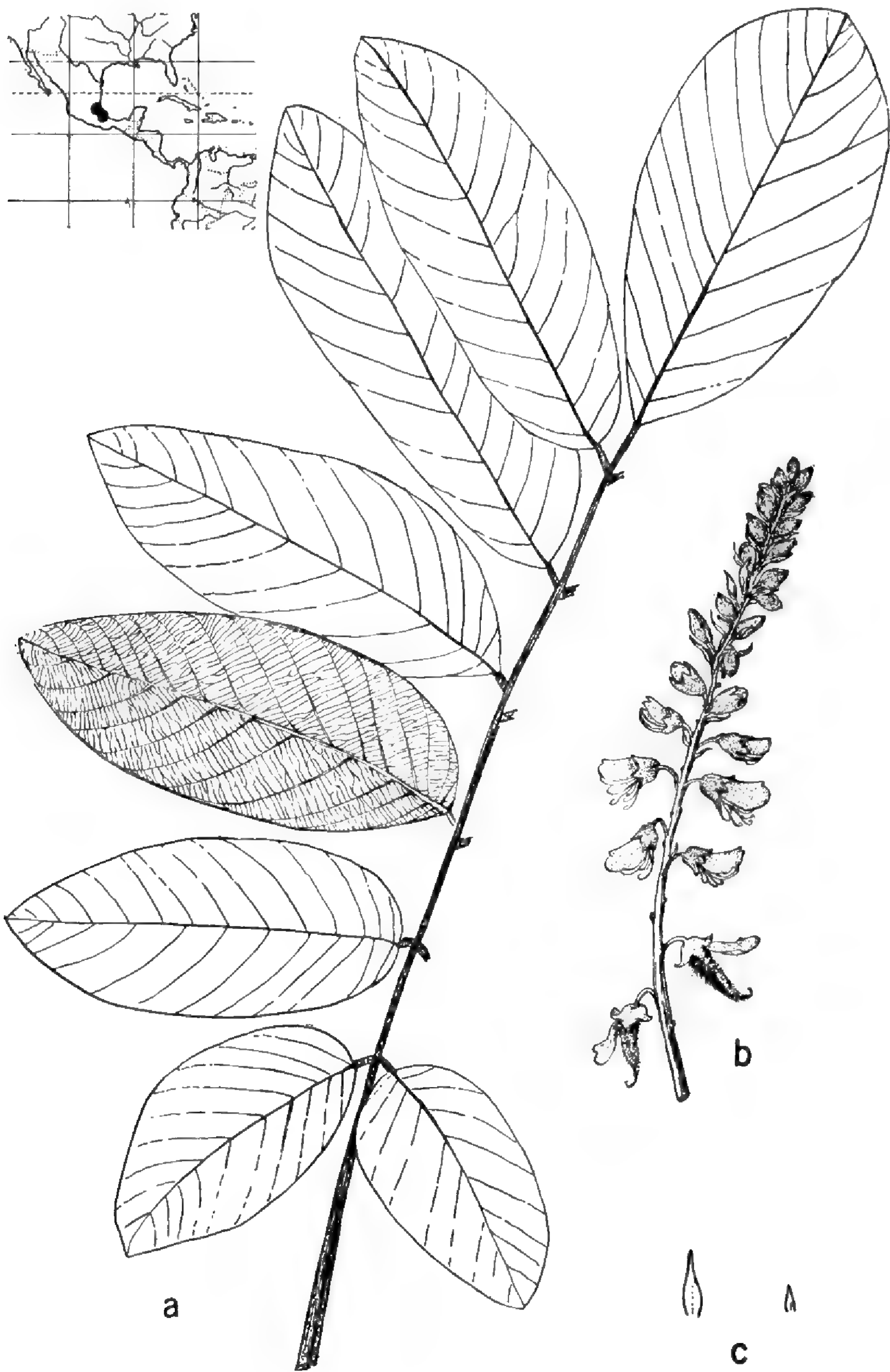


FIGURE 4.—*Dussia mexicana*: a, leaf, $\times \frac{1}{2}$; b, portion of inflorescence, $\times \frac{1}{2}$; c, bract (larger) and bracteole, $\times 1$.

surface glabrous, the lower surface moderately puberulent with patent or subpatent hairs, or sometimes crispate along the major veins, the secondary veins commonly 8–15 pairs, forming angles of 50° – 60° with the midvein; inflorescence with axes ferrugino-tomentose, the bracts lanceolate, acute to acuminate, 5–9 mm. long, 0.5–2 mm. broad, the bracteoles lanceolate, obtuse to acute, $3\text{--}4 \times 0.5\text{--}1$ mm.; flowers 18–22 mm. long; calyx 8–10 mm. long, the tube 5–6 mm. long, the teeth 3–4 mm. long; petals pink; ovary fulvo-villous; fruit minute fulvo-velutinous, 5–6 cm. long and about 2.5 cm. broad, dehiscent, the valves curling; seeds not seen.

TYPE LOCALITY: Zacuapan, Veracruz, Mexico. Type collected by C. A. Purpus (No. 6326), cited below.

DISTRIBUTION: Known only from the state of Veracruz, Mexico, in forest.

MEXICO: VERACRUZ: Zacuapan, Purpus 6326 (GH, MO, NY, US type *Ormosia mexicana*). El Mirador, Purpus 277 (A), 16459 (A, F, US); Liebman 5355 (F). Zontecomapan, André & Axtell 5 (US). Tapalapan, André 91 (US).

Local names: frijolillo; jaboncillo.

Dussia mexicana appears to be most closely related to *D. cuscatlanica*, its nearest neighbor geographically. The two species have similar spreading pubescence and in many characters there are but small differences. In general, the leaves, leaflets, flowers, floral bracts and fruits of *D. mexicana* are smaller than those of *D. cuscatlanica*. The leaflets of *D. mexicana* are acute or obtuse at the apex but usually conspicuously acuminate in *D. cuscatlanica*. Superficially in shape and number of leaflets, *D. mexicana* and *D. martinicensis* are similar, differing in the crispate pubescence of the latter, more spreading in *D. mexicana*.

4. *Dussia cuscatlanica* (Standl.) Standl. & Steyerl. Field Mus. Pub. B. 22:341. 1940. FIGURE

Cassia cuscatlanica Standl. Journ. Wash. Acad. Sci. 13:441. 1923.

Dussia grandifrons Johnst. Journ. Arn. Arb. 19:118. 1938.

Tree, to about 50 m. tall; young stems fulvo- to ferrugino-pubescent, the hairs patent to crispate, glabrate with age; leaves 11–25-foliolate, the axis about 30–100 cm. long, the petiole 5–17 cm. long, the “pair” of leaflets 4–8 cm. apart, the petiolules 4–10 mm. long, 1.5–4 mm. thick, the blades subcoriaceous, 7–35 cm. long, 2.5–9 cm. broad, oblong, sometimes ovate or obovate, the apex acuminate to acute, the base obtuse, truncate, or subcordate, the upper surface glabrous, the lower surface moderately pubescent with subpatent or somewhat crispate hairs, the secondary veins mostly 15–20 pairs, forming angles of 40° to 60° with the midvein; inflorescence with axes fulvo-ferrugino-tomentose, the bracts tridentate to rhombic, or lanceolate, ciliate or entire, acuminate, 5–10 mm. long, 2–4 mm. broad, the



FIGURE 5.—*Dussia cuscatlanica*: *a*, portion of young leaf, $\times \frac{1}{2}$; *b*, portion of leaflet lower surface showing spreading pubescence, $\times 5$; *c*, calyx with bracteole, $\times 1$; *d*, bract (larger) and bracteole, $\times 1$; *e*, portion of inflorescence with young fruit, $\times \frac{1}{2}$; *f*, mature fruit, $\times \frac{1}{2}$.

bracteoles obovate, entire or dentate, acuminate, 5–7 mm. long and 2–3 mm. broad; flowers (15–) 18–25 mm. long; calyx 8–10 mm. long, the tube 4–5 mm. long, the teeth 4–5 mm. long; petals pink with greenish or purple markings; fruit 5–10 cm. long, 1- or 2-seeded, fulvo-velutinous, 2.5–3.5 cm. broad, dehiscent, the valves curling; seeds 2–3.5 cm. long, 1.3–1.7 cm. in diameter.

TYPE LOCALITY: Finca Colima, Sierra de Apaneca, Ahuachapán, El Salvador, in mountain forest, at 870 meters elevation. Type collected by P. C. Standley (No. 20197), cited below.

DISTRIBUTION: In forest, southern Mexico to Costa Rica, at 20–2000 meters elevation.

MEXICO: CHIAPAS: Near Finca Prusia, south of Jaltenango, *Miranda* 6964 (MEXU, US).

GUATEMALA: CHIMALTENANGO: Volcán Fuego, *Steyermark* 52072 (A,F). QUEZALTENANGO: Colomba, *Skutch* 2027 (A type of *D. grandifrons*, F,NY, US). Quebrada San Gerónimo, between Santa María de Jesús and Calahuaché, *Steyermark* 33329 (F). Río Samalá, between Santa María de Jesús and Calahuaché, *Steyermark* 33862 (F). SUCHITEPÉQUEZ: Volcán Zunil, *Steyermark* 35244 (F).

EL SALVADOR: AHUACHAPÁN: Sierra de Apaneca, *Standley* 20197 (GH, NY,US type of *Cashalia cuscatlanica*). Colina de Santa Tecla, *Calderón* 1752 (GH,NY,US) 2070 (GH,NY,US). Comasagua, *Calderón* 1379 (GH,US).

HONDURAS: ATLÁNTIDA: Tela, Lancetilla Valley, *Standley* 54199 (US), 55293 (US).

COSTA RICA: ALAJUELA: La Palma de San Ramón, *Brenes* (412) 4627 (F). PUNTARENAS: Golfito de Golfo Dulce, *Allen* 5988 (US).

Local names: Matabuey (Mexico); cashal (El Salvador); cereza de montaña, garvancillo de montaña, palo de tigre (Guatemala).

The longest leaves and the largest leaflets of the genus are to be found in this species. The type collection of *D. grandifrons* appears to be an especially luxuriant example of *D. cuscatlanica*. The oblong, acuminate leaflets, frequently as many as 25, and the spreading pubescence found on the leaves and young stems of most specimens help to distinguish the species. The collection, *Allen* 5988, referred tentatively to *D. cuscatlanica*, exhibits finer pubescence, rather crispate, and the secondary veins of the leaflets meet the midvein at a broader angle than average, resembling somewhat the type collection of *D. sanguinea*.

This species is the type of the genus *Cashalia*, originally placed in the Caesalpinaceae, and later recognized as synonymous with *Dussia*.

A photograph showing the buttressed based trunk of *D. cuscatlanica* was published by Miranda in "La Vegetación de Chiapas" (pt. 1:86. 1952).

5. *Dussia macrophyllata* (Donn. Sm.) Harms, Repert. Sp. Nov. 24:212. 1928.

FIGURE 6

Diplothropis macrophyllata Donn. Sm., Bot. Gaz. 61:56. 1913.

Cashalia panamensis Standl. Trop. Woods 16:16. 1928, nomen; Field Mus. Bot. 4:212. 1929.

Tree, to about 40 m. tall; young stems fulvo- to ferrugino-tomentose; leaves 7- or 9-foliolate, the axis 25–30 cm. long, tomentose, the petiole 10–12 cm. long, the “pairs” of leaflets 4–5 cm. apart, the petiolules 4–5 mm. long, 2–4 mm. in diameter, the blades coriaceous, 6–18 cm. long, 4–9 cm. broad, ovate, elliptic, elliptic-oblong, or obovate, the apex obtuse, the base obtuse to subcordate, the upper surface glabrous, the lower surface moderately to densely crisp-pubescent, the secondary and tertiary veins raised, the secondary veins about 15 pairs, forming angles of about 55° with the midvein; inflorescence with axis ferrugino-tomentose, the bracts clawed, rhomboid-lanceolate, acuminate, 7–10 mm. long, 4–7 mm. broad, oblique, erose, the bracteoles clawed, cordate, erose-dentate, 9–12 mm. long, 8–9 mm. broad, acute; flowers 17–20 mm. long; calyx about 10 mm. long, the tube 5 mm. long and the teeth 5 mm. long; petals purplish; fruit [submature] about 5 cm. long and 2.5 cm. broad 1-seeded.

TYPE LOCALITY: Las Vueltas, Tucurrique, Cartago, Costa Rica, in forest, at an elevation of 635 meters. Type collected by A. Tonduz (No. 12949), cited below.

DISTRIBUTION: In rain forest, at elevations of 15 to 2000 meters, southern Costa Rica and western Panamá.

COSTA RICA: CARTAGO: Tucurrique, *Tonduz* 12949 (NY, US type of *Diplothropis macrophyllata*). PUNTARENAS: Coto Junction, *Allen* 6655; Golfito de Río Dulce, *Allen* 6703 (photographs by Allen in “Rain Forests of Golfo Dulce,” pl. 15. 1956).

PANAMÁ: BOCAS DEL TORO: Almirante, *Cooper* 520 (F type of *Cashalia panamensis*, US). CHIRIQUÍ: El Volcán, *Little* 6048 (MO, US, USFS).

Local names: Citrón, pizarró (Panamá).

This species shares with *D. lehmannii* the character of bracts and bracteoles that are larger and more leaflike than in any other species of the genus, and it is unique in that the bracteoles are larger than the bracts.

The relatively few, predominantly broad, obovate leaflets, densely crisp-pubescent below, and the fairly small fruit, help to distinguish *D. macrophyllata*. Probably *D. lehmannii* and *D. coriacea* are its closest relatives, but *D. cuscatlanica*, its nearest neighbor geographically, is least related.

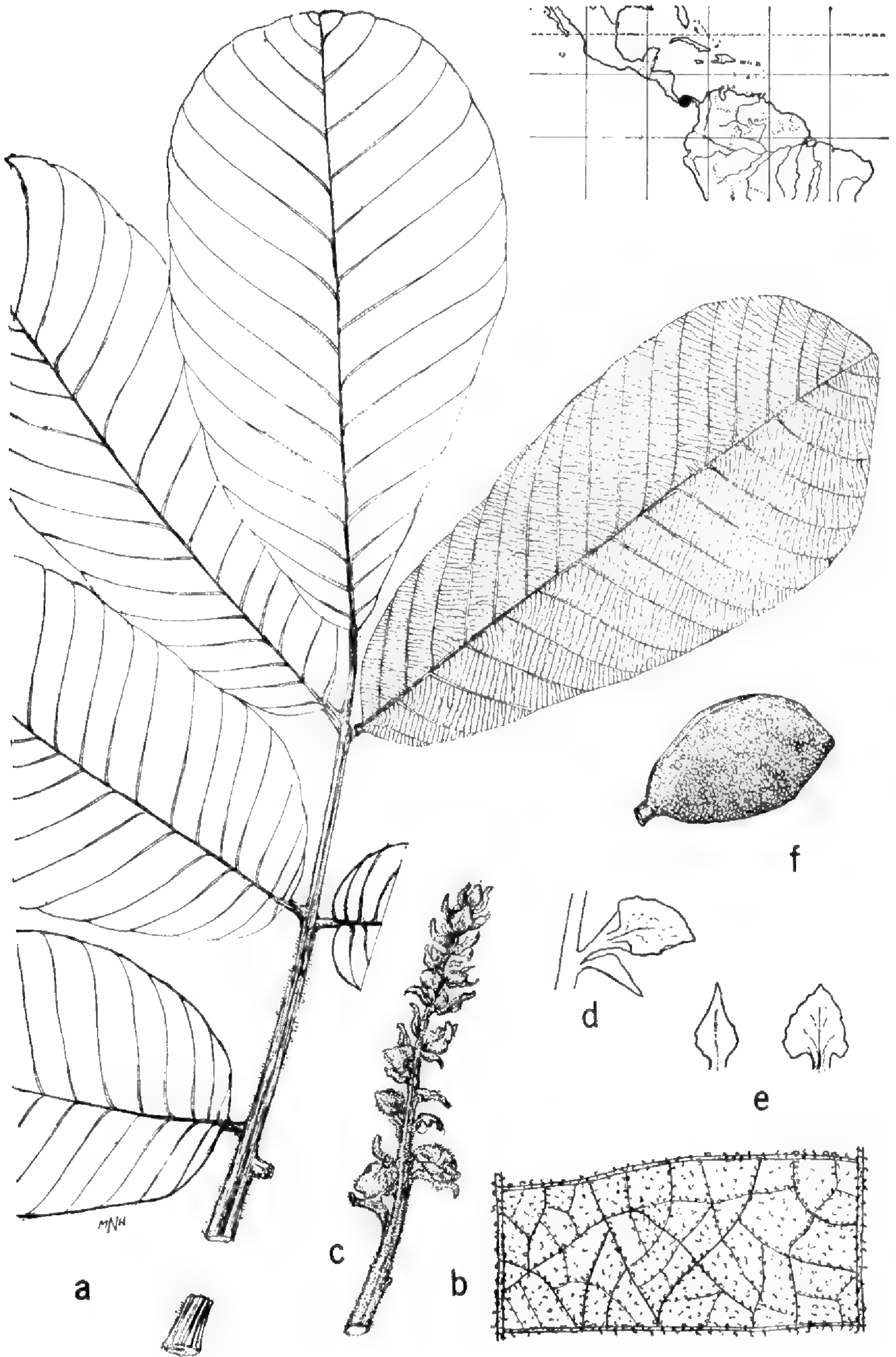


FIGURE 6.—*Dussia macrophyllata*: *a*, leaf, $\times \frac{1}{2}$; *b*, portion of lower surface of leaflet showing crispate pubescence, $\times 5$; *c*, portion of inflorescence, $\times \frac{1}{2}$; *d*, flower bud showing bract and bracteole, $\times 1$; *e*, bract (smaller) and bracteole, $\times 1$; *f*, fruit, $\times \frac{1}{2}$.

Dussia lehmannii Harms, Repert. Sp. Nov. 19:292. 1924. FIGURE 7
 Tree, to about 35 m. tall; young stems fulvo-puberulent, glabrate;
 leaves 5-7-foliolate, the axis 13-40 cm. long, finely puberulent, the



FIGURE 7.—*Dussia lehmannii*: a, portion of leaf, $\times \frac{1}{2}$; b, fruit, $\times \frac{1}{2}$; c, opened fruit, showing seeds, $\times \frac{1}{2}$; d, flower with bract and bracteole, $\times 1$; e, bract (larger) and bracteole, $\times 1$.

petiole 8–20 cm. long, the “pairs” of leaflets 3–6 cm. apart, the petiolules 5–15 mm. long, 2–5 mm. in diameter, the blades coriaceous, 8–26 cm. long, 4–15 cm. broad, elliptic, ovate, or obovate, the apex brevicaudate or sometimes obtuse the base obtuse or subcordate, the upper surface glabrate, the lower surface puberulent with short subappressed hairs and also minutely papillose, appearing farinose, the secondary veins mostly 10–12 pairs, forming angles of 45°–50° with the midvein; inflorescence fulvo-puberulent, glabrate, the bracts deltoid-ovate, acute, somewhat erose, about 10–12 mm. long and 8–10 mm. broad, the bracteoles about 6 mm. long and 3–5 mm. broad, rhombic, acute, erose; flowers 18–20 mm. long; calyx 8–10 mm. long, the teeth about half as long as the tube; petals pinkish to lilac; fruit ellipsoidal, dehiscent, minutely fulvo-velutinous, 1- or 2-seeded, 3–5 cm. long, 2–2.5 cm. broad; seeds 20–30 mm. long, 10–14 mm. in diameter.

TYPE LOCALITY: Coastal region between Buenaventura and Guapi, El Valle or Cauca, Colombia. Type collected by F. C. Lehmann (N. 8985), probably no longer extant, photograph cited below.

DISTRIBUTION: Known only from the general area of the type collection, at elevations up to about 80 meters.

COLOMBIA: EL VALLE: Río Yurumanguí, between Isla de Golondro and La Amargura, *Cuatrecasas* 16054 (F). Río Calima, between La Esperanza and Bellavista, *Cuatrecasas* 16788 (F, US). Río Calima, Quebrada de la Brava, *Cuatrecasas* 21075 (F), 26094 (US). Barco, *Cuatrecasas* 17258 (F, US). Quebrada de Guapecito, *Cuatrecasas* 17680 (F, US). Bahía de Buenaventura, Quebrada San Joaquín, *Cuatrecasas* 19897 (F, US). **CAUCA, OR EL VALLE?:** Between Buenaventura and Guapi, *Lehmann* 8985 (F.M. Neg. 1896, photo of type ex herb.).

Local names: Embagatao, bagatá.

The smallest fruits of the genus are found in this species. Other characters that aid in recognition are the relatively few large leaflets with fine, pseudofarinose pubescence. The bracts are conspicuous, usually erose, the bracteoles fairly large and also erose. The nearest relative probably is *D. macrophyllata*. The two species are readily separable but both have smaller fruit than the other species of *Dussia* and large leaflets, bracts, and bracteoles.

7. *Dussia coriacea* Pierce, Bull. Torrey Club 69:590. 1942. FIGURE 1

Ormosia avilensis Pittier, Bol. Soc. Venez. Cien. Nat. 4:84. 1938, pro parte (descr. flor., non typus fructiferus), non emend Pierce, loc. cit.

Dussia avilensis (Pittier) Pittier, Bol. Téc. Caracas 5:16. 1944, pro parte (flores fructusque, non typus fructiferus).

Tree, to about 20–30 m. tall, the trunk 60 cm. in diameter; young stems crisp-pubescent with fulvous hairs; leaves 5-foliolate, the axis about 8–12 cm. long, crisp-pubescent, the petiole 4–6 cm. long, the “pairs” of leaflets 2.5–4 cm. apart, the petiolules 3–6 mm. long and about 2 mm. in diameter, the blades coriaceous, ovate to oblong.

elliptic, the terminal leaflet usually obovate, 4–13 cm. long, 2.5–7 cm. broad, the apex obtuse, the base obtuse to subcordate, the upper surface glabrous at maturity, the lower surface minutely crisp-pubescent, the secondary veins about 13–15 pairs, forming angles of about 55° with the midvein; inflorescence with axes fulvo-tomentose.

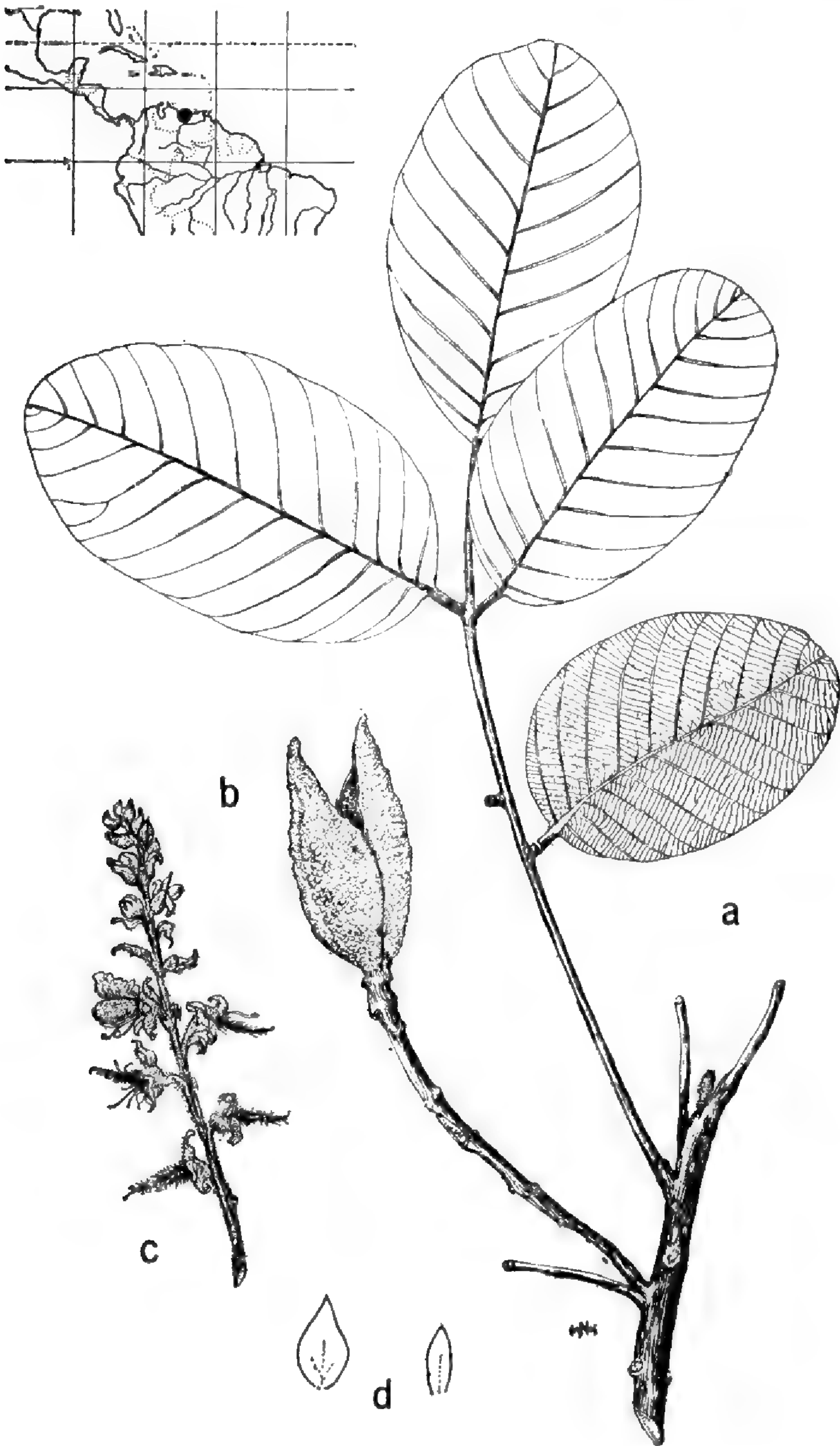


FIGURE 8.—*Dussia coriacea*: a, leaf, $\times \frac{1}{2}$; b, fruit, partly opened, $\times \frac{1}{2}$; c, portion of inflorescence, $\times \frac{1}{2}$; d, bract (larger) and bracteole, $\times 1$.

the bracts lanceolate to ovate, acute, entire, 4–9 mm. long, 2–5 mm. broad, the bracteoles lanceolate or rhombo-lanceolate, acute to obtuse, entire, 3–7 mm. long and 1.5–3 mm. broad; flowers 15–17 mm. long, calyx 10 mm. long, the tube and teeth about 5 mm. long each; petals reddish purple; fruit fulvo-velutinous, 5–7 cm. long, 2.5–3 cm. broad; seed about 3 cm. long and 1.5 cm. in diameter.

TYPE LOCALITY: "Selvas del Avila," Distrito Federal, Venezuela. Type collected by E. Delgado (No. 47), cited below.

DISTRIBUTION: Known only from the type locality, in sheltered forest at about 1600 meters elevation.

VENEZUELA: DISTRITO FEDERAL: El Avila, Caracas, *Delgado* 47 (F, G, D, type, US, VEN), 153 (F, G, US, VEN), 430 (US, VEN)

Dussia coriacea, thus far known only from the type locality, recognizable by its leaves, 5-foliolate, with subelliptic, obtuse leaflets, crisp-pubescent below. They resemble but are smaller than those of *D. macrophyllata*. The bracts resemble those of *D. martinicensis*. The fruit is intermediate in size and shape between those of *macrophyllata* and *D. martinicensis*.

Pierce's name for this species, *Dussia coriacea*, is correct, but there has been considerable confusion in nomenclature and typification. Somehow, material from Delgado's collections of *Dussia* and *Ormosia* became mixed, a situation unfortunately overlooked by Pittier. A sheet of *Delgado* 35 (erroneously cited in publication as 37) with leaves and seeds of *Ormosia* was annotated as the type of *O. avilensis* Pittier. The floral portion of the original description of *O. avilensis* was based on *Dussia* flowers, undoubtedly from *Delgado* 47, but no flowering specimen was cited.

In connection with his studies of *Ormosia*, Pierce encountered the bigeneric description, and as a means of clarification, published *Dussia coriacea* based on the collections of Delgado, Nos. 47 and 153, along with an emendation of *O. avilensis* to exclude the description of *Dussia* flowers. Pittier, still not recognizing that a mixture of collections was involved, apparently misinterpreted Pierce's delimitation of *Dussia* and *Ormosia* and transferred *Ormosia avilensis* to *Dussia avilensis* (Pittier) Pittier, placing *D. coriacea* Pierce in synonymy. In the list of "colectores y colecciones Venezolanas papilionaceas hasta 1942" (op. cit. p. 157) Pittier cited the three Delgado collections, 35, 47, and 153, all as *Dussia avilensis*. The illustrations in that same publication include a camera lucida drawing of a *Dussia* flower (fig. 5) and a plate (pl. VI) with leaves of *Dussia* from *Delgado* 153 at VEN, a flowering branch of *Dussia* from *Delgado* 47 at VEN, but a fruit of *Ormosia*, probably from *Delgado* 59 at VEN, which is the type of *Ormosia tovarensis* Pittier.

Because the type of *Ormosia avilensis* is unquestionably a specimen of *Ormosia*, the use of the specific epithet *avilensis* in this case is correctly limited as emended by Pierce. The name *Dussia avilensis* fortunately falls into synonymy, as indicated above.

8. *Dussia foxii* Rudd, sp. nov.

FIGURE 9

Arbor ad 18 m. alta, ramulis junioribus ferrugineo-tomentosis, glabratis; folio integro non vidi, fortasse 5-foliolato, foliolis cum petiolulis 4–5 mm. longis et 3 mm. diametro, laminis coriaceis, ovatis vel elliptico-ovatis, 9–12 cm. longis, 4–8 cm. latis, apice acutis, basi obtusis vel subcordatis, supra glabris, subnitidis, subtus densovelutinis, nervis secundariis utrinsecus 12–15; inflorescentiis ferrugineo-tomentosis, bracteis deltoideo-ovatis, unguiculatis, acuminatis 4–5 mm. \times 2–3 mm., bracteolis lanceolatis, acutis 3 mm. \times 1.5 mm.; floribus 18–20 mm. longis, calyce 9–10 mm. longo, tubo 6–7 mm., dentibus 2–3 mm. longis, petalis pallido-rosaceis, ovario ferrugineo-villoso, 4- vel 5-ovulato; legumen ignotum.

Type in the Herbarium of the Royal Botanic Gardens, Kew, collected at Liberia, Department of Loreto, Peru, January 17, 1911, by W. Fox (No. 85). Isotype at K.

DISTRIBUTION: Known only from the type collection.

The above cited collection of *Dussia* was found among undetermined specimens of *Ormosia*. The material on the two herbarium sheets consists of five leaflets and several pieces of inflorescence, with flowers. The leaf rachis is missing, so that one can merely surmise that the complete leaf was 5-foliolate, with four ovate lateral leaflets and one somewhat elliptical terminal leaflet.

The pubescence of tightly crispate hairs on the lower surface of the leaflets and the relatively small bracts and bracteoles of *D. foxii* are characteristics also found in *D. coriacea*, *D. sanguinea*, and *D. martinicensis*. The angles at which the secondary veins join the midvein in *D. foxii* are among the broadest of the genus, about 60°–70°.

9. *Dussia tessmannii* Harms, Notizbl. Bot. Gart. Berlin 9:972. 1926.

FIGURE 10

Tree, to about 25 m. tall; young stems fulvo-velutinous; leaves (9–) 13–17-foliolate, the axis 15–70 cm. long, fulvo-puberulent, the petiole 10–18 cm. long, the "pairs" of leaflets 2–6 cm. apart, the petiolules 4–10 mm. long, 1–2 mm. in diameter, the blades 3–17 cm. long, 3–7 cm. broad, subcoriaceous, lanceolate, oblong-lanceolate, or ovate, the apex acute to breviacuminate, the base obtuse, the upper surface glabrous, the lower surface moderately pubescent with subpatent or tightly crispate hairs, especially on young leaflets, the secondary veins about 15–20 pairs, forming angles of 45°–55° with the midvein; inflorescence fulvo-velutinous; bracts ovate-lanceolate to rhombic, acute or acumi-

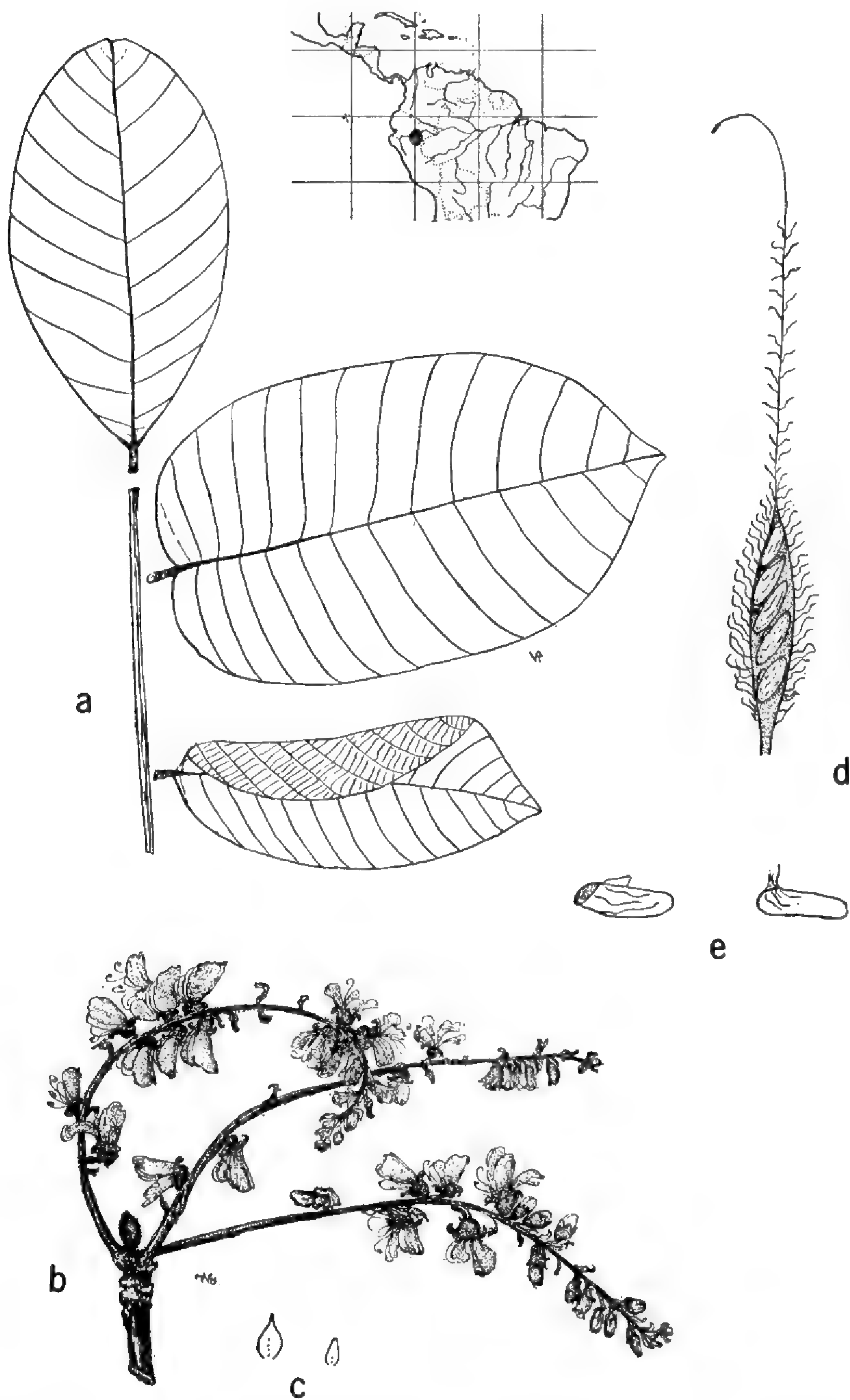


FIGURE 9.—*Dussia foxii*: *a*, three leaflets arranged in postulated position on rachis, $\times \frac{1}{2}$; *b*, portion of inflorescence, $\times \frac{1}{2}$; *c*, bract (larger) and bracteole, $\times 1$; *d*, gynoecium with five ovules, $\times 5$; *e*, ovules, $\times 10$.

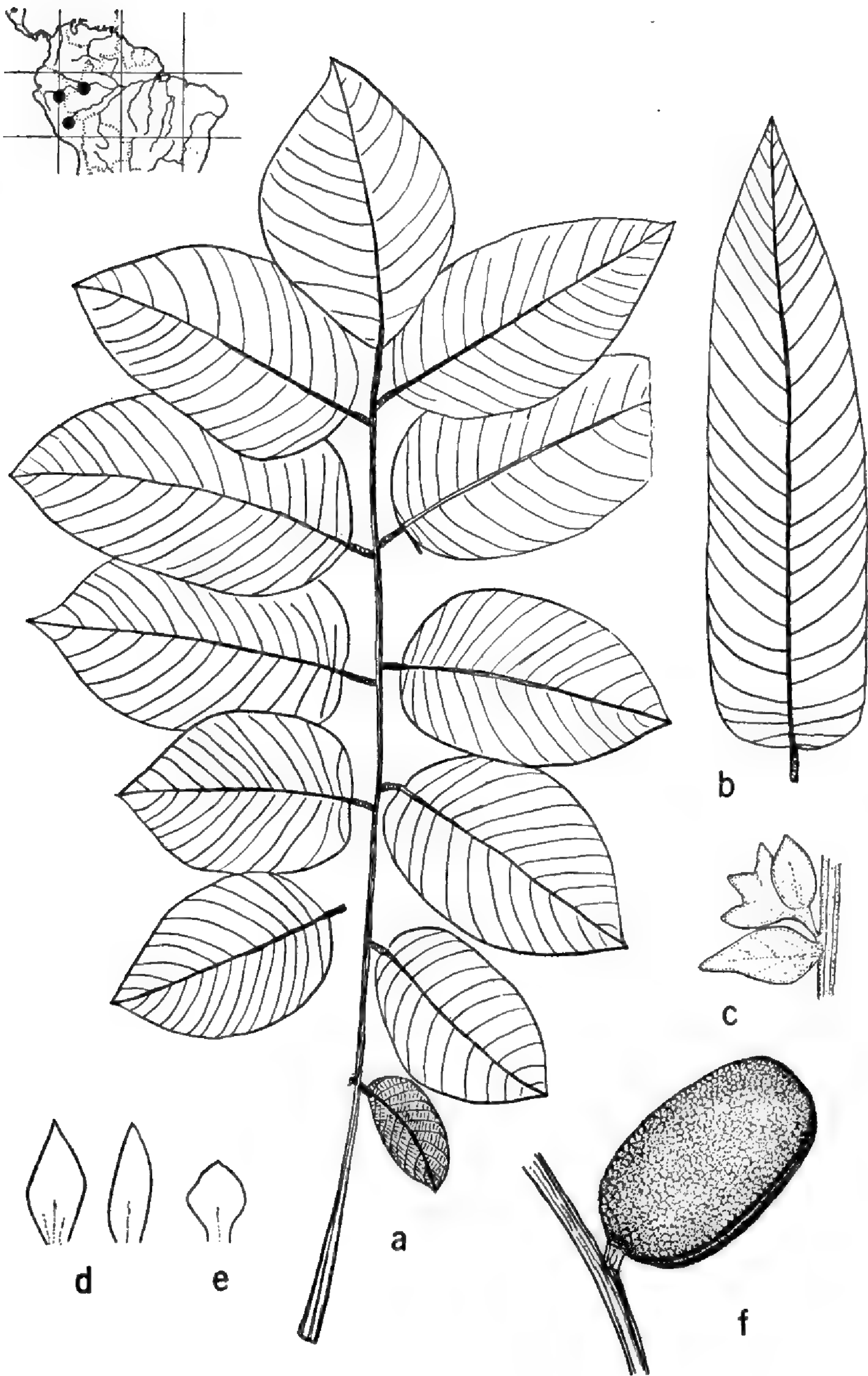


FIGURE 10.—*Dussia tessmannii*: a, leaf, *Ducke* 1031, $\times \frac{1}{2}$; b, leaflet, *Tessmann* 4085, $\times \frac{1}{2}$; c, calyx with bract and bracteole, $\times 1$; d, bracts, $\times 1$; e, bracteole, $\times 1$; f, fruit, *Ducke* 1031, $\times \frac{1}{2}$.

nate, the base broadly clawed to subhastate, 12–20 mm. long, 7–10 mm. broad, the bracteoles ovate, lanceolate, or spatulate, 6–17 mm. long, 7–8 mm. broad; flowers 17–21 mm. long; calyx 8–10 mm. long, the tube 4–5 mm. long, the teeth 4–5 mm. long; petals lilac or pink with white or purple markings; fruit reddish orange, velvety, ellipsoidal, 4–6 cm. long, 3–4 cm. in diameter, 1- or 2-seeded, the valves lignous, 3–4 mm. thick, apparently not curling when dry.

TYPE LOCALITY: In high forest, mouth of the Río Santiago, Department of Loreto, Peru. Type collected by G. Tessmann (No. 4085) cited below.

DISTRIBUTION: In the upper Amazon basin of Peru and Brazil.

PERU: LORETO: Mouth of Río Santiago, *Tessmann* 4085 (F.M. Neg. 1885, photo of type ex B; F fragment of type ex B, NY isotype). Río Marañón near Teniente Pinglo, just above Pongo de Manseriche, *Wurdack* 2087 (US, USM). **JUNÍN:** La Merced, Río Chanchosmayo, *Weberbauer* 1877 (F.M. Neg. 1898, B; F fragment ex B).

BRAZIL: AMAZONAS: Esperança, mouth of Rio Javary, *Ducke* 18 (A, F), 1032 (MO, NY, US), 1032 (GH, MO, NY, US), [RB No.] 23800 (U, US).

As indicated in the key, this species is distinguished from its nearest relative, *Dussia discolor*, by larger bracts and smaller fruit with thick valves that do not curl when dry. Unfortunately, so few collections are available that generalizations are difficult to make. Macbride's inclusion of *D. tessmannii* under *D. discolor* in the Flora of Peru (Publ. Field Mus. Bot. 13: 244. 1943) may be correct, but for the time being it seems convenient to consider the material from the upper Amazon region as distinct.

The type of *D. tessmannii* presumably is no longer extant, but represented by a photograph and a fragment, as well as by one or more isotypes.

10. *Dussia discolor* (Benth.) Amsh. Meded. Bot. Mus. Utrecht 52:50. 1939

FIGURE

Geoffroya discolor Benth. Journ. Bot. Hooker 2:69. 1840.

Vexillifera micranthera Ducke, Arch. Jard. Bot. Rio de Janeiro 3:140. 1922.

Dussia micranthera (Ducke) Harms, Repert. Sp. Nov. 19:291. 1924.

Dussia cayennensis Harms, Repert. Sp. Nov. 19:293. 1924.

Tree, to about 30 m. tall and 50 cm. in diameter, buttressed to 10 m.; young stems puberulent with ferruginous to pallid aureus hairs; leaves (7-fide Bentham) 9–13-foliolate, the axis 10–35 cm. long, the petiole 2.5–12 cm. long, the “pairs” of leaflets 1.5–5 cm. apart, the petiolules 3–4 mm. long and 1.5 mm. in diameter, the blades coriaceous or subcoriaceous, ovate to oblong, 3–13 cm. long, 1.5–7 cm. broad, the terminal leaflet usually obovate or oblanceolate, the apex obtuse to acute or breviacuminate, the base obtuse or subcordate, the upper surface glabrous the lower surface pallid pubescent with hairs sparse, the venation patent to minutely papilliform, the secondary veins 12–20 pairs, for

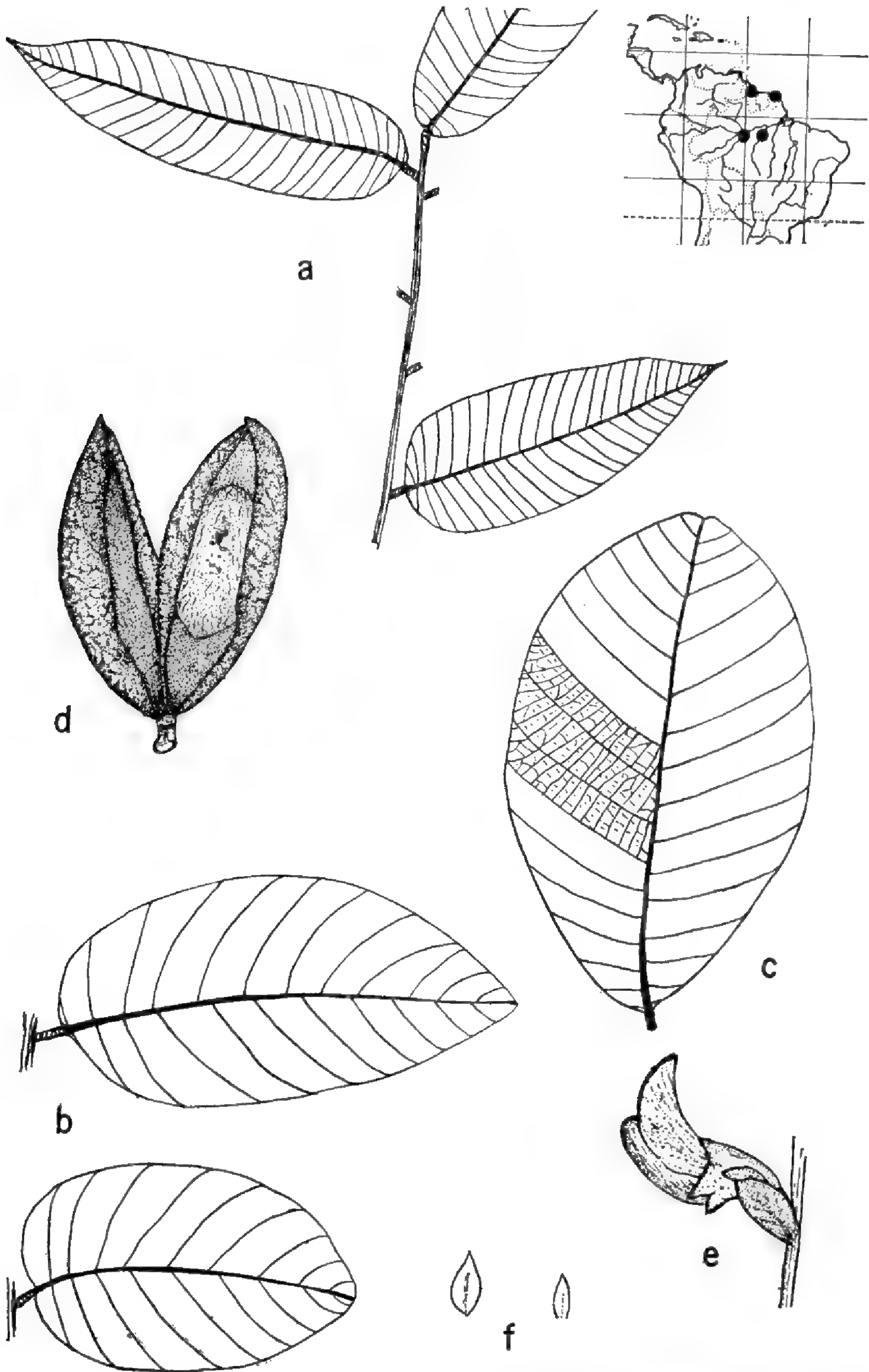


FIGURE 11.—*Dussia discolor*: *a*, portion of leaf, *Bur. Agric. & For. Guyan.* 340, $\times \frac{1}{2}$; *b*, leaflets, *Fanshawe* 2097, $\times \frac{1}{2}$; *c*, leaflet, *Ducke* 988, $\times \frac{1}{2}$; *d*, fruit with seed, $\times \frac{1}{2}$; *e*, flower with bract and bracteole, $\times 1\frac{1}{2}$; *f*, bract (larger) and bracteole, $\times 1$.

ing angles of 55°–65° with the midvein; inflorescence fulvo-puberulent, or pallid; bracts deltoid-ovate, acuminate, 4–8 mm. long, 3–5 mm. broad, the bracteoles 4–6 mm. long and about 3 mm. broad; flowers 15–18 mm. long; calyx fulvous, 8–10 mm. long, the tube 4–5 mm. long, the teeth 3–4 mm. long; petals rose-lilac; fruit minutely velutinous, fulvous or ferruginous, 6–12 cm. long, 3–4.5 cm. broad, 1- or 2-seeded, the seeds red, 2–5 cm. long, 2 cm. in diameter.

TYPE LOCALITY: Cayenne, French Guiana. Type collected by J. Martin (s.n.), cited below.

DISTRIBUTION: French Guiana, British Guiana, and lower Amazon basin of Brazil, in non-inundated forest.

FRENCH GUIANA: Cayenne, *Martin s.n.* (F.M.Neg. 1895, photo of type of *D. cayennensis* ex B=isotype of *Geoffroya discolor*). Between St. Laurent and Cayenne, *Bur. Agric. & For. Guyan.* 127 M (U); St. Laurent, *Bur. Agric. & For. Guyan.* 340 M (NY, U).

BRITISH GUIANA: Takutu Creek to Puruni R., Mazaruni R., *Fanshawe* 2097 [*For. Dept. B.G.* 4833] (NY, U, US).

BRAZIL: PARÁ: Rio Tapajoz, between Poção and Pimental, *Ducke* [MG Herb. No. 16411=RB Herb. No. 11457] (F.M.Neg. 20307 ex G, U, US, isotypes of *Vexillifera micranthera*). AMAZONAS: Borba, *Ducke* 988 (MO, NY, US).

Local names: Goué-goué-sabana, montouchi, montouchi de savanne (French Guiana).

In combining *Dussia discolor* with *D. micranthera*, I am following Amshoff rather than Harms, but with so little material available it is difficult to decide which is the better opinion. The collections here cited under *D. discolor* all have fairly small bracts and bracteoles, in contrast to the larger ones of *D. tessmannii*.

Dussia discolor is the earliest described species of the genus, but not the type because it was originally placed in *Geoffroya* of the tribe Dalbergieae. Amshoff recognized that *G. discolor* Benth. and *Dussia cayennensis* Harms were based on the same collection, and correctly made the combination *Dussia discolor* (Benth.) Amsh.

Reduction of the genus *Vexillifera* Ducke was accepted by Ducke, and, in fact, anticipated by him. In his original publication of the genus he noted that it seemed to have affinity with the genus *Dussia*, which he apparently knew only from its description.

Collections of *Dussia* Cited

- ALLEN, P. H.
 5988. *cuscatlanica*
 6655. *macrophyllata*
 6703. *macrophyllata*
- ANDRLE, R. F.
 91. *mexicana*
 ANDRLE, R. F., and AXTELL, H. R.
 5. *mexicana*
- BRENES, A. M.
 4627 (412). *cuscatlanica*
- CALDERÓN, S.
 1379. *cuscatlanica*
 1752. *cuscatlanica*
 2070. *cuscatlanica*
- COOPER, G. P.
 520. *macrophyllata*
- CUATRECASAS, J.
 16054. *lehmannii*
 16788. *lehmannii*
 17258. *lehmannii*
 17680. *lehmannii*
 19897. *lehmannii*
 21075. *lehmannii*
 26094. *lehmannii*
- DELGADO, E.
 47. *coriacea*
 153. *coriacea*
 430. *coriacea*
- DUCKE, A.
 18. *tessmannii*
 988. *discolor*
 1031. *tessmannii*
 1032. *tessmannii*
 11457. (RB Herb.) *discolor*
 16411. (MG Herb.) *discolor*
 23800. (RB Herb.) *tessmannii*
- DUSS, A.
 1072. *martinicensis*
 3757. *martinicensis*
 s.n. *martinicensis*
- EKMAN, E. L.
 H.7569. *sanguinea*
 H.7928. *sanguinea*
 H.10709. *sanguinea*
- FANSHAWE, D. B.
 2097. (For. Dept. B.G. 4833) *discolor*
 FOX, W.
 85. *foxii*
- GUIANA, BRITISH, FOREST DEPARTMENT
 4833. *discolor*
- GUIANA, FRENCH, BUREAU AGRICOLE & FORESTIER
 127 M. *discolor*
 340 M. *discolor*
- LEHMANN, F. C.
 8985. *lehmannii*
- LIEBMANN, F. M.
 5355. *mexicana*
- LITTLE, E. L., JR.
 6048. *macrophyllata*
- MARTIN, J.
 s.n. *discolor*
- MIRANDA, F.
 6964. *cuscatlanica*
- PURPUS, C. A.
 277. *mexicana*
 6326. *mexicana*
 16459. *mexicana*
- SKUTCH, A. F.
 2027. *cuscatlanica*
 SMITH, H. H., and SMITH, G. W.
 s.n. *martinicensis*
- STANDLEY, P. C.
 20197. *cuscatlanica*
 54199. *cuscatlanica*
 55293. *cuscatlanica*
- STEYERMARK, J. A., ET AL
 33329. *cuscatlanica*
 33862. *cuscatlanica*
 35244. *cuscatlanica*
 52072. *cuscatlanica*
 91191. *martinicensis*
- TESSMANN, G.
 4085. *tessmannii*
- TONDUZ, A.
 12949. *macrophyllata*
- WEBERBAUER, A.
 1877. *tessmannii*
- WURDACK, J. J.
 2087. *tessmannii*

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U N I T E D S T A T E S N A T I O N A L M U S E U M

CONTRIBUTIONS FROM THE UNITED STATES NATIONAL HERBARIUM

VOLUME 32, PART 5

THE AMERICAN SPECIES OF ORMOSIA
(LEGUMINOSAE)

By VELVA E. RUDD



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SMITHSONIAN INSTITUTION • WASHINGTON, D.C. • 1965

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THE AMERICAN SPECIES OF ORMOSIA (LEGUMINOSAE)

By VELVA E. RUDD

Introduction

Ormosia of the plant kingdom is a genus of tropical legumes comprising some 100 species, about half of which are American, the other half native to the Old World. All of the species are woody. Some are timber trees as much as 60 meters tall, others are small and scrubby, and at least two species have been reported as scandent. Seeds of some species are believed to have pharmaceutical properties. Native use of the seeds as beads inspired the name *Ormosia*, based on the Greek word *hormos*, meaning necklace.

There is no general treatment of the American species of *Ormosia*. The existing regional floras have limited scope and some areas have not been included in any recent floristic work. Among the available collections are several taxa new to science.

The present study is based on specimens from the herbaria listed below. To the curators of these institutions, who made such material available, the writer is most grateful.

Abbreviations of herbarium names are those of Lanjouw and Stafleu (*Index Herbariorum*, part I, ed 5. 1964).

A	Arnold Arboretum of Harvard University.
B	Botanisches Museum, Berlin.
BM	British Museum (Natural History).
BR	Jardin Botanique de l'Etat, Bruxelles.
C	Botanical Museum and Herbarium, Copenhagen.
CAS	California Academy of Sciences.
DS	Dudley Herbarium, Stanford University.
F	Chicago Natural History Museum.
G	Conservatoire et Jardin Botaniques, Genève.
GH	Gray Herbarium of Harvard University.
IAN	Instituto Agronómico do Norte, Belém.
IJ	Science Museum, Institute of Jamaica.
INPA	Instituto Nacional de Pesquisas da Amazônia, Manaus.
K	The Herbarium and Library, Kew.
LL	Lundell Herbarium, Texas Research Foundation.
M	Botanische Staatssammlung, München.
MER	Universidad de los Andes, Mérida, Venezuela.

MEXU	Herbario Nacional del Instituto de Biología, Universidad Nacional de México.
MO	Missouri Botanical Garden.
NA	U.S. National Arboretum.
NY	New York Botanical Garden.
P	Muséum National d'Histoire Naturelle, Laboratoire de Phanérogamie, Paris.
POM	Pomona College.
R	Museu Nacional, Rio de Janeiro.
RB	Jardim Botânico, Rio de Janeiro.
S	Naturhistoriska Riksmuseum, Stockholm.
SI	Instituto de Botánica Darwinion.
TRIN	Imperial College of Tropical Agriculture, Trinidad.
U	Botanical Museum and Herbarium, Utrecht.
UC	University of California, Berkeley.
US	U.S. National Museum, Smithsonian Institution.
USFS	Forest Service Herbarium, U.S. Department of Agriculture.
VEN	Instituto Botánico, Caracas.
Y	School of Forestry, Yale University.

The citations of "F. M. Neg." refer to Field Museum [now Chicago Natural History Museum] negatives of a series of photographs taken in European herbaria by J. F. Macbride during 1929 to 1939.

The maps presented in this paper are based on Goode Base Maps No. 101 M, copyright by the University of Chicago Press.

The line drawings are chiefly the work of Mrs. Martha H. Niepold.

Historical Consideration

The genus *Ormosia* was presented to the scientific world by George Jackson, F.L.S., in a paper read to the Linnean Society of London on February 6, 1810. It was published the following year as an "Account of *Ormosia*, a new Genus of Decandrous Plants belonging to the Natural Order of Leguminosae" (Trans. Linn. Soc. Lond. 10: 358-362, t. 25-27. 1811). It included three species: *Ormosia coccinea*, based on *Robinia coccinea* Aublet, from French Guiana; *O. coarctata*, from British Guiana; and *O. dasycarpa*, from the West Indies. The latter was referred by Jackson to Swartz's *Sophora monosperma*, and is now correctly cited as *Ormosia monosperma* (Sw.) Urb.

An earlier generic name, *Toulichiba*, had been proposed by Adanson (Fam. 2: 326. 1763), based on the same Plumier illustration "M.S. 7, t. 145" (pl. 1) that Jackson cited as "a very good representation" of his *Ormosia dasycarpa*. However, *Toulichiba* was published as a monomial and, apparently, no specific names have ever been ascribed to it. Under the provisions of the International Code of Botanical Nomenclature (ed. 2: 98. 1935), *Ormosia* Jackson, with *O. coccinea*

(Aubl.) Jacks. as the type, has been conserved against *Toulichiba* Adanson.

De Candolle, in his *Prodromus* (2 : 97. 1825), listed under *Ormosia* only the three species of Jackson. No new American species were added until 1837, when Vogel (*Linnaea* 11 : 405. 1837) described three species based on Brazilian collections. During the next 25 years seven more species were published, two by Tulasne and five by Bentham. Among the latter were three new species of Richard Spruce, validated by Bentham, and included in his treatment of *Ormosia* for Martius' *Flora Brasiliensis* (*Fl. Bras.* 15 (1) : 314–319. 1862). This brought the total American species of *Ormosia* to about a dozen, the exact number depending on specific interpretation.

No additional species of American *Ormosia* were published until about the turn of the century. Urban added one species in 1899 and another in 1908. Glaziou published two *nomina nuda* in 1906. Huber published one species in 1909.

The largest increase in the genus occurred in the 1920's, when about 15 American species were added. The most active worker was Ducke, in Brazil, who not only collected the material but also described 11 new species and published a treatment of the Amazonian taxa. He also published the genus *Ormosiopsis* with two species, now being transferred to *Ormosia*.

Since 1920, in addition to Ducke's work, about 20 species have been added to the literature, mostly singly, by Benoist, Harms, Huber, Kleinhoonte, Kuhlmann and Campos Porto, Pittier, Monachino, Macbride, Standley, Schery, Pires, and Rudd. The present paper recognizes 50 species of American *Ormosia*, including 16 described as new.

The history and synonymy of *Ormosia* in the Old World has been treated by Merrill and Chen (*Sargentia* 3 : 77–117. 1943) and van Meeuwen (*Reinwardtia* 6 : 225–238. 1962) and will be referred to in the present paper only when pertinent to New World taxa. None of the species has been found to be native to both Eastern and Western Hemispheres.

Economic Consideration

The wood of most species of *Ormosia* is used locally for building and furniture construction. In Mexico, the wood of *O. isthmensis* "is used for ax handles, railroad ties, house-posts, and general construction" and that of *O. toledoana* (= *O. macrocalyx*) "for general construction and sometimes for canoes" (Standley and Steyermark, *Fieldiana* 24 (5) : 311. 1946). Bentham states in his original description of *O. panamensis*, "wood durable and used for building purposes."

In Dominica "the coarse-grained, hard wood of caconier [*O. monosperma*] is used by Carib and Creole alike for shingles and general building purposes" (Hodge and Taylor, *Webbia* 12 : 565. 1947). In French Guiana *O. paraensis* is called "bois de tournerie" (collector's notes, *Bena* 1157). "Sucupira branca," *O. flava*, has been reported as having "wood very durable; used for construction" (collector's notes, *Fróes* 1913, from Maranhão, Brazil). According to Record and Hess (*Timbers of the New World*, 300. 1943), the wood of *Ormosia*, exclusive of *O. coutinhoi*, is "not easy to work, finishing poorly; durability doubtful. A coarse unattractive wood, apparently of no commercial possibilities." The wood of *Macroule* (= *O. coutinhoi*), however, "will take a high polish; probably resistant to decay. Appears suitable for good furniture" (Record and Hess, *op. cit.*, 292).

