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A Continuation of the
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VOLUME 31

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15-18

STUDIES IN AMERICAN PLANTS

DOROTHY N. GIBSON

TWO NEW NICARAGUAN JUGLANDACEAE

ANTONIO MOLINA R.

STUDIES IN THE PALM GENUS *SYAGRUS* MART.

S. F. GLASSMAN

TROPICAL AMERICAN PLANTS, IX

LOUIS O. WILLIAMS

JUL 15 1968

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TROPICAL AMERICAN PLANTS, IX

LOUIS O. WILLIAMS

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Tropical American Plants, IX

In the course of the studies for the next part of "Flora of Guatemala" I have seen the collections in U. S. National Herbarium and borrowed many for closer study; Dr. C. L. Lundell kindly sent me all the Guatemalan and British Honduran "Contortae" from his herbarium for study; the type of *Lisianthus oreopolus* has been loaned from Gray Herbarium; Dr. George Taylor supplied type photographs of certain critical species of *Lisianthus* conserved at Kew; several critical specimens were loaned by Missouri Botanical Garden. The excellent collections of Dennis Breedlove from Chiapas and Guatemala, sent for determination, have helped to make certain Gentianaceae more easily understandable.

The Peruvian materials included indicates a continuing interest in Peruvian Amazonia. Materials have been received through Dr. Kukachka for the U. S. Forest Products Laboratory—Servicio Forestal y de Caza of Peru's joint program, and through our own program with Servicio Forestal.

Dr. Eizi Matuda has sent a number of Mexican Orchidaceae for determination. Two of these have proven to be undescribed species.

Much of the field work and travel involved here has been made possible by grants from National Science Foundation.

APOCYNACEAE

Two species of *Plumeria* occur in the range of the "Flora of Guatemala." These are accounted for in Woodson's revision of the genus (Ann. Mo. Bot. Gard. 25: 202-224. 1938).

Plumeria obtusa L. is represented by the var. *sericifolia* (C. Wright) Woodson, which differs from the species in having the under surface of the leaves, and sometimes the petioles and inflorescences, pubescent.

Plumeria rubra L. is represented by an almost endless number of flower color forms. Woodson gives formal recognition to four forms: f. *typica* (= f. *rubra*), f. *lutea*, f. *acutifolia* and f. *tricolor*.

Of these formae all have been seen in cultivation by myself in Central America. The only one which I have seen as a wild tree is the white flowered "so called" form. This appears in Dr. Woodson's account as "forma *acutifolia* (Ait.) Woodson, comb. nov." unfortunately a *lapsus* for the only "*acutifolia*" in the synonymy under *P. rubra* is *P. acutifolia* Poir. (and in Gray card index this is assumed to be basionym). However, there is a *P. acuminata* Ait. in the synonymy so that there is a question whether Dr. Woodson's *lapsus* involves the name or the authority.

Woodson has not used the formal designation "*acutifolia*" on any specimen which I have seen, although he has determined specimens said to have white flowers with the name *P. rubra* L., certainly in accord with his feeling expressed in discussion in his revision. He provided names for a few outstanding color variations "for the use of those who desire some distinction in the matter." In "Flora of Guatemala" they will be provided for the same reason.

Plumeria obtusa L. var. **sericifolia** (C. Wright) Woodson, Ann. Mo. Bot. Gard. 25: 214. 1938. *P. sericifolia* C. Wright ex Griseb. Cat. Pl. Cub. 171. 1866. *P. multiflora* Standl. Field Mus. Bot. 8: 33. 1930.

Guatemala: "flor de chombo," tree, bajo del Hormiguero in *tintal*, Petén, Jan. 21, 1959, *Contreras 479* (LL); "flor de Mayo," tree 9 inches in diameter and 30 feet high, corolla white, bajo de Santa Fé, Petén, May 11, 1959, *Lundell 15985* (LL).

These are the first collections of this *Plumeria* which I have seen from Guatemala. It is to be found also in Mexico (Yucatan), British Honduras and on several of the islands of the West Indies.

In Dr. Woodson's revision of *Prestonia* (Ann. Mo. Bot. Gard. 23: 276-367. 1936) his "Section 4 Tomentosae" has four species in Central America, *P. mexicana* A. DC., *P. amenuensis* Woodson, *P. isthmica* and *P. speciosa* Donn.-Sm. Since 1936 Woodson described two more species of the group, *P. allenii* and *P. wedelii*, both from Panama. There is still another species of this group in Chiapas that must be the most attractive species of the genus, with corollas twice as large as any of the others. So far as I know this species has been collected only by Dr. Eizi Matuda.

Prestonia grandiflora L. Wms. sp. nov.

Liana suffruticosa, volubilis. Folia ovata, late ovata vel late obovata, abrupte acuminata, nervis utroque costae 8-10, fulvo-pubescent, breviter petiolata; flores

flavae; calyx usque ad basem divisus, lobi elliptico-lanceolati, ovato-lanceolati vel lanceolati, acuti vel acuminati, obscure fulvo-pubescent; corolla grandis, 5 cm. longa vel ultra, extus pubescens, lobi late obovati, leviter obliqui.

Woody rampant vines. Branches terete, fulvous pubescent, glabrous with age, 7-8 mm. or possibly more in diameter; leaves opposite, ovate to broadly ovate or broadly obovate, abruptly acuminate, rounded to the base, petiole short, 1 cm. long or less, lateral nerves 8-10 on each side of mid-nerve, sparsely fulvous pubescent above except densely so along the nerves, prominently fulvous pubescent below, the blades 9-17 cm. long and 3.5-11 cm. broad; stipules corneous, 4-6 along the base of the petiole and interpetiolar, 2-3 mm. long; inflorescences axillary, corymbose and several times branched, bearing few to several large yellow flowers, shorter than the subtending leaf, minutely ferruginous pubescent, bracts lanceolate, to 10 mm. long; calyx divided to the base, the lobes elliptic-lanceolate to ovate-lanceolate or lanceolate, acute or acuminate, minutely fulvous pubescent, 12-14 mm. long and 3.5-5 mm. broad, bearing at the base within a single bilobate squamella or apparently sometimes missing; corolla largest of the genus, fulvous pubescent outside except along the plicae, about 6 cm. long when mature, tubular-campanulate, the basal tube about 3.5-4 cm. long to the throat, the apical portion somewhat expanded and containing the stamens, with an inconspicuous internal lamellate corona at the throat, the limb plicate, contorted in the bud, when mature the lobes about 3 mm. long and up to 2 cm. broad, divided to the throat, somewhat oblique and broadly obovate; stamens inserted below the throat, anthers linear-lanceolate, sagittate, 8-9 mm. long and about 2 mm. broad at the base, filaments about 2 mm. long, arched inward, attached peltately to the base of the stamen; carpels two with a maniculate stigma reaching to the enclosing anthers, subtended by 5 nearly separate nectaries; immature fruits densely fulvous tomentose pubescent.

