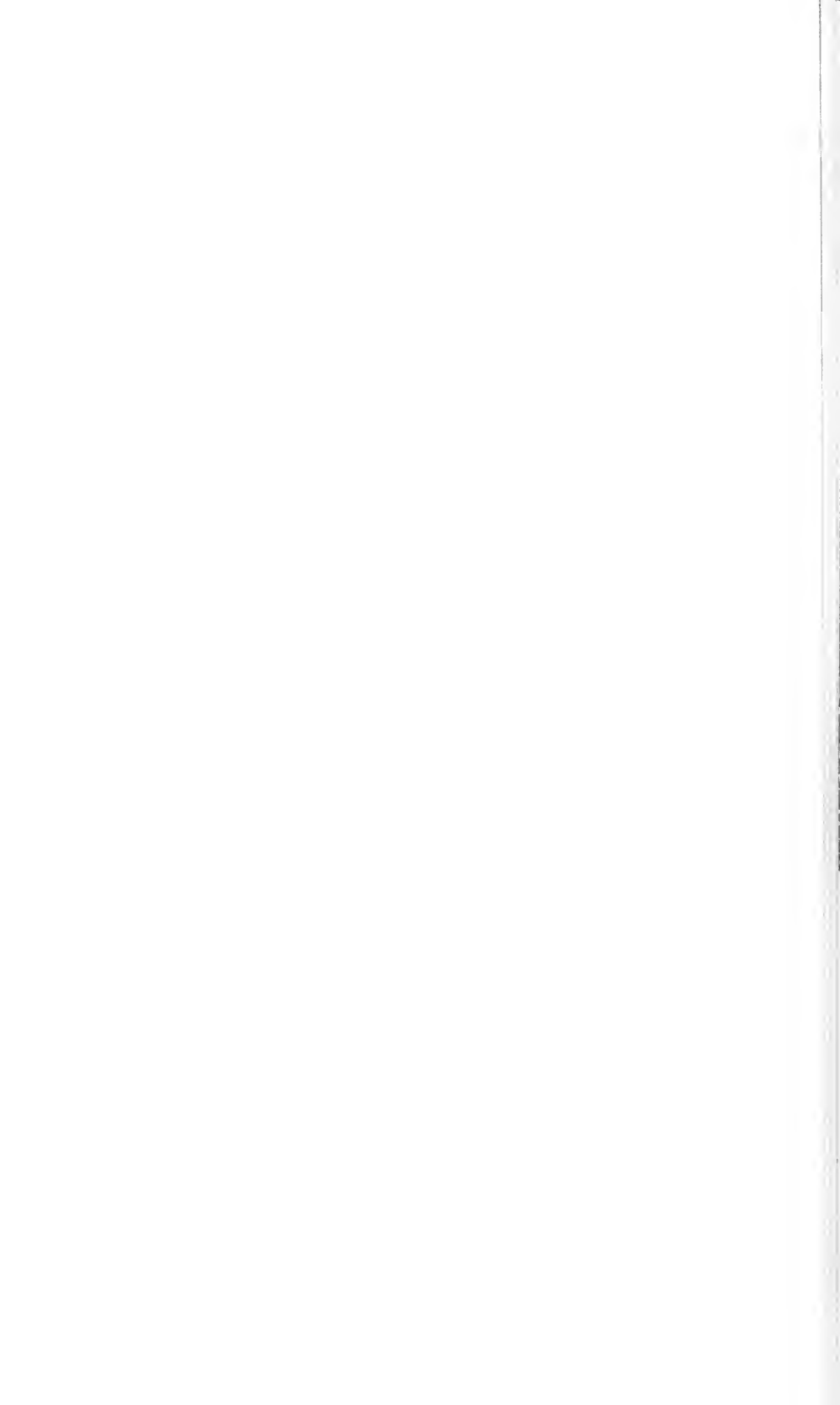


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FLORA OF GUATEMALA

PAUL C. STANDLEY

AND

LOUIS O. WILLIAMS

MAR 22 1968

University of Illinois

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FIELDIANA: BOTANY

VOLUME 24, PART VIII, NUMBER 3

Published by

FIELD MUSEUM OF NATURAL HISTORY

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FLORA OF GUATEMALA

PART VIII

FLORA OF GUATEMALA

PAUL C. STANDLEY

Late Curator of the Herbarium

AND

LOUIS O. WILLIAMS

Chief Curator, Botany, Field Museum of Natural History

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CONTENTS

Families Included in Part VIII, Number 3

	PAGE		PAGE
Sapotaceae	211	Symplocaceae	251
Ebenaceae	244	Styracaceae	258

ILLUSTRATIONS

FIGURE		PAGE
62.	<i>Bumelia obtusifolia</i> var. <i>buxifolia</i>	214
63.	<i>Chrysophyllum cainito</i>	217
64.	<i>Dipholis salicifolia</i>	221
65.	<i>Manilkara achras</i>	225
66.	<i>Mastichodendron capiri</i> var. <i>tempisque</i>	230
67.	<i>Micropholis mexicana</i>	233
68.	<i>Pouteria mammosa</i>	239
69.	<i>Diospyros nicaraguensis</i>	249
70.	<i>Symplocos bicolor</i>	253
71.	<i>Styrax argenteus</i>	259

Flora of Guatemala · Part VIII · Number 3

EBENALES¹

Trees or shrubs (generally dioecious in Ebenaceae) with usually alternate, simple, entire leaves; the corolla is sympetalous but sometimes the petals appear to be nearly free; the stamens are borne on the corolla in 2-3 series, often reduced to staminodes; the placentation is axile with 1-several seeds on the placentae; carpels 2-16, the ovary superior or half inferior or inferior (in Symplocaceae; some Styraceae, but not in ours).

The Ebenales are a small group, as treated by Engler and Diels, with four families in our area. These families represent both suborders:—the Sapotineae represented by the Sapotaceae with several genera,—the Diospyrineae represented by three families, Ebenaceae, Symplocaceae, and Styraceae,—each of which has but a single genus in our area.

Each of these families is remarkably homogeneous. The homogeneous character of the Sapotaceae has made the genera difficult to separate one from another. The rather extensive synonymy to be found among the Sapotaceae in Guatemala is largely due to the difficulty of delimiting genera. Fifty genera of Sapotaceae are given as valid in Della Torre and Harms' *Genera Siphonogamarum* (1907). Nearly the same number of genera have been published as new since 1907.

The remaining three families are not especially complicated in our region.

Some of the most beautiful trees of Central America belong to this order; outstanding are those of several genera of the Sapotaceae and members of the genus *Symplocos*. Plants of economic importance are abundant in the order, especially in the Sapotaceae.

SAPOTACEAE. Sapodilla Family

References: Paul C. Standley, An enumeration of the Sapotaceae of Central America, Trop. Woods 4: 1-11. 1925; Additions to the

¹ The field work and travel which was helpful in the preparation of this portion of *Flora of Guatemala* was made possible through a grant from National Science Foundation, which we are happy to acknowledge.

Sapotaceae of Central America, l.c. 31: 38–46. 1932. Arthur Cronquist, Studies in the Sapotaceae, II, Lloydia 9: 241–292. 1946; Studies in the Sapotaceae, III, Journ. Arn. Arb. 26: 425–471. 1945; Studies in the Sapotaceae, VI, Bull. Torr. Bot. Club 73: 465–471. 1946.

Shrubs or usually trees, often very large, sometimes armed with spines, the sap usually milky; leaves alternate, petiolate, entire, usually coriaceous; stipules none; flowers small, perfect or rarely polygamous, fasciculate in the leaf axils or on defoliated nodes below the leaves, whitish or yellowish; sepals 4–12, imbricate, broad, most often sericeous, frequently very unequal; corolla gamopetalous, lobate, with a usually short and broad tube, often bearing appendages between the lobes; stamens as many as the corolla lobes, often alternating with staminodia, the filaments distinct, inserted on the corolla tube; ovary sessile, 4–12-celled, the styles united; ovules solitary in the cells, anatropous; fruit baccate, small or often very large; seeds 1 or more in each fruit, often large, usually smooth and lustrous over most of the surface; embryo straight.

All of the genera of Sapotaceae found in North America are to be found in Guatemala. We have borrowed Cronquist's key to the North American genera, with his permission, to help separate the genera of our area.

The family is a large one in South America and also in the Old World. There are perhaps as many as 35 genera in the world.

The Sapotaceae are a well-marked and natural family which has had a reputation, with some reason, as one in which the generic units were difficult, if not impossible, to distinguish. We have accepted Dr. Cronquist's survey of the North American genera as a basis for the Sapotaceae of this flora. It seems to us the most logical separation of the family into generic units, so far as our area is concerned, that has been proposed.

From an economic standpoint the family is of importance in our region, as well as in the Yucatan Peninsula. Most important is the sapodilla (*Manilkara achras*) which furnishes the chicle of commerce, and in addition one of the better tropical fruits. Other members furnish quite acceptable fruits and useful gums. Woods of fair to good quality are found in the family, some of them exceedingly durable.

KEY TO THE NORTH AMERICAN GENERA OF SAPOTACEAE

(After Cronquist)

Sepals imbricate or spiraled, not distinctly biseriate except sometimes in *Pouteria*, and then 2 plus 2; appendages of the corolla-lobes lateral or absent.

Staminodia present (rarely suppressed in *Pouteria*, which has no endosperm).

Seed-scar basal or basilateral, not extending to the middle of the seed; ovules basilaterally attached; ovary glabrous or hairy.

Corolla-lobes without lateral lobes; endosperm present; ovary glabrous; leaves mostly well over 6 cm. long; unarmed. *Mastichodendron*.

Corolla-lobes bearing lateral lobes (absent in a few species of *Bumelia*), leaves often but not always less than 6 cm. long; frequently spiny or thorny.

Endosperm present; ovary nearly always glabrous; young fruit commonly abruptly tapering to the style; unarmed. *Dipholis*.

Endosperm absent; ovary usually hairy; young fruit commonly not at all tapering to the style, being rounded or truncate at the apex instead; usually spiny or thorny. *Bumelia*.

Seed-scar lateral, generally extending nearly or quite the whole length of the seed, or sometimes nearly the whole seed-coat more or less grown to the pericarp; ovules attached laterally, though sometimes near the base; ovary hairy.

Endosperm present; primary lateral veins of the leaves relatively numerous, crowded, and straight or nearly so, the leaf more or less striate.

Micropholis.

Endosperm absent; primary lateral veins fewer, more widely spaced, evidently curved at least near the margins, the leaf not striate. *Pouteria*.

Staminodia absent; endosperm present. *Chrysophyllum*.

Sepals biseriate, commonly 3 plus 3 (rarely 2 plus 2, occasionally 4 plus 4); corolla-lobes often but not always with paired dorsal appendages which resemble supernumerary lobes; endosperm present; seed-scar lateral. *Manilkara*.

BUMELIA Swartz

Reference: Arthur Cronquist, Studies in the Sapotaceae, III, Journ. Arn. Arb. 26: 447-471. 1945.

Shrubs or trees often or usually armed with spines, or the branches spinescent; leaves relatively small, often clustered at the nodes of the branches; flowers small, pedicellate, greenish or white, fasciculate in the leaf axils, mostly 5-merous; calyx deeply 5-parted, the sepals unequal; corolla 5-lobate, with a pair of lobe-like appendages at each sinus (in ours), the tube very short; stamens 5, inserted near the base of the corolla tube, the anthers sagittate; staminodia 5, petaloid; ovary 5-celled, the style filiform, usually pubescent; fruit a small berry, the pericarp fleshy and juicy; seed 1, erect, lustrous, the hilum basal.

Species about 25, chiefly in tropical America, but *Bumelia* is the only genus of the Sapotaceae to reach temperate North America, coming as far north as the Missouri River. The wood is yellowish, occasionally with a tinge of green or pink. The luster is medium, the specific gravity from 0.80 to 1.01. We do not know that the wood is used, except possibly for firewood and other minor purposes.

Fruits 1.5-2.5 cm. long. *B. pleistochasia*.

Fruits 0.6-1.5 cm. long.

Leaves borne in fascicles on fertile branches (occasionally scattered on vigorous sterile branches) *B. celastrina*.

Leaves not borne in fascicles on fertile branches (rarely so on old branches).

Pubescence of young leaves gray *B. obtusifolia* var. *buxifolia*.

Pubescence of young leaves rufous, or sericeous below, and tardily glabrate.

B. retusa var. *neglecta*.

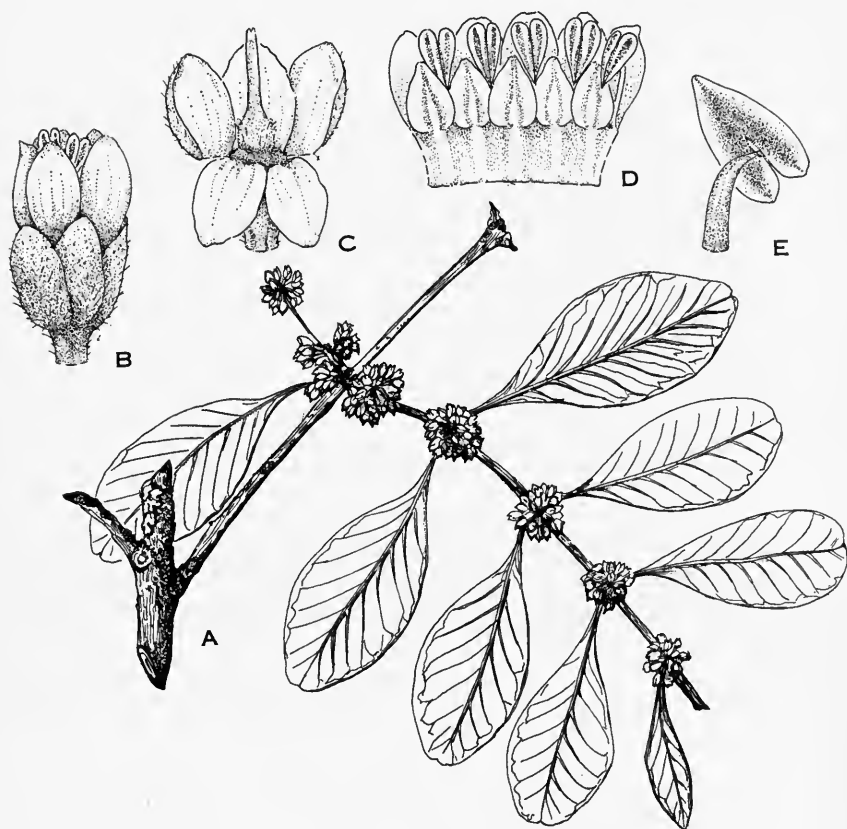


FIG. 62. *Bumelia obtusifolia* var. *buxifolia*. A, a branch, $\times \frac{1}{2}$. B, flower in natural position, $\times 5$. C, calyx opened to show ovary, $\times 5$. D, corolla opened out, $\times 5$. E, a stamen, $\times 10$.

Bumelia celastrina H.B.K., Nov. Gen. et Sp. 7: 212. 1825.
B. ferox Schlecht. & Cham. Linnaea 6: 392. 1831.

Dry, brushy, often rocky plains and hillsides, often in coastal thickets, 450 meters or less; Zacapa; Chiquimula; El Progreso; Escuintla; Retalhuleu; San Marcos; doubtless in all the Pacific coast departments. Southern United States; Mexico; Bahamas; El Salvador.

A densely branched shrub or small tree, seldom more than 9 meters high, glabrous throughout, the bark reddish gray, deeply fissured; branches armed with numerous slender or stout, short or long, sharp spines; leaves short-petiolate, cuneate-oblong, oblanceolate, or spatulate, coriaceous, rounded at the apex, attenuate to the base, mostly 2-5 cm. long and 0.3-2.5 cm. broad; flowers fasciculate, short-petiolate, white or cream-colored, glabrous; sepals oblong-elliptic, 2-2.5 mm. long;

corolla 3–4.5 mm. long, tube very short 0.8–1.2 mm. long, appendages of the corolla ovate-lanceolate, acute; staminodia ovate, acute, erose; fruit oval or ellipsoid, purple-black, 8–10 mm. long or smaller.

The Maya name of Yucatan is "*Hapuche*." In that region it is reported that the tree is sometimes tapped for chicle.

Bumelia obtusifolia R. & S. var. ***buxifolia*** (Roem. & Schult.) Miq. in Mart. Fl. Bras. 7: 47. 1863. *B. buxifolia* R. & S. Syst. Veg. 4: 802. 1819. *B. conglobata* Standl. Trop. Woods 31: 40. 1932 (type from Salamá, Kellerman 6588). *B. mayana* Standl. l.c. 41. *B. obtusifolia* subsp. *buxifolia* Cronquist, Journ. Arn. Arb. 26: 457. 1945. *Abalo* or *avalo*; *limonaria cimarrona*.

Moist forest and thickets, 850 meters or less; Petén; Baja Vera-paz; Zacapa. Mexico; British Honduras; El Salvador; Honduras; Nicaragua; northern South America.

Shrubs or trees to 14 m. Branches armed with sharp, stout spines, puberulent; leaves broadly elliptic to ovate or suborbicular, rounded at the apex and often emarginate, 2–8 cm. long and mostly 1–3.5 cm. broad, glabrous above, densely sericeous below; inflorescence a fascicle of 10–30 flowers, the pedicels 6–15 mm. long, sericeous; corolla 2.5–5.5 mm. long, sepals sericeous, 1.5–3 mm. long; staminodia ovate, petaloid; fruits subglobose, 8–15 mm. long.

Bumelia pleistochasia Donn.-Sm. Bot. Gaz. 18: 4. (type from San Lucas, Sacatépequez, *Donnell Smith 2184*); *B. leiogyna* Donn.-Sm., l.c. (type from Capetillo, Sacatépequez, *Donnell Smith 1451*); *B. megaphylla* Blake, Contr. Gray Herb. n. s. 52: 76. 1917. *Tempisquito*; *alfiler*; *morespino*.

Thickets and open forests, 500–2,000 meters; Petén; Escuintla; Sacatépequez; Guatemala; Jutiapa; Quezaltenango; San Marcos. Mexico through Central America to Venezuela.

Shrubs or trees often with relatively thick trunks, the branches armed with often slender spines; leaves elliptic to elliptic-lanceolate or ovate-oblong, acuminate, acute or somewhat obtuse, glabrous or nearly so, 5–12 cm. long and 2–5 cm. broad; inflorescence a fascicle of axillary flowers, the pedicels mostly about 2–3 mm. long; sepals puberulent or glabrescent, 2–4 mm. long; corolla 3–6 mm. long with the tube short and 1–2 mm. long, staminodia lanceolate to obovate, somewhat fimbriate; fruit oblong to subglobose, 1.5–2.5 cm. long.

Bumelia retusa Swartz, Prodr. Veg. Ind. Occ. 49. 1788.

In mangrove swamps, British Honduras (All Pines, *Schipp 585*); to be expected on the coast of Izabal. Yucatan Peninsula of Mexico; West Indies.

A tree of 6 meters, the trunk 10 cm. in diameter, the branches unarmed, rufous-sericeous at first; leaves short-petiolate, coriaceous, cuneate-obovate to or-

bicular-obovate, 2-5 cm. long, broadly rounded at the apex and often emarginate, cuneate-acute at the base or almost rounded, densely rufous-sericeous when young and usually abundantly sericeous even in age; flowers densely fasciculate, usually longer than the petioles, sericeous; sepals ovate or rounded, rounded at the apex, densely sericeous; corolla white, twice as long as the calyx; appendages of the corolla lanceolate, cuspidate, half as long as the corolla lobes; staminodia broadly ovate, serrate; fruit black at maturity, lustrous, glabrous, subglobose, broadly rounded at apex, about 8 mm. long.

