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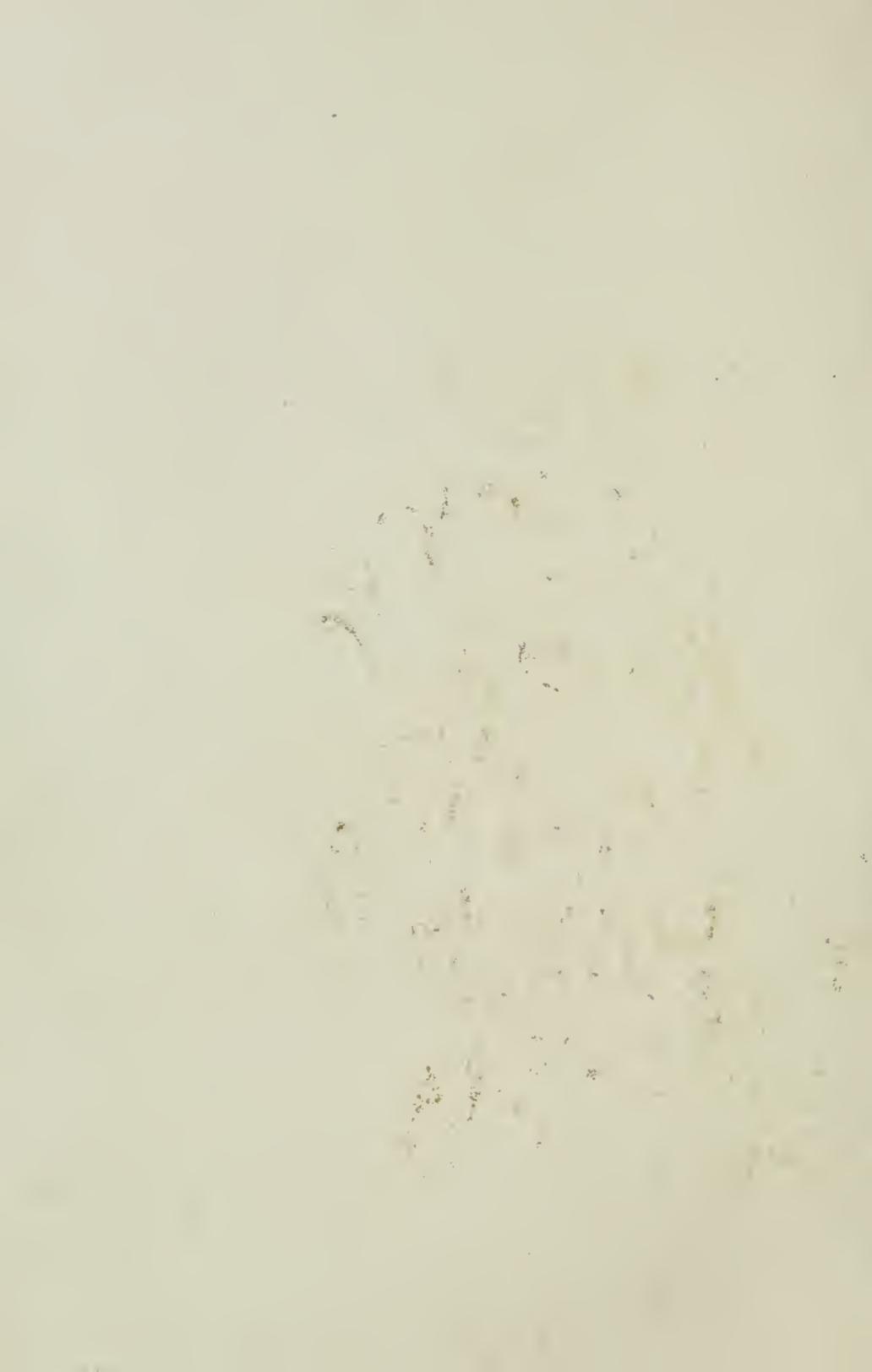


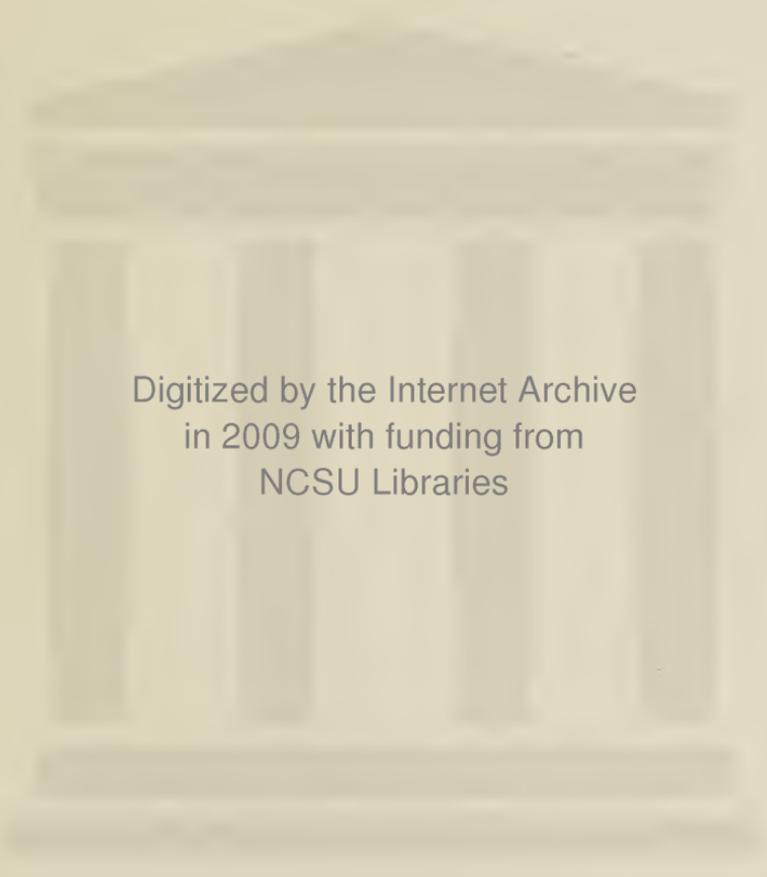
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HOUGH'S
AMERICAN
WOODS.

PART XIII.





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THE
AMERICAN WOODS,

ILLUSTRATED BY ACTUAL SPECIMENS

WITH FULL TEXT,

BY

ROMEYN B. HOUGH, B. A.

PART XIII.

REPRESENTING TWENTY-FIVE SPECIES

BY

TWENTY-FIVE SETS OF SECTIONS

LOWVILLE, N. Y., U. S. A.

PUBLISHED AND SECTIONS PREPARED BY THE AUTHOR

1913.

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BY ROMEYN B. HOUGH

THOMAS J. GRIFFITHS
PRINTING, PUBLISHING AND BINDING
UTICA, N. Y.

TO
DR. JOHN GIFFORD,
FORESTER AND STUDENT OF TREES,
THIS VOLUME IS DEDICATED
AS AN EXPRESSION
OF ESTEEM

PREFACE

While the southern end of the peninsula of Florida and its many neighboring islands are not strictly within the tropics, in the sense of extending below the Tropic of Cancer, their flora is distinctly tropical nevertheless. That is doubtless due to the fact that the warm waters of the Gulf Stream wash their shores and bring thither the climate and conditions of the tropics lying not many miles to the southward. Undoubtedly the same currents, too, lodge upon their shores the fruits and growing parts of trees and other plants of tropical origin, and their establishment there becomes a matter of course. Hence it is that we may consider the flora of southern Florida and keys as distinctly tropical.

As one enters the region from northern Florida he notices an almost complete change of vegetation as he passes a line extending across the peninsula approximately from Tampa Bay to Cape Canaveral. The species he was familiar with in northern Florida have one after another, with very few exceptions, been left behind, and the strange species of the tropics have taken their places. Probably what has impressed him first of the change is the appearance of the Cocomut and Royal Palms, with their enormous plume-like leaves waving in the breezes. On reaching the "hammocks" of southern Florida he finds the change quite complete, and he cannot fail to be impressed at the amazing number of new trees, shrubs and vines which he finds within a given area. They are mostly evergreen and some are found to be in both flower and fruit most of the year through, or to produce flowers and fruit more than once each year, entirely at variance with the habits of northern species.