Mexico: vine, Siltepec, Chiapas, June 23, 1941, *Matuda 4681* (F, LL); La Grandeza, Chiapas, alt. 2016 m., May 19, 1945, *Matuda 5570* (LL); La Grandeza, Chiapas, alt. 2016 m., May 19, 1945, *Matuda 15570* (type F).

Related to *Prestonia mexicana* and to the several other species of the section *Tomentosae*, but easily distinguished from them by the very large flowers.

Dr. Matuda's numbers 5570 and 15570 undoubtedly represent a single collection.

Thevetia ahouai (L.) A. DC. in DC. Prodr. 8: 344. 1844. *Cerbera ahouai* L. Sp. Pl. ed. 2. 303. 1762. *C. nitida* HBK. Nov. Gen. & Sp. 3: 225. 1819. *T. nitida* A. DC. l.c. 345. *Plumeriopsis ahouai* Rusby & Woodson, Ann. Mo. Bot. Gard. 24: 11. 1937.

A shrub distributed through southern Mexico, Central America to northern South America. Drs. Rusby and Woodson have separated it as a genus, *Plumeriopsis*, based upon presumed differences in the fruit and whether or not the corolla is infundibuliform or

salverform. I find that the endocarp in *T. ahouai* is not so woody as in some other species of *Thevetia*, but when it is mature it is not "membranaceous." The shape of the corolla, whether infundibuliform or salverform (*Plumeriopsis*), is hardly of generic worth. *Thevetia gaumeri*, of southern Mexico and Guatemala, has corollas that are somewhat intermediate between those prescribed for *Plumeriopsis* and those of other Central American species of *Thevetia*. If *Plumeriopsis* were kept as a genus, then certainly *Thevetia gaumeri* would need to be transferred to that genus.

GENTIANACEAE

Dr. Steyermark has argued (*Fieldiana, Bot.* 28: 496-497. 1953) for the inclusion of several segregate genera allied to *Lisianthus* into that genus. *Chelonanthus alatus* (Aubl.) Pulle is the only species of Dr. Gilg's "segregate" that is to be found in Guatemala. This, along with about a dozen other species, seems to me to have some characters that argue for their retention in a genus apart from *Lisianthus*.

The species of *Chelonanthus* all have corolla structure quite different from that of *Lisianthus*, usually gibbous on one side and much shorter in relation to width. The inflorescence of those things that I would call *Chelonanthus* is a terminal once or twice bifurcately branched dichasium, the ultimate divisions being few-(one-)many-flowered secund racemes. There are no leaves in the inflorescence, i.e., the inflorescences are not borne in leaf axils and are determinate—most often a single flower is borne in the axil of the bifurcate branches of the inflorescence and terminates its growth. The whole inflorescence is sometimes reduced to a single flower.

The type species of *Lisianthus* is the Jamaican *L. longifolius* L. and we have several similar to this in Central America. The corollas are relatively long and slender and not gibbous on one side; the stem and inflorescence are tricotomously and indeterminately branched. Furthermore, these branches of the stem and inflorescences are from the axils of well-developed leaves—while this is not the case in *Chelonanthus*. The ultimate branch of the inflorescence in no *Lisianthus* available to me could be described as a secund raceme. I should describe the inflorescence of *Lisianthus* as paniculate.

Stated in another way it might be said that the plants of *Chelonanthus* are terminated by an inflorescence and *mostly* not otherwise branched; *Lisianthus*, while variable, has few to many pairs of lateral

branches and that these often multitudinous branches are ultimately terminated by one or few (often three) flowers.

These Lisianthoid genera of the Gentianaceae are much in need of study. Until a careful review of them can be made upon the more adequate material now available, I prefer to follow Dr. Gilg and to maintain *Chelonanthus*.

Gentiana adsurgens Cerv. ex Griseb. Gen. & Sp. Gent. 286. 1838. *Pneumonanthe bicuspidata* G. Don, Gen. Syst. 4: 194. 1838. *Gentiana bicuspidata* Briq. Candollea 4: 324. 1931.

There is some question whether Grisebach's work or that of George Don, both cited above, appeared first. The date of Don's *General History*, volume 4, is 1838 according to Pritzel and this date appears on the copy in Field Museum. However, Otto Kuntze, Rev. Gen. Pl. 1: CXXVII. 1891 says "Der 4. Band nach Pritzel 1838 trägt 1837 auf dem Titel." I cannot trace this information.

A. H. R. Grisebach's *Genera et Species Gentianearum* bears the date 1839 on the title page and this is the date that Dr. Briquet used in making the transfer cited above. However, Dr. Hooker says "The manuscript was dismissed from the author's hands before the middle of 1838, and the work had actually reached London booksellers, near a month before the close of 1838." (London Jour. Bot. 4: 237. 1845). Dr. Hooker should have known for the volume was dedicated to him. Until it is proven otherwise I shall use *G. adsurgens* as the correct name of this plant and place Don's epithet in synonymy.

There are two fragmentary Sessé & Mociño collections in Field Museum, one bearing number 682, the other 1368. It is not unlikely that one of these represents authentic material. Pringle's 4309 and 15007 are the same species. Dennis Breedlove and Peter Raven have recently collected this species in the Mexican state of Chiapas, no great distance from Guatemala, where the species may be expected. (*Breedlove 12443; Breedlove and Raven 13421.*)

Gentiana guatemalensis Standl. & Steyerl. Field Mus. Bot. 23: 75. 1944, and **G. lewisiae** Standl. & Steyerl. l. c. 76.

These two gentians occur on the high mountains of Guatemala, the first in the Cuchumatanes Mountains and the second in the Sierra Madre. We now have several collections of each of them. The two seem to retain the cited characters, or at least part of them, but these characters are not too impressive in the Gentianaceae.

We shall leave both species in "Flora of Guatemala" but call attention to their similarity. These species are closely related to *G. adsurgens*, mentioned above.

Halenia crassiuscula Rob. & Seaton, Proc. Am. Acad. 28: 113. 1893.

A collection of this species was made from Cerro María Tecum in the Sierra Madre of Guatemala (*Williams, Molina & Williams 23164*) from which a selection of six plants was made to illustrate the variation found. Two extremes of flower forms from this collection are illustrated for "Flora of Guatemala."

LISIANTHUS IN CENTRAL AMERICA

An account of the genus *Lisianthus* for "Flora of Guatemala" required a review of those of the five Central American countries, Panama and some of those found in Mexico that extend to Central America. Twenty-five species have been credited to or described from Central America, including one proposed here. Three of these, *L. tetragonus* Benth., *L. crassicaulis* Mart. & Gal. and *L. oerstedii* Grieseb. are synonyms of *Chelanthus alatus* (Aubl.) Gilg; one *L. browallioides* is a genus not previously known in North America; the remainder are species of *Lisianthus*. These are given below with my understanding of them.