The Maya name of Yucatan "*putsmucuy*."

Dr. Cronquist separates this as *Bumelia retusa* subsp. *neglecta* Cronquist (Journ. Arn. Arb. 26: 461. 1945, type *Schipp* 585 from All Pines, British Honduras). It has the flowers slightly larger than the typical form of the West Indies.

EXCLUDED

***Bumelia guatemalensis* Standl.** Trop. Woods 4: 9. 1925.

The type of this species is in the U. S. National Herbarium,—*Avalo*. white latex, El Paso, Petén, Guatemala, July 1925, *Durland* s.n. The type is a sterile undeterminable specimen. Dr. Cronquist apparently did not see the type for it bears no annotation and was placed by him, in synonymy, under both *B. persimilis* and *B. obtusifolia* var. *buxifolia*.

CHRYSOPHYLLUM L.

Reference: Arthur Cronquist, Studies in the Sapotaceae, I. Bull. Torr. Bot. Club 72: 191-204. 1945.

Usually large trees, unarmed; leaves persistent, alternate, more or less coriaceous, sericeous beneath (in Guatemalan species); flowers small, mostly 5-parted, in axillary or lateral fascicles; sepals subequal; corolla lobes not appendaged; stamens included; staminodia none; ovary pubescent, the style short; fruit a large or small berry, containing 1-several large seeds; seeds subterete or compressed, the testa hard, usually lustrous; endosperm carnose.

Species about 60, mostly in tropical America. One or two other species are known from southern Central America.

Fruit globose or depressed-globose, 5-8 cm. in diameter, several-seeded; leaves very densely covered beneath with lustrous, silky, rather dark brown hairs; corolla sericeous.....*C. cainito*.

Fruit oval, 1-2 cm. long, 1-seeded; leaves sericeous beneath with pale brown or grayish hairs; corolla glabrous.....*C. mexicanum*.

***Chrysophyllum cainito* L.** Sp. Pl. 192. 1753. *Caimito*. *Star-apple*.

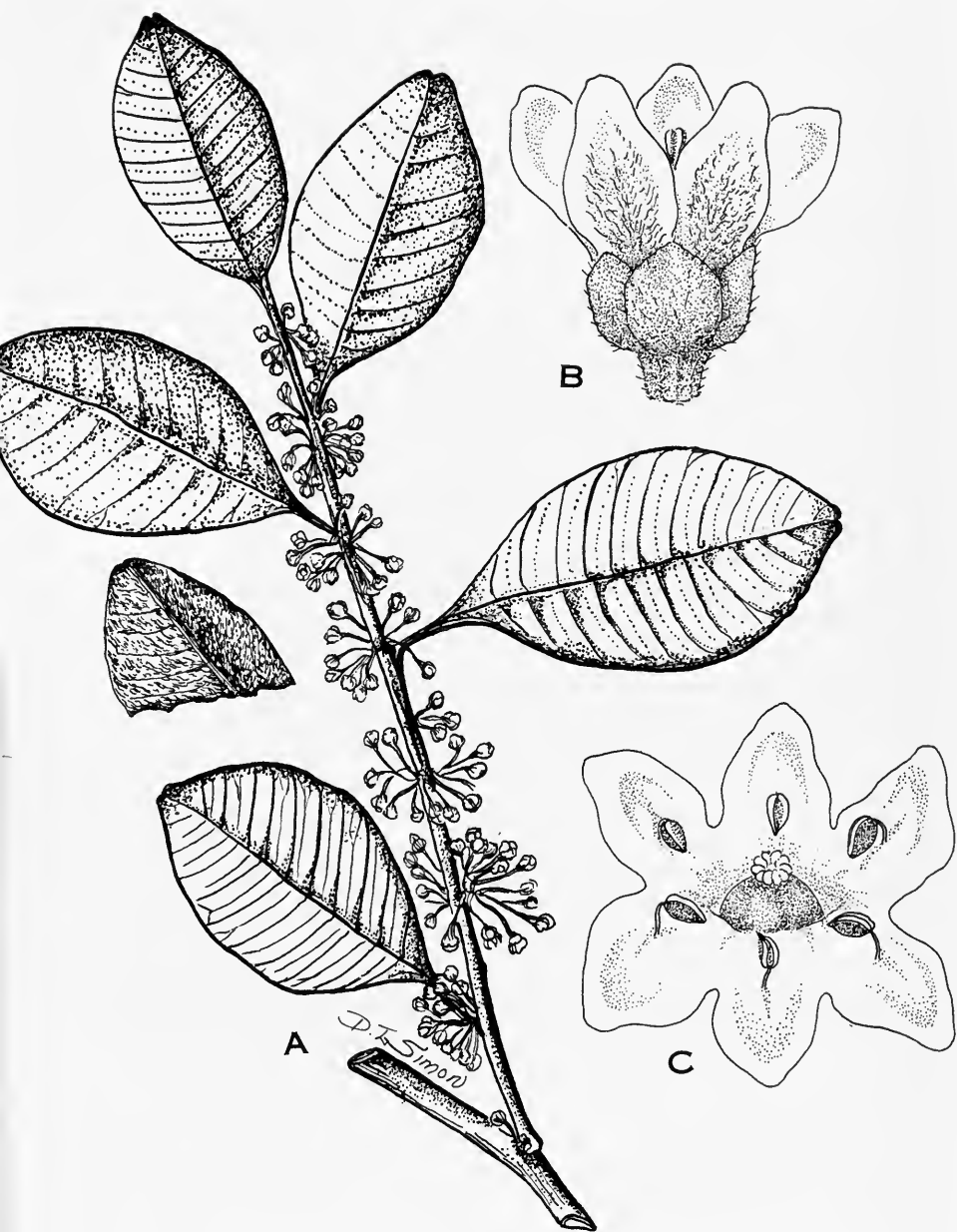


FIG. 63. *Chrysophyllum cainito*. A, Habit, $\times \frac{1}{2}$. B, Flower in natural position, $\times 5$. C, Corolla opened to show stamens and ovary, $\times 5$.

Cultivated commonly in all parts of the tierra caliente, at 900 meters or less, and sometimes found more or less naturalized, but not native in Central America; perhaps native in the West Indies, but possibly unknown in a truly wild state; native of America, but also planted in the Old World tropics.

A handsome tree, 8-30 meters high, with a dense spreading crown, the low trunk sometimes almost a meter in diameter, the branches densely brown-sericeous; leaves short-petiolate, elliptic to oblong-elliptic, subcoriaceous, 5-15 cm. long, deep green and glabrous above, densely brown-sericeous beneath, abruptly acute or obtuse, obtuse or subacute at the base; flowers purplish white or pale yellow, usually numerous in each fascicle, the pedicels about 1 cm. long; sepals 1.5 mm. long, densely brown-sericeous; corolla 3.5-5.5 mm. long, sericeous outside, 5-7-lobate, the lobes about equaling the tube; ovary 6-11-celled, tomentose; stamens shorter than the corolla lobes; fruit usually globose or depressed-globose, sometimes ellipsoid, 5-8 cm. broad or more, green or deep purple, several-seeded.

Called "*cayumito*" in Yucatan. The term "*caimito*" is probably of Antillean origin. El Caimital is a *caserio* of the Department of Suchitupéquez. It is noteworthy that no Nahuatl name is recorded for this tree, an indication that it probably was not found on the mainland at the time of the conquest. The star-apple receives its name from the fact that when the fruit is cut transversely, the several seeds are seen radiating like the points of a star. This is a favorite fruit in Central America, grown only in the lowlands and intermountain valleys, but often carried to the highland markets for sale. Most northern people find the sweet, somewhat milky, colorless flesh rather cloying or insipid, but the native people like its flavor. The tree is one of the handsomest of tropical shade trees. When the foliage is stirred by the wind, the lower surfaces of the leaves are exposed, causing what appear to be waves or ripples of gold to pass over the trees. There are great numbers of exceptionally tall and fine star-apple trees along the Pacific foothills of Guatemala.

The wood of this and related species is sometimes used locally for construction purposes but it is not exported. The heartwood varies from pale brown or pinkish to rather dark brown; luster rather low; hard and heavy, of medium texture and fairly straight grain; not difficult to work, finishes smoothly; of fair to good durability.

Chrysophyllum mexicanum Brandegees ex Standl. Contr. U. S. Nat. Herb. 23: 1114. 1924. *Siciya*, *zikiya* (Petén, Maya); *caimito*.

Moist or wet, mixed forest, on plains and hillsides, often on exposed rocky slopes, 1,700 meters or less, most common at low elevations; Petén; Alta Verapaz; Izabal; Zacapa; Chiquimula; Santa Rosa;

Escuintla; Guatemala; Baja Verapaz; Chimaltenango; Retalhuleu; Huehuetenango; Quezaltenango. Southern Mexico; British Honduras to Honduras and El Salvador.

A small to large tree, sometimes 23 meters high with a trunk 50 cm. in diameter, the bark fissured, the branches sericeous with whitish or brownish hairs; leaves petiolate, subcoriaceous, oblong to ovate or oval, 4-10 cm. long, acutish or short-acuminate, rounded to acute at the base, glabrous above, densely sericeous beneath with pale brownish or grayish hairs; fascicles few-flowered, the pedicels 5-10 mm. long, sericeous; sepals 1.5 mm. long, sericeous; corolla white, glabrous outside, 4-6 mm. long; ovary 5-celled; fruit purple-black, oval, 1-2 cm. long, 1-seeded.

Known in British Honduras as "*chicheh*" (Maya), "wild star-apple", and "damsel"; "*caimito morado*", "*zapotillo*", "*guayabillo*" (El Salvador); "*caimito silvestre*" (Yucatan); "*caimitillo*" (Veracruz); "*guayaba de danto*" (Honduras). The wood is employed in Veracruz for making ax handles. This is a wild tree, never cultivated, its fruit small and probably not eaten by man.

DIPHOLIS A. De Candolle

Reference: Arthur Cronquist, Studies in the Sapotaceae, III, Journ. Arn. Arb. 26: 435-445. 1945.

Trees or large shrubs with milky sap, unarmed; leaves alternate, persistent, more or less coriaceous; flowers small, whitish or greenish, often fragrant, in axillary or lateral fascicles; sepals ovate or suborbicular, imbricate; corolla rotate or funnellform, the lobes with 2 appendages at each sinus; stamens inserted on the corolla tube opposite the lobes, exerted, the filaments filiform, the anthers exserted; staminodia 5, often petaloid, alternate with the stamens; ovary glabrous, 5-celled, the ovules ascending, the style slender; fruit baccate, ovoid, subglobose, or oblong, usually 1-seeded; testa of the seed coriaceous, the endosperm carnose.

Species about 15, in tropical North America. One other species is found in southern Central America.

Leaves densely rufous-tomentose on the lower surface, rounded at the apex.

D. stvensonii.

Leaves glabrous or sericeous on the lower surface, apex acute, acuminate or rounded.

Leaves rounded at the apex, sericeous pubescent below, becoming glabrate.

D. matudae.

Leaves acute or acuminate, glabrous.

Sepals 3.5-4 mm. long; leaves thick and hard *D. durifolia.*

Sepals about 2 mm. long; leaves thin and flexible *D. salicifolia.*

Dipholis durifolia Standl. Carnegie Inst. Wash. Publ. 461: 78. 1935.

Known only from the type, on bare hilltops, Jacinto Hills, British Honduras, 210 meters, rare, *Schipp 1202*.

A tree of 12 meters, the trunk 12 cm. in diameter, the branchlets when young sericeous with intermixed gray and rufous hairs; leaves stiff-coriaceous, on petioles 18–25 mm. long, narrowly lance-oblong, 7.5–9 cm. long, 17–25 mm. broad, attenuate-acuminate, acute at the base, glabrous; flowers fasciculate in the leaf axils, creamy white, the pedicels 5–7 mm. long, rufous-tomentose, the buds ovoid, obtuse; sepals broadly ovate, obtuse, rufous-tomentose, 3.5–4 mm. long; corolla glabrous, the lobes short, broadly ovate, obtuse, the appendages ovate, acuminate, dentate; staminodia ovate, dentate; style short, glabrous; ovary ovoid, glabrous.

Dipholis matudae Lundell, Contr. Univ. Mich. Herb. 7: 43. 1942. *Sideroxylon matudai* Lundell, Phytologia 1: 221. 1937. *Sideroxylon steyermarkii* Standl. Field Mus. Bot. 22: 364. 1940 (type from Dept. Quezaltenango, *Steyermark 33858*). *Cacho de venado*.

Moist or wet, mixed forest, 500–1,300 meters; Suchitépéquez; Quezaltenango; San Marcos.

A tree 8–30 meters high with milky sap, the branchlets thick, sericeous when young; leaves subcoriaceous, rigid, on stout petioles 1–2 cm. long, oblanceolate-oblong or obovate-oblong, 10–21 cm. long, 3.5–9.5 cm. broad, obtuse or usually rounded at the apex, arcuately narrowed to the cuneate-acute base, glabrous above, slightly paler beneath, grayish-sericeous, often densely so, the lateral nerves 9–14 pairs, prominent; inflorescence fascicles of 10–40 flowers on defoliated nodes, the fruiting pedicels thick, 1.5–2 cm. long; sepals about 6, unequal, closely imbricate, glabrous or glabrate, 2.5–3 mm. long, obtuse or rounded at the apex; style stout, 2 mm. long; fruit 1-seeded, broadly ovoid, glabrous, lustrous when dry, 2 cm. long and 1.5 cm. broad, rounded at the base, pointed at the apex; seed 1, smooth, 1.5 cm. long, pale yellowish.

Dr. Cronquist has placed this species as a synonym of *Dipholis minutiflora*. However, we think that there is ample reason to maintain the species as distinct for the plant is one with much larger leaves and ones with different venation, differences in the inflorescence and flowers seem evident.

Dipholis salicifolia (L.) A. DC. Prodr. 8: 188. 1844. *Achras salicifolia* L. Sp. Pl. ed. 2. 470. 1762. *Bumelia persimilis* Hemsl. Biol. Cent. Am. Bot. 2: 298. 1881. *Tuulche*, *zitzya* (Petén, Maya).

Moist or wet savannas or hillsides, chiefly on limestone, 300 meters or less; Petén. Southern Florida; Mexico (Oaxaca and Veracruz to Yucatan); British Honduras; West Indies.

A small or large tree, sometimes 23 meters high with a trunk 1.5 meters in diameter, usually smaller, the scaly, young branches sericeous; leaves thin-coriaceous, short-petiolate, oblong to lanceolate, 6–12 cm. long, acute to long-acuminate at each end, glabrous in age, green and lustrous above, paler beneath; flowers whitish, the fascicles mostly shorter than the petioles, the pedicels 2–3 mm. long; sepals sericeous, 1.5 mm. long, ovate or oblong, obtuse; corolla 4 mm. long, the lobes oval,

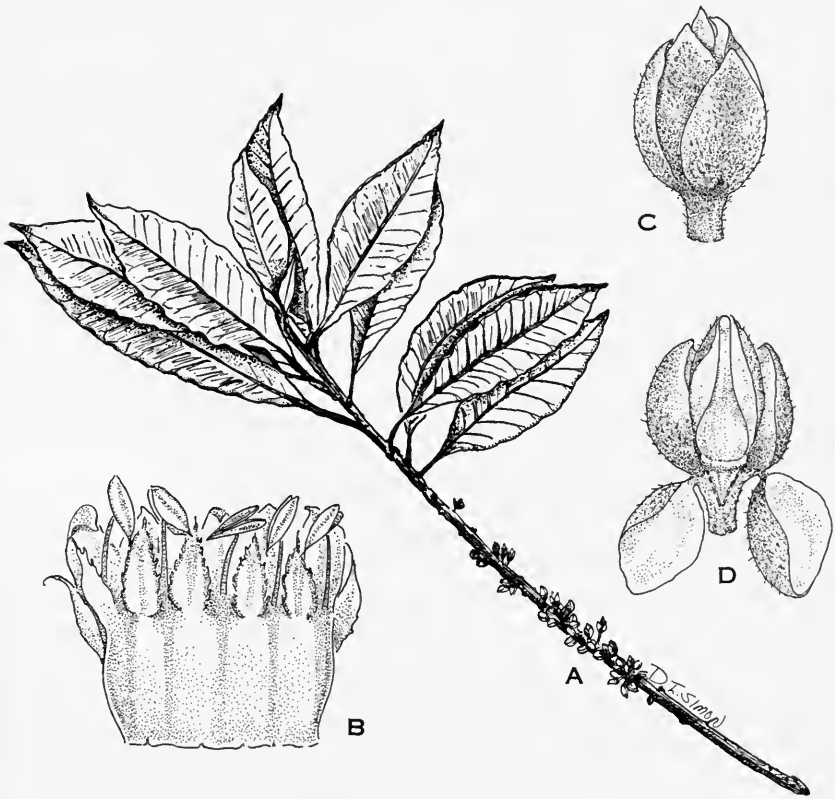


FIG. 64. *Dipholis salicifolia*. A, Habit, $\times \frac{1}{2}$. B, Corolla opened out, $\times 5$. C, Flower in natural position, $\times 5$. D, Flower dissected open to show ovary, $\times 5$.

obtuse, about equaling the tube, the appendages half as long; staminodia ovate, irregularly dentate; berry ovoid or globose, black, 6–8 mm. in diameter.

Known in British Honduras as “cháchiga” and “mijico”; “chacya”, “txitxya”, “tsiisyab”, “sac-chum” (Yucatan, Maya). The tree is said to be rich in chicle, and often to have been tapped by the *chicleros*. The heartwood of this and some of the related species is brownish to reddish-brown, not highly lustrous, odor not distinctive; taste somewhat bitter; very hard and heavy, the specific gravity 0.90 to 1.00; texture medium fine, the grain fairly straight, not difficult to work, finishing smoothly; durability fair to good. The wood is used locally for construction purposes.

Dipholis stevensonii Standl. Trop. Woods 11: 21. 1927 (type from Mopán region, British Honduras). *Sideroxylon rufotomentosum*

Standl. Carnegie Inst. Wash. Publ. 461: 79. 1935 (type from Camp 32, Petén on the border of British Honduras, *Schipp* 5674). *Zapote faisán*; *faisán*.

Moist or wet mixed upland forests, 850 meters or less; Petén. British Honduras.

A tree of 20–25 meters, the trunk 30–45 cm. in diameter, the branches thick, densely rufous-tomentose; petioles stout, 2.5–4.5 cm. long, rufous-tomentose; leaf blades broadly oblong to oval or oblong-obovate, 15–25 cm. long, 7–11 cm. broad, broadly rounded or very obtuse at the apex, slightly narrowed to the rounded or very obtuse base, subcoriaceous, when young covered with a dense, rather lax, rufous tomentum, in age glabrate above, some of the tomentum usually persisting beneath and conspicuous, the lateral nerves about 14 pairs, prominent; flowers fasciculate on old nodes below the leaves, the stout pedicels at first 1 cm. long or shorter, in age 1.5–2 cm. long; sepals about 6, ferruginous-tomentose, rounded or broadly ovate, 3–3.5 mm. long, rounded at the apex, ferruginous-tomentulose, the inner ones sericeous; fruit broadly oval, 2 cm. long, 1.5 cm. broad, broadly rounded at the base, the apex subtruncate, depressed, cap-like, sharply differentiated from the rest of the fruit, densely ferruginous-tomentose when young, glabrate in age; seed 1, oval, 1.5 cm. long, 1 cm. thick, narrowed to the obtuse ends, dark brown, slightly lustrous, smooth, the hilum oblique, pale, oval, 5 mm. long, 3 mm. broad.