Such trees commence growth at germination and apparently continue it until old age with very little if any periods of rest. As one might infer, such trees show very little if any evidence of annual rings, in the cross-section of their wood, and he finds his old ideas of being able to determine the age of a tree by counting its annual layers of growth (rings in cross section) do not apply here. But that is not the only nor the chief surprise that awaits him, if he look further into

tree-growth. He finds that in the wood of one species at least, the Black Mangrove, *Avicennia nitida*, there are no medullary rays that extend from year to year, such as he was familiar with in woods in general; and furthermore that its annual rings, if such they may be, are not continuous at all but very much broken and sometimes even with ends overlapping. In another wood, that of the Strong-back, *Bourreria havanensis*, there is a remarkable intermingling of a firm wood tissue and a very frail pith-like tissue, at variance again with his ideas of wood-structure as ordinarily understood.

The woods of twenty-five species of these tropical trees have been collected and are shown in the illustrative specimens of this volume. After an extended experience in collecting and sectioning woods, covering now over three hundred species, for use in *AMERICAN WOODS* (See announcement at the close of this volume), the writer has not, in all of them together, found as many surprises in unusual structures, etc., as he has found in gathering those for this volume. Of a few of them it was found impossible to make transverse sections suitable for use, owing to their brittle nature. Of others we were unable to make sections of the standard thickness adopted in *AMERICAN WOODS*, but we could make them thinner. A few of the transverse sections we have had to reduce in size, and the very thin ones we have had to protect with celluloid or mica on account of their fragile nature.

In the preparation of this work I wish to gratefully acknowledge assistance in the field-work by Dr. John Gifford, of Coconut Grove, Florida, to whom it is my pleasure to dedicate the volume. For information on the colloquial names in foreign languages by which these trees are known in the tropics I wish to express my gratitude to Dr. H. Pittier, Mr. C. D. Mell, and Dr. C. F. Millspaugh.

LOWVILLE, N. Y., Nov. 28, 1913.

A SYSTEMATIC STUDY

OF THE

SPECIES WHOSE WOODS ARE REPRESENTED IN THE ACCOMPANYING
SECTIONS.

CLASS ANGIOSPERMÆ

All trees, excepting the tree ferns of tropical regions, belong to the division of the vegetable kingdom known as *Spermatophyta*, i. e., they produce seeds.

This group is subdivided into *Angiospermae* and *Gymnospermae*, both of which are represented in our arborescent flora, and are subdivided in turn into orders, genera, etc. The *Angiospermae* include all plants producing flowers in which the seed is developed in a closed ovary. Such of the orders as we have to do with here will be defined in the following pages.

ORDER MORACEÆ: MULBERRY FAMILY.

Leaves conduplicate or involute in the bud, petiolate, alternate, deciduous, with caducous stipules inclosing the leaf in the bud. *Flowers* monœcious or diœcious, small, in ament-like spikes or heads, from the axils of caducous bud-scales or of the lower leaves of the shoots of the season; calyx 3-5-lobed or parted; corolla none; stamens 1 to 4, inserted at the bases of the calyx-lobes; ovary superior, 1-2-celled; styles 1-2; ovules solitary, anatropous and pendulous. *Fruit* an aggregation of drupelets, each inclosed in the thick fleshy calyx.

Trees, shrubs and herbs of over nine hundred species, generally with milky juice and natives of temperate and tropical regions. They are grouped in fifty-four genera, of which four are represented in North American trees, three being indigenous and the fourth a naturalized species.

GENUS FICUS LINNÆUS.

Leaves alternate, thick and leathery, persistent or deciduous, mostly pinnately veined; stipules enveloping the young leaves and deciduous; buds naked. *Flowers* unisexual, monœcious (or rarely diœcious) and borne on the inside of hollow receptacles situated in the axils of the leaves or leaf-scars; the staminate and pistillate flowers borne on the same or different receptacles; staminate fls. subsessile; sepals 2-6 or wanting; stamen 1 with short erect filament and 2-celled innate anther longitudinally dehiscent; pistillate fls. pedicellate, the pedicels becoming succulent in the fruit; calyx-lobes narrower than in the pistillate fls.; ovary sessile, 1-celled, with lateral elongated style and usually 2-lobed stigma; ovule solitary, anatropous. *Fruit* drupaceous, with thin, mucilaginous flesh and hard nutlet, mostly inclosed in the enlarged succulent concave receptacle closed at the apex.

A very large genus of about 600 species of trees, shrubs and woody climbers, containing a milky juice, and are of tropical distribution, mainly in the Orient and on the islands in the Pacific. The name, *Ficus*, is the ancient Latin name of the fig.

301. FICUS AUREA NUTT.

GOLDEN FIG. WILD RUBBER-TREE. STRANGLE-TREE.

Ger., *Wilder Feigenbaum*. Fr., *Figuier doré*. Sp., *Metapolo*.

SPECIFIC CHARACTERS:—*Leaves* thick, leathery and persistent, oblong to oval, 2-5 in. long, acute or abruptly pointed and acute, obtuse or narrowly rounded at base, entire, smooth and lustrous with broad pale midribs above, paler yellow green beneath, the lateral veins arcuate and uniting near the margin; petioles stout, $\frac{1}{2}$ to 1 in. long; stipules reddish, enveloping the young leaves at first and falling early. *Flowers* reddish purple, both sessile and pedicellate in the sub-globuse receptacles which are subsessile, solitary or in pairs in the axils of leaves or leaf-scars. *Fruit* sessile or subsessile, about $\frac{1}{3}$ in. in diameter, yellow or reddish at maturity and containing light brown nutlets.

The specific name, *aurea*, alludes to the golden color of the fruit.

A strange tree which lives, or at least begins life, at the expense of other trees. It is not parasitic in the sense that the mistletoe is, but is rather an assassin among trees. Its seed finds lodgment, probably chiefly through the agency of birds, in a crevice in the bark, a crotch or decayed spot in some tree and soon germinates. The stem and leaves of the infant tree spring upward and strong cord-like roots drop downward to the soil beneath. Once established additional roots are sent out, amalgamating with each other where they cross and eventually forming a sort of net-work about and more or less enveloping the

trunk, while the rampant stem above closely entwines the trunk and branches. Constantly then with unrelenting grip it strangles the life out of the victim tree, which then rapidly decays and disintegrates, through the agency of the many fungi and insects of the tropics, and the fig-tree, with braided, twisted trunk, stands alone in the place of the tree it has killed. Such trunks may be 3 or 4 ft. (1 m.) or more in diameter and the top may be 50 or 75 ft. (25 m.) above ground in high forest growth. When in the open, however, the trees develop wide-spreading and often irregular tops, and from its branches extend down aerial roots which finally become secondary trunks and the top spreads wider until it may cover several square rods in extent. The bark of the trunk is quite smooth and of a bluish gray color very like that of the Beech tree.

HABITAT.—The hammocks of the peninsula of Florida, the southern keys, Bahamas and Cuba.

PHYSICAL PROPERTIES.—Wood one of the very lightest of the American forests, soft, weak, compact, coarse-grained, with fine medullary rays, very perishable and of a brownish white color with sap-wood somewhat lighter. *Specific Gravity*, 0.2616; *Percentage of Ash*, 5.03; *Relative Approximate Fuel Value*, 0.2484; *Coefficient of Elasticity*, 25699; *Modulus of Rupture*, 239; *Resistance to Longitudinal Pressure*, 162; *Resistance to Indentation*, 61; *Weight of a Cubic Foot in pounds*, 16.30.

USES.—The wood is used to a limited extent for interior work, and aside from the occasional planting of the tree as an ornamental shade tree it is of little economic value. The fruit though edible is little eaten. It is eagerly devoured by birds.

ORDER POLYGONACEÆ: BUCKWHEAT FAMILY.

Leaves mostly alternate, coriaceous and entire, petiolate and with stipules united—sheathing the stem. *Flowers* perfect, regular; calyx 5-lobed, or 5-parted, persistent; petals none; stamens usually 8, with slender filaments and 2-celled anthers; pistil solitary, superior, with 2-cleft or 3-cleft style and 1-celled ovary containing a single orthotropous ovule. *Fruit* an achenium or nutlet enveloped by an enlarged calyx-tube and lobes.

A family of nearly 1,000 species, grouped in about 30 genera, of mostly herbaceous plants of the temperate zone. Of these the Buck-

wheat is perhaps the most important representative species. Within the tropics the family is represented also by shrubs and trees, those of the following genus being the only tree representatives in America.

GENUS COCCOLOBIS P. BROWNE.

Leaves simple, evergreen, entire and with pronounced stipular sheaths. *Flowers* small, perfect, with short jointed pedicels, in 1 or few-flowered clusters in axillary or terminal racemes; calyx cup-shaped with thin white lobes reflexed at first but finally thickening and enveloping the nutlet; stamens 8 borne on the rim of the calyx-tube; pistil free, with sessile 3-angled ovary, short style and 3-lobed stigma. *Fruit* subglobose or ovoid usually with thin fleshy acidulous pulp, though sometimes dry, crowned with the persistent calyx-lobes and containing the single 3-5-lobed pit.