An Asiatic species, *O. hosiei* Hemsl. & Wilson, known as "Hung-tou shu" or "red-bean tree" has been described as "one of the most beautiful of all Chinese trees and its red-colored wood, which is heavier than water, is esteemed above all other Chinese wood for high-grade cabinet work." (Rehder and Wilson *in Plantae Wilsonianae*, Publ. Arn. Arb. No. 4 : 94. 1916.)

Natives of both the Old and New World have used the brightly colored seeds of *Ormosia* as beads for personal adornment and as "gems" in ornamentation of weapons and other objects. Necklaces and earrings featuring *Ormosia* seeds are offered for sale to the tourist trade in several countries.

The seeds also are used medicinally. In eastern Venezuela *O. monosperma*, "pionia montañero," is "the seed used by doctors; cook seed and drink for pains of the heart; also cooked seed placed in water, given to children to put around their necks for sore throat" (collector's notes, *Steyermark* 61330).

Seeds of several species of *Ormosia* have been tested as possible sources of pharmaceutical preparations. Hess and Merck (*Ber.*, 52, 1976. 1919) reported that seeds of *O. "dasycarpa"* [actually the red-seeded *O. avilensis*, or *O. venezolana*, not *O. dasycarpa* (= *O. monosperma*), *fide* B. Krukoff, personal communication] contained the alkaloids ormosine and ormosonine, and that the former had a physiological effect resembling that of morphine. Lloyd and Horning (*Am. Chem. Soc. Journ.* 80 : 1506-1510. 1958) further investigated the problem and isolated the alkaloid panamine, supposedly from seeds of *O. panamensis* [actually, in part, at least, from seeds of *O. macrocalyx*]. In tests with dogs, panamine has been found to have hypotensive action.

In "Alkaloid-bearing plants and their contained alkaloids" (Willaman and Schubert, *Tech. Bull.* 1234, A.R.S., U.S. Dept. Agric. 1961) nine species of *Ormosia* are listed, with references to the chemical

literature. As stated in the introductory remarks, the plant names used are not necessarily true taxonomic synonyms, and it is not always possible to know what material the chemist had at hand. In the light of the present taxonomic study, at least two of the specific determinations should be changed, as indicated above, and a third species, *O. stipitata*, is a synonym of the true *O. panamensis*.

Geographic Distribution

Ormosia is essentially a tropical genus with an extension to about 30° N. latitude in Asia and 30° S. latitude in eastern South America (fig. 1).

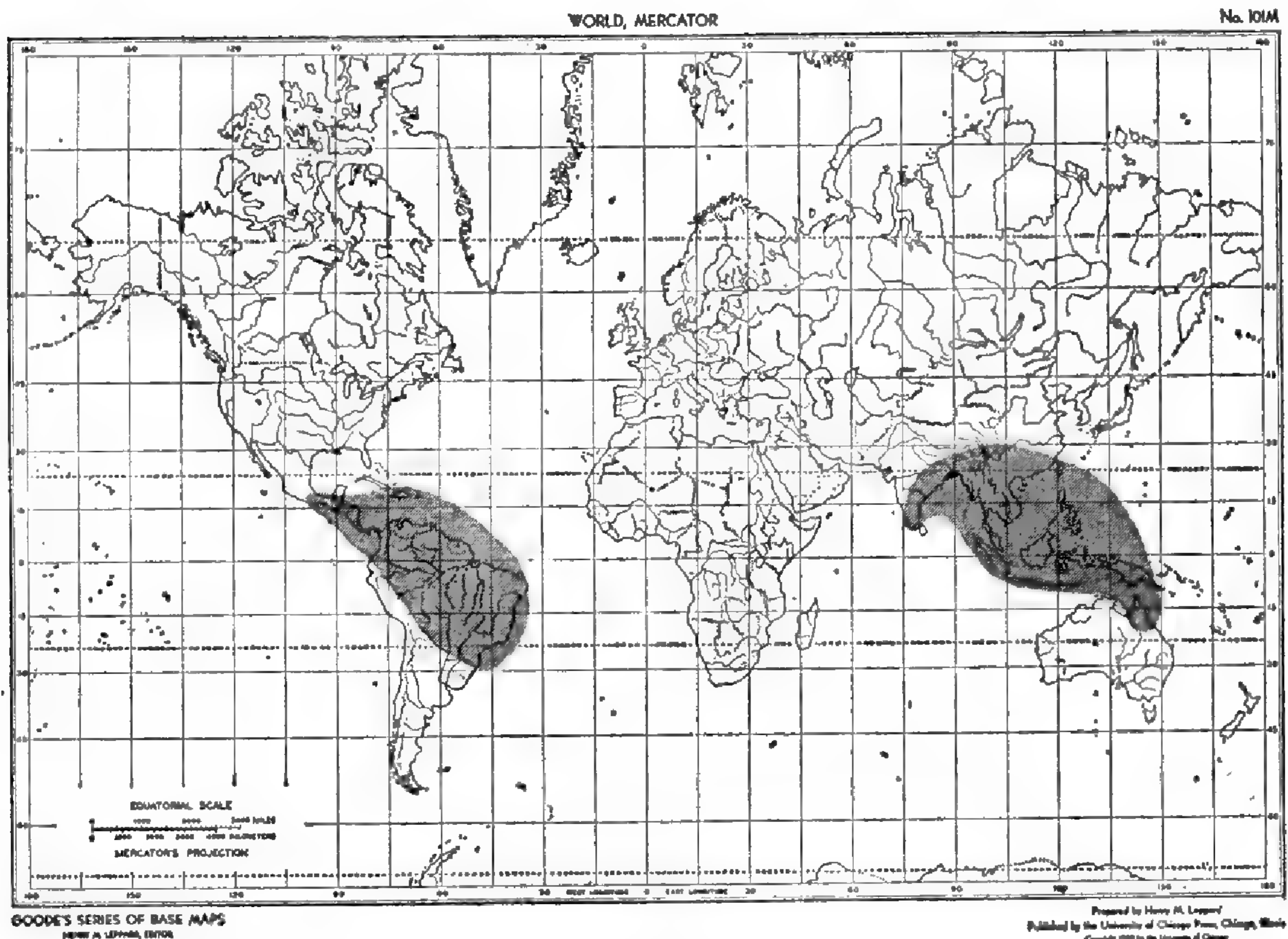


FIGURE 1.—Geographic distribution of the genus *Ormosia*.

Most American species are components of tropical or subtropical rain forest; some, such as *O. excelsa* and *O. smithii*, occur on wet land along the rivers near sea level; others, including *O. monosperma*, *O. tovarensis*, *O. venezolana*, and *O. colombiana*, are found on mountain slopes at elevations of about 1000–2000 meters; *O. costulata* and *O. bahiensis* are able to survive in dry woods or savanna areas.

The present disjunct distribution of the genus suggests an earlier continuous and much more extensive range, possibly with a trans-pacific connection in Cretaceous and Early Tertiary time. The various taxa appear to have developed from a common gene pool. Today,

although there are no species of *Ormosia* common to the Eastern and Western Hemispheres, there must be some close relationships. The best example is the similarity of *O. panamensis* to certain Chinese species such as *O. polysperma*, *O. xylocarpa*, and *O. henryi*. The most widespread *Ormosia* species of the Old World, *O. calavensis*, known from the Philippine Islands south to Australia, resembles, in many characters, members of the American section *Unicolores*, especially *O. macrocalyx*. Other species with unicolored seeds, such as those of series *Excelsae* and *Isthmenses*, also show varying degrees of kinship with species of the Eastern Hemisphere. The species with the strikingly marked red and black seeds, such as those of series *Coccineae* and *Monospermae*, are singularly American, although some Old World species show a tendency toward bicoloration with mottling or banding.

There are many gaps in our distribution records, not only of *Ormosia* but also of related genera, so many areas that are unknown botanically, that it is premature to generalize about areas of origin or paths of migration. The paleobotanical record does not provide any definite clues. Apparently, no fossils have been ascribed to *Ormosia*.

The individual maps and the citations that appear in the following text illustrate the current geographic information concerning the American species of *Ormosia*.

Morphological Characters

All species of *Ormosia* are woody; some are large trees to about 60 m. tall; a few are small and scrubby, not more than about 4–5 m. high, and two, *O. scandens*, from Asia, and *O. coarctata*, from Brazil, have been described as scandent. The trunks may be buttressed or not, the diameter breast high not more than 1 or 2 m. The bark is gray and rough. The wood characters have been summarized as hard and heavy, or moderately so, the grain irregular or roey, the heartwood pinkish, reddish, or brownish yellow, the sapwood whitish to yellowish or gray (Record and Hess, *Timbers of the New World*, 292, 300, 301, pl. 45, fig. 1. 1943; Ortega-Gonzales, *Investigaciones sobre utilización industrial de maderas tropicales*, México, 2 : 89. 1959).

The young stems, leaves, floral axes, and fruit are densely pubescent, velutinous or tomentulose, in most species, sericeous in others, frequently glabrescent, the stems terete or somewhat angular, the floral axes often fasciculate, at least toward the base. The collector's notes for one specimen of *O. macrophylla* (Maguire, et al. no. 37603) state, "stems hollow; ant infested."

Apparently, symbiosis with nitrogen-fixing bacteria may occur in members of *Ormosia*, as is customary in the Leguminosae in general. Nodules are present on the roots of at least one herbarium voucher of

O. coarctata at Kew: "seedling of *Barakaro* 1 month old from forest nursery, Mazaruni Station, British Guiana, Forest Dept. B. G., Record no. 4363, Field no. *Fanshawe* 1627."

Stipules are deltoid or linear, about 0.5–15 mm. long, pubescent like the stems, usually caducous, not known in some species, possibly lacking. Minute, usually acicular, stipels are sometimes found in a few species.

The leaves are imparipinnate, the lateral leaflets paired, or approximately so, 3–19-foliolate, or, sometimes, unifoliolate. The leaflets mostly are large, their blades 1.5–35 cm. long and 0.5–20 cm. broad, coriaceous or subcoriaceous, the upper surface essentially glabrous, the lower glabrous to densely pubescent. The basal leaflets usually are the smallest and the terminal leaflet the largest. The axis may be as much as 50 cm. long, or more, the maximum length often not recorded because herbarium specimens tend to represent the smaller, more easily collected examples. The venation is pinnate, the secondary veins essentially straight and parallel, or arcuate and only approximately parallel, the tertiary veins and veinlets parallel or reticulate.

The inflorescences are racemose, many-flowered, terminal or pseudo-terminal with the branch resuming growth after flowering. The axes, bracts, and calyx are uniformly pubescent, sometimes glabrescent. The bracts are stipule-like, deltoid to lanceolate, about 0.5–10 mm. long and 0.5–4 mm. broad, pubescent like the floral axes, frequently caducous. Bracteoles are paired, subtending the calyx, deltoid to filiform, about 0.5–8 mm. long and 0.5–1 mm. broad, sometimes caducous, sometimes persistent at top of pedicel.

The flowers are 5-merous. The calyx is campanulate with 5 subequal deltoid teeth or lobes, the base of the tube hypanthoid. The corolla is papilionoid, the 5 petals separate, essentially glabrous, greenish white, yellow, pink, violet, or blackish purple. In some species the color is fairly uniform and constant, in others, variable with contrasting markings of white, green, red, or purple.

The stamens are alternately subequal, with filaments separate to the base, inserted on the inner surface of the calyx tube. The smaller stamens, in some cases, apparently are sterile, sometimes reduced in number, or lacking (viz, *O. semicastrata* Hance, a Chinese species, with only 5 fertile stamens).

The ovary is pubescent and essentially sessile in most species, commonly 3–6-ovulate. The style is decreasingly pubescent toward the apex, sometimes glabrous, characteristically curved with the bilobed stigma in a lateral position (fig. 2); in a few species and occasional individuals of others, the style is straight or nearly so, with the stigma oblique or terminal.

The fruits are 1-6-seeded, moderately compressed to somewhat inflated, dehiscent in most species with the valves separating, usually without distortion. A few species are indehiscent. The valves may be densely pubescent or glabrous at maturity, coriaceous and scarcely 1 mm. thick or carnose, 3-4 mm. thick, or they may be woody, 1-7 mm. thick. In one American species, *O. panamensis*, there are septae between the seeds, a character also found in several Asiatic species. The color of the fruit, if glabrous, may be fulvous to blackish brown; if pubescent, light to dark brown, or grayish.

The seeds of many American species, including the type, *O. coccinea*, are bicolored red and black. The marking of some species is very constant; the seeds of other species are characteristically variable from all red to almost all black, even within the same pod. One species is bicolored yellowish and red. Other species have unicolored seeds, red, yellow, or black. The yellow-seeded species, *O. excelsa*, apparently represents arrested chemical development, as the immature seeds of red-seeded species frequently are yellow in color but turn red gradually, even when removed from the pod. In shape, the seeds commonly are elliptic, slightly compressed, but also may be globose or lenticular. The hilum in most species is elliptic, 1-5 mm. long, and terminal; in *O. coutinhoi* the hilum is circumcinct, 30-45 mm. long, and in *O. cinerea*, somewhat transitional, about 20 mm. long.

Chromosome counts of $2n=16$ have been published by Earlene Atchison for *O. krugii*, *O. macrocalyx* [as *O. panamensis*], and *O. monosperma* [as *O. dasycarpa*] (Journ. Elisha Mitchell Soc. 65 : 118-122. 1949; Amer. Journ. Bot. 38 : 538-546. 1951).

Taxonomic Position

Ormosia is a genus of papilionoid legumes of the subfamily Faboideae, tribe Sophoreae. As is characteristic of the tribe, the stamens are separate to the base, the filaments being connate at their point of attachment to the calyx.

The genera most closely related appear to be *Clathrotropis* and *Diplostropis*, and, possibly, *Sophora*. *Ormosia* is primarily recognized by the style, which is usually curved so that the bilobed stigma is lateral. Two segregate genera are combined with *Ormosia* in this paper, *Ormosiopsis*, with its style slightly curved, or straight, placing the stigma in a terminal or oblique position, and *Macroule*, characterized by large seeds with the hilum longer than in other American species of *Ormosia*.

Comparative morphological studies are needed to establish relationships, not only within the Sophoreae, but also with the members of the tribe Dalbergieae and genera of the subfamily Caesalpinoideae, such as *Swartzia* and *Aldina*.

Systematic Treatment

Ormosia Jacks.

- Ormosia* Jacks. Trans. Linn. Soc. Lond. 10:360, t. 25-27. 1811. Nom. cons.
Toulichiba Adans. Fam. 2:326. 1763. Nom. rejec.
Layia Hook. & Arn. Bot. Beech. Voy. 183. 1833, non Hook. & Arn. ex DC.
 1838.
Macrotropis sensu Miq. Fl. Ind. Bat. Suppl. 294. 1861, non DC. 1825.
Chaenolobium Miq. Fl. Ind. Bat. Suppl. 302. 1861.
Arillaria Kurz, As. Soc. Beng. 42(2):70. 1873.
Podopetalum F. v. Muell. Melbourne Chem. Drugg. 5:12. 1882, non Gaudin
 1828.
Ormosiopsis Ducke, Arch. Jard. Bot. Rio de Janeiro 4:61. 1925.
Macroule Pierce, Trop. Woods 71:2. 1942.

Trees, very tall to small and shrubby or, sometimes, reported as scandent; leaves imparipinnate, 3-19-foliolate, occasionally reduced to 1-foliolate; stipules small, deltoid to linear, caducous, possibly lacking in some species; inflorescences racemose, many-flowered, terminal or pseudoterminal; calyx campanulate, hypanthoid, with 5 subequal deltoid teeth or lobes; corolla papilionoid about twice as long as the calyx, composed of 5 separate petals, yellow to blackish purple, the standard glabrous on the outer face, sometimes with contrasting whitish or reddish spot; stamens 10, alternately subequal with 5 about as long as the standard and 5 slightly shorter, the filaments separate to the base, attached inside the calyx tube; fruit commonly dehiscent, a few species indehiscent, glabrous to densely pubescent, moderately compressed or turgid, 1-6-seeded; seeds ellipsoid, globose, or lenticular, unicolored red, yellow, or black, or bicolored red and black, or yellowish and red, the hilum terminal, elliptic in most species, sometimes linear.

The type of the genus is *O. coccinea* (Aubl.) Jacks., based on *Robinia coccinea* Aubl., as designated in the International Code of Nomenclature (ed. 2 : 98. 1935), in connection with conservation of the generic name *Ormosia*.

In the following treatment, Ducke's arrangement of the species into sections on the basis of fruit and seed characters has been followed in general, with certain modifications. The species of section *Ormosia* have been grouped into series, somewhat along the lines of the Merrill and Chen treatment of the Chinese and Indo-Chinese species.

In the keys, identifying characters are used that are not necessarily technical taxonomic criteria. When convenient, vegetative characters are included since specimens with adequate reproductive parts are not always available.

Key to Sections and Series

Leaflets with both surfaces essentially glabrous at maturity, the secondary veins arcuate, only approximately parallel, about 5-9 pair; mature fruit glabrous or nearly so; seeds unicolored red, reddish brown, or black.

Hilum of seed linear, 20-45 mm. long, the seeds red or reddish brown; fruit indehiscent, the valves lignous, glabrous, 3-7 cm. broad.

Section I. **Macrocarpae**

Hilum of seed elliptic, about 3 mm. long or less, the seeds bright red or, in *O. flava*, black; fruit dehiscent, the valves coriaceous, glabrous or nearly so at maturity, 1-3.7 cm. broad Section II. **Unicolores**

Leaflets essentially glabrous above but the lower surface usually pubescent at maturity, sometimes glabrate, the secondary veins essentially straight and parallel, although arcuate toward the margin, usually about 10-50 pair; mature fruit pubescent or glabrous; seed unicolored yellow or red, or bicolored red and black (or, yellowish and red in *O. friburgensis*) . Section III. **Ormosia**

Fruit indehiscent or tardily dehiscent; seeds unicolored, yellow to red or bicolored yellowish with red, or red with black, the hilum relatively larger than in other species of the section, 2.5-5 mm. long . Series 1. **Excelsae**

Fruit dehiscent; seeds red or bicolored red and black, the hilum relatively small, 1-4 mm. long.

Mature fruit glabrous or nearly so, usually nitid.

Seeds unicolored red.

Valves of fruit fulvous or light brown, carnose-coriaceous, septate between the seeds, 3-5 cm. broad including an alate margin; leaflets with lower surface fulvo- or aureo-sericeous, usually glabrescent.

Series 2. **Panamenses**

Valves of fruit black to ferruginous brown, lignous, sublignous, or coriaceous, not septate between the seeds, 2.5-4 cm. broad, the margin not alate; leaflets with lower surface pubescent, sometimes glabrate, but never fulvo- or aureo-sericeous. Series 3. **Isthmenses**

Seeds bicolored red and black.

Surface of fruit reticulate-rugose; leaflets with tertiary veins usually conspicuous, essentially parallel, or striate . Series 4. **Amazonicae**

Surface of fruit not rugose; leaflets with tertiary veins usually inconspicuous, reticulate or subparallel. Series 5. **Coccineae**

Mature fruit manifestly pubescent at maturity (unless glabrate due to weathering).

Valves of fruit minutely velutinous, sericeous, to subfarinose, sometimes glabrescent, coriaceous, about 1-2 mm. thick; seeds irregularly bicolored, red and black, or varying, sometimes within the same pod, from completely red to nearly all black; leaflets with lower surface sericeous or minutely velutinous, or, less commonly, tomentose.

Series 6. **Nobiles**

Valves of fruit densely velutinous or tomentose, lignous or sublignous, about 2-5 mm. thick; seeds bicolored, red and black, or sometimes completely red Series 7. **Monospermae**

Key to Species and Varieties

SECTION I. MACROCARPAE

Fruit (3.5-) 5-7 cm. broad; seeds discoid or lenticular, 3-4 cm. long, 2.5-4 cm. broad, 1-2 cm. thick, the hilum 30-45 mm. long, 1.5-3 mm. wide; flowers (17-) 20-25 mm. long, the calyx 12-15 mm. long, 7-8 mm. in diameter (French Guiana; Surinam; British Guiana) **1. O. coutinhoi**

Fruit about 3 cm. broad; seeds ellipsoid, about 2.5 cm. long and 1.7 cm. in diameter, the hilum 20 mm. long and 1.5-2 mm. wide; flowers 15-18 mm. long, the calyx 6-11 mm. long, 3-7 mm. in diameter (French Guiana; Surinam).

2. O. cinerea

SECTION II. UNICOLORES

Fruit 1-2 cm. broad; seeds red or black.

Seeds black (Surinam; northeastern Brazil) **3. O. flava**

Seeds red.

Flowers 6 mm. long, the calyx 4 mm. long; seed 7-9 mm. long, 6-8 mm. broad, and 6 mm. thick, the hilum 1.2 mm. long and 0.8 mm. wide; leaves 7-11-foliolate, the leaflets breviacuminate (Surinam) . **4. O. melanocarpa**

Flowers 15-17 mm. long, the calyx 7-10 mm. long; seed 7-10 mm. long, 10-14 mm. broad, and 6-9 mm. thick, the hilum 2-3 mm. long and 1-1.5 mm. wide; leaves (1-)3-5-foliolate, the leaflets conspicuously acuminate (western Brazil; eastern Peru) **5. O. grandiflora**

Fruit 2-3.7 cm. broad (if less than 2.5 cm., usually with some fine pubescence); seeds red.

Surface of fruit glabrous at maturity; flowers less than 18 mm. long, the calyx usually less than 10 mm. long.

Valves of fruit carnose, 3-4 mm. thick; seed with hilum 1.2 mm. long and 1 mm. wide; flowers 8-10 mm. long (northeastern Brazil) . **6. O. bahiensis**

Valves of fruit 1-2 mm. thick; seed with hilum 2 mm. long and 1 mm. wide; flowers about 10 mm. long (possibly to 15 mm.).

Leaflets conspicuously acuminate, the base rounded or subcordate; flowers about 10 mm. long, the calyx 6-7 mm. long (Pará, Brazil).

7. O. holerythra

Leaflets acute or breviacuminate, the base acute to rounded; flowers probably more than 10 mm. long, the calyx 7-10 mm. long (Espírito Santo, Brazil) **8. O. nitida**

Surface of fruit glabrate but retaining considerable fine pubescence at maturity; flowers 18-25 mm. long, the calyx usually about 10-15 mm. long; leaflets obtuse to breviacuminate (southern Mexico to Brazil) . **9. O. macrocalyx**

SECTION III. ORMOSIA

SERIES 1. EXCELSAE

Seeds globose or ellipsoid, 17-20 mm. thick, unicolored yellow to red or bicolored yellowish and red, the hilum 4-5 mm. long, 1-1.5 mm. wide; fruit 3-3.5 cm. broad; flowers 8-10 mm. long, the calyx 4-5 mm. long (southern Brazil).

11. O. friburgensis

Seeds compressed, 10 mm. thick or less, unicolored yellow or red, or bicolored red and black, the hilum 2-5 mm. long, 1.5-2 mm. wide; fruit 1.5-3.3 cm. broad; flowers 12-18 mm. long, the calyx 6-10 mm. long.

Leaves 11-19-foliolate; seeds unicolored yellow to orange, the hilum about 5 mm. long and 2 mm. wide; fruit 2.5-3.3 cm. broad; flowers 15-18 mm. long, the calyx and axes of the inflorescences pallido- to fulvo-tomentose (Amazon basin of Brazil) **10. *O. excelsa***

Leaves 5-9-foliolate; seeds unicolored red, or bicolored red and black, the hilum 2.5-4 mm. long and 2 mm. wide; fruit 1.5-2.5 cm. broad; flowers 12-15 mm. long, the calyx ferrugino- to fulvo-tomentose.

Seed red, sometimes with an inconspicuous black line, about 10 mm. long, 10 mm. broad, and 6-7 mm. thick, the hilum 2.5 mm. long and 2 mm. wide; fruit 1.5-2 cm. broad; leaflets obtuse to acute (Rio Negro basin of Venezuela, Colombia, and Brazil) **12. *O. williamsii***

Seed bicolored red and black, 11-14 mm. long, 10-13 mm. broad, 8-10 mm. thick; fruit 2-2.5 cm. broad; leaflets acute or breviacuminate.

Hilum of seed about 4 mm. long and 2 mm. wide; mature fruit strongly rugose; leaflets 7 or 9, ovate to ovate-oblong, the secondary veins scarcely raised (São Paulo [and Minas Gerais?], Brazil) . **13. *O. minor***

Hilum of seed 2.5-3 mm. long and 1.5 mm. wide; fruit not rugose; leaflets 9, elliptic to oblong, the secondary veins moderately raised (Minas Gerais, Brazil) **14. *O. vicosana***

SERIES 2. PANAMENSES

One species (Panamá) **15. *O. panamensis***

SERIES 3. ISTHMENSES

Fruit about 1.5 cm. broad, the valves 1 mm. thick; leaflets elliptic to elliptic-oblong, 1.5-3.5 cm. broad, glabrous or nearly so, the pubescence sparse, minute, appressed (Panamá) **16. *O. cruenta***

Fruit 2-4 cm. broad, the valves 1-3 mm. thick; leaflets mostly more than 3.5 cm. broad, velutinous or tomentulose along the major veins, otherwise, moderately pubescent to glabrous.

Flowers about 10 mm. long, the calyx 7-8 mm. long, cinereo- or fulvo-velutinous; fruit 2-3 cm. broad (México to northern Colombia) . **17. *O. isthmensis***

Flowers more than 10 mm. long (complete flowers not known in *O. venezolana*), the calyx 10-13 mm. long, fulvo- to ferrugino-tomentulose; fruit 2.5-4 cm. broad.

Leaves (5-) 7-11-foliolate; fruit (2.5-) 3-3.5 cm. broad; seeds 12-14 mm. long, the hilum 2-3 mm. long (western Colombia) . . **18. *O. colombiana***

Leaves 5-7-foliolate; fruit 3-4 cm. broad; seeds 15-20 mm. long, the hilum 3-3.5 mm. long (Coastal Cordillera, Venezuela) . . . **19. *O. venezolana***

SERIES 4. AMAZONICAE

Flowers 13-17 mm. long, the calyx fulvo- to ferrugino-tomentulose.

Leaflets predominantly broadly ovate, cordate, the lower surface with tightly crispate pubescence; flowers 15-17 mm. long (upper Amazon basin of Brazil and Peru) **20. *O. amazonica***

Leaflets predominantly elliptic to oblong, rounded to subcordate at the base, the lower surface with laxly crispate, spreading, or subappressed pubescence; flowers 13-15 mm. long (upper Amazon basin of Peru and Bolivia).

21. *O. bopiensis*

Flowers 18–22 mm. long, the calyx cinereo- to fulvo-tomentulose (southern Mexico; British Honduras) **22. *O. schippii***

SERIES 5. COCCINEAE

Valves of fruit lignous, 2–7 mm. thick.

Leaflets with the lower surface puberulent to tomentulose along the major veins, otherwise minutely appressed-pubescent to subglabrous.

Flowers 10–15 mm. long, the calyx ferrugino-tomentulose, 7–9 mm. long; fruit 1.5–3 cm. broad, the valves 2–5 mm. thick; seeds 10–15×10–12×8–10 mm., the hilum 2×1 mm.

Leaflets predominantly ovate, or obovate to elliptic, with midvein tomentulose below, the major secondary veins mostly 4–10 mm. apart forming angles of 60°–70° with the midvein; petiole 3–5 cm. long; petiolules 3–5 mm. long, the pairs of leaflets 2–4 cm. apart; fruit 2–3 cm. broad, the valves 3–5 mm. thick **23a. *O. coccinea* var. *coccinea***

Leaflets elliptic to obovate with midvein puberulent or appressed-pubescent below, the major secondary veins mostly 10–25 mm. apart, forming angles of about 50°–60° with the midvein; petiole 5–7 cm. long, the petiolules 5–10 mm. long, the pairs of leaflets 5–7 cm. apart; fruit 1.5–2.5 cm. broad, the valves 2–3 mm. thick.

23b. *O. coccinea* var. *subsimplax*

Flowers (13–) 16–20 mm. long, the calyx fulvo-tomentulose, (8–) 10–12 mm. long; fruit 2.5–3.5 cm. broad, the valves 2–3 mm. thick; seeds about 13–15×13×10 mm., the hilum 3.5×1.5 mm. (southeastern Brazil) **24. *O. arborea***

Leaflets with lower surface uniformly pubescent to subglabrous.

Pubescence of leaflets crispate, the secondary and tertiary veins prominent; fruit with valves 2.5–4 cm. broad, 5–7 mm. thick.

Hairs of leaflets laxly crispate, mostly about 1 mm. long; seeds with hilum 2–2.5×1–1.5 mm (Manaus, Brazil) **25. *O. grossa***

Hairs of leaflets minute, scarcely 0.1 mm. long; seeds with hilum 3×1.5 mm. (French Guiana; British Guiana; southeastern Venezuela; upper Amazon area of Brazil) **26. *O. lignivalvis***

Pubescence of leaflets appressed or subappressed, minute, sometimes lacking; fruit with valves 1.5–3 cm. broad, 2–5 mm. thick.

Leaves 7–19-foliolate, the lower surface of leaflets with secondary veins scarcely raised, about 12–20 pair, 3–7 mm. apart, forming angles of 60°–70° with the midvein (French Guiana; Surinam; southern Venezuela; Brazil) **27. *O. paraensis***

Leaves 7- or 9-foliolate, the lower surface of leaflets with secondary veins prominent, about 10 pair, 5–10 mm. apart, forming angles of 45°–50° with the midvein (Brazil, along southern tributaries of the Amazon River) **28. *O. elata***

Valves of fruit sublignous or coriaceous, 1–2 mm. thick.

Fruit 1.2–2 cm. broad; seeds 6–11 mm. long, the hilum 1–1.5 mm. long; leaflets 1–7 (Surinam; British Guiana; middle Amazon region of Brazil).

29. *O. costulata*

Fruit 2–3 cm. broad; seeds 12–15 mm. long, the hilum 2–3 mm. long; leaflets 5–11.

Leaflets 9 or 11, the lower surface puberulent along the midvein, otherwise minutely and sparsely appressed, pubescent; seeds 15–17×15–17×10–

- 11 mm., red except for a black line along one edge, the hilum 3 mm. long (Jamaica) **30. *O. jamaicensis***
 Leaflets 5-9, the lower surface finely puberulent or subfarinose, sometimes tomentulose along the major veins; seeds 12-14×10-11×8-9 mm., approximately half red and half black, the hilum 2 mm. long (southern British Guiana; Rio Branco-Rio Negro region of Brazil) . **31. *O. smithii***

SERIES 6. NOBILES

- Flowers 15-27 mm. long, the calyx (8-) 10-15 mm. long; fruit 1-6 (frequently 4-6)-seeded; leaflets sericeous or subsericeous below.
 Leaflets predominantly elliptic to oblong, sometimes suborbicular, obovate, or ovate.
 Fruit (1.3-) 2-2.7 cm. broad; seeds 10-13 mm. long, the hilum 3 mm. long; leaflets frequently suborbicular (Hispaniola; Puerto Rico; Lesser Antilles) **32. *O. krugii***
 Fruit 1.5-2.2 cm. broad; seeds 8-11 mm. long, the hilum 1.5-2.5 mm. long; leaflets commonly elliptic to oblong.
 Leaves 3-9-foliolate, the leaflets coriaceous, or sometimes subcoriaceous, densely sericeous below, with major lateral veins about 10-15 pair, diverging from the midvein at angles of 60°-70°.
 Valves of fruit usually glabrate at maturity; leaflets commonly about 15-30 cm. long, the secondary veins conspicuous, about 10-35 mm. apart (coastal French Guiana; Bolivia; middle and lower Amazon basin of Brazil) **33a. *O. nobilis* var. *nobilis***
 Valves of fruit fulvo-sericeous at maturity, little glabrescent; leaflets about 8-18 cm. long, the secondary veins relatively inconspicuous, 5-20 mm. apart (British Guiana and Bolivar, Venezuela).
33b. *O. nobilis* var. *bolivarensis*
 Leaves commonly 9-11-foliolate, the leaflets subcoriaceous, densely to sparsely sericeous below, with major lateral veins 12-20 pair, 2-10 mm. apart, diverging from the midvein at angles of 50°-60° (middle to upper Amazon basin of Colombia, Peru, and Brazil).
33c. *O. nobilis* var. *santaremnensis*
 Leaflets predominantly ovate, cordate, or subcordate, sometimes elliptic, obtuse at the base.
 Apex of leaflets acute or breviacuminate, the acumen to about 10 mm. long in largest leaflets; fruit 1.3-2 cm. broad; seeds 8-9 mm. long, the hilum 1.5-2 mm. long (middle to upper Amazon basin of Brazil; southern Venezuela; southwestern Colombia) **34. *O. macrophylla***
 Apex of leaflets acuminate, the acumen 10-30 mm. long; fruit 2-2.5 cm. broad; seeds 10-11 mm. long, the hilum 3 mm. long (Pacific coast of Colombia).
35. *O. cuatrecasasii*
 Flowers (presumably) less than 15 mm. long, the calyx 4-8 mm. long; fruit 1-3-seeded; leaflets sericeous to tomentose below.
 Major veins of leaflets 20-50 pair, 2-10 mm. apart, the leaflets sericeous below (upper Amazon basin of Brazil, Venezuela, and Colombia) . **36. *O. discolor***
 Major veins of leaflets 10-25 pair, 5-25 mm. apart, the leaflets velutinous, tomentose, or subsericeous below.
 Calyx 6-8 mm. long; fruit 1.5-2.3 cm. broad.
 Leaves 3-7-foliolate, the leaflets strongly revolute; seeds about 8 mm. long, the hilum 2-2.5 mm. long (Pacific slope of Colombia) . **37. *O. revoluta***

Leaves 9-foliolate, the leaflets not revolute; seeds 10–12 mm. long, the hilum 3 mm. long (southern Venezuela) . . . **38. *O. maguireorum***
 Calyx 4–6 mm. long; fruit 1–2 mm. broad.

Leaflets elliptic, obtuse at the base, tomentose below (Bolivia).

39. *O. larecajana*

Leaflets ovate to elliptic, cordate to obtuse at the base, finely velutinous to subsericeous below.

Fruit 1–1.5 cm. broad; seeds 7–8 mm. long, the hilum 1 mm. in diameter (southern Venezuela) . . . **40. *O. steyermarkii***

Fruit 1.5–2 cm. broad; seeds 8–10 mm. long, the hilum 2 mm. × 1 mm. (upper Amazon basin of Brazil) . . . **41. *O. solimoesensis***

SERIES 7. MONOSPERMAE

Seed bicolored, red and black, the black area about one-third to one-half as large as the red.

Lower surface of leaflets tomentulose along the major veins, otherwise sparsely and minutely crisp-pubescent, glabrescent (Lesser Antilles; northeastern Venezuela) . . . **42. *O. monosperma***

Lower surface of leaflets uniformly pubescent or nearly so.

Hairs on lower surface of leaflets loosely crispate to subpatent.

Fruit 2.7–3.8 cm. broad; seeds 15–22 mm. long, the hilum 3–3.5 mm. × 1.5–2.5 mm. (Coastal Cordillera, Venezuela to Cordillera Oriental, Colombia) . . . **43. *O. tovarensis***

Fruit 1.5–2.5 cm. broad; seeds about 10–13 mm. long, the hilum 2–4 mm. × 1.5 mm.

Blade of leaflets broadly ovate to elliptic; calyx about 10 mm. long (Amazonas, Brazil) . . . **44. *O. froesii***

Blade of leaflets ovate, obovate, oblong, or elliptic; calyx 6–9 mm. long.

Leaflets predominantly obovate to elliptic, the pubescence laxly crispate to subpatent; fruit 1.5–2 (–2.5) cm. broad; seed with hilum 2–4 × 1.5 mm.; bracts deltoid, about 4 mm. long (British Guiana; Pará, Brazil) . . . **45. *O. coarctata***

Leaflets predominantly ovate to oblong, the pubescence loosely crispate; fruit 2–2.5 mm. broad; seed with hilum 2 × 1.5 mm.; bracts linear-lanceolate, about 4–10 mm. long (southeastern Brazil).

46. *O. fastigiata*

Hairs on lower surface of leaflets tightly crispate.

Fruit 1.5–2.5 cm. broad; seed 10–12 mm. long, the hilum 2.5–3 × 1–1.5 mm. (Central America) . . . **47. *O. velutina***

Fruit 2.5–3 cm. broad; seed 12–15 mm. long, the hilum 3 × 1.5 mm. (Cordillera Central, Colombia) . . . **48. *O. antioquiensis***

Seed completely red or red with a black line or narrow spot along one edge.

Leaflets with lower surface moderately to densely crisp-pubescent (Surinam; British Guiana; Brazil, along the northern coast and Amazon basin).

49. *O. stipularis*

Leaflets with lower surface tomentulose along the major veins, otherwise moderately and inconspicuously crisp-pubescent, glabrescent (El Avila, Venezuela) . . . **50. *O. avilensis***

Section I. *Macrocarpae*

Ormosia section *Macrocarpae* Ducke, Arch. Jard. Bot. Rio de Janeiro 3 : 135, 136, 1922.

Macroule Pierce, Trop. Woods 71 : 2. 1942.

Trees; leaves 3–11-foliolate, the leaflets with blades coriaceous, essentially glabrous at maturity, the secondary veins about 5–9 pair, arcuate, only approximately parallel; fruit glabrous, indehiscent, lignous; seeds large, 25–40 mm. long, unicolored, red or drying to reddish brown, the hilum linear, 20–45 mm. long and 1.5–3 mm. wide.

Ormosia coutinhoi, the type, and *O. cinerea* are the only members of this section. The long hilum of the seed is the outstanding character and is the chief basis for Pierce's genus *Macroule*. This character is known only in these two species of *Ormosia* in the New World, but somewhat similar long hila are present in several Asian species. A variation in length of hilum occurs in other legume genera, notably, *Mucuna*, but is not usually considered sufficient basis for segregation.

1. *Ormosia coutinhoi* Ducke, Arch. Jard. Bot. Rio de Janeiro 3 : 135, 136, t. 9, 10a. 1922. FIGURE 2

Macroule coutinhoi (Ducke) Pierce, Trop. Woods 71 : 2. 1942.

Tree to 60 m. high or more; young stems ferrugino-puberulent; stipules not seen; leaves 5–11-foliolate, the axis 8–50 cm. long, puberulent to subglabrous, the petiole 3–5 cm. long, the pairs of leaflets 4–8 cm. apart, the petiolules 8–20 mm. long, 4–5 mm. in diameter, the blades coriaceous, 6–27 cm. long, 3–16 cm. broad, ovate to elliptic or the terminal leaflet sometimes obovate, the apex obtuse or acute, the base rounded or subcordate, the upper surface glabrous, nitid, the lower surface glabrate, essentially glabrous at maturity, the secondary veins raised, about 6–9 pair, irregularly spaced, only approximately parallel, mostly 1–3 cm. apart, forming angles of 40°–50° with the midvein; inflorescences with axes argenteo- or cinereo-sericeous, the bracts minute, deltoid, about 1 mm. long and 1 mm. broad at the base, caducous, the bracteoles deltoid, about 0.5 mm. long and broad; flowers (17–) 20–25 mm. long; calyx argenteo-sericeous, 12–15 mm. long, the tube 7–10 mm. long, 7–8 mm. in diameter, the teeth 4–5 mm. long; petals pinkish to dark purple; fruit indehiscent, lignous, blackish brown, glabrous, nitid or sometimes minutely rimose with age, usually 1-seeded, 5–7 cm. long, sometimes 2-seeded, about 10–13 cm. long, constricted between the seeds, (3.5–) 5–7 cm. broad with a margin about 4 mm. wide, the valves 3–5 mm. thick; seeds red, or drying reddish brown, discoid or lenticular, 2.5–4 cm. in diameter, 1–2 cm. thick, the hilum linear, 30–45 mm. long and 1.5–3 mm. wide.

TYPE LOCALITY: "Belem do Pará," Brazil. Lectotype collected by Ducke (Museu Goeldi no. 16798), cited below.

DISTRIBUTION: British Guiana, Surinam, French Guiana, and the lower Amazon region of Brazil, in rain forest, "igapo," swampy flats, sandy banks, and hill slopes, at elevations up to about 400 m.

FRENCH GUIANA: Between Charvein and Acarouany, *Bur. Agr. & For. Guyanais* 73 M (P), 142 M (P), 212 M (U). Acarouany, *Melinon* 243 (P). Cachoeira Grande Roche, Rio Oiapoque, *Maguire, Pires, & Maguire* 47060 (K, NY, US).

SURINAM: Dam, *Stahel* 251 (A, K, NY, U). Jaffa, Commewijne, *Bosbeheer* 1021 (K, U). Mapana, *Bosbeheer* 1025 (U), 1026 (U). Macreabo, *Bosbeheer* 344 (U).

BRITISH GUIANA: Two miles E. of Atkinson Field, *Irwin* 165 (US). Makauria Creek, *Fanshawe* 523 [*For. Dept. B.G.* 3259] (K, NY, US). Barima R., *De la Cruz* 3388 (GH, NY, U, US). Butukari Forest, Bartica-Potaro Road, 54th mile, *Dawson* 8 [*For. Dept. B.G.* 2013] (K, NY). Near Haiama Creek, Demerara, *Hohenkerk* s.n. [*For. Dept. B.G.* 124 B] (K). "Santa," Pokorero Creek, Kumuni R., Demerara, *Hohenkerk* s.n. [*For. Dept. B.G.* 124 C] (K). Mahaica Camp, Mobilissa Path, Demerara, *C. W. Anderson* s.n. [*For. Dept. B.G.* 582] (K, NY). Kaieteur Plateau, *Cowan & Soderstrom* 1976 (US).

BRAZIL: PARÁ: Without exact locality, *Martius* [*Iter brasiliense*] s.n. (M). Belém, *Ducke* 352 (NY), 585 (F, MG, MO, NY, R, US), 1615 (A, F, NY, R, US), 1962 (A, K, MG, NY, US), 16188 [MG no. = RB no. 15491] (BM, MG, P, S, U, US), 16798 [MG no.] (BM, F photo and fragment ex MG, MG lectotype, US); *Silva* 470 (IAN, NY, US). Guatipurú, *Fr. Lima* 16572 [MG no.] (BM, F photo and fragment ex MG, MG, US). Breves, *Ducke* 17093 [RB no.] (RB, US). Antonio Lemos, *Black* 48-3032 (IAN). "On beach at Caripi," *Spruce* s.n. in 1850 (K). Rio Guamá, Ourém, *Pires & Silva* 4626 (IAN, NY). AMAPÁ: Rio Araguari, Cachoeira do Paredão, *Frões & Black* 27679 (IAN, NY). Rio Iaue, confluence with Rio Oiapoque, *Irwin, Pires, & Westra* 47915 (K, NY, US).

LOCAL NAMES: Aguitin, neko-oudou, St. Martin blanc (French Guiana); warabokkadan (Surinam); korokororo, kurukoruru, kruk, red horse-eye (British Guiana); buiussú (Brazil).

The woody indehiscent fruit and large seeds with linear hila are distinctively characteristic of *O. coutinhoi*. In my opinion, however, these characters do not justify generic separation, and the species is retained in *Ormosia* rather than segregated in *Macroule*.

Of the three collections cited in the original description, Museu Goeldi numbers 16188, 16572, and 16798, the latter, with mature fruit and seed is designated as lectotype.

2. *Ormosia cinerea* R. Ben. Bull. Mus. Hist. Nat. Paris 26 : 86. 1920. FIGURE 2

Tall tree; young stems ferrugino-pubescent with subappressed hairs, glabrescent; stipules not seen; leaves (3-) 5-7-foliolate, the axis about (5-) 10-20 cm. long, puberulent, glabrate, the petiole 2-3 cm. long, the pairs of leaflets 3-4 cm. apart, the petiolules about 8 mm.

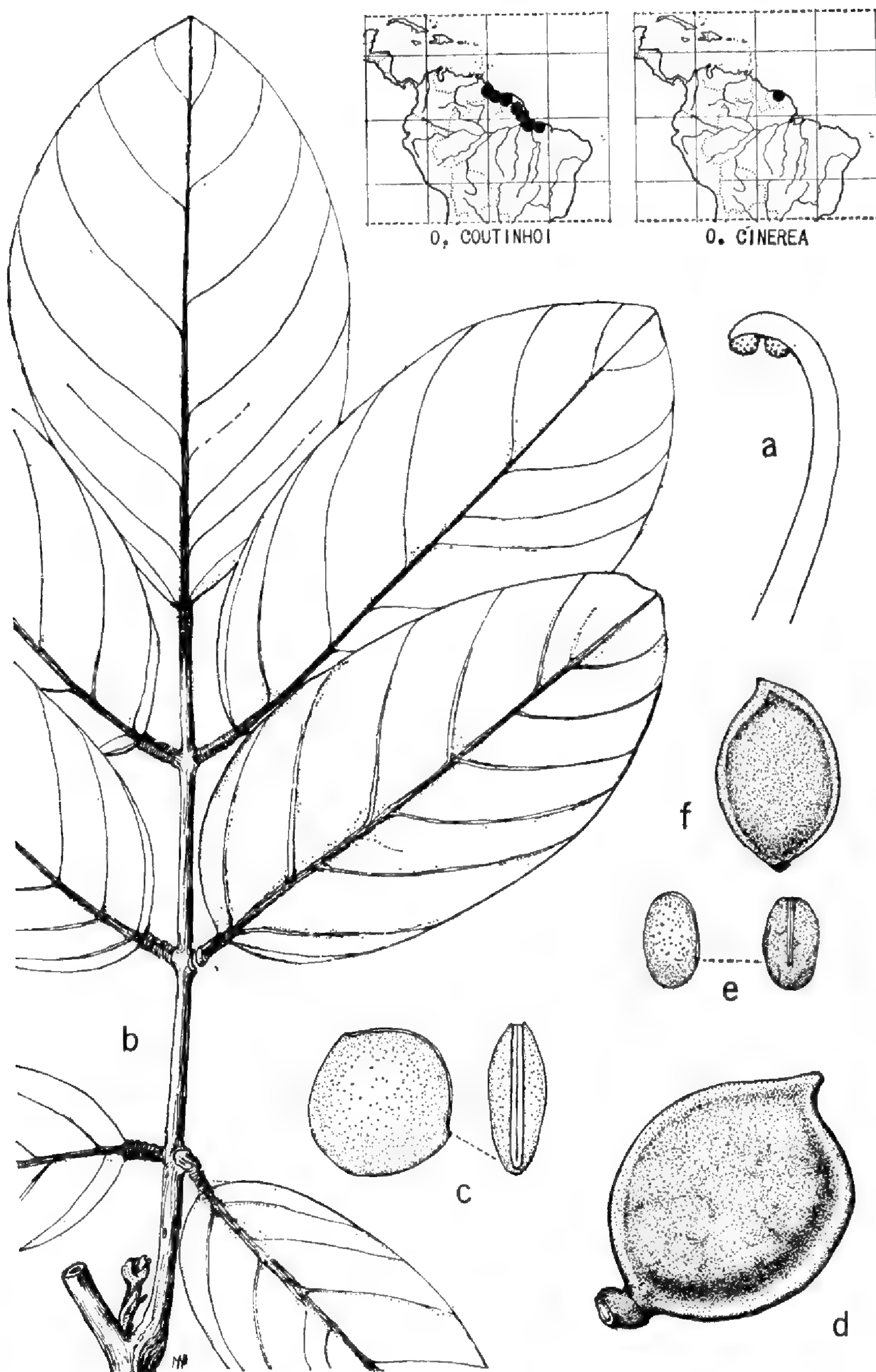


FIGURE 2.—*Ormosia* section *Macrocarpae*: Geographic distribution of species; *O. coutinhoi*: a, style showing bilobed stigma, $\times 7$; b, leaf, $\times \frac{1}{2}$; c, seed, $\times \frac{1}{2}$; d, fruit, $\times \frac{1}{2}$. *O. cinerea*: e, seed, $\times \frac{1}{2}$; f, fruit, $\times \frac{1}{2}$.

long and 1.5–2 mm. in diameter, the blades subcoriaceous, elliptic, 6–16 cm. long, 4–8 cm. broad, the apex acute or obtuse, the base acute to obtuse, the upper surface glabrous, nitid or subnitid, the lower surface glabrous at maturity, the secondary veins moderately raised, about 6–9 pair, irregularly spaced, only approximately parallel, mostly 1–2 cm. apart, forming angles of 45°–50° with the midvein; inflorescences with axes subsericeous, the hairs cinereous, the bracts and bracteoles deltoid, 1 mm. long or less, caducous; flowers 14–18 mm. long; calyx cinereo-subsericeous, 5–11 mm. long, the tube 4–8 mm. long, 3–7 mm. in diameter, the teeth 1–3 mm. long; petals dark purple, the standard with a white stripe down the middle, the wings whitish at the base; fruit indehiscent, lignous, brown, somewhat rugose, glabrous, nitid, 1-seeded, about 5 cm. long, 3 cm. broad with a margin 2–3 mm. wide, 2 cm. thick, the valves 1.5–2 mm. thick; seed red or reddish brown, ellipsoid, about 2.5 cm. long and 1.7 cm. in diameter, the hilum elongate, 20 mm. long and 1.5–2 mm. wide.

TYPE LOCALITY: Maroni River, French Guiana. Lectotype collected by Wachenheim (no. 88), cited below.

DISTRIBUTION: Known only from the region of the lower Maroni (=Marowijne) and Mana rivers, in French Guiana and Surinam.

FRENCH GUIANA: Maroni, *Melinon* 92 (P), s.n. in 1863 (BM, K, NY, P, US), s.n. in 1864 (BM, GH, K); *Wachenheim* 88 (P lectotype), 305 (K, P). St. Jean, *Benoist* 877 (P). Mana, *Bur. For. & Agr. Guyan.* 7335 (NY), 7357 (NY).

SURINAM: Marowijne R., *Bosbeheer* 609 (U). Nassau, *Lanjouw & Lindeman* 2958 (K, NY, U). Bigieston, Marowijne R., *Lanjouw & Lindeman* 3451 (K, NY, U). Montecattinisoord, Marowijne R., *Wullschlägel* 1439 (BR, U fragment ex BR).

LOCAL NAMES: Nekooudou, panacoco blanc de Marecage, San Martin blanc (French Guiana); agiti (Surinam).

This species, known only from a limited area of French Guiana and Surinam, is less robust and smaller in flower, fruit, and seed than its close relative, *O. coutinhoi*.

Pierce (*Trop. Woods* 71:2. 1942) suggested that *O. cinerea* probably was referable to *Macroule* and annotated several herbarium sheets with the combined name. He did not, however, officially publish the combination. As indicated earlier in this paper, I do not believe that segregation of the two species, *O. coutinhoi* and *O. cinerea*, into a separate genus is desirable.

Of the two Wachenheim collections cited by Benoist, nos. 88 and 305, both in flower, no. 88 is chosen as lectotype; the packet on that sheet contains a dissected flower, probably the basis of the original floral description.

Section II. *Unicolores*

Ormosia section *Unicolores* Amsh. Meded. Bot. Mus. & Herb. Rijks. Univ. Utrecht 52:48. 1939.

Ormosiopsis Ducke, Arch. Jard. Bot. Rio de Janeiro 4:61. 1925.

Ormosia section *Bicolores* Ducke subsection *Unicolores* (Amsh.) Ducke, Ann. Acad. Bras. Sc. 11:187. 1939.

Ormosia section *Unicolores* (Amsh.) Ducke, Bol. Tecn. I.A.N. Belem 18: 154. 1949.

Shrubs or trees; leaves (1-) 3-11-foliolate, the leaflets with blades coriaceous or subcoriaceous, essentially glabrous at maturity, the secondary veins about 5-9 pair, arcuate, only approximately parallel; fruit dehiscent, the valves coriaceous or sublignous, glabrous or nearly so at maturity; seeds small to medium-sized, 7-15 mm. long, unicolorous red or black, the hilum elliptic, 1.2-3 mm. long and 0.8-1.5 mm. wide.

The seven species included in this section seem to form a natural group, differing from one another chiefly in details of flower, fruit, and seed size and in shape of leaflets. One species, *O. flava*, differs in being black-seeded.

Although Ducke originally reduced the rank of *Unicolores* from section to subsection, later, in 1949, he indicated sectional status for the group, with the previous circumscription but without citing Amshoff as author.

Two species, *O. holerythra* and *O. melanocarpa*, were ascribed to this section by Amshoff. The older of the two, *O. holerythra*, is herewith designated as lectotype.

Ormosiopsis is not considered to be generically distinct and is being reduced to *Ormosia*. The chief basis of separation was the position of the stigma, lateral in *Ormosia*, terminal in *Ormosiopsis*. Actually, the so-called terminal stigmas of *Ormosiopsis* frequently are oblique, and are sometimes found in flowers of unquestioned "good" *Ormosia* species.

3. *Ormosia flava* (Ducke) Rudd, comb. nov.

FIGURE 3

Clathrotropis ? *flava* Ducke, Arch. Jard. Bot. Rio de Janeiro 3 : 134. 1922.

Ormosiopsis flava (Ducke) Ducke, Arch. Jard. Bot. Rio de Janeiro 4 : 61, pl. 25a, b. 1925.

Clathrotropis ? *surinamensis* Kleinh. Rec. Trav. Bot. Néerl. 22:61, fig. 11. 1925.

Tree, to about 35 m. tall; young stems ferrugino-pubescent, the hairs subappressed, glabrate; stipules minute, deltoid, about 0.5 mm. long; leaves 5-11-foliolate, the axis about 7-15 cm. long, moderately appressed-pubescent, glabrescent, the petiole 2-3 cm. long, the pairs of leaflets 2-3 cm. apart, the petiolules 3-5 mm. long, 1-2 mm. in diameter, the blades coriaceous or subcoriaceous, elliptic or oblong-elliptic, 4-14 cm. long, 2-6 cm. broad, acute or broadly acuminate,

the acumen to about 1 cm. long, the base obtuse, the upper surface glabrous, nitid or subnitid, the lower surface ferrugino-sericeous along the midvein, otherwise glabrous or nearly so, the secondary veins inconspicuous, usually 8 or 9 pair, arcuate, irregularly spaced, about 5–15 mm. apart, forming angles of about 50°–60° with the midvein; inflorescences with axes ferrugino-pubescent with subappressed hairs, the bracts and bracteoles deltoid or linear-deltoid, about 1 mm. long or less; flowers 15–18 mm. long; calyx 8–12 mm. long, ferrugino-sericeous, the tube 6–10 mm. long, 5–7 mm. in diameter, the teeth about 2 mm. long; petals yellow, the standard sometimes with a red spot; fruit dehiscent, coriaceous or sublignous, reddish brown or dark brown, glabrous at maturity, 1–3-seeded, about 3–5 cm. long, often appearing stipitate due to abortion of the basal ovules, about 1–2 cm. broad, slightly constricted between the seeds, 1.5–1.7 cm. thick, the valves about 1–1.5 mm. thick; seeds black, 10–14 mm. long, 9–14 mm. wide, 9–12 mm. thick, the hilum elliptic, 1.5–2 mm. long and 1–1.5 mm. wide.

TYPE LOCALITY: Rio Branco de Obidos, Pará, Brazil. Lectotype collected by Ducke (MG no. 16955), cited below.

DISTRIBUTION: Surinam and lower Amazon basin of Brazil, on "terra firma."

SURINAM: Forest Reserve, Sectie O, Arbor no. 849, *For. Bur. Sur.*, [Herb. no. 2834] (BR, K, NY, US, isotypes of *C. surinamensis*). Brownsberg, Arbor no. 1095, *For. Bur. Sur.* [Herb. no. 1710] (K, NY).

BRAZIL: PARÁ: Belém, Bosque Municipal, *Ducke* 1714 (A, F, K, MG, NY, US), 1721 (A, F, K, MG, NY, US); *da Silva* 87 (P); *Pires & Black* 30 (P). Rio Tapajoz, Cach. do Mangabal, *Ducke* [MG no.] 16746 BM, (FM Neg. 28035 ex G, MG syntype of *C.? flava*, US). Rio Tapajoz, Pimental, *Ducke* [MG no.] 16779 (BM, MG syntype of *C.? flava*, US), [RB no.] 17081 (K, US). Rio Tapajoz, Francez, *Ducke* [RB no.] 17080 (K, US). Rio Branco de Obidos, *Ducke* [MG no.] 16955 (BM, MG lectotype of *Clathrotropis? flava*). Benevides, *Fr. Lima* [MG no.] 11834 (MG, US). Castanhal, Colonia 3 de Outubro, *Pires & da Silva* 4455 (NY, P). Rio Guamá, Ourem, *Pires & da Silva* 4631 (NY). MARANHÃO: Mata da Cachoeira, Rio Maracassumé, *Fróes* 1913 (F, K, NY, U, US).

LOCAL NAMES: Tatebojotok [Arawak], arieshie ie [Carib] (Surinam, fide Amshoff); tento preto (Pará, Brazil); sucupira branca (Maranhão, Brazil).

Black seeds and predominantly yellow flowers identify *O. flava* as unique among the American species of *Ormosia*. In Asia, however, there are several black-seeded species, and yellow or white flowers are not uncommon. The curved style with a lateral, bilobed stigma, as is characteristic of the genus *Ormosia*, is somewhat modified in this species; the style may be straight, or slightly curved, and the stigma may be terminal, or oblique with one lobe terminal, the other lateral.

Vegetatively, *O. flava* is essentially identical with the other species of section *Unicolores*.

Examination of type material of *C. surinamensis* shows that species to be conspecific with *O. flava*.

Of the three collections cited by Ducke in the original description of *C. flava*, on which this species is based, *Ducke* no. 16955, at MG, has been chosen as lectotype; that sheet alone bears a black seed, the outstanding character of the species. The other sheets, with flowers and fruits only, are less distinctive.

Walter Egler, in his list of Ducke's types (Bol. Mus. Emilio Goeldi II. Bot. 18 : 63. 1963), cites the sheet RB 17111 (MG 11834). It was not, however, cited in the original description of *Clathrotropis? flava*, the basionym of this species, and cannot correctly be designated as type.

4. ***Ormosia melanocarpa*** Kleinh. Rec. Trav. Bot. Néerl. 22 : 391. 1926. FIGURE 3

Tree; young stems fulvo- or ferrugino-pubescent with appressed hairs, glabrescent; stipules minute, deltoid, pubescent, scarcely 1 mm. long, caducous; leaves 7-11-foliolate, the axis about 8-10 cm. long, tomentulose, glabrescent, the petiole 3-5 cm. long, the pairs of leaflets 2-2.5 cm. apart, the petiolules 3-5 mm. long and 1-1.5 mm. in diameter, the blades subcoriaceous, ovate to elliptic-oblong, 5-11 cm. long, 3-5 cm. broad, the apex breviacuminate, the base rounded, the upper surface glabrous, nitid, the lower surface glabrous or minutely and sparsely appressed-pubescent, the major secondary veins inconspicuous, about 7-9 pair, irregularly spaced, forming angles of 40°-50° with the midvein; inflorescence with axes fulvo-pubescent, the hairs mostly appressed, the bracts deltoid-ovate, about 1 mm. long and 1 mm. broad, the bracteoles linear, mostly less than 1 mm. long; flowers about 6 mm. long; calyx about 4 mm. long, fulvous, appressed-pubescent, the tube about 3 mm. long and 2 mm. in diameter, the teeth about 1 mm. long; corolla dark brown (fide Kleinhoonte); fruit dehiscent, coriaceous, black or blackish brown, glabrous, nitid, 1- or 2-seeded, 2-3 cm. long, 1.3-1.8 cm. broad, scarcely constricted between the seeds, 8-9 mm. thick, the valves 1-2 mm. thick; seeds dark red, 7-9 mm. long, 6-8 mm. broad, and 6 mm. thick, the hilum elliptic, about 1.2 mm. long and 0.8 mm. wide.

TYPE LOCALITY: In Forest Reserve, "Sektion O," Surinam. Type from tree no. 775, (Herb. no. 4699, without collector's name), cited below.

DISTRIBUTION: In forest on sandy ridges, French Guiana and Surinam.

FRENCH GUIANA: Charvein, *Benoist* 212 (P).

SURINAM: Forest Reserve, "Sektion O," tree no. 775, *For. Bur. Sur.* [Herb.

no. 1409] (U), [Herb. no. 2391] (U), [Herb. no. 4699] (K, NY, U type), [Herb. no. 5015] (K, NY). Perica R., Commewijne, *Lindeman* 5358 (U, US).