Sometimes called “white faisán” or “red faisán.” The tree is tapped commonly for chicle, and its yield is said to compare favorably with that from *Manilkara achras*.

MANILKARA Adanson

Reference: Charles L. Gilly, Studies in the Sapotaceae, II. The sapodilla-nispero complex, Trop. Woods 73: 1–22. 1943.

Large trees, unarmed; leaves petiolate, coriaceous, usually with very numerous parallel lateral nerves, these slender and often obscure; flowers fasciculate in the leaf axils or at defoliated nodes, sometimes solitary, pedicellate, the pedicels much thickened in fruit; sepals 3, valvate in bud; petals 3, imbricate; androecium corona-like, tubular at the base; outer staminodia 18, free or united in groups of 3; stamens 6, inserted at the apex of the tube, the anthers extrorse, the 2 cells longitudinally dehiscent; inner staminodia 6; ovary pubescent, 12–6-celled, the cells 1-ovulate, the style glabrous; fruit baccate, several-seeded or by abortion 1-seeded; seeds compressed, lustrous, the testa crustaceous or chartaceous; scar of the seed lateral or subbasal, linear, equaling or shorter than the length of the seed.

A large genus distributed in the tropics of both hemispheres. The generic type is *Manilkara kauki* (L.) Dubard, an Old World species. The genus is important as an economic plant in Central America for from it comes chicle, the main ingredient of the ubiquitous chewing gum. One of the better tropical fruits comes from these trees,—*nispero*, *chico* or *chicozapote* or *sapodilla*.

In the revision of North American *Manilkaras* by Gilly, cited above, a dozen species are given. From a practical standpoint there are in Guatemala and elsewhere in Central America but two distinct species of chicle trees, one that we call here *Manilkara achras*, following Fosberg's recent note, and *M. chicle*. The species of *Manilkara* given by Gilly are listed here and we have adapted his key to our purpose.

We have followed Gilly in his nomenclature for the flower parts, which is unlike that employed here for other genera of this family. His outer and inner perianth segments, i.e., sepals and petals, are usually called sepals; his outer staminodia are the corolla and corolla appendages of most authors; while his inner staminodia have usually been termed merely staminodia.

Petaloid or subpetaloid exterior staminodia 18, united in groups of 3 for one-fifth to three-fifths their length.

Inner staminodia minute, truncate, inflexed; lateral pair of each group of outer staminodia longer than the median lobes *M. staminodella*.

Inner staminodia erect, bifid at the apex; lateral pair of each group of outer staminodia shorter than the median lobe *M. striata*.

Petaloid exterior staminodia fused in groups of 3, thus appearing to be only 6, these compound staminodia apically entire, or 3-dentate for not more than one-fifth their length.

Corona tube not more than half the length of the exterior staminodia; flowers fasciculate in the leaf axils. *M. chicle*.

Corona tube of essentially the same length as the exterior staminodia, or longer; flowers solitary in the leaf axils.

Outer surface of the corona tube and inner staminodia completely glabrous. *M. achras*.

Outer surface of both corona tube and inner staminodia pubescent. *M. breviloba*.

Manilkara achras (Mill.) Fosberg, Taxon 13: 254. 1964. *Achras zapota* L. Syst. Nat. ed. 10. 2: 988. 1759, non Linnaeus 1753. *Achras zapota* L. Sp. Pl. ed. 2. 469. 1762, variant of *A. zapota* L. but based on a different type and therefore a later homonym rather than synonym. *A. zapota* β *zapotilla* Jacq. Stirp. Am. 57, t. 41. 1763. *Sapota achras* Mill. Gard. Dict. ed. 8. 1768. *Achras zapotilla* Nutt. No. Am. Sylv. 3: 28. 1849. *Manilkara zapotilla* Gilly, Trop. Woods 73: 20. 1943. *Nispero achras* Aubréville, Adansonia 5: 19, t. 1. 1965, as to presumed basionym, not illustration. *Chico*, *chico sapote* or *chico-zapote* (most of Guatemala); *mui* (Quecchí); *tzaput* (Quiché); *ya* (Maya); *zapote* (Petén); *zapote blanco*; *zapote colorado*; *sapodilla*.

Planted commonly for its fruits in many places in Guatemala from sea level to about 1,200 meters; native in the mixed forests of the Petén, Baja Verapaz and Alta Verapaz; perhaps naturalized or persisting around sites of former villages or dwellings. Mexico (Vera

Cruz to Oaxaca and Yucatan peninsula); British Honduras; doubtfully native in other parts of Central America; cultivated or perhaps naturalized elsewhere in tropical America.

A large tree, sometimes 40 meters tall, often with a very thick trunk; bark dark brown, with a grayish tinge, moderately smooth or shallowly fissured; leaves more or less coriaceous, elliptic to oblanceolate, 5–12 cm. long and 3.5–5.5 cm. broad, or sometimes larger; obtuse to acuminate, rounded to cuneate at the base, the petiole 1.5–3 cm. long; flowers solitary in the leaf axils, equaling or longer than the petioles; sepals broadly ovate to ovate-lanceolate, 6–9 mm. long, densely sericeous or tomentulose; petals elliptic to ovate or lanceolate, subacute to acuminate, 6.5–10 mm. long; tube of the corona 3.5–7 mm. long; outer compound staminodia petaloid, 3–6 mm. long, ovate to lanceolate, entire, crenulate, or tridentate at the apex; inner staminodia petaloid or subpetaloid, usually equaling the outer staminodia, ovate-lanceolate to linear-lanceolate, entire or bidentate at the apex; stamens half as long as the staminodia or longer, the anthers 1.5–3 mm. long; ovary 6–12-celled, the style equaling or longer than the staminodia; fruit variable in size and shape, ellipsoid, ovoid, or subglobose, 9 cm. or less in diameter; seeds compressed, variable in shape, 16–23 mm. long, the hilum 9–17 mm. long, occupying one-half to seven-eighths of the ventral margin.

The usual name for this tree and its fruit in Guatemala is “*chicozapote*” or merely “*chico*”, the same terms used in much of Mexico. The name *chico* has nothing to do with the Spanish word *chico*, but is derived from the Nahuatl name for the fruit, “*tzicozapoll*”, i.e., “gum zapote.” In other parts of Central America the usual name for the fruit is “*nispero*”, but in Guatemala this is used only for the loquat, *Eriobotrya japonica*.

The *chicozapote* is one of the favorite fruits of Central America. It has a somewhat rough, brownish, thin skin. The flesh is soft, rather mucilaginous, somewhat milky before maturity, brownish white and very sweet when fully ripe. The widely spreading branches sometimes are so loaded with the fruits that they drag downward.

The wood of all the species is much alike. The heartwood is dark reddish or reddish brown, the sapwood pinkish; luster rather low; without distinctive odor or taste, very hard and heavy, the specific gravity about 1.09; weight 68 pounds per cubic foot; rather fine-textured and with fairly straight grain; not easy to work and has a tendency to splinter, but can be finished smoothly; very resistant to decay. It is noted for its strength and durability, and was much used by the Mayas in construction of their temples and other larger buildings. It is employed at present for railway ties, flooring, tool handles, and many other purposes, but is not exported.

Economically, the *sapodilla* was one of the important trees of Central America, and the most important one of the region in which

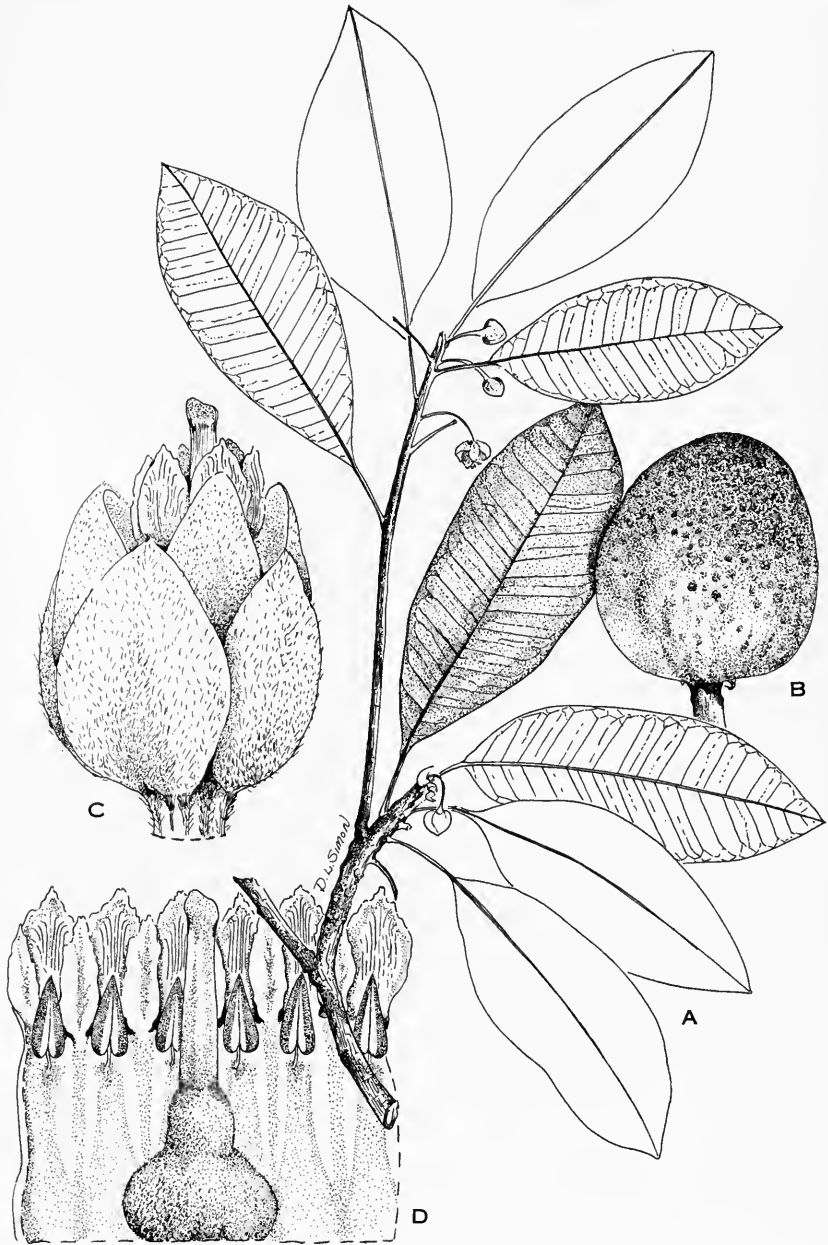


FIG. 65. *Manilkara achras*. A, Habit, $\times \frac{1}{2}$. B, Mature fruit, $\times \frac{1}{2}$. C, Flower, $\times 5$. D, Flower dissected to show corolla, stamens and pistil, $\times 5$.

it is native, supplying one of the principal exports of the Yucatan Peninsula—chicle gum, from which chewing gum is manufactured. Most was produced in Petén, British Honduras, and the adjacent Yucatan Peninsula of Mexico, where it was estimated that one hundred million trees existed. At the height of production, 1927–29, the production was about twelve million pounds annually, but it is now very much less. In 1930 the import of chicle into the United States was nearly fourteen million pounds. The manufactured output in 1930 was valued at more than seventy million dollars, representing a retail business of more than one hundred million dollars.

Chicle gum is obtained from oblique cuts or slashes made in the trunk of the tree during the rainy months. From these cuts there issues a milky latex which must be coagulated by heat, and formed into solid blocks for export. *Manilkara achras* is considered to yield much better chicle for manufacture of chewing gum than any other tree, but the individual trees were said to vary greatly in their yield and in the quality of their product. Some large and vigorous trees were not tapped for latex, because they were found unsatisfactory. The latex of various other trees, of the Sapotaceae and other families, often was or is employed to adulterate the true chicle, especially in Petén and northern British Honduras, where suitable trees are found in some abundance. Chicle gum was used for chewing by the ancient Maya, and crude gum may be seen rarely in some of the Indian markets of Guatemala, usually in the form of long, thin bars that often are brilliantly colored in red and green. Some chewing gum is manufactured in Guatemala and some is imported from the United States. The name Chiclet is about as well known in Guatemala as it is in the United States. It is rather disconcerting to meet a file of mountain Indian women on a country road, all in their beautiful local costumes, each with a burden of some sort on her head, and all wagging their jaws lustily as they enjoy the Chiclets that they have bought during their visit to the nearby market place.

The Antillean name for this tree was "*canizte*", and in Cuba the name "*canistel*" is used at present. The best account of the chicle industry is probably that by John S. Karling, *Torreya* 42: 38 et seq. 1943; see also Record & Hess, *Timbers of the New World* 495. 1943.

It may be mentioned here that the possibilities of splitting of species in this genus perhaps have not been exhausted. The *chicleros*, the men who tap the trees, have names for several varieties that they distinguish by bark, latex, and other characters, some quite worthless as a source of chicle.

Manilkara breviloba Gilly, Trop. Woods 73: 19. 1943.

Known only from the type, Maskall, Belize District, British Honduras, *Gentle 1238*.

Leaves thin, narrowly elliptic, 8–12 cm. long, 4.5–5.5 cm. broad, subacute or subacuminate, rounded at the base, glabrous, the petiole 2–3.5 cm. long; pedicels equaling the petioles; sepals broadly ovate, 7 mm. long, acute; petals 8 mm. long, 5 mm. broad, acuminate-cucullate; tube of the corona 5.5–6 mm. long, much longer than the staminodia; outer compound staminodia 3.5 mm. long or less, elliptic, entire or subtridentate; inner staminodia equaling the outer ones, constricted at the middle, above the middle elliptic, below truncate-triangular; outer and inner staminodia connate above the apex of the corona tube; stamens inserted below the apex of the corona tube, 2–2.5 mm. long; anthers 1–1.2 mm. long; ovary 9–10-celled.

Manilkara chicle (Pittier) Gilly, Trop. Woods 73: 14. 1943.

Achras chicle Pittier, Journ. Wash. Acad. Sci. 9: 436. 1919. *Zapote macho* (Petén); *chicle macho*; *nispero* (Izabal); *chicozapote*; *zapotillo*; *chico*.

In mixed forest, 1,100 meters or less; Petén; Izabal (type from Vega Grande, *Pittier 8537*); Alta Verapaz; Huehuetenango. Mexico (Oaxaca; Chiapas; Tabasco); El Salvador.

A tall tree, sometimes 37 meters high, the trunk as much as 75 cm. in diameter, the branches and leaves glabrous or nearly so; leaves on petioles 2–3.5 cm. long, coriaceous, obovate-elliptic, 12–20 cm. long, 4–7 cm. broad, obtuse or subacute and minutely emarginate at the apex, cuneate or rounded-cuneate at the base, deep green and dull above, paler beneath; flowers fasciculate, the pedicels equaling or shorter than the petioles; sepals oblong-lanceolate or narrowly oblong-ovate, 7.5 mm. long; petals similar to the sepals, sometimes broadest above the middle, 8 mm. long; corolla tube 1.5–2 mm. long; outer compound staminodia ovate-lanceolate, subacute or rounded at the apex, 5–6 mm. long; inner staminodia 4.5 mm. long, ovate-lanceolate, acuminate, the apex irregularly lacerate; stamens about as long as the outer staminodia, the anthers 3 mm. long; ovary 6–9-celled; fruit depressed-globose to obovoid, 3.5–4 cm. in diameter; seeds compressed, rhombic-elliptic, brown, somewhat lustrous, 20–23 mm. long, 14–18 mm. broad, 5–7 mm. thick, the hilum 6–7.5 mm. long, occupying one-third of the ventral margin.

The crown is broad and spreading, the bark medium to dark brown, scaly or with vertical fissures, the inner bark pinkish brown; sapwood yellowish or cream-colored, the heartwood distinct, reddish brown, used in southern Mexico for railroad ties, house building, and other purposes. The fruits are edible, as probably are those of all the species. The tree yields a considerable quantity of latex, which is said to be difficult to coagulate. Its gum is much used as an adulterant of chicle in the regions where both grow, or it is sold separately, under the name Crown gum. It is said to be soft and difficult to mold, therefore less satisfactory for chewing gum than the gum of *M. achras*.

Manilkara staminodella Gilly, Trop. Woods 73: 10. 1943.

Mixed upland forest, 800 meters or less; Petén (type collected at Camp 33, on the British Honduras boundary, *Schipp 1310*). British Honduras.

A tree of 30 meters, the trunk almost a meter in diameter; leaves small, on slender petioles 2 cm. long or shorter, thin, elliptic or lance-elliptic, 5–9 cm. long, 2.5–3.5 cm. broad, obtuse or subacute, subacute at the base, slightly paler beneath, glabrous; pedicels equaling or slightly shorter than the petioles; sepals ovate, acute, 7–8 mm. long; petals obovate-rectangular or elliptic, 8–9 mm. long; outer staminodia 5 mm. long, the middle lobes shorter than the lateral ones, spatulate, the lateral lobes lanceolate; inner staminodia minute, 1.2 mm. long, reflexed, pubescent, truncate; stamens half as long as the outer staminodia, the anthers 1.5–2 mm. long; ovary 8–9-celled; style equaling the outer staminodia.

Manilkara striata Gilly, Trop. Woods 73: 11. 1943.

Known only from the type, Carmelita, Petén, *Odell 12270–10*.

A tree 20 meters high; leaves on petioles 2–2.5 cm. long, thin-coriaceous, somewhat lustrous above, narrowly elliptic or lance-elliptic, 8–14 cm. long, 3.5–4.5 cm. broad, acute or subacuminate, rounded-cuneate at the base; pedicels 1.5–2 cm. long; sepals 7.5 mm. long; petals narrowly ovate, subacute, 8 mm. long; tube of the corona 4 mm. long, about equaling the outer staminodia; outer staminodia glabrous, 4–5 mm. long, the middle lobe longer than the lateral ones, oblanceolate or spatulate, the lateral lobes narrowly ovate, subacute; inner staminodia 2 mm. long or less, petaloid, ovate-rectangular, sparsely villous outside, bifid at the apex; stamens half as long as the outer staminodia, the anthers 2 mm. long; ovary 6-celled.

MASTICHODENDRON Cronquist

Small or large unarmed trees; leaves alternate or subopposite, the mid-rib more or less canaliculate, the channel often terminating in a pouch at the base of the blade; primary lateral veins not very numerous, curved; secondary lateral veins forming an evident fairly open reticulum, the surface not closely areolate; flowers 5-merous as to sepals, petals, stamens, staminodes, and usually locules of the young ovary; corolla subtotate, the tube short; stamens attached at or a little above the level of the sinuses; staminodes present, not petaloid; ovary essentially glabrous; ovules attached basilaterally, usually only 1 maturing in each fruit; seed about 1–2.5 cm. long, with basilateral lanceolate to circular scar up to as much as 9 mm. long but not extending to the middle of the seed; endosperm copious; mature fruit more or less fleshy, mostly 1.5–4.5 cm. long.

