

STUDIES OF MEXICAN AND CENTRAL AMERICAN PLANTS—IV¹

C. L. Lundell

During July, 1937, the writer and Mrs. Lundell botanized along the Laredo-Mexico City highway as far south as Santa Ana, Hidalgo. A week was spent at Tamazunchale, San Luis Potosí, where the largest series of plants was obtained.

Observations were made to determine the approximate north and south boundaries of the plant formations. From Laredo to Ciudad Victoria, Tamaulipas, xerophytic thickets 2 to 6 meters high predominate. The characteristic plants include *Leucophyllum frutescens* (Berlandier) Johnston (*L. texanum* Benth.), *Cassia Greggii* A. Gray, and several species of *Acacia*. South of Ciudad Victoria and extending almost to Tamazunchale, San Luis Potosí, there is a wide belt of transitional vegetation which approaches, in areas such as Galeana Canyon, wet tropical growth. Much of the region has been cleared for *potreros*, and such areas are largely overgrown with *Guazuma ulmifolia* Lam. Considerable stands of *Sabal* remain in the wet lowlands.

At Tamazunchale, areas of wet forest, although largely secondary, bear a striking resemblance to certain areas of forest in Campeche and the Department of Petén, Guatemala. A few of the outstanding collections are noted below, and a complete list will be published later. A number of plants, not known previously outside of the Yucatan Peninsula, are common in the Huastec country.

At Tamazunchale the ascent to the central plateau begins. Near Chapulhuacan, Hidalgo, at an altitude of 1,000 meters, *Liquidambar* and *Quercus* become conspicuous. Beyond Chapulhuacan, *Liquidambar styraciflua* L. forms almost solid stands on undisturbed peaks. Northeastern Hidalgo, at least as far as Jacala, is covered with wet mountain forest, now largely secondary.

¹Contribution from the Herbarium of the University of Michigan.

Of the four novelties described below, two are from San Luis Potosí, and two from British Honduras. Of outstanding interest is the new species of *Carpodiptera*, this West Indian and African genus not having been recorded previously from Mexico and Central America. Distributional and economic notes are given for seven other species.

GRAMINEAE

Olyra yucatanica Chase

This perennial grass, common in the forests of the Yucatan Peninsula, but not known heretofore outside of that area, may now be reported from the Huastec country: Tamazunchale, San Luis Potosí, Mexico, *C. L. & Amelia A. Lundell* 7238 (det. Swallen), collected in forest on hillside, July 14, 1937.

ARISTOLOCHIACEAE

Aristolochia rhizantha Lundell, sp. nov.

Fruticosa, brunneo-hirsuta, 2—3 m. alta. Folia subcoriacea, breviter petiolata, petiolo crassiusculo 8—11 mm. longo; lamina late elliptica vel suborbicularia, 18.5—24 cm. longa, 12—18.5 cm. lata, apice apiculata, basi rotundata vel subcordata, supra rugosa, demum glabrata, subtus hirsuta, crassinervia, prominenter reticulata. Calyx 4.5—6 cm. longus, extus breviter hirsutus, intus glabratus, limbo in lobos 3 fisso. Stamina 6. Capsula brunneo-hirsuta, oblonga, 4—4.5 cm. longa.

A clambering, unbranched shrub, 2 to 3 m. high, with floriferous rhizomes; stems brown-hirsute, striate. Leaves subcoriaceous, large; petioles thick, 8 to 11 mm. long, hirsute; blades broadly elliptical or suborbicular, 18.5 to 24 cm. long, 12 to 18.5 cm. wide, apex abruptly but broadly apiculate, base rounded or shallowly cordate, sparingly hirsute above at first, glabrate with age, coarsely rugose, persistently hirsute beneath, strongly reticulate veined, the lateral nerves 7 to 9 on each side. Flowers in axillary racemes, or borne on lax protruding branches of rhizomes; the axillary racemes brown-hirsute, few-flowered, about 7 cm. long; pedicels 1 to 1.5 cm. long, brown-hirsute; calyx reddish-brown, 4.5 to 6 cm. long, short-hirsute, glabrous within, the tube 1 to 1.3 cm. long, the limb cleft at apex into three slender acuminate lobes as much as 1.8 cm. long; stamens 6, in three pairs adnate to stigma lobes; stigma deeply 3-lobed, the lobes thick, rounded at apex; ovary densely brown-hirsute. Capsules sparingly hirsute with age, oblong, 4 to 4.5 cm. long.