Lisianthus auratus Standl. Trop. Woods 37: 29. 1934. Described from central Honduras from whence the type and four additional collections (*Williams & Williams 18382, 18707; Molina 6358, 6524*). A single collection is known from British Honduras (*Hunt 401*) and one from Guatemala (*Steyermark 31603*). Three collections from the Atlantic coastal plain of Nicaragua (*Molina 15037, 15171, 15206*), I cannot distinguish from the Honduran material except that the flowers are a bit smaller. The veinlets in the membranaceous leaves of this species are not like those of any other collection of this genus known to me. They form areolate reticulations similar to those in leaves of certain species of *Polypodium*. The relationship of this species is probably with *L. brevidentatus*.

Lisianthus axillaris Hemsl. Biol. Cent. Am. Bot. 2: 344. 1882. *L. francisiae* Sprague, Kew Bull. 1928: 8. 1928. A distinctive species known only from British Honduras. The inflorescence is reduced usually to a single (red) flower in the axils of leaves.

Lisianthus brevidentatus (Hemsl.) Kuntze, Rev. Gen. Pl. 2: 420. 1891, as *Lisianthus*. *Leianthus brevidentatus* Hemsl. Biol. Cent. Am. Bot. 2: 344. 1882. *L. quichensis* Donn.-Sm. Bot. Gaz. 52: 51. 1935. *L. calciphilus* Standl. & Steyerl. Field Mus. Bot. 22: 267. 1940. *L. elatus* Standl. & Steyerl., l.c. *L. petensis* Standl. & Steyerl. Bull. Torr. Bot. Club 84: 46. 1957.

There are differences in the material that I have tentatively placed here as *L. brevidentatus*. The differences, however, seem to be ones that depend on the stage of growth and what might well be individual differences in plants. Some have the inflorescence much reduced while in others the top of the plant is diffusely branched and superficially appears quite different from the others. There seems to be minor differences in the calyx and in the lobing of the corolla but nothing that is easily defined. The plant is known from Mexico, Guatemala and British Honduras, mostly at middle to low elevations.

Lisianthus nigrescens var. **nigrescens**. *Lisianthus nigrescens* Schlecht. & Cham. Linnaea 6: 388. 1831; Robinson, Proc. Am. Acad. 45: 398. 1910. *Leianthus nigrescens* Griseb. Gen. & Sp. Gent. 199. 1838. *Petasostylis nigrescens* Griseb. in DC. Prodr. 9: 71. 1845.

This species was described from a Schiede & Deppe collection made at Papantla (Vera Cruz, Mexico) and is fairly widely distributed through eastern and southern Mexico and extends to Guatemala. I have seen but one specimen from Guatemala that seems to belong to the typical variety. Miss Perkins in her monographic study of *Lisianthus* (Engler, Bot. Jahrb. 31: 493. 1902) included in *L. nigrescens* Bertoloni's *L. cuspidatus* and possibly specimens were cited that are the same as Dr. Robinson's *L. oreopolus* described some years later. Although Dr. Robinson thought *L. cuspidatus* to be close to *L. nigrescens*, he cited several characters which he thought would separate the two species. The characters that he pointed out to separate *L. cuspidatus*—leaves with subcuneate bases, corolla more deeply lobed with the lobes surpassing the pistil—begin to lose their significance with more adequate collections. The relatively large and deeply lobed corolla seems to occur on specimens now known from Chiapas and from Guatemala. I would separate this as a variety, rather than to submerge it entirely as did Miss Perkins or to maintain it as a separate entity as did Dr. Robinson, but would call attention to the possibility that the two black flowered varieties may eventually be shown to be the same when still more

collections are available. Dr. Robinson described *L. oreopolus* at the same time and compared it to *L. nigrescens*, apparently not realizing that it is hardly more than a color and geographical variety of the plant which he maintained as *L. cuspidatus*.

Lisianthus nigrescens* var. *cuspidatus (Bertoloni) L. Wms. comb. nov. *Lisianthus cuspidatus* Bertoloni, Nov. Comm. Acad. Bonon. 4: 408, t. 37. 1840.

Differs from the typical variety in larger corollas which are more deeply lobed. Hooker has illustrated this variety (Bot. Mag. 69: t. 4043. 1843) under the name of *Leianthus nigrescens* (Schlecht. & Cham.) Griseb. The specimen was grown from seeds sent from Guatemala by Skinner.

Lisianthus nigrescens* var. *oreopolus (Rob.) L. Wms. comb. nov. *Lisianthus oreopolus* Rob. Proc. Am. Acad. 45: 398. 1910.

This variety is an almost exact duplicate of var. *cuspidatus* in flower size and lobing. The flower color, clear yellow, is so strikingly different from the near "black" of the var. *cuspidatus* that upon first examination the two might not be associated. This variety is known to me only from the state of Chiapas (Mexico) and so far as I know its range does not overlap with that of var. *cuspidatus*. I have had the privilege of examining the type, in Gray Herbarium, of *L. oreopolus* Rob. (Chiapas, etc., ann. 1864-70, *Dr. Ghiesbreght 702 bis*). Recently I have received for determination four excellent collections from Chiapas, *Breedlove 6477, 10996, 11015* and *12069*.

Lisianthus peduncularis L. Wms. sp. nov.

Herbae suffruticosae vel frutices usque ad 3 m. altae. Folia elliptica, ovalia vel ovato-oblongata, acuminata, subcarnosa; inflorescentiae longe pedunculatae, pauciflorae; corolla campanulato-tubulosa, lobi angusti ovati, acuminati; capsula ellipsoidea.

Suffruticose herbs or subshrubs to 3 m. tall. Stems leafy, becoming leafless below and with prominent leaf-scars, leafy above; leaves elliptic to oval or ovate-oblongate, abruptly acuminate, attenuated at the base into a petiole 1-2 cm. long or sometimes longer, somewhat fleshy, with 3-4 pairs of arching lateral nerves, joined at the base by a scarious interpetiolar "stipule" which is deciduous but leaves a prominent scar; inflorescence dichasioid, borne from the axils of leaves on long peduncles to 10-15 cm. long, these branched above the middle and each with about nine flowers; flowers yellow; calyx 7-9 mm. long, the lobes 5-6 cm. long and 1-1.5 mm. broad, linear-lanceolate, acute or acuminate, margin scarious; corolla 5-6 cm. long at anthesis, campanulate-tubular, the basal one-third constricted to a narrow tube and somewhat marcescent, then broadening to 7-9 mm. in diameter



FIG. 1. *Lisianthus peduncularis* L. Wms. A, habit, $\times \frac{1}{2}$. B, dissected flower showing stamens and pistil, $\times 1\frac{1}{2}$. C, internode showing interpetiolar stipule, $\times 3$.

at the middle then again somewhat constricted at the throat, the corolla lobes 6–8 mm. long and 2–3 mm. broad, narrowly ovate, acuminate, dextrorsely contorted in the bud, erect; stamens 5, about as long as the corolla or slightly exceeding it, attached about 1 cm. above the base of the corolla, anthers about 3 mm. long, oblong, versatile; capsule ellipsoidal, 12–14 mm. long and 3–4 mm. in diameter when mature.