Cronquist gives five species of *Mastichodendron* for North America, four of which are in our range.

In the *Index Nominum Genericorum* the authority for *Mastichodendron* is given as “(Engler) Lam”,—we believe incorrectly.

Leaves fulvous tomentose below, the hairs lax or spreading. . . . *M. angustifolium*.
Leaves glabrous beneath, or if pubescent then the hairs appressed.

Corolla less than 3.5 mm. long; leaves glabrous. . . *M. foetidissimum* var. *gaumeri*.
 Corolla 3.5 mm. or more long.

Sepals and pedicels glabrous; petioles short, less than 2 cm. long. . . *M. belizense*.
 Sepals and pedicels sparsely to densely sericeous; petioles more than 3 cm. long.
M. capiri var. *tempisque*.

Mastichodendron angustifolium (Standl.) Cronquist, *Lloydia* 9: 251. 1946. *Sideroxylon angustifolium* Standl. Contr. U. S. Nat. Herb. 23: 1124. 1924 (type from Sinaloa, Mexico). *Tempisque*; *matabuy* (Huehuetenango).

Mountain forests at 1,350–1,600 meters; Huehuetenango; Guatemala. Mexico.

A tree about 15 meters high, the trunk 40–60 cm. in diameter; leaves on petioles 2–2.5 cm. long, coriaceous, elliptic-oblong to oblong-oblancoate, mostly 10–15 cm. long, usually very obtuse or rounded at the apex, obtuse or subacute at the base, fulvous-tomentose at first on both surfaces, in age more or less glabrate above, the pubescence usually persistent beneath; flowers densely fasciculate on old wood, the pedicels 7–9 mm. long, tomentose; sepals 3 mm. long, brown-sericeous; ovary 5-lobate, glabrous; fruit 1-seeded, glabrous, oval, 2–2.5 cm. long, rounded at the apex, the pedicels in fruit thick and about 1 cm. long.

The bark is said to be used in Sinaloa, Mexico, for curdling milk.

Mastichodendron belizense (Lundell) Cronquist, *Lloydia* 9: 250. 1946. *Sideroxylon belizense* Lundell, Contr. Univ. Mich. Herb. 6: 55. 1941 (type from Camp 32, British Honduras, *Schipp 1269*). Izabal; Petén. British Honduras.

Trees to 12–15 meters tall and the trunk 25 cm. in diameter; branchlets sparsely rufous pubescent at first, soon glabrous; leaves elliptic to elliptic-lanceolate, acute or somewhat acuminate, coriaceous, 5–9 cm. long and 2–4 cm. broad, acute to obtuse at the base, petiole slender, 1–2 cm. long; flowers solitary or in fascicles on the old wood; sepals 5, coriaceous, rounded, 2–2.5 mm. long; corolla glabrous, firm, strongly thickened in the throat, about 7 mm. long, the tube about 2 mm. long, the lobes 5, ovate-elliptic, rounded at the apex; anthers 2 mm. long, exserted; staminodia 5, short, laciniate, about 1 mm. long; style short and stout; immature fruit globose-ovoid, glabrous, about 8 mm. long.

Mastichodendron capiri (A. DC.) Cronquist var. **tempisque** (Pittier) Cronquist, *Lloydia* 9: 250. 1946. *Sideroxylon tempisque* Pittier, Contr. U. S. Nat. Herb. 13: 461. 1912 (type from El Salvador). *Tempisque*; *cobac* (Cacciuel).

Moist or dry mixed forest, often along river banks, mostly at 1,200 meters or less; Zacapa; Suchitpequez; Santa Rosa; Esquintla; Guatemala; Quiché; Huehuetenango. Mexico to Panama, mostly near the Pacific.



FIG. 66. *Mastichodendron capiri* var. *tempisque*. A, Habit, $\times \frac{1}{2}$. B, Flower opened, $\times 5$. C, Flower bud, $\times 4$. D, Fruit, natural size. E, Anther, $\times 10$.

A medium-sized or rather large tree, usually with a low thick trunk and a large, broad crown, the lower branches sometimes more or less drooping, the bark dark gray; branchlets sericeous or glabrate; petioles usually very long and slender, mostly 4–8 cm. long, sometimes longer than the blades; leaf blades mostly elliptic or ovate-elliptic, sometimes oblong-elliptic, 7–12 cm. long, 3–7 cm. broad, rounded to subacute at the apex, acute to rounded at the base, abruptly contracted and narrowly decurrent, the margins inrolled and united to form a long tube or pouch; when young more or less sericeous but in age glabrous or nearly so; flowers cream-colored, fasciculate at defoliated nodes, the pedicels 5 mm. long or sometimes longer, sericeous or glabrous; sepals 3 mm. long, rounded-ovate, sericeous; corolla 7–8 mm. long, slightly pubescent or glabrous, the tube very short, the lobes elliptic-ovate, rounded at the apex; staminodia minute, ovate, squamiform; stamens almost equaling the corolla lobes, glabrous; anthers 3.5–4 mm. long; ovary sericeous, 5-celled, the style thick; fruit oval or ovoid, pointed, 3–4 cm. long, 2–2.5 cm. thick, apiculate, yellowish, smooth and glabrous; seed 1, ovoid, 2.5 cm. long, smooth, brown; hilar scar ovate-elliptic, whitish.

The local name "*saquaia*" is reported from El Salvador. The term "*tempisque*" is probably of Nahuatl origin. It has given names to villages of Baja Verapaz, Zacapa and Jutiapa. The species has been reported from Guatemala as *S. mastichodendron* Jacq., a West Indian species. The wood of this and related species is lemon to orange, its luster medium; taste somewhat bitter; very hard, heavy, tough, and strong; specific gravity about 1.05, the weight about 66 pounds per cubic foot; texture medium, the grain straight to variable; not easy to work but finishes smoothly; durability fair. It is not exported, but is used locally for railroad ties, sugar mill machinery, and general construction. The wood is valued for fuel because it burns for a long time.

Pittier considered *Sideroxylon capiri* and *S. tempisque* to be distinct species. Cronquist treated all the Central American material as *Mastichodendron capri* var. *tempisque*. The actual difference, if any, is minor.

The fruits are sometimes eaten but those we have tried are poor in flavor and the flesh is scant.

Mastichodendron foetidissimum (Jacq.) Cronquist var. ***gaumeri*** (Pittier) L. Wms. Fieldiana, Bot. 31: 263. 1967. *Sideroxylon gaumeri* Pittier, Contr. U. S. Nat. Herb. 13: 460. 1912. *M. foetidissimum* subsp. *gaumeri* Cronquist, Lloydia 9: 248. 1946.

Mixed upland forests at 300 meters or less, British Honduras; Mexico.

A large or medium-sized tree, glabrous almost throughout, said to be sometimes 30 meters high; petioles slender, mostly 3–4.5 cm. long; leaf blades subcoria-

ceous, bright green, lustrous, elliptic-oblong to lance-oblong, 8–16 cm. long, 3–5.5 cm. broad, mostly acute or subacute, rarely rounded at the apex, acute at the base, usually abruptly contracted and narrowed into a slender tube as in *M. capiri*; flowers densely fasciculate at defoliated nodes, the pedicels 4–5 mm. long, often glabrous; sepals 1.5 mm. long, sparsely sericeous, suborbicular; corolla cream-colored, 3.5–4 mm. long, glabrous, the lobes ovate, obtuse; staminodia ovate-acuminate, 1.5 mm. long, denticulate; anthers ovate, 1.5 mm. long; ovary glabrous, 5-sulcate; style short; fruit oval, 2.5 cm. long, 2 cm. broad, rounded at each end, glabrous, lustrous.

Known in British Honduras as “cream tree”, “zoy” and “dzoï” (Maya); “caracolillo” (Campeche); “subul” (Yucatan, Maya); “ébanó amarillo” (Yucatan).

Mastichodendron sp.

There has been found along Lake Amatitlán, Dept. Guatemala, and at an unspecified locality in Dept. Esquintla a tree related to *M. capiri* which appears to be undescribed. Both specimens (*Aguilar 1589*; *Steyermark 52152*) bear immature fruits but no flowers. Common names are given as “trompillo” and “sapotillo.”

MICROPHOLIS [Grisebach] Pierre

Unarmed trees with alternate exstipulate leaves; leaves with numerous, nearly straight lateral veins mostly less than 1 mm. apart; flowers 5–6-merous; stamens attached to the corolla at the level of the sinuses; staminodia present, often subpetaloid, ovary pubescent, the ovules laterally attached, the seeds with a long linear scar, endosperm present; fruit with 1–several seeds.

A small genus with five species in North America and a greater number in South America. Four other North American species are in the West Indies;—there is an additional one in Panama, apparently undescribed. The genus is closely related to *Mastichodendron*.

Micropholis mexicana Gilly ex Cronquist, *Lloydia* 9: 257. 1946. *Sideroxylon calophylloides* Lundell, *Contr. Univ. Mich. Herb.* 6: 56. 1941, non *M. calophylloides* Pierre.

In moist broad-leaf forest near sea level; Izabal. Mexico; British Honduras.

Tree to 6–7 meters. Leaves 10–15 cm. long and 3–5 cm. broad, elliptic to elliptic-obovate or elliptic-oblong, abruptly acuminate, glabrous and lustrous, lateral veins numerous and fine, 5–6 veins to 1 mm.; petioles 1–1.5 cm. long; inflorescences axillary fascicles with 5–30 flowers, borne on defoliated wood or new wood, pedicels puberulent; corolla 5–6 mm. long, the lobes longer than the tube, glabrous; staminodes 1.5–3 mm. long, lance-subulate, apex sometimes barbellate; sepals 5–(6), broadly ovate, puberulent, the outer ones acute, the inner ones usually obtuse or

rounded and ciliate; ovary pubescent, the style 5–6 mm. long; fruit pyriform, 3 cm. long or more; seed one with a longitudinal linear-scar about 5 mm. broad, seed coat brown, lustrous.

The material available of this species is inadequate for an understanding of the species. The specimen from Izabal (*Steyermark 42059*) has immature fruits with relatively short fleshy, thick pedicels. It may be another species.

POUTERIA Aubl.

References: Charles Baehni, *Memoires sur les Sapotacées*, II Le Genre *Pouteria*, *Candollea* 9: 147–475. 1942. Arthur Cronquist, *Studies in Sapotaceae*, II, *Lloydia* 9: 259–291. 1946.

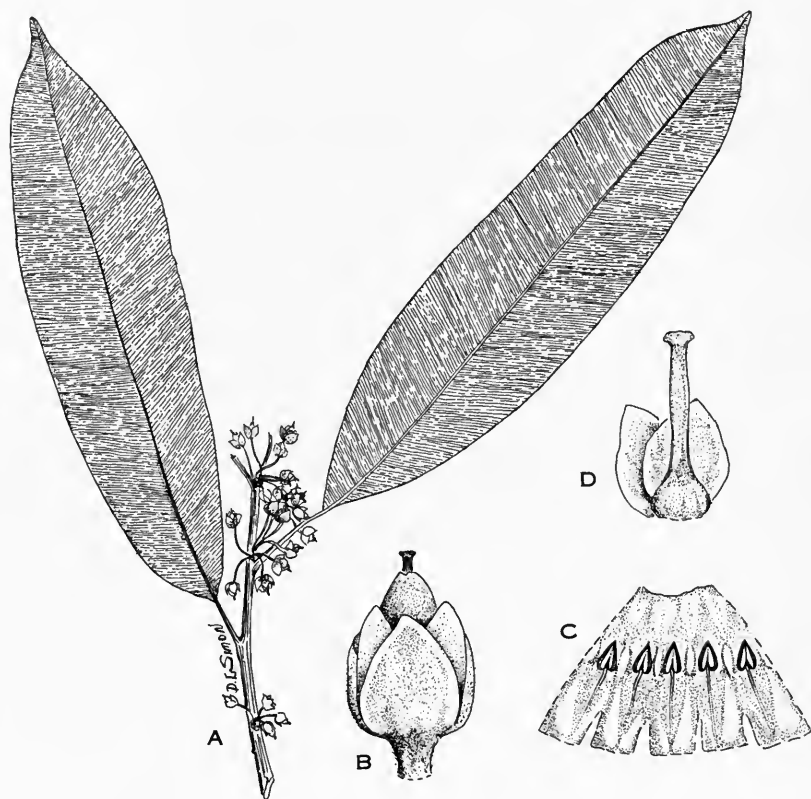


FIG. 67. *Micropholis mexicana*. A, Habit, $\times \frac{1}{2}$. B, Flower in natural position, $\times 5$. C, Corolla opened out, $\times 5$. D, Pistil with two sepals, $\times 5$.

Small or large trees, unarmed, glabrous or often sericeous; leaves petiolate, commonly more or less coriaceous; flowers small, pedicellate, fasciculate or solitary in the leaf axils or at defoliated nodes; sepals usually 4-5 (-12), strongly imbricate; corolla more or less urceolate, the tube short, the 4-6 lobes imbricate; stamens 4-6, inserted on the corolla tube opposite the lobes, the filaments short or elongate and slender; ovary 2-9-celled, usually pubescent, the style subulate or conic; fruit baccate, with abundant or scant flesh, sometimes gall-like, often edible, usually small; seeds 1-5.

A genus of perhaps 50 species or more, chiefly American although possibly with African and Asian representatives.

The generic name *Lucuma* has been commonly used for this group of plants, apparently incorrectly.

Flowers relatively small, the corolla 5.5 cm. or usually shorter, the calyx 4 mm. long or shorter.

Flowers evidently pedicellate, some pedicels at least 3 mm. long.

Ovary 4-5 loculate; corolla lobes ciliate *P. quieheana*.

Ovary 1-2 loculate; corolla lobes ciliate or not.

Locules 2; corolla lobes not ciliate; leaves evidently reticulate above.

P. lundellii.

Locule 1; corolla lobes ciliate; leaves usually but obscurely reticulate above.

P. unilocularis.

Flowers not pedicellate, subsessile or never more than 2 mm. long.

Filaments attached below middle of corolla tube; where known smooth part of seed coat occupying one-fourth or less of the surface *P. hypoglaucina*.

Filaments at or near level of the sinuses; smooth part of seed coat occupying about one-half of seed surface.

Ovary 4-5 loculate; fruits 1-seeded; leaves broadest at or below the middle.

Sepals 4-5; seed scar covering less than half the seed *P. amygdalina*.

Sepals 6-7; seed scar covering half the seed *P. izabalensis*.

Ovary bi-(rarely tri-) loculate; fruits 2-(rarely 1-3-) seeded; leaves commonly broadest above the middle *P. durlandii*.

Flowers relatively large, corolla 6-16 mm. long, the calyx 4.5 mm. long or more.

Sepals 4-6 and about equal.

Flowers and fruit pedicellate.

Fruit gall-like and covered with flattened chaffy, puberulent processes.

P. squamosa.

Fruit fleshy, without flattened superficial processes *P. campechiana*.

Flowers and fruit sessile or subsessile.

Corolla exceeding the calyx; secondary lateral veins irregular and only slightly more conspicuous than the final reticulation *P. gallifructa*.

Corolla shorter than the calyx, secondary lateral veins distinctly more conspicuous than the final reticulation *P. neglecta*.

Sepals about 8-12, evidently spiralled and increasing in size inward.

Fruits furfuraceous or mealy roughened; leaves nearly glabrous below except for usually appressed hairs along the midrib and main veins.

P. mammosa.

Fruit smooth; leaves more or less villous pubescent below with spreading hairs especially along the midrib and main veins *P. viridis*.

Pouteria amygdalina (Standl.) Baehni, Candollea 9: 360. 1942.
Lucuma amygdalina Standl. Trop. Woods 4: 5. 1935 (type from Pe-

tén, *Durland s.n.*). *Sideroxylon amygdalinum* Standl. Trop. Woods 31: 45. 1932. *Bumelia laurifolia* Standl. Trop. Woods 31: 45. 1932 (type from Honey Camp, British Honduras, *Lundell LP14*). ? *Pouteria psilocarpa* Baehni, l.c. 249 (type from Petén, Guatemala, *Bartlett s.n.*). *Zapote faisán*; *quiebra-hacha de leche*; *pacecen pacece* (Maya); *silión*; *ciruelillo cimarrón*.

Moist or wet, mixed forest, 850 meters or less; Petén. British Honduras.

A large or medium-sized tree, sometimes 35 meters high, with a trunk 60 cm. or more in diameter, the branches slender, sericeous or soon glabrate; petioles slender, mostly 1–2 cm. long, glabrous; leaf blades coriaceous, often darkening in drying, narrowly oblong or lance-oblong, 6–15 cm. long, mostly 2–3.5 cm. broad, acute or acuminate with an obtuse tip, somewhat lustrous above, slightly paler beneath, glabrous, the lateral nerves about 15 pairs, the veins prominulous and finely reticulate; flowers cream-colored, 2.5 mm. long, densely fasciculate in the leaf axils, sessile; sepals densely rufous-sericeous; fruit ovoid or oval, 2–2.5 cm. long, green, rounded at each end, glabrous, lustrous; seed 1, oval-ellipsoid, 1 cm. long, 8 mm. in diameter, rounded at each end, smooth, brown, very lustrous, the hilar area oblong, 4 mm. broad, acute at each end, roughened, dull pale brownish.

Known in British Honduras as "Silly Young", a corruption of the Spanish (?) name of Petén.

Pouteria campechiana (HBK.) Baehni, *Candollea* 9: 398. 1942. *Lucuma campechiana* HBK. Nov. Gen. & Sp. 3: 240. 1819. *Lucuma laeteviridis* Pittier, *Contr. U. S. Nat. Herb.* 20: 482. 1922 (type from Izabal, *Pittier 8534*); *Lucuma heyderi* Standl. Trop. Woods 11: 22. 1927 (type from British Honduras, *Heyder 25*). *Cakixó* (Cobán, Quechí); *limoncillo*; *zapotillo de montana* (Petén); *canizte* (Petén, Maya).

Moist or wet mixed forest, sometimes in pine forests, often on limestone, often in cultivation, mostly 1,400 meters or less; Petén; Alta Verapaz; Escuintla; Chimaltenango; Quezaltenango. Mexico to Panama; and in West Indies and perhaps elsewhere as an escape from cultivation.

A small to large tree, sometimes 20–27 meters high, with a trunk more than a meter in diameter, the trunk irregularly and deeply ridged and furrowed, the crown broad and spreading, the bark brown; leaves thick-membranaceous, on rather short, slender petioles, oblanceolate to obovate, mostly 9–20 cm. long, obtuse or subacute with an obtuse tip, acute or attenuate at the base, glabrous or nearly so, the lateral nerves about 11 pairs, prominent beneath, the veins inconspicuous; flowers axillary or at defoliated nodes, in few-flowered fascicles or sometimes solitary, the slender pedicels longer than the flowers; sepals 3–5 mm. long, densely sericeous, rounded at the apex; corolla whitish, scarcely if at all exceeding the sepals, sparsely sericeous outside; fruit dull yellow, green, or brown, subglobose or

depressed-globose, about 2.5–5 cm. in diameter or somewhat larger, glabrate, containing 1–4 large seeds, the flesh yellow, often milky, sweet.