LOCAL NAMES: St. Martin jaune (French Guiana); agipau, awaakoko, barakaro korero ibibero iwi, kokriki (Surinam).

The flowers, fruit, and seeds of this species are smaller than average for the genus, as well as for the section *Unicolores*. It has been especially helpful in preparing a description to have material in flower and fruit known to be from the same tree. Otherwise, *O. melanocarpa* has been little collected.

A holotype was not indicated in the original description, but the collection cited above has been so designated in the herbarium at Utrecht, presumably by the author of the species.

5. *Ormosia grandiflora* (Tul.) Rudd, comb. nov.

FIGURE 3

Diplostropis grandiflora Tul. Arch. Mus. Par. 4 : 109. 1844.

Clathrotropis grandiflora (Tul.) Harms, Engl. Bot. Jahrb. 33, Beibl. 72 : 27. 1903.

Ormosiopsis triphylla Ducke, Arch. Jard. Bot. Rio de Janeiro 5 : 133. 1930.

Ormosiopsis cuspidata Pierce ex Macbride, Field Mus. Pub. Bot. 13 : 247. 1943.

Tree or shrub to about 10 m. tall; young stems ferrugino- or fulvo-pubescent with short, subappressed hairs, glabrate; stipules linear, pubescent, about 1 mm. long, caducous; leaves (1-) 3-5-foliolate, the axis 2-15 cm. long, moderately appressed-pubescent to glabrous, the petiole 1.5-6 cm. long, the pairs of leaflets 1-3.5 cm. apart, the petiolules about 4-10 mm. long and 1-2 mm. in diameter, the blades subcoriaceous, ovate, obovate, or elliptic, 5-20 cm. long, 3-9 cm. broad, the apex acuminate with acumen 6-20 mm. long, the base obtuse to acute, the upper surface glabrous, subnitid, the lower surface essentially glabrous, the secondary veins inconspicuous or slightly raised, about 5-8 pair, arcuate, irregularly spaced, 6-30 mm. apart, forming angles of 40°-50° with the midvein, the tertiary reticulations sometimes prominent; inflorescences with axes cano- to fulvo-pubescent with subappressed hairs, glabrate, the bracts linear-deltoid, 1-1.5 mm. long, the bracteoles linear, about 0.5 mm. long; flowers 15-20 mm. long; calyx 8-12 mm. long, moderately appressed-pubescent, glabrescent, the tube 4-6 mm. long, 6-7 mm. in diameter, the teeth 3-6 mm. long; petals dark purple (fide Klug), pale lilac (fide Ducke), or greenish yellow (fide Ferreyra); fruit dehiscent, coriaceous or sublignous, black or dark brown, sparsely appressed-pubescent, glabrate, 1- or 2-seeded, 3-5 cm. long, 1.3-2 cm. broad, slightly constricted between the seeds, 1.5-2 cm. thick, the valves about 1 mm. thick; seeds bright red, 7-12 mm. long, 10-14 mm. broad, and 6-11 mm. thick, the hilum elliptic, 2-3 mm. long, 1-2 mm. wide.

TYPE LOCALITY: Pará, Brazil. Type at P, presumably collected by A. R. Ferreira. Isotype cited below.

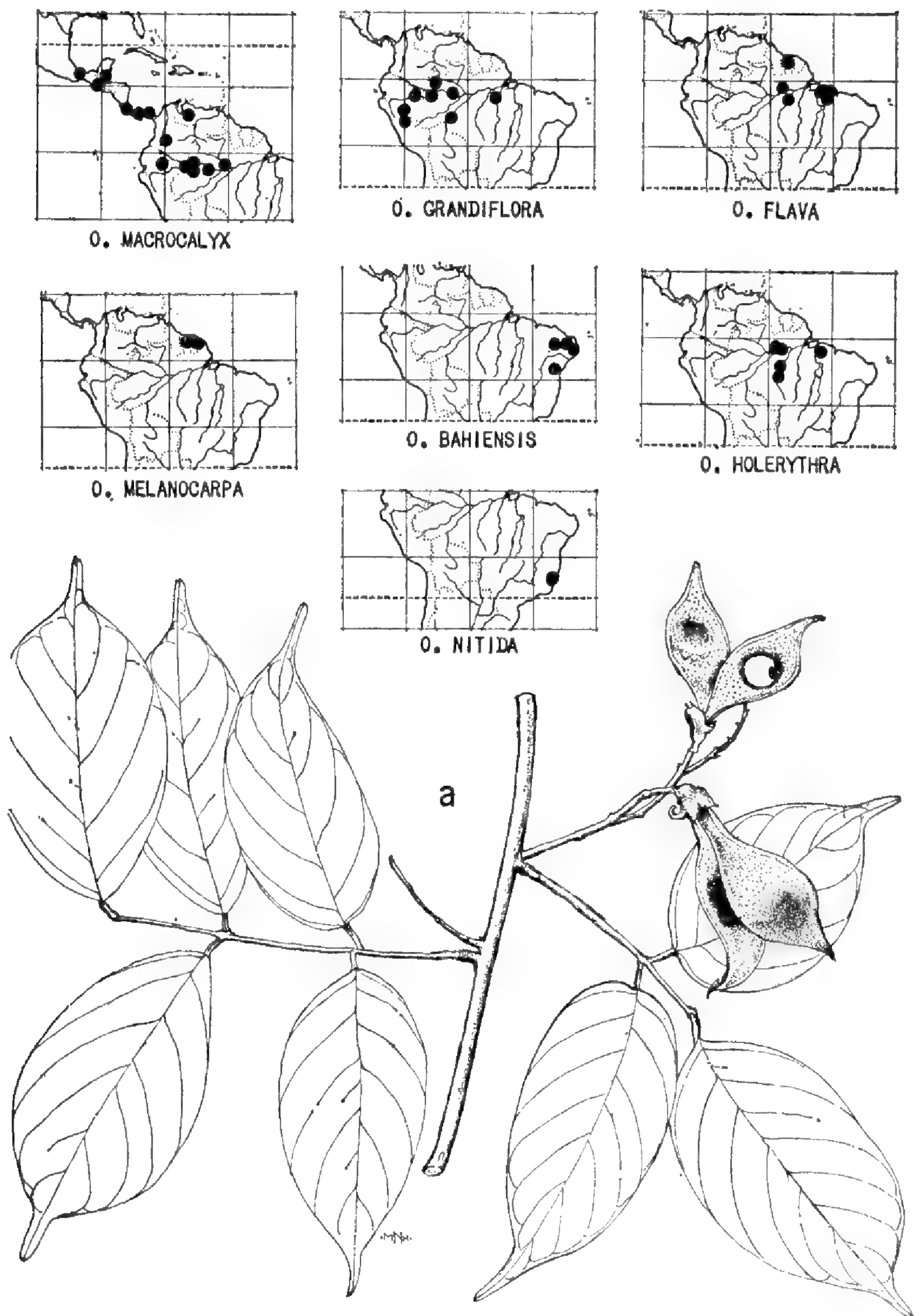


FIGURE 3.—*Ormosia* section *Unicolores*: Geographic distribution of species; *O. grandiflora*: a, portion of branch showing leaves, fruit, and seed, $\times \frac{1}{2}$.

DISTRIBUTION: In woods, "terra firma," Amazon basin in Peru and Brazil.

PERU: LORETO: Yurimaguas, Killip & Smith 29068 (A, NY type of *Ormosiopsis cuspidata*, US). Pampa de Sacramento, between Tingo María and Pucallpa, Ferreyra 1188 (US). Mishuyacu, near Iquitos, Klug 1207 (US).

BRAZIL: AMAZONAS: Teffé, *Ducke* [RB no.] 17260 (US iso-syntype of *O. triphylla*). Jauareté, S.P., Vaupés, *Fróes* 21158 (F, IAN, K, M, NY, US). São Paulo de Olivença, *Fróes* [*Krukoff*] 12081 (A, F, NY, US). Basin of the Rio Madeiro, *Lobo* [*Krukoff* Herb. no.] 15458 (NY). RONDÔNIA [Guaporé]: Pôrto Velho, *da Silva* 366 (US). PARÁ: Without exact locality, *A. R. Ferreira* s.n. (K isotype of *D. grandiflora*). Santa Julia, *Ducke* [RB no.] 20367 (NY, US, iso-lectotypes of *O. triphylla*).

LOCAL NAME: Tento (Brazil).

Examination of flowering material of *Ducke* 20367 and *Klug* 1207, shows the stigma to be bilobed and oblique to lateral, as is characteristic of *Ormosia*. The isotype of *Diploctropis grandiflora* examined at K is also a flowering specimen but the stigmas have been broken from the styles. The other collections cited above, all in fruit or seed, including the type of *Ormosiopsis cuspidata*, are similar vegetatively, varying slightly in prominence and angle of venation of the leaflets and in shape of the leaflet base. In general, this taxon closely resembles other members of the section of *Ormosia* to which it is being transferred in this paper.

As lectotype of *Ormosiopsis triphylla*, *Ducke* 20367, in flower, has been chosen rather than the other syntype, *Ducke* 17260, with weathered fruit, and with seeds that vary from sheet to sheet, possibly not belonging to this collection.

6. *Ormosia bahiensis* Monachino, *Phytologia* 4: 36. 1952.

FIGURE 3

Tree about 10 m. high; young stems fulvo- to cinereo-pubescent with subappressed hairs; stipules linear-deltoid, about 2–3 mm. long and 1 mm. broad, or less, caducous; leaves 5–7-foliolate, the axis about 8–12 cm. long, glabrous or nearly so, the petiole 3–4 mm. long, the pairs of leaflets 3–4 cm. apart, the blades coriaceous, ovate to elliptic, 6–11 cm. long, 2.5–7 cm. broad, the apex acute or brev acuminate, the base subcordate or rounded, the upper surface glabrous, nitid, the lower surface glabrous or sparsely pubescent along the midvein, the secondary veins moderately conspicuous, about 6–8 pair, forming angles of about 55°–60° with the midvein; inflorescences with axes fulvo- to ferrugino-pubescent with subappressed hairs, the bracts linear to deltoid, about 2 mm. long, scarcely 1 mm. broad, the bracteoles linear, about 1 mm. long; flowers 8–10 mm. long; calyx 6–7 mm. long, subvelutinous with subappressed, fulvous hairs, the tube 3–4 mm. long and about 5 mm. in diameter, the teeth about 3 mm. long; petals purplish; fruit dehiscent, carnose-coriaceous, sometimes somewhat lignous, black, glabrous, nitid, 1–4-seeded, 4–5 cm. long, 2.5–3.7 cm. broad, little constricted between the seeds, about 2 cm. thick, the valves 3–4 mm. thick; seeds red, 11–13 mm. long, 10 mm. broad, 8–9 mm. thick, the hilum elliptic, about 1.2 mm. long and 1 mm. wide.

TYPE LOCALITY: "Carrasco" dry land, Andaraí, Bahia, Brazil.
Type collected by Fróes (no. 12629), cited below.

DISTRIBUTION: In dry woodland, northeastern Brazil.

BRAZIL: PARÁIBA: Areia, *Moraes* 893 (IAN, NY, P). PERNAMBUCO: Rio Gurjaú, *Ducke & Lima* 106 (IAN, R). Tuima, *Lima* 52-997 (IAN, R). Usina Agua Branca, *Gomes Leal e Octavio* 206 (RB, US). Usina Capiberibe, Recife, *Lima* s.n. (IAN). BAHIA: Andaraí, *Fróes* 12629 (A, CAS, DS, NY type).

LOCAL NAMES: Mongoló (Bahia); murta preta (Paráiba); brauna do mata, sucupira baraquim (Pernambuco).

As indicated in the key, the relatively fleshy fruits of this species help to distinguish it from others of the section.

7. *Ormosia holerythra* Ducke, Arch. Jard. Bot. Rio de Janeiro 4:61. 1922.

FIGURE

Ormosia tapajosensis Pires, Bol. Técn. Inst. Agron. No. 38 : 25. 1960.

Shrub or tree to about 5 m. high; young stems fulvo-pubescent with subappressed hairs, glabrescent; stipules linear-deltoid, 1.5-2 mm. long, caducous; leaves 5-11-foliolate, the axis 8-30 cm. long, glabrous or sparsely appressed-pubescent, the petiole about 3-6 cm. long, the pairs of leaflets 2-5 cm. apart, the petiolules 3-7 mm. long and about 2 mm. in diameter, the blades coriaceous, ovate to elliptic-oblong, 3.5-14 cm. long, 2.5-5 cm. broad, the apex bluntly acuminate, the acumens (5-) 10-20 mm. long, the base rounded, usually obliquely, or subcordate, the upper surface glabrous, nitid, the lower surface glabrous or nearly so, the secondary veins inconspicuous, 5 or 6 pairs irregularly spaced, forming angles of about 50°-60° with the midvein; inflorescences with axes cinereo- to fulvo-puberulent, the bracts linear deltoid, attenuate, 1.5-2.5 mm. long, 0.5 mm. broad at the base, the bracteoles linear, about 1 mm. long; flowers about 10 mm. long, the calyx 6-7 mm. long, cinereo-puberulent, the tube about 2 mm. long and 4 mm. in diameter, the teeth 4-5 mm. long; petals dark reddish purple; fruit dehiscent, coriaceous, black, glabrous, nitid, 1-3-seeded, 4-6.5 cm. long, 2.5-3.6 cm. broad, somewhat constricted between the seeds, 1.5-2 cm. thick, the valves 1.5-2 mm. thick; seeds red, 12-15 mm. long, 10-12 mm. broad, and 8-9 mm. thick, the hilum elliptic, about 2 mm. long and 1 mm. wide.

TYPE LOCALITY: "In arenosis siccis Campinas do Achipicá," near Rio Trombetas, Pará, Brazil. Type collected by Ducke ("Herbario Amazon. Mus. Paraensis" no. 10944), cited below.

DISTRIBUTION: "Terre firme," dry sandy soil, secondary forest, Pará, Brazil.

BRAZIL: PARÁ: Obidos, *Barbosa Rodrigues* [R no.] 64377 (R); *Ducke* [RB no.] 20366 (RB, S, U). Rio São Manoel, Cachoeira do Caldeirão, above Igarapé Preto, *Pires* 3823 (IAN, NY). Campinas do Achipicá, near Trombetas, *Duc*

[MG no.] 10944 [RB no. 17112] (RB type, S, U). Rio Capim, *Fróes & Pires* 24162/74 (IAN). Arboretum IAN (cultivated, from Villa Nova, upper Tapajos R.), *J. S. Rodrigues* 205 (IAN, type of *O. tapajosensis*, US), 206 (IAN, US); *Pires* 7643 (IAN).

LOCAL NAMES: Pau do tentos, tento.

Examination of specimens cited by the authors of *O. holerythra* and *O. tapajosensis* shows the two species to be synonymous. The type of the former appears to be somewhat depauperate in comparison with the type of *O. tapajosensis*, which was taken from a tree in cultivation.

The type of *O. holerythra*, although originally cited as located in the Amazonian Herbarium, was later transferred by Ducke to the herbarium of the Jardim Botânico, Rio de Janeiro.

8. *Ormosia nitida* Vog. *Linnaea* 11 : 405. 1837, non sensu Bentham 1862, non Prain ex King 1897. FIGURE 3

Tree 10–12 m. high; young stems finely appressed-pubescent with fulvous hairs, glabrescent; stipules deltoid, pubescent, about 1 mm. long, caducous; leaves 5–9-foliolate, the axis about 6–17 cm. long, glabrous or nearly so, the petiole 2–5 cm. long, the pairs of leaflets about 2–5 cm. apart, the petiolules 5–7 mm. long and 1 mm. in diameter, the blades subcoriaceous, ovate to elliptic-oblong, 4–10 cm. long, 1.5–4.5 cm. broad, the apex acute to breviacuminate, the base rounded to acute, the upper surface glabrous, nitid, the lower surface glabrous with major secondary veins moderately evident, about 5–7 pair, irregularly spaced, 5–15 mm. apart, forming angles of 40°–50° with the midvein; inflorescences with axes appressed-pubescent with fulvous to cinereous hairs, glabrate, the bracts deltoid, attenuate, 1–2 mm. long, the bracteoles linear, about 1 mm. long; complete flowers not seen, probably 10–15 mm. long; calyx 7–10 mm. long, appressed-pubescent with fulvous hairs, the tube 4–5 mm. long, 5–6 mm. in diameter, the teeth 3–5 mm. long; fruit dehiscent, coriaceous, black, glabrous, 1–3-seeded, 4–6 cm. long, 2.5–3.5 cm. broad, slightly constricted between the seeds, 8–10 mm. thick, the valves 1–2 mm. thick; seeds scarlet, about 12 mm. long, 10 mm. broad, and 8 mm. thick, the hilum elliptic, about 2 mm. long and 1 mm. wide.

TYPE LOCALITY: "Vittoria-Bahia," probably in Espírito Santo, Brazil. Type collected by Sellow (no. 510), cited below.

DISTRIBUTION: Known only from the general area of the type locality.

BRAZIL: Without exact locality, *Sellow* s.n. in 1815–17 (BM), 820 (BM). ESPÍRITO SANTO?: "Vittoria-Bahia," *Sellow* 510 (F fragment, presumably of type ex B; F.M.Neg. 1913 of type ex B). ESPÍRITO SANTO: Lagôa do Juparaná, Linhares, Rio Dôce, *Kuhlmann* 110 (K, RB, U, US).

LOCAL NAME: Tento.

Ormosia nitida Prain ex King (Journ. As. Soc. Bengal 66 : 149. 1897) is a homonym of *O. nitida* Vog. and was superseded by the new name *O. polita* Prain (Journ. As. Soc. Bengal 69 : 184. 1900). *Ormosia nitida* sensu Bentham is actually *O. arborea* (Vell.) Harms. The misinterpretation was recognized by Harms (Repert. Sp. Nov. Fedde 19 : 288. 1924) who cited the type of *O. nitida* Vog. as *Sellow* no. 510. That specimen, at Berlin, presumably is no longer extant but it is represented by a photograph, no. 1913, of the Field Museum series, and by a fragment at F.

In general, on the basis of incomplete material, this species appears to be most closely related to *O. macrocalyx*, but, because of the geographic separation and minor differences, as indicated in the key, I believe that, for now, at least, the two taxa should not be combined.

9. *Ormosia macrocalyx* Ducke, Arch. Jard. Bot. Rio de Janeiro 3:137. 1922.

FIGURE 3

Ormosia apulensis Cortés, Flora de Colombia, 61. 1919, nomen nudum.

Ormosia toledoana Standl. Carnegie Inst. Publ. 461:64. 1935.

Ormosia chlorocalyx Ducke, Bol. Téc. Inst. Agron. Belém, 2:23. 1944.

Tree to about 40 m. high; young stems finely pubescent with subappressed hairs, glabrate; stipules linear, about 5 mm. long, caducous; leaves 7–11-foliolate, the axis 10–45 cm. long, sparsely pubescent, glabrate, the petiole 4–10 cm. long, the pairs of leaflets 2.5–5 cm. apart, the petiolules 6–8 mm. long, 1.5–3 mm. in diameter, the blades coriaceous or subcoriaceous, ovate to ovate-oblong, 6–19 cm. long, 3–9 cm. broad, the apex obtuse to breviacuminate, the base rounded to subcordate, the upper surface glabrous, nitid or subnitid, the lower surface glabrous, the secondary veins inconspicuous, about 5–8 pair irregularly spaced, about 10–15 mm. apart, forming angles of about 40°–60° with the midvein; inflorescences with axes cinereo- to fulvo-pubescent with appressed hairs, the bracts linear, 3–10 mm. long, 1 mm. broad or less, the bracteoles subulate, 1–1.5 mm. long; flowers 18–25 mm. long; calyx 8–15 mm. long, pubescent with gray, subappressed hairs, the tube (3-) 8–10 mm. long, 8–10 mm. in diameter, the teeth 3–5 mm. long; petals lilac to dark purple; fruit dehiscent, coriaceous, black or brown, glabrescent but often with considerable fine, fulvous pubescence at maturity, 1–6- (commonly 2- or 3-) seeded, 3–10 cm. long, 2–3.5 cm. broad, slightly constricted between the seeds, 10–15 mm. thick, the valves 1.5–2 mm. thick; seeds red, 10–13 mm. long, 10 mm. broad, 7–8 mm. thick, the hilum elliptic, 1.2–1.5 mm. long, 1 mm. wide.

TYPE LOCALITY: Lake Teffé, Amazonas, Brazil. Type collected by Ducke (no. 7345), cited below.

DISTRIBUTION: In wet, swampy forest, "igapo," southern Mexico to the Amazon basin of Brazil, at elevations up to about 100 meters.

MEXICO: VERACRUZ: Fortuño, Río Coatzacoalcos, *Ll. Williams* 8926 (F, G, K, S, U, US). TABASCO: Cocoital, Comalcalco, *Guzmán* s.n. (US).

GUATEMALA: ESCUINTLA: "Lower coast," *Pettersen* 9984 (NY).

BRITISH HONDURAS: TOLEDO: Forest Home, *Schipp* 1052 (A, BM, F type of *O. toledoana*, G, GH, K, MO, NY, S, UC, US).

COSTA RICA: HEREDIA: Muella de San Carlos, *Holdridge* 5203 (F).

PANAMÁ: BOCAS DEL TORO: Changuinola Valley, *Cooper & Slater* 125 (A, GH, NY, US, Y). CHIRIQUÍ: Progreso, *Cooper & Slater* 243 (F, GH, NY, US, Y). CANAL ZONE: ANCON (cultivated), *Schubert & Lindsay* 602 (US). Paraíso Sta., *Hayes* 522 (BM, BR, K, M). PANAMÁ: Chepo, *Kluge* 14 (US, Y).

CUBA: LAS VILLAS: Cienfuegos, Soledad (cultivated, introduced from Panamá). *Atchison* 66 (US); *Gonzales* s.n. (SI, US); *Walsingham* [Krukoff Herb. no.] 15153 (NY), s.n. (NY).

VENEZUELA: COJEDES: Between Campo Carabobo and San Carlos, *Aristeguieta* 3252 (US, VEN). PORTUGUESA: Píritu, *Brito* 40 (VEN). BARINAS: Barrancas, *Díaz* 3 (MER, US); *Ruiz-Terán & Marcano-Berti* 1172 (MER, US).

COLOMBIA: AMAZONAS: Río Loretoyacu, *Schultes* 6088 (F, US). CUNDINAMARCA: Río Apulo, *Triana* 4336 (BM, isotype of *O. apulensis*).

PERU: LORETO: Gamitanococha, Río Mazán, *Schunke* 214 (A, F, NY, US).

BRAZIL: AMAZONAS: Paraná do Careiro, *Ducke* 1998 (A, MG, NY, R, SI, U, US), 2133 (MG, R, SI). Lago do Genipapo, Rio Javari, *Fróes* [Krukoff] 12083 (A, DS, F, NY, US). Rio Tonantins, *Fróes* [Krukoff] 12206/119 (A, F, NY, SI, US), 12208/121 (A, F, NY, SI, US). Manaus, Paraná do Xiborema, *Fróes* 29622 (IAN, NY, US), 29638 (IAN, NY, UC, US); Manaus, Rio Janoeiré, *Corner* 5 (IAN). Manaus, *Ducke* [RB no.] 24060 (F, G, K, NY, P, RB, S, U, US). Camatian, *Fróes* 24047 (IAN, NY, US), 23982 (IAN, NY). Lago Teffé, *Ducke* 7345 (BM isotype). Rio Teffé, Assahituba, *Fróes* 26114 (IAN, NY, US). Esperança, Rio Solimões, "boca do Javari," *Ducke* 1516 (A, F, K, MG type of *O. chlorocalyx*, NY, R, SI, US).

LOCAL NAMES: Colorín, caracolillo (Mexico); alcornoque, casique, pernila del monte (Panamá); chocho grande (Colombia); tento (Brazil); huyruro (Peru).

According to Egler (Bol. Mus. Par. Emilio Goeldi II. 18 : 63. 1963), the type of *O. macrocalyx* is at MG. I have not seen that specimen but an isotype from BM has been available for study.

The collections previously assigned to *Ormosia apulensis*, *O. chlorocalyx*, and *O. toledoana* all appear to be conspecific with *O. macrocalyx* although there are minor differences, especially in leaflet characters. The material from Panamá, for example, commonly has subcoriaceous, subnitid leaflets, blunt at the apex; collections from Brazil mostly have coriaceous, nitid leaflets, with acute to brev acuminate tips. The variations are not consistent, however. The flower color varies somewhat, from lilac to dark purple.

Specimens from Panamá and Cuba, the latter introduced from Panamá, have been erroneously identified and distributed as *O.*

panamensis. Examination of the type of *O. panamensis* shows it to be a distinct species.

One of the Mexican collections cited above as *O. macrocalyx*, *Ll. Williams* 8926, was included as a paratype in the original description of *O. isthmensis* but with the note that it "exhibits some differences from the type, and it is possible that it really represents a different species."

Section III. *Ormosia*

Ormosia Jacks. Trans. Linn. Soc. London 10 : 360. 1811. Nom. cons.

Toulichiba Adans. Fam. 2 : 326. 1763. Nom. rejec.

Ormosia, *Concolores* [rank not designated] Benth. in Mart. Fl. Bras. 15(1) : 315. 1862.

Ormosia, *Discolores* [rank not designated] Benth. in Mart. Fl. Bras. 15(1) : 318. 1862.

Ormosia section *Concolores* (Benth.) Taub. in Engler & Prantl Natur. Pflanzenfam. 3(3) : 194. 1892.

Ormosia section *Discolores* (Benth.) Taub. in Engler & Prantl Natur. Pflanzenfam. 3(3) : 194. 1892.

Ormosia subgenus *Toulichiba* (Adans.) Prain, J. As. Soc. Beng. 69 : 176. 1900.

Ormosia section *Flavae* Ducke, Arch. Jard. Bot. Rio de Janeiro 3 : 135. 1922.

Ormosia section *Bicolores* Ducke, Arch. Jard. Bot. Rio de Janeiro 3 : 135. 1922.

Ormosia section *Bicolores* subsection *Subglobosae* Ducke, Ann. Acad. Bras. Sc. 11 : 187, 192. 1939.

Ormosia section *Bicolores* subsection *Vulgares* Ducke, Ann. Acad. Bras. Sc. 11 : 187, 192. 1939.

Trees or shrubs; leaves (1-) 3-19-foliolate, the leaflets with blades coriaceous or subcoriaceous, essentially glabrous above at maturity but usually pubescent below, tomentose, velutinous, sericeous, or subfarinose, sometimes glabrate, the secondary veins about 10-50 pairs essentially straight and parallel; fruit dehiscent, glabrous to densely velutinous, the valves lignous, sublignous, or coriaceous; seeds small to large, 8-25 mm. long, unicolored red to yellow, or bicolored, red and black, or yellowish with red, the hilum elliptic, 1-5 mm. long.

This section is typified by *O. coccinea* (Aubl.) Jacks., the type of the genus.

The large majority of American species of *Ormosia* have black and red, bicolored seeds, and belong to this section. Several species included here have seeds that are unicolored, red, or yellow, but in other characters show closer relationship to the typical species of the section than to members of section *Unicolores*.

All of the species in Bentham's *Concolores* and *Discolores*, separately on the basis of leaflet pubescence, are referable to section *Ormosia* as interpreted in this paper.

Series 1. *Excelsae* Rudd, ser. nov.

Ormosia section *Flavae* Ducke, Arch. Jard. Bot. Rio de Janeiro 3 : 135. 1922.

Ormosia section *Bicolores* subsection *Subglobosae* Ducke, Ann. Acad. Bras. Sc. 11 : 187, 192. 1939, in part.

Ormosia section *Bicolores* subsection *Vulgares* Ducke, Ann. Acad. Bras. Sc. 11 : 187, 192. 1939, in part.

Arbores vel arbusculae; fructus indehiscens nonnumquam tarde dehiscens, valvulis coriaceis vel sublignosis, pubescentibus, saepe glabratis; semina unicolora flava vel coccinea aut bicolora, flava macula rubra notata, aut bicolora, coccinea macula nigra notata, hilo elliptico, 2.5–5 mm. longo.

Chief distinguishing characters of this group of species are the indehiscent fruits, usually opening only by decay, and the seeds with hila relatively longer than in other species of section *Ormosia*. The members of this series may be transitional to other groups, yet they seem to show closer relationships to one another.

The type of this series is *O. excelsa* Spruce ex Benth., which bears the oldest specific name, and is also the type of Ducke's section *Flavae*.

10. *Ormosia excelsa* Spruce ex Benth. in Mart. Fl. Bras. 15(1) : 318. 1862.

FIGURE 4

Sclerolobium polyphyllum Benth. ex Ducke, Arch. Jard. Bot. Rio de Janeiro 4 : 61. 1925, nomen in synon.

Tree to about 15 m. high; young stems ferrugino-tomentose; stipules linear, attenuate, 3–4 mm. long, 1 mm. wide at the base or less, tomentose, caducous; leaves 11–19-foliolate, the axis about 8–20 cm. long, fulvo- to cano-tomentose, the petiole 4–7 cm. long, the pairs of leaflets about 1–2.5 cm. apart, the petiolules 2–3 mm. long and 1 mm. in diameter, the blades coriaceous or subcoriaceous, ovate or obovate to oblong, about 2–9 cm. long, 2–4 cm. broad, the lower leaflets frequently much smaller than the upper and terminal leaflets, the apex acute to acuminate, the base rounded to subcordate, the upper surface glabrous or sparsely pubescent, subnitid, the lower surface puberulent along the midvein, otherwise mostly glabrous, pallid, the secondary veins moderately conspicuous, about 9–11 pair, essentially parallel, 3–5 mm. apart, forming angles of about 60° with the midvein; inflorescences with axes densely pallido- to fulvo-tomentose, the bracts deltoid to linear, attenuate, about 4–5 mm. long, 1 mm. broad or less, the bracteoles linear, about 3 mm. long; flowers 15–18 mm. long; calyx densely pallido-tomentose, 7–10 mm. long, 5 mm. in diameter, the tube 4–5 mm. long, the teeth about 4–5 mm. long; petals lilac to purple; fruit indehiscent or tardily dehiscent, coriaceous, fulvo-pubescent or glabrate, dark brown, 1- or 2-seeded,

4–7 cm. long, 2.5–3.3 cm. broad, only slightly constricted between the seeds, 12–14 mm. thick, the valves 1.5–2 mm. thick; seeds pale yellow to orange, 15 mm. long, 10–15 mm. wide, 8 mm. thick, the hilum about 5 mm. long and 2 mm. wide.

TYPE LOCALITY: "Santarem-inund. forest by the Amazon," Pará, Brazil. Type collected by Spruce (no. 1068), cited below.

DISTRIBUTION: In inundated forest, "igapo," along the Amazon and Mamoré rivers, Brazil.

BRAZIL: PARÁ: Santarem, *Spruce* s.n. [probably no. 1068] (BM, C, F fragment ex B, F.M. Neg. 1907 ex B, K, M), 1068 (G, GH, K type, NY, P); *Ducke* [MG no.] 16361 [= RB no. 15493] (BM, G, MG, P, R, RB, S, U, US). Rio Jamunda, *Ducke* [MG nos.] 11726 (MG), 11740 (MG). Belterra, *Schultes & Lopez* 10293 (US). Oriximiná, *Ducke* [MG no.] 15902 (BM, G, MG, US). Rio Cumina below Trombetas, *Ducke* [MG nos.] 14836 (BM, MG, US), 14836a (G, MG), 15883 (BM, G, MG, US). Piriqueto, Rio Tapajos, *Ducke* [MG no.] 16401 (BM, MG). Boa Vista, Tapajos, *Capucho* 415 (F). Monte Alegre, *Fróes* 30572 (IAN, US), 30577 (IAN, US). Faro, *Ducke* 15915 (BM, G, MG, P, R, US); *Black & Ledoux* 50–10708 (IAN, NY, U). AMAZONAS: Manaus [as "Barra"], *Spruce* 1194 (M), 1450 (K, NY), s.n. (F. M. Neg. 1809 ex B); *Ducke* 145a (A, F, Y), 182 (A, F, K, MO, NY, R, S, US), 577 (F, GH, K, MG, MO, NY, R, SI, US); *Rodriguez & Chagas* 1318 (US). Parintins, *Ducke* 145 (A, F, NY, Y). Prainha, Rio Negro, *Fróes* 12016 (A, F, NY, SI, US). Maués, *Pires* 77 (IAN). Rio Urubú, *Fróes* 25422 (IAN, US). RONDÔNIA [Guaporé]: Rio Ouro Preto, *Kuhlmann* [RB no.] 18222 (S, U).

LOCAL NAMES: Itauba-rana, jatobahy do igapó, tento, tento amarello.

The leaves with numerous leaflets, the pallid pubescence of the inflorescence, and the indehiscent pods with yellow seeds make *O. excelsa* one of the most easily recognized species of the genus.

No collection number was cited in the original description but the Spruce collection, no. 1068 at K, annotated in both Spruce's and Bentham's handwriting, is obviously the type, and has been so assigned in that herbarium. Several other specimens distributed without number appear to be of the same collection and presumably are isotypes.

As pointed out by Ducke, specimens distributed as *Sclerolobium polyphyllum* (Spruce nos. 1194 and 1450) are referable to *O. excelsa*.

11. *Ormosia friburgensis* Taub. ex Harms, Fedde Rep. Spec. Nov. 19: 29. 1924. FIGURE

Ormosia friburgensis Taub. ex Glaziou, Bull. Soc. Bot. Fr. 53, Mem. 3b : 15. 1906, nomen nudum.

Ormosia getuliana Kuhlmann & Campos Porto, Arch. Jard. Bot. Rio de Janeiro 6 : 113, t. 13. 1933.

Tree about 4 m. high; young stems fulvo-tomentose; stipules not seen; leaves 7–13-foliolate, the axis about 7–12 cm. long, glabrous or subglabrous, the petiole 1–4 cm. long, the pairs of leaflets 1–2 cm.

apart, the petiolules 1–2 mm. long, 1 mm. in diameter, the blades subcoriaceous, mostly elliptic-oblong, about 2–8 cm. long, 1–3 cm. broad, the base and apex acute, the terminal leaflet sometimes obovate, the basal leaflets ovate, the upper surface glabrous, subnitid, the lower surface sericeous along the midvein, otherwise sparsely sericeous, glabrescent, often completely glabrous at maturity, the secondary veins relatively inconspicuous, about 10–12 pair essentially parallel, 2–5 mm. apart, forming angles of about 55° – 60° with the midvein; inflorescences with axes fulvo-tomentose, the bracts deltoid, 1–2 mm. long, the bracteoles linear, scarcely 1 mm. long; flowers 8–10 mm. long; calyx 4–5 mm. long, densely ferrugino-tomentulose, the tube 2–3 mm. long, 3 mm. in diameter, the teeth about 2 mm. long; petals purplish; fruit indehiscent, sublignous, transversely rugose, ferrugino-velutinous, 1- or 2-seeded, 2.5–4.5 cm. long, 3–3.5 cm. broad, slightly constricted between the seeds, about 2 cm. thick, the valves 1.5–2 mm. thick; seeds ellipsoid or globose, yellow to red or, sometimes, bicolored, yellowish and red, 17–25 mm. long, 18–25 mm. wide, and 17–20 mm. thick, the hilum about 4–5 mm. long and 1–1.5 mm. wide.

TYPE LOCALITY: "Au bord de la riviere," Nova Friburgo, Rio de Janeiro, Brazil. Type collected by Glaziou (no. 19045), cited below.

DISTRIBUTION: Along rivers; known only from the general area of the type collection and São Paulo.

BRAZIL: RIO DE JANEIRO: Nova Friburgo, *Glaziou* 19045 (F. fragm. of type ex B, F.M.Neg. 1910 ex B, K, P). Itatiaia, *Campos Porto* 2077 (RB, US iso-syntypes of *O. getuliana*), [RB no.] 17942 (US iso-syntype of *O. getuliana*); *Duarte de Barros* [Parque Nacional de Itatiaia Herb. no.] 1184 (MG, R, SI, US), 1212 (K, M, NY, P, U, US). SÃO PAULO: Socavão, near Bananal, *Manduca Palma* [R no.] 69343 (R, US).

LOCAL NAME: Olho de cabra grande.

The globose seeds, commonly bicolored yellowish and red, furnish a good character for recognizing this species. The coloration suggests a transition in the series from the completely yellow-seeded *O. excelsa* to the red and black seeded *O. minor*. The bicolored marking of the seeds of *O. friburgensis* shows the same design as is found in many species of *Ormosia*, including the type of the genus, *O. coccinea*.

Harms is correctly cited as the publishing author of Taubert's herbarium name rather than Glaziou because the latter's description "grand arbre, fl. roses" was essentially nude, being applicable to many species, of many families. Harms' description was based on the same collection although, presumably, the sheet at Berlin rather than the one at Paris. The Field Museum photograph, no. 1910 ex B, and a fragment at F probably is all that remains to represent the holotype.

12. *Ormosia williamsii* Rudd, sp. nov.

FIGURE 4

Arbuscula 6-8 m. alta; ramuli novelli ferrugino-tomentosi; stipulae deltoideae, tomentosae, acuminatae, circiter 4 mm. longae et basi 1

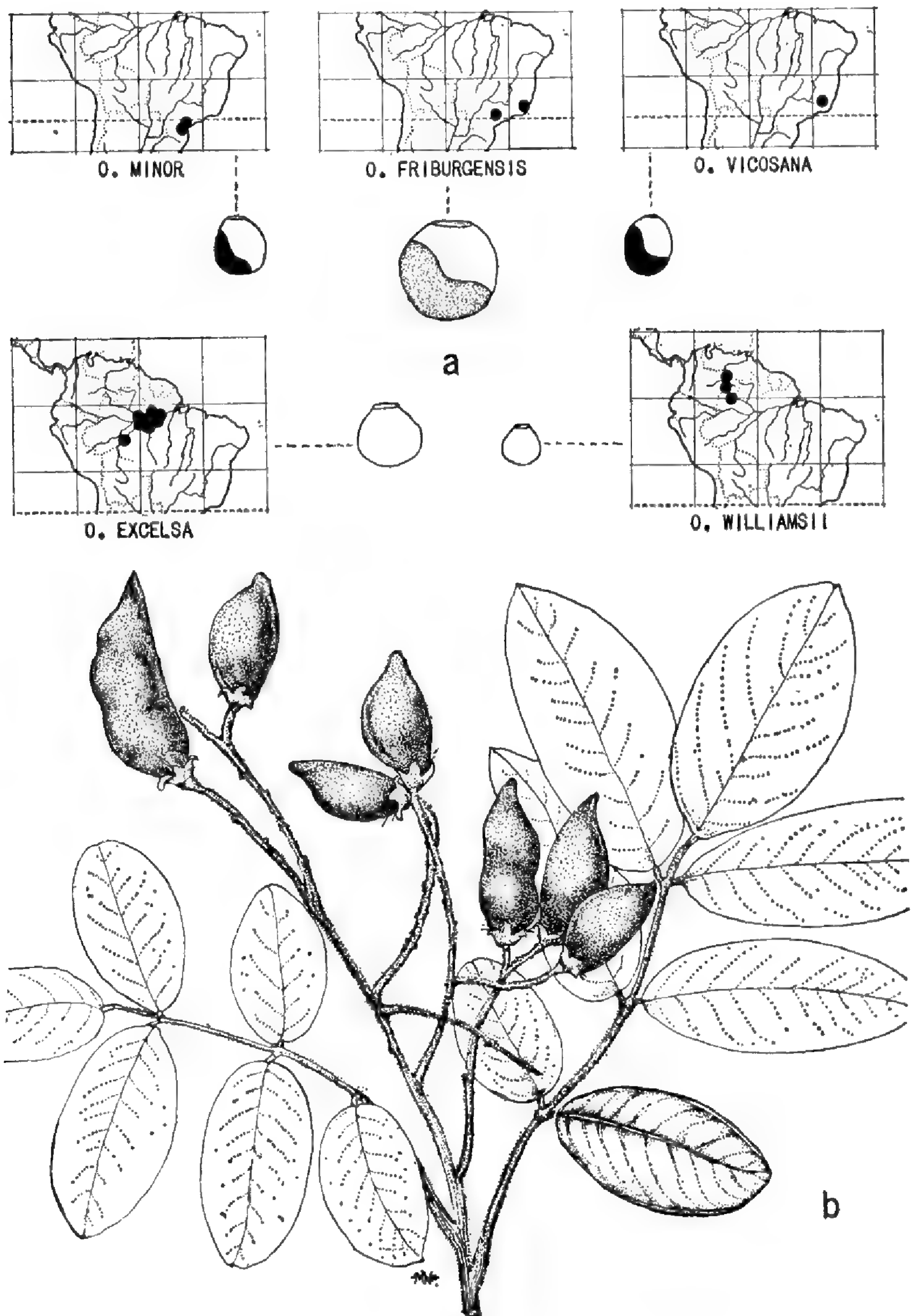


FIGURE 4.—*Ormosia* section *Ormosia* series *Excelsae*: Geographic distribution of species; a, seeds of *O. excelsa*, *O. minor*, *O. friburgensis*, *O. vicosana*, and *O. williamsii*, $\times \frac{1}{2}$; b, branch with leaves and fruit of *O. williamsii*, $\times \frac{1}{2}$.

mm. latae, caducae; folia 5-9-foliolata, axi 6-15 cm. longo, ferrugino-tomentoso, petiolo 2-5 cm. longo, jugis inter sese 2-3 cm. distantibus, stipellis parvis saepe emersis, foliis cum petiolulis 1-2 mm. longis et 1.5 mm. diametro, laminis coriaceis, ovatis vel oblongis, circiter (1-) 3-10 cm. longis, (1-) 2-5 cm. latis, apice obtusis vel acutis, basi obtusis, supra glabris, subnitidis, subtus glabris, ad venis marginibusque tomentulosis, saepe glabratis, venis secundariis mediocriter elevatis, utrinsecus 10-15, fere parallelis, inter sese 3-8 mm. distantibus, angulis venarum costaeque circiter 55° - 65° ; inflorescentiae cum axibus ferrugino- vel fulvo-tomentosis, bracteis anguste deltoideis, 4-5 mm. longis et 1 mm. latis, bracteolis linearibus circiter 2 mm. longis; flores 15 mm. longi, calyce ferrugino- vel fulvo-tomentoso, 6-8 mm. longo, tubo 3-4 mm. longo, 5 mm. diametro, dentibus 3-4 mm. longis, petalis atropurpureis; fructus indehiscens, coriaceus, fulvo-tomentosus, glabrescens, 1-3-spermus, 3-4 cm. longus, 1.5-2 cm. latus, inter semina plus minusve constrictus, 1 cm. crassus, valvulis 1-1.5 mm. crassis; semina coccinea vel bicolora, macula linearia nigra notata, circiter 10 mm. longa et lata, 6-7 mm. crassa, hilo 2.5 mm. longo et 2 mm. lato.

Type in the U.S. National Herbarium, no. 1834939, collected in forest along the lower Río Sanariapo, Territorio Amazonas, Venezuela, July 2, 1942, by Llewelyn Williams (no. 15965). Duplicates at F, G, MO, NY, S, VEN.

DISTRIBUTION: In wet forest along streams in the region of the upper Río Negro and upper Río Orinoco.

ADDITIONAL SPECIMENS EXAMINED:

VENEZUELA: AMAZONAS: Sanariapo, *Ll. Williams* 15954 (F, G, US, VEN). Caño Magua, Río Orinoco, *Wurdack & Adderly* 43791 (F, K, NY, S, US, VEN).

COLOMBIA: AMAZONAS: Río Negro, near base of Cerro Cocuy, *Schultes* 9888 (US).

BRAZIL: AMAZONAS: "Uananaca," between Barcellos and São Gabriel, *Spruce* 2071 (K, M, P). Rio Cajury-Miri, *Fróes [Krukoff]* 12449/193 (A, CAS, DS, F, NY).

LOCAL NAME: Tento (Brazil).

The fruit and seeds of this species are very similar to those of *O. excelsa*, but average somewhat smaller, and the seeds are red, occasionally marked with a thin black line, indicating relationship with other bicolored species.

Flowering material of this species, *Spruce* 2071, was erroneously referred to *O. dasycarpa* by Benthams (Fl. Bras. 15(1) : 317. 1862). Ducke noted this as a distinct species but did not publish it as new (An. Acad. Bras. Sci. 18 : 191. 1939).

13. *Ormosia minor* Vog. *Linnaea* 11 : 405. 1837. FIGURE 4
Ormosia dasycarpa var. *minor* (Vog.) Benth. in Mart. Fl. Bras. 15(1) : 316.
 1862 [as β *minor*].

Tree; young stems ferrugino-tomentose; stipules minute, deltoid, about 1 mm. long; leaves 7- or 9-foliolate, the axis 8-14 cm. long, tomentulose to subglabrous, the petiole 2-4 cm. long, the pairs of leaflets 1.5-3 cm. apart, the petiolules puberulent, 3-6 mm. long, 1-2 mm. in diameter, the blades subcoriaceous, ovate to ovate-oblong, 3-10 cm. long, 1-4 cm. broad, the apex acute to breviacuminate, the acumen to about 6 mm. long, the base rounded, the upper surface glabrous, subnitid, the lower surface sometimes ferrugino-tomentose along the midvein, otherwise essentially glabrous, the secondary veins scarcely raised, about 10-12 pair, essentially parallel, 3-10 mm. apart, forming angles of 40°-50° with the midvein, the tertiary veins reticulate, inconspicuous; inflorescences with axes ferrugino-tomentose, the bracts linear, 4-5 mm. long, 0.5 mm. broad or less, the bracteoles linear, 2-3 mm. long; flowers 12-13 mm. long; calyx 6-9 mm. long, ferrugino-tomentose, the tube 3-5 mm. long, 5-6 mm. in diameter, the teeth 3-4 mm. long; petals purplish; fruit indehiscent or tardily dehiscent, coriaceous or somewhat lignous, rugose, ferrugino-velutinous glabrescent, becoming dark brown, 1- or 2-seeded, 4-6 cm. long, 2-2.5 cm. broad, somewhat constricted between the seeds, about 13-17 mm. thick, the valves 1-1.5 mm. thick; seeds bicolored red and black, about 12-14 mm. long, 10-13 mm. broad, and 8-10 mm. thick, the hilum 4 mm. long and 2 mm. wide.

TYPE LOCALITY: São Paulo ? or Minas Gerais, Brazil. Lectotype collected by Sellow (no. 353), cited below.

DISTRIBUTION: Known only from the region of the type collections.

BRAZIL: Without exact locality [São Paulo ?], *Sellow* 353 (B lectotype, presumably no longer extant but represented by fragment at F and F.M.Neg. 1912 ex B, K iso-lectotype). SÃO PAULO: Alto da Serra, Paranapiacaba, *Andrade* [R no.] 1557 (R); *Burkart* 17437 (SI). São Paulo, cultivated, *J. Coelho* [SPSF no.] 3094 (MO); *Pickel* [SPSF no.] 3715 (MO). São Paulo, Jardim Botânico, Planta vivi (nativa) no. 210, *Hoehne* [SP no.] 28688 (A, GH, NY, S, SI, US), [RB no.] 24951 (RB).

LOCAL NAMES: Olho de cabra; guaraci; guaracy.

The indehiscent, or tardily dehiscent, fruit and the relatively large hilum of the seed indicate relationship of *O. minor* with other species of series *Excelsae*. The unmistakable red and black bicoloration of the seeds suggests a link between the *Excelsae* and species of other series of section *Ormosia*, such as the *Coccineae* and the *Monospermae*.

In the original description of this species, Vogel cited two collections, "Manso et Lhotzky leg. in Prov. Minas Geraës; Sellow leg. in Brasil. merid." I have not seen a specimen of the former collection; the

material that Vogel studied at Berlin presumably is no longer extant. The other collection, by Sellow, cited above as lectotype, probably also was destroyed but it had been photographed by MacBride, and is now represented by that photograph, a fragment at F, and a duplicate at K.

14. *Ormosia vicosana* Rudd, sp. nov.

FIGURE 4

Arbor (?); ramuli novelli fulvo- vel ferrugino-tomentulosi, glabrescentes; stipulae non visae; folia 9-foliolata, axi 6–15 cm. longo, petiolo 2–3 cm. longo, jugis inter sese 1.5–3 cm. distantibus, foliolis cum petiolulis 2–3 mm. longis et 1.5 mm. diametro, laminis coriaceis vel subcoriaceis, ellipticis vel oblongis, 4–11 cm. longis, 2–5 cm. latis, apice acutis vel breviacuminatis, acumine usque ad 4 mm. longo, basi acutis vel obtusis, supra glabris, subtus glabris vel subglabris, ad venas principales pauciter vel mediocriter tomentulosi, venis secundariis mediocriter elevatis, utrinsecus 10–12, fere parallelis, inter sese 5–8 mm. distantibus, angulis venarum costaeque circiter 45°–50°; inflorescentiae cum axibus fulvo- vel ferrugino-tomentulosi, bracteis acute deltoideis, circiter 2–4 mm. longis, basi 1 mm. latis vel minor, bracteolis linearibus circiter 1 mm. longis; flores completi non visi; calyx circiter 5 mm. longus, tubo 2.5 mm. longo et 4 mm. diametro, dentibus 2.5 mm. longis; fructus indehiscens vel tarde dehiscens, lignosus vel sublignosus, fulvo- vel ferrugino-velutinus, 1-spermus, 3–4 cm. longus, 2–2.3 cm. latus, 1.2 cm. crassus, valvulis 1.5–2 mm. crassis; semina coccinea macula nigra notata, 11–13 mm. longa et lata, circiter 9 mm. crassa, hilo 2.5–3 mm. longo et 1.5 mm. lato.

Type in the U.S. National Herbarium, no. 2370768, collected by Alvim at the Escola Superior de Agricultura, Viçosa, Minas Gerais, Brazil (E.S.A.V. no. 3527).

ADDITIONAL SPECIMENS EXAMINED:

BRAZIL: MINAS GERAIS: Escola Sup. Agric., Viçosa, *Kuhlmann* 2263 (US); without collector's name, 3935 (US); without collector's name or number (S).

LOCAL NAMES: Olho de onca, olho de cabra, tento.

The specimens cited above show some similarity to material of *O. minor* but, as indicated in the description and the key, appear to be sufficiently distinct to warrant publication of a new species. The leaflets of *O. vicosana* somewhat resemble those of *O. arborea*; the seed and fruit characters approach those of *O. fastigiata*.

Series 2. *Panamenses* Rudd, ser. nov.

Arbores vel arbusculae; fructus dehiscens, valvulis glabris, fulvis, carnosio-coriaceis, inter semina transverse septatis; semina unicolora rubra obscura, hilo elliptico circiter 2.5 mm. longo.

This series has been circumscribed to include only the one species, *O. panamensis*. There apparently are no close relatives in the New World; instead, the affinities seem to be with Chinese species such as *O. polysperma* Chen and *O. xylocarpa* Chun ex Chen of series *Xylocarpae* Merrill and Chen or, possibly, *O. henryi* Prain of series *Layia* (Hook. and Arn.) Merrill and Chen (Sargentia 3:77-117. 1943), all of which have fruit septate between the seeds.

15. *Ormosia panamensis* Benth. in Seem. Bot. Voy. Herald 111. 1854. FIGURE 5
Ormosia stipitata Schery, Ann. Missouri Bot. Gard. 30: 90, fig. 2. 1943.

Tree to about 15 m. high; young stems fulvo- or aureo-sericeous, glabrate; stipules not seen; leaves 5-9-foliolate, the axis 9-17 cm. long, sparsely pubescent, glabrate, the petiole 5-8 cm. long, the pairs of leaflets 2-3 cm. apart, the petiolules 5-8 mm. long, 1-1.5 mm. in diameter, the blades subcoriaceous, elliptic to obovate-oblong, 4.5-15 cm. long, 2-5.5 cm. broad, the apex acute to breviacuminate with acumen about 1 cm. long, the base obtuse, the upper surface subglabrous, glabrate, the lower surface moderately to densely aureo- or fulvo-sericeous, glabrescent, the secondary veins scarcely raised,

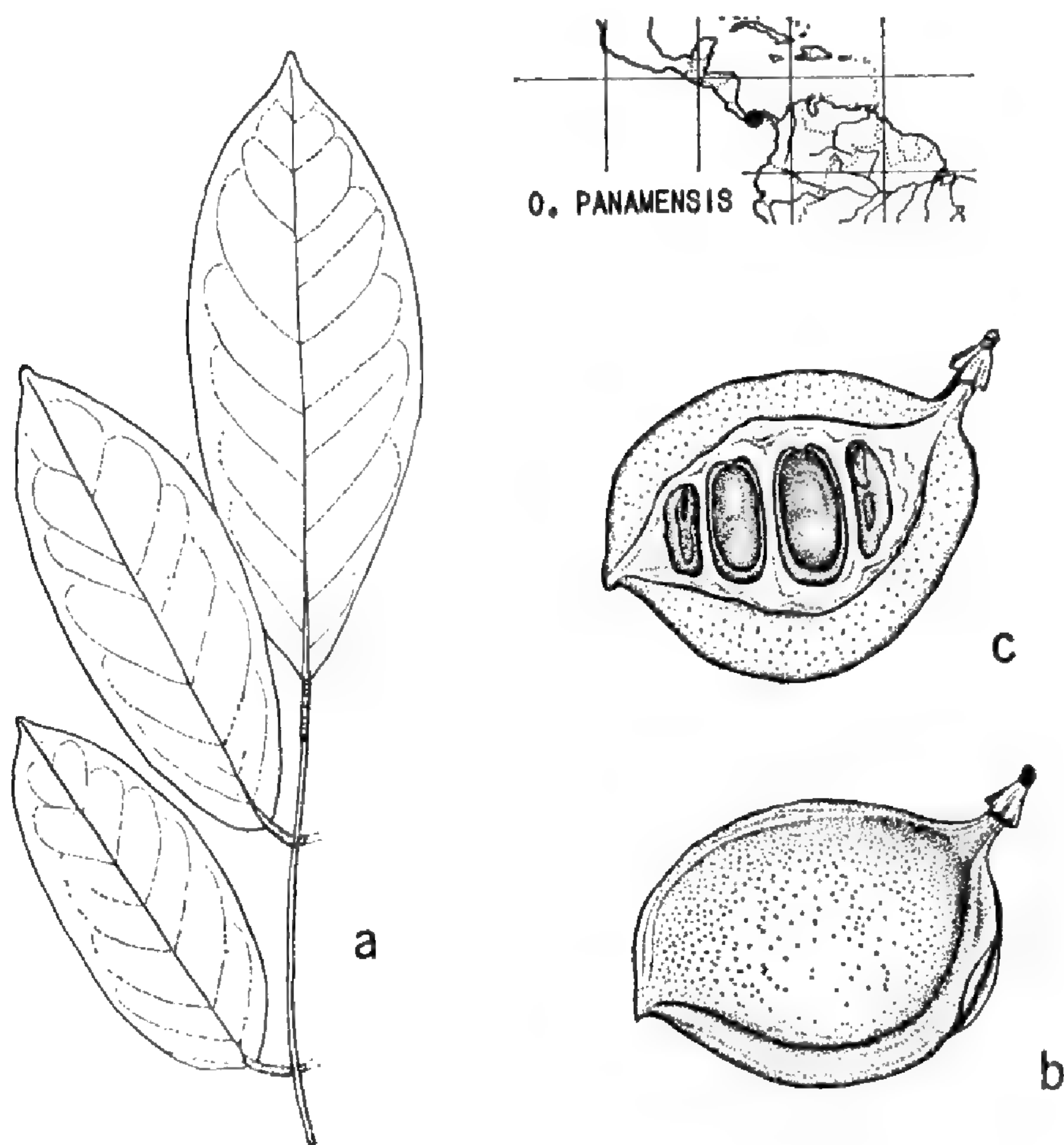


FIGURE 5.—*Ormosia* section *Ormosia* series *Panamenses*: *O. panamensis*: Geographic distribution; a, portion of leaf, $\times \frac{1}{2}$; b, fruit, $\times \frac{1}{2}$; c, inside of fruit, $\times \frac{1}{2}$.

about 10–16 pair, essentially straight and mostly parallel, 5–20 mm. apart, forming angles of about 40° – 50° with the midvein; inflorescences with axes densely aureo- to fulvo-pubescent, the bracts deltoid, 1 mm. long, the bracteoles 0.5 mm. long; flowers 15–20 mm. long; calyx densely fulvo-sericeous, 8–11 mm. long, the tube 6–7 mm. long, 8–10 mm. in diameter, the teeth 3–4 mm. long; petals lilac or the standard lilac, the other petals white; fruit dehiscent, coriaceous, fulvo-sericeous, glabrate, light brown or fulvous, 1–4-seeded, septate between the seeds, but little constricted, 3–7 cm. long, about 2 cm. thick, 3–5 cm. broad including an alate margin 0.5–1.5 cm. wide, the valves 1–1.5 mm. thick, thinnest at the margin; seeds dark red, 15–17 mm. long, 9–10 mm. broad, 7 mm. thick, the hilum elliptic, about 2.5 mm. long and 1 mm. wide.

TYPE LOCALITY: "Village of Remedios, Veraguas," Chiriquí, Panamá. Type collected by Seemann, cited below.

DISTRIBUTION: Known only from western Panamá.

PANAMÁ: BOCAS DEL TORO: Talamaca Valley [near Almirante], *Cooper & Slater* 150 (US). CHIRIQUÍ: Remedios, *Seemann* s.n. (K type). Between Remedios and David, *White* 306 (MO type of *O. stipitata*, US). David, *Seemann* 1673 (BM, K). Near David, on road to Gualaca, *Birdsall* s.n. (US); *Roy* s.n. (US).

LOCAL NAMES: Peronil, coronil.

Comparison of the types of *O. panamensis* and *O. stipitata* shows the two species to be identical.

I am especially grateful to Mr. José M. Roy, of David, for providing ample fruiting material so that the relative taxonomic position of *O. panamensis* could be established.

Series 3. *Isthmenses* Rudd, ser. nov.

Arbores vel arbusculae; fructus dehiscens, valvulis lignosis, sublignosis, vel coriaceis, glabratiss; semina unicolora coccinea, hilo elliptico 2–4 mm. longo.

Ormosia isthmensis, the earliest named species of the group, typifies this series. In characters such as seed color and leaf venation the members of this series show relationship with species of section *Unicolores*, but the fruit, flowers, and pubescence tend to resemble those of the *Coccineae*.

The smallest seeds of the *Isthmenses* are essentially identical with those of section *Unicolores*. The largest, those of *O. venezolana*, resemble the seeds of *O. stipularis*. The valves of the fruit are most woody in *O. isthmensis*, less so in the other species.

The four species of this series seem to form a natural group. *Ormosia cruenta*, vegetatively and as to fruit, is most distinctive, but in flowering characters is much like *O. colombiana*. Otherwise, the

other three species are similar, with differences chiefly in size of parts, grading from smallest in *O. isthmensis* to largest in *O. venezolana*.

16. *Ormosia cruenta* Rudd, sp. nov.

FIGURE 6

Arbor usque ad 30 m. alta; ramuli ferrugino-tomentosi, glabrati; stipulae triangulares, attenuatae, 1-2 mm. longae et basi 1 mm. latae; folia 5-11-foliolata, axi 8-10 cm. longo, velutino, glabrescenti, petiolo circa 2 cm. longo, jugis inter sese 2-2.5 cm. distantibus, foliolis cum petiolulis 2 mm. longis et 1-1.5 mm. diametro, laminis subcoriaceis ellipticis vel elliptico-oblongis, 2-8 cm. longis, 1-3.5 cm. latis, apice acutis, basi obtusis, supra glabris, subnitidis, subtus glabris vel tenuiter sericeis, venis secundariis inconspicuis, utrinsecus 5-10; inflorescentiae cum axibus ferrugino-velutinis, bracteis bracteolisque triangularibus, 1-3 mm. longis et 1 mm. latis, floribus 15-18 mm. longis, calyce ferrugino-velutino, 10 mm. longo, tubo 6 mm. longo, dentibus 4 mm. longis, petalis lilacinis; ovarium sessile, ferrugino-villosum, 3-5-ovulatum; fructus dehiscentis, subligosis, glaber, subnitidus, nigratus, 1-spermus, 2-2.5 cm. longus, 1.5 cm. latus, 1 cm. crassus, valvulis 1 mm. crassis; semina coccinea, 8-10 mm. longa, 9-10 mm. lata, 7-9 mm. crassa, hilo 2 mm. longo et 1.5 mm. lato.

Type in the U.S. National Herbarium, no. 1820777, collected at Boquete, Chiriquí, Panamá, June 30, 1938, by M. E. Davidson (no. 848). Duplicates at A, F, MO.

DISTRIBUTION: Known only from the mountains of western Panamá, at elevations of about 800-1300 meters.