Panama: flowers yellow, tips of the lobes green, woody herbs fairly common along trail, vicinity of La Mesa, north of El Valle de Antón, Prov. Coclé, alt. 1,000 m., May 12, 1941, *Allen & Allen*; flowers yellow, shrub 1–2 m. tall, El Valle de Antón, alt. 1,000 m., March 16, 1946, *Allen 3410* (MO, type; illustration from type); flowers yellow with green lobes, shrub 3 m., Cerro Pajita, hills north of El Valle de Antón, alt. 1,000–1,200 m., Feb. 7, 1947, *Allen & Allen 4187* (MO).

Lisianthus peduncularis is closely related to *L. skinneri* of those species found in continental North America. It may be distinguished from that by its larger and long acuminate corolla lobes and by the calyx which is twice as long and with narrower lobes. The long pedunculate, few-flowered inflorescences are characteristic of both species mentioned, and of the West Indian (Jamaican) *L. latifolius* Sw.

The Gentianiaceae are said to be *without stipules*, as are all or most families of the Sympetalae, with the notable exception of the Rubiaceae. However, in this and some other species of *Lisianthus* there are structures much like the interpetiolar stipules found in the Rubiaceae. Whether these are called “sheathing leaf bases” or “stipules” is of little importance for their origin would seem to be the same.

Lisianthus saponarioides Schlecht. & Cham. *Linnaea* 6: 389. 1831. *Leianthus saponarioides* Griseb. *Gen. & Sp. Gent.* 198. 1838. *Petasostylis saponarioides* Griseb. in DC. *Prodr.* 9: 71. 1845. *Lisianthus meianthus* Donn.-Sm. *Bot. Gaz.* 52: 51. 1911. *Lisianthus congestus* Standl. *Carnegie Inst. Wash. Publ.* 561: 82. 1935.

This species is unlike the other species of the genus in Central America in that the lobes of the corolla are widely spreading. Grisebach based his genus *Petasostylis* on this species but added to it *L. nigrescens*, which is less related to *L. saponarioides* than to *L. longifolius* L. The species is found in Mexico (from whence I have seen no specimens, authentic or otherwise) in Guatemala and British Honduras.

Lisianthus seemannii (Griseb.) Perkins in Engler, Bot. Jahrb. 31: 491. 1902. *Leianthus seemannii* Griseb. in Seemann, Bot. Voy. Herald 170. 1854. *Lisianthus corymbosus* Perkins, l.c.

This species is related to *L. brevidentatus* but is easily distinguished superficially by the longer and more prominent lobes of the relatively shorter corolla. The species is not uncommon in Costa Rica, it is occasional in Panama and is the only species of *Lisianthus* subg. *Lisianthus* that I know to occur in South America. A single specimen (*Haught 4652*, F, US) has been collected in the department of Antioquia, Colombia. A type photograph of *L. seemannii* from Kew shows that *L. corymbosa* Perkins, which has been the name commonly used for this taxon, is a synonym.

Lisianthus skinneri (Hemsl.) O. Kuntze, Rev. Gen. Pl. 2: 429. 1891. *Leianthus skinneri* Hemsl. Biol. Cent. Am. Bot. 2: 345. 1882. *Lisianthus arcuatus* Perkins in Engler, Bot. Jahrb. 31: 492. 1902.

I know this species from Guatemala only from the photograph of the type specimen at Kew, which bears the data "Guatemala, Skinner." The species is known from Honduras, is quite common in Costa Rica and is occasional in Panama. Most specimens in herbaria will be found under *L. arcuatus*.

Lisianthus viscidiflorus Robinson, Proc. Am. Acad. 45: 398. 1910.

Known to me only from Alta Verapaz. It is easily distinguished from all the other species of *Lisianthus* by the relatively short calyx lobes and the red flowers, or green ones tinged with red.

VOYRIA AND LEIPHAIMOS¹

¹Since this account of *Voyria* and *Leiphaimos* was prepared A. Raynal has published an "Etude Critique des Genres *Voyria* et *Leiphaimos* (Gentianaceae) et Révision des *Voyria* d'Afrique" in *Adansonia* ser. 2, 7: 53-71, *illus.* 1967. There is a good account of the history of the saprophytic gentians with some quite good drawings.

Raynal has kept three saprophytic genera, *Voyria*, *Voyriella* and *Leiphaimos*, as I would do, but he has restricted *Leiphaimos* to the type species; *Voyriella* with two species in tropical South America; and *Voyria* with some 15 species in South and Central America, the Antilles and tropical Africa.

The main difference between Mr. Raynal's findings and mine is that he restricts *Leiphaimos* to the type species, while I believe that the genus is not monotypic. This difference of opinion is due in part surely to the materials which we had to study, his principal concern being with the African kinds and mine with the more abundant kinds of Central America and Mexico. Mr. Raynal did not concern himself greatly with seed and capsule characters which I believe to be the best and easiest characters to use for they are almost always available. Seed and capsule characters, with others pointed out here, seem to provide a means of separating these plants into supra specific units.

The relatively few species of saprophytic Gentianaceae in Central America have been placed either in *Voyria* or *Leiphaimos*, or in both. There is no modern revision of the group but there is possibly now enough material available to make such a study worthwhile. The South American species should be studied at the same time for unusual distribution is surely to be found in the group.

The study of the Central American kinds for "Flora of Guatemala" seems to indicate that the two traditional genera *Voyria* and *Leiphaimos* are valid but I have shifted the emphasis on characters, using the character of wingless ovoid or trigonous seeds and the lack of elator-like hairs along the suture inside the capsule in *Voyria*, in contrast to minute flat seeds with narrow terminal or lateral, often almost hair-like wings or appendages and with elator-like hairs along the sutures inside the capsule in *Leiphaimos*. This will give a basic division between the species of the group. The species with winged seeds have very much reduced tight cauline bracts. The inflorescence consists of one or very few flowers. The calyx seems to be ephemeral, often the lobes soon fall away. There may also be correlation in the way the capsule ruptures, only laterally in the species with winged seeds.

The species with wingless seeds and no elator-like hairs in the capsule, which I call *Voyria*, have relatively large cauline bracts that are loose and normally surround the stem, the inflorescence is from one- to several-flowered. The calyx is well developed and persistent. The capsule may rupture through the apex but I suspect not in some cases.

There appears to be a difference in the root structure in some species but not enough specimens with roots are available to be useful in such a study.

I have seen the types of all the species of *Leiphaimos* described from Panama by Standley (in Contr. U. S. Nat. Herb. 20: 194-200. 1919). The six new species described in that place all seem to me to belong to *Voyria* and all except one seem to be valid. Two other species included in the account are *Leiphaimos*. It is curious also that all six of these new species were collected by Pittier from one locality in a period of less than two months. One of these species is still known only from the type. Five of them are known to have wider ranges, and three of these four extend their range to British Honduras and Guatemala, and thus within the range of the "Flora of Guatemala."

There would seem to be two subgeneric groups in *Voyria*, as represented in Central America, and likewise two subgeneric groups in *Leiphaimos*.

Voyria alba (Standl.) L. Wms. comb. nov. *Leiphaimos albus* Standl. Contr. U. S. Nat. Herb. 20: 198. 1919.