Known in British Honduras as “*mamey cerea*”, “*mamey cerilla*”, “*kanizte*”, “*mamee ciruela*” (it is probable that *ciruela* is the correct form of the Spanish name); “*güicume*”, “*guaicume*” (El Salvador); “*mamey de Campeche*” (Yucatan); “*zbul*” (Yucatan, Maya). The fruit is eaten commonly, but it is not very good. This tree, like other members of the genus, has abundant latex, which sometimes is used to adulterate chicle. The wood of the various species is grayish brown to reddish brown, usually not clearly separated from the lighter-colored sapwood; luster rather low; taste sometimes astringent; moderately to very heavy and hard; texture mostly medium, uniform, typically straight-grained. The wood is suitable for construction purposes, and the more deeply colored forms are very resistant to decay.

Additional synonyms, which have been applied to Central American material are *Lucuma nervosa* A. DC., *L. salicifolia* HBK. and *Pouteria campechiana* var. *palmeri* (Fernald) Baehni.

Pouteria durlandii (Standl.) Baehni, *Candollea* 9: 422. 1942. *Lucuma durlandii* Standl. *Trop. Woods* 4: 5. 1925. *Paralabatia durlandii* Aubr. *Adansonia* ser. 2, 5: 21. 1963. *Zapotillo*.

Moist or wet, mixed, upland forest, sometimes on stream banks, 300 meters or less; Petén (type from El Paso, *Durland*); Alta Verapaz (Río Sebol). Mexico; British Honduras; Honduras; Costa Rica.

A small to large tree, the trunk sometimes 50 cm. in diameter; leaves on stout petioles 1–2 cm. long, subcoriaceous, oblanceolate-oblong or obovate-oblong, mostly 13–30 cm. long, usually abruptly acuminate or long-acuminate, attenuate to the base, glabrous or nearly so, the venation prominent and closely reticulate on both surfaces, the lateral nerves about 10 pairs; flowers white, almost sessile, densely clustered in the leaf axils or at defoliated nodes, 4 mm. long; sepals about 3 mm. long, densely sericeous, oval or rounded, rounded at the apex; corolla glabrous; fruit short-pedicellate, ovoid, 12–18 mm. long; seed 1, subglobose, 12 mm. long, brown, smooth, the area of the hilum covering about half the seed, roughened, whitish, shallowly sulcate beyond the hilum.

Called “*mamey cerera*” or “*mamey cadera*” in British Honduras.

Pouteria gallifruca Cronquist, *Lloydia* 9: 285. 1946.

Primary forest at about 200 meters (type from British Honduras, *Schipp 1323*). British Honduras.

Tree up to nearly 30 m. high; leaves broadly oblanceolate or narrowly obovate, obtuse or with a very short abrupt acumination, about 10–21 cm. long, 4–8 cm.

broad, clustered at the ends of the twigs, glabrous or with some strigose hairs on the midrib and main veins beneath; primary lateral veins raised and conspicuous beneath, about 15–25 pairs, more closely set near the base than above; secondary lateral veins irregular and only slightly more conspicuous than the final reticulum, which is evident and slightly raised on both surfaces; petioles about 1–3 cm. long; flowers abundant, fasciculate, chiefly at defoliated nodes, subsessile, the densely strigose pedicels about 1–3 mm. long; sepals 4, about 4.5–6.5 mm. long, elliptic-orbicular, densely strigose; corolla about 8.5–9 mm. long, greenish-white, finely papillate, the 4 erose lobes not quite half as long as the tube; filaments about 2–2.5 mm. long, attached a little above the middle of the tube; anthers about 1.3–1.5 mm. long; staminodes subulate, about 1.2–1.4 mm. long; style slender, about 8–10 mm. long; ovary densely pilose, strongly flattened, about 4–6-loculate; fruit gall-like, covered with short densely hairy processes, probably reaching 3–4 cm. in diameter.

Pouteria hypoglauca (Standl.) Baehni, *Candollea* 9: 250. 1942.

Lucuma hypoglauca Standl. *Trop. Woods* 4: 4. 1925. *Mamey de Santo Domingo*.

Cultivated in Petén for its fruit. Southern Mexico; El Salvador (cultivated); apparently native in San Luis Potosí and various regions of southern Mexico; probably not indigenous in Central America.

A medium-sized tree, sometimes 20 meters high, with broad low crown, the trunk as much as 45 cm. in diameter, the young branches densely leafy, densely sericeous; leaves on petioles 6–12 mm. long, oblong or oblanceolate-oblong, 8–22 cm. long, 2.5–5 cm. broad, usually very obtuse, attenuate to the base, subcoriaceous, glabrous above or nearly so, pale or grayish beneath, at first densely and very finely sericeous, in age glabrate; flowers fasciculate in the leaf axils, subsessile; sepals 5, broadly elliptic, 3 mm. long, obtuse or rounded at the apex, densely sericeous; corolla 2 mm. long, glabrous, the lobes broader than long, broadly rounded or truncate at the apex; staminodia ovate, half as long as the corolla lobes; ovary densely hairy; fruit oval-globose, about 7 cm. long and 5 cm. broad, smooth, glabrous, rounded at each end, the shell very thick and hard; seeds about 4, almost white, smooth, 4 cm. long, 2.5 cm. thick, the hilar scar elliptic-linear, 2.5 cm. long.

“*Choch*” (Yucatan, Maya); “*zapote blanco*” (Yucatan); “*pan de la vida*”, “*chicozapote*” (El Salvador). The flesh of the fruit is fragrant, edible, and highly esteemed by some persons.

Pouteria izabalensis (Standl.) Baehni, *Candollea* 9: 347. 1942.

Lucuma izabalensis Standl. *Trop. Woods* 4: 6. 1925. *Silión*.

Moist or wet, mixed forest, 300 meters or less; Petén; Izabal (type from Las Playitas, *Whitford & Standmiller* 35). British Honduras; Honduras; Nicaragua.

A tree of 10–25 meters with a tall trunk and broad thin buttresses, the trunk 40–90 cm. in diameter, the bark, dark, rich, reddish brown, roughened, exuding a white latex when cut; leaves on petioles 1–2 cm. long, subcoriaceous, oblong to

elliptic-oblong, 14–20 cm. long, abruptly narrow-acuminate, glabrous or nearly so, usually lustrous above, somewhat paler beneath, the venation more or less prominent and closely reticulate, the lateral nerves about 9 pairs; flowers fasciculate in the leaf axils, on very short pedicels, greenish; sepals rounded, scarcely 2 mm. long, sparsely sericeous or glabrate, rounded at the apex; fruit globose-ovoid, yellow, glabrate, about 3 cm. long and 2.5 cm. broad, broadly rounded at the base.

The trunk sometimes has a merchantable length of 15–18 meters, and an average diameter of 60 cm. The logs will not float. The wood has been employed in Izabal for railroad ties and for general construction purposes.

This species was described from a sterile branch. Our interpretation follows that of Cronquist who, incidentally, did not see or, at least, did not annotate the type. See Williams, *Fieldiana*, Bot. 31: 264. 1967.

Pouteria lundellii (Standl.) L. Wms. *Fieldiana*, Bot. 31: 264. 1967. *Sideroxylon lundellii* Standl. Publ. Carnegie Inst. Wash. 461: 79. 1935. *Lechillo*.

Upland mixed forest, 300 meters or less; Petén (type from Monte Santa Teresa, *Lundell 2767*). Mexico; British Honduras.

A tree 8–30 meters high, the trunk as much as a meter in diameter, the young branchlets slender, brown-sericeous; leaves thin, on petioles 7–8 mm. long, oval to obovate or oblanceolate-oblong, 6–9 cm. long, 2.5–4.5 cm. broad, obtuse at the apex or abruptly contracted and short-apiculate, acute and decurrent at the base, glabrous or nearly so in age, the lateral nerves 10–13 pairs; flowers fasciculate at the leaf axils or at defoliated nodes, the stout pedicels 3–4 mm. long, densely sericeous; sepals 4, rounded, minutely sericeous; corolla slightly longer than the sepals, glabrous outside, 4-lobate almost to the middle, the lobes broadly rounded; anthers small, subglobose; staminodia small, fleshy, ovate; ovary densely pilose, the style short and thick.

See *Pouteria belizensis* at the end of the genus (p. 243).

Pouteria mammosa (L.) Cronquist, *Lloydia* 9: 287. 1946. *Sideroxylon sapota* Jacq. Enum. Pl. Carib. 15. 1760, in part. *Achras mammosa* L. Sp. Pl. ed. 2. 469. 1762. *Lucuma mammosa* Gaertn. Fruct. 3: 130. 1807. *Calocarpum mammosum* Pierre, Symb. Antill. 5: 98. 1904. *Achradelpha mammosa* Cook, Journ. Wash. Acad. Sci. 3: 160. 1913. *Calocarpum sapota* Merrill, Enum. Philip. Pl. 3: 284. 1923. *Zapote*; *satul* (Quecchí); *sesaltul* (Quecchí *vide* Sandoval); *tulul* (Cacchiquel); *saltul* (Poconchí).

Planted commonly in fincas at 600 meters or less, less common at 900 meters, but rare at 1,200 meters or more, although sometimes seen at least as high as 1,500 meters; frequent or common throughout

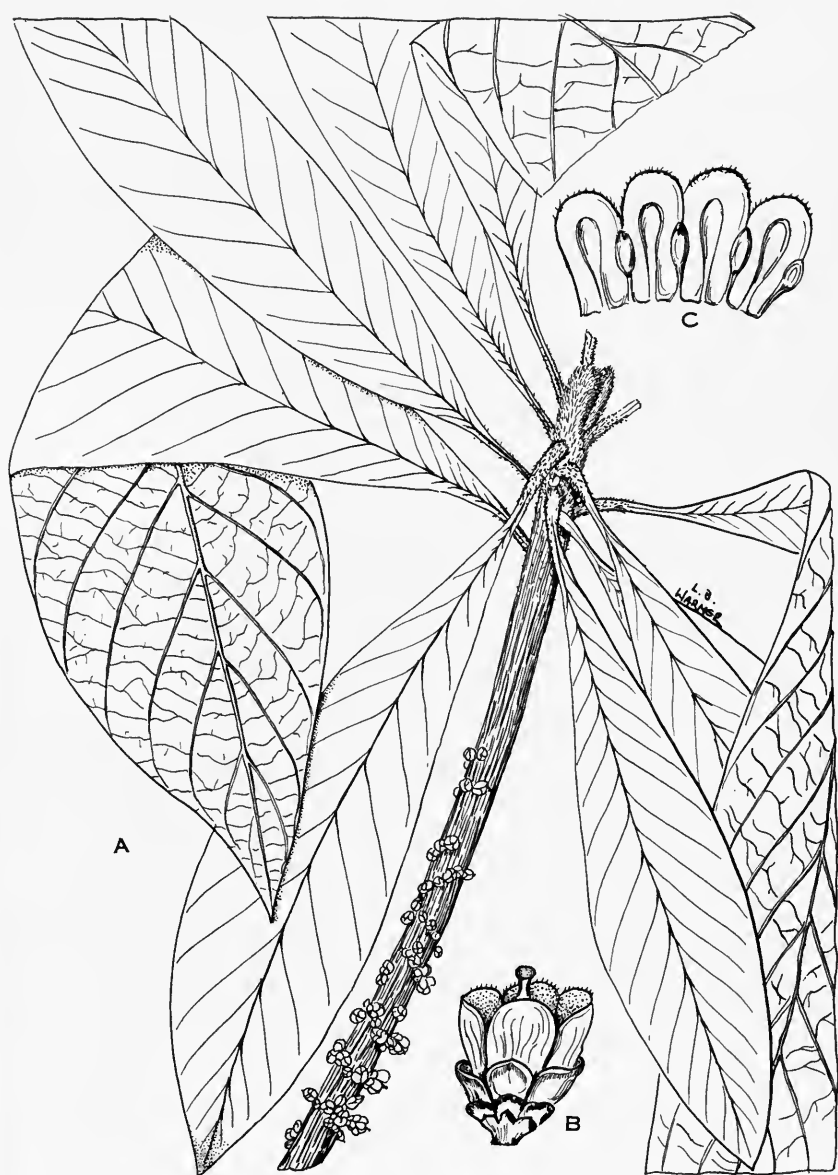


FIG. 68. *Pouteria mammosa*. A, Habit, $\times \frac{1}{2}$. B, Flower, $\times 2\frac{1}{2}$. C, Corolla opened out (with sterile stamens), $\times 2\frac{1}{2}$.

Guatemala at these elevations; often found more or less wild or naturalized, and perhaps native in Izabal and Petén. Southern Mexico; British Honduras; common in cultivation in lowlands of Central America, and possibly native along the Atlantic coast. Cultivated commonly in Tropical America, and in some parts of the Old World tropics.

A beautiful large tree, often 30 meters high, the trunk sometimes a meter in diameter, short or usually tall, often with narrow buttresses, the bark scaly or shaggy or moderately smooth, reddish brown; branchlets thick, usually densely brown-tomentose; leaves large and thin, clustered near the ends of the branches, obovate to oblong-oblancheolate, 15-30 cm. long, almost glabrous and lustrous above, paler beneath, glabrate or often puberulent or short-pilose, obtuse or rounded at the apex and apiculate, long-attenuate to the base; petioles stout, 2-4 cm. long; whitish, densely clustered on older branches below the leaves, sessile or short-pedicellate, 7-8 mm. long; sepals rounded, densely imbricate and appressed, densely sericeous; corolla about 10 mm. long; fruit globose or ellipsoid, commonly 10-15 cm. long, brown and rough-skinned, the pulp soft and sweet, often somewhat milky, yellowish to reddish or pinkish; seed 1, very large, lustrous brown, with a very large, pale scar on one side.

Known in British Honduras as "mamee apple" or "mamee zapote"; "*zapote mamey*" (southern Mexico); "*chacalhaas*" (Yucatan, Maya); "*mamey*," "*mamey colorado*" (Yucatan). The term "zapote" is very widely used; it is derived from the Nahuatl *tzapotl*. It appears in many place names in Guatemala, such as El Zapote, El Zapotal, Zapotón, Zapotitlán and Zapotitlancito.

This tree produces one of the favorite fruits of Central America, and it is noted that Guatemalans, when given a choice of dessert fruits at lunch, will usually take zapotes in preference to bananas (which are not esteemed highly), oranges, or other common fruits that are likely to be preferred by northern people. The fruits usually are eaten raw, but they sometimes are made into preserves and marmalade. They may be found in the markets at almost all season of the year. There are many thousands of giant trees in Guatemala, especially along the Pacific foothills and out on the plains. The seeds are called "*sapuyules*" or "*sapuyulos*." Large quantities of the dried kernels, strung on sticks or string, are seen in the markets. They have a flavor suggestive of bitter almonds and when ground are commonly employed for flavoring chocolate, atol, and other beverages. Sometimes they are used to flavor candies. The kernels are rich in oil which is utilized to some extent in soap making, and also is a common dressing for the hair, which it makes sleek and shining. In some regions of Mexico and Central America there is a belief that the oil prevents falling of the hair and promotes its growth. The very

smooth seeds formerly were much used in Central America for smoothing starched linen, like an iron, and it is stated that they are still used for this purpose in Guatemala. The wood is light-colored when first cut, changing to light brown or buff and finally having a slight tinge of red; luster rather low; odor none but taste sometimes slightly bitter; hard, heavy, tough, strong; texture medium, the grain usually straight; durability doubtful. It is little used, because the trees are conserved for their fruit.

Pouteria neglecta Cronquist, *Lloydia* 9: 286. 1946.

Moist or wet broadleaf forest at low elevations; Izabal. British Honduras (type from Temash River, *Schipp* 1354); Honduras and Costa Rica. *Sapote de mico*.

Tree reaching 15 meters or more in height; leaves broadly oblanceolate to obovate, with an acuminate tip commonly 1–4 cm. long, about 10–50 cm. long, 4.5–16 cm. broad, glabrous above, rufous hirsute with loosely spreading hairs especially along the midrib and main veins beneath, becoming subglabrous in age; primary lateral veins about 20–35 pair, raised and conspicuous beneath, more closely set toward the base than above; secondary lateral veins fairly regular and nearly perpendicular to the primary ones, distinctly more raised and conspicuous than the final reticulation; petioles about 1–4 cm. long; flowers few, fasciculate at defoliated nodes, subsessile; sepals 4, about 7.5–8.5 mm. long, loosely appressed-hirsute, the outer suborbicular and enclosing the broadly obovate inner; corolla greenish, glabrous, about 6.5 mm. long, the 4 lobes a little exceeding the tube; anthers conspicuously extrorse, about 1.4–1.5 mm. long, including the prominent 0.3–0.4 mm. cusp at the apex; staminodes linear-cylindric, about 1.5 mm. long; style short, about 2.5 mm. long; fruit gall-like, covered with short hairy processes, becoming 5 cm. long and 3.5 cm. thick; seeds subspherical, about 2–3 cm. long, the scar covering a little more than half the surface; seed coat about 0.7 mm. thick.

The tree is said to be called "red manwood" in British Honduras. The curious gall-like fruits are found also in *P. gallifruta* and *P. squamosa*.

Pouteria quicheana Cronquist, *Lloydia* 9: 263. 1946.

Mixed forest or along streams; Quiché (type Quiché, *Aguilar* 1331), apparently endemic.

Woody, presumably a tree; leaves narrowly elliptic or elliptic-oblanceolate, about 8–17 cm. long and 2–4 cm. broad, merely acutish at the tip, glabrous at maturity; primary lateral veins about 15 pair; secondary veins fine and slightly raised beneath, those near the midrib curving and oblique, those nearer the margins becoming perpendicular to the costae; petioles about 1–1.5 cm. long; flowers clustered in the axils, the pedicels about 3–4 mm. long, finely grayish-sericeous; mature flowers unknown, but a nearly mature bud shows the following characteristics: sepals 4, about 4.3 mm. long, the outer ones finely grayish-sericeous outside,

the inner glabrous; corolla 3.5–3.9 mm. long, 4-lobed, the lobes fringed-ciliolate, about two-thirds as long as the tube; filaments about 2 mm. long, attached about 0.5 mm. from the base of the tube; anthers plump, evidently short-cuspidate; 0.65–0.75 mm. long; staminodes oblong-spatulate, nearly as long as the corolla-lobes; ovary 4-loculate; fruit unknown.

Pouteria squamosa Cronquist, *Lloydia* 9: 283. 1946.

Broad-leaf, ciliar forest near sea level; Izabal (type *Steiermark* 39557). Endemic.

Tree; leaves elliptic or narrowly elliptic-obovate, with an acuminate tip about 1–2 cm. long, acute at the base, 15–25 cm. long, 5.5–9 cm. broad, glabrous; primary lateral veins well spaced, about 15–20; secondary lateral veins curved, oblique to the primary ones, those near the margins becoming straighter and perpendicular or nearly so; petioles about 2–3 cm. long; sepals persistent in fruit, firm, relatively narrow, about 5 mm. long; fruiting pedicel about 5 mm. long; fruit spherical or nearly so, about 3–4 cm. thick, gall-like in appearance, the pericarp thick and woody, covered with closely set divergent scales less than 1 cm. long, about 4-loculate.

Cronquist comments that “the possibility exists that the fruit of the type are abnormal, or that the plant is not sapotaceous.” However, he concluded that it must be sapotaceous and described it. It is still known only from the type.

Pouteria unilocularis (Donn.-Sm.) Baehni, *Candollea* 9: 273. 1942.