Type in the Herbarium of the University of Michigan, *C. L. & Amelia A. Lundell* 7257, collected in low forest on hillside, Tamazunchale, San Luis Potosí, Mexico, July 15, 1937.

A. rhizantha is a very distinct species noteworthy for its floriferous rhizomes and large rugose, strongly veined, hir-

sute leaves. The weak protruding branches of the rhizomes extend as much as two feet from the stem of the plant, bearing flowers and fruits half concealed by leaves and humus.

SIMARUBACEAE

Picramnia xalapensis Planch.

The shrub has been known only from the type locality, Jalapa, Vera Cruz. Another locality, considerably extending its range, may now be recorded: above Chapulhuacan, Hidalgo, Mexico, *C. L. & Amelia A. Lundell 7195* (flowers), collected in west *Liquidambar styraciflua* forest on July 12, 1937, at altitude of 1,300 meters.

BURSERACEAE

Protium multiramiflorum Lundell, sp. nov.

Arbor glabra, 10—13-metralis. Folia glabra, 12—26 cm. longa, 2.5—6 cm. longe petiolata. Foliola 3-7; lamina subcoriacea, oblonga vel ovato-oblonga, 5.5—12.5 cm. longa, 2.4—5.4 cm. lata, apice breviter acuminata. Inflorescentiae glabrae, paniculatae, multiflorae, 2—7 cm. longae. Flores glabri; pedicellis 1—3 mm. longis. Calyx 4-, raro 5-partitus. Petala 4, raro 5, ovata, 2.8—3.3 mm. longa, 1.7—2 mm. lata, acutiuscula. Stamina 8; filamentis 1—1.3 mm. longis. Ovarium glabrum.

A glabrous medium-sized tree 15 to 22.5 cm. in diameter and 10 to 13 m. high with long straight bole; cortex reddish. Leaves glabrous, 12 to 26 cm. long, leaflets 3 to 7; petioles 2.5 to 6 cm. long, petiolules of lateral leaflets 4 to 13 mm. long, those of terminal leaflets 13 to 27 mm. long; blades subcoriaceous, oblong or ovate-oblong, 5.5 to 12.5 cm. long, 2.4 to 5.4 cm. wide, abruptly short-acuminate, the acumen acutish, base acute or abruptly acutish; costa and lateral nerves conspicuous on both surfaces, lateral nerves 8 to 16 on each side. Inflorescence glabrous, paniculate, much-branched from the base, many-flowered, 2 to 7 cm. long. Flowers glabrous, cream-colored, the pedicel 1 to 3 mm. long. Calyx 4- rarely 5-lobed, the lobes depressed-ovate, 1, to 1.5 mm. wide, acutish, obscurely ciliolate under a high power microscope lens. Petals 4, rarely 5, ovate, 2.8 to 3.3 mm. long, 1.7 to 2 mm. wide, acutish, obscurely ciliolate under a high power microscope lens, glabrous otherwise. Stamens 8; filaments 1 to 1.3 mm. long; anthers about 0.6 mm. long. Disk thick, 8-crenate. Ovary glabrous, small, 4-celled, surrounded at base by disk. Style short, thick.

Type in the Herbarium of the University of Michigan, *C. L. Lundell 6212*, collected in advanced valley forest at Valentin, El Cayo District, British Honduras, June 24, 1936; vernacular name "*copal colorado*."

Additional specimens examined: BRITISH HONDURAS: Toledo District, Westmoreland, *Schipp 1021*.

In the vicinity of Valentin, *P. multiramiflorum* is abundant in advanced, valley forest. It is related perhaps to *P. panamense* (Rose) I. M. Johnston, but may be separated at once from that species by its smaller leaves and much-branched, many-flowered inflorescence.