British Honduras: *Gentle 9279* (LL); *Pelly 92* (F); *Schipp S-505* (F).

Honduras: *Standley 55391* (F).

Nicaragua: *Englesing 297a* (F).

Panama: *Brown 152a* (F); *Dodge et al. 16927* (US); *Kenoyer 495* (US); *Pittier 4094* (US), *4295* (US).

Colombia: *Haught 1790* (US).

Voyria alba often has been confused with *Leiphaimos parasitica*, although the two are distinguished by several characters. *Leiphaimos montana* Jonker, described from Surinam, is similar. *Voyria trinitensis* Griseb. from Trinidad is apparently the species to which *V. alba* is most closely related.

Voyria pittieri (Standl.) L. Wms. comb. nov. *Leiphaimos pittieri* Standl. Contr. U. S. Nat. Herb. 20: 197. 1919.

Panama: forests around Puerto Obaldía, San Blas coast, alt. 0-50 m., *Pittier 4292* (type, US; photo F).

There is additional data on the type sheet in Standley's script: "stem dark purple; corolla tube purplish; the lobes violet, with a white ring and dark blue lines at throat," doubtless from Pittier's field book.

Colombia: flores violaceas, en los alrededores del Río Ampurumiado en selva muy húmeda, alt. \pm 220 m., 11 Oct. 1947, *Gutiérrez & Barkley 17C225* (F); a saprophyte with purple stems and snowy white flowers, vicinity of Barranca Bermeja, Magdalena Valley, between Sogamoso and Colorado Rivers, dept. Santander, alt. 100-500 m., Dec. 19, 1961, *Haught 1461* (US).

Venezuela: flowers deep blue with white crown at throat, in forests of Lora River, Zulia, 12 Dec. 1922, *Pittier 10919* (US).

Voyria pulcherrima (Standl.) L. Wms. comb. nov. *Leiphaimos pulcherrimus* Standl., Contr. U. S. Nat. Herb. 20: 199. 1919.

Panama: hills back of Puerto Obaldía, San Blas coast, alt. 50-200 m., August 1911, *Pittier 4306* (type, US).

This is the only one of the six species described by Standley, l.c., that is not now known from a wider range.

Voyria spruceana Benth. in Hook. Journ. Bot. 6: 197. 1854.
Leiphaimos stellatus Standl. Contr. U. S. Nat. Herb. 20: 197. 1919.

Panama: flowers yellow, forests around Puerto Obaldía, San Blas coast, alt. 0-50 m., Aug. 1911, *Pittier 4294* (type of *L. stellatus* Standl.).

Brazil: Río Negro, Amazonas, *Holt & Blake 562* (US).

My understanding of *V. spruceana* is based on the Holt & Blake specimen which was "compared with the type at Kew by A. C. S. [mith]." This specimen matches the type of *L. stellatus* Standl. very closely.

Voyria thalesioides (Standl.) L. Wms. comb. nov. *Leiphaimos thalesioides* Standl., Contr. U. S. Nat. Herb. 20: 198. 1919.

British Honduras: small plant, flowers yellow, in Cohune ridge, near Jacinto Creek, Toledo district; January 31, 1945, *Gentle 5182* (LL; photo, F).

Panama: stems purplish-yellow, hills of Sperdi, near Puerto Obaldía, San Blas coast, alt. 20-200 m., Sept. 1911, *Pittier 4351*, in part (type, US).

The type specimen, unfortunately, is a mixed collection. The flower used by Standley for dissection is still in a pocket on the type sheet and indicates that it was taken from the largest plant on the sheet which is here designated the holotype. The other plant on this sheet is a single stem and flower of *Voyria pittieri* (Standl.) L. Wms.

In preparing manuscript for "Flora of Guatemala" I had designated the *Gentle* collection as a new species for it seemed to fit none of the descriptions of species previously described. An examination of the type of *Voyria thalesioides*, with admixture of another species, showed that the principal part of that was the same as the specimen from British Honduras.

I have not seen the type or any other specimen of *Leiphaimos stenoloba* Jtn. (*Sargentia* 8: 243. 1949) from San José Island, Panama. It must be very close to *Voyria thalesioides*, if not the same.

Voyria truncata (Standl.) Standl. & Steyerem. Field Mus. Bot. 23: 78. 1944. *Leiphaimos truncatus* Standl. Contr. U.S. Nat. Herb.

20: 196. 1919. *Voyria allenii* Steyerl. Ann. Mo. Bot. Gard. 28: 460. 1941.

Guatemala: *Steyerl* 41610, 41892, 45701 (F).

Nicaragua: *Schramm* 52 (US).

Panama: *Allen* 2240 (F); *Pittier* 4306a (US).

This is the largest of the Central American species of *Voyria*.

HUMIRIACEAE

Vantanea parviflora Lam. Journ. Hist. Nat. Par. 1: 145, f. 7. 1792; Cuatrecasas, Contr. U. S. Nat. Herb. 35: 74. 1961.

Peru: "Loro shungo." Arbol de 20 m. y 0.5 m. de diámetro, flores blancas, bosque húmedo tropical, Santa María, Río Nanay, Dpto. Alto Nanay, Pcia. Maynas, Depto. Loreto, alt. 150 m., 19 setiembre 1963, *Aróstegui Vargas* 129; same tree, fruits, 3 marzo 1964, *Aróstegui Vargas* 149.

This wide-spread species has not been reported from Peru previously. The collector says the tree is used in house construction, for fire wood and to make charcoal.

OLEACEAE

FRAXINUS IN GUATEMALA: The ashes approach their southern limit in Guatemala and the amount of material available for study is limited and much of it sterile, including two types. Dr. Standley, when he prepared the preliminary manuscript for "Flora of Guatemala," gave six species for the country. I am able to distinguish only three but there are involved sterile type specimens.

Fraxinus cavakiana Standl. & Steyerl., Field Mus. Bot. 23: 74. 1944.

The type is in fruit and these are the largest for any species of Mexico or Central America known to me. There are 13 more specimens determined with this name by Standley, all but one sterile—and quite possibly at least two species are represented. The lateral leaflets on the type are essentially sessile but this is not so with some of the sterile material associated with this name. The species is maintained in "Flora of Guatemala" but only localities known for fruiting material are given.

Fraxinus purpusii Brandegees, Univ. Cal. Publ. Bot. 4: 90. 1910.

Several collections from western Guatemala have been determined by Standley as *F. purpusii*. This seems doubtful and they do not match too well authentic material available. The break in distribution is not a reasonable one, from highland Mexico to eastern Guatemala, with no intermediate stations. I have placed these Guatemalan specimens tentatively with *F. vellerea*.

Fraxinus schiedeana Schlecht. & Cham. Linnaea 6:391. 1831.

Reported from Guatemala on a sterile specimen taken from a "shrub" (*Steiermark 51640*). It is doubtful if it is *F. schiedeana*. Not included in the flora.

Fraxinus vellerea Standl. & Steyerl. Field Mus. Bot. 23: 74. 1944; *F. bicolor* Standl. & Steyerl. l.c. 73.