Upland forest or along streams, 850 meters or less; Petén; Alta Verapaz; Izabal. British Honduras; Honduras; Costa Rica.

A tall or medium-sized tree, sometimes 18 meters high, the trunk as much as 50 cm. in diameter, glabrous throughout except on the flowers; leaves coriaceous, on petioles 5–15 mm. long, elliptic-oblong or elliptic, 6–20 cm. long, 2.5–9 cm. broad, abruptly long-acuminate or caudate-acuminate, the tip obtuse, acute at the base and often long-decurrent, the lateral nerves about 14 pairs; flowers white, densely fasciculate in the leaf axils, the pedicels 3–6 mm. long, sparsely brown-sericeous; sepals 4–6, ovate-rounded, 2 mm. long, sparsely ferruginous-sericeous, ciliate; corolla glabrous, almost 3 mm. long, the lobes broadly rounded, ciliate, more than twice as long as the tube; stamens inserted at the apex of the tube, the filaments short, the anthers short, broadly oblong; staminodia 5, narrowly lanceolate, slightly shorter than the stamens; young fruit oval or ellipsoid, 1–1.5 cm. long, rounded at each end, glabrous.

Called “*zapotillo*” or “*zapotillo negro*” in British Honduras. The synonymous names *Pouteria meyeri* (Standl.) Baehni and *P. hondurensis* (Standl.) Baehni may have been applied to Guatemalan specimens.

Pouteria viridis (Pittier) Cronquist, *Lloydia* 9: 290. 1946. *Calocarpum viride* Pittier, *Contr. U. S. Nat. Herb.* 18: 84, *tt.* 52–54. 1914.

Achradelpha viridis Cook, U. S. Bur. Pl. Ind. Invent. Seeds 36: 10, 69. 1915. *Injerto*; *injerto*; *raxtul* (Quecchí); *raxtulul* (Poconchí); *tulul* (Casciquel).

Planted commonly in Guatemala at 900–2,100 meters, especially in the central region and in Alta Verapaz (type from Cobán, Alta Verapaz, *O. F. Cook 214*); native habitat uncertain, but quite possibly in Alta Verapaz. Cultivated also in Mexico, El Salvador, Honduras; Nicaragua and Costa Rica.

A large tall tree, similar in most respects to *P. mammosa*; leaves on petioles 1–2 cm. long, cuneate-oblong or obovate-oblong, 10–25 cm. long, 5–7 cm. broad, obtuse or acute and apiculate at the apex, attenuate to the base, almost glabrous above, whitish-tomentose or soft-pilose beneath; flowers whitish, in clusters of 2–5 at defoliated nodes below the leaves, sessile or short-pedicellate; sepals 9–10, rounded, closely imbricate, 2–4 mm. long, densely sericeous; corolla 10 mm. long, sometimes pinkish, pubescent outside, the lobes ovate-rounded, equaling the tube; staminodia pubescent, 2.5 mm. long; stamens glabrous; ovary sericeous at the base of the style; fruit subglobose to ovoid, somewhat pointed at the apex, commonly 7–10 cm. long, 1–2-seeded; rind thin and soft, olive-green tinged with yellow or reddish; seeds 4.5–6 cm. long, pointed at each end, light brown, very smooth and lustrous; the umbilical area reddish and almost smooth.

Called "*zapotillo calenturiente*" in Honduras; "*chulul*" (Chiapas); "*zapote injerto*" (El Salvador). The fruit of this tree is highly esteemed, and is considered better than that of *P. mammosa*. It is sweeter, less fibrous, and lacks the "raw" taste that usually is present in the common zapote. The fruit varies greatly in size and shape, is often globose. The fruits of the two species of this genus are so unlike in every respect that there is no doubt that two distinct species are represented, yet it seems impossible to separate them by foliage characters. The trees and fruit are more abundant in Alta Verapaz than elsewhere, but the fruits often are plentiful in the markets of such places as Guatemala and Antigua. At Cobán the fruit is especially plentiful around Holy Week, and at this time the hundreds of discarded seeds are seen scattered among the cobblestone streets. Some of the fruits sold in the Cobán market are very small, not more than 5 cm. in diameter, globose, and seedless. We have been unable to see this form on the tree, but it is said to be taken from the trees that bear the large fruits with seeds. Two or more place names of Guatemala, *Injerto*, are derived from the name of this tree.

POUTERIA BELIZENSIS (Standl.) Cronquist, *Lloydia* 9: 267. 1946. *Lucuma belizensis* Standl. *Trop. Woods* 4: 6. 1925 (type from British Honduras, *Kluze 41*).

This species was described from sterile material and may or may not be the same as *Pouteria lundellii* of this flora. Dr. Cronquist, although he made the appropriate combination, also indicated reservations as to the proper identification of the plant. Dr. Baehni has annotated the type as "*Chrysophyllum* ?." See also *P. izabalensis* and *P. durlandii*.

EBENACEAE. Ebony Family

Trees or shrubs, usually dioecious, lacking milky sap. Leaves alternate, without stipules, simple, entire, often coriaceous; flowers small, usually unisexual, sometimes perfect, inflorescence axillary or lateral at defoliated nodes, flowers solitary or cymose; pistillate flowers often solitary or at least fewer than the staminate flowers; pedicels articulate below the flower; calyx inferior, gamosepalous, the 3-7 lobes valvate, imbricate, or contorted, somewhat accrescent and persistent in fruit; corolla gamopetalous, rotate to globose, urceolate, tubular, or salverform, the 3-7 lobes dextrorsely contorted, rarely imbricate or valvate; stamens as many as the corolla lobes, twice as many, or numerous, hypogynous, the filaments usually shorter than the anthers, free or variously connate; anthers narrow, erect, basifixed, the 2 cells parallel, dehiscent by lateral slits or rarely by terminal pores, the connective commonly produced and apiculate; disk none; ovary superior, sessile, the cells as many as the styles or twice as many; styles 2-8, free or connate, the stigmas terminal, small, entire or emarginate; ovules twice as many as the styles, solitary or geminate in the cells, affixed to the interior angle of the cell, pendulous, anatropous; fruit coriaceous or fleshy, usually indehiscent, by abortion generally few-celled and 1-few-seeded; seeds pendulous, commonly oblong and compressed, the testa thin or coriaceous, smooth; endosperm copious, cartilaginous, sometimes ruminant; embryo axile, straight or curved, the cotyledons foliaceous, the radicle superior, cylindrical.

Genera four or five, the following and one other in the New World.

DIOSPYROS L.

Trees or shrubs, dioecious or rarely polygamous; flowers small, in small axillary cymes or lateral on old wood, the inflorescences sometimes reduced to a single flower; calyx 3-7-fid, usually 3-5-fid, persistent and accrescent in fruit, rarely truncate or irregularly ruptured; corolla urceolate, tubular, campanulate, or salverform, pubescent outside, the lobes mostly 3-5, almost always contorted; staminate flowers with 3-many stamens, these inserted on the base of the corolla or hypogynous, the filaments variously connate or free; anthers oblong-linear or lanceolate, usually dehiscent by lateral slits; pistillate flower usually with staminodia, but these fewer than the stamens of the staminate flower; ovary conic or globose, pubescent or glabrous; styles or style branches 1-4; fruit depressed-globose to ovoid, oblong, or conic, pulpy; seeds oblong, the testa usually fuscous and lustrous; endosperm entire or ruminant.

About 250 species, chiefly in tropical regions of both hemispheres, only a few extending to temperate regions. Many authors have

treated *Maba* as a distinct genus, with a trilobate calyx in contrast with the 4-5-lobate calyx of *Diospyros*. This is a convenient but purely artificial and mechanical division of the group, and unfortunately sometimes plants are found with 3-4-lobate calyces on the same plant, thus invalidating the only character by which the two genera were presumed to be distinguished. One or two other species are found in Central America, several more are native in Mexico, and two reach the United States. *D. virginiana* L. of the eastern half of the United States is the persimmon, noted for its edible fruit, intensely bitter when green but sweet and well-flavored after being frosted. Large quantities of the fruits are eaten raw, or sometimes utilized in the preparation of confections or jellies and jams. The fruit was an important food of some of the United States Indians.

The species of *Diospyros* furnish the true ebony of commerce, which is obtained from Old World members of the genus. Ebony is usually pictured as a fine-grained black wood, such as that used for piano keys and many other miscellaneous purposes, and it has been highly valued for thousands of years. However, the heart-wood of most species of *Diospyros* is only mottled or streaked with black, and not a substitute for the classical ebony.

The Central American species of *Diospyros* are of little or no importance as sources of wood. Most of the Guatemalan species are inadequately known and a satisfactory key to separate them is difficult to make.

Leaves oblanceolate or cuneate-obovate, rounded and obtuse at the apex, cuneate-attenuate to the base, broadest toward the apex.

Leaves subfasciculated at the ends of branches *D. anisandra*.

Leaves not subfasciculated.

Fruits longer than broad; leaves mostly 3-4.5 cm. long. *D. bumelioides*.

Fruits globose or depressed globose; leaves mostly 5-8 cm. long.

Mature fruit about 3 cm. broad *D. johnstoniana*.

Mature fruit mostly less than 1.5 cm. broad *D. cuneata*.

Leaves mostly lanceolate, oblong-elliptic or oval, broadest at or near the middle, often or usually acute or narrowed to the apex.

Calyx and corolla trilobate, fruits small, to 3 cm. broad or usually less.

Leaves glabrous below or nearly so, often thinly sericeous or strigose with closely appressed hairs *D. verae-crucis*.

Leaves densely and softly pubescent below *D. nicaraguensis*.

Calyx and corolla 4-6-lobate; fruits large or small.

Fruits very large, 4-7 cm. broad, the flesh black; leaves 12-20 cm. long.

D. digyna.

Fruits small, 1-2 cm. in diameter.

Leaves narrowly lanceolate, attenuate to the base *D. schippii*.

Leaves oval to elliptic-oblong, rounded or obtuse to the base.

Fruit as broad as long or broader; lateral leaf nerves about 7 pairs or fewer.....*D. yatesiana*.

Fruit ellipsoid, longer than broad; lateral leaf nerves more than 7 pairs.
D. campechiana.

***Diospyros anisandra* Blake, Proc. Biol. Soc. Wash. 34: 44. 1921.**

Low forests or moist thickets; Petén. Mexico (Yucatan Peninsula, type *Gaumer 23307*).

Shrubs or small trees to 5 meters tall. Branchlets short, glabrous; leaves subfasciculate at the tips of the branches, obovate, rounded and retuse at the apex and cuneate to the base, glabrous or nearly so, 2-6 cm. long and 1.2-3 cm. broad; inflorescences axillary; staminate flowers 1-2, pendulous, pedicels 1-2 mm. long, calyx funnelform, about 4 mm. long, the 4 lobes lanceolate, acuminate, and about 1.5 mm. long, the corolla urceolate, about 14 mm. long, the tube 7 mm. long lanceolate, acuminate lobes equally long; pistillate flowers 1-2, the calyx tube turbinate and about 1.5-2 mm. long, the 4 lobes ovate, acute or obtuse, the corolla urceolate, glabrous, about 10 mm. long, the tube 4 mm. and the lanceolate, acuminate lobes about 6 mm. long; fruits globose, about 1 cm. in diameter, shiny black berries when mature.

The only known Guatemalan specimens were collected by Dr. Lundell (*17227, 17232*) on gypsum cliffs along the shore of Lake Petén-Itza.

***Diospyros bumelioides* Standl. Trop. Woods 18: 31. 1929.**

Low forest or thickets at or but little above sea level; Petén. British Honduras (type from Orange Walk, *Lundell 137*). Mexico.

Shrubs or trees to as much as 15 meters tall, apparently densely branched, the branchlets thick, short, grayish, densely leafy at the tips; leaves sessile, narrowly cuneate-spatulate or cuneate-obovate, mostly 2.5-4.5 cm. long and 1-1.5 cm. broad, rounded at the apex and often emarginate, cuneate-attenuate to the base, glabrous above or puberulent on the costa, often lustrous, dull beneath, glabrous or essentially so; pistillate flowers solitary, on stout pedicels 3-5 mm. long; fruiting calyx glabrate outside, puberulent within, the tube 4-5 mm. long, the 4 lobes broadly ovate or elliptic, 5-6 mm. long, obtuse or broadly rounded at the apex, green, recurved; fruit subglobose, about 1.5 cm. in diameter, slightly longer than broad, rounded at the apex, lustrous, sparsely sericeous or glabrate; seeds 4, about 1 cm. long.

***Diospyros campechiana* Lundell, Contr. Univ. Mich. Herb. 4: 23. 1940.**

In high ciliar forests, Petén. Mexico (Campeche).

Trees 7-20 meters tall, the trunk 40-45 cm. in diameter, the branches glabrous or (*vide* Lundell) minutely puberulent. Leaves elliptic or oblong-elliptic, subacuminate, glabrous or (*vide* Lundell) minutely puberulent and sparsely black strigillose, lateral nerves 7-10 pairs, 8-20 cm. long and 3.2-5.5 cm. broad; inflorescences short 3-4-flowered axillary cymes, minutely and obscurely black strigillose, pedicels 1-

2 mm. long; calyx persistent, 10–12 mm. broad, 4–(5-) lobed, the lobes suborbicular; corolla unknown; fruits ellipsoidal, to about 1.8 cm. long and 1.5 cm. broad when mature, orange-colored, glabrous.

Diospyros cuneata Standl. Field Mus. Bot. 8: 33. 1930.

At or little above sea level, British Honduras (Corozal District, *Gentle 292*). Mexico (Yucatan Peninsula).

A shrub or tree, sometimes flowering when only 2 meters high, but often reaching a height of 5–6 meters, the young branches sparsely strigillose, soon glabrate, densely leafy; leaves on petioles 2–3 mm. long, cuneate-obovate or cuneate-oblong, subcoriaceous, often lustrous, 4–8.5 cm. long, 1.5–3.5 cm. broad, obtuse or broadly rounded at the apex, cuneately narrowed to the base, puberulent above on the costa or glabrous, very sparsely strigillose beneath when young, soon glabrate; staminate flowers in axillary 3–4-flowered short-pedunculate cymes, short-pedicellate; calyx campanulate, 3.5 mm. long, densely sericeous, shallowly 4-lobate, the lobes broadly triangular or rounded, scarcely half as long as the tube; corolla salverform, densely sericeous outside, 6–7 mm. long, the 4 lobes shorter than the tube; fruiting calyx 13–15 mm. broad, 4–6-lobate, the lobes rounded at the apex, sparsely strigillose outside, densely sericeous within; fruit globose, about 13 mm. in diameter, rounded at the apex, strigose at first, later glabrate, very lustrous; seeds little compressed, blackish, 8 mm. long.

Known in Yucatan by the Maya names “*sibil*” and “*silil*.”

Diospyros digyna Jacq. Hort. Schoenbr. 3: 35, *t. 313*. 1798; Howard, Journ. Arn. Arb. 42: 434. 1961. *D. obtusifolius* Humb. & Bonpl. ex Willd. Sp. Pl. ed. 4, 4: 1112. 1806; HBK. Nov. Gen. & Sp. 3: 253, *t. 247*. 1819. *D. ebenaster* of authors. *Zapote negro; matazano de mico*.

Dry or wet mixed forest usually at or little above sea level; Izabal; said to grow in the lowlands of Huehuetenango, and to be planted occasionally in other regions but the tree is not cultivated commonly in Guatemala. Mexico; British Honduras; Nicaragua; Costa Rica; West Indies; naturalized in the Old World tropics and cultivated there.

A medium sized or sometimes rather large tree, as much as 25 meters high with a trunk 45 cm. in diameter; leaves on short, stout petioles, subcoriaceous, lustrous, mostly oblong or elliptic-oblong, sometimes as much as 30 cm. long, persistent, somewhat narrowed to the obtuse or subacute apex, obtuse or acute at the base, glabrous; flowers polygamous, whitish, fragrant, in small, sessile or short-pedunculate few-flowered cymes, almost 1 cm. long, the corolla sericeous outside, urceolate, the lobes much shorter than the tube, rounded; fruiting calyx about 3.5 cm. broad, usually 4-lobate; fruit globose or depressed-globose, 4–7 cm. broad, olive-green or yellowish green, the flesh when fully ripe black; seeds about 1.5–2 cm. long, brown, somewhat compressed, smooth.

Called "*zapote de mico*" in El Salvador; "*zapote prieto*" (Mexico); "*tauchi*" (Tabasco); "*tauch*" (Maya); "*ebano*" (Yucatan). The immature fruits are intensely bitter and pucker the mouth. The ripe fruits are sweet and edible, but the black mushy flesh is repulsive in appearance, reminding one of dirty axle grease. In spite of this, the ripe fruit is much eaten in Mexico and some other countries, and is sometimes made into preserves, or fermented to produce a kind of brandy. The wood is reported to have the qualities of typical ebony.

Diospyros pergamentacea Lundell, from Mexican territory adjacent to Guatemala, seems not to be distinct from *D. digyna*.

Diospyros johnstoniana Standl. & Steyerl. Field Mus. Bot. 22: 165. 1940.

Known only from the type, damp, densely forested ravine along Río Guacalate, near Pastores, Sacatepéquez, alt. 1,600 m., *Standley 59934*.

A tree 7.5 meters high, the branchlets densely leafy, at first sparsely hispidulous with spreading hairs; leaves membranaceous, on petioles 4–7 mm. long, cuneate-ovate to oblanceolate-oblong, 3.5–5.5 cm. long, 1.5–2.5 cm. broad, broadly rounded or obtuse at the apex, cuneately narrowed to the base, glabrous or glabrate above, sparsely hirtellous beneath, mostly on the nerves and costa, or glabrate; fruiting calyx 1.5 cm. broad, shallowly 3–4-lobate, sparsely hispidulous outside; fruit depressed-globose, green, glabrous except at the strigose apex, 3 cm. broad, broadly rounded at the apex; seeds somewhat compressed, fuscous-brown, 14 mm. long, with acute margins.

This species was named for John R. Johnston, in whose company the type was collected. Specimens of the type collection are in poor condition. The species has been collected but once. Superficially, the species resembles *D. anisandra* Blake but the fruits are much larger and the species is one of the mountains rather than of the lowlands.

Diospyros kaki L. f., the Japanese persimmon, introduced from China and Japan, is rarely cultivated in Guatemala, at 1,300–1,500 meters, as at Antigua, Panajachel, and Cobán, where it usually is called "*persimón*." It is said to grow and produce well, but the plants seen at Chirripec near Cobán were very small trees or more properly bushes. Some of the grafts had died, but the stocks on which they were grafted, some other species of *Diospyros*, had grown into large trees, which were worthless for fruit. The Japanese persimmon is a beautiful fruit, large and handsomely colored, but it has found little favor in the United States, being considered too sweet and insipid.