Protium Schippii Lundell, sp. nov.

Arbor, 10-metralis; ramulis puberulis. Folia 3- vel 5-foliolata vel simplicia, petiolis et petiolulis puberulis; lamina chartacea, elliptico-oblonga vel ovato-oblonga, 7.5—14 cm. longa, 3.2—5 cm. lata, apice obtuse acuminata, basi acutiuscula vel cuneata, supra, secus costas puberula. Inflorescentiae paniculatae, 1—3 cm. longae, puberulae. Pedicelli ca. 1 mm. longi. Calyx 4-partitus. Petala 4, ovata, 2.2—2.4 mm. longa, 1.1—1.3 mm. lata, apice acuta, adpresse puberula. Stamina 8; filamentis ca. 1.1 mm. longis. Ovarium 4-loculare, rufo-pilosum.

A medium-sized tree 22.5 cm. in diameter and 10 m. high; branchlets tan, striate, puberulent. Leaves simple or 3- or 5-foliolate; petioles and petiolules puberulent, petioles of simple leaves 10 to 15 mm. long, petioles of pinnate leaves 15 to 30 mm. long, petiolules of lateral leaflets 3 to 8 mm. long, those of terminal leaflet very slender, 15 to 24 mm. long; blades chartaceous, glabrous except along the costa, elliptic-oblong or ovate-oblong, 7.5 to 14 cm. long, 3.2 to 5 cm. wide, abruptly acuminate, the acumen obtusish, base acutish to cuneate; costa prominent above, puberulent, prominent beneath, glabrescent with age, lateral nerves prominent beneath, 9 to 12 on each side. Inflorescence very small, axillary, paniculate, 1 to 3 cm. long, puberulent. Flowers cream-colored, subsessile, the pedicel 1 mm. long or less. Calyx 4-lobed, the lobes depressed-ovate, about 1.2 mm. wide, acutish, bearing a few short appressed hairs. Petals 4, ovate, 2.2 to 2.4 mm. long, 1.1 to 1.3 mm. wide, acute, pubescent on both sides with scattered appressed reddish hairs. Stamens 8; filaments about 1.1 mm. long; anthers about 0.45 mm. long. Disk thick, 8-crenate. Ovary small, nearly submerged in the disk, pubescent with reddish hairs, 4-celled. Style short, thick. Dry immature fruits ovoid, 16 to 19 mm. long, apiculate, 1- or 2-seeded.

Type in the Herbarium of the University of Michigan, W. A. Schipp 973 (flowers), collected at 22 Mile, Stann Creek Railway, Stann Creek District, British Honduras, June 6, 1932.

Additional specimens examined: BRITISH HONDURAS: Stann Creek District, Middlesex, Schipp 229 (fruits), July 10, 1929.

The species is described by the collector as a medium-sized tree 10 m. high and 15 to 22.5 cm. in diameter; flowers cream, fruits red. Common along river banks in open places and in primary forest.

Another collection from southern British Honduras, Schipp 1038 from Punta Gorda, Toledo District, differs in having longer floral pedicels and leaves with 3 to 7 leaflets,

the blades of lateral leaflets lanceolate, the terminal ones narrowly elliptic-oblong, sparingly pubescent on both surfaces at first with loose reddish hairs, but glabrous very early except along the persistently puberulent costa and lateral nerves.

From description, *P. Schippii* appears to be closely related to *P. costaricensis* (Rose) Engler. It is noteworthy in having some simple leaves.

VITACEAE

Ampelocissus Erdwendbergii Planch.

In a recent account of the continental North American species of *Ampelocissus* (Carnegie Inst. Wash. Publ. 478: 214. 1937), the writer reported *A. Erdwendbergii* from Yucatan and Tamaulipas in Mexico, and the Department of Petén, Guatemala. Two additional state records for Mexico are now available: Cuitlahuac, Vera Cruz, *Eizi Matuda 1434* (flowers), May 16, 1937; Tamazunchale, San Luis Potosí, *C. L. & Amelia A. Lundell 7097* (fruits), a clambering shrub with acid edible fruits, collected in second growth on hillside, July 9, 1937. At Tamazunchale the species is abundant.