Types of both these species are from eastern Guatemala and both are sterile. I feel that these two names represent phases of the same species. Possibly Guatemalan material named *F. purpusii* by Standley is but a less pubescent phase of this.

Tentatively I am placing this material together, and selecting *F. vellerea* as the acceptable name because the type specimen came from a tree, while the type of *S. bicolor* came from a "shrub," possibly a sapling.

ORCHIDACEAE

Epidendrum liparidoglossum L. Wms. sp. nov.

Herbae epiphyticae usque ad 30 cm. vel ultrae. Caules ramosi, apice bifoliati; folia lineari-elliptica vel lineari-lanceolata, acuta; inflorescentia brevis, 3-5-flora, fractiflexa; sepalum dorsale ellipticum vel anguste oblanceolatum, acutum vel acuminatum, 5-nervium; sepala lateralia elliptica, acuminata, 5-nervia; petala oblanceolata, obtusa, 3-nervia; labellum oblongum vel oblongo-subcordatum, basis auriculi retrorsi ornatum; discus basi bicallosus; columna generis.

Epiphytic herbs to 30 cm. long or probably much longer. The stems much branched but the individual branches mostly less than 10 cm. long, covered at first with infundibuliform sheaths, becoming naked with age, the individual branches with a pair of subopposite leaves at or near the apex, internodes 1-2.5 cm. apart, roots developing along stem as the plant becomes older; leaves linear-elliptic or linear-lanceolate, acute, 4.5-8 cm. long and 0.4-0.9 cm. broad; inflorescence a short subterminal, 3-5-flowered fractiflex raceme up to 3 cm. long; flowers rather small for the genus, short pedicellate, subtended by oblong, acute, cucullate bracts 3-6 mm. long; dorsal sepal elliptic or narrowly oblanceolate, acute or narrowly oblanceolate, acute or acuminate, 5-nerved, 8-11 mm. long and 3-3.5 mm. broad; petals oblanceolate, obtuse, 3-nerved, about 7-10 mm. long and 2-2.3 mm. broad; lip oblong or oblong-subcordate, the retrorse basal auricles prominent, the

disc provided with two small lamellate-mammillate calluses at the apex of the column and with 1-3 obscure raised longitudinal ridges with 3 main nerves with lateral branches, column 6-8 mm. long.

Mexico: en bosque alto, ladera húmida, Cerro de Ahuacatlán, Almoloya de Alquisteras, estado de México, alt. 1700 m., 29-30 marzo 1954, *Matuda 30583* (type in Herbarium of Field Museum).

This species is another of those that might be placed either in section *Epidendrum* or section *Encyclium*. Ames, Hubbard and Schweinfurth in their "The Genus *Epidendrum*" (1936) have placed species of this relationship in both sections. I feel that it should be placed in section *Epidendrum* for most characters indicate this. The short leaf-bearing stems with two sub-opposite and nearly terminal leaves, however, point to section *Encyclium*. A close relative of this species is not known to me.

The specific name recalls the shape of the lip often found in Asiatic species of *Liparis*.

Moss attached to the specimens indicate that it was found in wet mossy forest.

***Epidendrum matudae* L. Wms. sp. nov.**

Herbae epiphyticae vel terrestres usque ad 30 cm. vel ultra. Folia subcoriacea, lanceolata, acuta, apice obscure bilobata; inflorescentia pauciflora, subumbellata; sepalum dorsale late oblanceolatum, acutum, 5-nervatum; sepala lateralia late oblanceolata, acuta vel obtusa, 5-nervata; petala oblanceolata, obtusa, 3-nervata; labellum profunde trilobatum, discus prope apicem columnae bicallosus, lobi laterales late ovati et paulo obliqui, lobus medius ellipticus, unicarinatus; columna generis.

Terrestrial or epiphytic herbs of unknown size, specimen in hand about 30 cm. long. Stem cane-like, somewhat flattened above, covered with leaf sheaths, the leaves 1-3 cm. apart; leaves deciduous, subcoriaceous, lanceolate, acute and obscurely bilobed at the apex, about 7-11 cm. long and 1.5-2 cm. broad; inflorescence terminal, to some 7 cm. long, few-flowered and the flowers subumbellate at the apex, peduncle with 3-4 scarious sheathing bracts below, bracts subtending flowers, lanceolate, acuminate, about 5 mm. long; flowers apparently yellowish, borne on slender pedicels about 2 cm. long; dorsal sepal broadly oblanceolate, acute, 5-nerved, 10-12 mm. long and about 5 mm. broad; lateral sepals broadly oblanceolate, slightly oblique, shortly carnate dorsally at the apex, acute or obtuse, 5-nerved, 10-12 mm. long and about 5 mm. broad; petals oblanceolate, obtuse, 3-nerved, about 10 mm. long and 3 mm. broad near the apex; lip adnate up to the apex of the column, deeply 3-lobed, somewhat fleshy, disc with a pair of lamellate-mammillate calluses at the apex of the column, lateral lobes widely spreading, broadly ovate and slightly oblique, each about 5 mm. long and 4 mm. broad, mid-lobe less than half as large as the laterals, elliptic, with a median fleshy carina, about 4 mm. long and 2 mm. broad; column about 8 mm. long.

Mexico: en ladera húmida, bosque mixto claro, Valle de México, Tepoztlán, Morelos, alt. 1700 m., 8 junio 1952, *Matuda 26360* (type in Herbarium of Field Museum).

Epidendrum matudae belong to *Epidendrum* section *Epidendrum* and appears to be most closely related to *E. oaxacanum* Rolfe ex Ames of which I do not have a specimen for comparison but the description of the leaves and of the flowers seems to indicate adequate differences.

The flowers of *E. oaxacanum* have lips in which the lobes are relatively smaller than in the present species, except the mid-lobe which is larger and differently shaped.

Spiranthes valida (Ames) L. Wms. comb. nov. *Sarcoglottis valida* Ames, Sched. Orch. 2: 12. 1923.

Nicaragua: lip and petals yellow-green, sepals more greenish, terrestrial in dry woods near Río Estanzuela, about 8 km. southwest of Estelí, Depto. Estelí, alt. 1160 m., January 9, 1967, *Williams & Molina 20188* (F, EAP); Jinotega grade above the town of Jinotega, Depto. Jinotega [Cordillera Central de Nicaragua], alt. 1100 m., February 1962, *A. H. Heller 4206* (F).

When preparing "An Enumeration of the Orchidaceae of Central America, British Honduras and Panama" (Ceiba 5: 32. 1956) I placed this species as a synonym of *Spiranthes acaulis* (J. E. Sm.) Cogn. These recent Nicaraguan collections seem to indicate that the species is distinct and in the field it looks very different from *S. acaulis*.

RHAMNACEAE

Berchemia scandens (Hill) Trelease, Trans. St. Louis Acad. Sci. 5: 364. 1889.

Mexico: Aguacatenango, Municipio Venustiano Carranza, Chiapas, alt. 5900 ft., April 12, 1965, *Breedlove 9655*; San Cristóbal las Casas, Municipio San Cristóbal las Casas, Chiapas, alt. 7100 ft., July 4, 1965, *Breedlove 10710*.