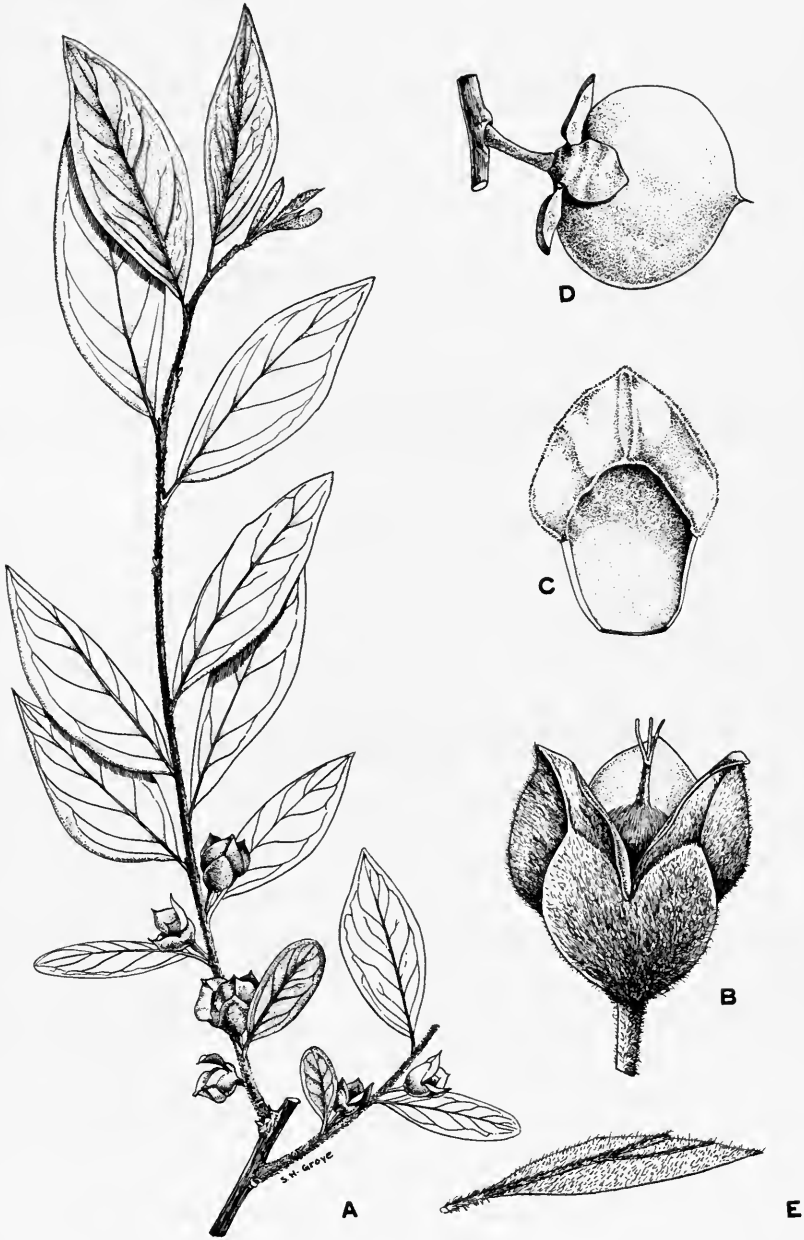


FIG. 69. *Diospyros nicaraguensis*. A, Habit, $\times \frac{1}{2}$. B, Flower, $\times 4$. C, Petal, $\times 4$. D, Fruit, $\times 1\frac{1}{2}$.

In recent years we have seen beautiful fruits of this plant offered in Mexican markets where we heard the common name "*kaki*" used.

Diospyros nicaraguensis Standl. Carnegie Inst. Wash. Publ. 461: 80. 1935. *Maba nicaraguensis* Standl. Contr. U. S. Nat. Herb. 20: 193. 1919. *D. yucatanensis* Lundell, Carnegie Inst. Wash. Publ. 478: 217. 1937 (type from Lago de Petén, near San Andrés, *Lundell 3237*). *Salmón-ac* (Huehuetenango, Spanish and Maya); *jaboncillo* (Petén); *guayaba cimmarona* (Zacapa).

Dry or wet mixed forests, 1,400 meters or usually less, on plains or hillsides; Petén; Izabal; Baja Verapaz; El Progreso; Zacapa (?); Chiquimula; Huehuetenango. Mexico; Honduras; Nicaragua; Costa Rica.

Trees or shrubs to 15 meters tall and 20 cm. in diameter but usually smaller. Leaves elliptic or ovate-oblong or often obovate or oblanceolate, acute or short acuminate, sometimes quite obtuse, densely soft pubescent on both surfaces, more so below, occasionally glabrate, especially above, 2–10 cm. long and 1–6 cm. broad; pistillate inflorescences 1-flowered, axillary, nearly sessile, the pedicels not more than 3 mm. long, the flowers mostly 3-merous, calyx deeply trilobate, the lobes rounded, fulvous-pubescent outside, 3–6 mm. long or to 15 mm. broad in fruit, corolla urceolate, sericeous, about 8 mm. long; staminate inflorescences one- or usually 2–3-flowered cymes, axillary, calyx deeply trilobate, sericeous or fulvous-pubescent outside, the lobes lanceolate, acute, corolla urceolate, sericeous, 6–8 mm. long, stamens about 6; fruit subglobose, 2–3 cm. in diameter and yellow or orange when mature.

Called "*silion*" in British Honduras; "*manzote*" in Honduras; "*chocoyo*" or "*chocomico*" in Nicaragua.

This is the commonest species of *Diospyros* in Central America and one that is quite variable. It is widespread in the pine-oak region of central Honduras although never abundant.

Diospyros schippii Standl. Carnegie Inst. Wash. Publ. 461: 80. 1935.

In forest, 780 meters, known only from the type, *Schipp 1281*, collected at Camp 34, on the boundary between Petén and British Honduras.

A tree 15 meters high with a trunk 20 cm. in diameter, the young branchlets sparsely strigose; leaves on petioles 5–7 mm. long, subcoriaceous, narrowly oblong-lanceolate, 6–9 cm. long, 1.5–2 cm. broad, gradually narrowed to the narrowly obtuse apex, gradually narrowed to the base, glabrous, somewhat lustrous above, dull beneath; fruit subglobose, 12 mm. long, rounded and apiculate at the apex, densely sericeous or glabrate; fruiting calyx 8–9 mm. broad, shallowly 4-lobate, sparsely and minutely strigillose or glabrate, the lobes rounded at the apex; seeds dark brown, oval, almost smooth, 9 mm. long.

Diospyros verae-crucis Standl. Carnegie Inst. Wash. Publ. 461: 80. 1935. *Maba verae-crucis* Standl. Contr. U. S. Nat. Herb. 18: 119. 1916.

Brushy quebradas, about 200 meters; Santa Rosa (region of La Sepultura, west of Chiquimulilla, *Standley 79392*); Chiquimula, at 480 meters (?). Southern Mexico; El Salvador.

A tree of 5 meters, the branchlets slender, somewhat pubescent at first, soon glabrate; leaves on petioles 5 mm. long or less, membranaceous, narrowly obovate to oblanceolate, 6-12 cm. long, 2-4 cm. broad, narrowed to the acute or acuminate apex, the tip obtuse, attenuate to the base, sparsely strigose beneath or almost glabrous; fruiting calyx about 1.5 cm. broad, shallowly trilobate, the lobes broadly rounded, densely sericeous within; fruit subglobose, 12-16 mm. in diameter or slightly larger, about 6-celled, sericeous when young but almost glabrous at maturity.

Called "*pepenance*" or "*pipinance*" in El Salvador.—This species is perhaps too close to *D. nicaraguensis*. Should they prove to be the same, this is the older name.

Diospyros yatesiana Standl. Carnegie Inst. Wash. Publ. 461: 81. 1935. *D. zacapana* Standl. & Steyerl. Field Mus. Bot. 22: 263. 1940 (type from Zacapa, *Steyermark 29490*).

Moist or dry thickets or open lowland forest, 200-400 meters; Zacapa; Petén. Mexico.

Trees to 20 meters or more tall, the branchlets strigillose but soon glabrous; leaves elliptic to broadly elliptic or oval, acute or acuminate, 8-20 cm. long and 4.5-8 cm. broad, sparsely strigillose below but soon glabrate, coriaceous or subcoriaceous when mature, petioles about 1 cm. long; inflorescence (pistillate) apparently of single flowers borne on the old wood, the pedicel 1-2 mm. long; fruiting calyx to about 12 mm. broad, 4-lobate, puberulent outside and inside; corolla unknown; fruits globose, puberulent but becoming glabrous, orange colored when mature, 2-2.5 cm. in diameter.

SYMPLOCACEAE

Reference: A. Brand, Symplocaceae, Pflanzenreich IV. 242. 1901.

Shrubs or trees with alternate, estipulate, coriaceous, entire or serrulate leaves. Inflorescences axillary or terminal, few- or one-flowered to many-flowered, racemes, cymes, panicles, spikes or fascicles; flowers perfect (or rarely unisexual), regular; calyx 5-lobed, imbricate, persistent on the fruit; corolla sympetalous but lobed to near the base, lobes 5-10 (five in ours) in one or two series, imbricate; stamens 4-many (ours), inserted from the middle to the base of the corolla and the filaments variously connate (ours) or free; pistil one, the ovary inferior or sometimes half inferior, the stigma 2-5-lobate or simple; locules 2-5, placentation axile with usually 2 seeds in each locule; fruit a berry or drupaceous, crowned (in ours) with the persistent calyx, endosperm copious.

The family contains a single genus and some 300 species, chiefly in the tropics of America and Asia. In addition to those listed below, there are several other species in Mexico and southern Central America. The trees are often quite attractive when seen in the tropical forests.

SYMPLOCOS Jacquin

The genus has the characters of the family.

Petals pubescent dorsally.

Calyx lobes less than 1.5 mm. long, rounded at the apex. *S. matudae*.

Calyx lobes more than 4 mm. long, either acute or rounded at the apex.

Flower peduncles 2-5 cm. long; calyx lobes rounded. *S. vatterii*.

Flower peduncles 0.3 cm. long or less; calyx lobes acute. *S. hartwegii*.

Petals glabrous dorsally.

Branches hirsute with long spreading brown hairs; leaves narrowed to a rounded base. *S. tacanensis*.

Branches sparsely pilose with appressed hairs, or glabrous.

Style conspicuously pubescent to the middle; leaves 15 cm. long or more.

S. johnsonii.

Style glabrous or at most sparsely pubescent; leaves mostly less than 15 cm. long.

Inflorescences terminal, paniculate. *S. sp.*

Inflorescences lateral or axillary.

Calyx lobes 4-5 mm. long; leaves mostly less than 5 cm. long.

S. abietorum.

Calyx lobes less than 4 mm. long; leaves mostly more than 5 cm. long.

Apex of leaves rounded. *S. culminicola*.

Apex of leaves acuminate or acute.

Leaves distinctly bicolored on the two sides, the upper surface distinctly darker than the lower surface or often nearly black when dried.

Calyx lobes densely pubescent dorsally; flower pink or lavender; leaves oval to elliptic-ovate; montane species. . . *S. vernicosa*.

Calyx lobes glabrous or nearly so dorsally; flowers white; leaves elliptic to elliptic-obovate; lowland species. *S. bicolor*.

Leaves even colored on the two sides, mostly broadest above the middle, not becoming black or very dark in drying.

S. limoncillo.

***Symplocos abietorum* Standl. & Steyerl. Field Mus. Bot. 23: 221. 1947.**

Cool mixed forest at about 3,300 m., Huehuetenango (type *Steyermark 48482*), endemic.

A shrub or tree 4.5-9 meters high, densely branched, the branches stout, at first sparsely hispidulous with rigid brownish spreading hairs, the internodes short; leaves small, on stout petioles 4-5 mm. long, rigid-coriaceous, oval or obovate-oval, 3-5 cm. long, 1.5-2 cm. broad, rounded or very obtuse at the apex, obtuse or rounded at the base, yellowish when dry, evidently repand-denticulate, glabrous

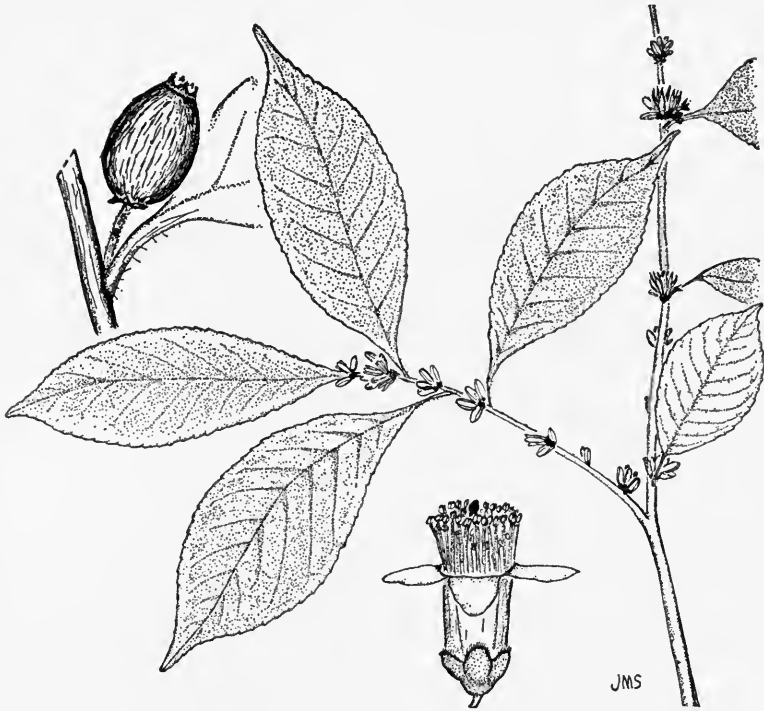


FIG. 70. *Symplocos bicolor*. A, Branch, $\frac{1}{2}$ natural size. B, Flower, $\times 3$. C, Fruit, $\times 5$.

and lustrous above, the veins impressed, sparsely pilose beneath with somewhat spreading, brownish hairs, the lateral nerves about 6 on each side, the veins prominent and closely reticulate; flowers solitary, sessile or subsessile, the bracts rounded-ovate, obtuse and apiculate, 2 mm. long, ciliate, glabrous; sepals ovate, to triangular-ovate, acute, glabrous, the margins ciliolate, 4–5 mm. long; corolla campanulate, glabrous, about 10–12 mm. long, 5-lobed, the lobes oblong-oval, obtuse, imbricated, about 8–9 mm. long; stamens bi- or triseriate, numerous, shorter than the corolla, the filaments connate and forming a corona; fruits broadly ellipsoid to obovate, 1.5–2 cm. long and 1–1.5 cm. in diameter, sessile.

Symplocos bicolor L. Wms. Fieldiana, Bot. 31: 265. 1967.

Lowland forests or jungle, sea level to 650 meters; Izabal; Petén. British Honduras (type from Mullins River Road, *Schipp* 862).

Trees to 10 meters tall and 20 cm. in diameter, the twigs sparsely strigose pubescent at first but soon glabrous, angulate but soon terete, grayish. Leaves elliptic to elliptic-obovate, acuminate, obscurely repand-serrulate or entire, the two surfaces distinctly bicolored, the blades mostly 5–13 cm. long and 2–5 cm. broad, the petioles somewhat fleshy, 0.5–1 cm. long; inflorescences short few-flowered axil-

lary cymes; the rachis puberulent, mostly less than 1 cm. long; flowers white, fragrant, small, mostly 7-9 mm. long; calyx lobes broadly ovate to suborbicular, obtuse, glabrous or nearly so, but somewhat ciliolate, about 1 mm. long; corolla divided to below the middle, 5.5-7 mm. long, the lobes oblong, obtuse, glabrous, reflexed at anthesis, 4-6 mm. long; stamens about 30 in 2-3 series, the filaments connate and forming a short corona, adnate with the corolla up to the throat of the tube, about as long as the corolla; style about 6 mm. long, glabrous, the stigma subcapitate, lobate; the fruits small, ovoid, glabrous, about 6-10 mm. long and 5-7 mm. broad.

The leaves of the dried material are nearly black above, the under surface much lighter. Called "male pigeon plum" in British Honduras.

Symplocos culminicola Standl. & Steyerl. Field Mus. Bot. 23: 222. 1947.

Moist wet forest, 1,500-2,000 meters; endemic; Chiquimula (type from Volcán de Quezaltepeque, *Steyerl. 31489*).

Trees about 8 meters tall, glabrous throughout or nearly so; leaves on thick petioles 6-10 mm. long, coriaceous when mature, yellowish when dry, elliptic-oblong to oblong-obovate, broadly rounded at the apex, subacute to the base, entire, the margins perhaps revolute when mature, the nerves prominulous below, 5-10 cm. long and 3-5.5 cm. broad; inflorescence axillary, apparently 1-flowered, the peduncle in fruit about 2 cm. long; calyx in fruit about 4 mm. long, the lobes broadly rounded, ciliate; fruit oblong-ellipsoid, about 2.5 cm. long and 1.5 cm. in diameter.

The type of this species, which is all that is available, is fruiting and inadequate. It seems to be different from anything else in Guatemala because of the coriaceous leaves with rounded apices.—The original description included specimens that probably belong to two species.

Symplocos hartwegii A. DC. Prodr. 8: 252. 1844. *S. cernua* Humb. & Bonpl. var. *mexicana* A. DC. l.c. 248 (based on *Hartweg 545*).

Moist or wet forest, 1,200-3,400 meters; Quiché; Quezaltenango (type from Santa María de Jesús, *Hartweg 545*); San Marcos; endemic.

A tree of 7-9 meters, the young branchlets sparsely hirsute with whitish hairs or weakly pilose, rather densely leafy; leaves petiolate, membranaceous to subcoriaceous, elliptic to elliptic-oblong, mostly 5-6.5 cm. long and 2-3.5 cm. broad, subacute with obtuse tip, obtuse at the base, serrulate to subentire, glabrous above and deep green, beneath paler, hirsute on the costa and sometimes over the whole surface with spreading or appressed hairs; flowers solitary or few together, almost sessile; calyx 5-6 mm. long, appressed-pilose outside, the lobes broadly ovate, obtuse, ciliate; corolla pink, appressed-pilose outside, except the margins of the lobes, 12 mm. long; stamens triseriate; ovary hirsute.

This has been reported from Guatemala as *S. speciosa* Hemsl., by both Captain Smith and Brand. The latter, in fact, cites only a Guatemalan collection for *S. speciosa*, which actually was described from Mexico! Apparently he had seen no material of *S. speciosa*, corolla of which is described by Hemsley as glabrous.

Symplocos johnsonii Standl. Journ. Wash. Acad. Sci. 17: 169. 1927.

Known only from the type, collected at Samac, near Cobán, Alta Verapaz, 1,350 meters, *Harry Johnson 874*.

A tree of 18 meters, the branchlets glabrous; leaves on petioles 12–20 mm. long, oblong or elliptic-oblong, 12–22 cm. long, 4.5–8 cm. broad, abruptly acute with obtuse tip, acute or acuminate at the base, subcoriaceous, entire or nearly so, glabrous, lustrous above, the lateral nerves about 14 pairs; inflorescence few-flowered, axillary, dense, congested, the flowers sessile; calyx tube 2 mm. long, glabrous, the lobes broadly rounded, 2 mm. long, ciliolate; corolla rose-pink, 16 mm. long, the tube 8–9 mm. long, glabrous; stamens equaling the corolla lobes, the filaments connate into a tube, very unequal; style densely hirsute below.

The leaves are the largest of any of those of the Guatemalan species.

Symplocos limoncillo Humb. & Bonpl. Pl. Aequin. 1: 196. 1808.

Moist mixed forest, 1,000–2,600 meters; San Marcos; Huehuetenango. Southern Mexican; Nicaragua.