A genus of about 120 species confined to the tropics of the New World and represented in the U. S. by the following two species of trees. Name is from Greek roots meaning *a berry with a husk*.

302. COCCOLOBIS UVIFERA JACQ.

SEA GRAPE.

Ger., *Coccoloba-holz*.

Fr., *Raisinier de mer*.

Sp., *Uvero, Uvifero, Uva del mar, Uva* (Cuba).

SPECIFIC CHARACTERS:—*Leaves* thick, leathery, suborbicular, 4-6 in. across, rounded or slightly pointed or notched at apex, deeply heart-shaped at base, lustrous dark green above, paler beneath, with very short thick flattened petiole and reddish veins and conspicuous stipular sheath about $\frac{1}{4}$ in. long. *Flowers* appearing almost continuously throughout the year in 1-6-flowered fascicles with pubescent pedicels about $\frac{1}{8}$ in. long; in thick-stemmed racemes 6-12 in. long; calyx bell-shaped, with its white lobes slightly longer than the red stamens; pistil with short stigmatic lobes. *Fruit* resembling a bunch of blue grapes in compact dropping racemes, each fruit being subglobose or obovoid, about $\frac{3}{4}$ in. long with thin juicy flesh and thin-walled nutlet.

A low rounded or wide-spreading tree rarely over 15 ft. (5 m.) in height in Florida, with compact beautiful foliage and crooked, gnarled and more or less prostrate trunk sometimes 3 or 4 ft. (1 m.) in diameter. Such trees commonly present the appearance of a dome of their singular foliage extending from the ground up and hiding the trunk. It is often shrubby and attains its greatest dimensions south of the United States. The bark of trunk is thin, scarcely more than $\frac{1}{8}$ in. in



Fig. 1—GOLDEN FIG. STRANGLE TREE.

The tree victimized by this subject was so completely consumed that its identification was impossible.



Fig. 2—SEA GRAPE

Usually very crooked trunks and sometimes showing branching and uniting again, as in this case.

thickness and smooth, of mottled brown and gray. It exfoliates with age in conchoidal fractures in thin rounded scales leaving distinct curved lines of their imprints.

HABITAT.—The immediate vicinity of the sea coast of southern Florida and the Keys up to a little above Cape Canaveral, on the east coast, and Tampa Bay on the west; thence southward generally among the Antiles to Colombia and Brazil; also the coast of Mexico and Central America.

PHYSICAL PROPERTIES.—Wood very heavy, hard, strong and close-grained, with very fine medullary rays, indistinct annual rings and quite uniformly distributed ducts. It is of a rich brown color, darkest along the margin of the heart-wood. The sap-wood is lighter in tint, that nearest the bark being the lightest. *Specific Gravity*, 0.9635; *Percentage of Ash*, 1.37; *Relative Approximate Fuel Value*, 0.9503; *Resistance Longitudinal Pressure*, 258; *Weight of a Cubic Foot in Pounds*, 60.05.

USES.—The hard, close-grained wood is used especially in Jamaica in the manufacture of furniture and its susceptibility of a beautiful polish would suggest its usefulness in turnery. It also is excellent for fuel.

The fruit, though not an article of commerce, is edible and very pleasing to some tastes.

MEDICINAL PROPERTIES.—It is this tree which is believed to yield the West Indian or Jamaica *Kino* which is used in medicine on account of strong astringent properties.*

303. COCCOLOBIS LAURIFOLIA JACQ.

PIGEON PLUM.

Ger., *Coccoloba-holz*.

Fr., *Raisinier à feuilles d'aurier*.

Sp., *Uvillo, Uverillo, Cucubano, Gateado*.

SPECIFIC CHARACTERS:—*Leaves* ovate to oblong, 2-4 in. long, rounded or obtuse at both ends, thick and firm, glabrous, green above and somewhat paler beneath, with entire revolute margin, pale midrib and remote primary veins, petioles $\frac{1}{2}$ in. or less in length, stipular sheaths narrow. *Flowers* in early spring, with slender pedicels about $\frac{1}{4}$ in. in length, in 1 to few-flowered terminal racemes

*U. S. Dispensatory, 19th Ed., p. 682.

2-3 in. in length; calyx cup-shaped with 5 rounded lobes; stamens rather longer than calyx-lobes; with slender yellow filaments and orange anthers; pistil with long stigmatic lobes. *Fruit* ripening in the following winter in open racemes, subglobose, dark red, about $\frac{1}{3}$ in. long, with thin acidulous flesh and hard light brown pit-like nutlet.

A handsome tree and one of the most abundant of the tropical trees found in Florida. It attains the height of 60 or 70 ft. (20m.) and a trunk diameter of $1\frac{1}{2}$ or 2 ft. (0.60m.). The bark of trunk is of a rich brown color, exfoliating in thin papery scales which leave areas of a light grayish brown beneath. This gives the bark a decidedly mottled appearance and sometimes a little roughness due to the irregular loosening scales.

HABITAT.—Unlike the other representative of this genus in the United States, which is confined to saline marshes and shores, this tree is found in the dense hammocks of the coast region of Florida from Cape Canaveral to the Keys on the east coast and from the vicinity of Cape Romano to Cape Sable on the west. It is also found on the Bahama Islands and throughout the West Indies to northern South America.

PHYSICAL PROPERTIES.—Wood very heavy, hard strong, close-grained, brittle and of a rich brown color with thick sap-wood of gradually lighter color until it is of a brownish white tint near the bark. *Specific Gravity*, 0.9835; *Percentage of Ash*, 5.03; *Relative Approximate Fuel Value*, 0.9340; *Coefficient of Elasticity*, 113538; *Modulus of Rupture*, 918; *Resistance to Longitudinal Pressure*, 771; *Resistance to Indentation*, 394; *Weight of a Cubic Foot in Pounds*, 61.29.

USES.—Like the wood of the Sea Grape, which is not easily distinguishable from this with the naked eye, it is used to a limited extent in the manufacture of furniture and it makes an excellent fuel.

ORDER ANONACEÆ: CUSTARD-APPLE FAMILY.

Leaves deciduous, alternate, entire, petiolate, pinnately-veined, conduplicate in the bud, without stipules. *Flowers* solitary, perfect and mostly axillary; sepals three, valvate in the bud; petals six in two series; stamens numerous on an elevated rounded receptacle with very short filaments and 2-celled introrse anthers adnate to the thick fleshy truncate connective; pistils few on the summit of the receptacle; ovary 1-celled, containing from one to many anatropous ovules. *Fruit* fleshy, baccate, formed by the ripening of the single or several united pistils; seed inclosed in an aril, large anatropous, with thin lustrous brown crustaceous coat and minute embryo at the base of the ruminant albumen.

Trees and shrubs of about fifty genera and five hundred and fifty species, with generally aromatic properties and mainly of the tropical

and subtropical regions of both the Old World and the New. Two genera only are represented in North America, one in southern Florida and the West Indies and the other in the eastern states.

GENUS ANONA LINNAEUS.

Leaves alternate, coriaceous, entire, often glandular-punctate and persistent or tardily deciduous. *Flowers* perfect, nodding; calyx small, green and with 3 valvate lobes, deciduous; petals 6 in 2 series of 3 each, thick and fleshy, valvate, hypogenous, ovate, concave, white or yellow; stamens numerous, club-shaped, crowded on the sides of the hemispheric receptacle, with short filaments and confluent anther cells; pistils numerous, on top of the receptacle, each with one-ovuled ovary and style stigmatic on inner face; the pistils coalescing after fertilization. *Fruit* compound, fleshy, subglobose or ovoid, with many 1-seeded cells.

A genus of about 50 tropical species of both hemispheres and containing several valuable fruit-bearing species, such as the Soursop (*A. muricata*), Sweetsop (*A. squamosa*), Cherimoya (*A. cherimolia*), etc.

The name (sometimes spelled *Annona*) is said to be of Malayan derivation.

304. ANONA GLABRA L.

POND APPLE. WILD CUSTARD APPLE.

Ger., *Flaschenbaum*.

Fr., *Anone*, *Corossol*.

Sp., *Corazon*, *Cimarron*, *Baga* (Cuba), *Anona* (Mexico.)