The genus *Berchemia* is rare in Mexico. It is widely distributed through the southeastern United States and is known from a single specimen from Baja Verapaz in Guatemala.

Zizyphus thrysiflora Bentham, Bot. Voy. Sulph. 78. 1844.

Peru: "Ebano." Hualtaco, Distrito Pampas de Hospital, Peia. Tumbas, Depto. Tumbes, June 10, 1964, *José Vargas Alvarez* 40; same data, same tree in fruit, *Vargas A.* 41.

This *Zizyphus* is new to the flora of Peru but may have been expected in Tumbes for the species is not uncommon along the Ecuadoran Pacific region, from whence it was originally described.

This particular tree, which was given field number 30-T, was said by the collector to be about 0.5 m. in diameter and 20 m. tall. It is used for ties, planks and to make beds for trucks or ox carts.

RHIZOPHORACEAE

Rhizophora mangle L. Sp. Pl. 443. 1753.

Peru: "Mangle dulce." Isla don Pancho, Tumbes, March 3, 1964, *José Vargas Alvarez* 35.

Macbride comments (Field Mus. Bot. 13, part 4, No. 1: 220. 1941) upon this conspicuous plant of tropical shores being absent in Peru and postulates that this may be due to the lack along the Peruvian coast of the muddy flats and estuaries usually inhabited by the mangrove. This is the only collection known to me from Peruvian territory and it may be assumed that it did occur along muddy shores.

STERCULIACEAE

The genus *Pterygota* Schott & Endlicher was described to contain a tree of India then called *Sterculia alata* of Roxburgh. Schumann in "Flora Brasiliensis" described the genus *Basiloxylon* to contain a single species, *B. rex* (Mart.) Schum. A few years later, in *Pflanzenf.* 3^o: 98. 1895, where Schumann wrote the account of the Sterculiaceae he changed this to *Basiloxylon brasiliensis* (Allemão & Allemão) Schum., without mentioning *B. rex*.

The next mention of the complex in America is in "Flora of Guatemala" where attention is called to a tree belonging here but with inadequate material. Standley, who wrote the note in "Flora of Guatemala," called attention to the similitarty of *Pterygota* and *Basiloxylon*.

In 1952 Dr. Cuatrecasas described *Pterygota colombiana*, a Colombian species with quite distinct leaves (very similar to those of specimens called *Sterculia pruriens* Schum.) but still with winged seeds.

Standley and myself described *Basiloxylon excelsum* in 1952, bringing to three the number of species of the complex in America.

Kostermans (Reinwardtia 5: 415-417, fig. 1961) wrote a short note, rather loosely worded, about the group. He transferred *Basiloxylon excelsum* to *Pterygota*, even though he felt the species would prove to be the same as *P. brasiliensis*.

There has now come to hand additional material of the complex from Peru, and I saw trees of the species there in December, 1966. An attempt to place the plant has brought a review of the American kinds.

I feel now that Standley was correct in suggesting that *Basiloxylon* perhaps was not distinct from *Pterygota*. Even to follow Bentham & Hooker (Gen. Pl. 1: 218. 1862) and place *Pterygota* in *Sterculia* has some merit. The seeds of *Pterygota* are winged, those of *Sterculia* are not. *Pterygota* seems to have a large number of seeds in each cell of the ovary while those of *Sterculia* seem to be limited in number.

Pterygota brasiliensis Allemão & Allemão¹ (*Basiloxylon brasiliense* Schum.) is known to me only from eastern Brazil and apparently does not get into the Amazon basin. It is easily distinguished on leaf characters from the other American species.

Pterygota excelsa (Standl. & L. Wms.) Kostermans (*Basiloxylon excelsum* Standl. & L. Wms.) is the only species of the complex known in North America. It is easily distinguished from the two previously described species, both in morphology and range. It occurs in Guatemala and Costa Rica. Contrary to Kostermans' statement the species was not described from fruit only, but Kostermans mentioned leaves in the next sentence.

There has now appeared abundant material of another species from Amazonian Peru. This species is more closely related to *P. excelsa* from Central America than it is to *P. brasiliensis* from eastern South America. This is not an unnatural distribution, although perhaps somewhat unusual. Furthermore, Tobías Lasser has reported that fruits of this genus have been found in Venezuela.

The genus *Pterygota* encompasses a large geographical area with relatively few species. Ceylon, India and China have two species; southeast Asia has five described species; there are ten described

¹ Neither Schumann nor Kostermans, if they saw the original publication, noticed that there were two authors, Francisco and Manuel Friere Allemão, given on the dust cover.

from tropical Africa; and two more from Madagascar. There are now three species known from South America, one from eastern Brazil and two from the Amazon drainage. There is a single species known in North America.

***Pterygota amazonica* L. Wms. sp. nov.**

Arbor excelsa 45 metralis vel ultra. Ramis peltato-pubescent, glabrescens; folia longipetiolata, glabra vel obscure peltato-pubescent, glabrescens, late ovata vel late obovata, basi truncata vel subcordata, apice abrupte et breviter acuminata; fructus magnus, lignosus, transverse ovalis et apiculatis; semina plusminusve 20, alata, parte seminifera incrassata.

Tall deciduous forest trees to about 45 m. and about 1 m. in diameter, mature trees in the forest with branches only near the top; branchlets terete or minutely striate when dry, obscurely pubescent with minute peltate scales, these soon deciduous, apparently leafy only near the apex; leaves long petiolate, the petioles 6–10 cm. long and about 0.2 cm. in diameter, glabrous or with minute peltate scales, soon glabrous, slightly thickened toward the apex; leaf blades from broadly ovate to broadly obovate, broadest at or slightly above the middle, truncate or slightly cordate at the base, the apex with a broad short acumen mostly less than 1 cm. long; mature leaves 14–19 cm. long and 12–15 cm. broad, with 5 prominent palmate nerves at the base, the pair near the mid-nerve with 3–5 lateral nerves *only* on the outer side, main nerve with 3–4 pairs of lateral nerves, these without prominent lateral (tertiary) veins, veinlets between nerves nearly at a right angle to the veins; the axils of the secondary veins at attachment with flap-like structures almost always have been inhabited by insects and galls formed there, flaps also formed in the axils of the veins at apex of petiole (these mostly not inhabited); inflorescences axillary, few-flowered, relatively short; fruit large, woody, borne on a long stipe, transversely ovoid and apiculate, surface fuscous, farinaceous or minutely stellate tomentose, about 10–12 cm. long from stipe to apex and about 10 cm. thick parallel to suture, about 6 cm. thick contrary to suture; seeds about 20, 6–7 cm. long and 2–2.5 cm. broad including the brown spongy wing, narrowly oblong or oblong-oblongate, the fertile base thick and hard.