ADDITIONAL SPECIMEN EXAMINED:

PANAMÁ: COCLÉ: Cerro Pajita, Allen 4499 (C, G, K, MO, NY, S, U, US).

This is a distinctive species, yet it is known only from the two collections cited above, one, the type, in fruit, the other, in flower. Originally, duplicates of these numbers were distributed as *O. panamensis*, an entirely different species.

17. *Ormosia isthmensis* Standl. Publ. Field Mus. Bot. 17 : 264. 1937.

FIGURE 6

Tree, to about 50 m. tall; young stems ferrugino- to fulvo-velutinous; stipules deltoid, acicular, about 1-2 mm. long, 1-1.5 mm. broad at the base, pubescent like the stem; leaves (3-5-) 7-13-foliolate, the axis 9-45 cm. long, pubescent, glabrescent, the petiole 4-8 cm. long, the pairs of leaflets 3-5 cm. apart, the petiolules 4-6 mm. long, 2-3 mm. in diameter, the blades coriaceous, ovate, oblong, to obovate-oblong, 3-35 cm. long, 2-10 cm. broad, acute to abruptly acuminate, the acumen to about 10 mm. long, the base obtuse or truncate, the upper surface glabrous, subnitid or nitid, the lower surface finely velutinous

along the major veins, otherwise finely and sparsely appressed-pubescent, glabrescent, the secondary veins moderately raised, about 10–12 pair, essentially parallel, 5–25 mm. apart, forming angles of 50°–55° with the midvein; inflorescences with axes fulvo- to cano-velutinous, the bracts and bracteoles linear, 2–3 mm. long; flowers about 10 mm. long; calyx cano- to fulvo-velutinous, 7–8 mm. long, the tube 3–4 mm. long, 4 mm. in diameter, the teeth 4 mm. long; corolla white and pink purplish (fide Schultes & Reko); fruit dehiscent, lignous, black or dark brown, glabrous, nitid or subnitid, 1–3-, commonly 1-seeded, 3–7 cm. long, 2–3 cm. broad, 1 cm. thick, the valves 1.5–3 cm. thick; seeds red, 10–13 mm. long, 10–11 mm. wide, and 6–8 mm. thick, the hilum 2–2.5 mm. long and 1 mm. wide.

TYPE LOCALITY: Ubero, Oaxaca, Mexico. Type collected by Llewelyn Williams (no. 9423), cited below.

DISTRIBUTION: In rain forest, from southern Mexico to northern Colombia, at elevations of about 5–800 meters.

MEXICO: OAXACA: Ubero, *Ll. Williams* 9423 (BM, F type, G, K, S, US). Santiago Yaves, Choapan, *Reko* 9(F). San Juan Lalana, Choapan, *Schultes & Reko* 822 (F, GH, NA, UC). Sierra Juarez, *Gomez-Pompa, Sharp, & Hernandez* 380 (MEXU, US).

GUATEMALA: ALTA VERAPAZ: Cubilgüitz, *Steyermark* 44658 (F). IZABAL: Between Puerto Barrios and Milla 7, *Steyermark* 42058 (F, NY, US).

BRITISH HONDURAS: TOLEDO: Temash River, *Kinlock* 6 (F, Y).

HONDURAS: "Potrero, along Highland Creek, Pto. Sierra," *Wilson* 144 (NY, US). ATLANTIDA: Lancetilla Valley, near Tela, *Standley* 52908 (F).

COSTA RICA: SAN JOSÉ: San Isidro del General, *Dayton & Barbour* 3127 (NY, USFS).

PANAMÁ: VERAGUAS: Isla Coiba, *Dwyer* 1170 (US). CANAL ZONE: Río Grande Sta., *Hayes* 352 (BM, K). Peña Blanca Bay, Barro Colorado Island, *Shattuck* 1103 (F, US).

COLOMBIA: CHOCÓ: Without exact locality, *Krukoff* [Herb no.] 9383 (US).

LOCAL NAMES: Colorín, mū-sa, palo de Salvador (Mexico); acu-té (Guatemala); hormiga (British Honduras); alasán (Costa Rica).

Of the four species assigned to this series, *O. isthmensis* has been most collected and is known over the largest geographic area. It exhibits the greatest variability in size, shape, and number of leaflets, sometimes on the same branch. The fruits also show some variation in size and number of seeds; the 3-seeded fruits are not only longer but usually narrower than those with one seed.

Two of the collections cited above, *Dayton & Barbour* 3127 from Costa Rica and *Krukoff* 9383 from Colombia, are sterile but appear to be referable to this species.

In the original description of *O. isthmensis*, Standley cited a paratype, *Ll. Williams* 8926, but noted that it differed from the type and might represent another species. In this present paper it is so treated, as *O. macrocalyx*.

18. *Ormosia colombiana* Rudd, sp. nov.

FIGURE 6

Arbores vel arbusculae usque ad 15 m. altae; ramuli novelli cano-vel ferrugino-velutini; stipulae deltoideae, velutinae, circiter 2 mm. longae, basi 1 mm. latae; folia (5-) 7-11-foliolata, axi velutino, 9-18 cm. longo, petiolo 2.5-6 cm. longo, jugis inter sese 2-6 cm. distantibus, petiolulis 3-4 mm. longis, 1.5-2 mm. diametro, laminis coriaceis vel subcoriaceis, ovatis, 4-10 cm. longis, 3-7 cm. latis, apice acutis, basi obtusis, supra glabris, subnitidis, subtus plus minusve glabris praeter venis maioribus saepe tomentulosis, venis secundariis medio-criter elevatis, utrinsecus 8-12, fere parallelis, inter sese 5-20 mm. distantibus, angulis venarum costaeque circiter 60°-70°; inflorescentiae cum axibus fulvo-vel ferrugino-velutinis, bracteis deltoideis, circiter 3 mm. longis et latis; flores 17-20 mm. longi, calyce ferrugino-velutino, 10-13 mm. longo, tube 5-7 mm. longo et 7 mm. diametro, dentibus 5-6 mm. longis, petalis atroviolaceis; fructus dehiscens, coriaceus vel sublignosus, saepe transverso-rugosus, subtiliter ferrugino-tomentulosus, glabrescens, 1-4-spermus, 3-8 cm. longus, (2.5-) 3-3.5 cm. latus, 1.5 cm. crassus, inter semina plus minusve constrictus, valvulis 1-1.5 mm. crassis; semina coccinea, 12-14 mm. longa, 10-14 mm. lata, 9-11 mm. crassa, hilo elliptico 2-3 mm. longo et 1-1.5 mm. lato.

Type in the U.S. National Herbarium, no. 1900922, collected in the Hoya de Albán, El Valle, Colombia, at 1350-1400 meters elevation, October 26, 1946, by J. Cuatrecasas (no. 22617). Isotype at F.

DISTRIBUTION: Western Colombia, at elevations of about 1350-1730 meters.

ADDITIONAL SPECIMENS EXAMINED:

COLOMBIA: MAGDALENA: Vista Nieve, *Espina & Giacometto* A102 (Y). CUNDINAMARCA: Bogota, *Cespedes* s.n. (BM). ANTIOQUIA: Jerico, *Bro. Daniel* 2459 (S, US). Sonsón, *Bro. Daniel* 2476 (A, F, NY). Itagui, Medellín, *Domingo-Penagos* [*Bro. Daniel* no.] 3823 (US). EL VALLE: Quebrada de la Elvira, *Cuatrecasas* 23785 (F). Between Sevilla and Caicedonia, *Pérez-Arbeláez & Cuatrecasas* 6452 (US).

LOCAL NAMES: Chocho (Antioquia); mate (Magdalena).

This species appears to be intermediate between *O. isthmensis* and *O. venezolana*, probably more closely related to the latter.

The specimen from Magdalena is sterile, with essentially glabrous leaflets. From the wood it was identified by S. J. Record as *Ormosia* sp. It is being referred to *O. colombiana*, tentatively, and with the hope that other collections will be forthcoming.

19. *Ormosia venezolana* Rudd, sp. nov.

FIGURE 6

Arbor; ramuli novelli fulvo-vel ferrugino-velutini; stipulae deltoideae, velutinae, 1.5-2 mm. longae, basi 1 mm. latae; folia 5-

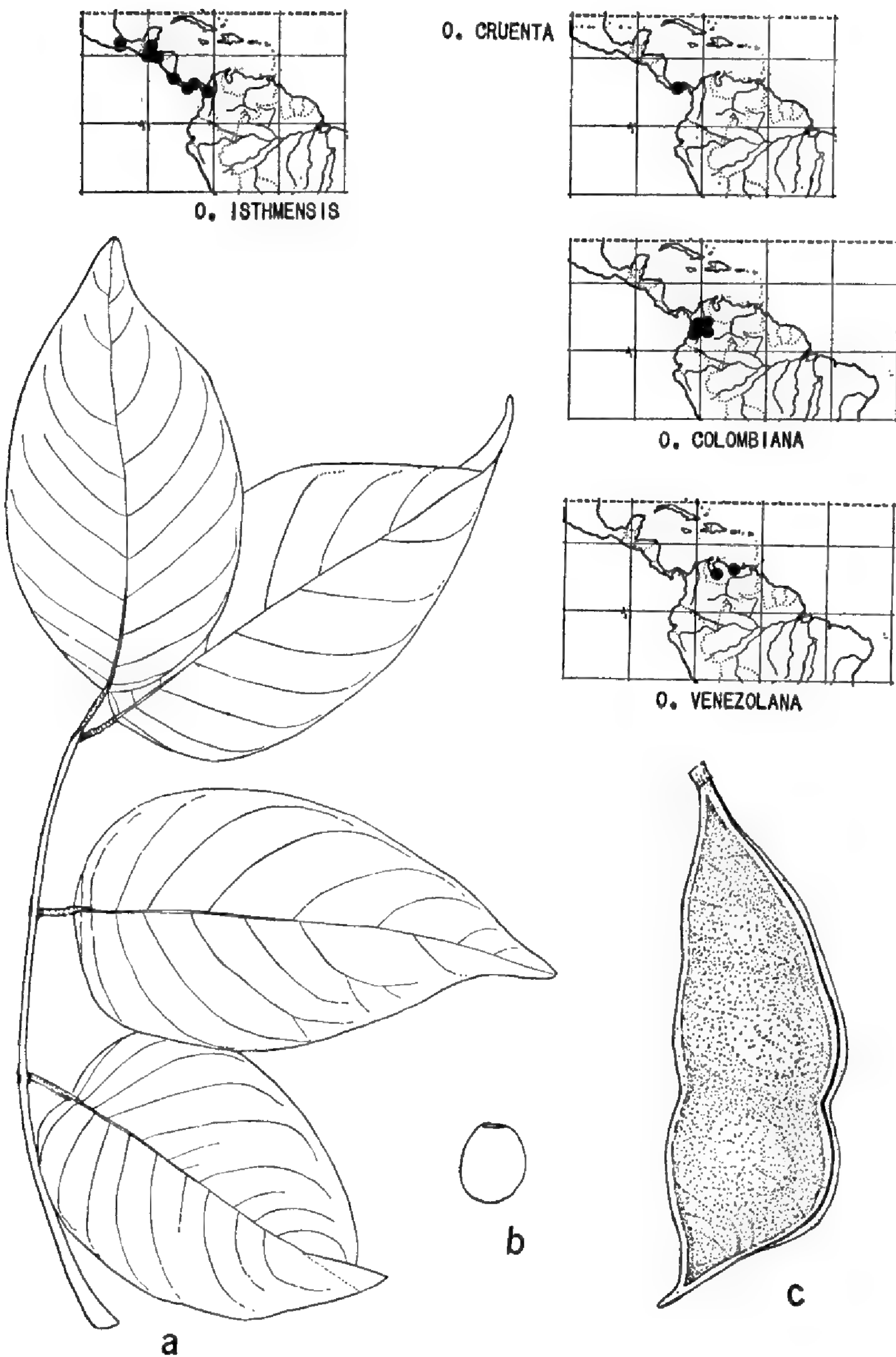


FIGURE 6.—*Ormosia* section *Ormosia* series *Isthmenses*: Geographic distribution of species; *O. venezolana*: a, portion of leaf, $\times \frac{1}{2}$; b, seed, $\times \frac{1}{2}$; c, fruit, $\times \frac{1}{2}$.

vel 7-foliolata, axi velutino, glabrati, 9–15 cm. longo minimo, petiolo 4–6 cm. longo, jugis inter sese 2.5–5 cm. distantibus, petiolulis 3–6 mm. longis, 2 mm. diametro, laminis coriaceis vel subcoriaceis, ovatis, 4–15 cm. longis, 3–9.5 cm. latis, apice acutis, basi obtusis vel subcordatis, supra glabris, subnitidis, subtus plus minusve glabris

praeter venis maioribus saepe tomentulosis, venis secundariis mediocriter elevatis, utrinsecus 8-10, prope parallelis, inter sese 5-20 mm. distantibus, angulis venarum costaeque circiter 40°-55°; inflorescentiae cum axibus fulvo- vel ferrugino-velutinis, nec bracteis bracteolisque nec floribus completis visis, calyce fulvo- vel ferrugino-velutino circiter 10 mm. longo, tubo 4 mm. longo et 6 mm. diametro, dentibus 6 mm. longis; fructus dehiscens, coriaceus vel sublignosus, reticulosus vel saepe transverso-rugosus, subtiliter fulvo- vel ferrugino-tomentulosus, glabrescens, 1-5-spermus, 5-12 cm. longus, 3-4 cm. latus, 1.5 cm. crassus, inter semina nonnihil constrictus, valvulis 0.5-1 mm. crassis; semina coccinea, 15-20 mm. longa, 13-18 mm. lata, 11-13 mm. crassa, hilo elliptico 3-3.5 mm. longo et 1-1.5 mm. lato.

Type in the U.S. National Herbarium, no. 2373489, collected in the Quebrada los Chorros, El Avila, above Caracas, Estado Miranda, Venezuela, at about 1400 meters elevation, April 4, 1962, by José Rafael Garcia (s.n.).

DISTRIBUTION: Coastal Cordillera, Venezuela, in forest at elevations of about 1400-2100 meters.

ADDITIONAL SPECIMEN EXAMINED:

VENEZUELA: MÉRIDA: Between La Trampa and Caña Brava, *Bernardi* 3155 (MER).

As suggested by the characters given in the key, the two species, *O. venezolana* and *O. colombiana*, are very similar, differing chiefly in size of fruit and seed. It seems desirable, however, on the basis of the limited number of specimens available, to maintain them as separate taxa.

Series 4. *Amazonicae* Rudd, ser. nov.

Arbores; venae tertiae foliolorum communiter conspicuae, parallelae; fructus dehiscens, valvulis glabris vel subglabris, reticulato-rugosis; semina bicolora coccinea macula nigra notata, hilo elliptico, 2-3 mm. longo.

As indicated in the key, this series appears to be related to the *Coccineae*. However, these three species resemble one another closely enough to suggest a natural group.

The type of this series is *O. amazonica*.

20. *Ormosia amazonica* Ducke, Arch. Jard. Bot. Rio de Janeiro 3 : 139. 1922.

FIGURE 7

Ormosia euneura Harms, Notizbl. Bot. Gard. Berlin 9 : 972. 1926.

Tree to about 20 m. high; young stems cinereo- to fulvo-tomentulose; stipules not seen; leaves 7-11-foliolate, the axis 14-40 cm. long, velutinous or tomentulose, the petiole 7-12 cm. long, the pairs of

leaflets 5–7 cm. apart, the petiolules 5–10 mm. long, 2–4 mm. in diameter, the blades coriaceous, elliptical, ovate, or obovate, 8–22 cm. long, 4.5–11 cm. broad, the apex obtuse, breviacuminate, the base rounded to cordate, the margin sometimes revolute, the upper surface essentially glabrous, the lower surface finely and tightly crisp-pubescent, the venation prominent, the secondary veins about 10–12 pair, essentially parallel, 5–20 mm. apart, forming angles of about 60°–65° with the midvein; inflorescences with axes fulvo-tomentulose, the bracts lanceolate, acuminate, about 8 mm. long, 1–2 mm. broad,

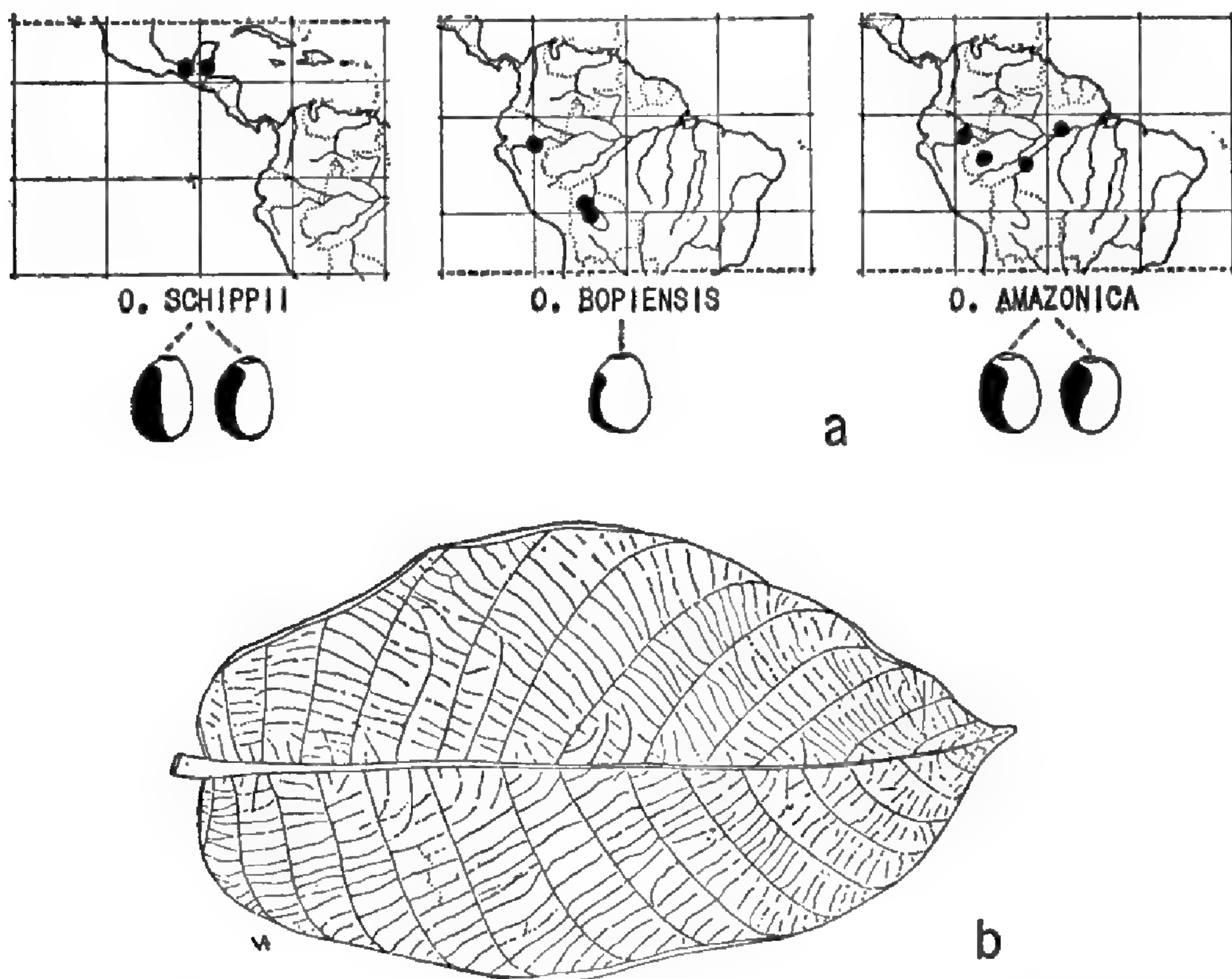


FIGURE 7.—*Ormosia* section *Ormosia* series *Amazonicae*: Geographic distribution of species; a, seeds of *O. schippii*, *O. bopiensis*, and *O. amazonica*, $\times \frac{1}{2}$; b, leaflet of *O. amazonica*, $\times \frac{1}{2}$.

the bracteoles linear, 7–8 mm. long and 1 mm. wide or less; flowers 15–17 mm. long; calyx fulvo- to ferrugino-tomentulose, 8–10 mm. long, the tube 4–5 mm. long and about 5 mm. in diameter, the teeth 4–6 mm. long; petals purplish; fruit dehiscent, sublignous or coriaceous, essentially glabrous at maturity, reticulate-rugose, black to dark brown, 1–3-seeded, about 2–5 cm. long, 1.5–2.5 cm. broad, somewhat constricted between the seeds, 1.5 cm. thick, the valves 1–1.5 mm. thick; seeds bicolored, red with a black spot, 10–13 mm. long, 9–11 mm. broad, and 7–8 mm. thick, the hilum 2 mm. long and 1.5 mm. wide.

TYPE LOCALITY: "Cacoal Imperial," below Obidos, Pará, Brazil. Type collected by Ducke (no. 14833), cited below.

DISTRIBUTION: In forests along rivers, periodically inundated, "varzea land," middle to upper Amazon basin, Brazil and Peru.

BRAZIL: PARÁ: Obidos, *Ducke* [MG no.] 14833 (B M, F.M. neg. 28237 ex G, G, NY, P, R type, US). **AMAZONAS:** Near mouth of Rio Embira, *Krukoff* 4838 (A, G, K, NY), 5123 (A, BM, F, G, K, M, MO, NY, S, UC, US). "Basin of Rio Madeira," *Lobo* [Krukoff Herb. no.] 15459 (NY).

PERU: LORETO: Iquitos, *Tessmann* 3665 (F fragment of type of *O. euneura* ex B, F.M. neg. 1808 of type of *O. euneura* ex B, NY, S, US).

LOCAL NAMES: Mulungu, tento grande da varzea (Brazil).

Examination of type material of *O. amazonica*, in fruit, and *O. euneura*, in flower, shows the two species to be synonymous.

21. *Ormosia bopiensis* Pierce ex Macbr. Field Mus. Pub. Bot. 13(3) : 248. 1943. FIGURE 7

Tree to about 20 m. high; young stems fulvo- to ferrugino-tomentulose; stipules linear-deltoid, 3–10 mm. long, 1–2 mm. broad at the base; leaves (3–5-) 7–13-foliolate, the axis 6–35 cm. long, tomentulose, glabrate, the petiole 3–10 cm. long, the pairs of leaflets 2–8 cm. apart, the petiolules 2–9 mm. long, 1.5–4 mm. in diameter, aculeate stipels, about 2 mm. long, sometimes present, the blades coriaceous, ovate, elliptic-oblong, or obovate, 4–35 cm. long, 3–17.5 cm. broad, the apex obtuse to acuminate with acumen 10–15 mm. long, the base truncate, subcordate, or obtuse, the upper surface subnitid, glabrous except for a trace of pubescence along the major veins, the lower surface tomentulose along the major veins, otherwise moderately to sparsely pubescent with loosely crispate hairs, the secondary veins moderately raised, about 10–18 pair, essentially parallel, 3–30 mm. apart, forming angles of 50°–60° with the midvein; inflorescences with axes fulvo- to ferrugino-tomentulose, the bracts linear-deltoid, 4–10 mm. long and about 2 mm. broad at the base, the bracteoles linear, 4–5 mm. long, 1 mm. broad or less; flowers 13–15 mm. long; calyx 8–12 mm. long, the tube about 4–6 mm. long and 4–6 mm. in diameter, the teeth 4–6 mm. long; petals deep violet (fide Klug), reddish brown (fide Pearce) fruit dehiscent, sublignous or coriaceous, finely velutinous, glabrescent, essentially glabrous at maturity, black or dark brown, reticulate-rugose, 1- or 2-seeded, 3–6 cm. long, (1.5–) 2.5–2.8 cm. broad, constricted between the seeds, about 1.5 cm. thick, the valves 1 mm. thick; seeds bicolored red and black, 11–14 mm. long, 10–12 mm. broad, 6–8 mm. thick, the hilum about 2 mm. long and 1–1.5 mm. wide.

TYPE LOCALITY: Mishuyacu, near Iquitos, Loreto, Peru, in forest, 100 meters elevation. Type collected by Klug (no. 669), cited below.

DISTRIBUTION: Upper Amazon basin of Peru and Bolivia.

PERU: LORETO: Mishuyacu, near Iquitos, *Klug* 669 (F type, NY, US). **Cuzco:** Paucartambo, *Vargas* 14907 (US).

BOLIVIA: LA PAZ: Rio Coroico, *Pearce* s.n., April 1866 (BM, NY). Basin of Río Bopi, San Bartolomé, near Calisaya, *Krukoff* 10408 (A, F, G, K, MO, NY, S, U, US, Y). Apolo, *R. S. Williams* 1434 (BM, K, NY, UC).

LOCAL NAME: Huyruro (Bolivia).

Superficially, this species resembles *O. amazonica* and, obviously, there is a close relationship. The differences are not readily expressed, as indicated by my wording of the key. However, I believe that at least two taxa are involved.

The NY sheet of *Krukoff* 10408, a fruiting specimen from the Río Bopi, Bolivia, was annotated by Pierce as the type of his *Ormosia bopiensis*, but he did not publish the species. Macbride, who validated the name in his treatment of the Leguminosae for the Flora of Peru, cited only a Peruvian collection, *Klug* 669, in flower, that Pierce had annotated as *O. bopiensis*, and which, therefore automatically became the type of the species. The original description, however, must have been based on the *Krukoff* collection, because fruit was described, but not flowers.

22. *Ormosia schippii* Pierce ex Standl. and Steyerl., emend Rudd, Trop. Woods No. 113:125. 1960. FIGURE 7

Ormosia schippii Pierce ex Standl. and Steyerl. Fieldiana Bot. 24(5):311. 1946, pro. parte.

Tree to about 35–40 m. high; young stems fulvo- to cinereo-tomentulose; stipules not seen; leaves 5–9-foliolate, the axis 10–35 cm. long, tomentulose, glabrescent, the petiole about 5–7 cm. long, the pairs of leaflets 3–5 cm. apart, the petiolules 4–5 mm. long, 2–3 mm. in diameter, the blades coriaceous or subcoriaceous, ovate to ovate-oblong, or, sometimes obovate, 5–27 cm. long, 3–11 cm. wide, the apex acute or breviacuminate, the acumen to about 10 mm. long, the base obtuse to subcordate, the upper surface glabrous except for a trace of pubescence along the major veins, the lower surface moderately pubescent, the hairs loosely crispate, the secondary veins raised, about 8–14 pair, essentially parallel, 5–20 mm. apart, forming angles of about 55°–65° with the midvein; inflorescences with axes cinereo- or fulvo-tomentulose, glabrescent, the bracts lanceolate, acuminate, 8–10 mm. long, 2–2.5 mm. broad, the bracteoles linear, 7–8 mm. long, 1 mm. broad; flowers 18–22 mm. long; calyx cinereo- to fulvo-tomentulose, 7–10 mm. long, the tube 4–5 mm. long, 4–5 mm. in diameter, the teeth 3–5 mm. long; corolla reddish purple; fruit dehiscent, sublignous, black or dark brown, essentially glabrous at maturity but often with a trace of pubescence at the base, commonly 1-seeded, 2–3 cm. long, 2–2.5 cm. broad, about 1.5 cm. thick, the valves 1–2 mm. thick; seeds bicolored, red with a black spot, 12–13 mm. long, 10–12 mm. broad, and 7–9 mm. thick, the hilum 2–3 mm. long and 1–1.5 mm. wide.

TYPE LOCALITY: "Temash River, in forest shade," Toledo District British Honduras. Type collected by Schipp (no. 1297), cited below.

DISTRIBUTION: In rain forest, generally in swampy places, southern Mexico and British Honduras, at elevations up to about 150 meters.

MEXICO: CHIAPAS: Selva Lacandona, *Gomez-Pompa* 339 (MEXU, US). Between La Arena and Salas, *Miranda* 8471/1 (MEXU).

BRITISH HONDURAS: EL CAYO: Gallon Jug, *Lancaster* 24 (US). TOLEDO: Temash R., SCHIPP 1297 (A, BM, F type, G, GH, K, MO, NY, S); *Peck* 800 (GH, K).

LOCAL NAMES: Palo macho, carne de caballo (Mexico); John Crow bead (British Honduras).

The original publication of *O. schippii* was based on two specimens, one in fruit, *Schipp* 132, which Pierce had annotated as the type of his unpublished species, and *Schipp* 1297, in flower, which Standley and Steyermark designated as type. Later it was observed that the two specimens represented different species; one, *O. schippii*, was emended, the other, given the name *O. velutina*, was published as new.

Series 5. *Coccineae* Rudd, ser. nov.

Arbores nonnumquam maximae; fructus dehiscens, valvulis lignosis vel sublignosis, glabris, usitate nitidis; semina bicolores coccinea macula nigra notata, hilo elliptico 1–3.5 mm. longo.

The type of this series is *O. coccinea*, which is also the type of the genus. This may in part be an artificial grouping, but the similarities seem to outweigh the dissimilarities, and there appears to be intergradation from species to species. Perhaps this is a complex of species showing effects of isolation as well as hybridization.

23. *Ormosia coccinea* (Aubl.) Jacks. Trans. Linn. Soc. 10 : 360, t. 25. 1811.

FIGURE 8

Tree to about 30 m. high; young stems ferrugino- to fulvo-tomentulose, sometimes glabrescent; stipules minute, deltoid, 1–2 mm. long; leaves 7–11-foliolate, the axis 8–30 cm. long, tomentulose to subsericeous, the petiole 3–7 cm. long, the pairs of leaflets 2–7 cm. apart, the petiolules 3–10 mm. long, 2–4 mm. in diameter, the blades coriaceous, ovate, elliptic, or obovate, 3–22 cm. long, 2–11 cm. broad, acute, breviacuminate, or obtuse, the base obtuse, the margin sometimes revolute, the upper surface glabrous, nitid or subnitid, the major veins sometimes deeply impressed, the lower surface usually tomentulose along the major veins, sometimes appressed-pubescent, or glabrate, otherwise sparsely pubescent with minute appressed hairs, or sometimes glabrate, the secondary veins usually conspicuously raised, about (8–) 10–17 pair, 4–25 mm. apart, forming angles of 50°–70° with

the midvein; inflorescences with axes fulvo- to ferrugino-tomentulose, the bracts deltoid or linear-deltoid, 2–3.5 mm. long and about 1 mm. broad at the base, the bracteoles linear or linear-deltoid, 1–2 mm. long; flowers 10–15 mm. long; calyx fulvo- or ferrugino-tomentulose, 7–9 mm. long, the tube 4–4.5 mm. long, 4 mm. in diameter, the teeth 3–5 mm. long; corolla dark purplish; fruit dehiscent, lignous, black or dark brown, glabrous at maturity, nitid, usually 1-seeded, sometimes with 2–4 seeds, about 2.5–6 cm. long, 1.5–3 cm. wide, slightly constricted between the seeds, about 1 cm. thick, the valves 2–5 mm. thick; seeds bicolored, red and black, 10–15 mm. long, 9–12 mm. broad, and 7–10 mm. thick, the hilum elliptic, about 2 mm. long and 1 mm. wide.

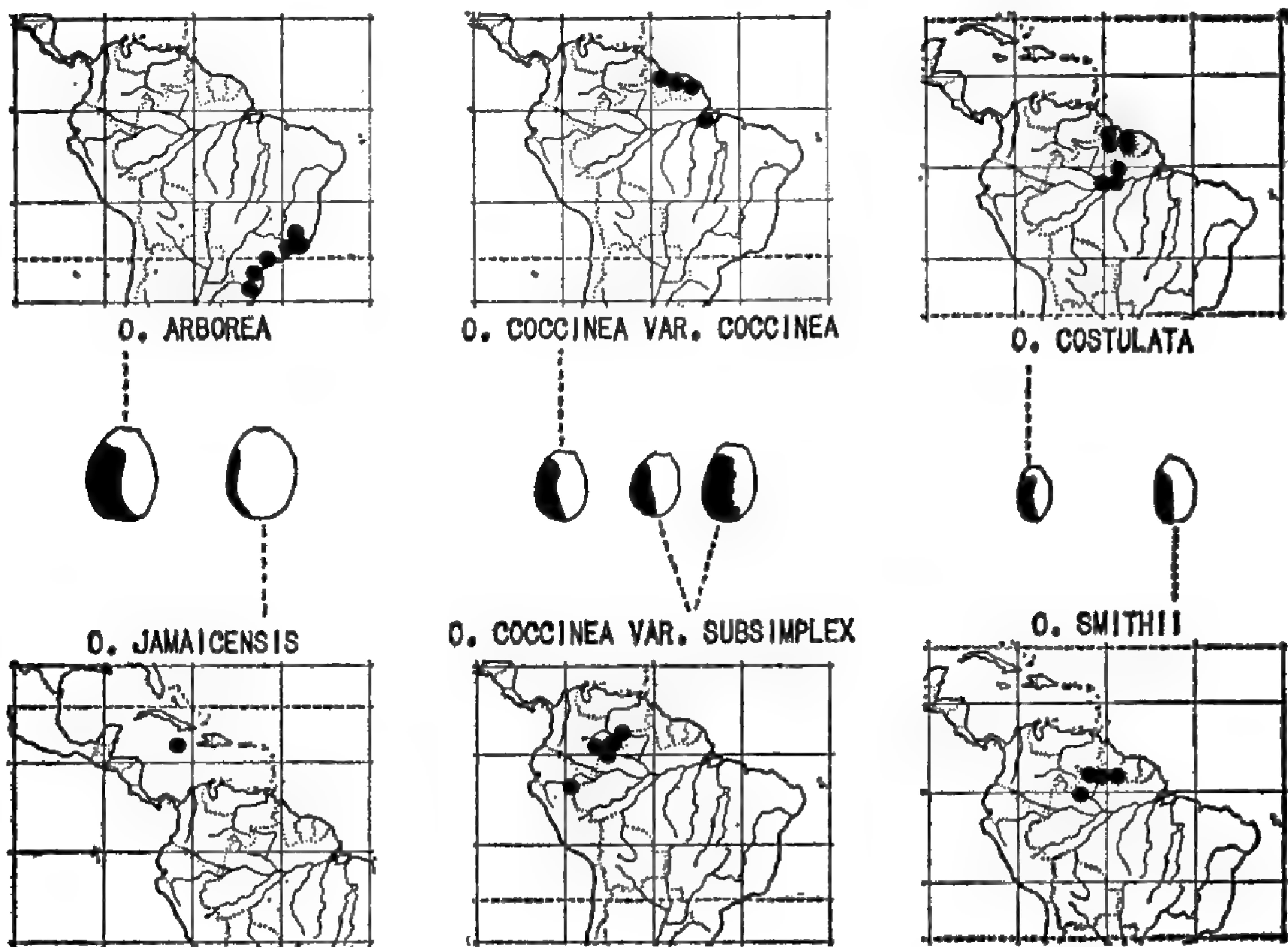


FIGURE 8.—*Ormosia* section *Ormosia* series *Coccineae*, in part: Geographic distribution of species; seeds of *O. arborea*, *O. jamaicensis*, *O. coccinea* var. *coccinea*, *O. coccinea* var. *subsimplex*, *O. costulata*, and *O. smithii*, $\times \frac{1}{2}$.

23a. *Ormosia coccinea* var. *coccinea*.

FIGURE 8

Ormosia coccinea (Aubl.) Jacks. Trans. Linn. Soc. 10 : 360, t. 25. 1811.

Robinia coccinea Aubl. Fl. Guian. 2 : 773. 1775, sine syn. Plumieri.

The typical variety characteristically has leaflets ovate, or obovate to elliptic, with lateral veins mostly 4–10 mm. apart, strongly depressed above and raised below, diverging from the midvein at 60°–70° angles; petiole 3–5 cm. long, the petiolules 3–5 mm. long, the pairs of leaflets 2–4 cm. apart; fruit 2–3 cm. broad, the valves 3–5 mm. thick.

TYPE LOCALITY: French Guiana. Type collected by Aublet, cited below.

DISTRIBUTION: French Guiana, Surinam, British Guiana, and Amazon delta of Brazil, in sandy soil.

FRENCH GUIANA: Without exact locality, *Aublet* s.n. (BM type of *R. coccinea*); *Richard* s.n. (P); *Martin* s.n. (BM, NY); *Poiteau* s.n. (G). Mana, *Sagot* 112; (BM, F, K, P). Route de Mana, Camp des Malagaches, *Bur. For. & Agric. Guyan.* 7323 (NY). Pariacabo, *Benoist* 1417 (P). Godebert, *Wachenheim* s.n. (A, BM), 95 (P), 140 (P). Cayenne, *Soubirou* s.n. (P); *Cowan & Maguire* 38037 (NY). Route Charvein-Acarouany, *Bur. For. & Agric. Guyan.* 274 M (NY, U). Estrada Kourou-Sinnamary, *Black & Klein* 54-17330 (US).

SURINAM: Wayombo, Donderkreek, *Stahel* 357 (A, K, NY, U, Y); *Lindeman* 7127 (U). Brownsberg, *Zaandam, Sur. For. Bur.* 6630 [tree no. 1252] (U). Moengo tapoe, *Lanjouw & Lindeman* 645 (U).

BRITISH GUIANA: Upper Kamuni Creek, Demerara R., *C. W. Anderson* 283 (K).

BRAZIL: PARÁ: Gurupá, *Ducke* [MG no.] 15962 (BM, G, MG, R, US); [MG no.] 16675 [=RB no. 945] (BM, G, MG, P, R, RB, S, U, US); *Pires & Silva* 4730 (NY, US). Porto de Moz, *Ducke* [MG no.] 16657 (MG). Rio Xingu, Campo Grande, *Ducke* [MG no.] 17159 (MG). Breves, *Pires, Fróes, & Silva* 5421 (IAN); *Ducke* [RB no.] 17097 (U).

LOCAL NAMES: Panacoco, agui (French Guiana); kokriki, hoogland-kokriki (Carib, Surinam); barakaro firiberoebana ibikaro iwi (Arawak, Surinam).

In general, the collections listed above are remarkably uniform in character, in contrast to those that have been "lumped" in the other variety of *O. coccinea*. Among the material of *Stahel* 357, however, are some large leaflets similar to those commonly found on specimens of *O. coccinea* var. *subsimplax*.

Jackson, in his original description of *O. coccinea*, did not mention the specimens collected by Martin, cited above, but it appears that Martin's material, with flowers and fruit, was used in preparing the illustration of the species. The general aspect of the specimens indicates the likelihood, and they were at one time a part of the Lambert Herbarium, to which Jackson did refer in his paper. The holotype of *Robinia coccinea*, the basionym of the species, is a sterile specimen and, apparently, did not serve as the artist's model.

23b. *Ormosia coccinea* var. *subsimplax* (Spruce ex Benth.) Rudd, comb. et stat. nov.

FIGURE 8

Ormosia subsimplax Spruce ex Benth. in *Mart. Fl. Bras.* 15(1):316. 1862.

The leaflets of this variety are elliptic to obovate, with the lateral veins less conspicuous than in the typical variety, commonly 10-15 mm. apart, diverging from the midvein at angles of about 50°-60°; petiole 5-7 cm. long, the petiolules 5-10 mm. long, the pairs of leaflets 5-7 cm. apart; fruit 1.5-2.5 cm. broad, the valves 2-3 mm. thick.

TYPE LOCALITY: San Carlos, Amazonas, Venezuela. Type collected by Spruce (no. 2955), cited below.

DISTRIBUTION: Upper Río Negro, Río Vaupes, and Río Orinoco basins of Venezuela, Colombia, and Brazil, and in the upper Amazon basin of Peru, at edge of savannas, in "sabaneta," and "restinga."

VENEZUELA: AMAZONAS: Maroa, *Ll. Williams* 14304 (F, G, US, VEN), 14336 (F, G, US, VEN). San Carlos, *Spruce* 2955 (K type, NY, P); *Holt & Blake* 632 (GH, NY, US, VEN); *Ll. Williams* 14614 (F, G, US, VEN), 14660 (A, F, MO, US, VEN). Caño Arapacua, Río Pacimoni, *Maguire & Wurdack* 34882 (G, NY, U, VEN). Between San Fernando de Atabapo and San Antonio, *Level* 49 (NY, US, VEN). Cerro Moriche, Río Ventuari, *Maguire, Cowan, & Wurdack* 30845 (NY, VEN). La Esmeralda, *Croizat* 154 (NY). Santa Rosa de Amena-dona, *Ll. Williams* 14694 (F, G, US, VEN). BOLÍVAR: Piedra Marimare, 2 km. east of Río Orinoco, opposite head of Isla El Gallo, *Wurdack & Monachino* 40856 (F, G, K, NY, S, US, VEN), 40883 (F, K, NY, S, US, VEN).

COLOMBIA: VAUPÉS: Río Apaporis, Jirijirimo, *Schultes & Cabrera* 14541 (NY, US); *García-Barriga* 13686 (US). Miraflores, *Gutiérrez & Schultes* 825 (US). AMAZONAS: Río Igaraparana, La Chorrera, *Schultes* 3973 (K, SI, US).

BRAZIL: AMAZONAS: "Prope Panure ad Rio Uaupes," *Spruce* 2951 (BM, BR, F, G, K, NY, P). Rio Uaupes, *Fróes [Krukoff]* 12468/211 (A, CAS, NY, POM), 12566/290 (A, CAS, DS, F). Coró-Coró, Rio Uaupes, *Pires* 858 (IAN, NY); *Schultes & Pires* 8998 (US). Ca-te-espera, São Gabriel, *Fróes [Krukoff]* 12377/137 (A, CAS, F, NY, POM). Cucui, *Fróes [Krukoff]* 12406/150 (A, CAS, DS, F, NY, POM). Içana, Rio Negro, *Fróes* 22279 (IAN, NY, U). Tunuí, Rio Içana, *Pires* 762 (IAN, NY). Rio Içana, between Içana and Tunuí, *Black* 48-2668 (IAN).

PERU: LORETO: Alto Río Itaya, *Ll. Williams* 3505 (F, G, US).

LOCAL NAMES: Huairura (Quechua, Peru); peonía (Venezuela); tento, tento da restinga (Brazil); wo-ká (Puinave, Colombia).

Bentham, at the close of his original description of *O. subsimplex*, questioned whether it should be considered as a variety of *O. coccinea*. However, the two collections by Spruce that he cited as *O. coccinea* are now placed in *O. smithii*, another species, although closely related.

The specimens being assigned to var. *subsimplex* in this paper are not uniform in characters, and it is possible that additional varieties or forms should be recognized. Surprisingly, the westernmost collections, from Colombia and Peru, resemble those of the typical variety more closely than do most of the collections from the intervening area.

24. *Ormosia arborea* (Vell.) Harms, Repert. Sp. Nov. 19:288. 1924.

FIGURE 8

Abrus arboreus Vell. Fl. Flum. 303. 1825; Icon. 7: pl. 99. 1835.

Ormosia acuta Vog. Linnaea 11:405. 1837.

Tree, to about 12 m. tall; stipules not seen; young stems fulvo-tomentulose; leaves 7-11-foliolate, the axis about 12-30 cm. long, pilose, the petiole 4-8 cm. long, the pairs of leaflets 3-5 cm. apart,

the petiolules 3–5 mm. long and 2–3.5 mm. in diameter, the blades subcoriaceous, elliptic-oblong to ovate, 5–22 cm. long, 4–9 cm. broad, obtuse, acute to acuminate, the base rounded or subcordate, the upper surface subnitid, glabrous, the lower surface fulvo-tomentulose along the major veins, otherwise sparsely and minutely subappressed-pubescent, glabrescent, the secondary veins raised, about 10–15 pair, 3–8 (–20) mm. apart, forming angles of about 50°–55° with the midvein; inflorescences with axes fulvo-tomentulose, the bracts linear, 2–3 mm. long, the bracteoles linear, 1.5–2 mm. long; flowers (13–) 16–20 mm. long; calyx fulvo-tomentulose, (8–) 10–12 mm. long, the tube 7–8 mm. long, 6–7 mm. in diameter, the teeth 4–5 mm. long; petals lilac, bluish, or purple; fruit dehiscent, lignous, glabrous or nearly so at maturity, nitid, black, 1–3-, commonly 1-seeded, 4–6 cm. long, 2.5–3.5 cm. broad, 2 cm. thick, the valves 2–4 mm. thick; seeds bicolored red and black, about 13–15 mm. long, 13 mm. broad, and 10 mm. thick, the hilum 3.5 mm. long and 1.5 mm. wide.

TYPE LOCALITY: Rio de Janeiro, Brazil. Type presumably collected by Vellozo, represented by Plate 99, op. cit.

DISTRIBUTION: In woods and along the coast in "restinga," southeastern Brazil.

BRAZIL: Without exact locality, *Claussen* s.n. (P); *Sellow* 155 (BM, possible isotype of *O. acuta* ?), s.n. (F fragment, possibly type material of *O. acuta* ? ["inter Rio et Campo"]). RIO DE JANEIRO: Cabo Frio, *Ule* s.n. (R, US); *Segadas-Vianna et al.*, Restinga I-571 (US). Macae [Macahé], *Riedel & Luschnath* 1254 (MO). GUANABARA: Rio de Janeiro: *Gomes* s.n. (K); *Glaziou* 15 (BR, P); *Riedel* s.n. (NY); *Richard* s.n. (BR, G, P); *Widgren* s.n. (S). Jardim Botânico, cultivated, *Constantino* 276 (K, S, U, US); *Whitford* 38 (F, GH, S, US, Y). "Praia Copacabana," *Luschnath* 131 [*Martius Herb. Fl. Bras.* no.] (BR, G, M, P). Copacabana, *Nadeaud* s.n. (P); *Neves Armand* 44 (R). Recreio do Bandeirantes, *Lutz* 655 (R). Restinga de Tijuca, *Kuhlmann* 732 [RB no.] (RB, US); *Mikan* s.n. (F, NY, US); *Machado* [RB no.] 76105 (RB), 76112 (RB, US). "Praia da Tijuca," *Lund* 101 (C). Gruta de Imprensa, *Duarte* 64 (RB, US). Morro dos Cabritos, *Kuhlmann* [RB no.] 41437 (RB). MINAS GERAIS: Caldas, *Regnell* III.472 (K, S, US). Horto Florestal de Paraopeba, *Heringer* [RB no.] 93624 (RB). Carlos Prates, Belo Horizonte, *Mendes de Magalhães* s.n. (R). Tombos, *Mello Barreto* 1981 (R). Lagoa Santa, *Warming* s.n. (P). SÃO PAULO: Campinas, *Severin* 157 (S). Santos, *Mosén* 2830 (S). Santa Rita do Passa Quatro, *Hemmendorff* 235 (S). Serra da Cantareira, *Hoehne* 29416 (NY). Rio Itararé, Itaporanga, *Joly* 725 (SI). PARANÁ: Jacareí, *Dusén* 8265, (BM, S, US), 8731 (BM, S, US). Itararé, opposite Morungava, *Dusén* 16533 (A, BR, F, G, GH, MO, S). Alexandra, *Dusén*, s.n. (S). SANTA CATARINA: Barra do Sul, Araquari, *Reitz & Klein* 799 (G, NY, S, U, UC, US). Cedro Baixo, *Reitz & Klein* 1406 (NY, S, UC). Luiz Alves, Itajai, *Reitz* 4212 (BR, G, NY, S, U, UC, US).

LOCAL NAMES: Mariana, olho de cabra, olho de onca, pau ripa, pau de Santo Inácio, tento, sapiranga.

This species appears to be a part of the *O. coccinea* complex that has been geographically separated from the main area of distribution

for some time. I believe that it is desirable to maintain it as a separate species, at least until we have more information concerning the flora of the intervening region.

Harms correctly noted that *O. arborea*, based on Vellozo's *Abrus arboreus*, was distinct from Vogel's *O. nitida* and should not be in synonymy, as placed by Bentham.

25. *Ormosia grossa* Rudd, sp. nov.

FIGURE 9

Arbor 8 m. alta; ramuli novelli fulvo-velutini; stipulae non visae; folia 7- vel 9-foliolata, axi 8-14 cm. longo, velutino, petiolo 3-3.5 cm. longo, jugis inter sese 2-3.5 cm. distantibus, foliolis cum petiolulis 4-5 mm. longis et 3 mm. diametro, laminis coriaceis, ellipticis, 6-11 cm. longis, 3.5-5 cm. latis, obtusis vel retusis, basi obtusis, supra nitidis, glabris, subtus leviter tomentosi, pilis ferruginis, circiter 1 mm. longis, laxe crispis, venis secundariis prominentibus, utrinsecus circiter 9-11, fere parallelis, inter sese 5-10 mm. distantibus, angulis venarum costaeque circiter 50° - 55° ; inflorescentiae cum axibus fulvo-velutinis; bractee bracteolaeque non visae; flores non visi; fructus dehiscentis, lignosus, glaber, nitidus, 1-4-spermus, 4-9 cm. longus, 3-3.5 cm. latus, inter semina aliquanto constrictus, 2.5-3 cm. crassus, valvulis 5-7 mm. crassis; semina bicolora, coccinea macula nigra notata, 13-14 mm. longa, 11-13 mm. lata, et 10-11 mm. crassa, hilo 2-2.5 mm. longo et 1-1.5 mm. lato.

Type in the Herbarium Amazonicum, Museu Paraense Emilio Goeldi, no. 21296, collected at Cachoeira Baixa do Tarumã, Manaus, Amazonas, Brazil, July 1, 1955, by W. Rodrigues (Instituto Nacional de Pesquisas da Amazonia no. 1291).

DISTRIBUTION: Known only from the type collection.

LOCAL NAMES: Mulungu, tento.

The one known specimen cited above appears to be sufficiently distinct to warrant specific recognition. Superficially, it is most similar to *O. lignivalvis* but differs, as indicated in the key, in characters that seem to be significant, at least in this genus.

26. *Ormosia lignivalvis* Rudd, sp. nov.

FIGURE 9

Arbor usque ad 50 m. alta; ramuli novelli fulvo- vel cano-velutini; stipulae minutae, deltoideae, 1 mm. longae vel minus, caducae; folia 5-11-foliolata, axi 8-20 cm. longo, velutino, petiolo 2-8 cm. longo, jugis inter sese 1-4 cm. distantibus, foliolis cum petiolulis 3-10 mm. longis et 1.5-3.5 mm. diametro, laminis coriaceis, ellipticis vel oblongis, 3-17 cm. longis, 1.5-9 cm. latis, obtusis vel subacutis, basi obtusis vel subcordatis, supra nitidis, glabris, interdum costa puberulis, subtus uniformiter subsericeis, pilis plus minus crispis, venis secundariis prominentibus, utrinsecus circiter 10-15, fere parallelis,

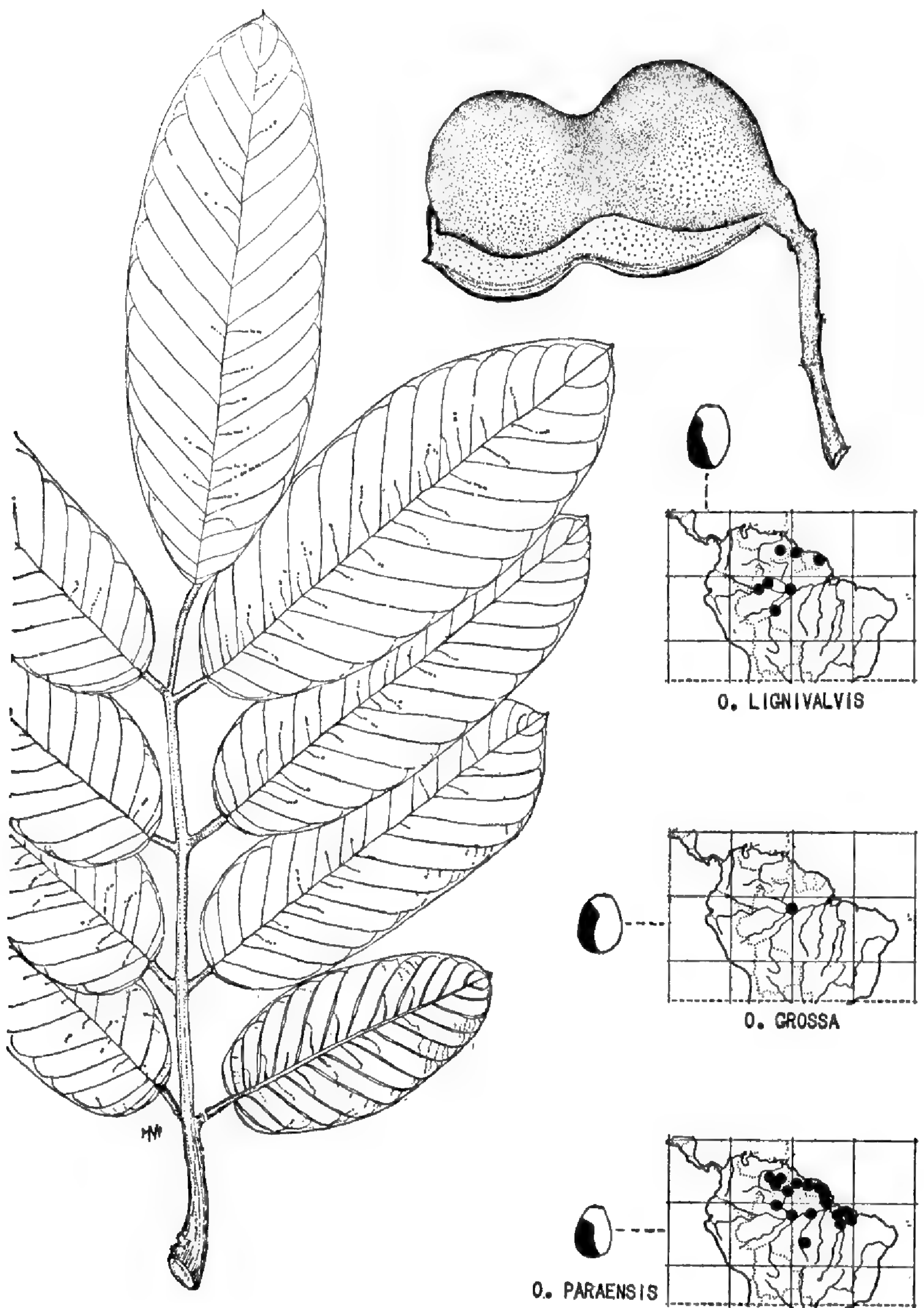


FIGURE 9.—*Ormosia* section *Ormosia* series *Coccineae*, in part: Geographic distribution of species; leaf, fruit, and seed of *O. lignivalvis*; seeds of *O. grossa* and *O. paraensis*, $\times \frac{1}{2}$.

inter sese 3–10 mm. distantibus, angulis venarum costaeque circiter 50° – 60° ; inflorescentiae cum axibus fulvo- vel ferrugino-velutinis, bracteis deltoideis, 1–4 mm. longis, basi 1 mm. latis, bracteolis deltoideis, 1–1.5 mm. longis; flores 11–12 mm. longi, calyce fulvo-

velutino, 6–7 mm. longo, tubo 4–4.5 mm. longo, 4.5 mm. diametro, dentibus 2–2.5 mm. longo, petalis atropurpureis, vexillo macula alba notato; fructus dehiscens, lignosus, glabrescens, nitidus, castaneus, nigratus, 1–4-, communes 1-spermus, 6–10 cm. longus, 2.5–4 cm. latus, inter semina aliquanto constrictus, circiter 2.5 cm. crassus, valvulis 5–7 mm. crassus; semina bicolora, coccinea macula nigra notata, 13–15 mm. longa, 12–13 mm. lata, 9–10 mm. crassa, hilo 3 mm. longo et 1.5 mm. lato.

Type in the U.S. National Herbarium, no. 2266008, collected at São Paulo de Olivença, Amazonas, Brazil, April 1945, by R. de Lemos Fróes (no. 20796). Duplicates at F, K, and NY.

DISTRIBUTION: In forest on sandy soil, "terra firma," in French and British Guiana, southeastern Venezuela, and the upper Amazon area of Brazil.

ADDITIONAL SPECIMENS EXAMINED:

FRENCH GUIANA: Route de St. Laurent à Cayenne, km. 11.5, *Bur. Agr. & For.* 151 M (P). Route de Cayenne, km. 8.9, *Bur. Agr. & For.* 7535 (NY, U).

BRITISH GUIANA: Aiamoradan Forest, Mazaruni Station, *Fanshawe* 734 [For. Dept. B.G. no. 3470] (K, US).

VENEZUELA: BOLÍVAR: E. of Cruzero, ESE of Villa Lola, *Steyermark* 86413 (US, VEN). NE of Serranía Pia-shauhy, *Steyermark* 90665 (US, VEN). Pica de La Lira, El Dorado, *Conejos-Sobrino* 82 (MER, US).

BRAZIL: AMAZONAS: Tonantins, Vila Velha, *Ducke* 770 (F, GH, MG, MO, NY, R, RB, SI, US). São Paulo de Olivença, *Fróes* 12077 (A, F, NY, US), 12082 (A, F, NY, US). Rio Tonantins, *Fróes* 12183/94 (A, F, NY, US), 12185/96 (A, NY). Manaus, *Ducke* [RB no.] 23366 (P, RB, S, US). Basin of Rio Madeira, *Lobo* [Krukoff Herb. no.] 15461 (NY). Humaitá, Cipoal, *Krukoff* 7222 (A, BM, BR, F, K, MO, NY, U, US).

LOCAL NAMES: Agui [Paramaka], panacoco (French Guiana); barakaro (British Guiana); chaparillo, peonío (Venezuela); tento, tenteiro, tento da terra firma (Brazil).

The minutely crispate pubescence of the leaflets and the relatively long hilum of the seed are characters that help to distinguish *O. lignivalvis* from the other species with thick-valved fruit.

27. *Ormosia paraensis* Ducke, Arch. Jard. Bot. Rio Janeiro 4 : 62. 1925.

FIGURE 9

Ormosia crassicarpa Pierce ex Pittier, Bol. Soc. Venez. Cienc. Nat. 10 : 108. 1944; M. A. C. Serv. Bot. Bol. Tecn. No. 5 : 15. 1944, without Latin diagnosis.

Ormosia heterophylla Pires, Bol. Técn. Inst. Agron. Belém No. 38 : 24. 1960.

Tree to about 40 m. high; young stems subsericeous, the hairs fulvous or canus; stipules not seen; leaves (1–3–) 7–15– (–19) foliolate, the axis (2–) 7–25 cm. long, subsericeous, the petiole about 2–6 cm. long, the pairs of leaflets 1.5–4 cm. apart, the petiolules 6–7 mm. long and 1.5–2 mm. in diameter, the blades coriaceous or subcoriaceous,

elliptic-oblong, 4–23 cm. long, 1.5–8 cm. broad, obtuse to acute or sometimes breviacuminate, the base obtuse, the upper surface glabrous, nitid or subnitid, the lower surface minutely appressed-pubescent, glabrescent, the secondary veins inconspicuous, but slightly raised, about 12–20 pair, 3–7 mm. apart, forming angles of 60°–70° with the midvein; inflorescences with axes fulvo-sericeous, the bracts deltoid or lanceolate, 1–2 mm. long and 1 mm. broad at the base, the bracteoles linear, about 1 mm. long; flowers (6–) 9–10 mm. long; calyx fulvo-sericeous, (4.5–) 6–7 mm. long, the tube 2.5–4 mm. long, 2.5–3 mm. in diameter, the teeth about 2–3 mm. long; petals purplish, marked with white; fruit dehiscent, lignous, glabrous at maturity, nitid, black or dark brown, 1–3-seeded, 3–6.5 cm. long, 2–3.5 cm. broad, 1.2–2 cm. thick, the valves 2–5 mm. thick; seeds bicolored red and black, 12–15 mm. long, 10–13 mm. broad, and 8–10 mm. thick, the hilum about 2 mm. long and 1 mm. wide.

TYPE LOCALITY: "Serra Itauajury prope Montealegre," Para, Brazil. Lectotype collected by Ducke (RB no. 17108).

DISTRIBUTION: Sandy or clay soil, "terra firma," lowland, high jungle of the Guianas, Venezuela, and the middle to lower Amazon region of Brazil, at elevations up to about 800 meters.

FRENCH GUIANA: Camp Lorrain, *Bur. Agric. & For. Guyan*, 7 M (P). "Route babassou," *Bena* [Herb. no.] 1157 (U).

SURINAM: Commewigne, Perica R., *Lindeman* 5352 (US). Near Paramaribo, Zanderij I, *Stahel* 118 (NY, U); *For. Bur. Sur.*, *Arbor* no. 77 [Herb. no.] 1508 (U), 4647 (K, NY, U); *Arbor* no. 192, [Herb. no.] 1427 (BR, U). Forest Reserve, Sektie O, *Arbor* no. 572 [Herb. nos.] 1138 (U), 6079 (K, U). Watramiri, *Arbor* no. 1589 [Herb. no.] 1824 (U).