SPECIFIC CHARACTERS:—*Leaves* oblong or ovate, 3-5 in. long, entire, mostly rounded or subcordate at base, acute at apex, coriaceous, bright green above, paler beneath and midrib and reticulate veins prominent; petioles about $\frac{1}{2}$ in. long. *Flowers* opening in April from 3-angled buds, solitary axillary, calyx-lobes broad ovate, pointed; petals connivent, yellowish white, those of the outer row somewhat larger than those of the inner row and bearing on the inner side near the base a red spot. *Fruit* compound, fleshy, broad ovoid, 3-5 in. long, flattened or depressed at the base and rounded at apex, yellow and often blotched with brown when fully ripe. It contains numerous seeds about $\frac{1}{2}$ in. long, insipid in flavor.

A tree 30 or 40 ft. (12m.) in height, with trunk attaining a diameter sometimes of $1\frac{1}{2}$ ft (0.45m.) and, as is often the case with trees growing in very wet soil, commonly with wide or buttressed base. The bark of trunk is of a gray-brown color, with low, rather firm longitudinal and reticulated scaly ridges.

HABITAT.—The shores of ponds and wet sink holes of southern Florida south of Cape Canaveral on the east coast and Tampa Bay on the west. It attains its largest size in the vicinity of Bay Biscayne. It is also found on the Bahama Islands and on some of the West Indies.

PHYSICAL PROPERTIES.—The wood very light, soft, not strong, with many rather conspicuous though small medullary rays and quite uniformly distributed small open ducts. It is of a light yellow color streaked and blotched with brown. *Specific Gravity*, 0.5053; *Percentage of Ash*, 4.86; *Relative Approximate Fuel Value*, 0.4807; *Coefficient of Elasticity*, 50113; *Modulus of Rupture*, 607; *Resistance to Longitudinal Pressure*, 302; *Resistance to Indentation*, 127; *Weight of a Cubic Foot in Pounds*, 31.49.

USES.—On account of its great lightness and consequent buoyancy the wood is valued for floats for fishing-nets, but aside from that is little used.

The fruit is scarcely edible, though it is sometimes eaten by the country people, preferably when served with cream.

ORDER ROSEACEÆ: ROSE FAMILY.

Leaves alternate (opposite in *Lyonothamnus*) with stipules. *Flowers* regular, perfect, calyx 5-lobed; petals 5 (0 in *Cercocarpus*) imbricated in the bud; stamens numerous, distinct and inserted with the petals, on a disk lining the calyx-tube; anthers small, 2-celled, introrse (extrorse in *Vauquelenia*) longitudinally dehiscent; pistils 1-many; ovary 1-celled with generally two anatropous ovules in each cell; seeds mostly without albumen.

The Rose Family consists of trees, shrubs and a few herbs of wide distribution throughout temperate regions, and of upwards of fifteen hundred species grouped in about ninety genera. Most of our succulent fruits are among its products. Ten of the genera are represented by arborescent species in the United States.

GENUS CHRYSOBALANUS LINNAEUS.

Leaves persistent, alternate, entire, coriaceous, very short-petiolate, stipules deciduous. *Flowers* small, perfect, in axillary and terminal cymes 1 to 2 in. in length, with short stout peduncles and subtended by deciduous bracts; calyx bell-shaped, pubescent, with 5 imbricated lobes, deciduous; petals 5, alternate with the calyx-lobes, spatulate, creamy white; stamens about as long as the petals, indefinite, distinct, inserted in a single row with the petals on the edge of a thin disk on the margin of the calyx cup, with slender hairy filaments and 2-celled anthers longitudinally dehiscent; pistil solitary, superior; sessile, rising from the base of the ovary and with small terminal stigma, ovary 1-celled with 2 ascending ovules. *Fruit* a fleshy subglobose or oval drupe about 1 in. long,



Fig. 3—PIGEON PLUM



Fig. 4—POND APPLE

smooth, generally dark purple or pinkish in color, with sweet juicy pulp adherent to a rather large 5- or 6-angled thin walled reticulated pit.

A genus represented in the United States by one shrubby species in the coastal region of Georgia and Alabama and by the following arborescent species. It takes its name from two Greek roots meaning *golden fig*.

305. CHRYSOBALANUS ICACO L.

COCO PLUM. COCOA PLUM. GOPHER PLUM.

Ger., *Cocos-Pflaume*; Fr., *Icaquier*; Sp., *Icaco*.

SPECIFIC CHARACTERS:—*Leaves* broad obovate to oval, 1—3½ in. long, with thick petioles ¼ in. or less in length, entire wide cuneate at base, rounded or emarginate at apex, lustrous dark green above, paler, with broad conspicuous midrib and rather obscure reticulate veinlets beneath. *Flowers*, during the spring and summer, with thick tomentose pedicels; calyx bell-shaped, hoary-tomentose; petals 5, whitish, spatulate, about twice as long as the calyx; stamens with slender distinct filaments about as long as the petals; pistil with hoary-pubescent ovary and slender long hairy style rising from its base. *Fruit* subglobose or oblong, about 1 in. long, smooth and when fully ripe with sweet juicy pulp adherent to the 5- or 6-angled prominently reticulated pointed pit.

A small tree occasionally attaining the height of 25 or 30 ft. (9m.), with trunk rarely 10 or 12 in. (0.30m.) in diameter, but it is usually considerably smaller and still more commonly only a shrub in size and habit of growth. It is of handsome striking foliage, which quickly distinguishes it from the trees and shrubs with which it is associated. The bark of trunk, when it attains the stature of a tree, is about ⅛ in. thick and gray or grayish brown in color. It is quite smooth and exfoliates with age in small friable scales.

HABITAT.—Along the shores of southern Florida south of Capes Canaveral and Romano and attaining its largest size, in Florida, in the vicinity of Bay Biscayne and the Miami River. It is also found along the coasts of the West Indies, southern Mexico and Central America and South America, as far south as southern Brazil. It is also found on the west coast of Africa, it is thought by some botanists from seeds carried thither by ocean currents from this continent.

PHYSICAL PROPERTIES.—Wood heavy, hard, strong, close-grained with indistinct annual rings, fine medullary rays and open ducts, and

of a pinkish brown color, lightest near the bark. *Specific Gravity*, 0.7709; *Percentage of Ash*, 0.87; *Relative Approximate Fuel Value*, 0.7642; *Coefficient of Elasticity*, 110973; *Modulus of Rupture*, 961; *Resistance to Indentation*, 221; *Weight of a Cubic Foot in Pounds*, 48.04.

The wood of the Coco Plum is not of commercial importance, though of desirable properties for use in turnery, for fuel, etc. The fruit is juicy and of pleasant flavor and is eaten by country folk to some extent, as are also its fragrant rich seeds when fresh. Such is the oily nature of the kernel of these seeds that it readily burns and they are sometimes used as candles. The seeds are sometimes sent to England from the African coast under the name of "Varach" seeds.

MEDICINAL PROPERTIES of an astringent nature are found in the bark, leaves and roots and they are used in tropical America for lotions and applications where such action is indicated.

ORDER LEGUMINOSÆ: PULSE OR PEA FAMILY.

Leaves alternate, usually compound, with stipules. *Flowers* regular or papilionaceous and usually perfect; stamens 10 or many, with diadelphous (sometimes distinct) filaments and 2-celled anthers opening longitudinally; pistil solitary, with one or several-celled superior ovary. *Fruit* a legume.

A very large and important family of trees, shrubs and herbs of wide distribution throughout all temperate and tropical regions, generally free from obnoxious properties and many of its representatives of the greatest economic importance. There are about 7,000 species grouped in nearly 450 genera, and of these seventeen have arborescent representatives in the United States.

GENUS LYSILOMA BENTHAM.

Leaves deciduous, evenly bipinnate with 2-5 pairs of pinnæ, the terminal pair shortest, the slender petiole, bearing a large gland near the first pair; pinnæ with 10-30 pairs of small leaflets, stipules membranaceous, $\frac{1}{2}$ in. or less in length. *Flowers* usually whitish, perfect, in terminal or axillary clusters of globular many flowered heads, calyx bell-shaped, with 5 short lobes; corolla funnel-shaped with 5 reflexed lobes; stamens about 20, twice as long as the corolla, with slender filaments united into a tube at base; anthers minute, versatile; pistil with sessile smooth ovary, slender subulate style and terminal stigma. *Fruit* maturing in autumn, a straight, flat, legume, the valves separating from the margins at maturity; seeds flattened, oblong, transversely arranged in the pod and each with a long funicle attached.

A genus of about ten species of tropical American trees and shrubs with unarmed slender branchlets. The following one species finds its

northernmost distribution on the Bahamas and in extreme southern Florida.

The name is from Greek roots referring to the separating of the sides of the pods from their margins in liberating the seeds.