Peru: "paujilruru." Arbol 44 metros de alto y de 1 metro de diámetro, bosque seco tropical, carretera a Tournavista, distrito Honoria, provincia Pachitea, departamento de Huanuco, altitud 280 metros sobre nivel del mar, 22 setiembre 1965, *Eduardo Jenssen S. 44* (type for mature leaves, F); el mismo árbol con frutos pardo oscuros, 15 julio 1965, *Eduardo Jenssen S. 36* (type for mature fruits, F); el mismo árbol flores (inmaduras) en pequeños racimos axilares, 31 julio 1965, *Eduardo Jenssen S. 37*. [*Todas las colecciones citadas el Ing. Jenssen colectó de un sólo árbol. Este árbol tenía el número 64-P, para record en el bosque.*]

The three collections and wood samples were made from the same tree by Ing. Jenssen. For purposes of record the tree in the forest was numbered 64-P. The species is said by Ing. Jenssen to



FIG. 2. *Pterygota amazonica* L. Wms. A, branchlet, $\times \frac{1}{2}$. B, mature fruit from the side, $\times \frac{1}{2}$. C, mature fruit showing suture. D, winged seed, $\times \frac{1}{2}$.

be used commonly for lumber. The locality given is along the Río Pachitea about 20 km. above its confluence with Río Ucuyalí.

Pterygota amazonica is closely allied to *P. excelsa* of Central America. The difference in localities covers a large part of neotropical rain forest area, but it may be assumed that the great gap will eventually be lessened as knowledge of the neotropics increases. The fruits of *P. amazonica* are larger and differently shaped than those of *P. excelsa*, the seeds are smaller, the wings much narrower, and more symmetrical.

The leaves in the two species are very similar; in *P. amazonica* there are five veins from the apex of the petiole and only the pair near the mid-nerve produces lateral veins on the outer side; in *P. excelsa* there are seven veins from the apex of the petiole and the two pairs nearest the mid-rib produce lateral veins; the "flaps" at the juncture of the veins in *P. amazonica* are apparently more prominent and most had been inhabited by insects and galls formed, in *P. excelsa* the "flaps" are prominent but none on an isotype had been inhabited.

STYRACEAE

The Styraceae was revised by Miss J. Perkins for Engler's Pflanzenreich IV. 241: 1-111. 1907. There were accepted in this revision some one hundred species for the world. The number of these credited to Mexico, Central America and Panama were relatively few and more than half were described by Miss Perkins. All those for Central America as well as those described from Mexico were studied in the preparation of the manuscript for the "Flora of Guatemala." A revision of the American species of *Styrax* should prove interesting and quite possibly would provide results different from those which I arrived at in the study of the group for "Flora of Guatemala."

There follows a list of the names that have been applied to Central American species and of some Mexican ones where floristic relationship is to Central America.

Styrax argenteus Presl, Rel. Haenk. 2: 60. 1836.

This is the oldest name for what seems to me to be the common and widespread species of Mexico and Central America. The type was collected by Haenke near "Acapulco," Mexico.

Styrax conterminus Donn.-Sm. Bot. Gaz. 18: 5. 1893.

This species is a good one and relatively easily distinguished. It is known to me from Mexico, Guatemala (type, *Heyde & Lux 2915*) and El Salvador.

***Styrax glabrescens* Benth., Pl. Hartw. 66. 1839.**

This species is like no other in Central America and is easily distinguished by the imbricated, not valvate, corolla lobes. There are species in Mexico to which it is related. There is a minor pubescent variety in Mexico and it should be found in Guatemala. The typical variety is known from Mexico (from whence the type), Guatemala and Costa Rica.

***Styrax glabrescens* var. *pilosa* Perkins, Pflanzenr. IV. 241: 72. 1907. *S. pilosa* Standl. Contr. U. S. Nat. Herb. 23: 1129. 1924.**

The type of this Mexican variety no longer exists. An isotype, *Galeotti 2852*, is in Field Museum. It seems to be referable to *S. argenteus* Presl.

***Styrax guatemalensis* Donn.-Sm. Bot. Gaz. 15: 27. 1890,** described from Alta Verapaz is a synonym of *S. glabrescens* Benth.

***Styrax hintonii* Bullock, Kew Bull. 1936: 9. 1936,** collected by Hinton in Mexico is quite typical *S. argenteus* Presl.

***Styrax magnus* Lundell, Bull. Torr. Bot. Club 66: 600. 1939,** was collected on Tacaná Volcano by Matuda, N° 2982. It seems to be a large leafed form of *S. argenteus*.

***Styrax myristicifolius* Perkins in Engler, Bot. Jahrb. 31: 481. 1902.**

Two specimens are cited in the original publication, *Warscewicz s.n.* from Panama and *Heyde & Lux 6182* from Guatemala. No type was chosen but a reference is made to a publication where the *Heyde & Lux* specimen is given. The specimens in the Berlin Herbarium no longer exist but it seems reasonable to select the *Heyde & Lux* collection as representing the type. *I select Heyde & Lux 6182 from Guatemala and designate the specimen in Field Museum as lectotype!* The species is a synonym of *S. argenteus* Presl.

***Styrax panamensis* Standl. Contr. U. S. Nat. Herb. 18: 121. 1916.**

I have seen no material of this species.

Styrax pilosus (Perkins) Standl. Contr. U. S. Nat. Herb. 23: 1129. 1924. See *S. glabrescens* var. *pilosus*.

Styrax polyanthus Perkins in Engler, Bot. Jahrb. 31: 479. 1901.

The type collection is *Warscewicz 40* from Costa Rica or Panama. The type in the Berlin herbarium was destroyed. A photograph of the type (Field Neg. 4320) and a fragment of the type is in Field Museum. It is designated **lectotype**. The name is a synonym of *S. argenteus* Presl.

Styrax polyneurus Perkins ex Donn.-Sm. Bot. Gaz. 35: 5. 1903.

The type collection is *Tonduz 11744* from Costa Rica. A fragment is in Field Museum. The species is a synonym of *S. argenteus* Presl.

Styrax punctatum Donn.-Sm. appears in the Gray card index, not DC. The name is not published but can be easily traced to *S. myristicifolius* Perkins, a synonym of *S. argenteus* Presl.

Styrax punctatum DC. has been credited to Central America. It is Brazilian.

Styrax vulcanicola Standl. & Steyerl. Field Mus. Bot. 22: 264. 1940.

The type from Guatemala, *Steyerl 36801*, is an immature specimen with relatively large leaves. It is probably the same form as *S. magnus* Lundell and I believe it to be a synonym of *S. argenteus* Presl.

Styrax warscewiczii Perkins in Engler, Bot. Jahrb. 31: 480. 1901.

The type is *Warscewicz 203* from Veraguas, Panama. I have seen no authentic material of the species.

There are a number of Mexican species the names of which have never been applied to Central American specimens, nor could they have effect on the names used in "Flora of Guatemala": *Styrax cyathocalyx* Perkins; *S. diplotrichus* Diels; *S. jaliscanus* S. Wats.; *S. micranthus* Perkins; *S. orizabensis* Perkins; *S. ramirezii* Greenm. var. *micranthus* Perkins and var. *orizabensis* Perkins.

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COMPILED BY
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