BRITISH GUIANA: Moraballi Creek, Essequibo R., *Fanshawe* 464 [*For. Dept. B.G.* no. 3200] (K). Keriti Creek, Essequibo R., *Fanshawe* 881, [*For. Dept. B.G.* no. 3617] (K, NY).

VENEZUELA: BOLÍVAR: Guayapo, *Ll. Williams* 12058 (K, NY, UC, US, VEN type of *O. crassicarpa*). Ptari-tepui, *Steyermark* 60683 (F, MO, VEN). Urimán, Río Apacará, *Bernardi* 1623 (VEN).

BRAZIL: RIO BRANCO: Estrada Bôa Vista, Caracarai, *Frôes* 22971 (IAN); *Black* 51–13457 (NY, P). Serra do Divisor Brazil-Venezuela, *Frôes* 23174 (IAN). AMAZONAS: Manaus, *Ducke* 1047 [MG no. 18125] (K, MG, MO, NY, R, SI, US), 1275 [MG no. 18126] (A, F, MG, NY, R, SI, US), [RB no.] 23357 (K, RB, S, US). Padauri, Rio Negro, Tapera, *Frôes* 22900 (NY, U, US). AMAPÁ: Curiaú, Macapá, *Pires & Silva* 4771 (NY, US). Mt. Tipac, *Irwin* 48691 (NY, US). PARÁ: Belém, *Ducke* [MG no.] 15543 (F photo and fragment ex MG, MG syntype, S), 16575 [MG no.] (F photo and fragment ex MG, MG syntype, U). Bragança, *Ducke* [RB no.] 17107 (K, P, S, U, US, isosyntypes). Serra do Santarem, *Ducke* [MG no.] 16357 (F photo and fragment ex MG, MG syntype). Breu Branco, Rio Tocantins, *Frôes* 23571 (IAN, NY). Belterra, *Black* 47–1003 (NY, U, US, VEN, Y). Mosqueiro, *Ducke* [RB no.] 20362 (RB, S, U). Bôa Vista, Tapajos R., *Monteiro da Costa* 93 (F). Upper Cupari R., *Krukoff* 1164 (A, BM, K, NY, P, S, U). Near highway Belém-Brasília, km. 93, *Kuhlmann & Jimbo* 307 (IAN type of *O. heterophylla*); *Pires & Egler* 7648 (IAN paratype of

O. heterophylla, NY). MARANHÃO: Mata da Cochoeira, Maracassumé R., *Fróes* 1910 (A, G, K, NY, S, U). São Luiz, *Fróes* 11601 (A, K, MO, NY, U, UC, US), 11612 (A, K, MO, NY, U, UC, US), 21573 (F, K, NY, US). Candido Mendes, *Fróes* 1796 (A, BM, F, G, MO, NY, P, S, U, US). Alcântara, *Fróes* 30763 (US). MATO GROSSO: Rio Arinos, *Kuhlmann* 383 (R), 384 (RB), 385 (R), 387 (R).

LOCAL NAMES: Agui, panacoco (French Guiana); barakaro konok-hodiboxo ibikoro [Arawak], barakaroe hohoro di koro [Arawak], "tervejoballi"? [Arawak], itjoerano anakoko [Carib], konoboyepo [Carib], konoweyno [Carib], wootjiano-anakoko [Carib], kokriki (Surinam); barakaro, jumbi bean (British Guiana); metari-yek [Arekuna], mureyenu-yek, peonía, peonilla (Venezuela); tento, tenteiro (Pará, Brazil); jutahy do capoeira, mulungu, mulunga da mata (Maranhão, Brazil).

The specimen that Egler (Bol. Mus. Par. Emílio Goeldi, II. 18:63. 1963) cited as type, RB no. 17108, collected by Ducke, actually a lectotype, has not been available to me. However, I have seen several syntypes as well as other collections annotated by Ducke, so that the identity of his *O. paraensis* can be readily established. After examining types of *O. crassicarpa* and *O. heterophylla*, I believe they should be included within the circumscription of *O. paraensis*. The species, *sensu latior*, has a relatively extensive geographic range, and, according to the collectors' notes, can be found on clay or sandy soil. There is considerable variation in the size and number of leaflets, but the pubescence and the angle of divergence of the secondary veins is fairly constant. The types of *O. crassicarpa* and *O. heterophylla* are similar in having leaflets larger than average. There is a gradation in size of fruit from small pods in the paratype of *O. heterophylla*, for example, to larger ones in the type of *O. crassicarpa*, but there seems to be no general geographic correlation.

28. *Ormosia elata* Rudd, sp. nov.

FIGURE 10

Arbor usque ad 60 m. alta; ramuli novelli fulvo- vel cano-velutini; stipulae minutae, deltoideae, 1 mm. longae vel minus, caducae; folia 7-9-foliolata, axi 12-17 cm. longo, jugis inter sese 2.5-3.5 cm. distantibus, foliolis cum petiolulis 3-8 mm. longis et 2 mm. diametro, laminis subcoriaceis, ovatis, obovatis, vel oblongis, 4-15 cm. longis, 3-7 cm. latis, acuminatis, basi obtusis, supra glabris vel subglabris, nitidis, costa puberulis, subtus uniformiter puberulis vel suffarinosi, venis secundariis prominentibus, utrinsecus circiter 10, fere parallelis, inter sese 5-10 mm. distantibus, angulis venarum costaeque circiter 45°-50°; inflorescentiae cum axibus fulvo- vel cano-tomentulosis, bracteis deltoideis vel rhombicis, 3-5 mm. longis, 1-2 mm. latis, bracteolis linearibus, 1.5-2 mm. longis; flores maturi non visi, calyce juvenali circiter 5 mm. longo; fructus dehiscens, lignosus, glabrescens,

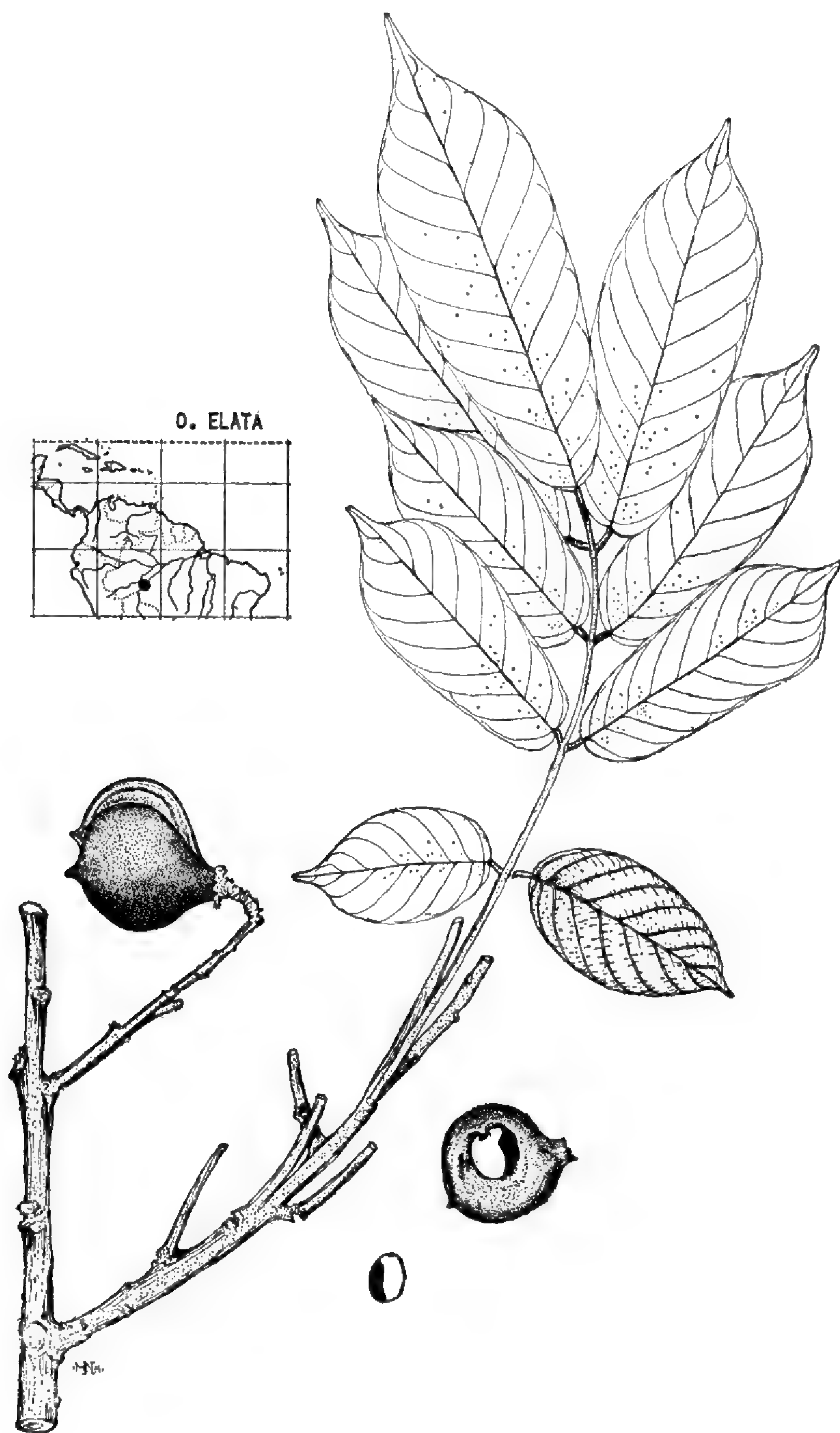


FIGURE 10.—*Ormosia* section *Ormosia* series *Coccineae*, in part: *O. elata*: Geographic distribution; leaf, fruit, and seeds, $\times \frac{1}{2}$.

castaneus, nigratus, nitidus, 1- vel 2-spermus, 3-6 cm. longus, 2-3 cm. latus, inter semina aliquanto constrictus, circiter 1.5 cm. crassus, valvulis 4-5 mm. crassis; semina bicolora, coccinea macula nigra notata, circiter 13 mm. longa, 10 mm. lata, 8-9 mm. crassa, hilo 2.5 mm. longo et 1 mm. lato.

Type in the U.S. National Herbarium, no. 1660701, collected on "low terra firma," near Tres Casas, Humaitá, State of Amazonas, Brazil, September 14-October 11, 1934, by B. A. Krukoff (no. 6478). Duplicates at A, BM, BR, F, G, K, MO, NY, S, U.

DISTRIBUTION: On "low terra firma," along southern tributaries to the Amazon.

ADDITIONAL SPECIMENS EXAMINED:

BRAZIL: AMAZONAS: Tres Casas, Humaitá, *Krukoff* 6303 (A, BM, BK, F, G, K, NY, S, U, US). Near mouth of Rio Embira, *Krukoff* 5053 (A, F, G, K, MO, NY, U, US), 5894 (A, G, K, NY).

LOCAL NAME: Mulungu.

In leaflet pubescence this species resembles *O. smithii*, but the fruits are heavier valved, as in *O. coccinea*, and related species. The angles of divergence of the secondary veins are more acute than in most species of the genus.

29. *Ormosia costulata* (Miq.) Kleinh. Rec. Trav. Bol. Néerl. 22 : 392. 1925.

FIGURE 8

Leptolobium costulatum Miq. Stirp. Sur. Sel. 17. 1850.

Ormosia trifoliolata Huber, Bol. Mus. Goeldi 5 : 398. 1909.

Ormosia costulata var. *trifoliolata* (Huber) Amshoff (as *trifoliata*).

Tree to about 14 m. high; young stems fulvo-velutinous, glabrescent; stipules minute, deltoid, about 1 mm. long; leaves (1-) 3-7-foliolate, the axis about 2-9 cm. long, the petiole 1-3 cm. long, the pairs of leaflets 1-2 cm. apart, stipels sometimes visible, especially in young plants, the petiolules 3-5 mm. long, 1-2 mm. in diameter, the blades coriaceous, elliptic to obovate, 2-18 cm. long, 1-10 cm. broad, obtuse or emarginate to broadly acute, the base acute to subcordate, the upper surface glabrous, nitid, the veins slightly impressed, the lower surface puberulent along the midvein, otherwise minutely pubescent with appressed hairs, glabrescent, the secondary veins prominent, about 9-15 pair, 3-6 mm. apart, forming angles of about 50°-60° with the midvein; inflorescences with axes fulvo-velutinous, the bracts deltoid, acute, 1-2 mm. long and about 1 mm. broad at the base, the bracteoles deltoid, about 1 mm. long; flowers 10-12 mm. long; calyx 5-7 mm. long, densely fulvo-sericeous, the tube about 3 mm. long and 3-4 mm. in diameter, the teeth 3-4 mm. long; petals blackish purple, the banner sometimes with a white mark at base; fruit dehiscent, sublignous or coriaceous, brown to black, glabrate, 1-3-, commonly 1-, seeded, 2-4 cm. long, 1.2-2 cm. wide, slightly constricted between the seeds,

1-1.2 cm. thick, the valves 1-2 mm. thick or less; seeds bicolored, red and black, (6-) 9-11 mm. long, (6-) 8-10 mm. wide, and 5-6 mm. thick, the hilum elliptic, 1-1.5 mm. long and 1 mm. wide.

TYPE LOCALITY: Surinam. Type collected by Hostmann (no. 1299), cited below.

DISTRIBUTION: In sandy savanna, Surinam, British Guiana, and the middle Amazon region of Brazil at elevations up to about 500 meters.

SURINAM: Without exact locality, *Wullschlägel* 829 (BR); *Hostmann* 1299 (BM, C, FM neg. 21898 ex C, GH, K, NY, P, S, U type of *Leptolobium costulatum*). *Matta, Maguire & Stahel* 24960 (A, F, K, NY, U, US, VEN); *Gonggrijp* 442 (U). "Zandery," *Samuels* 261 (A, K, NY, P, US); *Zanderij I, Lindeman* 6515 (U); *Stahel* 119 (NY, U); *Maguire & Stahel* 25051 (A, F, K, NY, U, US, VEN); *Stahel [For. Bur. Sur.]* 83 (A, K, NY, Y); *Maguire* 24222 (BR, F, K, MO, NY, U, US, VEN). *Tafelberg, Lisa Creek, Maguire* 24383 (NY, U). *Corantyne R., Pulle* 473 (NY, U). *Patamaka, Lanjouw & Lindeman* H 9 (NY, U). *Wia Wia Bank, Lanjouw & Lindeman* 1292 (K, NY, U). *Sapende, Lanjouw & Lindeman* H 59 (U). *South of Paramaribo, Lindeman* 4526 (U). *Donder Kreek, Lindeman* 7126 (U). "Tibiti savanne," *Lanjouw & Lindeman* 1710 (NY, U). *Jodensavanne, Suriname R., Heyligers* 295 (US).

BRITISH GUIANA: Without exact locality, *Jenman* 6569 (K). *Membaru Creek, upper Mazaruni R., Pinkus* 206 (F, G, GH, IAN, MO, NY, S, US). 6 miles east of *Atkinson Field, Irwin* 189 (US). *Upper Demerara R., Jenman* 4171(K). *Demerara R., Jenman* 6299 (K). *Imbaimadai savannas, upper Mazaruni R., Maguire & Fanshawe* 32247 (NY). *Malali, Demerara R., De La Cruz* 2662 (F, GH, MO, NY, US). *Hariva Quarry, 32 miles south of Mackenzie, Cowan* 39274 (NY). *Partang Rapids, Partang R., Maguire, Tillett & Tillett* 43858 (NY, US). *Kamantin Creek, Wiruni R., For. Dept. B.G. no. 2604 [D 563] (K)*. *Orealla savannah, Courantyne R., For Dept. B.G. no. 5383 [Field no. 2595] (K)*.

BRAZIL: AMAZONAS: *Manaus, Ducke* 1194 (K, MG, MO, NY, R, SI, US), [MG no.] 11195 (MG). *Barreira do Baracari, Rio Uatumã, Rodrigues* 212 (US). PARÁ: *Faro, Ducke [MG no.] 8697 (F fragment & photo ex MG, FM neg. 28239 ex G, G, MG syntype of O. trifoliolata), [MG no.] 15797 (BM, FM neg. 28239 ex G, G, MG, P, R, S, U, US), [RB no.] 5695 (K, RB)*. *Rio Mapuera, Ducke [MG no.] 9118 [= RB no. 566] (BM, F fragment & photo ex MG, MG syntype of O. trifoliolata, RB)*.

LOCAL NAMES: *Barakaro [Arawak] (British Guiana; Surinam); barakaroe, barakaroe ibiberoe, barakaroe karabandikoro, ibikoro barakaro [Arawak]; koenakoko, woitjano anakoko [Carib]; kokriki, kokrikie, sabana kokrikie, savanne-kokrikie (Surinam). Tonto (Brazil)*.

The leaves of *O. costulata* are sometimes difficult to distinguish from those of *O. paraensis* and *O. coccinea* var. *subsimplax*, but the relatively small, thin-valved fruits are distinctive.

Reduction in number of leaflets to one, or three, the basis for separating *O. trifoliolata*, is not believed to be sufficiently significant

for specific delimitation, especially since the other characters appear to be constant.

30. *Ormosia jamaicensis* Urb. Symb. Ant. 5:366. 1908.

FIGURE 8

Tree, to about 25 m. tall; stipules not seen; young stems moderately fulvo-puberulent, glabrescent; leaves 9- or 11-foliolate, the axis about 10–25 cm. long, puberulent to subglabrous, the petiole 4–8 cm. long, the pairs of leaflets 3–5 cm. apart, the petiolules 5–7 mm. long, 1.5 mm. in diameter, the blades subcoriaceous, ovate to oblong-lanceolate, 4–14 cm. long, 2–7 cm. wide, acuminate, the base rounded, the upper surface glabrous, subnitid, the lower surface puberulent along the midvein, otherwise minutely and sparsely pubescent with fulvous, appressed hairs, the secondary veins moderately raised, about 12–18 pair, essentially parallel, 5–10 mm. apart, forming angles of about 50° with the midvein; inflorescences with axes minutely fulvo-velutinous, sometimes glabrescent, the bracts linear, attenuate, 2–6 mm. long, 1 mm. broad or less at the base, the bracteoles filiform, 1–2 mm. long; flowers 11–14 mm. long; calyx fulvo- to ferrugino-velutinous, about 7–9 mm. long, the tube 3–5 mm. long, 5 mm. in diameter, the teeth 3–4 mm. long; corolla rose-purple; fruit dehiscent, coriaceous, nitid, black or brown, glabrous or sparsely and minutely appressed-pubescent, 1- or 2-seeded, about 5–6 cm. long, 2.5–3 cm. broad, 1.5 cm. thick, the valves 1–2 mm. thick; seeds red with a black line along the chalazal edge, 15–17 mm. long, 15–17 mm. broad, and 10–11 mm. thick, the hilum about 3 mm. long and 1.5 mm. wide.

TYPE LOCALITY: Jamaica, Hanover Parish, along road from Askenish to Dolphin Head, at 400–530 m. elevation. Type collected by W. Harris (no. 9241), cited below.

DISTRIBUTION: KNOWN only from the general area of the type collection, on Dolphin Head, at about 300–540 m. elevation.

JAMAICA: HANOVER PARISH: Dolphin Head, *Harris* 9241 (NY isotype); *Britton & Hollick* 2210 (F, NY); *Barton & Spence* s.n. (IJ, NY, US); *Barton* s.n. (IJ, US fragment); *Proctor* 10406 (IJ), 10414 (IJ, NY, US); *Stearn* 145 (A, BM, K).

LOCAL NAME: Nickel, a corruption of necklace.

This species not only is geographically isolated, with a very restricted range, but is so distinct from its putative relatives that its origin is obscure. Superficially, *O. jamaicensis* most resembles a glabrous-fruited form of *O. monosperma*, and, perhaps, is more closely related to that species than members of the *Coccineae*.

31. *Ormosia smithii* Rudd, sp. nov.

FIGURE 8

Arbor usque ad 20 m. alta; ramuli novelli fulvo- vel pallido-velutini; stipulae minutae, deltoideae, circiter 2 mm. longae, basi 0.5 mm. longae, caducae; folia 5–9-foliolata, axi 9–22 cm. longo, fulvo-velutino,

petiolo 4–8 cm. longo, jugis inter sese 2–5 cm. distantibus, foliolis cum petiolulis 5–10 mm. longis et 2–2.5 mm. diametro, laminis coriaceis vel subcoriaceis, ovatis vel obovato-oblongis, (2–) 4–15 cm. longis, (1.5–) 2–6 cm. latis, acutis vel breviacuminatus, acumine ad 10 mm. longo, basi obtusis, supra glabris, subnitidis, subtus subtiliter pubescentibus vel suffarinosus, interdum venis maioribus tomentulosus, venis secundariis plus minus prominentibus, utrinsecus circiter 11–14, fere parallelis, inter sese 5–15 mm. distantibus, angulis venarum costaeque circiter 50° – 60° ; inflorescentiae cum axibus fulvo- vel cano-tomentulosus, glabrescentibus, bracteis linearibus, circiter 3 mm. longis et 1 mm. latis vel minus, bracteolis linearibus, circiter 1 mm. longis; flores 13–15 mm. longi, calyce pallido- vel fulvo-velutino, 6–7 mm. longo, tubo circiter 4 mm. longo et 4 mm. diametro, dentibus 2–3 mm. longo, petalis violaceis vel purpureis, vexillo macula alba notato; fructus dehiscentis, sublignosus, glaber, nitidus, castaneus, nigratus, 1–5, communes 1-spermus, 2–5 (–10) cm. longus, 1.5 cm. latus, inter semina aliquanto constrictus, circiter 1.5 cm. crassus, valvulis 1–2 mm. crassis; semina bicolora, coccinea macula nigra notata, 12–14 mm. longa, 10–11 mm. lata, et 8–9 mm. crassa, hilo 2 mm. longo et 1 mm. lato.

Type in the U.S. National Herbarium, no. 1777602, collected in forest, Isherton, basin of the Rupununi River, British Guiana, November 11, 1937, by A. C. Smith (no. 2455). Isotypes at A, F, K, MO, NY, P, S, U, Y.

DISTRIBUTION: Southern British Guiana and the Rio Branco-Rio Negro region of Brazil, usually in forest along rivers.

ADDITIONAL SPECIMENS EXAMINED:

BRITISH GUIANA: Isherton, Rupununi R., *A. C. Smith* 2513 (A, F, G, MO, NY, P, S, U, US). "Banks of the Quitaro" [Kwitara R. ?], *Schomburgk* 580 (A, BM, BR, F, G, K, NY, P, US).

BRAZIL: RIO BRANCO: Porto Alegre, Rio Amajari, *Fróes* 23119 (IAN, NY, U). Between Fazendas Bom Intento and Capela, *Black* 51–13226 (IAN, NY, P). Igarapé Caraná, *Black* 51–12779 (IAN, NY). Anno Bom, *Kuhlmann* [RB no.] 3133 (S, U, US). Maruay, Rio Surumú, *Luetzelburg* [Exped. Rondon] 21194 (M).

AMAZONAS: Rio Negro between Barcelos and Santa Isabel, *Spruce* 1958 (BM, G, GH, K, M, NY, P). Barcelos, *Fróes* 33853 (IAN); *Ducke* [MG no.] 7168 b (BM, MG). Santa Isabel, *Krukoff* 12103/15066 (A, F, NY, US). "Ad Rio Negro," *Spruce* 3785 (BM, BR, G, K, NY, P). Ilha Nova Vida, upper Rio Negro, *Baldwin* 3267 (US). Tapera, Rio Preto, *Fróes* 22438 (U, VEN).

Although the fruit and seeds of *O. smithii* are entirely different from those of *O. excelsa*, the pallid pubescence of the floral axes is similar. Two specimens here assigned to *O. smithii* (*Spruce* 1958 and 3785) were cited by Bentham (*Fl. Bras.* 15 (1) : 317. 1862) as *O. coccinea*, which is similar in seed characters but otherwise differs in many respects, as indicated in the key and descriptions. *Ducke* (*Ann.*

Acad. Bras. 11 : 189. 1939) identified collections of *O. smithii* (Ducke 7168 and Kuhlmann 3133) as *O. discolor*, apparently on the basis of table 126 in Flora Brasiliensis (15(1). 1862), which, unfortunately, does not accurately represent *O. discolor*.

Series 6. Nobiles Rudd, ser. nov.

Arbores; fructus dehiscens, valvulis coriaceis, brevissimo-velutinis, sericeis, vel suffarinosi, nonnumquam glabrescentibus; semina irregulariter bicolores, coccinea macula nigra variegata, nonnumquam in ipsissimo legumine nunc semina unicolora coccinea nunc fere unicolora nigra; hilo elliptico 1–3 mm. longo.

The chief characteristic of this series is the irregular marking of the seeds, with no two seeds exactly alike, this in contrast to the great degree of uniformity found in the seeds of other series. In the same pod of some species of this series there may be seeds entirely red to almost entirely black, with intermediates of varying patterns of red and black. When only one seed is present, it tends to be mostly red. The specimens illustrated are merely examples and do not show all of the possible sizes and patterns.

The type of this series is *O. nobilis* Tul.

32. *Ormosia krugii* Urb. Symb. Ant. 1 : 320. 1899.

FIGURE 11

Tree, to about 25 m. tall; young stems finely aureo to fulvo-sericeous; stipules not seen; leaves 5–9-foliolate, the axis finely velutinous or sericeous, about 20–50 cm. long, the petiole 7–28 cm. long, the pairs of leaflets 6–16 cm. apart, the petiolules 8–20 mm. long, 3–5 mm. in diameter, the blades subcoriaceous, elliptic to suborbicular, (9–) 14–23 cm. long, (5–) 8.5–20 cm. wide, the terminal leaflet sometimes obovate, the apex obtuse, sometimes breviacuminate, the acumen about 10 mm. long or less, the base rounded to subcordate, the upper surface glabrous, subnitid, the lower surface moderately sericeous or subsericeous, sometimes glabrate, the secondary veins about 14–20 pair, essentially parallel, mostly 10–20 mm. apart, forming angles of 50°–60° with the midvein; inflorescences with the axes aureo- to ferrugino-sericeous or finely velutinous; the bracts and bracteoles deltoid, 1 mm. long or less; flowers 15–18 mm. long; calyx 10–12 mm. long, ferrugino-sericeous, the tube 5–7 mm. long, 7 mm. in diameter, the teeth 3–6 mm. long; petals brownish to blackish purple, the standard with a white center; fruit dehiscent, coriaceous, brown, fulvo- or ferrugino-sericeous, glabrescent, sometimes somewhat reticulate rugose, 1–6-seeded, 3–10 cm. long, (1.5–) 2–2.7 cm. broad, submoniliform, about 1.5 cm. thick; seeds red, or bicolored red and black, the markings variable in shape and proportion, 10–13 mm.

long, 12–13 mm. broad, 9–10 mm. thick, the hilum about 3 mm. long and 1.5 mm. wide.

TYPE LOCALITY: "Prope Juncos in monte Guvuy," Puerto Rico. Lectotype collected by P. Sintenis (no. 1886), cited below.

DISTRIBUTION: In rain forest, Puerto Rico, Hispaniola, and the Lesser Antilles, at elevations of 100–880 meters.

HAITI: Massif du Nord, Mt. Organisé, *Ekman* 6232 (A, F, G, IJ, S, US).

DOMINICAN REPUBLIC: Duarte, Matanzas, *Ekman* 15890 (K, NY, S, US). La Cumbre, *Ekman* 11422 (S), 12425 (S). Liali, *Abbott* 2658 (US). La Vega, Piedra Blanca, *Allard* 18841 (US). La Cidra, *Jiménez, Gonzales, & Marcano* 2953 (US).

PUERTO RICO: Juncos, *Sintenis* 1886 (BM, F, G, GH, K, M, MO, NY, S, SI, US lectotype). "Sierra de las Piedras in Monte Francés," *Sintenis* 5336 (BM, BR, F, G, GH, K, M, NY, P, S, UC, US). "Sierra de Lares ad Guajataca," *Sintenis* s.n. (A). Sierra de Yabucoa, *Sintenis* 2587 (P). "Prope Utuado ad Roncador," *Sintenis* 6509 (BR, K, POM, UC). Fajardo, Río Arriba, *Britton & Shafer* 1695 (F, NY, US). Bayamón, *Stahl* 319 (F, S). Manatí, *Hess* 4105 (NY). Sierra de Naguabo, *Shafer* 3167 (K, NY). Maricao, *Britton, Cowell, & Brown* 4465 (F, NY, US); *Schubert, Winters, & Veléz* 334; *Schubert & Winters* 334 a (US). Luquillo Mts., *Britton & Brunner* 7670 (NY, US); *Kramer* 10 (Y). Luquillo Forest, *Hess* 5376 (NY).

GUADELOUPE: Ste. Rosa, *Stehlé & Quentin* 5680 (US). Petit Bourg, *Questel* 2488 (P, US).

DOMINICA: Castle Bruce, *Ramage* s.n. (BM, K). Riversdale, *Beard* 240 (A, K, MO, NY, U, UC), 659 (A, K, MO, NA, NY, U, UC).

LOCAL NAMES: Bois nan-non (Haiti); palo peronia, peronila, peonia (Dominican Republic); matos, palo de matos, mosongo (Puerto Rico); caconnier, caconier blanc (Dominica; Guadeloupe).

This taxon is obviously so closely related to the varieties of *O. nobilis*, especially var. *santaremnensis* and var. *bolivarensis*, as to suggest that it might be correct to treat it as a fourth variety of that species. However, in view of the geographic separation, our inadequate knowledge of *O. nobilis*, sens. lat., and the distinguishing characters summarized in the key, it has been decided to maintain the status quo of *O. krugii*.

From the numerous sheets of syntype material cited above, viz. the collections made by Sintenis, Stahl, and Ramage, I have chosen as lectotype a fruiting specimen, *Sintenis* no. 1886, at US; in this species the fruit and seeds provide better diagnostic characters than do the flowers. The specimens studied at Berlin by Urban presumably are no longer extant, hence the designation of the US sheet.

33. *Ormosia nobilis* Tul. Arch. Mus. Par. 4 : 106. 1844.

FIGURE 13

Tree, to about 40 m. tall; young stems fulvo-sericeous or subsericeous; stipules deltoid, about 1 mm. long; leaves 3–11-foliolate, the axis 8–70 cm. long, finely velutinous, glabrate, the petiole 4–20 cm. long, the pairs of leaflets 2–35 cm. apart, the petiolules 8–30 mm. long, 2–5 mm.

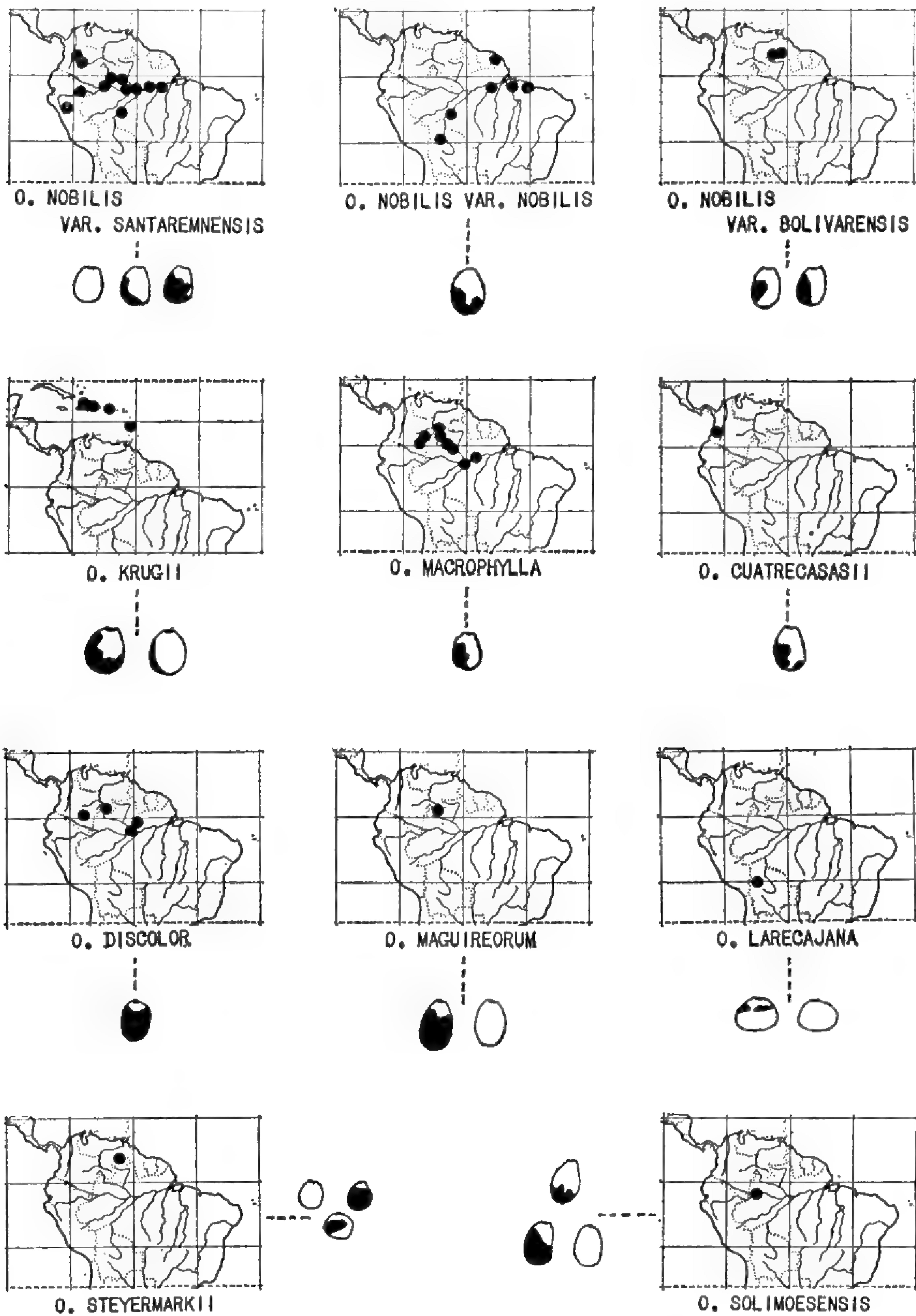


FIGURE 11.—*Ormosia* section *Ormosia* series *Nobiles*, in part: Geographic distribution of species; seeds of *O. nobilis* var. *santaremnensis*, *O. nobilis* var. *nobilis*, *O. nobilis* var. *bolivarensis*, *O. krugii*, *O. macrophylla*, *O. cuatrecasasii*, *O. discolor*, *O. maguireorum*, *O. larecajana*, *O. steyermarkii*, and *O. solimoensis*, all $\times \frac{1}{2}$.

in diameter, the blades coriaceous or subcoriaceous, elliptic to elliptic-oblong, sometimes ovate or obovate, 5–35 cm. long, 2–20 cm. broad, the apex acute to breviacuminate, the acumen to 1 cm. long, the base obtuse to subcordate, the upper surface glabrous, nitid or subnitid, the lower surface aureo- or fulvo-sericeous, the secondary veins conspicuous or only moderately raised, about 10–20 pair, essentially parallel, 2–35 mm. apart, forming angles of 50°–70° with the midvein, the tertiary reticulations sometimes prominent; inflorescences with axes fulvo- to ferrugino-sericeous, the bracts deltoid, acute, 1–2 mm. long, the bracteoles 1 mm. long or less; flowers 15–22 mm. long; calyx (8-) 10–15 mm. long, fulvo- or ferrugino-sericeous, the tube 5–10 mm. long, 6–8 mm. in diameter, the teeth 3–5 mm. long; petals dark purple, the standard usually with a white spot; fruit dehiscent, coriaceous, finely fulvo- or ferrugino-sericeous, usually glabrate, light or dark brown, about 2.5–7.5 cm. long, 1.5–2.2 cm. broad, 1–6-seeded, submoniliform, about 1 cm. thick, the valves about 1 mm. thick; seeds red, or red and black, usually varying, sometimes within the same pod, from all red to almost all black, 8–11 mm. long, 7–10 mm. wide, 5–8 mm. thick, the hilum 1.5–2.5 mm. long and 1–1.5 mm. wide.

33a. *Ormosia nobilis* Tul. var. *nobilis*

FIGURE 11

Ormosia nobilis Tul. Arch. Mus. Par. 4 : 106. 1844.

The typical variety is characterized by leaves commonly with 7 or 9, sometimes only 5, large, coriaceous leaflets, densely sericeous below, with 10–15 pair of secondary veins spaced about 10–35 mm. apart, forming angles of 60°–70° with the midvein, the tertiary reticulations often prominent; flowers usually 18–22 mm. long.

TYPE LOCALITY: Pará, Brazil, without further data, cited below.

DISTRIBUTION: In forest of coastal French Guiana; Bolivia; middle and lower Amazon basin of Brazil.

FRENCH GUIANA: Gourdouville, *Benoist* 1611 (P).

BRAZIL: PARÁ: Without exact locality and collector (F fragment, probably of type ex P, P type collection?). Belém, *Ducke* [RB no.] 15492 (K, RB, S, U), [MG no.] 15814 (MG), [MG no.] 16189 (BM, G, MG, US), [MG no.] 17033 (BM, MG, R, US); *Dahlgren & Sella* 688 (F, US); *Guedes* 304 (US), 335 (IAN, US). Bragança, *Ducke* [RB no.] 17098 (RB, S, U, US), [RB no.] 1709 (RB). Vigia, Ilha de Colares, *Black* 54–16888 (US). Santarém, *Ducke* [RB no.] 5096 (K, S, U, US). MARANHÃO: Estrada do Pinheiro, *Fróes* [*Krukoff*] 11984/1502 (A, NY, US). AMAZONAS: Humaitá, *Krukoff* 7085 (A, BR, F, K, M, MO, NY, S, U, US). Basin of Rio Madeira, *Lobo* [*Krukoff* Herb. no.] 15463 (NY). Barcelos, Rio Negro, *Ducke* [RB no.] 35175 (G, K, P, RB, S, U, US); *Fróes & Addison* 29319 (IAN).

BOLIVIA: "Moro Yungas," *Pearce* s.n., January 1866 (K).

LOCAL NAMES: Mulungu, tenteiro, tento, tento das campinas.

33b. *Ormosia nobilis* var. *bolivarensis* Rudd, var. nov.

FIGURE 11

A varietate typica foliolis minoribus, venis tertiariis inconspicuis, calyce breviori, densiter fulvo-sericeo (floribus completis non visis), fructibus maturis breviter fulvo-sericeis, minus glabrescentibus differt.

The leaves are 3–9, predominantly 5–9-foliolate as in the typical variety, but with the leaflets averaging smaller in size, about 10–18 cm. long, coriaceous or subcoriaceous, minutely and densely fulvo-sericeous below, with 10–15 pair of secondary veins, 5–20 mm. apart, forming angles of 60°–70° with the midvein.

Type in the U.S. National Herbarium, no. 1833230, collected in "selvas del valle del Canaracuni," Bolívar, Venezuela, December 29, 1941, by F. Cardona (no. 405). Isotypes at UC and VEN.

DISTRIBUTION: In rain forest, southern part of the state of Bolívar, Venezuela and adjacent British Guiana, at elevations of about 300–500 meters.

ADDITIONAL SPECIMENS EXAMINED:

BRITISH GUIANA: Kako River, *Tillett & Tillett* 45476 (NY, US).

VENEZUELA: BOLÍVAR: Río Ayaiche, headwaters of Río Chicanán, Sierra de Lema, *Steyermark* 89475 (US, VEN). Sierra Ichún, *Steyermark* 90344 (US, VEN). Icabarú, *Bernardi* 6665 (NY).

33c. *Ormosia nobilis* var. *santaremnensis* (Ducke) Rudd, comb. nov. FIGURE 11

Ormosia santaremnensis Ducke, Arch. Jard. Bot. Rio de Janeiro 4 : 63. 1925.

Ormosia faroensis Ducke, Arch. Jard. Bot. Rio de Janeiro 4 : 64. 1925.

The leaves tend to have more leaflets than those of the typical variety, usually 9 or 11, narrower, subcoriaceous, more closely spaced on the axis, the blades less densely pubescent on the lower surface, the secondary veins commonly about 12–20 pair, 2–10 mm. apart, forming angles of 50°–60° with the midvein; the flowers average somewhat smaller than in the typical variety, about 15–20 mm. long.

TYPE LOCALITY: Near Santarém, Pará, Brazil. Type collected by Ducke [MG no. 16718], cited below.

DISTRIBUTION: In "terra firma," clay or sandy soil, in "restinga" and secondary forest, middle to upper Amazon basin of Colombia, Peru, and Brazil.

COLOMBIA: CUNDINAMARCA: El Pénón, *García-Barriga* 12475 (US). META: San Martín, *Uribe-Uribe* 1611 (US).

PERU: SAN MARTÍN: north of Uchiza, *Schunke* 5783 (US). LORETO: Iquitos, San Juan Nuevo, *Ducke* 1818 [MG no. 18129] (F, MG, NY, R, RB, US).

BRAZIL: PARÁ: Santarém, *Ducke* [MG no.] 16718 (BM, G, MG type of *O. santaremnensis*, P, R, RB, US). Faro, *Ducke* [MG no.] 15912 [RB no. 15494, in part, as to flowers] (BM, G, K, MG type of *O. faroensis*, P, R, RB, S, U, US). AMAZONAS: Manaus, *Ducke* 664 [MG no. 18121] (F, K, MG, MO, NY, R, SI, UC, US), [RB no.] 23365 (K, NY, P, RB, S, U, US). São Paulo de Olivença,

Ducke [RB no.] 20363 (RB); *Krukoff* 8986 (A, BM, BR, K, MO, NY, S, U, US). Codajás, *E. Ferreira* 58-237 (IAN). Rio Tonantins, *Fróes* 12184/95 (A, DS, NY, U, US), 12211/124 (A, F, NY, SI, US), 12234/126 (A, F, NY, US). Tonantins, above Villa Velha, *Ducke* (IAN no.) 125 (IAN, US). Rio Uaupés, *Fróes* 12564/288 (A, CAS, DS, F, POM). "Porto Curucuhy," Rio Negro, *Fróes* 21107 (F, K, M, NY, U, US). Moura, Rio Negro, *Krukoff* 12102 (A, NY, US). Humaitá, Cipoal, *Krukoff* 7194 (K, U, US). Parintins, *Pires & Black* 1145 (IAN). Rio Tiquié, *Pires* 1012 (IAN).

LOCAL NAMES: Chocho, peonía (Colombia); mulungu, tento (Brazil); huayuro hembra (Peru).

In his original description of *O. santaremnensis* Ducke noted the close affinity of that species to *O. nobilis*, and on the next page described *O. faroensis* as being closely related to *O. nobilis* and *O. santaremnensis*. Later (Ann. Acad. Bras. Sci. 11:190. 1939) he reduced *O. faroensis* to synonymy under *O. santaremnensis*. Had he not published that reduction, I should have preferred to reverse the relationship, making *O. santaremnensis* the synonym; the type of *O. faroensis* is a little more distinct and representative of the variety as a whole, whereas the type of *O. santaremnensis* better shows the transition to the typical variety of *O. nobilis* and to var. *bolivarensis*.

34. *Ormosia macrophylla* Benth. Ann. Wien. Mus. 2:88. 1838. FIGURE 11

Tree, to about 10 m. high; young stems minutely aureo- or fulvo-sericeous; stipules not seen; leaves 5-9-foliolate, the axis 15-30 cm. long, minutely fulvo-velutinous, the petiole 5-15 cm. long, the pairs of leaflets about 4-7 cm. apart, the petiolules 10-15 mm. long, 3-4 mm. in diameter, the blades coriaceous, broadly ovate or sometimes elliptical, 4-21 cm. long, 3-13 cm. broad, the apex obtuse to breviacuminate, the acumen to about 10 mm. long, the base usually cordate, sometimes rounded, the upper surface glabrous, nitid, the lower surface densely aureo-sericeous, the secondary veins moderately raised, about 10-20 pair, essentially parallel, 5-10 mm. apart, forming angles of 70°-75° with the midvein, the tertiary veins inconspicuous; inflorescences with axes fulvo- to ferrugino-velutinous, the bracts and bracteoles deltoid, acute, about 1 mm. long or less; flowers 17-27 mm. long; calyx fulvo- or aureo-sericeous, about 10-15 mm. long, the tube 5-8 mm. long, 6 mm. in diameter, the teeth 5-7 mm. long; petals brownish to dark purple; fruit dehiscent, coriaceous, fulvo-sericeous to dark brown, glabrate, sometimes reticulate-rugose, 1-6-seeded, 2-8 cm. long, (1.3-) 1.8-2 cm. broad, submoniliform, about 1 cm. thick, the valves 1.5-2 mm. thick; seeds red or red and black, sometimes varying within the same pod, 8-9 mm. long, 7-8 mm. broad, 6 mm. thick, the hilum 1.5-2 mm. long and 1 mm. wide.

TYPE LOCALITY: "In campis ad montes Araracoara provinciae Rio Negro Brasiliae" [Colombia], in the region of the upper Japurá river. Type collected by Martius, cited below.

DISTRIBUTION: Gallery woods, scrub forest, savanna, or caatinga, in sandy soil at elevations up to about 400 meters, southern Venezuela, and upper Amazon basin of Colombia and Brazil.

VENEZUELA: AMAZONAS: Santa Rosa, *Fróes* 12384/143 (A, DS, F, NY, POM), 12385/144 (A, DS, F, NY), 12386/145 (A, DS, F, NY). Near Yapacana, northwest base of Cerro Yapacana, *Maguire & Wurdack* 34486 (F, NY, S, US, VEN), 34491 (K, NY, VEN). Río Siapa, Caño Hechimoni, *Maguire, Wurdack & Bunting* 37650 (NY, VEN). Río Pacimoni, *Maguire, Wurdack, & Bunting* 37603 (F, NY, S, US, VEN); *Maguire, Wurdack, & Maguire* 41668 (K, NY, US).

COLOMBIA: VAUPÉS: Río Kananarí, Cerro Isibukurí, *Schultes & Cabrera* 14533 (US). Río Negro, Piedra de Cocuí, *Schultes & Lopez* 9503 (US). Raudal de Yuruparí, *Schultes & Cabrera* 19747 (NY, US). **AMAZONAS:** Araracuara, *Martius* s.n. (F.M. Neg. 6278 ex M, M type); *Maguire, Maguire, & Fernandez* 44171 (K, NY, US).

BRAZIL: AMAZONAS: Preto, Rio Negro, *Fróes* 22765 (IAN, NY, U, US, VEN). Ca-te-espera, São Gabriel, *Fróes* 12380/139a (A, DS, F, NY). **PARÁ:** Lago de Faro, near Serra do Dedal, *Ducke* [MG no.] 8613 (BM), [RB no.] 11429 (K, RB, S, U, US). Borba, *Ducke* 230 [RB no. 35177], July 7, 1936 (A, F, G, K, MO, NY, P, R, RB, S, U, US), 230 II, August 25, 1942 (MG, SI, US).

LOCAL NAMES: Tento (Venezuela; Brazil).

This species, like *O. krugii*, is closely related to *O. nobilis* and its varieties. In leaf characters it also shows considerable similarity to *O. cuatrecasasii* and *O. discolor*.

35. *Ormosia cuatrecasasii* Rudd, sp. nov.

FIGURE 11

Arbor circiter 8 m. alta vel plus; ramuli novelli aureo-sericei; stipulae deltoideae, acutae, 1 mm. longae vel minus; folia 7-9-foliolata, axi sericeo, (10-) 20-25 cm. longo, petiolo (3-) 8-9 cm. longo, jugis inter sese 3-5 cm. distantibus, petiolulis 10-13 mm. longis, 4 mm. diametro, laminis coriaceis, ellipticis vel ovatis, 7-24 cm. longis, 4-11 cm. latis, apice acuminatis, acumine 10-30 cm. longo, basi obtusis vel subcordatis, supra glabris, nitidis vel subnitidis, subtus densiter aureo-sericeis, pilis brevissimis, venis secundariis mediocriter elevatis, utrinsecus 11-14, fere parallelis, inter sese 7-20 mm. distantibus, angulis venarum costaeque 55°-60°, venis tertiariis inconspicuis; inflorescentiae cum axibus subtiliter aureo- vel ferrugino-velutinis; bracteae deltoideae, acutae, 1-2 mm. longae, bracteolis deltoideis, acutis, 1 mm. longis vel minus; flores completi non visi; calyx subtiliter ferrugino-sericeus, circiter 10 mm. longus, tubo 6-7 mm. longo, 7 mm. diametro, dentibus 3-4 mm. longis; fructus dehiscentis, coriaceus, sublignosus, marginatus, subtiliter fulvo- vel ferrugino-velu-

tinus, glabrescens, brunneus, 1-6-spermus, 5-10 cm. longus, 2-2.5 cm. latus, 0.8 cm. crassus, valvulis circiter 1-2 mm. crassis; semina coccinea vel bicolora coccinea macula nigra notata, 10-11 mm. longa, 9-10 mm. lata, 7 mm. crassa, hilo 3 mm. longo et 1.5 mm. lato.

Type in the U.S. National Herbarium, no. 1900636, collected near the Pacific coast, at 0-10 meters elevation, Bahía de Buenaventura, Quebrada de San Joaquín, Departamento del Valle, Colombia, February 22, 1946, by J. Cuatrecasas (no. 19914). Isotypes at F, US, and Y.

DISTRIBUTION: Known only from woods on the western slope of the Cordillera Occidental, Colombia, at elevations of 0-1000 meters.

ADDITIONAL SPECIMEN EXAMINED:

COLOMBIA: VALLE: Río Digua, Piedra de Moler, *Cuatrecasas* 15129 (F, US).

Superficially, this species resembles *O. macrophylla* and some specimens of *O. nobilis*. However, it differs from those taxa in various characters, as summarized in the key, and, geographically, its location indicates a long period of separation.

36. *Ormosia discolor* Spruce ex Benth. *in* Mart. Fl. Bras. 15(1) : 318. 1862.

FIGURE 11

Ormosia micrantha Ducke, Arch. Inst. Biol. Veg. Rio de Janeiro 4 : 21. 1938.

Tree, to about 18 m. high; young stems fulvo- or ferrugino-velutinous, glabrescent; stipules not seen; leaves (3-) 5-7-foliolate, the axis 5-18 cm. long, finely velutinous, glabrescent, the petiole 3-10 cm. long, the pairs of leaflets 2-6 cm. apart, the petiolules 5-25 mm. long, 1.5-4 mm. in diameter, the blades coriaceous, ovate to oblong, 7-30 cm. long, 4-12 cm. broad, acuminate, the acumen to about 1-1.5 cm. long, the base rounded to subcordate, the upper surface glabrous, nitid, the lower surface finely fulvo-sericeous, the secondary veins inconspicuous, about 20-50 pair, essentially straight and parallel, 2-10 mm. apart, forming angles of 70°-75° with the midvein; inflorescences with axes minutely fulvo- or ferrugino-velutinous, the bracts linear-deltoid, 2-4 mm. long, the bracteoles deltoid, scarcely 1 mm. long; flowers 6-8 mm. long; calyx fulvo- to ferrugino-velutinous, 4-6 mm. long, the tube 2.5-4 mm. long and about 3 mm. in diameter, the teeth deltoid, 1.5-3 mm. long; corolla blackish purple; fruit dehiscent, coriaceous, minutely fulvo- to ferrugino-velutinous, usually 1- or 2-seeded, 2-5 cm. long, 1.5-2 mm. wide, 1 cm. thick, the valves about 1 mm. thick; seeds red, or red with irregular black markings, 9-11 mm. long, 8 mm. broad, and 6 mm. thick, the hilum about 1.5 mm. long and 1 mm. wide.

TYPE LOCALITY: "Barra do Rio Negro" [Manaus], Amazonas, Brazil. Type collected by R. Spruce (no. 1506), cited below.

DISTRIBUTION: In forest, "terra firme," "arenoso, capoeira fechada, alta," upper Amazon basin of Colombia, Venezuela, and Brazil.

COLOMBIA: VAUPÉS: Río Apaporis, Cachivera de Jirijirimo, *Schultes & Cabrera* 12952 (NY, US).

VENEZUELA: AMAZONAS: Río Casiquiare at mouth of Río Pacimoni, *Spruce* 3408 (BR, C, F fragment, F. M. Neg. 21899 ex C, G, GH, K, NY, P). Río Yatua, *Wurdack & Adderly* 43432 (NY, US).

BRAZIL: AMAZONAS: "Barra do Rio Negro" [Manaus], *Spruce* 1506 (BM, G, GH, K type, M, NY, P). Manaus, Cachoeira do Mindú, *Ducke* 547 [in fruit] and 35084 [RB no., in flower] (A, F, G, K, MO, NY, P, S, U, US, composite sheets, isosyntypes of *O. micrantha*). Manaus, Cachoeira alta do Tarumã, *Chagas* [INPA no.] 948 (MG). Manaus, Igarapé do Binda, *Coelha* [INPA no.] 3839 (IAN, US). Rio Urubú, Pedra Branca, *Fróes* 25269 (IAN, US), 25397 (IAN).

LOCAL NAMES: Mulungū, tenteiro (Brazil).

This species is readily recognizable by its small flowers and leaflets with numerous lateral veins. Specimens of *Wurdack & Adderly* 43432 have larger and glossier leaflets than the other collections cited, but otherwise they seem to be comparable.

According to Egler (Bol. Mus. Par. Emílio Goeldi, II. 18:63. 1963) the type, actually a lectotype, of *Ducke's O. micrantha* is RB no. 35084, which is a flowering specimen, presumably at RB. *Ducke* cited two collections in his original description, one in flower, the other in fruit; composite specimens with material of both collections have been distributed to various herbaria, sometimes as one number, sometimes as the other, or with both numbers. Since the material is essentially identical to the collections by *Spruce* cited above, including the type of *O. discolor*, *O. micrantha* falls into synonymy and the designation of its holotype becomes relatively unimportant. *Ducke* apparently based his concept of *O. discolor* on the illustration, table 126, in *Flora Brasiliensis*, which is misleading as to venation of the leaflets; his misinterpretation, as indicated by specimens that he annotated as *O. discolor*, prompted him to describe his material of true *O. discolor* as the new species, *O. micrantha*.

37. *Ormosia revoluta* Rudd, sp. nov.

FIGURE 12

Arbor magna; ramuli novelli ferrugino-tomentosi; stipulae deltoideae, 2–3 mm. longae, basi 2 mm. latae; folia 3–7-foliolata, axi velutino 6–18 cm. longo, petiolo 4–6 cm. longo, jugis inter sese 3–5 cm. distantibus, petiolulis circiter 5 mm. longis et 3 mm. diametro, laminis coriaceis, ellipticis vel ovato-ellipticis, 7–16 cm. longis, 3–7 cm. latis, apice acutis, basi obtusis, marginibus fortiter revolutis, supra glabris, nitidis, venis impressis, subtus densiter velutinis, pilis nonnihil crispis, venis secundariis fortiter elevatis, utrinsecus 12–16, fere parallelis, inter sese 5–10 mm. distantibus, angulis venarum costaeque

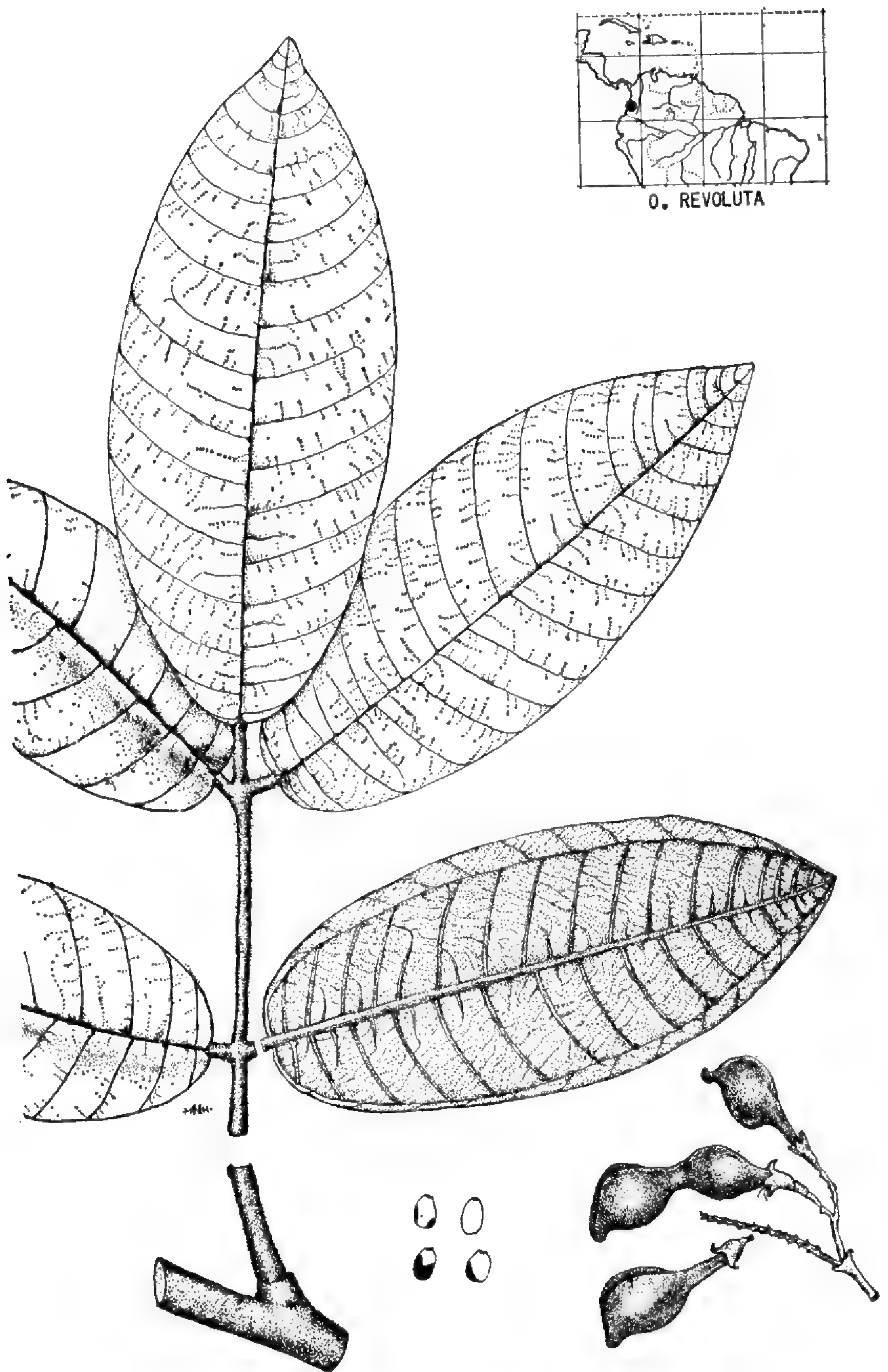


FIGURE 12.—*Ormosia* section *Ormosia* series *Nobiles*, in part: *O. revoluta*: Geographic distribution; portion of leaf, seeds, and fruit, $\times \frac{1}{2}$.

circiter 70° , venis tertiariis fortiter reticulatis; inflorescentiae cum axibus ferrugino- vel fulvo-tomentosis, bracteis bracteolisque caducis, non visis; flores completi non visi; calyx fulvo-tomentosus, 6–7 mm. longus, tubo 4 mm. longo et 4 mm. diametro, dentibus 2–3 mm. longis; fructus (submaturus) dehiscens, coriaceus vel sublignosus, fulvo-tomentosus, 1–3-spermus, 3–5 cm. longus, 1.5–2 cm. latus, circiter 1 cm. crassus, valvulis vix 1 mm. crassis; semina coccinea macula nigra, irreguliter notata, circiter 8 mm. longa, 8 mm. lata, et 7 mm. crassa, hilo elliptico 2–2.5 mm. longo et 1 mm. lato.

Type in the U.S. National Herbarium, no. 1852053, collected at Piedra de Moler, basin of the Río Digua, west slope of the Cordillera Occidental, El Valle, Colombia, August 27, 1943, by J. Cuatrecasas (no. 15198), at an elevation of 900–1180 meters. Isotypes at F.

DISTRIBUTION: Known only from the type collection.

The leaflets of the one collection cited above are more strongly revolute than in any other species treated in this paper. The pubescence of the leaflets and young fruit resembles that commonly seen on members of the series *Monospermae*. However, *O. revoluta* has irregularly marked seeds such as are characteristic of series *Nobiles*, and, I suspect that the fruit is potentially glabrescent.

38. *Ormosia maguireorum* Rudd, sp. nov.