306. *LYSILOMA BAHAMENSIS* BENTH.

WILD TAMARIND.

Ger., *Wilde Tamarinde*.

Fr., *Tamarin sauvage*.

Sp., *Tamarindo silvestre*.

SPECIFIC CHARACTERS:—*Leaves* about 4 or 5 in. long, glabrous, with slender petioles about 1 in. long and bearing a prominent gland near the first of the 2-5 pairs of pinnæ, which are $1\frac{1}{2}$ -3 in. long, the lowermost pair the longest, and each bearing 8-30 pairs of oblong, sessile, entire smooth leaflets $\frac{1}{4}$ - $\frac{1}{2}$ in. long bluntly pointed at apex and unequally rounded at base. *Flowers*, appearing in Florida in April and May, in axillary or terminal solitary or racemose clusters of globose, tomentose heads with peduncles $\frac{3}{4}$ to $1\frac{1}{2}$ in. long and acute membranous bracts and bractlets, the flowers themselves about $\frac{1}{3}$ in. long and the head when flowers are full open about 2-3 in. in diameter; calyx bell-shaped with 5 short lobes; corolla twice as long, with short lobes reflexed; stamens about 20, twice as long as corolla, their slender filaments united into a tube at base; pistil with smooth ovary and filiform style. *Fruit*, mature in autumn, the flat pods 4-5 in. long and 1 in. broad, with slender stems 1-2 in. long and 2-3 together on peduncles enlarged at apex, the thin papery valves finally separating from the firm margins at maturity and liberating the lustrous dark brown oblong seeds, which are about $\frac{1}{2}$ in. long.

A handsome distinct tree which sometimes attains the height of 50 or 60 ft. (15m.), with lofty wide-spreading flattened top, but with rather short trunk sometimes 3 ft. (0.90m.) in diameter, wide-buttressed at base. The bark of branches and young trunks is smooth and of a grayish white color. On old trunks it becomes fissured into rather firm grayish brown scales.

HABITAT.—The Hammocks of extreme southern Florida and adjacent Keys, the Bahamas and Cuba, growing in sandy, well-drained soil. It is rare on the mainland of Florida and only in the vicinity of Bay Biscayne, but common on some of the larger keys.

PHYSICAL PROPERTIES.—Wood heavy, hard, tough, with very uniformly distributed open ducts, rather obscure annual rings and fine medullary rays. It is of a rich mottled reddish brown color with nearly white sap-wood. *Specific Gravity*, 0.6418; *Percentage of Ash*,

2.12; *Relative Approximate Fuel Value*, 0.6282; *Coefficient of Elasticity*, 46064; *Modulus of Rupture*, 553; *Resistance to Longitudinal Pressure*, 481; *Resistance to Indentation*, 171; *Weight of a Cubic Foot in Pounds*, 40.00.

USES.—The wood is used in boat-building, for which it is highly valued, and its excellent properties and ornamental nature would suggest its usefulness for interior finishing, furniture, etc., but is not found in sufficient abundance to be extensively used.

GENUS ICHTHYOMETHIA BROWNE.

Leaves pinnately compound, 4-9 in. long, early deciduous, with 5-11 long petiolulate oblong to obovate leathery leaflets, which are 2-4 in. long, abruptly acuminate, rounded at base, entire, glabrous dark green above, paler and with rufous hairs on veins beneath and on petioles. *Flowers*, opening in May, papilionaceous, in thyrsoidal panicles, on branchlets of the previous season, calyx bell-shaped, persistent, canescent, with 5 short lobes implicated in the bud; petals pinkish white, clawed, the standard suborbicular, notched, grayish hairy outside and green blotch inside, wings oblong-spatulate; keel petals broadly falcate with claws connected; stamens 10, with filaments united, excepting the base of the upper one which is free at base only; anthers versatile all alike; pistil free, sessile, with silky pubescent ovary which narrows into a filiform style bent inward and capitate stigma; ovules numerous suspended in two ranks. *Fruit* ripening in July and August, an indehiscent linear legume, 3-4 in. long, with stalk longer than the calyx-tube and 4 membranaceous wings about $\frac{1}{2}$ in. broad running longitudinally; seeds brownish, compressed, oblong, without albumen, attached laterally by short funicles.

The name is a combination of two Greek words meaning *fish intoxication*, alluding to the use made of its bark by the Caribs.

307. ICHTHYOMETHIA PISCIPULA HITCH.

JAMAICA DOGWOOD.

Ger., *Jamaikischer Hundsholz*. Fr., *Boisivrant de la Jamaïque*.

Sp., *Borracho* (Venezuela), *Guama hediondo* (Cuba).

SPECIFIC CHARACTERS:—See generic description, this being the only species.

A tree attaining the height of 40 or 50 ft. (15m.) with commonly more or less crooked upright and spreading branches, and trunk attaining a thickness of 2 or 3 ft. (0.90m.) The bark of trunk is of an ashen gray color, $\frac{1}{8}$ in. or somewhat more in thickness and quite smooth, but finally exfoliating in irregularly rectangular plate-like scales. It is a



Fig. 5—COCO PLUM. GOPHER PLUM



Fig. 6—WILD TAMARIND

particularly handsome tree when bearing its abundance of flowers, which considerably resemble those of our common locust though in more upright clusters.

HABITAT.—The coast region of southern Florida southward from the vicinity of Bay Biscayne on the east coast and Peace Creek on the west, the southern Keys, the Bahamas, many of the islands of the West Indies and the coast of southern Mexico. It is one of the most abundant of the tropical trees of southern Florida.

PHYSICAL PROPERTIES.—Wood heavy, hard, close-grained, with few scattered open ducts and inconspicuous annual rings and medullary rays. It is of a yellowish brown color, usually darkest next the sapwood, which is light yellow. *Specific Gravity*, 0.8734; *Percentage of Ash*, 3.38; *Relative Approximate Fuel Value*, 0.8439; *Coefficient of Elasticity*, 85079; *Modulus of Rupture*, 752; *Resistance to Longitudinal Pressure*, 597; *Resistance to Indentation*, 337; *Weight of a Cubic Foot in Pounds*, 54.43.

USES.—The wood of the Jamaica Dogwood is very durable and is a favorite timber for piles, in making wharves, boat-building, etc. Its flowers yield an abundance of honey and its rapidity of growth as well as attractive habit give it value for ornamental planting.

The bark of the tree has long been used by the Caribs, and more recently by the negroes, in catching fish on account of its strong narcotic properties. When reduced to a pulp and placed in a bag or basket beneath the water it has a stupefying effect upon the fish, and as they come helpless to the surface they can be easily captured. The effect on large fish is said to be generally only temporary, but that it kills many of the small fish.

MEDICINAL PROPERTIES are not officinally recognized of this species, though it possesses strong astringent properties. It is also sedative and hypnotic, and has been found effective in producing sleep without injurious effects. A fluid extract of the bark is sometimes used for alleviating toothache.

ORDER SIMARUBACEÆ: QUASSIA FAMILY.

LEAVES generally alternate and pinnate, not glandular-punctate, without stipules. *Flowers* mostly in axillary racemes or panicles and diœcious or polygamous, regular; calyx 3-5-lobed or parted, imbricated in the bud; petals 3-5 (rarely wanting), hypogœnous; disk annular or elongated; stamens as many as the petals or twice as many, with distinct filaments each with a scale or hairs at base and inserted under the disk; anthers 2-celled introrse; pistils composed of 2-5 united carpels each of a single cell and containing a single anatropous ovule; style 1-5. *Fruit* a drupe or samara.

Trees, shrubs and a few herbs with generally bitter milky juice and confined mostly to tropical regions. About one hundred forty-five species, grouped in twenty-eight genera, are known. Of these one arborescent genus (*Simaruba*) is indigenous to the United States in subtropical Florida. Another (*Ailanthus*) is extensively naturalized throughout eastern United States and Canada.

GENUS SIMARUBA AUBLET.

Leaves alternate, odd-pinnately compound, with long petioles and long-petiolulate alternately arranged entire coriaceous leaflets. *Flowers* small, numerous, in large axillary and terminal panicles; calyx with 5 short lobes; corolla with 5 petals; stamens 10, as long as the petals in the staminate flowers, free, filiform, each attached to a ciliate scale at its base and bearing an oblong introrse 2-celled longitudinally dehiscent anther attached on the back below the middle; pistil (in the pistillate flowers) with deeply 5-lobed ovary and 5 recurved styles. *Fruit* a drupe, sessile, arranged 1 to 5 together, with thin flesh and crustaceous pit.