TILIACEAE

Carpodiptera Ameliae Lundell, sp. nov.

Arbor magnifica, 25 cm. diam., 25 m. alta. Folia 2—5.7 cm. longe petiolata, coriacea, laminis ovatis vel lanceolato-ovatis, 9.5—20 cm. longis, 5—9.5 cm. latis, apice obtusis vel obtuse acuminatis, basi subcordatis, utrinque lepidotis, e basi 5-nervibus. Inflorescentiae terminales, paniculatae, 10—20 cm. longae, multiflorae; pedicellis 5—11 mm. longis. Florium masculorum calyx ca. 5 mm. longus, 2- vel 3-partitus; petala obovato-spatulata, 8.5—10.5 mm. longa, 6—7 mm. lata, apice subtruncata vel emarginata; stamina 25-30. Florium femineorum (pseudo-hermaphroditum) calyx et petala ut in mare; staminodia 11-20; ovarium 4-lobatum, 2-loculare; stigmata 8-laminata, laminis pergrandibus amplis.

A magnificent tree 25 cm. in diameter and 25 m. high; branchlets minutely brown-lepidote. Leaves large, coriaceous; stipules very minute; petioles 2 to 5.7 cm. long, minutely and sparingly lepidote; blades ovate or lanceolate-ovate, 9.5 to 20 cm. long, 5 to 9.5 cm. wide, apex obtuse or acuminate, the acumen obtusish, base very shallowly cordate or rounded, minutely lepidote on both surfaces at first, barbate beneath in the axils of the nerves, 5-nerved at base. Inflorescence large, terminal, paniculate, 10 to 20 cm. long, much-branched, many-flowered, minutely tomentulose with stellate hairs; pedicels 5 to 11 mm. long. Staminate flowers: Calyx about 5 mm. long, deeply 2- or 3-lobed

at anthesis, densely and minutely tomentulose outside. Petals pinkish, drying purple, glabrous, obovate-spatulate, 8.5 to 10.5 mm. long, 6 to 7 mm. wide, apex subtruncate or emarginate, base short-clawed. Stamens 25 to 30, 2 to 3.2 mm. long, the filaments cohering at base. Pistillate flowers (pseudo-hermaphrodite): Calyx and corolla the same as in staminate flowers. Staminodia 11 to 20, biseriate, 1.5 to 2 mm. long, the filaments cohering or some free above. Ovary densely tomentulose, 4-lobed, 2-celled, with 1 pendulous ovule in each cell. Style short, tomentulose. Stigma large, white, 8-lobed, the lobes foliaceous erose. Fruits not known.

Type in the Herbarium of the University of Michigan, *C. L. & Amelia A. Lundell 7197* (pistillate flowers), collected in valley forest along Rio Moctezuma, near Tamazunchale, San Luis Potosí, Mexico, July 13, 1937; vernacular name "*telcon*."

Additional specimens examined: BRITISH HONDURAS: Belize District, Gracie Rock, Sibun River, *Percy H. Gentle 1691* (staminate flowers), July 22, 1935; a tree 37 cm. in diameter, growing in forest on top of limestone hill; vernacular name "*mountain pear*."

C. Ameliae differs from *C. cubensis* Griseb. in its much larger flowers and leaves. It appears to be closer related to *C. floribunda* Urban and *C. Simonis* Urban. The petals of *C. floribunda* are narrower, the stamens and staminodia are more numerous, and the stigma is dissimilar. The inflorescence of *C. Simonis* is much smaller, and the species differs further in shape and size of leaves, larger calyx and corolla, and other minor characteristics.

The Gentle collection from British Honduras, distributed as *C. cubensis*, was the first record of the genus for continental North America. At Tamazunchale, San Luis Potosí, *C. Ameliae* was abundant and very conspicuous, its entire crown being a mass of attractive flowers during July. Several trees were noted in dooryards where they had been planted for ornament and shade. The finding of such an outstanding species in the two distant areas is just another example of the inadequacy of botanical exploration in the wet tropical lowlands of eastern Mexico and Central America.