FIGURE 11

Arbor 15–25 m. alta; ramuli novelli fulvo-velutini; stipulae non visae; folia 9-foliolata, axi velutino, 30–35 cm. longo, petiolo 10 cm. longo, jugis inter sese 6–7 cm. distantibus, petiolulis 10 mm. longis, 4 mm. diametro, laminis coriaceis, elliptico-ovatis, 16–22 cm. longis, 8–11 cm. latis, apice acutis, basi obtusis, supra glabris, nitidis, subtus densiter velutinis, pilis brevissimis, venis secundariis fortiter elevatis, utrinsecus 18–25, fere parallelis, inter sese 5–15 mm. distantibus, angulis venarum costaeque 70° – 75° ; inflorescentiae cum axibus fulvo-tomentosis, bracteis bracteolisque non visis; flores completi non visi; calyx velutinus, 6–8 mm. longus, tubo 3–4 mm. longo, 4 mm. diametro, dentibus 3–4 mm. longis; fructus dehiscens, coriaceus vel sublignosus, velutinus, 1–3-spermus, 2–5 cm. longus, 1.7–2.3 cm. latus, 1–1.3 cm. crassus, valvulis circiter 1 mm. crassis; semina coccinea vel bicolora coccinea macula nigra irreguliter notata, 10–12 mm. longa, 9–10 mm. lata, 8–9 mm. crassa, hilo 3 mm. longo et 1.5–2 mm. lato.

Type in the U.S. National Herbarium, no. 2267454, collected at Cañon Grande, Cerro de la Neblina, Río Yatua, Amazonas, Venezuela, December 26, 1957, by Bassett Maguire, John J. Wurdack, and Celia K. Maguire (no. 42530) at an elevation of 1100–1150 meters. Isotypes at NY.

DISTRIBUTION: Known only from the type collection.

The specimens of the collection cited above are distinct from any known species of *Ormosia* but exhibit enough similarities to indicate close relationship to other members assigned to the series *Nobiles*.

39. *Ormosia larecajana* Rudd, sp. nov.

FIGURES 11, 13

Arbor circiter 23 m. alta; ramuli novelli fulvo-tomentulosi; stipulae deltoideae, tomentulosae, circiter 2 mm. longae, basi 1.5–2 mm. latae; folia 7- vel 9-foliolata, axi velutino, 15–25 cm. longo, petiolo 5–8 cm. longo, jugis inter sese 3–7 cm. distantibus, petiolulis 8–13 mm. longis, 3–4 mm. diametro, laminis coriaceis, ellipticis, 7–17 cm. longis, 3–8 cm. latis, apice obtusi vel acuti, basi obtusi, marginibus nonnihil revolutis, supra glabris, nitidis, subtus dense tomentosis, venis secundariis elevatis, utrinsecus 10–12, fere parallelis, inter sese 5–20 mm. distantibus, angulis venarum costaeque circiter 70°–75°; inflorescentiae floresque completi non visi; calyx tempestate jactatus, incompletus, glabratus, circiter 4–6 mm. longus, 3–4 mm. diametro; fructus dehiscens, coriaceus, velutinus, 1–3-spermus, 1.5–4 cm. longus, 1.3–1.5 cm. latus, circiter 1 cm. crassus, valvulis vix 1 mm. crassis; semina coccinea vel bicolora coccinea macula nigra irregulater notata, 8–10 mm. longa et lata, 6–8 mm. crassa, hilo elliptico, 2 mm. longo et 1–1.5 mm. lato.

Type in the U.S. National Herbarium, no. 1905696, collected at Copacabana, about 10 km. south of Mapiri, Province of Larecaja, La Paz, Bolivia, October 8–November 15, 1939, by B. A. Krukoff (no. 11049) at an elevation of 850–950 meters. Isotypes at A, F, G, K, MO, NY, S, U, Y.

DISTRIBUTION: Known only from the type collection.

This is another species with leaves that suggest relationship with members of series *Monospermae*. The decision to place *O. larecajana* in the series *Nobiles* is based on one seed from a sheet at K that shows irregular black spotting on an otherwise red surface. All other seeds of this collection that I have seen are completely red. The fruits are very similar to those of several other species being assigned to the *Nobiles*.

40. *Ormosia steyermarkii* Rudd, nom. nov.

FIGURE 11

Ormosia microsperma Pittier, Bol. Soc. Venez. Ci. Nat. 10 : 109. 1945, non Baker, 1878.

Tree, to about 17 m. high; young stems ferrugino-tomentulose; stipules deltoid, about 3 mm. long and 1.5 mm. broad at the base; leaves 3–7-foliolate, the axis 3–10 cm. long, tomentose, the petiole 2–5 cm. long, the pairs of leaflets 2–3.5 cm. apart, the petiolules 3–5 mm. long, 3 mm. in diameter, the blades coriaceous, ovate, 5–12 cm.

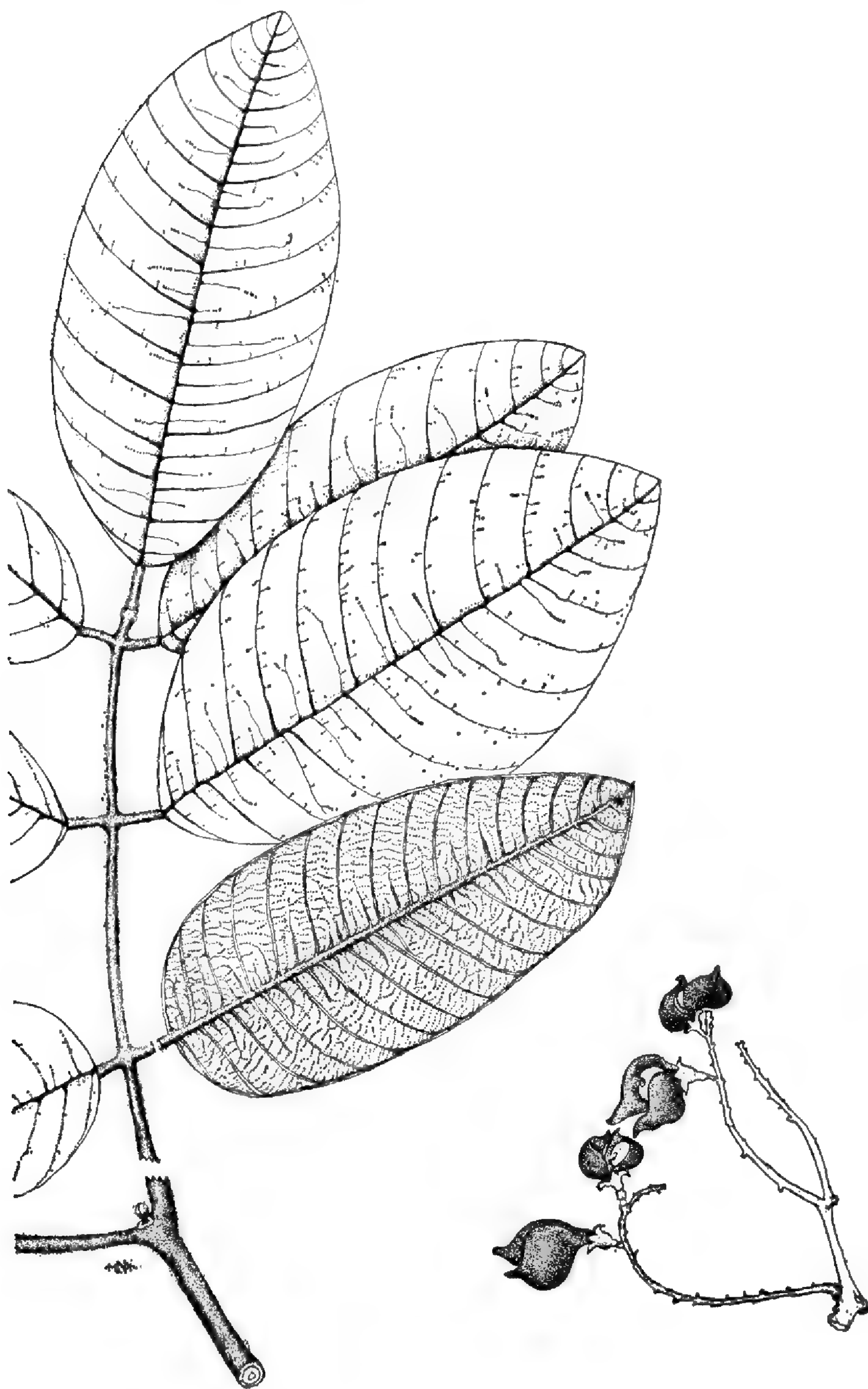


FIGURE 13.—*Ormosia* section *Ormosia* series *Nobiles*, in part: *O. larecajana*: fruit and portion of leaf, $\times \frac{1}{2}$.

long, 3.5–7 cm. broad, the apex acute to breviacuminate, the base obtuse to subcordate, the upper surface glabrous, nitid, the lower surface densely and minutely velutinous or subsericeous, the secondary veins prominent, about 10–13 pair, essentially parallel, 5–10 mm. apart, forming angles of about 65° with the midvein, the tertiary veins moderately raised; inflorescences with axes ferruginotomentulose; bracts and complete flowers not seen; bracteoles linear, about 1 mm. long; calyx ferrugino-velutinous, about 4 mm. long, the tube 2 mm. long and 3 mm. in diameter, the teeth 2 mm. long; fruit finely brown-velutinous, rugose, 1- or 2-seeded, 1–1.5 cm. broad, the valves chartaceous, less than 1 mm. thick; seeds bicolored, irregularly marked with red and black, or sometimes entirely red or almost entirely black, 7–8 mm. long, 8–10 mm. broad, and 7–8 mm. thick, the hilum orbicular, about 1 mm. in diameter.

TYPE LOCALITY: Río Pacairao, about 3 km. east of Santa Teresita de Kavanayén, Bolívar, Venezuela. Type collected by J. A. Steyermark (no. 60503), cited below.

DISTRIBUTION: Known only from Venezuela in the general vicinity of the type collection, at elevations of 1220–1615 meters.

VENEZUELA: BOLÍVAR: Kavanayén, *Steyermark* 60503 (F, MO, VEN type). Vicinity of Misia Kathy Camp, on mesa between Ptari-tepuí and Sororopán-tepui, *Steyermark* 60266 (F, MO).

LOCAL NAMES: Mutare-yek (Arekuna), peonilla (Spanish).

The name given by Pittier was especially appropriate for this small-seeded species of *Ormosia*; unfortunately, it was a later homonym, the earlier *O. microsperma* being a Malaysian species. A new name has been chosen honoring the collector of the only specimens thus far known of this species.

41. *Ormosia solimoesensis* Rudd, sp. nov.

FIGURE 11

Arbor circiter 18 m. alta; ramuli novelli fulvo-velutini; stipulae non visae; folia (3–) 5–9-foliolata, axi velutino, 10–30 cm. longo, petiolo 9–11 cm. longo, jugis inter sese 4–6 cm. distantibus, petiolulis 10–15 mm. longis, 3–4 mm. diametro, laminis coriaceis, ovatis vel ellipticis, 8–22 cm. longis, 6–12 cm. latis, apice acutis, basi truncatis vel subcordatis, supra glabris, subnitidis, subtus densiter velutini, pilis brevissimis, venis secundariis elevatis, utrinsecus 10–18, fere parallelis, inter sese 10–25 mm. distantibus, angulis venarum costaeque circiter 65° – 70° ; inflorescentiae cum axibus fulvo- vel ferrugino-velutinis, bracteis bracteolisque non visis; flores completi non visi; calyx velutinus, 4–5 mm. longus, tubo 2–3 mm. longo, 4 mm. diametro, dentibus 2 mm. longis; fructus dehiscens coriaceus, velutinus, 1–2-spermus, 2–3 cm. longus, 1.5–2 cm. latus, 1 cm. crassus, valvulis vix 1 mm. crassis; semina coccinea vel bicolora coccinea macula nigra irregulariter

notata, 8–10 mm. longa, 6–11 mm. lata, 6–8 mm. crassa, hilo elliptico circiter 2 mm. longo et 1 mm. lato.

Type in the U.S. National Herbarium, no. 1859577, collected at Belém, Município de São Paulo de Olivença, basin of the Rio Solimões, Amazonas, Brazil, June 28, 1941, by R. Fróes (Field no. 30, Krukoff no. 12078). Isotypes at A, F, NY.

DISTRIBUTION: KNOWN only from the type locality, in "igapo."

ADDITIONAL SPECIMEN EXAMINED:

BRAZIL: AMAZONAS: Belém, São Paulo de Olivença, Fróes 12075 (A, NY).

LOCAL NAME: Tento alongado.

The leaves of this species superficially suggest *O. amazonica*, but the pubescence is quite different, as are the fruit and seeds.

Series 7. *Monospermae* Rudd, ser. nov.

Arbores vel arbusculae; fructus dehiscens, valvulis lignosis vel sublignosis, densiter velutinis vel tomentosus; semina bicolora coccinea macula nigra notata nonnumquam unicolora coccinea, hilo elliptico, 2–5 mm. longo.

The densely pubescent fruits distinguish the members of this series. The type is *O. monosperma* (Sw.) Urb., the species with the prior epithet.

42. *Ormosia monosperma* (Sw.) Urb. Ant. 1:321. 1899.

FIGURE 14; PLATES 1, 2, 3, 4

Sophora monosperma Sw. Prodr. Veg. Ind. Occ. 66. 1788; Fl. Ind. Occ. 722. 1798.

Podalyria monosperma (Sw.) Poir. in Lam. Encyc. Meth. 5:440. 1804.

Ormosia dasycarpa Jacks. Trans. Linn. Soc. 10:362, tab. 26. 1811.

Virgilia rubiginosa DC. Ann. Sc. Nat. 4:98. 1824.

Ormosia subsessilis Pittier, Bol. Soc. Venez. Sci. Nat. 10:109. 1945.

Tree, to about 17 m. tall; young stems fulvo- to ferrugino-tomentulose; stipules linear-deltoid, about 3 mm. long; leaves (5–) 7–11-foliolate, the axis about 6–16 cm. long, tomentulose, glabrescent, the petiole 2–4 cm. long, the pairs of leaflets about 2–4 cm. apart, the leaflets sometimes subopposite, the petiolules 3–4 mm. long, 1.5–2 mm. in diameter, the blades subcoriaceous, ovate to oblong, 4–20 cm. long, 1.5–6 cm. broad, acute to acuminate, the acumen sometimes to 2 cm. long, the base rounded to acute, the upper surface glabrous, subnitid, the lower surface tomentulose along the major veins, otherwise sparsely and minutely crisp-pubescent, glabrescent, the secondary veins moderately raised, about 12–15 pair, essentially parallel, 5–7 mm. apart, forming angles of 50°–60° with the midvein, inflorescences with axes ferrugino-tomentulose; bracts linear-deltoid, about 3–5 mm. long and 1 mm. broad, the bracteoles linear, 2 mm. long; flowers 15–20 mm. long; calyx ferrugino-tomentulose, 8–10 mm.

long, the tube 4–5 mm. long and 5 mm. in diameter, the teeth deltoid, 3–5 mm. long; corolla dark purple, the standard with a white spot; fruit dehiscent, lignous or sublignous, densely fulvo- to ferrugino-velutinous, 1–3-seeded, 2–6 cm. long, (2–) 2.5–3.5 cm. broad, and about 2 cm. thick, the valves 2–3 mm. thick; seeds red and black, (13–) 15–17 mm. long, (10–) 15–17 broad, and (7–) 10–11 mm. thick, the hilum 4–5 mm. long and 1.5–2 mm. wide.

TYPE LOCALITY: West Indies, presumably St. Vincent. Type collected by Alexander Anderson, cited below.

DISTRIBUTION: Lesser Antilles, Trinidad, and northeastern Venezuela, in primary forest, on hillsides, at elevations up to about 1600 meters.

CUBA: Atkins Garden, Soledad, Cienfuegos [cultivated, introduced from Dominica], *Atchison* 88 (US).

LESSER ANTILLES: "Ind. Occ.," without collector's name or number (S). "Ind. Occid.," *Anderson* s.n. (G type of *O. dasycarpa*). "India Occidentalis," *Anderson* s.n. (BM type of *Sophora monosperma*). "India Occidentalis, St. Vincent," *Anderson* s.n. (G). "India occid." [Montserrat?], *Ryan* s.n. (BM). NEVIS: *Tobin* s.n. (G). MONTSERRAT: *Richard* s.n. (P); *Rohr* s.n. (BM); *Shafer* 537 (F, NY, US). GUADELOUPE: *Bertero* s.n. (G type of *V. rubiginosa*); *Duss* 3453 (NY), 3580 (F, NY, US); *Stehlé & Quentin* 5511 (US); *Stehlé, Quentin, & Béna* 5334 (US), 5667 (US); *Questel* 866 (P, US); *Holdridge* 448 (NY). DOMINICA: *W. H. & B. T. Hodge* 2037 (GH); *Imray* s.n. (GH, NY); *Eggers* 924 (US); *Ramage* s.n. (BM, K, UC); *Cowan* 1621 (NY, S, US). MARTINIQUE: *Plée* s.n. (P); *Hahn* 1346 (BM, BR, G, GH, K, P, US); *Duss* 686 (F), 1090 (MO, NY, US); *Bélangier* 1040 (G). ST. LUCIA: *Ramage* s.n. (BM, K); *Box* 1846 (BM); *Howard* 11367 (A, S, US); *Proctor* 17894 (NY, US); *Cowan* 1553 (NY, S, US). ST. VINCENT: *Eggers* 6833 (A, S); *H. H. & G. W. Smith* 460 (GH, K, NY), 1909 (NY). GRENADA: Bon Accord Mts., *Broadway* 1887 (BM, F, GH, NY, US). Black Forest Mts., *Broadway* s.n. (F, GH, K, NY, U).

TRINIDAD and TOBAGO: TOBAGO: Botanic Station, *R. O. Williams* s.n. (TRIN). TRINIDAD: Without exact locality, *Lockhead* s.n. (G). Royal Botanic Garden, *Crueger* 175 [TRIN no. 1007] (NY, TRIN, US). Arima, *Dannouse* s.n. (TRIN). Arima-Blanchisseuse Road, *Bhorai* 285 (TRIN, US). Valencia, *Britton, Hazen, & Mendelson* 1797 (GH, NY, US); *Britton* 9292 (TRIN). Matura, *Marshall* [TRIN no.] 12243 (K, TRIN); *Pierre* [TRIN no.] 12576 (K, TRIN), [TRIN no.] 12590 (K, TRIN). Toco Road, 8 mile, *Mélozan* [TRIN no.] 12439 (K, TRIN).

VENEZUELA: MONAGAS: La Cuchilla, between Guanaguana and Guácharo, *Steyermark* 62245 (F, MO, VEN type of *O. subsessilis*). ANZOÁTEGUI: Bergantín, *Steyermark* 61330 (F, MO, VEN). Between Barcelona and Cumaná, *Vareschi* 6338 (VEN).

LOCAL NAMES: Snakewood (Montserrat); bois fougé, caconi rouge (Guadeloupe); caconnier rouge (Dominica, Guadeloupe); bois oui, wawi, grain l'église, angelin (St. Lucia); bastard nickars (St. Vincent); jumbi beads, jumbie, jumby (St. Vincent, Grenada, Trinidad); pionia, pionia montañero (Venezuela).

As indicated in the key, the pubescence of the leaflets provides a convenient basis for recognition of this species. The shape and size

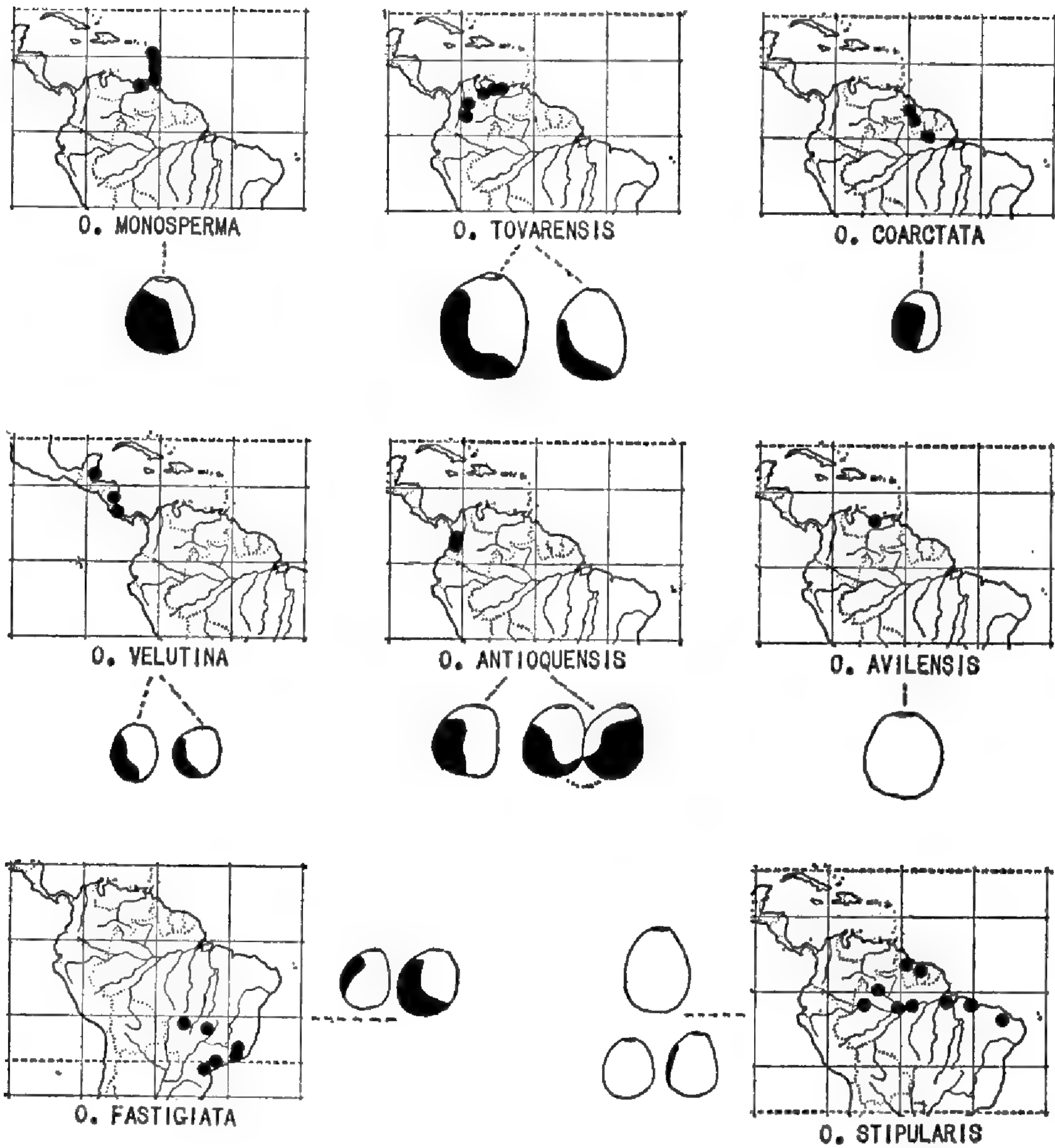


FIGURE 14.—*Ormosia* section *Ormosia* series *Monospermae*, in part: Geographic distribution of species; seeds of *O. monosperma*, *O. towarensis*, *O. coarctata*, *O. velutina*, *O. antioquensis*, *O. avilensis*, *O. fastigiata*, *O. stipularis*, all $\times \frac{1}{2}$.

of the blades are somewhat variable, but I do not believe that subdivision of the taxon is desirable.

Examination of type material or photographs of types shows the above listed species to be synonymous. An interesting surprise among the undetermined specimens from G was a sheet collected by Alexander Anderson that proved to be a mirror image of table 20 which illustrated Jackson's original description of *O. dasycarpa* (pls. 18, 19). It apparently had once been a part of the Lambert Herbarium, to which Jackson referred, and I consider it to be the type of *O. dasycarpa* which, however, falls into synonymy under *O. monosperma*.

In addition to the synonymy listed above, there are two earlier polynomial names cited by Jackson in connection with his original description of *O. dasycarpa*. The first is "Pseudo-acacia ingens, fructu coccineo, nigra macula notato. *Plum. Cat. p. 19, et MSS. cum Icone*," and through the kindness of Mr. T. D. Pennington, of the Commonwealth Forestry Institute, and Mr. R. C. Olby, Librarian of the Botany School, University of Oxford, England, a photograph of the "Icone" has been made available from the Sherardian collection (pl. 16). The other is "Glycine arboreum, foliis oblongis, seminibus majoribus. *Browne Jam. p. 298 [1756]*," concerning which Browne stated "I have seen this tree pretty often in Mountserat, where it grows naturally."

43. *Ormosia towarensis* Pittier, Bol. Soc. Venez. Cien. Nat. 4:85. 1938.

FIGURE 14

Tree, to about 25 m. tall; young stems fulvo- to ferrugino-tomentose; stipules deltoid, about 3–6 mm. long, 2.5 mm. broad at the base; leaves 7–11-foliolate, the axis 12–36 cm. long, the petiole 4–15 cm. long, the pairs of leaflets 4–12 cm. apart, the petiolules 3–10 mm. long, 3–5 mm. in diameter, the blades coriaceous, elliptic or oblong-elliptic, 8–30 cm. long, 1–18 cm. broad, the apex rounded or brevicauminate, the base rounded, the margins often revolute, the upper surface essentially glabrous, the lower surface densely to moderately ferrugino-pubescent with loosely crispate hairs, the secondary veins moderately raised, 13–20 pair, essentially parallel, 10–20 mm. apart, forming angles of 55°–65° with the midvein; inflorescences with axes ferrugino-tomentose, the bracts deltoid, 5–6 mm. long and 2 mm. broad at the base, the bracteoles linear-deltoid, about 2 mm. long and 1 mm. wide or less; flowers 15–16 mm. long, the petals violaceous; calyx ferrugino-tomentulose, 10–11 mm. long, the tube 6–7 mm. long and 6 mm. in diameter, the teeth 4–5 mm. long; fruit fulvo- to ferrugino-velutinous, 1–3-seeded, 4–9 cm. long, 2.7–3.8 cm. broad, 1.5–2 cm. thick, the valves lignous, about 1–3 mm. thick; seeds bicolored red and black, 15–22 mm. long, 13–19 mm. broad, and 10–18 mm. thick, the hilum 3–3.5 mm. long and 1.5–2.5 mm. wide.

TYPE LOCALITY: "Selvas del Avila," Distrito Federal, Venezuela, at 1700 meters elevation. Type collected by Delgado (no. 59), cited below.

DISTRIBUTION: On wooded slopes at elevations of 200–2745 meters, on the Coastal Cordillera of Venezuela and the Cordillera Oriental of Colombia.

VENEZUELA: DISTRITO FEDERAL: El Avila, *Delgado* 59 (F, P, VEN type); *Vogl* 795 (BR, M). San José del Avila, *Vogl* s.n. (F). Las Flores, El Avila, *Steyermark* 55144 (F, MO). Galipán, *Pittier* 7576 (US, VEN). Between Las

Flores and Galipán, *Rudd* 1001 (US, VEN). Quebrada Guayabal, above Los Venados, *Rudd* 1000 (US, VEN). Papelón, *Moncado* s.n. (US, VEN). "Camino de ronda del Papelón a la Ciénega," *Delgado* 123 (US, VEN). Boca del Tigre, *Alston* 5556 (BM). East of Colonia Tovar, *Rudd* 1008 (US). ARAGUA: Colonia Tovar, *Fendler* 1751 (G, GH, K, MO, NY, US). Quebrada de Guamitas, Parque Nacional Rancho Grande (Henri Pittier), *Pittier & Nakichenovitch* 15365 (US, VEN). Choroní Pass, Parque Nacional Rancho Grande (Henri Pittier), *Rudd* 1021 (US, VEN). MÉRIDA: Tabay, *Steyermark* 56581 (F, MO).

COLOMBIA: SANTANDER: Barranca Bermeja, *Castañeda* 4914 (US). CUNDINAMARCA: Gachalá, *Grant* 10562 (US). Pacho, *Uribe-Uribe* 1573 (US); *García-Barriga* 12510 (US). Ubalá, *Triana* 6667 (BM, K, P, US).

LOCAL NAMES: Peonía, pionillo (Venezuela); peronilo, pionío (Colombia).

The pods, seeds, and leaves of this species are among the largest in the genus. Some of the specimens from Colombia have more numerous leaflets than those from Venezuela, but that may be merely coincidence of the collections.

Steyermark's collection no. 56581, from the State of Mérida, Venezuela, is sterile. The leaflets are somewhat similar to those of the type of *O. avilensis*, a species of uncertain status, but they also resemble some of the Colombian material identifiable as *O. towarensis*. It is hoped that fruiting material of this taxon may be collected which will certify the determination.

44. *Ormosia froesii* Rudd, sp. nov.

FIGURE 15

Arbuscula usque ad 3 m. alta; ramuli novelli ferrugino-tomentulosi; stipulae deltoideae, 2–3 mm. longae, basi 1 mm. latae; folia 9-foliolata, axi tomentuloso, circiter 25–50 cm. longo, petiolo 8–15 cm. longo, jugis inter sese 7–10 cm. distantibus, petiolulis 5–10 mm. longis, 3–6 mm. diametro, laminis coriaceis, late ovatis vel ellipticis, 5–28 cm. longis, 5–16 cm. latis, acutis vel obtusis, basi obtusis, marginibus leviter revolutis, supra glabris, nitidis, venis maioribus fortiter impressis, subtus mediocriter pubescentibus, pilis brevibus laxo-crispatis, venis secundariis fortiter elevatis, utrinsecus circiter 10–12, fere parallelis, inter sese 5–25 mm. distantibus, angulis venarum costaeque circiter 50°–60°, venis tertiariis fortiter reticulatis; inflorescentiae cum axibus ferrugino-tomentosis, bracteis deltoideis, 3–5 mm. longis, 1–1.5 mm. latis, bracteolis linearibus, circiter 1 mm. longis; flores completi non visi; calyx ferrugino-tomentosus, circiter 10 mm. longus, tubo 5 mm. longo et 8 mm. diametro, dentibus 5 mm. longis; fructus dehiscens, lignosus, ferrugino-velutinus, 1- vel 2-spermus, 3–5 cm. longus, 1.5–2.3 cm. latus, circiter 1.5 cm. crassus, inter semina plus minusve constrictus, valvulis 1.5–2 mm. crassis; semina bicolora coccinea macula nigra notata, 10 mm. longa, 9–10 mm. lata, 8–9 mm. crassa, hilo 3 mm. longo et 1.5 mm. lato.

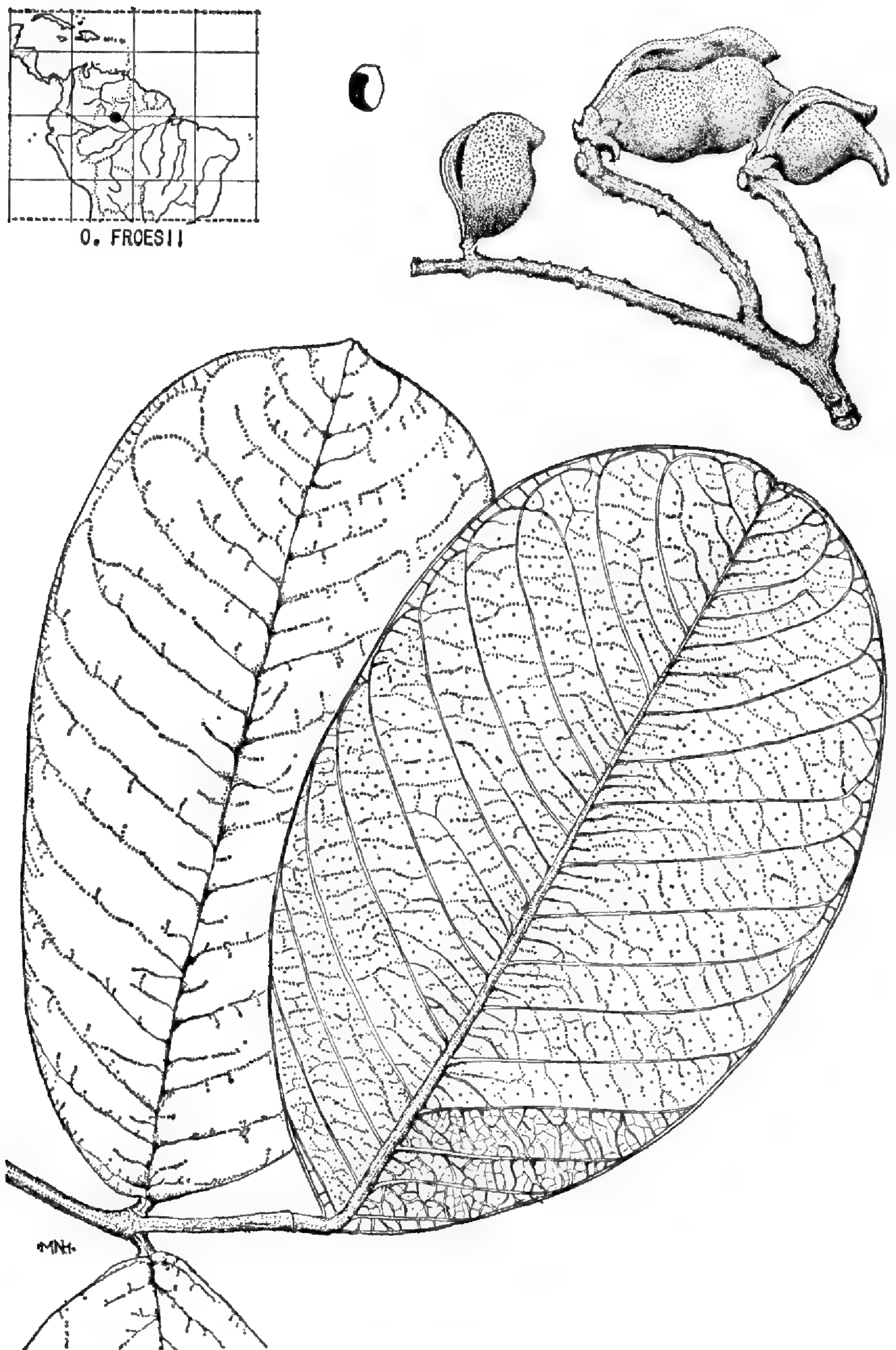


FIGURE 15.—*Ormosia* section *Ormosia* series *Monospermae*, in part: *O. froesii*: Geographic distribution; portion of leaf, seed, and fruit, $\times \frac{1}{2}$.

Type in the herbarium of the Instituto Agronomico do Norte, no. 32621, collected at Matupiri, Preto, Rio Negro, Amazonas, Brazil, November 1947, by R. L. Fróes (no. 22821).

DISTRIBUTION: In sandy soil, in the region of the lower Rio Negro, Amazonas, Brazil.

ADDITIONAL SPECIMEN EXAMINED:

BRAZIL: AMAZONAS: Rio Aracá, Rio Negro, *Fróes & Addison* 29268 (IAN, US).

The large, coriaceous leaflets of the two collections cited above are distinctive, and, considering other characters as well, I believe that the material represents a hitherto undescribed species of *Ormosia*.

45. *Ormosia coarctata* Jacks. Trans. Linn. Soc. 10 : 363, t. 27. 1811.

FIGURE 14; PLATES 5, 6

Ormosia cuneata Ducke, Arch. Jard. Bot. Rio de Janeiro 4 : 64. 1925.

Tree, to about 30 m. tall; young stems ferrugino- to fulvo-tomentose; stipules linear-deltoid, 3–5 mm. long and about 1 mm. broad at the base; leaves 5–11-foliolate, the axis 9–16 cm. long, velutinous, glabrescent, the petiole 1–7 cm. long, the pairs of leaflets 2–7 cm. apart, the petiolules 2–5 mm. long, 2–3 mm. in diameter, the blades coriaceous, obovate to elliptic, (1.5–) 6–19 cm. long, (0.5–) 3–8 cm. wide, the apex acute to brevi-acuminate, the acumen to about 5 mm. long, the base rounded or cuneate, the upper surface glabrous or sometimes with a trace of pubescence on the major veins, the lower surface moderately to densely pubescent with laxly crispate to subpatent, ferruginous hairs, the secondary veins prominent, 10–16 pair, essentially parallel, 5–10 (–15) mm. apart, forming angles of about 60°–70° with the midvein; inflorescences with axes ferrugino-tomentose, the bracts deltoid, about 4 mm. long and 1 mm. broad at the base, the bracteoles linear-deltoid, 1–2 mm. long, 1 mm. broad or less; flowers 12–15 mm. long; calyx ferrugino-tomentulose, 6–9 mm. long, the tube 4–5 mm. long, 4–6 mm. in diameter, the teeth 2–4 mm. long; petals dark purple; fruit dehiscent, sublignous, ferrugino- to fulvo-velutinous, 1–3-seeded, 2–4 cm. long, 1.5–2 (–2.5) cm. broad, about 1.3 cm. thick, the valves 1–2 mm. thick; seeds bicolored red and black, 10–13 mm. long, 9–11 mm. broad, and 7–10 mm. thick, the hilum 2–4 mm. long and 1.5 mm. broad.

TYPE LOCALITY: "Guiana" [British Guiana]. Type collected by Alexander Anderson, cited below.

DISTRIBUTION: British Guiana and southward into Pará, Brazil, north of the Amazon River.

TRINIDAD: [Cultivated in Royal Botanic Garden, Port of Spain ?], *Hart* [*Herb. Trin.* no.] 1014 (K).

BRITISH GUIANA: "Guiana," *A. Anderson* s.n. (G type). Upper Rupununi R., near Dadanawa, *De La Cruz* 1733 (F, GH, MO, NY, UC, US). Quimatata, Rupununi R., *Jenman* 5569 (BM, K, NY). Camaria Falls, Cuyuni R., *Davenport* 1 (K). Manaribisi Hole, Cuyuni R., *CAP* 47 [*For. Dept. B.G.* 5356] (K, MO, NY, P, S, U, US, VEN); *Fanshawe* F-248 [*For. Dept. B.G.* 2984] (K). Kurupung, upper Mazaruni R., *Lang & Persaud* 129 (F, NY). Muritaro, *Persaud* 26 (F, K, NY, Y). Malali Mission, Demerara R., *Fanshawe* F-901 [*For. Dept. B.G.* 3637] (K, NY). Upper Mazaruni R., *De La Cruz* 2380 (F, GH, MO, NY, UC, US). Upper Kamuni Creek, Demerara R. [*C.W.* ?] *Anderson* 283 (K).

BRAZIL: PARÁ: Rio Mapuera, upper Rio Trombetas, *Ducke* [MG no.] 9098 [=RB no. 779] (BM, RB type of *O. cuneata*). Rio Erepecurú (=Rio Cuminá), *Sampaio* 5354 (R). Rio Parú do Cuminá, *Sampaio* 5507 (R), 5560 (R, RB, US).

LOCAL NAMES: Baracaro, barakaro, bara-kara, jumbie bead (British Guiana); tenteiro (Brazil).

The specimen I have annotated as the type of *O. coarctata* was found among the unidentified *Ormosia* at Geneva. It obviously was the model for table 27 which illustrated the original publication of the species; the illustration may be readily recognized as a mirror image of the specimen (pls. 20, 21).

Miss G. J. H. Amshoff, in connection with her studies of "South American Papilionaceae" (Meded. Bot. Mus. & Herb. Rijks. Univ. Utrecht 52:49. 1939) stated that "The type specimen of *O. coarctata*, Anderson from Br. Guiana, could not be traced in the Br. Mus. or in Geneva. Possibly it is identical with *O. fastigiata* . . ." Although undoubtedly closely related, I prefer to maintain the two taxa as separate species.

Examination of the type of *O. cuneata*, however, reveals no essential differences from *O. coarctata* and I am treating the two species as synonyms.

One collection cited above, *Sampaio* 5507, has been reported as a "trepadeira," but since other collections of this species refer to trees, I suspect that the so-called vine is really a weak tree that is leaning on other larger trees, rather than truly scandent.

46. *Ormosia fastigiata* Tul. Arch Mus. Par. 4 : 108. 1844.

Ormosia escragnolliana Glaziov, Bull. Soc. Bot. France 53, Mem. 3 b:152 1906, nomen.

Ormosia glazioviana Harms, Fedde Repert. Sp. Nov. 19 : 289. 1924.

Large trees; young stems fulvo-tomentose; stipules lanceolate, 4-15 mm. long, 1-4 mm. broad at the base; leaves 7-11-foliolate, the axis about 10-20 cm. long, tomentose, glabrescent, the petiole 2-8 cm. long, the pairs of leaflets 2-6 cm. apart, the petiolules 2-5 mm. long and 2-5 mm. in diameter, the blades coriaceous, ovate to oblong, sometimes obovate, 3-16 cm. long, 2-10 cm. broad, the apex obtuse or acute or, sometimes, breviacuminate, the acumen about 5 mm. long,

the base obtuse to subcordate, the upper surface essentially glabrous except for a trace of pubescence along the midvein, the lower surface densely to moderately fulvo-tomentose, the hairs loosely crispate, the secondary veins usually prominent, about 10–13 pair, essentially parallel, 3–15 mm. apart, forming angles of about 55° – 70° with the midvein; inflorescences with axes fulvo-tomentose; the bracts linear-lanceolate, 4–10 mm. long, 1–2 mm. broad, the bracteoles linear, 2–3 mm. long, 0.5–1 mm. broad; flowers 10–15 mm. long; calyx fulvo- or ferrugino-tomentulose, 6–8 mm. long, the tube 4–5 mm. long, 5–6 mm. in diameter, the teeth 2–4 mm. long; petals dark lilac, or purple; fruit dehiscent, lignous, densely ferrugino- or fulvo-velutinous, 1–3-seeded, 2–5 cm. long, 2–2.5 cm. broad, slightly constricted between the seeds, about 1.5 cm. thick, the valves 2–3 mm. thick; seed bicolored, red and black, 10–13 mm. long, 9–12 mm. broad, 7–9 mm. thick, the hilum about 2 mm. long and 1.5 mm. wide.

TYPE LOCALITY: Near Belo Horizonte, Minas Gerais, Brazil. Type collected by Claussen (no. 1704), cited below.

DISTRIBUTION: Southeastern Brazil, along river banks, at elevations up to 500–600 meters.

BRAZIL: MINAS GERAIS: Near Belo Horizonte, *Claussen* 1704 (F, MO, P type, US); 239 [=1704?](M); s.n. [probably no. 1704](BM, BR, G, K). GOIÁS: Balsamo, *Macedo* 2687 (MO, S, US). MATO GROSSO: Branch of upper Jaurú R., *Hoehne (Comissão Rondon)* 713 (R), 714 (R), 715 (R). Cuiabá, *Malme* [Regnell II. no.] 2295 (R, S), 2295a (S). Santa Anna da Chapada, *Malme* s.n. (S). RIO DE JANEIRO: Petropolis, *Mello Moraes* [RB no.] 39323 (K, US). Nova Friburgo, *Glaziou* 20275 (F.M. Neg. 1911 ex B, type of *O. glazioviana*, BR, GH, K, NY, P, S, UC). GUANABARA: Tijuca, *Glaziou* 11892 (F.M. Neg. 1906 ex B, BR, F fragments ex B & P, G, K, P type of *O. escragnolliana*). "Near Rio de Janeiro, *Glaziou* 10555 (K). SÃO PAULO: Mococo, *Rawitscher* [Krukoff Herb. no.] 15362 (NY). PARANÁ: Carvalho, *Dusen* 12193 (S, SI). Campininha, Piraquara, *Hatschbach* 2646 (SI). Capão Grande, *Dusen* 4007 (M).

LOCAL NAMES: Angelim (Rio de Janeiro); arvore do tento (Mato Grosso); coronha, corunha (Paraná); tento (Goiás).

The type collection of *O. fastigiata* consists of flowering material, and one can only presume that the fruit would be velutinous and the seeds bicolored. On the basis of the leaves, compared with fruiting collections from the same general area, I believe that to be a safe presumption. In most cases, however, the other collections tend to have leaflets with less dense pubescence. There is some variation in the size and shape of the leaflet blades, but all extremes are represented on the many sheets of type material collected by Claussen.

In his original description of *O. glazioviana*, Harms suggested the possibility that *O. escragnolliana* might belong to his new species. I agree, but prefer to reduce both names to synonymy under *O. fastigiata*.

47. *Ormosia velutina* Rudd, Trop. Woods 113 : 124. 1960. FIGURE 14
Ormosia schippii Pierce ex Standl. & Steyerl., Fieldiana Bot. 24 (5) : 311.
 1946, pro parte, haud quoad typum.

Tree, to about 19 m. high and 23 cm. diameter; young stems fulvo- to aureo-tomentose; stipules deltoid-acicular, tomentose, 4–7 mm. long, 1–2 mm. broad at the base, caducous; leaves 5–7-foliolate, the axis fulvo-ferrugino-tomentose, about 8–22 cm. long, the petioles 3–7 cm. long, the pairs of leaflets 3–6 cm. apart, the petiolules 2–4 mm. long and 2–3 mm. in diameter, the blades coriaceous, obovate to elliptic, 3–16 cm. long, 2–9.5 cm. broad, the margins usually revolute, the apex obtuse to breviacuminate, the acumen about 6 mm. long or less, the base obtuse to subcordate, the upper surface glabrous, nitid, sometimes with a trace of pubescence along the midvein, the lower surface densely fulvo-tomentulose, the hairs tightly crispate, the secondary veins raised, about (5–) 10–12 pair, 5–20 mm. apart, essentially parallel, forming angles of about 60°–70° with the midvein; inflorescences with axes fulvo- to ferrugino-tomentose, the bracts tomentose, deltoid-acicular, about 5–6 mm. long, 1–2 mm. broad, bracteoles 5–6 mm. long, 0.5 mm. broad, linear, tomentose; flowers 14 mm. long; calyx fulvo- to ferrugino-tomentose, 10–12 mm. long, the tube 7–8 mm. long, 7 mm. in diameter, the teeth deltoid, 3–4 mm. long; corolla purple; fruit lignous, fulvo- to ferrugino-velutinous, 1–3-, commonly 1-, seeded, 2.5–6 cm. long, 1.5–2.5 cm. broad, about 1.5 cm. thick, the valves 2–3 mm. thick; seeds bicolored red and black, 10–12 mm. long, 9–10 mm. broad, and 8–10 mm. thick, the hilum 2.5–3 mm. long, 1–1.5 mm. wide.

TYPE LOCALITY: In hammock, Monkey River, near Jenkins Creek, Toledo District, British Honduras. Type collected by Gentle (no. 4145), cited below.

DISTRIBUTION: In forest, British Honduras to Costa Rica, at elevations up to about 200 meters.

BRITISH HONDURAS: EL CAYO: Humming Bird Highway, *Gentle* 8961 (LL). Ravine, Mountain Pine Ridge, *Bartlett* 11775 (A, MO, NY, S). STANN CREEK: Mullins River Road, *Schipp* 132 (A, BM, F, G, GH, MO, NY, POM, UC, U, US). TOLEDO: Monkey River, near Jenkins Creek, *Gentle* 4145 (A, LL, MO, NY, US type). Near Condemn Branch Pine Ridge, *Gentle* 5400 (LL).

NICARAGUA: ZELAYA [Bluefields]: Cukra, Pearl Lagoon, *Long* 162 (F).

COSTA RICA: HEREDIA: La Virgen de Sarapiquí, *Holdridge* 5181 (F), 5245 (F).

LOCAL NAMES: Pine-ridge grande betty (British Honduras); nena (Costa Rica).

As explained in connection with the original description of *O. velutina*, there was some confusion in the circumscription of *O. schippii*, the two collections included actually represented two different

species. For that reason, *O. schippii* was emended to include only the one collection, in flower, and a new species was proposed to accommodate the other, in fruit.

Among the specimens cited above, there is some variation in the width of the fruit which can be correlated with the number of ovules maturing; the 3-seeded pods are on the average considerably narrower than those with 1 seed.

48. *Ormosia antioquiensis* Rudd, sp. nov.

FIGURE 14

Ormosia xanthocarpa Lloyd and Horning, Journ. Org. Chem. 23 : 1074. 1958, nomen nudum.

Arbuscula 4–5 m. alta; ramuli novelli fulvo-tomentosi; stipulae lineari-deltaoideae, tomentosae, 3–4 mm. longae, basi circiter 1 mm. latae; folia 5–9-foliolata, axi fulvo- vel ferrugino-tomentoso, 10–30 cm. longo, petiolo 5–9 cm. longo, jugis inter sese 3–6.5 cm. distantibus, petiolulis 2–6 mm. longis et 2–5 mm. diametro, laminis coriaceis, obovatis vel ellipticis, 4–17 cm. longis, 2–10 cm. latis, marginibus nonnunquam revolutis, apice obtusis vel acutis, basi obtusis, supra glabris, nitidis, venis impressis, subtus densiter vel mediocriter tomentulosus, pilis crispis, venis secundariis fortiter elevatis, utrinsecus circiter 10–18, prope parallelis, inter sese, 5–15 mm. distantibus, angulis venarum costaeque circiter 55°–60°; inflorescentiae cum axibus ferrugino-tomentosis, bracteis bracteolisque non visis; flores non visi; fructus dehiscens, lignosus, fulvo- vel ferrugino-velutinus, 1- vel 2-spermus, 4–6 cm. longus, 2.5–3 cm. latus, circiter 1.5 cm. crassus, valvulis 2–3 mm. crassis; semina bicolora, coccinea macula nigra notata, 12–15 mm. longa, 11–15 mm. lata, 8–12 mm. crassa, hilo circiter 3 mm. longo et 1.5 mm. lato.

Type in the U.S. National Herbarium, no. 1802685, collected at Nigua, near Bello, Antioquia, Colombia, May 1941, collected for Bro. Daniel (no. 2460) by Bro. Luis Emmanuel. Isotype at S.

DISTRIBUTION: Known only from the region of the Cordillera Central, southern Antioquia, Colombia.

ADDITIONAL SPECIMENS EXAMINED:

COLOMBIA: ANTIOQUIA: Hatillo, *Bro. Daniel* 2103 (US). Sonsón, *Guarín* [Bro. Daniel no.] 2507 (S, US). Bello, *Bro. Daniel* [Krukoff Herb. no.] 19132 (US).

LOCAL NAME: Chocho.

This species, thus far known only from a limited area, shows characters intermediate between *O. velutina* from Central America and *O. towarensis*, which occurs farther east in Colombia and Venezuela.

49. *Ormosia stipularis* Ducke, Arch. Jard. Bot. Rio de Janeiro 4: 65. 1925.

FIGURE 14

Tree to about 25 m. tall; young stems fulvo-tomentose; stipules deltoid or linear-deltoid, 3–15 mm. long, 1–3 mm. broad at the base; leaves 7–13-foliolate, the axis 10–30 cm. long, tomentose, the petiole 3–8 cm. long, the pairs of leaflets 2–7 cm. apart, the petiolules 2–5 mm. long, 1.5–3 mm. in diameter, stipels sometimes present, the blades coriaceous, ovate, obovate, or oblong, 3–18 cm. long, 2–9 cm. broad, acute or breviacuminate with acumen to about 7 mm. long, the base obtuse to subcordate, the upper surface essentially glabrous, sometimes with a trace of pubescence along the midvein, the lower surface moderately to densely pubescent with crispate hairs, the secondary veins fairly prominent, (8–) 10–13 pair, approximately parallel, 5–15 mm. apart, forming angles of 50°–65° with the midvein; inflorescences with axes fulvo-tomentulose, the bracts linear-deltoid, 8–13 mm. long, 2–3 mm. broad, the bracteoles linear, 3–6 mm. long, 1 mm. broad or less; flowers 13–20 mm. long; calyx fulvo-tomentulose, 10–12 mm. long, the tube 6–7 mm. long and 6–7 mm. in diameter, the teeth 3–5 mm. long; petals pale lilac; fruit dehiscent, lignous, fulvo- or ferrugino-velutinous, 1–3-seeded, 3–7 cm. long (2–) 2.5–3.7 cm. broad, somewhat constricted between the seeds, 2–2.5 cm. thick, the valves 2–5 mm. thick; seeds red or red with a black line or small black spot along one edge, 12–16 mm. long, 10–15 mm. broad, and 8–10 mm. thick, the hilum 2–4 mm. long and 1.5–2 mm. in diameter.

TYPE LOCALITY: Breves, Pará, Brazil. Lectotype collected by Ducke (RB no. 17101), cited below.

DISTRIBUTION: "Terra firma" but low land, forest, primary or secondary, Surinam, British Guiana, and Brazil along the Amazon Basin and northern coast to Ceará.

SURINAM: Without exact locality, [*For. Bur. Sur.* no.] 6322 (U). Zanderij I, *Stahel* 120 (A, NY, U), 235 (A, K, NY, U, Y). Forest Reserve, Section O, tree no. 544, [*For. Bur. Sur.* no.] 1469 (U), 1612 (U), 1806 (U), 3382 (K, MO, NY, U), 5991 (BR, MO, U, US), 6132 (BR, MO, U, US). Raleigh Falls, Coppename R., *Stahel* [*For. Bur. Sur.* no.] 6346 (K, NY, U, US).

BRITISH GUIANA: Big Winiperu Creek, Demerara R., *Fanshawe* 387 [*For. Serv. B.G.* no. 3123] (K).

BRAZIL: AMAZONAS: Rio Negro, Padauri, Mata do Tucano, *Fróes* 22599 (IAN, U, US, VEN). Rio Urubú, *Fróes* 25334 (IAN, US). Manaus, Estrada da Raiz, *Ducke* 677 [MG no. 18122] (GH, K, MG, MO, NY, R, SI, US). Manaus, Ponte do Mindú, *Ducke* 758 [MG no. 18123] (GH, K, MG, NY, R, SI, US). Manaus, Cachoeira Mindú, *Ducke* [RB no.] 23363 (G, K, NY, P, RB, S, U, US). Rio Branco de Obidos, *Ducke* [RB no.] 20365 (RB, S, U). São Paulo de Olivença, *Fróes* [*Krukoff*] 12079 (A, NY, SI, US), 12080 (A, NY, US). PARÁ: Breves,

Ducke [RB no.] 17101 (K, RB lectotype, S, U, US). MARANHÃO: Candido Mendes, *Fróes* 1787 (A, BM, F, G, K, MO, NY, P, S, U, US). Caxias, *Ducke* [RB no.] 17102 (F fragment ex B, F.M.Neg. 1914 ex B isosyntypes). CEARÁ: Serra Grande [Ibiapaba], "Caminho S. Felix," *Löfgren* 333 (R). Sa. do Ibiapaba, São Benedicto, "Cayriris," *Allemão e Cysneiros* 440 (P, R, RB syntype), [as *Glaziou* 11898] (F.M.Neg. 1909 ex B, P).

LOCAL NAMES: Barakaro-friberoe (Arawak, Surinam); itoerano-anakoko (Carib, Surinam); kokrikie (Surinam); buiussu (Maranhão, Brazil); mulungu bravo, mulungu brabo (Ceará, Brazil); tenteiro, tento (Amazonas and Pará, Brazil).

Of the several syntypes it seemed appropriate to choose as lectotype one of *Ducke's* own collections and preferable to select a fruiting specimen.

The fruits of this species are relatively large for the series although a few specimens are well below the average size. Most of the seeds observed are completely red, but a few show a black line along one edge, suggesting relationship with other members of the *Monospermae*.

As mentioned under *O. fastigiata*, Amshoff believed *O. stipularis* to be synonymous with *O. fastigiata* and so convinced *Ducke* who, in his later works, treated the taxa as one. However, I consider them to be separate species.

Specimens distributed as *Glaziou* 11898, from Minas Gerais, appear to be in reality material of Fr. *Allemão* 440, from Ceara. The situation may be similar to that noted by *Sleumer* (*Bot. Jahrb.* 76 : 153, 154. 1954) concerning *Roupala pallida*: "Zu *Glaziou* 18464a bemerkt E. Ule in Herb. Berlin: Diese Pflanze hat A. *Glaziou* 1890 von mir unter nr. 1556 erhalten und wie so viele andere Pflanzen unter seinem Namen herausgegeben . . ."

50. *Ormosia avilensis* Pittier, *Bol. Soc. Venez. Cien. Nat.* 4:84. 1938; emend. *Pierce*, *Bull. Torr. Bot. Club* 69:590. 1942. FIGURE 14
Dussia avilensis (Pittier) Pittier, *Bol. Téc. Caracas* 5:16. 1944, pro parte.

Tree, about 10–12 m. tall; young stems ferrugino-velutinous; stipules deltoid, about 2 mm. long and 1 mm. broad at the base; leaves 3–9-foliolate, the axis 7–12 cm. long, the petiole 3–6 cm. long, the pairs of leaflets 2–4.5 cm. apart, the petiolules 3–4 mm. long, 2–3 mm. in diameter, the blades coriaceous, elliptic to ovate, 4–12 cm. long, 3–8 cm. broad, the apex acute, the base rounded to subcordate, the upper surface essentially glabrous, the lower surface ferruginotomentulose along the major veins, otherwise moderately and inconspicuously crisp-pubescent, glabrescent, the secondary veins about 10–17 pair, essentially parallel, 5–15 mm. apart, forming angles of

60°–70° with the midvein; inflorescences with axes ferruginovelutinous, the bracts, bracteoles, and complete flowers not seen; fruit dehiscent, lignous, brownish black, glabrate [due to weathering; originally velutinous?], 1-seeded, 3.5–4.5 cm. long, 2.5–3 cm. broad, about 1.5–2 cm. thick, the valves 1–2 mm. thick; seeds red, 14–17 mm. long, 14–18 mm. broad, and 10–15 mm. thick, the hilum 3–4 mm. long and 1.5–2 mm. broad.

TYPE LOCALITY: "Selvas del Avila, Guayabal; camino de ronda del Avila," above Caracas, Venezuela, at 1600–1700 meters elevation. Type collected by Delgado (no. 35), cited below.

DISTRIBUTION: Known only from the type collection.

VENEZUELA: DISTRITO FEDERAL: El Avila, Caracas, *Delgado* 35 (F, US, VEN type).

LOCAL NAME: Peonía.

In the original publication of this species, the type was erroneously cited as *Delgado* no. 37, obviously a typographical error, as the specimens, including the holotype at VEN, bear the number 35. As added confusion, a floral description was included, unfortunately based on *Dussia* flowers from material of *Delgado* no. 47. Pierce clarified the situation by emending the description of *O. avilensis* and publishing the new species, *Dussia coriacea* Pierce, typified by *Delgado* 47. Pittier apparently misunderstood Pierce's efforts and transferred *O. avilensis* to *Dussia avilensis*, compounding the confusion.

However, the type of *Ormosia avilensis*, *Delgado* 35, is unquestionably a specimen of *Ormosia*; the type of *Dussia coriacea*, *Delgado* 47, is entirely material of *Dussia*. Conveniently, the name *Dussia avilensis* falls into synonymy, in part under *Ormosia*, and partly under *Dussia*.

Not only has the nomenclature been confused by mixture of material, the species itself is suspect. It is possible that the leaves really represent young, less pubescent specimens of *O. tovarensis*, and the red seeds could be from *O. stipularis* or *O. venezolana*. Perhaps additional material will be found to elucidate the status of *O. avilensis*.

Excluded Taxa

Ormosia mexicana Standl. Contr. U.S. Nat. Herb. 23:436. 1922. = **Dussia mexicana** (Standl.) Harms.

Ormosia pacimonensis Spruce ex Benth. Journ. Linn. Soc. 4 suppl.:119. 1860, nomen in synon. = **Vatairea guianensis** Aubl.

Ormosiopsis paradoxa Sandw. Kew Bull. 1928:371. 1928. = **Clathrotropis paradoxa** Sandw.

New Taxa, New Names, and New Combinations

- Ormosia* series *Amazonicae* Rudd, ser. nov.
Ormosia series *Coccineae* Rudd, ser. nov.
Ormosia series *Excelsae* Rudd, ser. nov.
Ormosia series *Isthmenses* Rudd, ser. nov.
Ormosia series *Monospermae* Rudd, ser. nov.
Ormosia series *Nobiles* Rudd, ser. nov.
Ormosia series *Panamenses* Rudd, ser. nov.
Ormosia antioquiensis Rudd, sp. nov.
Ormosia coccinea var. *subsimplex* (Spruce ex Benth.) Rudd, stat. nov.
Ormosia colombiana Rudd, sp. nov.
Ormosia cruenta Rudd, sp. nov.
Ormosia cuatrecasasii Rudd, sp. nov.
Ormosia elata Rudd, sp. nov.
Ormosia flava (Ducke) Rudd, comb. nov.
Ormosia froesii Rudd, sp. nov.
Ormosia grandiflora (Tul.) Rudd, comb. nov.
Ormosia grossa Rudd, sp. nov.
Ormosia larecajana Rudd, sp. nov.
Ormosia lignivalvis Rudd, sp. nov.
Ormosia maguireorum Rudd, sp. nov.
Ormosia nobilis var. *bolivarensis* Rudd, var. nov.
Ormosia nobilis var. *santaremnensis* (Ducke) Rudd, stat. nov.
Ormosia revoluta Rudd, sp. nov.
Ormosia smithii Rudd, sp. nov.
Ormosia solimoesensis Rudd, sp. nov.
Ormosia steyermarkii Rudd, nom. nov.
Ormosia venezolana Rudd, sp. nov.
Ormosia vicosana Rudd, sp. nov.
Ormosia williamsii Rudd, sp. nov.