A genus of about a half dozen species of trees with bitter, resinous juice and tonic properties, confined to tropical America, and the following single species in southern Florida.

The name (spelled *Simarouba* by some authors) is the native Carib name of one of the species—*S. amara*.

308. SIMARUBA GLAUCA DE C.

PARADISE-TREE. BITTER-WOOD.

Ger., *Simaruba*.

Fr., *Simarouba*.

Sp., *Simaruba* (Sp. W. I.), *Olivo* (Panama), *Palo blanco* (Cuba).

SPECIFIC CHARACTERS:—*Leaves* 6-10 in. long, with petioles 2-3 in. long and 11 to 13 leaflets which are mostly obovate, 2-3 in. long, with entire, revolute margin, cuneate and more or less oblique at base, with rounded or slightly pointed apex, very lustrous dark green above, glaucous and with prominent midrib beneath; petiolules about $\frac{1}{4}$ in. long. *Flowers* appearing in early spring, about $\frac{1}{2}$ in. across, with very short pedicels and 2 to 6 together along the glaucous branches of wide-spreading panicles a foot or two across; calyx glaucous, petals pale yellow, fleshy, oblong. *Fruit* a drupe about 1 in. or less long, ovoid or oblong, somewhat oblique, slightly ribbed on one side and dark purple at maturity. This is the fruit known as the Mountain or Bitter Damsons in Jamaica.

The Paradise-tree is a tree of medium size, occasionally attaining the height of 50 ft. (15m.), with rounded top and a straight smooth trunk rarely if ever more than 18 in. (0.45m.) in diameter. The bark



Fig. 7—JAMAICA DOGWOOD.



Fig. 8—PARADISE TREE

of trunk is quite smooth and of a mottled brownish gray color, finally exfoliating in thin scales. It is considered by many as the handsomest of the tropical trees found in Florida, with its beautiful glossy foliage and massive clusters of yellow flowers or bright red and purple fruit. It is probably due to this fact that it is called the Paradise-tree.

HABITAT.—The Hammocks of southern Florida south of Cape Canaveral, and the southern Keys; also on the Bahama Islands (where it is known as "Ash"), and in Cuba, Jamaica, Central America, Guiana and Brazil.

PHYSICAL PROPERTIES.—Wood very light, soft, not strong, with scattered open ducts, indistinguishable annual rings and very fine medullary rays. It is of a quite uniform pale yellow color, with somewhat lighter sapwood and intensely bitter flavor. *Specific Gravity*, 0.4136; *Percentage of Ash*, 0.93; *Relative Approximate Fuel Value*, 0.4098; *Coefficient of Elasticity*, 93217; *Modulus of Rupture*, 564; *Resistance to Longitudinal Pressure*, 426; *Resistance to Indentation*, 86; *Weight of a Cubic Foot in Pounds*, 25.78.

USES.—Little if any use is made of the wood of this tree, though it possesses in a marked degree the tonic properties which give the closely related Quassia wood its medicinal value. The highly ornamental value of the tree and its rapidity of growth suggest a marked value for ornamental planting within or near the tropics.

MEDICINAL PROPERTIES of a bitter tonic and aromatic nature are found in both bark and wood, and in Costa Rica an infusion of the bark is used in the treatment of intermittent fever.

ORDER BURSERACEÆ: TORCHWOOD FAMILY.

Leaves alternate, odd-pinnate and without stipules. *Flowers* small regular, perfect or polygamous and borne in panicles or racemes; calyx of 3 to 6 imbricated sepals, persistent; petals of same number, sometimes slightly united, deciduous; stamens twice as many as the petals, inserted with them under a cup-like or annular disk with subulate filaments and introrse 2-celled anthers opening lengthwise; pistil with superior 2-5-celled ovary with 2 pendulous ovules in each cell, short style and 3-5-lobed stigma. *Fruit* drupe like, rather fleshy and usually dehiscent epicarp at maturity; seed with membranaceous coat and no albumen.

A family of about 20 genera and 200 species of trees and shrubs of the tropics of both hemispheres, with aromatic gummy sap. The following single genus is represented in the trees of the United States.

GENUS BURSERA JACQUIN.

Leaves alternate and clustered towards the tips of the branchlets, leaflets opposite, petiolulate, mostly entire. *Flowers* polygamous in lateral racemes or panicles; calyx with minute lobes; petals ovate to lance-oblong reflexed; stamens, etc., as described for the order; ovary 3-celled. *Fruit* subglobose or oblong, indistinctly 3-angled and splitting at the angles into 2 or 3 somewhat coriaceous valves at maturity and falling away from the seed, which contains a straight embryo and contorted cotyledons.

The genus consists of about forty species of Mexico, Central and South America and the Antilles, the following single species being found in southern Florida. It is named after Joachim Burser, a distinguished German botanist and physician.

309. BURSERA SIMARUBA SARG.*

GUMBO LIMBO. WEST INDIAN BIRCH.

Ger., *Gummitragender Bursere*. Fr., *Gomart d'Amerique*, *Gommier*.

Sp., *Almácigo*, *Caraño* (Sp. W. I., Mex., etc.), *Jiñocuave* (C. R.).

SPECIFIC CHARACTERS:—See generic description. *Leaves* tardily deciduous, 6-8 in. long, with long petioles and usually 5 to 9 coriaceous, ovate-oblong leaflets $2\frac{1}{2}$ -3 in. long, oblique at base, abruptly acuminate at apex and with petiolules $\frac{1}{2}$ in. or less in length. *Flowers*, appearing with or before the leaves, on pedicels about $\frac{1}{3}$ in. long, in raceme-like panicles 4-5 in. long of the staminate flowers and about half as long of the pistillate; sepals 5; petals 5, nearly twice as long as the sepals; stamens as long as the petals, or half as long in the pistillate flower. *Fruit* about $\frac{1}{2}$ in. long, with 3-valved epicarp and 1 or 2 triangular nutlets.

One of the most striking and characteristic of the tropical trees of Florida and sure to attract attention on account of its singular habit of growth. It may attain the height of 50 or 60 ft. (20m.), with irregular sprawling top of limbs "akimbo," as has been aptly said of it, and round smooth crooked trunk sometimes $2\frac{1}{2}$ or 3 ft. in diameter. This is covered with shining bronze red bark which exfoliates in thin papery strips transversely, giving a ragged appearance to old trunks similar to that of some of the birches of the north, and hence its name—West Indian Birch—though very distinct from the true birches.

HABITAT.—Widely distributed in the coast region of the West Indies, Central and northern South America, the Bahamas and the

*SYN.—*Bursera gummifera* L. *Terebinthus simaruba* Wright.

keys and mainland of southern Florida, as far north as Cape Canaveral on the east coast and the Caloosahatchie River on the west.

PHYSICAL PROPERTIES.—Wood very light, exceedingly soft, not strong, easily worked, with quite uniformly distributed open ducts and small but distinct medullary rays. It is of a light brown color with abundant lighter sap-wood and of satiny luster. *Specific Gravity*, 0.3003; *Percentage of Ash*, 2.04; *Relative Approximate Fuel Value*, 0.2942; *Coefficient of Elasticity*, 41684; *Modulus of Rupture*, 148; *Resistance to Longitudinal Pressure*, 155; *Resistance to Indentation*, 57; *Weight of a Cubic Foot in Pounds*, 18.71.

USES.—Little use has been made thus far of the wood of this tree, but stakes cut from its branches when stuck into the ground, even in the poorest of rocky soil, readily take root and grow; hence its value for "live" fences.

An aromatic resin obtained from the tree has been used as a varnish of inferior grade and an infusion of the leaves as a native substitute for tea.

ORDER MELIACEÆ: MAHOGANY FAMILY.

Leaves alternate, usually pinnately compound, without stipules and not pellucid-punctate. *Flowers* in panicles, regular, perfect; calyx with usually 5 small persistent lobes; petals usually 5, sometimes slightly united; stamens 8-10, with filaments united into a tube, and introrse 2-celled anthers opening lengthwise; pistil with superior 3-5-celled ovary, united styles and 5-lobed stigma; ovules generally numerous in each cell. *Fruit* various, a capsule, drupe or berry.

A family of about 700 species of mostly trees and shrubs of tropical regions, grouped in about 50 genera. Only two species are represented in our flora—the Mahogany and the China-berry (*Melia azedarach* L.), a naturalized tree from the Orient.

GENUS SWIETENIA JACQUIN.