The writer is indebted to the New York Botanical Garden for the loan of an isotype and other material of *C. cubensis*,

an isotype of *C. Simonis*, and specimens of *C. floribunda* and *C. hexoptera* Urban.

SAPOTACEAE

Achras Zapota L.

Forests of the Huastec country were formerly exploited for chicle, but little has been known concerning the source of the gum from that area. *Achras Zapota* is the only source of pure chicle, properly defined, in the Yucatan Peninsula, and I was able to determine from questioning of Indians who formerly bled chicle in the Pánuco River basin and from actual observations in the forest, that the same species was the source of chicle from that area. I found the tree growing naturally in wet, valley forest at Tamazunchale (*C. L. & Amelia A. Lundell* 7120) where it is called "zapote blanco."

Dipholis Stevensonii Standl.

In 1928 the writer collected sterile specimens of a tree called "red faisán" and "white faisán" (*Lundell* 688) at Camp 6, El Cayo District, British Honduras, which were identified by Dr. P. C. Standley as *Calocarpum viride* Pittier. The "faisán" is an important source of gum as Standley has reported (*Tropical Woods*, 31: 42. 1932; *Field Mus. Bot.* 12: 313, 1936). Unfortunately the "faisán" is not *C. viride*, but *Dipholis Stevensonii*. The leaves of *D. Stevensonii*, *Calocarpum viride*, and *C. mammosum* (L.) Pierre are very similar, and inasmuch as only sterile material was available, the misidentification can be easily accounted for.

Botanical explorations on the limestone plateau of southern British Honduras in 1936³ revealed the error. *D. Stevensonii*, known also as "zapote faisán," occurs in abundance throughout the advanced forest; it was collected twice at Valentin, El Cayo District (*Lundell* 6200, 6252). The tree reaches a diameter of 45 cm. and a height of 25 m.; the bole is long and straight, and the bark is very shallowly fissured. The bole is tapped by the same methods used in tapping *Achras Zapota*, and the yields of latex compare favorably with those obtained from the sapodilla.

²Lundell, C. L., Chicle exploitation in the sapodilla forest of the Yucatan Peninsula. *Field and Laboratory*, Vol. 2 (1933), pp. 15-21.

³The 1936 Carnegie-Michigan botanical expedition to British Honduras.

Achras Zapota occurs in abundance on the hills in the same area; the latex from the two trees is mixed about half and half, giving a gum somewhat inferior to pure chicle, but generally sold as chicle. The gum of *D. Stevensonii* is reported by Standley (Field Mus. Bot. 12: 314. 1936) to be called "*chicle faisán*."

"*Chicle bull*," "*chiquibul*," and "*crown gum*" are names often applied to the adulterated gums of southern British Honduras. Latex from *Achras Chicle* Pittier is apparently the chief adulterant in "*crown gum*."

Lucuma Durlandii Standl.

This tree, abundant in the sapodilla forest of the Department of Petén, Guatemala, and British Honduras, has not been known outside the Yucatan Peninsula. It may now be recorded from the Huastec country: Tamazunchale, San Luis Potosí, Mexico, *C. L. & Amelia A. Lundell 7199*, a tree 15 cm. in diameter and 12 m. high, growing in forest on slope of limestone hill; collected July 13, 1937.

Lucuma hypoglauca Standl.

The tree has been recorded from Salvador, the Yucatan Peninsula, and Vera Cruz. Another Mexican collection may now be reported: Tamazunchale, San Luis Potosí, *C. L. & Amelia A. Lundell 7128* (fruit), a tree 45 cm. in diameter and 20 m. high, fruits sessile, up to 9 cm. in diameter, edible; collected in wet forest.

In the Yucatan Peninsula, *L. hypoglauca* has been found only in cultivation, being valued for its fruits. At Tamazunchale it was one of the most abundant forest trees, having every appearance of being endemic. That the tree is native to the Huastec region is probable, hence its presence in cultivation southward is of considerable interest, further indicating ancient Indian practices of introducing economic plants from distant areas.