Collections of *Ormosia* Cited

(In most cases the numbers are those of the collectors, but some are herbarium numbers and are so indicated in the text if the fact is known.)

- ABBOTT, W. L.
2658. *krugii*
- ALLARD, H. A.
18841. *krugii*
ALLEMÃO E CYSNEIROS, FREIRE F.
440. *stipularis*
- ALLEN, P. H.
4499. *cruenta*
- ALSTON, A. H. G.
5556. *tovarensis*
- ANDERSON, A.
s.n. *coarctata*
s.n. *monosperma*
- ANDERSON, C. W.
283. *coccinea* var. *coccinea*
582. *coutinhoi*
- ANDRADE, N. DE
1557. *minor*
- ARISTEGUIETA, L.
3252. *macrocalyx*
- ATCHISON, E.
66. *macrocalyx*
88. *monosperma*
- AUBLET, F.
s.n. *coccinea* var. *coccinea*
- BAILEY, L. H.
s.n. *monosperma*
- BALDWIN, J. T., JR.
3267. *smithii*
- BARBOSA RODRIGUES, J.
s.n. *holerythra*
- BARTLETT, H. H.
11775. *velutina*
- BARTON, E., ET AL.
s.n. *jamaicensis*
- BEARD, J. S.
240. *krugii*
659. *krugii*
- BÉLANGER, C. P.
1040. *monosperma*
- BENA, P.
1157. *paraensis*
- BENOIST, R.
212. *melanocarpa*
877. *cinerea*
1417. *coccinea* var. *coccinea*
1611. *nobilis* var. *nobilis*
- BERNARDI, A. L.
1623. *paraensis*
3155. *venezolana*
6665. *nobilis* var. *bolivarensis*
- BERTERO, C. G. L.
s.n. *monosperma*
- BHORAI, M.
285. *monosperma*
- BIRDSALL, B. J.
s.n. *panamensis*
- BLACK, G. A., ET AL.
47-1003. *paraensis*
48-2668. *coccinea* var. *subsimplex*
48-3032. *coutinhoi*
50-10708. *excelsa*
51-12779. *smithii*
51-13226. *smithii*
51-13457. *paraensis*
54-16888. *nobilis* var. *nobilis*
54-17330. *coccinea* var. *coccinea*
- BOSBEHEER
(" 's Lands Bosbeheer," Surinam)
344. *coutinhoi*
609. *cinerea*
1021. *coutinhoi*
1025. *coutinhoi*
1026. *coutinoi*
- Box, H. E.
1846. *monosperma*
- BRITO
40. *macrocalyx*
- BRITTON, N. L., ET AL.
1695. *krugii*
1797. *monosperma*
2210. *jamaicensis*
4465. *krugii*
7670. *krugii*
9292. *monosperma*

BROADWAY, W. E.

1887. monosperma

s.n. monosperma

BUREAU AGRICOLE ET FORESTIER

GUYANAIS (FRENCH GUIANA)

7 *M. paraensis*

73 *M. coutinhoi*

142 *M. coutinhoi*

151 *M. lignivalvis*

212 *M. coutinhoi*

274 *M. coccinea* var. *coccinea*

7323. *coccinea* var. *coccinea*

7335. *cinerea*

7357. *cinerea*

7535. *lignivalvis*

BURKART, A.

17437. *minor*

CAMPOS PORTO, P.

2077. *friburgensis*

17942. *friburgensis*

CAPUCHO, P.

415. *excelsa*

CARDONA, F.

405. *nobilis* var. *bolivarensis*

CASTAÑEDA, R. R.

4914. *tovarensis*

CESPEDES, J. M. DE

s.n. *colombiana*

CHAGAS

948. *discolor*

CLAUSSEN, P.

239. *fastigiata*

1704. *fastigiata*

s.n. *fastigiata*

s.n. *arborea*

COELHO, D.

3839. *discolor*

COELHO, J. DE P.

3094. *minor*

CONEJOS-SOBRINO, J.

82. *lignivalvis*

CONSTANTINO, D.

276. *arborea*

COOPER, G. P., and SLATER, G. M.

125. *macrocalyx*

150. *panamensis*

243. *macrocalyx*

CORNER, E. J. H.

5. *macrocalyx*

COWAN, R. S., ET AL.

1553. *monosperma*

1621. *monosperma*

1976. *coutinhoi*

38037. *coccinea* var. *coccinea*

39274. *costulata*

CROIZAT, L.

154. *coccinea* var. *subsimplex*

CRUEGER, H.

175. *monosperma*

CUATRECASAS, J.

15129. *cuatrecasasii*

15198. *revoluta*

19914. *cuatrecasasii*

22617. *colombiana*

23785. *colombiana*

DAHLGREN, B. E., and SELLA, E.

688. *nobilis* var. *nobilis*

DANIEL, BRO.

2103. *antioquensis*

2459. *colombiana*

2460. *antioquensis*

2476. *colombiana*

2507. *antioquensis*

3823. *colombiana*

19132. *antioquensis*

DANNOUSE, L.

s.n. *monosperma*

DAVENPORT

1. *coarctata*

DAVIDSON, M. E.

848. *cruenta*

DAWSON, A.

8. *coutinhoi*

DAYTON, W. A., and BARBOUR, W. R.

3127. *isthmensis*

DE LA CRUZ, J. S.

1733. *coarctata*

2380. *coarctata*

2662. *coarctata*

3388. *coutinhoi*

DELGADO, E.

35. *avilensis*

59. *tovarensis*

123. *tovarensis*

DIONÍSIO

(see D. Coelho)

DOMINGO-PENAGOS

(see Bro. Daniel)

DUARTE, A. P.

64. *arborea*

DUARTE DE BARROS, V.

1184. *friburgensis*

1212. *friburgensis*

DUCKE, A., ET AL.

106. bahiensis
 125. nobilis var. santaremnensis
 145. excelsa
 145a. excelsa
 182. excelsa
 230. macrophylla
 230.II. macrophylla
 352. coutinhoi
 547. discolor
 566. costulata
 577. excelsa
 585. coutinhoi
 644. nobilis var. santaremnensis
 677. stipularis
 758. fastigiata
 770. lignivalvis
 779. coarctata
 945. coccinea var. coccinea
 1047. paraensis
 1194. costulata
 1275. paraensis
 1516. macrocalyx
 1615. coutinhoi
 1714. flava
 1721. flava
 1818. nobilis var. santaremnensis
 1962. coutinhoi
 1998. macrocalyx
 2133. macrocalyx
 5096. nobilis var. nobilis
 5695. costulata
 7168b. smithii
 7345. macrocalyx
 8613. macrophylla
 8697. costulata
 9098. coarctata
 9118. costulata
 10944. holerythra
 11195. costulata
 11429. macrophylla
 11726. excelsa
 11740. excelsa
 14833. amazonica
 14836. excelsa
 14836a. excelsa
 15491. coutinhoi
 15492. nobilis var. nobilis
 15493. excelsa
 15494. nobilis var. santaremnensis
 15543. paraensis
 15797. costulata
 15814. nobilis var. nobilis
 15883. excelsa
 15902. excelsa
 15912. nobilis var. santaremnensis
 15915. excelsa
 15962. coccinea var. coccinea
 16188. coutinhoi
 16189. nobilis var. nobilis
 16357. paraensis
 16361. excelsa
 16401. excelsa
 16572. (see Fra. Lima)
 16575. paraensis
 16657. coccinea var. coccinea
 16675. coccinea var. coccinea
 16718. nobilis var. santaremnensis
 16746. flava
 16779. flava
 16798. coutinhoi
 16955. flava
 17033. nobilis var. nobilis
 17080. flava
 17081. flava
 17093. coutinhoi
 17097. coccinea var. coccinea
 17098. nobilis var. nobilis
 17101. stipularis
 17102. stipularis
 17104. paraensis
 17106. paraensis
 17107. paraensis
 17112. holerythra
 17159. coccinea var. coccinea
 17260. grandiflora
 18113. flava
 18114. flava
 18117. lignivalvis
 18118. coutinhoi
 18119. coutinhoi
 18120. excelsa
 18121. nobilis var. santaremnensis
 18122. stipularis
 18123. stipularis
 18124. macrophylla
 18125. paraensis
 18126. paraensis
 18127. costulata
 18128. macrocalyx
 18129. nobilis var. santaremnensis
 18130. macrocalyx
 18131. macrocalyx
 20362. paraensis

20363. nobilis var. santaremnensis
 20365. stipularis
 20366. holerythra
 20367. grandiflora
 23357. paraensis
 23363. stipularis
 23365. nobilis var. santaremnensis
 23366. lignivalvis
 24060. macrocalyx
 35084. discolor
 35175. nobilis var. nobilis
 35177. macrophylla
 54971. coutinhei
 DUSEN, P.
 4007. fastigiata
 8265. arborea
 8731. arborea
 12193. fastigiata
 16533. arborea
 s.n. arborea
 DUSS, PÈRE
 686. monosperma
 1090. monosperma
 3453. monosperma
 3580. monosperma
 DWYER, J. D.
 1170. isthmensis
 EGGERS, H. F. A.
 924. monosperma
 6833. monosperma
 EKMAN, E. L.
 6232. krugii
 11422. krugii
 12425. krugii
 15890. krugii
 ESPINA AND GIACOMETTO
 A 102. colombiana
 FANSHAW, D. B.
 248. coarctata
 387. stipularis
 464. paraensis
 523. coutinhei
 734. lignivalvis
 881. paraensis
 901. coarctata
 15151. coutinhei
 FENDLER, A.
 1751. tovarensis
 FERREIRA, A. R.
 s. n. grandiflora
 FERREIRA, E.
 58-237. nobilis var. santaremnensis
- FERREYRA, R.
 1188. grandiflora
 FORESTRY BUREAU SURINAM
 (BOSCHWEZEN SURINAME)
 83. costulata
 1138. paraensis
 1409. melanocarpa
 1427. paraensis
 1469. stipularis
 1508. paraensis
 1612. stipularis
 1806. stipularis
 1824. paraensis
 2391. melanocarpa
 2834. flava
 3382. stipularis
 4647. paraensis
 4699. melanocarpa
 5015. melanocarpa
 5991. stipularis
 6079. paraensis
 6132. stipularis
 6322. stipularis
 6346. stipularis
 6630. coccinea var. coccinea
 FORESTRY DEPARTMENT BRITISH
 GUIANA
 2013. coutinhei
 2604. costulata
 2984. coarctata
 3123. stipularis
 3200. paraensis
 3259. coutinhei
 3470. lignivalvis
 3617. paraensis
 3637. coarctata
 5356. coarctata
 5383. costulata
 FRÓES, R. DE L., ET AL.
 (many actually are Krukoff numbers)
 1787. stipularis
 1796. paraensis
 1910. paraensis
 1913. flava
 11601. paraensis
 11612. paraensis
 11984. nobilis var. nobilis
 12016. excelsa
 12075. solimoesensis
 12077. lignivalvis
 12078. solimoesensis
 12079. stipularis
 12080. stipularis

- 12081/28. *grandiflora*
 12082. *lignivalvis*
 12083. *macrocalyx*
 12183/94. *lignivalvis*
 12184/95. *nobilis* var. *santaremnensis*
 12185/96. *lignivalvis*
 12206/119. *macrocalyx*
 12208/121. *macrocalyx*
 12211/124. *nobilis* var. *santaremnensis*
 12234/126. *nobilis* var. *santaremnensis*
 12377/137. *coccinea* var. *subsimplex*
 12380/139a. *macrophylla*
 12384/143. *macrophylla*
 12385/144. *macrophylla*
 12386/145. *macrophylla*
 12406/150. *coccinea* var. *subsimplex*
 12449/193. *williamsii*
 12468/211. *coccinea* var. *subsimplex*
 12564/288. *nobilis* var. *santaremnensis*
 12566/290. *coccinea* var. *subsimplex*
 12629. *bahiensis*
 15198. *excelsa*
 20796. *lignivalvis*
 21107. *nobilis* var. *santaremnensis*
 21158. *grandiflora*
 21573. *paraensis*
 22279. *coccinea* var. *subsimplex*
 22438. *smithii*
 22599. *stipularis*
 22765. *macrophylla*
 22821. *froesii*
 22900. *paraensis*
 22971. *paraensis*
 23119. *smithii*
 23174. *paraensis*
 23571. *paraensis*
 23982. *macrocalyx*
 24047. *macrocalyx*
 24162/74. *holerythra*
 25269. *discolor*
 25334. *stipularis*
 25397. *discolor*
 25422. *excelsa*
 26114. *macrocalyx*
 27679. *coutinhei*
 29268. *froesii*
 29319. *nobilis* var. *nobilis*
 29622. *macrocalyx*
 29638. *macrocalyx*
 30572. *excelsa*
 30577. *excelsa*
 30763. *paraensis*
 33853. *smithii*
- GARCÍA-BARRIGA, H.
 12475. *nobilis* var. *santaremnensis*
 12510. *tovarensis*
 13686. *coccinea* var. *subsimplex*
 GENTLE, P. H.
 4145. *velutina*
 5400. *velutina*
 8961. *velutina*
 GLAZIOU, A. F. M.
 15. *arborea*
 10555. *fastigiata*
 11892. *fastigiata*
 11898. *stipularis*
 19045. *friburgensis*
 20275. *fastigiata*
 GOMES, A. I.
 s.n. *arborea*
 GOMEZ LEAL E OCTAVIO, C.
 206. *bahiensis*
 GOMEZ-POMPA, A., ET AL.
 339. *schippii*
 380. *isthmensis*
 GONGGRIJP, J. W.
 442. *costulata*
 GONZÁLES, F.
 s.n. *macrocalyx*
 GRANT, M. L.
 10562. *tovarensis*
 GUARÍN, R.
 2507. *antioquensis*
 GUEDES, T. N.
 304. *nobilis* var. *nobilis*
 335. *nobilis* var. *nobilis*
 GUTIERREZ, G., and SCHULTES, R. E.
 825. *coccinea* var. *subsimplex*
 GUZMÁN, R.
 s.n. *macrocalyx*
 HAHN, L.
 1346. *monosperma*
 s.n. *monosperma*
 HARRIS, W.
 9241. *jamaicensis*
 HATSCHBACH, G.
 2646. *fastigiata*
 HAYES, S.
 352. *isthmensis*
 522. *macrocalyx*
 HEMMENDORFF, E.
 235. *arborea*
 HERINGER, E. P.
 93624. *arborea*

Hess, W. E.

4105. *krugii*

5376. *krugii*

HEYLIGERS, P. C.

295. *costulata*

HODGE, W. H. and B. T.

2037. *monosperma*

HOEHNE, F. C.

713. *fastigiata*

714. *fastigiata*

715. *fastigiata*

24951. *minor*

28688. *minor*

29416. *arborea*

HOHENKERK, L. S.

124 B. *coutinhoi*

124 C. *coutinhoi*

HOLDRIDGE, L. R.

448. *monosperma*

5181. *velutina*

5203. *macrocalyx*

5245. *velutina*

HOLT, E. G., and BLAKE, E. R.

632. *coccinea* var. *subsimplex*

HOSTMANN, F. W.

1299. *costulata*

HOWARD, R. A.

11367. *monosperma*

IMRAY, J.

s.n. *monosperma*

IRWIN, H. S., ET AL.

165. *coutinhoi*

189. *costulata*

47915. *coutinhoi*

48691. *paraensis*

JENMAN, G. S.

4171. *costulata*

5569. *coarctata*

6299. *costulata*

6569. *costulata*

JIMÉNEZ, J. DE J., ET AL.

2953. *krugii*

JOLY, A. B.

725. *arborea*

KILLIP, E. P., and SMITH, A. C.

29068. *grandiflora*

KINLOCK, J. B.

6. *isthmensis*

KLUG, G.

669. *bopiensis*

1207. *grandiflora*

KLUGE

14. *macrocalyx*

KRAMER, W. P.

10. *krugii*

KRUKOFF, B. A.

(see also Fróes)

1164. *paraensis*

4838. *amazonica*

5053. *elata*

5123. *amazonica*

5894. *elata*

6303. *elata*

6478. *elata*

7085. *nobilis* var. *nobilis*

7194. *nobilis* var. *santaremnensis*

7222. *lignivalvis*

8986. *nobilis* var. *santaremnensis*

9383. *isthmensis*

10408. *bopiensis*

11049. *larecajana*

12102. *nobilis* var. *santaremnensis*

12103/15066. *smithii*

KUHLMANN, J. G.

110. *nitida*

383. *paraensis*

384. *paraensis*

385. *paraensis*

387. *paraensis*

732. *arborea*

3133. *smithii*

18222. *excelsa*

41437. *arborea*

KUHLMANN, M., and JIMBO, S.

307. *paraensis*

LANCASTER, D. A.

24. *schippii*

LANG, H., and PERSAUD, A. C.

129. *coarctata*

LANJOUW, J., and LINDEMAN, J. C.

H 9. *costulata*

H 59. *costulata*

645. *coccinea*

1292. *costulata*

1710. *costulata*

2958. *cinerea*

3451. *cinerea*

LEVEL, J. S.

49. *coccinea* var. *subsimplex*

LIMA, D. A.

52-997. *bahiensis*

s.n. *bahiensis*

LIMA, FRA.

11834. *flava*

16572. *coutinhoi*

- LINDEMAN, J. C.
4526. *costulata*
 5352. *paraensis*
 5358. *melanocarpa*
 6515. *costulata*
 7126. *costulata*
 7127. *coccinea* var. *coccinea*
- LOBO, M.
15458. *grandiflora*
 15459. *amazonica*
 15461. *lignivalvis*
 15463. *nobilis* var. *nobilis*
- LOCKHEAD
- s.n. *monosperma*
- LÖFGREN, A.
333. *stipularis*
- LONG, L. E.
162. *velutina*
- LUETZELBURG, P.
21194. *smithii*
- LUSCHNATH,
131. [Martius no.] *arborea*
- LUTZ, B.
655. *arborea*
- MACEDO, A.
2687. *fastigiata*
- MACHADO, O.
76105. *arborea*
 76112. *arborea*
- MAGALHÃES, G. M. DE
- s.n. *arborea*
- MAGUIRE, B., ET AL.
24222. *costulata*
 24383. *costulata*
 24960. *costulata*
 25051. *costulata*
 30845. *coccinea* var. *subsimplex*
 32247. *costulata*
 34486. *macrophylla*
 34491. *macrophylla*
 34882. *coccinea* var. *subsimplex*
 37603. *macrophylla*
 37650. *macrophylla*
 41668. *macrophylla*
 42530. *maguireorum*
 43858. *costulata*
 44171. *macrophylla*
 47060. *coutinhoi*
- MALME, G. O. A.
2295. *fastigiata*
 2295a. *fastigiata*
 s.n. *fastigiata*
- MANDUCA PALMA
69343. *friburgensis*
- MARSHALL, R. C.
12243. *monosperma*
- MARTIUS, K. F. P. VON
131. *arborea*
 3143. *macrophylla*
 s.n. *coutinhoi*
 s.n. *macrophylla*
- MÉLINON, M.
92. *cinerea*
 243. *coutinhoi*
 s.n. *cinerea*
- MELLO BARRETO, H. L.
1981. *arborea*
- MÉLOZAN, L. F.
12439. *monosperma*
- MIKAN, J. C.
- s.n. *arborea*
- MIRANDA, F.
- 8471/1. *schippii*
- MONCADA, A.
- s.n. *tovarensis*
- MONTEIRO DA COSTA, R.
93. *paraensis*
- MORAES, J. C. DE
893. *bahiensis*
- MORAES, M.
39323. *fastigiata*
- MOSÉN, H.
2830. *arborea*
- NADEAUD, J.
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30. flava
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 858. coccinea var. subsimplex
 1012. nobilis var. santaremnensis
 1145. nobilis var. santaremnensis
 3823. holerythra
 4455. flava
 4626. coutinhoi
 4730. coccinea var. coccinea
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 II. 2295a. fastigiata
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 334a. krugii
 602. macrocalyx

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 3973. coccinea var. subsimplex
 6088. macrocalyx
 8998. coccinea var. subsimplex
 9503. macrophylla
 9888. williamsii
 10293. excelsa
 12952. discolor
 14533. macrophylla
 14541. coccinea var. subsimplex
 19747. macrophylla

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820. nitida
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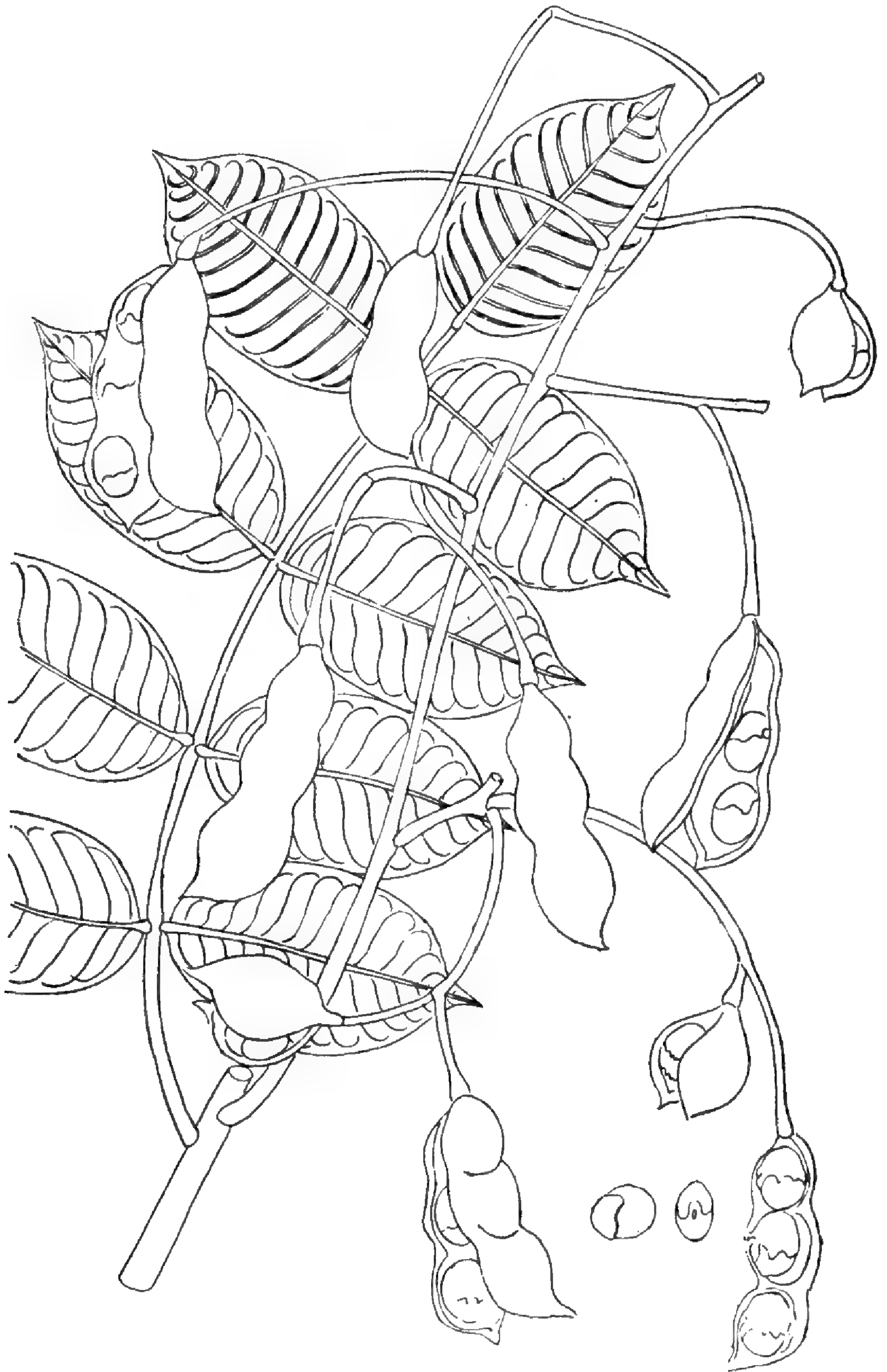
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PLATES



Pseudo-Acacia ingens, flore coccineo, nigra macula notata (at. 19).

Drawing of "Pseudo-Acacia ingens, fructu coccineo, nigra macula notata" from Plumier's Catalog, p. 19 (M.S. 7, t. 145) [Sherard MS 150, Plate 161, at University of Oxford]



Ind. ...

Ormosia ...



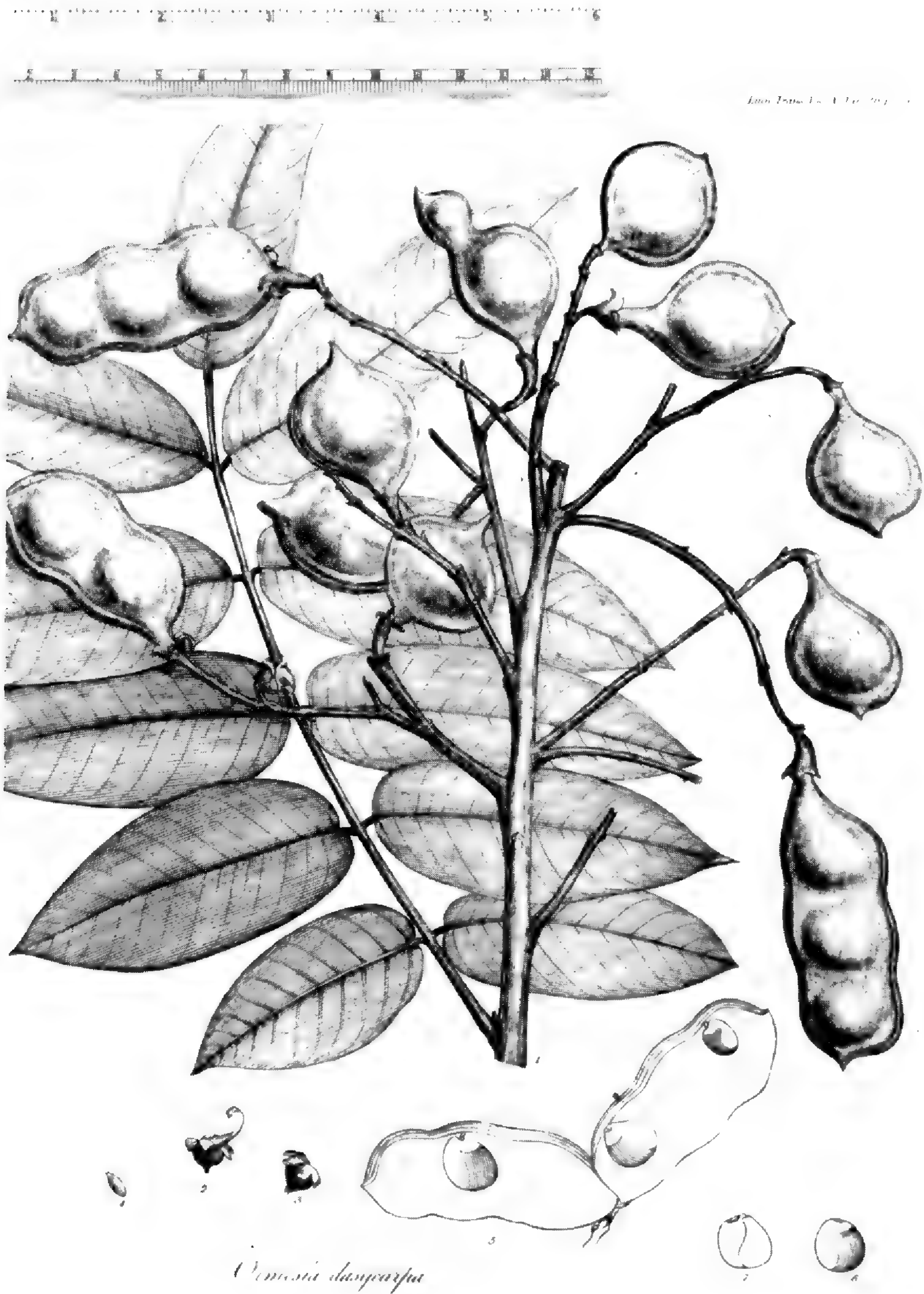
Specimen of *Sapiura monosperma* Sw. (= *Ormosia monosperma* (Sw.) Urb.) in Swartz herbarium.



And. Ind. Mex. Ind. Ind.

Ormosia dasycarpa Lin. *Trans: vol*
Sophora monosperma Lin. *Wild.*

Type of *Ormosia dasycarpa* Jacks. (= *O. monosperma* (Sw.) Urb.), originally in herbarium of A. B. Lambert.

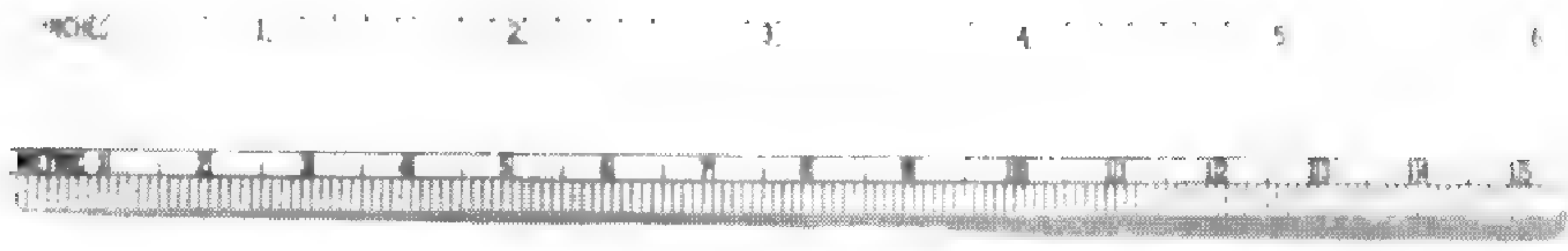


Ormosia dasycarpa

Illustration of *Ormosia dasycarpa* Jacks. (= *O. monosperma* (Sw.) Urb.) from original publication of the genus *Ormosia* Jacks., based on specimen shown in plate 3.



Type of *Ormosia coarctata* Jacks., originally in herbarium of A. B. Lambert.



Ormosia coarctata.

Illustration of *Ormosia coarctata* Jacks based on specimen shown in plate 5.

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VOLUME 32, PART 6

A RÉSUMÉ OF ATELEIA AND CYATHOSTEGIA
(LEGUMINOSAE)

By VELVA E. RUDD



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7. *Pterocarpus gummifer*
8. *Ateleia cubensis*
9. *Swartzia multijuga*

A RÉSUMÉ OF ATELEIA AND CYATHOSTEGIA (LEGUMINOSAE)

By VELVA E. RUDD

Introduction

In the Leguminosae, flowers with the corolla reduced to a single petal, presumably the vexillum, are interesting and enigmatic. To identify an unknown specimen to subfamily on the basis of the flower alone one must guess the position of that one petal in relation to the missing petals: would it be enfolded by the other petals, as is customary in members of the subfamily Caesalpinioideae, or be outermost and thus referable to the Faboideae. Anatomical studies of these aberrant flowers would be enlightening but, to my knowledge, such studies are yet to be made and one must seek other characters to aid in determination.

Two little known, superficially similar, unipetalate genera are *Ateleia* and *Cyathostegia*. The former, *Ateleia*, was first published by DeCandolle (1825) as a section of the genus *Pterocarpus*, in the tribe Dalbergieae, "subordo" Papilionaceae, "ordo" Leguminosae. Four species were included, one, *P. ateleia*, being based on "*Ateleia pterocarpa* fl. mex. ic. ined." of Sessé and Mociño. Bentham (1837, 1838) raised *Ateleia* to generic status in the tribe Dalbergieae but did not indicate specific combinations. Dietrich (1847), following the Linnaean system of classification, included "*Ateleia* Moc. et Sesse" in the "Diadelphia, Decandria" and transferred to the genus *Ateleia* the four species of DeCandolle's *Pterocarpus* section *Ateleia*. In 1860 Bentham stated, "DeCandolle's section *Ateleia*, of which he had not seen the flowers, comprises one or two species of an otherwise unpublished Caesalpineous genus . . .," but, in 1865, on the basis of the stamens with separate filaments, he placed *Ateleia* in the tribe Sophoreae of the "subordo" Papilionaceae. Taubert (1892), following the same interpretation, retained *Ateleia* as a genus of the tribe Sophoreae, in the "unterfamilie" Papilionatae. Hutchinson (1964), similarly, treated *Ateleia* as a genus of the tribe Sophoreae, in the "family" Fabaceae but expanded the circumscription to include *Cyathostegia*. Mohlenbrock (1962) in his revision of the genus refers

to *Ateleia* as "one of the Sophorean genera of papilionaceous legumes with strong affinities to the caesalpinaceous forms."

Cyathostegia was originally published by Bentham (1865) as a section of the genus *Swartzia* in the tribe Swartzieae of "subordo" Papilionaceae, without specific citation. In 1870 Bentham described the single species, *Swartzia matthewsii*, without tribal designation. Later that year, in Martius' *Flora Brasiliensis*, he assigned it to his *Swartzia* series *Cyathocalycinae*, without mention of the name *Cyathostegia*. Taubert (1892) treated *Cyathostegia* as a section of *Tounatea* (= *Swartzia*) in the tribe Tounateae, subfamily Caesalpinioideae. In 1950 Schery raised *Cyathostegia* to generic level in the "Caesalpinioideae, Swartzieae." Hutchinson (1964) reduced it to synonymy under *Ateleia*, in the "Fabaceae," tribe Sophoreae, but made no specific transfers. Cowan (1968) in his studies of *Swartzia* follows Schery in excluding *Cyathostegia* from *Swartzia*.

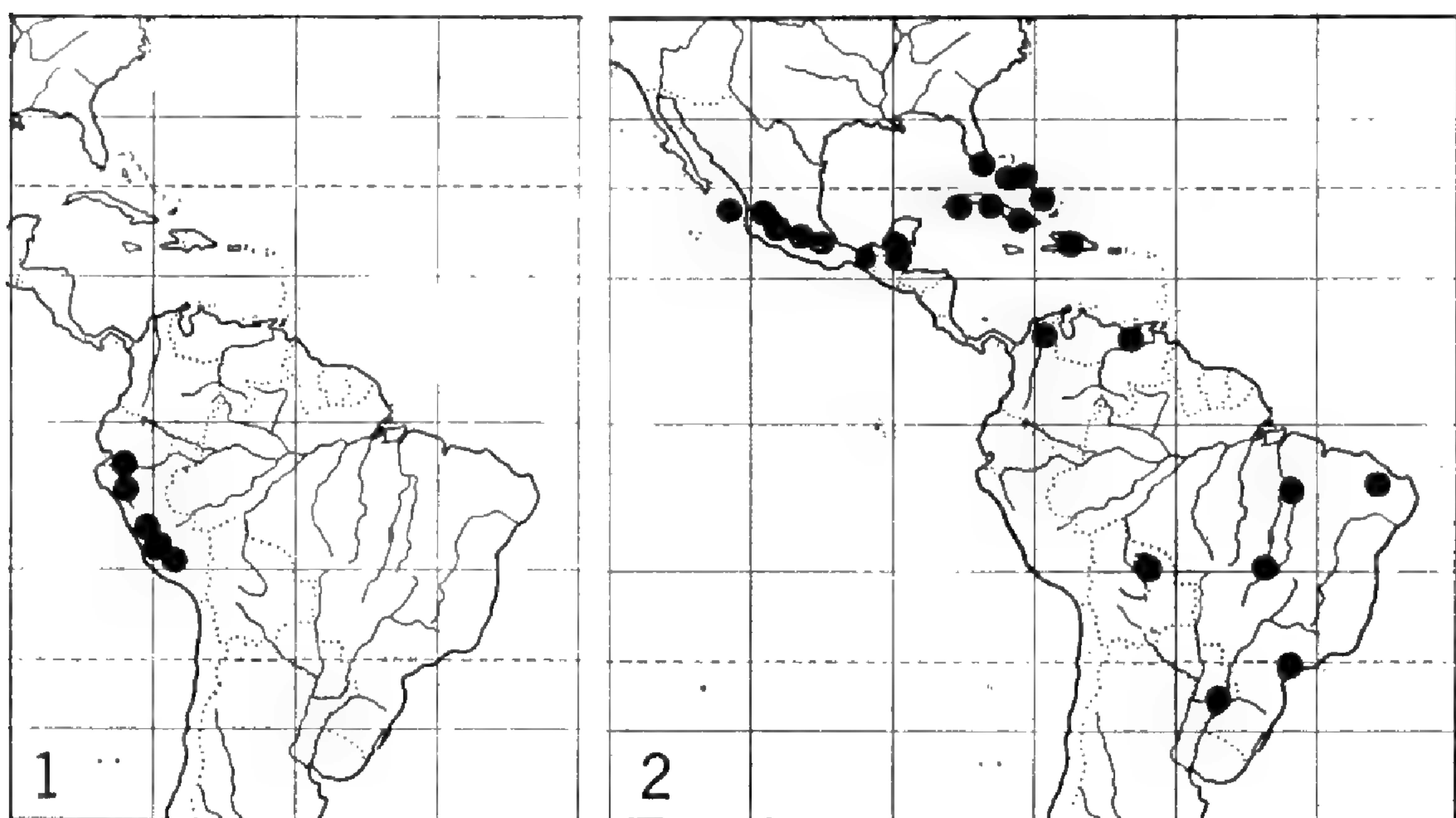


FIGURE 1.—Geographic distribution: 1, *Cyathostegia*; 2, *Ateleia*.

The similarity of *Ateleia* and *Cyathostegia* may be noted in characters other than the unipetalate corolla. First of all, the habit and general aspect are the same; both occur as shrubs or relatively small trees with pinnately compound leaves and white or yellowish flowers. In each case the calyx is essentially regular, cyathiform, truncate or subtruncate, valvate or subimbricate in bud. The fruits of *Cyathostegia* and at least one species of *Ateleia*, *A. arsenii*, from Mexico, show considerable resemblance. The reniform seeds of both genera, so far as known, appear to be almost identical. The most evident differences, as indicated in the key, are found in the stamens and the stigma.

Considering both the similarities and the dissimilarities, as currently understood, I prefer to treat *Ateleia* and *Cyathostegia* as distinct

genera, possibly both referable to the Caesalpinioideae, or the former referable to the Faboideae and the latter to the Caesalpinioideae.

The somewhat obscure relationship between *Ateleia* and *Cyathostegia* is but a part of a larger problem in the twilight zone between the clearly defined caesalpinoid and faboid genera of the Leguminosae, sensu latior. This zone includes, notably, two tribes sensu Hutchinson, the Cadieae and the Swartzieae, as well as what appear to be closely related genera in the Sophoreae. I know of no satisfactory classification, and it is unlikely that there can be one until we have adequate supporting data from anatomical, cytological, and chemical studies, as well as additional herbarium vouchers to amplify our knowledge of the general morphology and geographic distribution of the taxa.

The following systematic résumé is intended to facilitate identification of *Ateleia* and *Cyathostegia* and their component species, to revise certain points of nomenclature, to introduce a new species of *Ateleia*, and to provide a framework for supportive studies.

The citations of "F. M. Neg." refer to Field Museum (Chicago) negatives of a series of photographs taken in European herbaria by J. F. Macbride during the years 1929 to 1939.

Abbreviations of herbarium names are those of Lanjouw and Stafleu (Index Herbariorum, part I, ed. 5. 1964).

The maps presented in this paper are based on Goode Base Maps No. 101 M, copyright by the University of Chicago Press.

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Systematic Treatment

Key to Genera

- Flowers 15–30 mm long, the petal entire or slightly sinuate; stamens numerous, commonly 20 to 30, the anthers oblong, about 2 mm. long; ovary with style 2–5 mm. long, the stigma subcapitate; fruit without an alate margin along the upper suture 1. *Cyathostegia*
- Flowers 5–17 mm. long, the petal erose or sinuate; stamens 10 or less, rarely 11, the anthers ellipsoid, 1 mm. long or less; ovary with style reduced, the stigma peltate, essentially sessile; fruit with a narrow wing along the upper suture (except almost lacking in *A. arsenii*) 2. *Ateleia*

1. *Cyathostegia* (Benth.) Schery

Cyathostegia (Benth.) Schery, Ann. Mo. Bot. Gard. 37: 401. 1950.

Swartzia section *Cyathostegia* Benth. in Benth. & Hook. Gen. Pl. 1: 561. 1865.

Swartzia series *Cyathocalycinae* Benth. in Martius, Fl. Bras. 15(2): 40. 1870.

Touatea section *Cyathostegia* (Benth.) Taubert in Engler & Prantl, Natur. Pflanzenfam. 3, Abt. 3: 182. 1892.

Shrubs or small trees; leaves pinnate, 3–13-foliolate, the leaflets alternate; stipules linear to lanceolate, caducous; stipels lacking; inflorescences racemose, axillary or terminal, about 3–6 cm. long, commonly 10–30-flowered, the bracts and bracteoles small, linear, caducous; flowers 15–30 mm. long; calyx regular, cyathiform, subtruncate with 5 small deltoid teeth 0.5–2 mm. long, valvate in bud; petal 1, white, clawed, the blade oblong to elliptic, glabrous or sparsely pubescent on the outer face; stamens numerous, about 20–30, the filaments variable in length, shorter than the petal, united at the base, otherwise free, the anthers uniform, dorsifixed, oblong, about 2 mm. long; ovary pubescent, 1- or 2-ovulate, brevistipitate, the style 2–5 mm. long, glabrous except pubescent toward the base, the stigma terminal, subcapitate; fruit dehiscent, semiorbicular, 2-valved, commonly 2-seeded, compressed, stipitate, brevirostrate, the style mostly persistent; seeds reddish brown, reniform, the hilum orbicular, lateral.

Two species, in Peru and Ecuador. Type: *Swartzia matthewsii* Benth.

On the basis of the numerous stamens I favor excluding *Cyathostegia* from the Faboideae, members of which uniformly have flowers with 10 stamens, or fewer by reduction. Until more evidence is available, the genus might best be retained as a relative of *Swartzia*, in the Caesalpinioideae.

Key to Species of *Cyathostegia*

Leaflets with blades ovate, oblong, or lanceolate-oblong, subcordate, rounded, or cuneate at the base, crisp-pubescent to subsericeous with hairs about 0.3–0.5 mm. long, usually glabrescent, the petiolules 1–3.5 mm. long, crisp-pubescent to subsericeous; flowers 15–30 mm. long, the calyx tomentulose

to subsericeous; fruit crisp-pubescent to subsericeous, sometimes glabrescent, 3.5–5 cm. long including stipe 1–1.5 cm. long (Ecuador; Peru).

1. *C. matthewsii*

Leaflets with blades lanceolate or lanceolate-oblong, cuneate at the base, sericeous with minute hairs about 0.2 mm. long or less, the petiolules 1–2 mm. long, sericeous; flowers 15–22 mm. long, the calyx sericeous; fruit sericeous, about 4.5 cm. long including stipe about 1.8–2 cm. long (Peru) . 2. *C. weberbaueri*

1. *Cyathostegia matthewsii* (Benth.) Schery, Ann. Mo. Bot. Gard. 37: 401. 1950.

PLATE 1

Swartzia matthewsii Benth. in Hook. Icon. ser. 3, 1: 51, pl. 1064. 1870.

Tounatea matthewsii (Benth.) Taubert, Bot. Centralbl. 47: 392. 1891.

Shrub or tree, to about 8 m. tall; leaves 3–13-foliolate, the axis tomentulose, 5–10 cm. long; stipules lanceolate, to about 10 mm. long and 4 mm. broad; leaflets with blades ovate, oblong, or lanceolate-oblong, 1.5–9 cm. long, 0.5–3.5 cm. broad, obtuse to acute, the base subcordate, rounded, or sometimes cuneate, the upper surface subglabrous to moderately crisp-pubescent, glabrescent, the midvein depressed, usually crisp-pubescent, the lower surface subsericeous when young, at maturity moderately subsericeous, crisp-pubescent, or the hairs patent, usually glabrescent, the petiolules 1–3.5 mm. long, crisp-pubescent to subsericeous; bracts linear or linear-lanceolate, 1–7 mm. long, 1.5–4 mm. broad, the bracteoles linear, 1–1.5 mm. long; flowers 15–30 mm. long; calyx tomentulose to subsericeous, 4–7 mm. long including teeth 0.5–2 mm. long; petal 15–30 mm. long, 5–18 mm. broad, the claw 5–10 mm. long; ovary white-villous; fruit crisp-pubescent to subsericeous, sometimes glabrescent, 3.5–5 cm. long including stipe 1–1.5 cm. long, 1–1.3 cm. broad; seed about 8–10 mm. long, 4–4.5 mm. broad, and 2–4 mm. thick.

TYPE: *Matthews* s.n., "Prov. Chachapoyas, Peru" (K). Lectotype by Macbride, Field Mus. Publ. Bot. 13(3): 226. 1943. Isotype at NY.

DISTRIBUTION: In xerophytic, deciduous woods in inter-Andean valleys of Peru and southern Ecuador, at elevations of 500–2,300 meters.

ADDITIONAL COLLECTIONS:

ECUADOR: LOJA: Between El Tambo and La Toma, *Hitchcock* 21333 (GH, NY, US). Between Loja and Portovelo, *Rose, Pachano, & Rose* 23338 (GH, NY, US). Near La Toma, *Steyermark* 54839 (F), 54840 (F); *Espinosa* 854 (NY). Río Catamayo drainage, valley of Malacatos, east of Malacatos (Valladolid) 25 km. south of Loja, *Fosberg & Giler* 22904 (NY, US).

PERU: "Santa Anna (Bolivia ?), at an elevation of 3–4000 ft.," *Pearce* s.n. (K syntype). "R. Santa Ana," *Pearce* s.n. (BM, NY isosyntypes ?). CAJAMARCA: Jaén, *Woytkowski* 5601 (US). Mountains west of Jaén, *Weberbauer* 6204 (A, F, GH, NY, US). Between Chamaya and Pucará, *Ferreyra* 15648 (UC, US). LIMA: Near La Molina, cultivated, *Ferreyra* 8911a (US). HUANCVELICA: "Tayacaja, Chejyacc, abajo de Surcubamba, Valle del Mantaro," *Tovar* 3708 (US). APURÍMAC: "Bombac-wald, alt. 2300 m.," *Hirsch* s.n. (NY). "Lower end of quebrada opposite Hacienda Airobamba; ford on Rio Pampas; gravelly terrace

in narrow canyon. Alt. 2000 m.," *West* 3703 (GH, UC). Cuzco: "Prov. Panuro, Huaca-chaca bridge; Apurímac river, on open gravelly slope," *Vargas* 2381 (GH).

The complete range of this species is not yet known but it possibly extends into Bolivia. I think it probable, however, that the syntype collection made by Pearce is from Peru, where the locality name, Santa Ana, is not uncommon.

The petal dimensions in this species are variable, even on the same branch. This may be more apparent than real due to differences in maturity of the flowers at the time of collection.

I have been tempted to treat material from Ecuador as a new species and also to assign it to *C. weberbaueri*. The fruit tends to be glabrate at maturity and the stipe is shorter than on the type material of *C. weberbaueri*. On the other hand, I have a feeling that all collections of *Cyathostegia* might be correctly referred to only one variable species. Until more data become available, I have decided to maintain the status quo, with two species.

Dr. J. N. Rose annotated specimens of two collections from Ecuador as a new species of *Cyathostegia*. Had he published, he would have anticipated by two or three decades Schery's elevation of *Cyathostegia* to generic rank.

2. *Cyathostegia weberbaueri* (Harms) Schery, Ann. Mo. Bot. Gard. 37: 401. 1950

PLATE 2

Swartzia weberbaueri Harms, Fedde Rep. Sp. Nov. 18: 235. 1922.

Shrub, about 2 m. tall; leaves 7-13-foliolate, the axis sericeous, about 5-7 cm. long; stipules linear, 1-3.5 mm. long; leaflets with blades lanceolate to oblong-lanceolate, 1.5-5 cm. long, 0.5-1.5 cm. broad, acute or obtuse, the base cuneate, the surfaces densely sericeous when young, at maturity moderately sericeous with minute hairs, the midvein lightly depressed, the petiolules 1-2 mm. long, sericeous; bracts linear, 2-4 mm. long, the bracteoles linear 1-1.5 mm. long; flowers 15-22 mm. long; calyx sericeous, 7-9 mm. long including teeth 1-1.5 mm. long; petal 15-22 mm. long and about 10 mm. broad, the claw 4-5 mm. long; ovary white-sericeous; fruit sericeous, about 4.5 cm. long including stipe 1.8-2 cm. long, 1.3 cm. broad; seed not seen.

TYPE: *Weberbauer* 7216, "Dep. Cajamarca, Prov. Cajabamba, zwischen San Marcos und dem Tale des Flusses Crisnejas, 2300-2500 m., regenrönes Gesträuch, Nov. 1916" (B, presumably destroyed; F fragment ex B; F. M. Neg. 1866 ex B). Isotypes at F, GH, US.

DISTRIBUTION: Known only from the type collection.

2. *Ateleia* (DC.) Benth.

Ateleia (DC.) Benth. Leg. Gen. Comm. 91, 101. 1837 (preprint); Ann. Wien. Mus. Naturg. 2: 91, 101, 1838.

Pterocarpus section *Ateleia* DC. Prodr. 2: 419. 1825; Mém. Lég. 393. 1826.

Ateleia [Sessé & Mociño ex] DC. Prodr. 419. 1825; Mém. Lég. 394. 1826, nomen in synonym.

Shrubs or trees; leaves pinnate, 5–28-foliolate, the leaflets alternate or subopposite; stipules apparently lacking or reduced to a tuft of hairs; stipels lacking; inflorescences racemose, sometimes paniculate, axillary or terminal, about 5–20 cm. long with a few to several hundred flowers; bracts small, deltoid or linear, sometimes persistent, sometimes caducous; bracteoles apparently lacking; flowers 5–14 mm. long; calyx regular, cyathiform, valvate or subimbricate in bud, truncate or subtruncate with 5 lobes or teeth about 0.5 mm. long or less; petal 1, white or yellowish, clawed, cuculate, sometimes expanded at anthesis, glabrous or pubescent on the outer face, the margin erose or sinuate; stamens 6–10(–11), sometimes varying in number in flowers of the same inflorescence, the filaments free or attached at the base, alternately subequal in length, shorter than the petal, the anthers uniform, ellipsoid, 1 mm. long or less, dorsifixed; ovary pubescent or glabrous, brevistipitate, 1- or 2-ovulate, the stigma essentially sessile, peltate; fruit indehiscent, samaroid semiorbicular with a narrow wing along the upper suture, 2-valved, commonly 1-seeded, compressed, stipitate; seeds reddish brown to dark brown, reniform, the hilum lateral, orbicular or elliptic.

Sixteen species, in Mexico, northern Central America, the West Indies, and South America. Type: *Pterocarpus ateleia* DC.

Normally having 10 stamens with the filaments separate to the base, *Ateleia* is readily referable to the faboid tribe Sophoreae. In most characters, likewise, there is no basic disagreement with other genera of the group. However, certain relationships can also be found among the Caesalpinioideae sensu Taubert. Instability of stamen number, many specimens with less than 10 stamens per flower and one with 11 stamens per flower, is a character more often found in caesalpinoid genera. The peltate stigma of *Ateleia* is unique among the Faboideae, so far as I know, but it occurs in a few caesalpinoid genera such as *Arcoa*, *Bauhinia*, *Ceratonia*, and *Peltophorum*. Thus, the thought is strengthened that *Ateleia* might be related to *Cyathostegia*, although not congeneric.

Key to Species of *Ateleia*

(Some species incompletely known)

Leaflets with lower surface moderately to densely pubescent with crispate or spreading hairs, sometimes glabrescent.

- Fruit, including stipe, 3.5–4 cm. long.
 Flowers 10–14 mm. long, the calyx 4–6.5 mm. long, the petal pubescent; fruit pubescent, usually glabrescent, the wing along the upper suture very little developed; seed 9–15 mm. long (Mexico) **1. A. arsenii**
- Flowers less than 10 mm. long, the calyx 2–3 mm. long, the petal glabrous; fruit glabrous with the wing along the upper suture 1–2.5 mm. wide. Leaflets mostly rounded at the base, asymmetrical; petiolules 3–4 mm. long; fruit 1.5–1.8 cm. wide including wing 2–2.5 mm. wide (Mexico).
3. A. truncata
- Leaflets mostly cuneate at the base, essentially symmetrical; petiolules 2 mm. long or less; fruit 1–1.5 cm. wide including wing 1–2 mm. wide (Mexico; British Honduras; Guatemala; West Indies).
8. A. gummifera
- Fruit, including stipe, less than 3.5 cm. long.
 Leaflets mostly rounded at the base, asymmetrical.
 Fruit tomentose (Mexico) **6. A. tomentosa**
- Fruit essentially glabrous, the stipe sometimes puberulent.
 Leaflets tomentose below; fruit 2–2.3 cm. long, including stipe, and 1–1.2 mm. wide (Mexico) **5. A. pterocarpa**
- Leaflets moderately pubescent below; fruit 2.5–3 cm. long, including stipe, and about 1.5 cm. wide (Mexico) **4. A. standleyana**
- Leaflets cuneate or rounded at the base, essentially symmetrical.
 Base of leaflets usually rounded, the lower surface tomentulose, the margin revolute (Hispaniola) **9. A. microcarpa**
- Base of leaflets usually cuneate, the lower surface moderately pubescent, glabrescent, the margin not revolute.
 Tertiary veins of leaflets usually inconspicuous (Mexico; British Honduras; Guatemala; West Indies) **8. A. gummifera**
- Tertiary veins of leaflets clearly reticulate (Cuba) **10. A. apetala**
- Leaflets with lower surface glabrous to moderately pubescent with appressed or subappressed hairs.
 Young fruit pubescent (mature fruit not known); leaflets with petiolules 4–8 mm. long (Colombia) **14. A. herbert-smithii**
- Young fruit glabrous except sometimes pubescent at base and along margin; mature fruit essentially glabrous except the stipe sometimes puberulent; leaflets with petiolules 4 mm. long or less.
 Fruit 3–4 cm. long including stipe.
 Leaflets rounded or acute at base, mostly asymmetrical.
 Leaves 9–15-foliolate, the leaflets acute to obtuse at the apex.
 Leaflets obtuse at apex; flowers 6–7 mm. long, the calyx 2.5–3 mm. long (Mexico) **2. A. insularis**
- Leaflets acute or subacute at apex; flowers [probably] about 5 mm. long, the calyx 2 mm. long (Bolivia) **16. A. guaraya**
- Leaves 20–28-foliolate, the leaflets mostly attenuate at apex; flowers about 5 mm. long, the calyx 2 mm. long (Brazil; Argentina; Paraguay) **15. A. glazioveana**
- Leaflets cuneate at base, essentially symmetrical (Mexico; British Honduras; Guatemala; West Indies) **8. A. gummifera**
- Fruit less than 3 cm. long including stipe (fruit of *A. salicifolia* not known but estimated to be within this range).
 Base of leaflets rounded, asymmetrical.
 Fruit with upper suture shorter than the body; leaflets ovate (Brazil).
12. A. ovata

Fruit (immature) with upper suture as long as the body; leaflets elliptic-oblong (Venezuela) **13. A. venezuelensis**
 Base of leaflets cuneate, essentially symmetrical.

Tertiary veins of leaflets inconspicuous.

Leaflets with blades predominantly ovate, the length not much greater than the width; petiolules 2-3 mm. long (Mexico).

7. A. alboluteus

Leaflets with blades predominantly oblong, the length about twice the width; petiolules 2 mm. long or less (Mexico; British Honduras; Guatemala; West Indies) **8. A. gummifera**

Tertiary veins of leaflets clearly reticulate.

Leaflets ovate to rhombic, acute to acuminate, the length 2 to 3 times the width (Cuba) **10. A. apetala**

Leaflets linear, attenuate, the length about 7 times the width (Cuba).

11. A. salicifolia

1. Ateleia arsenii Standl. Contr. U.S. Nat. Herb. 20: 174. 1919.

Shrub, to about 1 m. tall; leaves 13-23-foliolate, the axis tomentulose, glabrescent, about 10-20 cm. long; leaflets with blades ovate, ovate-oblong, elliptic, or lanceolate-ovate, 1-5.5 cm. long, 0.5-2.5 cm. broad, acute to obtuse, the base obtuse, usually oblique, the upper surface moderately crisp-pubescent, glabrescent, the lower surface moderately crisp-pubescent, the secondary veins moderately conspicuous, the petiolules about 1 mm. long or less, crisp-pubescent; bracts deltoid to linear, 1-3 mm. long; flowers 10-14 mm. long; calyx tomentulose, 4-6.5 mm. long; petal 10-14 mm. long, 6-8 mm. broad, pubescent on the outer face, usually expanded at anthesis; ovary villous; fruit crisp-pubescent, glabrescent, 3.5-4 cm. long and 1.2-1.8 cm. broad, the upper margin essentially straight or slightly convex, incompletely developed, 1 mm. wide or less, the stipe 1-1.5 cm. long; seed 9-15 mm. long, 6-7 mm. wide, and about 2 mm. thick, the hilum about 0.8 mm. in diameter.

TYPE: *Arsène* 6655, Mexico, "Michoacán; Morelia, flancs du Quinceo, 2500 ? ou 3200 ? fruits en 1910" (US). Fragment at NY.

DISTRIBUTION: In oak woods, at elevations of about 1,800 to 3,000 meters. Known only from Mexico, from the states of México and Michoacán.

ADDITIONAL COLLECTIONS:

MEXICO: MÉXICO: Nanchititla, *Hinton* 3421 (A, F, G, K, MEXU), 6158 (A, F, K, MICH, US), 7621 (A, F, G, K); *Matuda* 37472 (MEXU). Temascaltepec, *Hinton* 407 (BM), 3526 (F, K), 4240 (A, BM, F, G, K), 5286 (A, BM, F, G, K, NY, US), 6093 (A, BM, G, K, MEXU, NY, US). MICHOCÁN: Quinceo, vicinity of Morelia, *Arsène* 2790 (GH, L, NY fragment, US).

LOCAL NAME: Haba de venado (Temascaltepec, Mexico).

This species is readily distinguished from the others by its larger calyx, pubescent petal, larger seeds, and its fruit with almost no wing

along the upper suture. The label of *Hinton* 3421 notes that this species provides food for deer.

2. *Ateleia insularis* Standl. Contr. U.S. Nat. Herb. 20: 175. 1919.

Tree or shrub, to about 10.5 m. tall; leaves 9–15-foliolate, the axis puberulous with appressed or subappressed hairs, glabrescent; leaflets; with blades ovate, 2–6.5 cm. long, 1–3.5 cm. broad, obtuse, the base obtuse, oblique, the surfaces glabrous except for a few appressed or subappressed hairs, especially along the midvein, the secondary veins moderately conspicuous, the petiolules 2–4 mm. long, puberulent, glabrescent; bracts deltoid, 0.5 mm. long or less; flowers 6–7 mm. long; calyx puberulent, 2.5–3 mm. long; petal 6–7 mm. long and about 4 mm. broad, glabrous, usually expanded at anthesis; ovary essentially glabrous; fruit glabrous, 3–4 cm. long, 1.5–2 cm. broad, the upper margin convex with a wing 2–3 mm. wide, the stipe 0.8–1 cm. long; seed about 7 mm. long, 4 mm. wide, and 4 mm. thick, the hilum about 0.8 mm. in diameter.

TYPE: *Nelson* 4186, Isla María Madre, Nayarit, Mexico (US). Isotype at A, F, NY fragment, P.

DISTRIBUTION: Known only from Isla María Madre, Nayarit, Mexico, at elevations of 700 meters or less.

ADDITIONAL COLLECTIONS:

MEXICO: NAYARIT: Isla María Madre, *Ferris* 5573 (A, DS, US), 5742 (DS, US); *Howell* 10471 (A); *Maltby* 73 (US); *Mason* 1843 (K, US).

Essentially the only difference between this species and the nearest mainland species, *A. standleyana* and *A. truncata*, is the presence of appressed pubescence rather than crispate or spreading.

3. *Ateleia truncata* Mohlenbrock, Webbia 17: 180, figs. 4, 17. 1962.