Leaves evenly pinnate, glabrous, long-petiolate, leaflets opposite petiolulate and oblique at base. *Flowers* small, perfect, in axillary panicles; calyx minute, cup-shaped, with 5 rounded lobes; petals 5, spreading; stamens united into a tube with 10 teeth and 10 2-celled anthers inside the tube at the intervals between the teeth; pistil superior, with ovoid 5-celled ovary, single slightly exerted style and terminal 5-lobed stigma. *Fruit* a 5-celled and 5-valved capsule, the valves separating septically from the base from the persistent 5-winged axis; seeds many, imbricated in 2 ranks in each cell, compressed and with long membranaceous wrinkled wing, with hilum at the tip, embryo transverse.

The genus consists of three species of large tropical trees, two of America and one of West Africa. The following species reaches its

northern limit of distribution on the keys of southern Florida. The name of the genus is in honor of Baron Gerard von Swieten, a distinguished Dutch physician and botanist of the 18th century.

310. SWIETENIA MAHAGONI JACQ.

MAHOGANY. MADEIRA-WOOD.

Ger., *Mahoganiholz*.

Fr., *Acajou, Mahogon* (Fr. W. I.).

Sp., *Caoba, Caobo*.

SPECIFIC CHARACTERS:—*Leaves* persistent, 6 to 10 in. long, with 3-5 pairs of lance-ovate leathery leaflets which are 2 to 4 in. long, cuneate and very oblique at base, acuminate, entire, shining dark green above, paler and somewhat rufous and with prominent reticulate veins beneath, petiolules about $\frac{1}{4}$ in. long. *Flowers*, in mid-summer, about $\frac{1}{3}$ in. across, in racemes 3-6 in. long, with slender pedicels bibracteolate near the middle; calyx cup-shaped, glabrous; petals about $\frac{1}{8}$ in. long, white, obovate-oblong, rounded or notched at apex. *Fruit*, ripening in late autumn, a 5-celled ovoid to oblong capsule, 3 to 5 in. long, with rough brown surface when ripe and dehiscent by 5 thick valves from the base; seeds about 1 in. long, brown with thin membranous wing ribbed on one side and with hilum at the tip.

The Mahogany is a noble tree in stature, as well as in the excellence of its wood. Early writers tell of great wide-spreading trees with huge wide-buttressed trunks 10 or 12 ft. (3.50m.) in diameter, and 40 or 50 ft. (15m.) in length, with massive spreading branches, but such grand specimens are not now found in Florida. It is still a beautiful and stately tree there, however, with its clean glossy foliage and trunk seldom now found thicker than 2 or 3 ft. (0.90m.). This is covered with a rough dark reddish brown bark, fissured into rather narrow scaly ridges very much resembling the bark of the Hemlock tree of the Northern States.

HABITAT.—Extreme southern Florida and the southern keys, the Bahamas, many of the West Indies, Mexico and Central and South America as far south as northern Brazil and Peru. It is hardy (within the tropics), growing in all kinds of soil, or even the most meagre soil among rocks, the slow growing trees producing the richer and more highly valued wood.

PHYSICAL PROPERTIES.—Wood heavy, hard, strong, of close grain, compact, very durable, with many fine medullary rays, susceptible of a

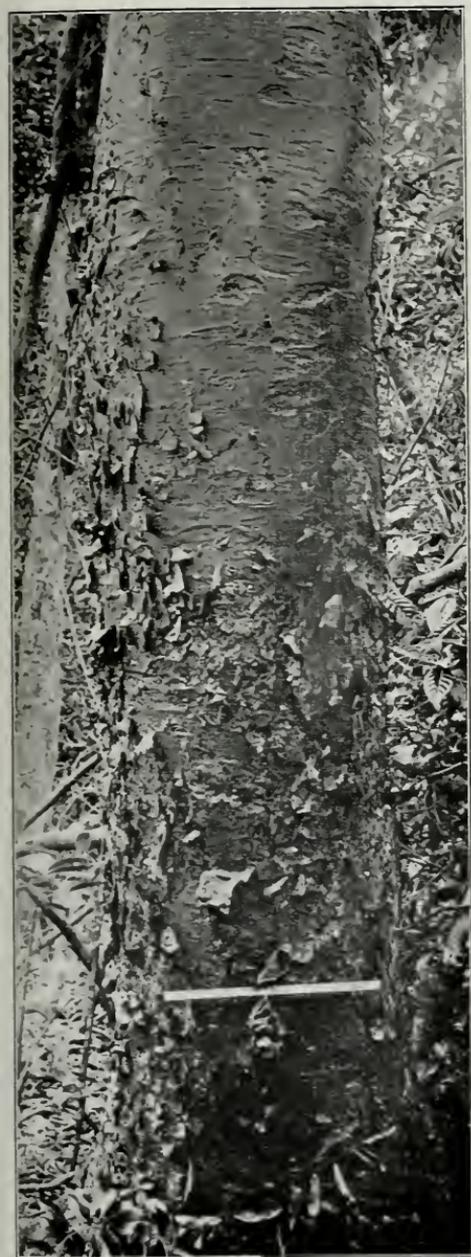


Fig. 9—GUMBO LIMBO

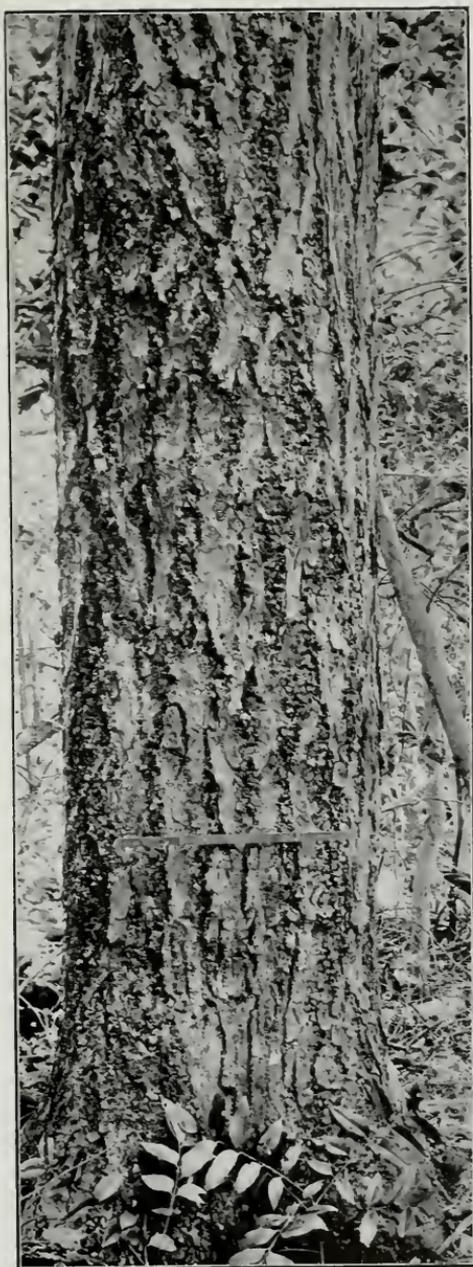


Fig. 10—MAHOGANY

high polish and of a rich reddish brown color, darkening with age, and thin pinkish white sap-wood. *Specific Gravity*, 0.7282; *Percentage of Ash*, 1.09; *Relative Approximate Fuel Value*, 0.7203; *Coefficient of Elasticity*, 106272; *Modulus of Rupture*, 1003; *Resistance to Longitudinal Pressure*, 666; *Resistance to Indentation*, 309; *Weight of a Cubic Foot in Pounds*, 45.38.

USES.—The most highly prized of all woods for cabinet making, interior finishing, furniture, etc., and formerly extensively used, especially the curved trunks and large branches as one of the most valuable timbers for the knees of vessels, for boat building, etc.

MEDICINAL PROPERTIES.—The bark is bitter and astringent and has been used as a remedy in intermittent fevers.*

ORDER EUPHORBIACEÆ: SPURGE FAMILY.

Leaves various, alternate, opposite, verticillate, reduced to scales, or wanting; stipules present or wanting. *Flowers* monœcious or diœcious, regular, and sometimes subtended by an involucre of petal-like bracts; calyx 3-6-lobed or parted, with divisions imbricated in the bud, or wanting; petals of the same number as the calyx-lobes or wanting; stamens from 2 or 3 to twice as many as the lobes of the calyx, with distinct or united filaments; pistil with usually 3-celled ovary having 1 or 2 suspended anatropous ovules in each cell. *Fruit* a drupe or 3-lobed capsule; seed with fleshy or oily albumen, straight embryo and broad cotyledons.

A family of trees, shrubs and herbs of some 4,000 species, grouped in about 200 genera and of world-wide distribution in temperate and tropical regions. They are all characterized by more or less acrid and sometimes poisonous milky juice, and among its representatives are several of great economic value, especially the trees of the genus *Hevea* of South America, producing the Para rubber. Several are of high ornamental or medicinal value. Three of the genera contain native trees, and one genus naturalized trees in southern Florida.