A tree of 6–15 meters, glabrous almost throughout; leaves short-petiolate, firm, usually bright green when dried, oblong to elliptic or oblanceolate-oblong, mostly 8–14 cm. long, acute to narrowly acuminate, acute at the base, serrulate or entire, usually lustrous; flowers racemose, the racemes few-flowered, the flowers pink or white, often on elongate pedicels; calyx glabrous, the lobes orbicular, ciliate; corolla about 1 cm. long, glabrous; fruit oval to oblong, 1.5–2 cm. long.

The flowers are fragrant. The specific name is the vernacular name given the tree in Veracruz, possibly because the foliage has a lemon odor. We are not sure that the Guatemalan specimens are this species but they seem to match a fragment from the type collections. *Symplocos flavifolia* Lundell may belong here,—or there is the possibility that this name should attach to the taxon which we call *S. limoncillo*.

Symplocos matudae Lundell, Am. Midl. Nat. 20: 241. 1938, as *S. Matudai*. *S. hartwegii* var. *opaca* Brand, Bull. Herb. Boiss. II, 6: 747. 1906 (type probably *Heyde & Lux 3011*, Sajabajá, Quiché, alt. 1,200 m.).

Mixed wet forest, 1,200–2,200 meters; Zacapa; Jalapa; Quiché; Alta Verapaz. Mexico (Chiapas, type *Matuda 472*).

Trees to 10–12 meters tall, twigs sparsely strigillose pubescent, soon glabrate, grayish. Leaves elliptic or elliptic-oblong, acuminate, obscurely repand-serrulate or usually entire, coriaceous or subcoriaceous, the upper surface darker than the lower, lateral nerves about 10 pairs, lower surface sparsely strigillose pubescent with appressed hairs, becoming glabrous, glabrous above, blade 6–9 cm. long and 2–3 cm. broad, the petiole fleshy, 0.6–1 cm. long; inflorescences few-several-flowered compact axillary cymes, the rachis strigillose; flowers purple to lilac, fragrant; calyx short, the lobes rounded, 1–1.3 mm. long and slightly broader, densely strigillose pubescent; corolla about 7–8 mm. long, subcampanulate, divided to near the base, lobes oblong or oblong-obovate, the apex rounded, strigillose pubescent except margins, about 6–7 mm. long; stamens about 30–40, bi- or triseriate, the filaments connate and forming a corona, adnate to the corolla at about the middle near the constricted throat; style pubescent toward the base; ovary pubescent.

Symplocos chiapensis Lundell, l.c. 240, is based on a specimen with detached fruits, from Mexico (Chiapas) near the Guatemalan border. It may or may not be the same as *S. matudae*.

Symplocos tacanensis Lundell, Bull. Torr. Bot. Club 66: 601. 1939.

Known only from the type collection, north slope of Volcán de Tacaná, 2,100 meters, *Matuda 2976*; doubtless extending into San Marcos.

A tree of 8–10 meters, the trunk 35 cm. in diameter, the young branches densely hirsute with long spreading ferruginous hairs; leaves short-petiolate, rather firm, oblong or elliptic-oblong, 5–12 cm. long, 3.5–5 cm. broad, acute or short-acuminate, somewhat narrowed to the narrowly rounded base, thinly hirsute above at first, soon glabrate, slightly paler beneath, brownish-hirsute, especially on the veins, serrulate or subentire, the lateral nerves 6–9 pairs; inflorescences sessile, dense, several-flowered, the flowers sessile; calyx densely appressed-pilose with brown hairs, the ovate lobes 3–3.5 mm. long; corolla 13–14 mm. long, glabrous except for a small area of short appressed hairs at the apex of the lobes; stamens glabrous; style densely pilose below; fruit ellipsoid, 17–20 mm. long, sparsely hirsute.

Symplocos vatteri Standl. & Steyerl. Field Mus. Bot. 23: 222. 1947.

Moist cool forests, 2,800–3,300 meters, Sierra de los Cuchumatanes, Huehuetenango (type *Steyermark 48463*).

A tree, the branchlets slender, brown, densely sericeous or appressed-pilose with sordid or brownish hairs; leaves on stout petioles 6–15 mm. long, chartaceous, elliptic-oblong, 9–14 cm. long, 4.5–5.5 cm. broad, acuminate, rounded or broadly obtuse at the base and sometimes abruptly short-decurrent, entire, green above, sparsely pilose with long weak hairs or glabrate, slightly lustrous, the nerves and veins prominulous but not conspicuous, much paler and brownish beneath, laxly

sericeous, the lateral nerves about 13 on each side, the veins prominulous, laxly reticulate; peduncles axillary, 1-flowered or rarely 2-flowered, 2-4 cm. long, slender, densely sordid-sericeous or subtomentose; sepals suborbicular, densely sericeous outside with long, whitish or ochraceous hairs, rounded at the apex; corolla pale purple, very densely sericeous outside with long white hairs, almost 2 cm. long, the lobes obovate-rounded, broadly rounded at the apex, glabrous within, denticulate or erose; stamens very numerous, few-seriate, almost equaling the corolla, the filaments thick, minutely papillose, the anthers scarcely 0.7 mm. long.

Symplocos vernicosa L. Wms., *Fieldiana*, Bot. 31: 267. 1967.

Humid or wet montane forests, 1,600-2,500 m., Alta Verapaz. Mexico (Chiapas); El Salvador; Honduras (type *Williams 17341*).

Trees mostly 5-15 meters, the branchlets appressed pubescent, soon glabrous, reddish. Leaves oval to elliptic-ovate or elliptic-obovate, obscurely serrulate, abruptly short acuminate, the upper surface very dark green and vernicose, the lower surface paler, pubescent on the mid-nerve below, blade 4.5-10 cm. long and 2-3.5 cm. broad, the petiole to 1 cm. long, fleshy, puberulent dorsally; inflorescence a much abbreviated, axillary few-flowered raceme or cyme; flower pink, waxy; calyx 2-2.5 mm. long, short strigillose pubescent dorsally but the margins glabrous, edges ciliate, the lobes broader than long, rounded, about 1 mm. long and 1.5 mm. broad; corolla 8-10 mm. long, subcampanulate, glabrous, divided to near the base, the lobes oblong, the apex rounded and obscurely lacerate, reflexed in anthesis; stamens 40-45, triseriate, the filaments connate and forming a corona with the anthers borne at or near the apex, adnate with the corolla up to about the middle; style slightly shorter than the corolla, glabrous or sometimes pubescent at the base; the stigma slightly enlarged and 3-4-lobate; fruits oblong-ovoid, 10-12 mm. long and 5-7.5 mm. in diameter.

Rare in Mexico and Guatemala but widely spread in the montane forests of Honduras.

Symplocos sp.

Cloud forest area of Volcán Sta. Luisa, Dept. Progreso, *Steyermark 43504*.

Trees to 12 meters tall, the branchlets glabrous, reddish. Leaves oblong-oval or oblong-obovate, short acuminate, coriaceous, 7-12 cm. long and 3-5.5 cm. broad; inflorescence terminal, paniculate.

This specimen seems to represent an undescribed species but we hesitate to describe it on the inadequate material. It has been determined by Standley as *S. culminicola* Standl. & Steyer.,—which was described from inadequate material but that has axillary inflorescences, apparently with a single flower. The terminal inflorescence is unique among the species known in Guatemala.

EXCLUDED

SYMPLOCOS MARTINCENSIS Jacq. Enum. Pl. Carib. 24. 1760.

This name has been used for a variety of lowland and highland species in Mexico and Central America. None of our material seems to match West Indian specimens.

STYRACACEAE Storax Family

Reference: J. Perkins, *Styracaceae*, *Pflanzenreich* IV. 241: 1-111. 1907.

Shrubs, or sometimes trees, the pubescence usually stellate, sometimes lepidote; leaves alternate, without stipules, entire or rarely dentate, penninerved; flowers regular, perfect, usually white, in simple or branched, terminal or axillary racemes, these often cyme-like or reduced to few-flowered fascicles, the bracts small or minute; pedicels 1-2-bracteolate or ebracteolate; calyx gamosepalous, the tube united at the base or throughout with the ovary, truncate or with 4-5 teeth or lobes; corolla generally 4-5-lobate, the lobes united only at the base or sometimes higher, valvate or imbricate in bud; stamens usually twice as many as the corolla lobes, affixed to the base of the corolla or higher, uniseriate, equal or of 2 lengths; filaments complanate, at least at the base, more or less connate below; anthers introrse, the cells parallel, longitudinally dehiscent; ovary inferior, semisuperior, or wholly superior (ours), 3-5-celled, sometimes 1-celled; style filiform, the stigma small, terminal, more or less 3-5-lobate; ovules 1 or more in each cell, affixed to the interior angle, erect or pendulous, anatropous; fruit drupaceous and indehiscent, or dry and irregularly dehiscent or 3-valvate, the calyx persistent; seeds with thin testa, the endosperm carnose or almost corneous; embryo straight or curved, the cotyledons oblong or broader.

Eighteen genera in temperate and tropical regions of both hemispheres. Only *Styrax* is found in Central America.

STYRAX L. Storax

Trees or shrubs, the pubescence stellate or lepidote; leaves entire or serrate; flowers white or tinged with pink, in axillary and terminal, short, simple or sparsely branched, usually cyme-like racemes, the bracts small or minute; calyx cupuliform, adnate basally to the ovary or almost wholly free, truncate, 5-denticulate, or 3-2-lobate; corolla usually 5-parted, the tube much shorter than the lobes, the lobes valvate or imbricate, erect-spreading or revolute; stamens 10, inserted on the base of the corolla, the filaments glabrous or pubescent; anther cells linear, erect; ovary usually densely pubescent, at first 3-celled, in anthesis usually becoming 1-celled; ovules few in each cell, rarely 1; fruits globose or oblong, dry or somewhat fleshy, the pericarp hard and indehiscent or 3-valvate; seed usually 1, subglobose or ellipsoid, erect, glabrous.

About 100 species, in tropical and temperate regions of the earth exclusive of Africa and Australia. In the tropics the trees are usually confined to cool mountain regions. *Styrax benzoin* Dryand. of Malaya and *S. officinalis* L. of the Mediterranean region yield balsams or resins that were formerly used in medicine under the name storax,

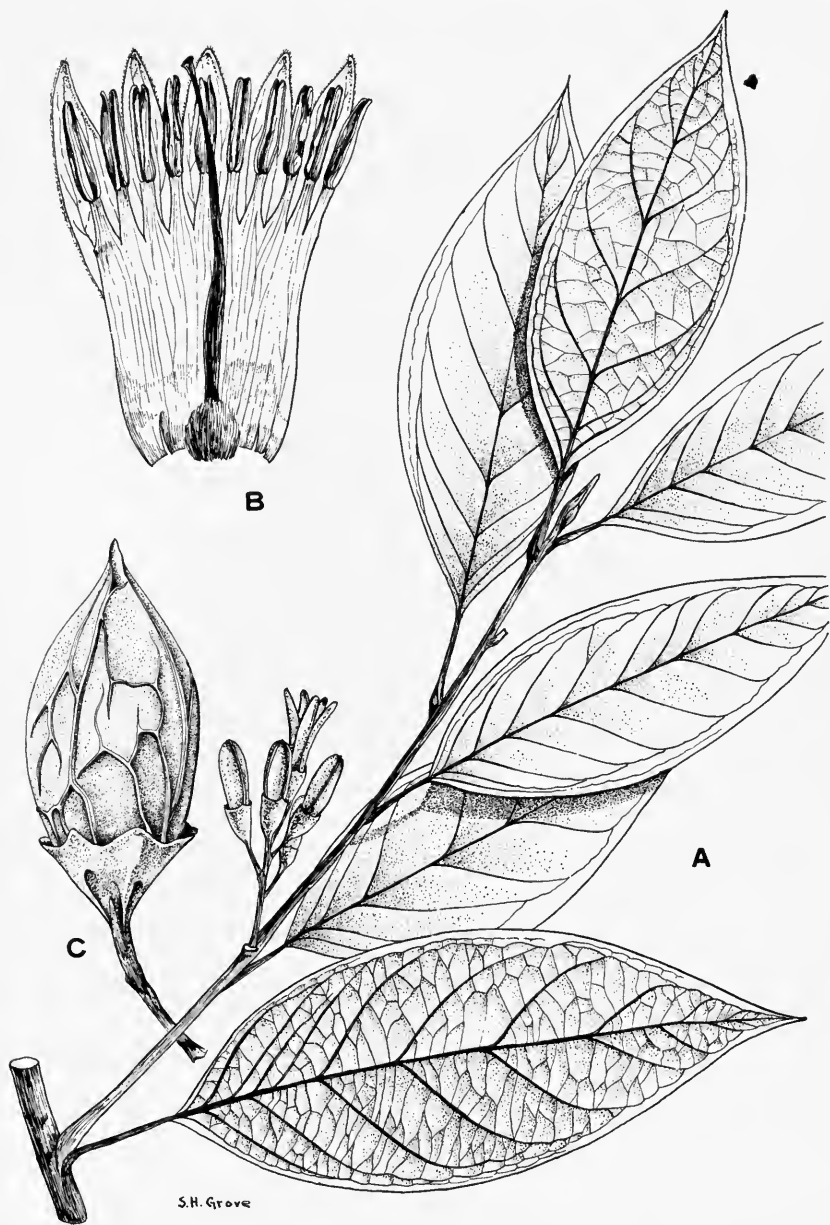


FIG. 71. *Styrax argenteus*. A, Branch, natural size. B, Corolla opened out, $\times 3$. C, Fruit in dried condition, $\times 2\frac{1}{2}$.

but the medicinal storax of the present time is obtained from the genus *Liquidambar* (Hamamelidaceae). An additional species of *Styrax* grows in southern Central America, and several more are described from Mexico.

Corolla lobes imbricated; leaves glabrous beneath or pilose *S. glabrescens*.
 Corolla lobes valvate; leaves abundantly pubescent with stellate pubescence or tomentose, occasionally with lepidote scales intermixed; or glabrous with abundant lepidote scales below.

Under surface of leaf with lepidote scales and abundant punctate glands, no hairs. *S. conterminius*.

Under surface of leaf with stellate or tomentose pubescence occasionally with lepidote scales intermixed *S. argenteus*.

Styrax argenteus Presl, Rel. Haenk. 2: 60. 1836. *S. polyanthus* Perkins in Engler, Bot. Jahrb. 31: 479. 1901. *S. myrsiticifolius* Perkins, l.c. 31: 481. 1902 (type, *Heyde & Lux 6182*). *S. polyneurus* Perkins ex Donn.-Sm. Bot. Gaz. 35: 5. 1903. *S. glabrescens* var. *pilosus* Perkins in Engler, Pflanzenr. IV. 241: 72. 1907. *S. pilosus* Standl. Contr. U. S. Nat. Herb. 23: 1129. 1924. *S. magnus* Lundell, Bull. Torr. Bot. Club 66: 600. 1939 (type, *Matuda 2982*, Volcán Tacaná, Chis.). *S. vulcanicola* Standl. & Steyerl. Field Mus. Bot. 22: 264. 1940 (type, *Steyermark 36801*, San Marcos). *Estoraque*; *roble* (Chiquimula, possibly in error); *tepeaguacate* (Huehuetenango); *naranja*; *duraznillo* (Huehuetenango).

Trees to 15 meters, often flowering when 2 m. tall, and with trunks 30 cm. or more in diameter, the crown often rounded. Branchlets softly stellate-pubescent, often with peltate scales; leaves coriaceous or sometimes membranaceous, the blade very variable, narrowly lanceolate to oblong or obovate, 7-10 (-25) cm. long and 2-5 (-17) cm. broad, short acuminate to obtuse, cuneate or obtuse at the base, essentially glabrous above, covered with stellate tomentum, longer silky hairs and stellate-lepidote hairs, often intermixed, lateral nerves 8-12 pairs; inflorescence racemose to paniculate, axillary, mostly 3-7-flowered (occasionally more), 5-10 mm. long, the pedicels mostly less than 1 cm. long; calyx about 4 mm. high and 5 mm. broad, truncate or obscurely lobed; corolla about 1 cm. long, white or pinkish, the lobes linear, covered with a dense and close silvery tomentum; fruits subglobose or ellipsoid, 0.7-2 cm. long, sage green in color, pubescent, becoming glabrescent.

Called "álamo" in Honduras. The Spanish name "Estoraque" is used as the name for two villages in Guatemala, one in Jutiapa the other in Baja Verapaz. The bark has been reported to be used as a fish poison, the gum obtained from the trunk is said to be burned as an incense in Costa Rica.

The species as interpreted here is a variable one. Leaf size and pubescence have been the basis for the segregation of some species given in synonymy. Pubescence is quite variable and one or all three types may be on a single specimen.

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

Moist thickets or forest, often in rocky places along streams, 1,800–2,500 meters; Zacapa; Quiché (type from San Miguel Uspanán, *Heyde & Lux 2915*); Huehuetenango; Zacapa. Mexico (Chiapas); El Salvador.

A tree of 7–10 meters, the branches fuscous-lepidote; leaves on petioles 1.5–2 cm. long, oblong or lance-oblong, 12–13 cm. long, 4–4.5 cm. broad, acuminate, cuneate-acute at the base, coriaceous, entire, very sparsely lepidote above, beneath densely covered with intermixed, yellowish white and fuscous scales, the nerves and veins immersed above and the surface more or less bullate, the lateral nerves 9–10 pairs; inflorescence racemose, 4–5 cm. long, 3–5-flowered, the pedicels 7–15 mm. long; calyx 4 mm. long, 5 mm. broad, densely squamose, the scales orbicular, attached by the center, the margin of the calyx truncate; corolla tube 3 mm. long, the lobes 11 mm. long, stellate-lepidote outside; ovary yellowish-lepidote, many-ovulate, 3-celled.

***Styrax glabrescens* Benth. Pl. Hartw. 66. 1839. *S. guatemalensis* Donn.-Sm. Bot. Gaz. 15: 27. 1890 (type from Sasis, Alta Verapaz, *Helmrich 1690*). *Azucena* (Huehuetenango).**

Moist, usually dense mixed mountain forests, 1,200–1,800 meters, Alta Verapaz; San Marcos; Quezaltenango; Huehuetenango; Quiché. Mexico; Honduras; Costa Rica.

A small tree or a shrub seldom more than 10 meters tall. The young branchlets sparsely stellate-pilose; leaves short-petiolate, membranaceous, ovate to elliptic or oblong, sometimes obovate, mostly 8–15 cm. long and 3–9 cm. broad, acuminate or long-acuminate, often somewhat oblique at the base and acute to narrowly rounded, entire or often dentate, almost glabrous but usually with a few scattered stellate hairs beneath, especially on the nerves, green beneath, not at all glaucous, the lateral nerves 6–9 pairs; inflorescences terminal or axillary, 4–12-flowered, the pedicels 6–10 mm. long; calyx 5–7 mm. long, 4–7 mm. broad, stellate-pilose, truncate; corolla usually snow-white, the tube 7 mm. long, the lobes thin, sparsely stellate-pilose, obovate-oblong, 12–20 mm. long; fruit subglobose or ovoid, 1 cm. long, tomentulose.

Styrax glabrescens is quite distinct from the other species of *Styrax* in Central America because of the imbricate, instead of valvate, corolla lobes. There is a pubescent variety of this occurring in the state of Chiapas which may be expected in Guatemala. So far as I know it has not received a name. *Styrax glabrescens* var. *pilosus* Perkins (*S. pilosus* Standl.), according to an isotype available, is a synonym of *S. argenteus*.



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