Tree or shrub; 11–13-foliolate, the axis about 9–10 cm. long or more, tomentulose; leaflets with blades elliptic to ovate or obovate, 4–6 cm. long and 1.5–3 cm. broad, obtuse, retuse, the base cuneate to obtuse, oblique, the upper surface crisp-pubescent, glabrescent, the lower surface moderately pubescent, the hairs crispate or somewhat spreading, the secondary veins moderately conspicuous, the petiolules 3–4 mm. long, tomentulose; bracts deltoid, 0.5–1 mm. long; flowers about 6–7 mm. long; calyx tomentulose, glabrescent, 2.5–3 mm. long; petal about 6–7 mm. long, 4 mm. wide, glabrous, probably expanded at anthesis (mature flowers not seen); ovary glabrous; fruit glabrous, 3.5–4 cm. long, 1.5–1.8 cm. broad, the upper margin convex with a wing 2–2.5 mm. wide, the stipe about 1 cm. long; seed (submature) about 7 mm. long, 4 mm. broad, and 2 mm. thick, the hilum about 1 mm. in diameter.

TYPE: *Salazar* s.n., March 6, 1914, Hacienda de la Huerta, near Apatzingán, Michoacán, Mexico (US). Isotypes at MEXU.

DISTRIBUTION: Known only from the type collection.

LOCAL NAME: Piojillo.

The species is characterized by the relatively large glabrous fruit. Because it is known only from the one collection it is difficult to know how "good" a species it is.

4. *Ateleia standleyana* Mohlenbrock, *Webbia* 17: 179, figs. 4, 16. 1962.

Tree, to about 12 m. tall; leaves 9–15-foliolate, the axis about 12–20 cm. long, velutinous, glabrescent; leaflets with blades ovate to sub-orbicular, 1–8.5 cm. long, 1–5.5 cm. broad, obtuse to acute, the base obtuse, oblique, the upper surface minutely crisp-pubescent to sub-appressed pubescent along the midvein, otherwise glabrous, the lower surface moderately crisp-pubescent, glabrescent, sometimes glaucous, the secondary veins moderately conspicuous, the petiolules 2–4 mm. long, crisp-pubescent; bracts deltoid, about 1 mm. long; flowers 6–7 mm. long; calyx 2–3 mm. long, tomentulose; petal 6–7 mm. long and about 2 mm. wide, cucullate or expanded at anthesis; ovary pubescent along the margin and at the base, otherwise glabrous; fruit mostly glabrous, 2.5–3 cm. long and about 1.3–1.5 cm. broad, the upper margin concave or convex with a wing 1–1.5 mm. wide, sometimes pubescent at the base of the stigma, the stipe puberulous to sub-glabrous, about 6 mm. long; seed about 6 mm. long, 4 mm. broad, and 1.5 mm. thick, the hilum about 1 mm. long and 0.9 mm. wide.

TYPE: *Rose*, *Standley*, and *Russell* 14474, dry hill, vicinity of Acaponeta, Tepic, Nayarit, Mexico (F). Isotypes at A, GH, NY fragment, US.

DISTRIBUTION: Known from Nayarit and western Jalisco, Mexico, at elevations of 30–450 meters.

ADDITIONAL COLLECTIONS:

MEXICO: NAYARIT: 1 km. north of El Cuatante, Valle de Banderas, *Rzedowski* 17870 (INCB). JALISCO: Soyatán, 30 km. south of Talpa, *Rzedowski* 15173 (INCB, US). Sta. Lucía, 7 km. north of Llano Grande, *McVaugh* (*Feddema*) 21275A (MICH).

LOCAL NAME: Jediondillo (Jalisco).

5. *Ateleia pterocarpa* Moc. & Sessé ex D. Dietr. Syn. Pl. 4: 1219. 1847. PLATE 3
Ateleia pterocarpa [Sessé & Moc. ex] DC. Prodr. 2: 419. 1825; *Mém. Lég.* 394. 1826, nomen in synonym.

Pterocarpus ateleia DC. Prodr. 2: 419. 1825; *Mém. Lég.* 394. 1826.

Tree or shrub, to about 7 m. tall; leaves 7–18-foliolate, the axis tomentulose, to about 15 cm. long; leaflets with blades ovate to elliptic, 2–8.7 cm. long, 1–5 cm. broad, obtuse to acute, sometimes retuse, the base rounded or acute, oblique, the upper surface puberulent

along the midvein, otherwise glabrous, the lower surface moderately tomentose, glabrescent, the secondary veins moderately conspicuous, the petiolules 2–3 mm. long, tomentulose; bracts deltoid, 1 mm. long; flowers 4–5 mm. long; calyx tomentulose, about 1.5–2 mm. long; petal 4–5 mm. long and 1.5–2 mm. wide, glabrous; ovary glabrous except for some pubescence on the stipe; fruit glabrous, 2–2.3 cm. long, 1–1.2 cm. broad, the wing 1–1.5 mm. wide, the stipe 4–7 mm. long, sometimes pubescent toward the base; seed about 5 mm. long, 3 mm. wide, and about 2 mm. thick.

TYPE: Plate 288, a painting from the unpublished "Flora Mexicana" of Sessé & Mocino, in the DeCandolle Library (G-DC; F. M. Neg. 30639 ex G-DC). [Lectotype by A. DeCandolle, "Calques des dessins de la Flore du Mexique de Mociño et Sessé qui ont servi des types d'espèces dans le systema ou le prodromus" 2: 288. 1874]. "Habitat in agris Cordovae et in Praedio S. Josephi" (Sessé & Mociño, Fl. Mex. ed. 2, 164. 1894 as *Amorpha*).

DISTRIBUTION: Southern Mexico, in savanna, at elevations of about 200 to 1,000 meters.

ADDITIONAL COLLECTIONS:

MEXICO: Without exact locality, presumably Veracruz, "in agris Cordovae" or "in Praedio S. Josephi," Sessé & Mociño 2017 (F, MA in part). VERACRUZ: Acatlán, Salazar s.n. (US). "Vallée de Cordova," Bourgeau 1899 (BM, K). Chihuilapan, south of Laguna de Catemaco, Los Tuxtlas, Sousa 2376 (MEXU, US). OAXACA: Chivela, Mell 15 (NY, US fragment). Temascal, Sousa 1319 (MEXU). Near Presa Alemán, Temascal, González-Quintero 533 (ENCB, US). CHIAPAS. Siltepec, Matuda 1588 (A, K, MEXU, MICH, NY, US). Amatenango del Valle, Matuda 5833 (LL, MEXU, US), 15833 (F). Pishtimbak, north of Tuxtla Gutierrez, Miranda 6029 (MEXU, US). Rancho Lindavista, 24 km. east of Villa Flores, Miranda 5993 (MEXU, US), 6435 (MEXU, US). San Quintín, Sohns 1639 (MICH, US). Habenal, Tenejapa, Breedlove 6487 (DS, US), 7644 (DS, ENCB, US).

LOCAL NAME: Huapinole (Veracruz).

Among Mexican *Ateleia* this species has the smallest fruit, with the shortest stipes. The pubescent leaflets have counterparts only in *A. tomentosa*.

According to Dr. Rogers McVaugh, who has been making a special study of Sessé and Mociño, the locality "in Praedio S. Josephi" is at or near Tospa, in the vicinity of Orizaba and Córdoba, Veracruz, Mexico.

The specimens of Sessé and Mociño 2017 cited above were annotated originally as *Amorpha fruticosa* and, presumably, are the basis for the description of *Amorpha* in their Flora Mexicana. At Paris there is a specimen of *Ateleia* with what appears to be an authentic Sessé and Mociño label, "Amorpha fruticosa NE" [Nueva España], but which is a specimen of *A. gummifera* with obovate or obovate-elliptic

leaflets closely resembling those in the illustration of *Swartzia multijuga* A. Rich., from Cuba. The sheet at Madrid bears a branch of *A. pterocarpa* with ovate leaflets and, in addition, one leaf of *A. gummifera*, with obovate-elliptic leaflets. Because a mixture of material is involved the correct interpretation of the species could be questioned. However, the painting, which is the type, clearly shows ovate leaflets that permit selection of one element of the Sessé and Mociño collection 2017 rather than the other.

6. *Ateleia tomentosa* Rudd, sp. nov.

PLATE 4

Ateleia pterocarpa affinis sed fructibus tomentosis notabilis.

Tree, about 12 m. tall; leaves 9–11-foliolate, the axis tomentose, about 8–12 cm. long; leaflets with blades ovate, 1–6 cm. long and 0.8–3 cm. broad, acute or subacute, the base rounded, usually oblique, the upper surface moderately pubescent, glabrescent, the lower surface tomentose, the secondary venation moderately conspicuous, the petiolules 2–3 mm. long, tomentulose; bracts deltoid, about 1 mm. long; flowers about 6 mm. long; calyx tomentulose, about 2.5 mm. long; petal glabrous, about 6 mm. long and 4–5 mm. long, somewhat expanded at anthesis; ovary pallid-villous; fruit [submature] tomentose, 2.5–2.8 cm. long and 1.2–1.3 cm. broad, including stipe about 8 mm. long, the upper margin straight or concave, the wing about 1 mm. wide; mature fruit and seed not seen.

TYPE: In the U.S. National Herbarium, no. 2466330, collected on a "wooded slope 3 miles southwest of Pinola Las Rosas along road to Soyatitán, Municipio of Venustiano Carranza, elevation 4200 feet, Chiapas, Mexico, 27 July 1965," by Dennis E. Breedlove (no. 11395). Isotype at DS.

DISTRIBUTION: Known only from the type collection.

In a genus with predominantly glabrous fruit a species with such densely pubescent pods as *A. tomentosa* is outstanding. Known thus far only from the type collection, it appears to be another of the several locally endemic species of *Ateleia*.

7. *Ateleia albolutescens* Mohlenbrock, Webbia 17: 182, figs. 4, 18. 1962.

Tree or shrub, to about 6 m. high; leaves 5–9-foliolate, the axis puberulent, about 6–10 cm. long; leaflets with blades predominantly ovate, sometimes rhombic to suborbicular, 3–7.5 cm. long, 2–5 cm. broad, obtuse to acute, sometimes retuse, the base cuneate, the upper surface puberulent along the midvein, glabrescent, sometimes nitid, the lower surface puberulent with whitish, subappressed hairs glabrescent, the secondary veins relatively inconspicuous, the petiolules 2–3 mm. long, puberulent; bracts deltoid, about 6 mm. long; flowers about 6 mm. long; calyx tomentulose, 1.5–2 mm. long; petal about 6 mm. long and 2–3 mm. wide; ovary glabrous or ciliate, glabrescent,

the stipe usually pubescent; fruit glabrous, 2–2.5 cm. long and 1–1.5 cm. broad, the upper margin convex or almost straight with a wing 1–2 mm. wide, the stipe puberulent, glabrescent, about 5–6 mm. long; seed 4.5–5 mm. long and 3–3.5 mm. wide (fide Mohlenbrock).

TYPE: *Purpus* 9248, September 1923, Hacienda Monserrate [south-east of Cintalapa], "Sierra Madre, Rocky Mt. slopes. Rare," Chiapas, Mexico (GH). Isotypes at F, NY, UC, US.

DISTRIBUTION: Known only from the general area of the type collection, in rocky ravines.

ADDITIONAL COLLECTIONS:

MEXICO: CHIAPAS: Hacienda Monserrate, *Purpus* 10291 (US), 10544 (A, F, NY) 10549 [or 10544 ?] (GH, UC), 10577 [or 10544 ?] (A). "Tuxtla Gutierrez-Jalisco" [Arriaga], *Purpus* 9248 (US).

This is another species known only from a limited area. In its general aspect it suggests relationships both with the Mexican *A. pterocarpa* and the Antillean *A. gummifera*.

The various sheets of *Purpus* 9248 apparently do not represent a "pure" collection, i.e., material from at least two different plants are included, sometimes one, sometimes the other. The holotype at GH appears to be a mixed sheet, as is one sheet at US bearing a different locality citation.

8. *Ateleia gummifera* (DC.) D. Dietr. Syn. Pl. 4: 1219. 1847. PLATES 7, 8, 9

Pterocarpus gummifer Bert. ex DC. Prodr. 2: 419. 1825; Mém. Lég. 395, pl. 57, f. 1. 1826.

Dalbergia gummifera Spreng. ex DC. Mém. Lég. 395. 1826, nomen in synonym.

Swartzia multijuga A. Rich. Essai Flor. Cuba 457. 1846; in Sagra, Hist. Fis., Pol., y Nat. Cuba 10: 201. 1846; 12: tab. 42. 1846, non Vog. 1837.

Ateleia cubensis Griseb. Mem. Am. Acad. N.S. 8: 180. 1860.

Ateleia multijuga (A. Rich.) A. S. Hitch. Rep. Mo. Bot. Gard. 4: 80. 1893.

Ateleia tumida Mohlenbrock, Webbia 17: 166, figs. 3, 10. 1962.

Ateleia gummifera var. *cubensis* (Griseb.) Mohlenbrock, Webbia 17: 172. 1962.

Ateleia parvifolia Mohlenbrock, Webbia 17: 174. 1962.

Shrub or small tree, to about 7 m. tall; leaves 5–13-foliolate, the axis puberulent, glabrescent, about 5–10 cm. long; leaflets with blades elliptic, rhombic, oblong, obovate, or ovate, 1–8 cm. long, 0.5–3.5 cm. broad, obtuse to subacute, sometimes retuse, the base cuneate to obtuse, the surfaces usually glabrous at maturity, sometimes pubescent, especially along the midvein, the hairs appressed or crispate, the secondary veins usually inconspicuous, the petiolules 2 mm. long or less, puberulent, glabrescent; bracts deltoid, commonly 1 mm. long; bracteoles apparently lacking; flowers 5–6 mm. long; calyx tomentulose, sometimes glabrescent, 2–3 mm. long; petal 5–6 mm. long, 2–4 mm. wide, cucullate, sometimes expanded at anthesis; ovary puberulent along margin and at the base, otherwise glabrous; fruit glabrous, 2–3.5 cm. long and 1–1.5 cm. broad, the upper margin with a wing

1–2 mm. wide, the stipe 0.5–1.3 cm. long, puberulent or glabrous; seed 5–7 mm. long, 3–3.5 mm. broad, and about 2 mm. thick, the hilum 1 mm. in diameter.

TYPE: *Bertero* s.n., "S. Doming.," Dominican Republic (G-DC; F. M. Neg. 33439 ex G-DC).

DISTRIBUTION: Mexico, northern Central America, and the West Indies, at elevations from about sea level to 1,000 meters.

ADDITIONAL COLLECTIONS:

MEXICO: CAMPECHE: Tuxpeña, *Lundell* 849 (A, DS, GH, K, MICH, NY, UC, US), 862 (DS, GH, MICH, NY, UC, US).

GUATEMALA: PETÉN: Tikal National Park, *Contreras* 555 (F, IJ).

BRITISH HONDURAS: COROZAL: Freshwater Creek Reserve, *Castillo* 32 (F). ORANGE WALK: Honey Camp, *Lundell* 680 (A, DS, F, GH, K, NY, UC, US). BELIZE: Near Manatee Lagoon, *Peck* 237 (GH). STANN CREEK: All Pines, *Schipp* 705 (A, BM, F, G, GH, K, MICH, NY, UC, US fragment).

BAHAMAS: ANDROS I.: *Brace* 5238 (F, NY), 6964 (F), 6985 (F, NY); *Small & Carter* 8714 (F, K, NY, US), 8784 (F, GH, K, NY, US). CAT I.: *Britton & Millspaugh* 5769 (F, NY). ELEUTHERA I.: *E. Britton* 6461 (F, NY); *Britton & Millspaugh* 5407 (F, NY). GREAT EXUMA I.: *Britton & Millspaugh* 2932 (F, NY). NEW PROVIDENCE I.: *Brace* 81 (F), 82 (NY), 536 (F); *Britton & Brace* (F, NY); *Curtiss* 37 (A, E, F, G, GH, K, L, MICH, NY, US); *Fisher* 1884 (L). NORTH CAICOS I.: *Wilson* 7722 (F, GH, K, NY); *Proctor* 9017 (IJ).

CUBA: Without exact locality: "Littoral," *Linden* 2044 (BM, BR, G, K). PINAR DEL RÍO: Guane, *Shafer* 10517 (NY, US). Cajálbana, *Alain* 2361 (GH, US). Las Pozas, *Alain* 2580 (GH, IJ). Viñales, *Alain* 2906 (GH, IJ). Pan de Azúcar, *Morton* 9891 (US).

HABANA: Isla de Pinos, *Britton, Britton, & Wilson* 15095 (NY, US); *Ekman* 12006 (NY). Cojimar, *Baker & Donovan* 4420 (NY); *van Hermann* 4420 [= *Baker & Donovan* 4420 ?] (POM); *Killip* 13811 (US); *León & Alain* 20437 (GH, IJ, US), 20438 (GH). "El Morro to Cojimar," *Wilson* 9137 (NY). "Rio Almendares to Playa de Marianao," *Wilson* 9492 (NY). "Thickets east of Playa de Marianao," *León & Hioram* 5695 (GH, IJ, NY). Managua, Mariano Beach, *León* 8467 (GH, IJ, NY). Coastal thickets west of Chorrera, *León* 4122 (GH, IJ, NY). Madruga, *Britton, Britton, & Shafer* 633 (F, NY). LAS VILLAS [formerly Santa Clara]: Cienfuegos, *Jack* 7564 (A, US), 8431 (NY, US); *Atchison* 274 (US). Pasa Caballo, *Wood & Atchison* 7447 (IJ). CAMAGÜEY: "La Gloria to Pilota," *Shafer* 569 (BM, F, GH, NY, US). Cayo Guajaba, *Shafer* 678 (F, NY, US). Cayo Ballenato Grande, *Shafer* 1032 (GH, NY, US). Cayo Romano, Pueblo Romano, *Shafer* 2441 (F, NY, US), 2472 (F, NY, US). Cayo Romano, Salina de la Principal, *Shafer* 2622 (F, GH, NY, US). Cayo Paloma, *Shafer* 2556 (F, GH, NY, US), 2596 (BM, F, GH, NY, US).

ORIENTE: Without exact locality [cited by Grisebach as "Nouvelle Sophie"], *Wright* 144 (GOET, MICH, UC, US); "Potrero San Andre, Farallones," *Wright* 144 (GH). "At edge of the Farallones," *Wright* 144 (GH). Holguin, *Shafer* 1223 (GH, NY, US); *Ekman* 3239 (A). "Sabana to Maisi," *Shafer* 7905 (K, NY, US). Santiago Bay, El Morro, *Britton & Cowell* 12565 (NY, US). Mir, *Ekman* 4857 (US), 7532 (US type of *A. parvifolia*). Cupey, *Ekman* 6290 (A). Reuter ["S. Juan de B^{na}. Vista"], *León* 3735 (NY). Santiago de Cuba, *Clemente* 2044 (GH, IJ, US), 3043 (GH), 4841 (GH), 5121 (GH, IJ), 6272 (GH, IJ), 7029 (GH); *López* 216 (US), 887 (IJ, US). Montecristo, *Alain & Morton* 5227 (GH);

Morton & Alain 9198 (US). North slope of Sierra Nipe, *Morton & Acuña* 2998 (US). Monte Picote, southern end of Sierra Nipe, *Morton* 9752 (US). Finca Confianza, near Guantánamo, *Hioram* 1970 (NY, US fragment).

HAITI: NORD: Between La Branle and Chaine de Belance [as "La Brande to Mt. Balance"], *Nash & Taylor* 1658 (NY, US). OUEST: "Massif de la Selle, Port-au-Prince, Monfleury," *Ekman* H. 9178 (A, GH, NY, US). Pétionville, *Buch* 2065 (IJ). Between Pétionville and Kenscoff, *Buch* 1460 (IJ, US).

DOMINICAN REPUBLIC: BARAHONA: Without other locality, *Fuertes* s.n. (A type of *A. tumida*, US fragment). Rincon, *Fuertes* 1331 (A). SAN CRISTÓBAL: Cambita, *Jiménez [Marcano]* 4091 (US). SAN JUAN: Rio Arriba del Norte, *Howard & Howard* 8901 (GH, US).

LOCAL NAMES: Balsamo hediondo, cerezo (Cuba); tushche (British Honduras).

Although there is some variation in their leaflet characters, there also is considerable intergradation; I believe that the taxa listed in synonymy above are all referable to *A. gummifera*. The type of *Pterocarpus gummifer* at G-DC and the specimen of *A. cubensis* (*Wright* 144) in the Herbarium Grisebachianum at GOET are almost identical, with predominantly oblong leaflets. The latter specimen was cited by Grisebach in connection with his new name for *Swartzia multijuga* A. Rich., which he had found to be a later homonym. The illustration of *S. multijuga* shows leaflets predominantly obovate. The type of *A. parvifolia* has smaller than average leaflets, but some, equally small, can be found on other specimens. Larger than average leaflets are found on specimens from the Yucatan Peninsula. Pubescence is variable; most of the leaflets are glabrous or sparsely appressed-pubescent but some from Hispaniola, eastern Cuba, and the Yucatan Peninsula tend toward crisp-pubescence, suggesting affinities, either by origin or by introgression, with *A. pterocarpa* at the western end of the range and *A. microcarpa* at the eastern end.

The exact publication date of Richard's work has been problematic. I am following the conclusions of Dr. George Brizicky (*Journ. Arn. Arb.* 43: 86. 1962) that 1846, as cited above, is correct for the pages pertinent to this genus.

Separating *A. gummifera* and *A. cubensis* on the basis of glabrous and pubescent calyces, respectively, is not accurate. The type of *A. gummifera*, collected by Bertero sometime between 1816 and 1821 was apparently well weathered by the time of gathering and has since suffered attrition due to handling.

The specimen on which *A. tumida* is based bears abnormal twinned fruits, the tumidity in each case being the smaller of a pair of pods joined at the upper margin. The members of each pair share a common stipe but have individual stigmas.

I am grateful to Dr. Lyman B. Smith for checking and photographing the specimens of the Wright collections of *A. cubensis* at GOET.

9. *Ateleia microcarpa* (Pers.) D. Dietr. Syn. Pl. 4: 1219. 1847.

PLATE 5

Pterocarpus microcarpus Pers. Syn. Pl. 2: 277. 1807.

Ateleia revoluta Mohlenbrock, Webbia 17: 174, f. 7. 1962.

Shrub; leaves 5–11-foliolate, the axis tomentulose, about 4–9 cm. long; leaflets with blades elliptic to obovate, 0.5–5 cm. broad, obtuse, sometimes emarginate, the base obtuse, the margin revolute, the upper surface moderately crisp-pubescent, glabrescent, the lower surface tomentose, the hairs mostly ferruginous, sometimes glabrescent, the secondary venation inconspicuous, the petiolules 0.5–1.5 mm. long, crisp-pubescent; bracts deltoid, about 0.5 mm. long; flowers about 6–7 mm. long; calyx tomentulose, about 2 mm. long; petal 6–7 mm. long and 2–3 mm. wide, sometimes expanded at anthesis; ovary ciliate and the stipe puberulent, otherwise glabrous; fruit glabrous except for the puberulent stipe, 1.8–2.5 cm. long, 1–1.2 cm. wide including wing 1–2 mm. wide, the stipe about 5 mm. long; seed not seen.

TYPE: *Dupuy* s.n., "Hab. in India (Herb. Dupuis et Juss.)," apparently from the Dominican Republic (P-JU). Isotype at G-DC; F. M. Neg. 33441 ex G-DC.

DISTRIBUTION: Known only from the Dominican Republic, at elevations up to about 400 meters.

ADDITIONAL COLLECTIONS:

DOMINICAN REPUBLIC: Santiago, *Wright, Parry, & Brummel* 98 (US). "Prov. of Monte Cristy," Monción, *Valeur* 715 (F, G, K, MICH type of *A. revoluta*, NY, US).

LOCAL NAME: Azota potranca.

Comparison of specimens of *A. microcarpa*, in fruit, and *A. revoluta*, in flower, shows the two taxa to be synonymous.

In 1895, Millspaugh, apparently unaware of Dietrich's treatment of *Ateleia*, published the superfluous combination, *Ateleia microcarpa* (Pers.) Millsp. Field Mus. Bot. Ser. 1: 21. 1895, and cited one of his own collections from Yucatán, Mexico: "Scrub about Izamal, Jan. 23, 1895 (177)." I have not been able to locate that specimen, which I expected to find at F, but suspect that it might be a collection of *A. gummifera*.

Dr. Alicia Lourteig has very kindly searched for material of *Pterocarpus microcarpus* Pers. at Paris and has written that a "splendid

specimen" is in the Jussieu Herbarium with a label in Jussieu's hand: "Donné par M. Dupuy." That sheet may be considered the type.

10. *Ateleia apetala* Griseb. Cat. Pl. Cuba 80. 1866.

PLATE 6

Ateleia apetala var. *pubescens* León, Contrib. Ocas. Mus. Hist. Nat. Col.

"De La Salle" No. 9: 13. 1950.

Tree or shrub, to about 12 m. tall; leaves 5-15-foliolate, the axis 3-12 cm. long, appressed-pubescent, glabrescent; leaflets with blades lanceolate, ovate, or rhombic, 1-10 cm. long, 0.5-4 cm. broad, acute to acuminate, the base cuneate, the surfaces commonly glabrous but sometimes pubescent with appressed hairs, the tertiary veins reticulate, the petiolules 1-4 mm. long, puberulent, glabrescent; bracts deltoid, about 0.5 mm. long; flowers 4-5 mm. long; calyx tomentulose, 1.5-2 mm. long; petal 4-5 mm. long and 2 mm. wide, glabrous; ovary glabrous except the stipe sometimes strigillose; fruit glabrous, 1.5-2.5 cm. long and 1 cm. broad including the wing about 1-1.5 mm. wide the stipe 0.5-1 cm. long; seed (submature) about 5 mm. long, 3 mm. wide, and 1 mm. thick, the hilum elliptic, 1 mm. long and 0.5 mm. wide; mature seed not seen.

TYPE: *Wright* 2381, "Cuba occ., pr. Retiro" [near Santa Cruz de los Pinos, Pinar del Río, Cuba] (GOET). "Isotypes" at BM, G, GH, K, NY, P, US.

DISTRIBUTION: Limestone areas of Cuba; cultivated in southern Florida, United States.

ADDITIONAL COLLECTIONS:

UNITED STATES: FLORIDA: Dade Co.: Near Homestead, cultivated, *Ledin* s.n. (NY).

CUBA: PINAR DEL RÍO: Sierra de Anafe, Loma San Gabriel, *Ekman* 10559 (US). Sierra Anafe, *León* 8815 (GH, IJ, NY). El Mogote, Soroa, *Alain* 2774 (GH, US). Pan de Guajaibón, *Alain & Acuña* 2955 (IJ). MATANZAS: Near Matanzas, *Rugel* 785 (NY), 800 (NY). Boca de Canasí, *León* 13689 (GH, IJ). Cárdenas, *Britton & Wilson* 180 (NY). Cumbre, near Matanzas, *Britton & Wilson* 87 (NY). LAS VILLAS [formerly Santa Clara]: Soledad, Cienfuegos, *Jack* 5492 (A, DS, F, P), 5642 (A, US), 6657 (A, DS, F, K, NY, US); *Howard* 6277 (GH, NY, US). Monte del Montanez, *González* 266 (A, IJ, MICH, NY). Castillo de Jagua, Cienfuegos, *Combs* 562 (F, GH, K, NY, P, US). "Banao Mts.," *Luna* 647 (NY). South of Sancti Spiritus, *Luna* 926 (NY). ORIENTE: Renté, Santiago Bay, *Clemente* 2887 (GH, IJ); *León* 9765 (GH, NY). Imías, *León* 12219 (GH). Orilla del Barro, near Guantánamo, *Hioram* 1830 (NY).

LOCAL NAME: Azulejo (Las Villas).

Thanks to Dr. Lyman B. Smith I have photographs of the two specimens of *Ateleia apetala* in the Herbarium Grisebachianum at Goettingen. One of those, bearing mature leaves, flowers, and immature fruits, annotated as number 2381, is here designated as lectotype. The other sheet, with floral buds and immature leaves, may or may

not be a true isotype. The other so-called "isotypes" cited above are of this species but apparently from various gatherings, as is the situation under many of Wright's numbers.

The specimens from Oriente have some pubescence on the leaflets and, presumably, are referable to var. *pubescens*. Unfortunately, I have not been able to locate a specimen of *Clemente* 3069, the type collection of *A. apetala* var. *pubescens*. The holotype, deposited at LS, may have been a unicate.

11. *Ateleia salicifolia* Mohlenbrock, *Webbia* 17: 159, figs. 3, 4. 1962.

Tree or shrub, to about 3.5 m. tall; leaves 11–19-foliolate, the axis to about 12 cm. long, subsericeous, glabrescent; leaflets with blades linear, 1.5–7.5 cm. long and 0.2–1.0 cm. broad, attenuate, the base cuneate, the upper surface nitid, glabrous, the lower surface glabrous or with sparse puberulence along the midvein, the tertiary venation reticulate, the secondary veins few, almost parallel with the midvein, the petiolules 1–2 mm. long, puberulent, glabrescent; flowers and fruit not known.

TYPE: *Jack* 6886, "On rocky ridge, Las Lagunas, Buenos Aires, about 2500 ft. alt.," Las Villas, Cuba (A). Isotype at NY.

DISTRIBUTION: Known only from the general area of the type collection, in dry forest on rocky slopes.

ADDITIONAL COLLECTIONS:

CUBA: LAS VILLAS: "Barren, rocky hillside, Rio San Juan," *Britton, Earle, & Wilson* 5884 (NY). "Rocky hillslope, ¼ mile west of Río San Juan crossing," *Howard et al.* 376 (A). Las Vegas de Mataguá, Buenos Aires, *Jack* 7914 (NY). "Dry thickets on road to Tope de Collantes, Trinidad Mts.," *Alain* 6672 (NY).

This species, known only from sterile collections, suggests a narrow-leaved variant of *A. apetala*. Its chief distinction, other than leaflet shape, is in the steeply angled secondary veins.

12. *Ateleia ovata* Mohlenbrock, *Webbia* 17: 176, fig. 1, 14. 1962.

Tree, to about 25 m. tall; leaves 9–23-foliolate, the axis about 18 cm. long, tomentulose; leaflets with blades ovate-elliptic, 1–7 cm. and 1–3 cm. broad, acute or subacute, the base oblique, rounded to subcordate, the surface nitid, glabrous except for some puberulence along the midvein, the lower surface moderately pubescent with minute spreading or subcrispate hairs, usually glabrescent, the petiolules 2–3 mm. long, tomentulose; bracts deltoid, about 1 mm. long; flowers about 6 mm. long; calyx tomentulose, 2–2.5 mm. long; petal about 6 mm. long and 2 mm. wide, glabrous, cucullate; ovary ciliate along the lower margin and at the base, otherwise glabrous; fruit glabrous, about 2–2.5 cm. long and 1–1.4 cm. wide including wing about 1 mm. wide, the stipe about 5–7 mm. long; seed not seen.

TYPE: *Krukoff* 2060, Brazil, "On 'carrasco' rocky land. At Santarem, Goiás, along the upper Rio Tocantins," Apr. 18, 1933. (US). Isotypes at A, K, and US.

DISTRIBUTION: Known from Maranhão, Ceará, and Goiás, Brazil, in dry woods.

ADDITIONAL COLLECTIONS:

Brazil: MARANHÃO: "Ilha dos Botes, a duas léguas abaixo de Carolina, Rio Tocantins," *Pires & Black* 2016 (NY). CEARÁ: "Mata da Serrinha," *Guedes* 373 (NY). GOIÁS: "Right bank of Rio Tocantins between San Pedro de Alcântan and Carolina," *Burchell* 9865 (GH, K).

LOCAL NAME: Amarelão (Ceará).

This species exhibits some instability of stamen number. Flowers on the holotype, at US, have 7 stamens each; those on *Guedes* 373 have 11 stamens. This higher number is suspect and warrants further investigation. Perhaps there has been bifurcation of one stamen in each flower. If all 11 stamens are normal, however, possible inclusion of *Ateleia* in the Caesalpinioideae is indicated.

In general appearance *A. ovata* is very similar to *A. pterocarpa* from Mexico. Without knowing the country of origin it would be difficult to identify some of the specimens.

13. *Ateleia venezuelensis* Mohlenbrock, *Webbia* 17: 178, fig. 1. 1962.

Tree or shrub; leaves 13–17-foliolate, the axis tomentulose, about 12–17 cm. long; leaflets with blades elliptic-oblong, 2–7 cm. long, 1–3 cm. broad, obtuse to subacute, the base oblique, acute to rounded, the upper surface essentially glabrous but with some puberulence along the midvein, the lower surface moderately pubescent with lax or crispate hairs, glabrescent, the secondary veins moderately conspicuous, the petiolules 1.5–2 mm. long, tomentulose; bracts deltoid, about 1 mm. long; flowers 6–7 mm. long; calyx tomentulose, glabrescent, 1.5–2.5 mm. long; petal 6–7 mm. long, about 3 mm. broad, glabrous; ovary sparsely puberulent along lower margin and at base, otherwise glabrous; fruit (immature) ciliate along the lower margin, about 1.3 cm. long and 0.4 cm. wide, the wing about 1 mm. wide, the stipe puberulent, about 0.6 cm. long; mature fruit and seed not seen.

TYPE: *F. D. Smith* 260, "Cantaura, edge Seelinger's house," Anzoategui, Venezuela (US). Isotype at NY.

DISTRIBUTION: Known only from the type collection.

This species is generally similar to *A. ovata*. I have not been able to ascertain if the specimens cited were native or cultivated. If native, it is surprising that there are no other collections from the area.

14. *Ateleia herbert-smithii* Pittier, *Contr. U.S. Nat. Herb.* 20: 112, fig. 51. 1918.

Tree, to about 18 m. tall; leaves 7–13-foliolate, the axis puberulous, glabrescent, to about 24 cm. long; leaflets with blades ovate, 3–9.5 cm.

long and 2–4.5 cm. broad, attenuate-acuminate, the apex obtuse, the base subcordate or truncate, the upper surface essentially glabrous at maturity, the lower surface minutely pubescent with subappressed hairs, glabrescent, the secondary veins moderately conspicuous, the petiolules 4–8 mm. long, puberulent or subglabrous; bracts deltoid, 1 mm. long or less; flowers 7–8 mm. long; calyx puberulous or subglabrous, 2–3 mm. long; petal 7–8 mm. long and about 5 mm. broad, glabrous, sometimes expanded at anthesis; ovary tomentulose; fruit (immature) 1.5 cm. long and 0.6 cm. wide, the stipe 0.5 cm. long; mature fruit and seed not seen.

TYPE: *H. H. Smith* 817, Colombia, Magdalena, "5 mi. S. of Mamatoco" (US). Isotypes at A, BM, F, G, GH, K, L, MICH, US.

DISTRIBUTION: Known only from the type collection and, according to the collector's notes, "also found in fl. 3 mi. n. of Bonda."

This distinctive species has never been recollected. Two Colombian botanists, Dr. Armando Dugand and Dr. R. Romero-Castañeda, have unsuccessfully searched for living specimens. It well may be another rare endemic that has succumbed to human activity.

15. *Ateleia glazioveana* Baill. Bull. Soc. Linn. Paris 1: 306. 1882.

Shrub or small tree; leaves 20–31-foliolate, the axis about 15–40 cm. long, tomentulose, glabrescent; leaflets with blades ovate to lanceolate, 3–7 cm. long, 1–2.5 cm. broad, acute to attenuate, the base oblique, acute or one side somewhat rounded, the upper surface appressed-pubescent when young, glabrescent, the lower surface moderately pubescent with minute, appressed hairs, glabrescent, the tertiary venation reticulate, the petiolules 1–3 mm. long, tomentulose; flowers 5–6 mm. long; calyx 2–3.5 mm. long, moderately sericeous; petal 5–6 mm. long and about 4 mm. wide, cucullate; fruit glabrous, 3–3.5 cm. long including stipe about 0.7–1 cm. long, 1.4–1.8 cm. wide including wing about 1.5–2 cm. long and 2 mm. wide; seed black, compressed, 4–4.5 mm. long and 2.5–3 mm. wide.

TYPE: *Glaziou* 12565, Nova Friburgo, Rio de Janeiro, Brazil (P). Isotypes at A, F, K, NY, UC; F. M. Neg. 1889 ex B.

DISTRIBUTION: In dry woods of southern Brazil, Paraguay, and in northeastern Argentina.

ADDITIONAL COLLECTION:

PARAGUAY: Sierra de Maracayú, in altoplanitie Yeruti, *Hassler* 5755 (A, NY).

LOCAL NAMES: Timbó blanco, timbó raposa, timbó del campo (Argentina, fide Burkart).

Burkart (*Las Leguminosas Argentinas*, ed. 2, 206. 1952) mentions that *A. glazioveana* is found in Argentina, in Misiones, and the plants are said to be insecticidal and poisonous to cattle.

This species is readily distinguished from the others by its numerous, acuminate leaflets and relatively large pods.

Index Kewensis cites 1881 as the date of the original publication of this species but 1882 apparently is correct. Baillon presented the description of "*Un Ateleia brésilien*" at the "seance du 4 Janvier 1882" of the Société Linnéenne de Paris.

16. *Ateleia guaraya* Herzog, Fedde Repert. Sp. Nov. 7: 55. 1909.

Small tree; leaves 9–15-foliolate, the axis about 15–22 cm. long, tomentulose, glabrescent; leaflets with blades ovate or elliptic, about 4–7 cm. long, 2–3 cm. broad, acute or subacute, the base mostly asymmetrical, acute or one side rounded, the terminal leaflet essentially rhombic with cuneate base, the upper surface glabrous at maturity except for some fine pubescence along the midvein, the lower surface subsericeous with minute, appressed hairs, the tertiary venation reticulate, the petiolules 2–3 mm. long, tomentulose; complete flowers not seen but probably about 5 mm. long (on basis of persistent filaments about 5 mm. long); calyx 2 mm. long, sericeous; fruit glabrous except for puberulent stipe, 3–3.5 cm. long and 1.5 cm. wide including wing about 1 mm. wide and stipe 1 cm. long; seed not seen.

TYPE: Herzog 303, "in den Cusi-palmenwaldern der Misiones de Guarayos (Prov. Velasco) bei Urubicha," Bolivia (Z).

DISTRIBUTION: Known only from the type.

This species seems to be intermediate between *A. glazioveana* and *A. ovata*; the pubescence and fruit most resemble the former, the leaflet shape and number, the latter.

In his original description Herzog referred to the hairs on the lower surface of the leaflets as "pilis minimis inaequaliter bicuribus." On close examination, however, I find them not to be "2-legged" but attached at one end and so closely appressed in many cases as to be bent downward at the middle, appearing to be malpighiaceous in structure. The pellucid punctae mentioned by Herzog and stressed by Mohlenbrock are similar to those in other species of *Ateleia* and are not particularly transparent.

I am indebted to Prof. Dr. F. Markgraf, Director of the Botanischer Garten und Institut für Systematische Botanik der Universität Zürich, for lending me the type of *A. guaraya*.

Excluded Species

Ateleia peltaria D. Dietr. Syn. Pl. 4: 1219. 1847 = *Wiborgia fusca* Thunberg, as *Viborgia*, fide Harvey and Sonder, Flora Capensis 2: 91. 1862.

New Species

Ateleia tomentosa Rudd.

Collections of *Ateleia* and *Cyathostegia* cited

- ALAIN, BRO. (E. E. LIOGIER), ET AL. 180. *A. apetala*
 2361. *A. gummifera*
 2580. *A. gummifera*
 2774. *A. apetala*
 2906. *A. gummifera*
 2955. *A. apetala*
 5227. *A. gummifera*
 6672. *A. salicifolia*
- ARSÉNE, BRO. G. (A. G. J. BROUARD)
2790. *A. arsenii*
 6655. *A. arsenii*
- ATCHISON, E.
274. *A. gummifera*
- BAKER, C. F. AND DONOVAN
4420. *A. gummifera*
- BERTERO, C. G.
- s.n. *A. gummifera*
- BOURGEAU, E.
1899. *A. pterocarpa*
- BRACE, L. J. K.
81. *A. gummifera*
 82. *A. gummifera*
 536. *A. gummifera*
 5238. *A. gummifera*
 6964. *A. gummifera*
 6985. *A. gummifera*
- BREEDLOVE, D. E.
6487. *A. pterocarpa*
 7644. *A. pterocarpa*
 11395. *A. tomentosa*
- BRITTON, E.
6461. *A. gummifera*
- BRITTON, N. L., ET AL.
87. *A. apetala*
- BUCH, W.
1460. *A. gummifera*
 2065. *A. gummifera*
- BURCHELL, W. J.
9865. *A. ovata*
- CASTILLO, A.
32. *A. gummifera*
- CLEMENTE, BRO. (A. C. TÉTEAU)
2044. *A. gummifera*
 2887. *A. apetala*
 3043. *A. gummifera*
 3069. *A. apetala* var. *pubescens*
 4841. *A. gummifera*
 5121. *A. gummifera*
 6272. *A. gummifera*
 7029. *A. gummifera*
- COMBS, R.
562. *A. apetala*
- CONTRERAS, E.
555. *A. gummifera*
- CURTISS, A. H.
37. *A. gummifera*
- DUPUY
- s.n. *A. microcarpa*
- EKMAN, E. L.
3239. *A. gummifera*
 4857. *A. gummifera*
 6290. *A. gummifera*

- EKMAN, E. L.—Continued
 7532. *A. gummifera*
 9178. *A. gummifera*
 10559. *A. apetala*
 12006. *A. gummifera*
 ESPINOSA B., M. R.
 854. *C. matthewsii*
 FEDDEMA, C. (see McVAUGH)
 FERREYRA, R.
 8911a. *C. matthewsii*
 15648. *C. matthewsii*
 FERRIS, R. S.
 5573. *A. insularis*
 5742. *A. insularis*
 FISHER, G. L.
 1884. *A. gummifera*
 FOSBERG, F. R., and GILER, M. A.
 22904. *C. matthewsii*
 FUERTES, PADRE M.
 1331. *A. gummifera*
 s.n. *A. gummifera*
 GLAZIOU, A.
 12565. *A. glazioveana*
 GONZÁLES, A.
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 GONZÁLEZ QUINTERO, L.
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 373. *A. ovata*
 HASSLER, E.
 5755. *A. glazioveana*
 HERZOG, T. K. J.
 303. *A. guaraya*
 HINTON, G. B.
 407. *A. arsenii*
 3421. *A. arsenii*
 3526. *A. arsenii*
 4240. *A. arsenii*
 5286. *A. arsenii*
 6093. *A. arsenii*
 6158. *A. arsenii*
 7621. *A. arsenii*
- HIORAM, BRO. (J. F. LAGORCE)
 1830. *A. apetala*
 1970. *A. gummifera*
 HIRSCH, P.
 s.n. *C. matthewsii*
 HITCHCOCK, A. S.
 21333. *C. matthewsii*
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 6277. *A. apetala*
 8901. *A. gummifera*
 HOWELL, J. T.
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 JACK, J. G.
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 5642. *A. apetala*
 6657. *A. apetala*
 6886. *A. salicifolia*
 7564. *A. gummifera*
 7914. *A. salicifolia*
 8431. *A. gummifera*
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 4091. *A. gummifera*
 KILLIP, E. P.
 13811. *A. gummifera*
 KRUKOFF, B. A.
 2060. *A. ovata*
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 LEÓN, BRO. (J. S. SAUGET), ET AL.
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 4122. *A. gummifera*
 5695. *A. gummifera*
 8467. *A. gummifera*
 8815. *A. apetala*
 9765. *A. apetala*
 12219. *A. apetala*
 13689. *A. apetala*
 20437. *A. gummifera*
 20438. *A. gummifera*
 LINDEN, J. J.
 2044. *A. gummifera*

- LÓPEZ F., M.
 216. *A. gummifera*
 887. *A. gummifera*
- LUNA, A.
 647. *A. apetala*
 926. *A. apetala*
- LUNDELL, C. L.
 680. *A. gummifera*
 849. *A. gummifera*
 862. *A. gummifera*
- MALTBY, F. G.
 73. *A. insularis*
- MARCANO, E. (see JIMÉNEZ)
 MASON, H. L.
 1843. *A. insularis*
- MATTHEWS, A.
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- MATUDA, E.
 1588. *A. pterocarpa*
 5833. *A. pterocarpa*
 15833. *A. pterocarpa*
 37472. *A. arsenii*
- McVAUGH, R. (BY C. FEDDEMA)
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- MELL, C. D.
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- MIRANDA, F.
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- MORTON, C. V., ET AL.
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 9198. *A. gummifera*
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 9891. *A. gummifera*
- NASH, G. V., and TAYLOR, N.
 1658. *A. gummifera*
- NELSON, E. W.
 4186. *A. insularis*
- PEARCE, R.
 s.n. *C. matthewsii*
- PECK, M. E.
 237. *A. gummifera*
- PIRES, J. M., and BLACK, G. A.
 2016. *A. ovata*
- PROCTOR, G. R.
 9017. *A. gummifera*
- PURPUS, C. A.
 9248. *A. albolutescens*
 10291. *A. albolutescens*
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- SALAZAR, F.
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 s.n. *A. truncata*
- SCHIPP, W. A.
 705. *A. gummifera*
- SESSÉ, M., and MOCIÑO, J. M.
 2017. *A. pterocarpa*
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- SHAFER, J. A.
 569. *A. gummifera*
 678. *A. gummifera*
 1032. *A. gummifera*
 1223. *A. gummifera*
 2441. *A. gummifera*
 2472. *A. gummifera*
 2556. *A. gummifera*
 2596. *A. gummifera*
 2622. *A. gummifera*
 7905. *A. gummifera*
 10517. *A. gummifera*

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 144. <i>A. gummifera</i>
 2381. <i>A. apetala</i></p> |
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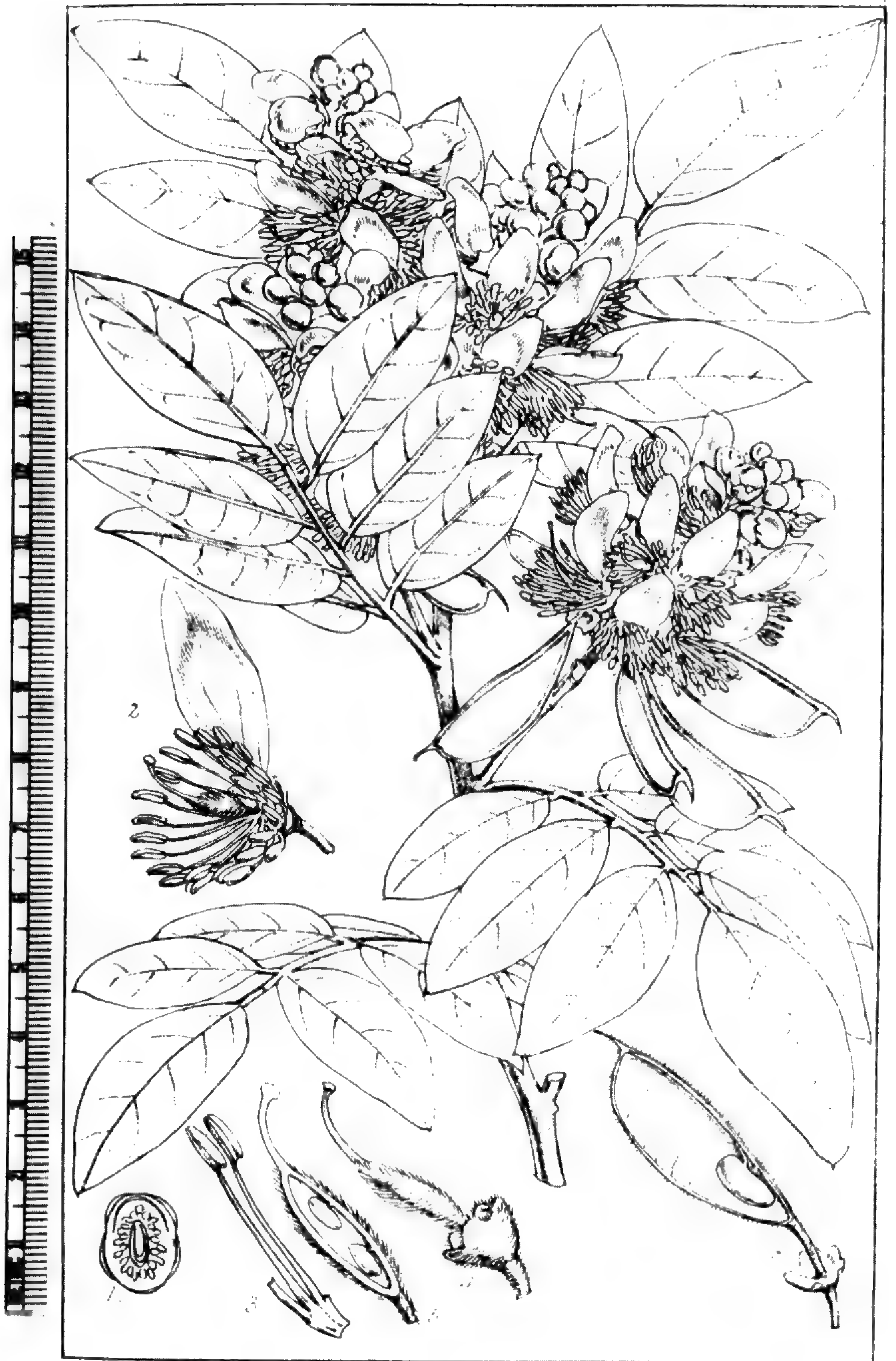
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Plates

17. 11. 1904



W H Fitch, del et lith

J N Fitch sculp

Swartzia matthewsii Benth.

Illustration of *Swartzia matthewsii* Benth. (*Cyathostegia matthewsii* (Benth.) Schery) from the original publication of the species.



Prof. Dr. A. WEBERBAUER, Flora von Peru.

26. SEPT. (BEGINN)

11

Type of *Swartzia weberbaueri* Harms (= *Cyathostegia weberbaueri* (Harms) Schery); F. M. Neg. 1866 ex B.



Type of *Ateleia pterocarpa* Moc. & Sessé ex D. Dietr.; F. M. Neg. 30639 ex G-DC.



2466330

PLANTS OF CHIAPAS, MEXICO TYPE

Ateleia tomentosa Rudd

Tree 40 feet tall.
Wooded slope 3 miles southwest of Finca Las
Rosas along road to Soyutitán. Municipio of
Venustiano Carranza.

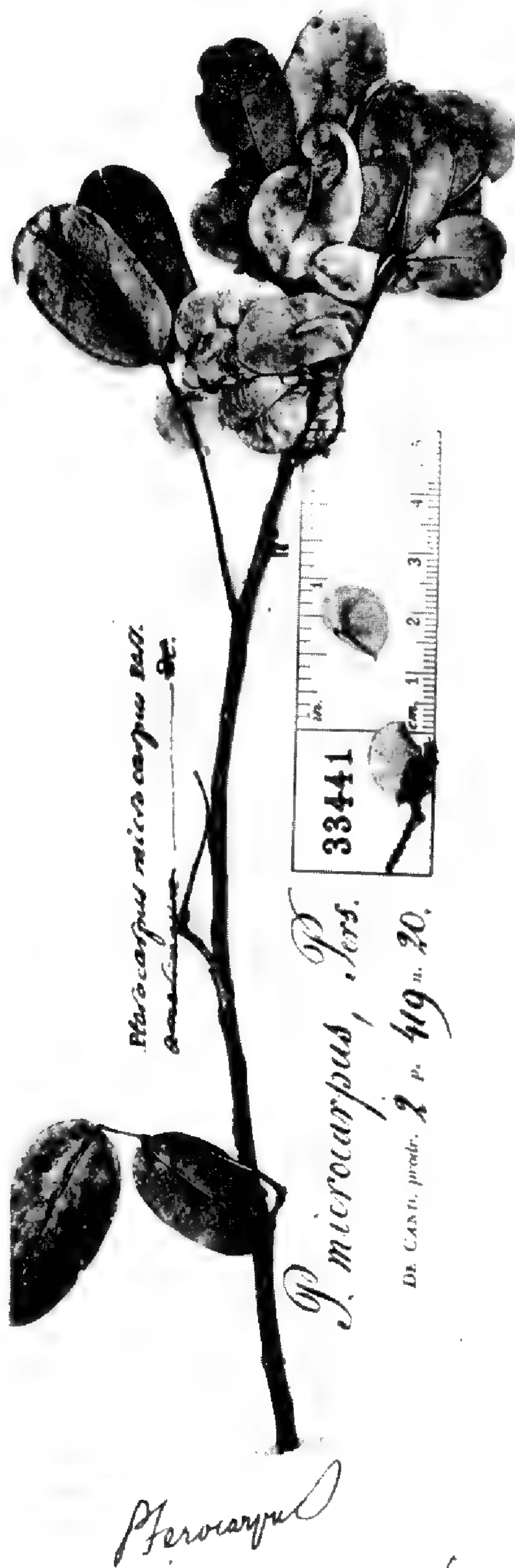
Elevation 4200 feet.

D. E. Breedlove 11395

27 July 1965



Type of *Ateleia tomentosa* Rudd; insert: fruit, approximately natural size.



Isotype of *Pterocarpus microcarpus* Pers. (= *Ateleia microcarpa* (Pers.) D. Dietr.); F. M. Neg. 33441 ex G-DC.



Ateleia apetala

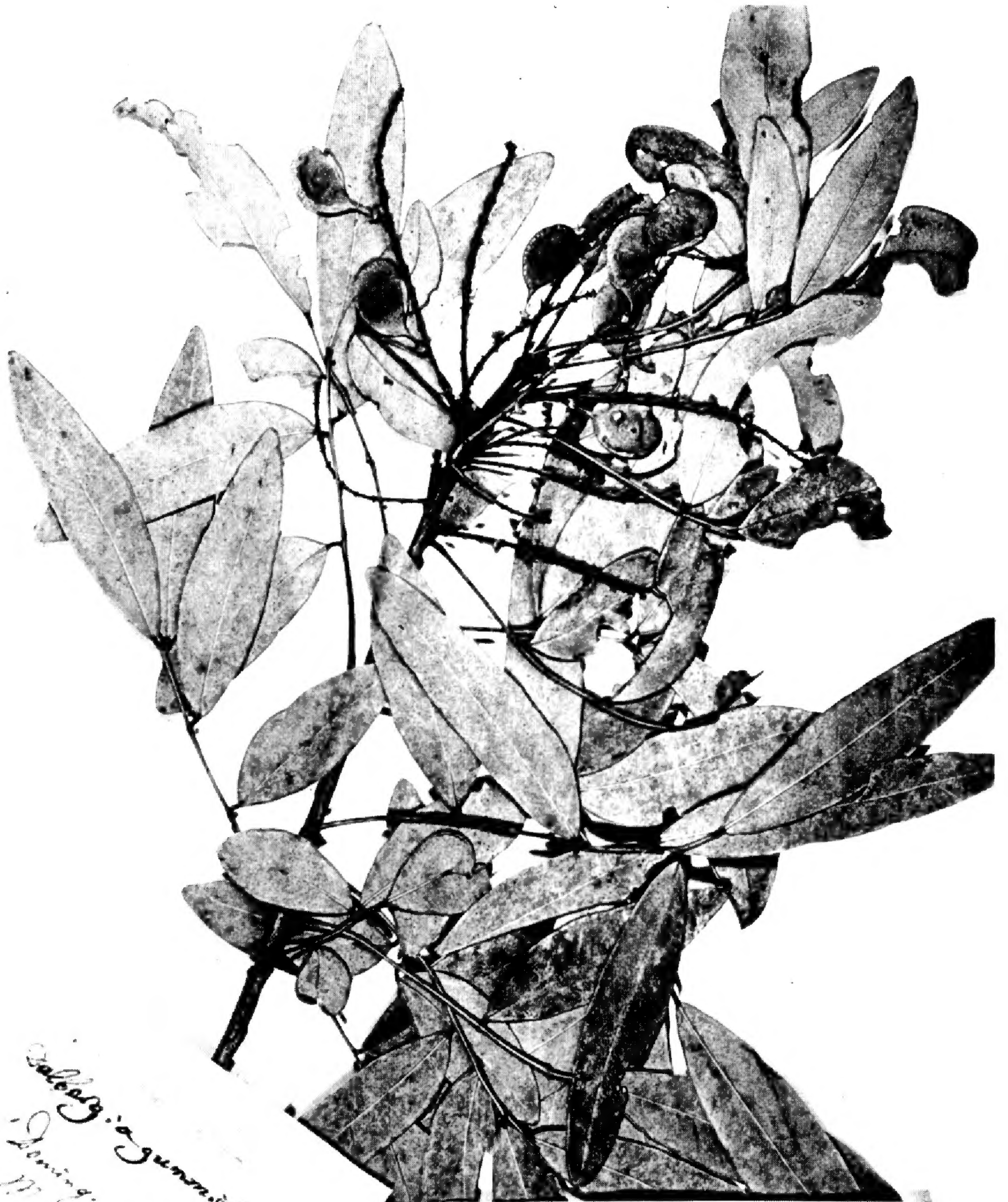
2387.
Ateleia apetala n.
Ateleia suberosa Griseb.
 det. n. 14. 1863.

Leguminosae Griseb.
 Griseb: Catal. plant. c.
 Seite 20



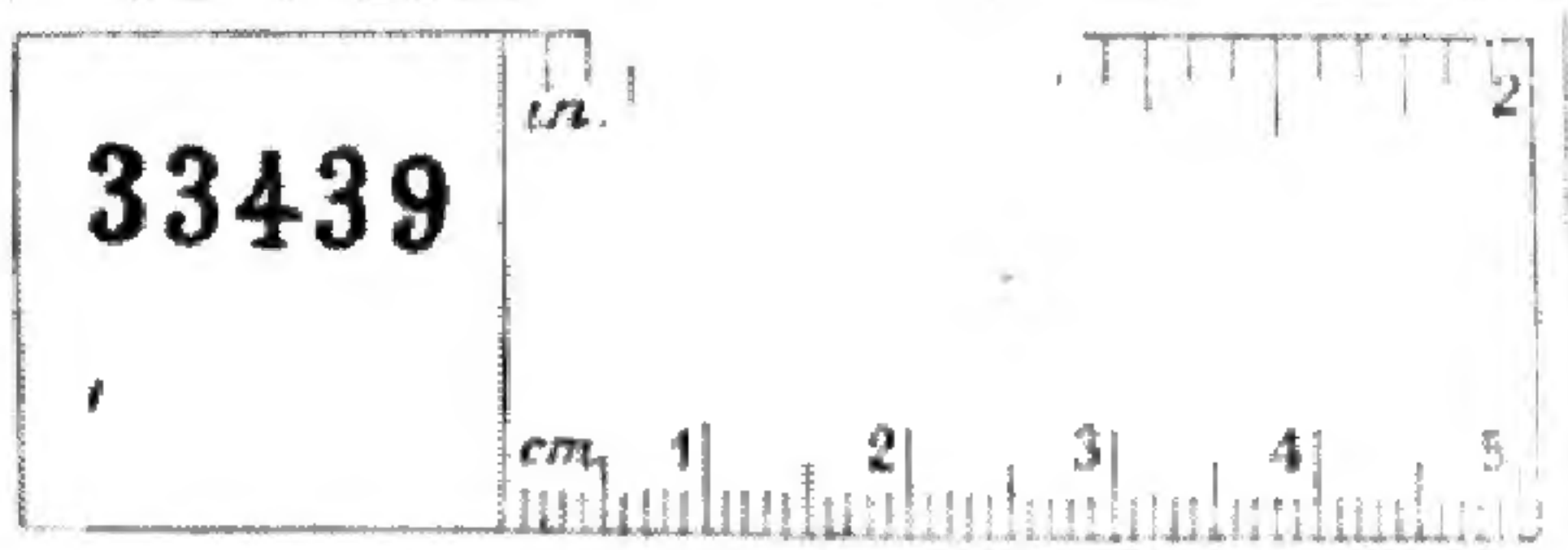
Hert. J. Oertling

Lectotype of *Ateleia apetala* Griseb.



Salvia gummifera
 Sprengel
 Daming, Bertoni
 M. Balbo 1821

Pterocarpus gummiferus DC.



P. gummifer, Bert.
 DE CAND. prodr. 2 p. 419 n. 21.

Type of *Pterocarpus gummifer* Bert. ex DC. (= *Ateleia gummifera* (DC.) D. Dietr.); F. M. Neg. 33439 ex G-DC.



Specimen of *Ateleia cubensis* Griseb. (= *A. gummifera* (DC.) D. Dietr.) cited in publication of nom. nov. for *Swartzia multijuga* A. Rich.



Swartzia multijuga Nob

Illustration of *Swartzia multijuga* A. Rich. (= *Ateleia gummifera* (DC.) D. Dietr.) from the original publication of the species.