GENUS DRYPETES Vahl.

Leaves persistent, alternate, petiolate, pinnately veined, leathery and with small caducous stipules. *Flowers* diœcious, axillary, short pedicellate or sessile, the staminate in close clusters and the pistillate solitary or few together; calyx deeply 4-5-lobed, imbricated in the bud; petals none; stamens as many or twice as many as the lobes of the calyx and inserted under the edge of a flat disk, with distinct filiform filaments and ovate 2-celled anthers opening lengthwise; pistil sessile, with ovoid usually 1-celled ovary, with very short style if any and a flat or 2-lobed stigma; ovules 2, pendent. *Fruit* a subglobose or oblong drupe with fleshy pulp and hard pit; seed with erect embryo and thin fleshy albumen.

*U. S. Dispensatory, 19th Ed., p. 1665.

A genus of 10 or 11 species of evergreen trees and shrubs of tropical America having thick milky juice, two of which are found as trees in southern Florida. The name is a Greek word descriptive of the resemblance of the fruit to that of the olive in appearance.

311. DRYPETES KEYENSIS URB.

FLORIDA WHITEWOOD. FLORIDA PLUM.

Ger., *Pflaume von Florida*.

Fr., *Prune de Florida*.

Sp., *Hucso* (Sp. W. I.), *Varital* (Porto Rico).

SPECIFIC CHARACTERS:—*Leaves* ovate to oblong and usually more or less falcate, 3-5 in. long, acuminate to rounded at apex, cuneate to rounded at base, with thickened entire margin, dark green above, paler beneath, lustrous and prominently reticulate veined both sides; petioles about $\frac{1}{2}$ in. long, stout and grooved above. *Flowers* appearing in early spring in the axils of the leaves of the previous year; calyx yellowish green with 5 lobes about $\frac{1}{16}$ in. long and finally deciduous; stamens 8 with filaments of unequal length and somewhat longer than the calyx-lobes; anthers about as broad as long, extrorse and with broad connectives; pistil with hairy ovary and flattened broad stigma somewhat oblique. *Fruit* oblong, bright white, about 1 in. long on stems about $\frac{1}{3}$ in. long, with dry mealy flesh and obovoid pit pointed at the base and containing a seed rounded at the ends and covered with light brown coat conspicuously marked with lines radiating from the hilum.

A tree rarely more than 30 or 40 ft. (12m.) in height or with trunk more than 1 ft. (0.30m.) in diameter. Its upright and spreading white-barked branches form a rounded top with glossy clean foliage and conspicuous among this in its season is the singular ivory-white fruit. The bark of the trunk is about $\frac{1}{2}$ in. thick, smooth and white, mottled with distinct irregular gray and yellowish brown patches. It is probably the white bark of this tree that has caused it to be called White-wood.

HABITAT.—Southern Keys of Florida and the Bahamas, growing in dry rocky and sandy soil, but nowhere in great abundance.

PHYSICAL PROPERTIES.—Wood rather soft, not strong, brittle, of very close grain, with indistinct annual rings, very thin medullary rays and small, quite uniformly distributed open ducts. It is light yellow but soon assumes a light bluish brown color. *Specific Gravity*, 0.9346; *Percentage of Ash*, 8.29; *Relative Approximate Fuel Value*, 0.8571; *Coefficient of Elasticity*, 83619; *Modulus of Rupture*, 707; *Resistance*

to Longitudinal Pressure, 520; Resistance to Indentation, 407; Weight of a Cubic Foot in Pounds, 58.24.

USES.—Little if any use is made of the wood of this tree owing to its limited abundance and inferior qualities, as compared with many of the woods with which it grows.

ORDER SAPINDACEÆ: SOAPBERRY FAMILY.

Leaves alternate in the American representatives, petiolate, pinnately or palmately compound, without stipules. *Flowers* regular or slightly irregular, polygamous, diœcious; calyx 4-5-lobed or divided, imbricated in the bud; petals 4-5, imbricated; disk annular, fleshy; stamens usually 5-10 inserted on the disk; anthers introrse, 2-celled, longitudinally dehiscent; ovary solitary, with 2-4 lobes and cells or entire; ovules 1 or 2 in each cell; styles terminal. *Fruit* a drupe or capsule with small solitary seed and containing no albumen.

Trees, shrubs and a few vines with watery juice and chiefly confined to the tropics of the Old World. Over a thousand species are known, grouped in about twenty genera. Of the arborescent genera five are represented in the United States, all southward.

GENUS EXOTHEA MACFADYEN.

Leaves evergreen, evenly pinnate, alternate, without stipules, with petioles $\frac{1}{2}$ to 1 in. long and usually two pairs of subsessile oblong leaflets, 3-5 in. in length, but slightly spreading and tending to fold lengthwise, usually acute or bluntly pointed, cuneate at base, with entire undulate margin, lustrous dark green above and slightly lighter green beneath. *Flowers*, opening in March or April, regular, about $\frac{1}{4}$ in. across, diœcious or polygamous, in terminal or axillary pubescent panicles; sepals 5, suborbicular, persistent; petals 5, white, alternate with the sepals and of about the same size; stamens 7-8, somewhat longer than the petals in the staminate flower and shorter in the perfect flower, inserted with the petals on the somewhat 5-lobed annular disk; filaments filiform, anthers oblong; pistil sessile with conical pubescent 2-celled ovary, short style and large terminal stigma turning to one side, ovules two in each cell suspended, anatropous. *Fruit*, maturing in autumn, a globular 1-seeded berry, about $\frac{1}{2}$ in. in diameter, tipped with the remnants of the style and subtended by the reflexed sepals, dark purple and juicy; seed globular with shining yellow brown coat.

A genus of the single following species and the name alludes to its separation from the genus in which it was originally placed.

312. **EXOTHEA PANICULATA** RADLK.

INK-WOOD. BUTTER-BOUGH.

Ger., *Tinten-holz*.Fr., *Bois d'encre*.Sp., *Guacarán, Gaita*.

SPECIFIC CHARACTERS:—See generic description, this being the only species.

The Ink-wood tree attains the height of 40 or 50 ft. (15m.), with dense rounded umbrageous top and reddish-brown branchlets thickly covered with small white lenticels. The trunk is sometimes 15 or 16 in. (0.40m.) in diameter and is vested in a rather thin reddish brown bark which exfoliates with age in broad irregular plate-like scales.

HABITAT.—The hammocks of the coast region of southern Florida south of about the latitude of 29 N., the southern Keys, Bahamas and Antilles at least as far south as St. Vincent, and it is also found in Guatemala.

PHYSICAL PROPERTIES.—Wood very heavy, hard, strong, close-grained, with very fine medullary rays and uniformly distributed very small open apex ducts. It is of a pinkish brown color with lighter sap-wood and is susceptible of a beautiful polish. *Specific Gravity*, 0.9533; *Percentage of Ash*, 1.25; *Relative Approximate Fuel Value*, 0.9414; *Coefficient of Elasticity*, 111144; *Modulus of Rupture*, 1190; *Resistance to Longitudinal Pressure*, 666; *Weight of Cubic Foot in Pounds*, 59.41.

USES.—The wood is used for piles, and in boat building, the handles of tools, etc.

Its leaves possess to some degree the saponiferous properties found in other members of the family and are said to be sometimes used as a substitute for soap.

ORDER RHAMNACEÆ: BUCKTHORN FAMILY.

Leaves simple, mostly alternate and often 3-nerved; stipules small, mostly deciduous. *Flowers* small, greenish, mostly perfect; calyx 4-5-lobed valvate; petals 4-5 inserted on the calyx; disk annular and lining the calyx-tube or none; stamens opposite the petals and inserted with them on the edge of the fleshy disk; anthers introrse, versatile; ovary superior, 2-5-celled with 1 anatropous ovule in each cell; style columnar with terminal stigma. *Fruit* a drupe or drupe-like, tipped with the remnants of the style; seed usually with albumen.

Trees and shrubs with watery bitter juice and of about 575 species, grouped in 45 genera. They are natives of warm and temperate



Fig. 11—FLORIDA WHITEWOOD



Fig. 12—INK-WOOD.

The straight line to the left of the Ink-wood trunk is the taut root of a Strangle-tree, which had begun life on a branch of the Ink-wood and would undoubtedly have strangled it in time had not the tree been taken for our sections.

regions, and six of the genera have arborescent representatives in the United States.

GENUS COLUBRINA BRONGNIART.

Leaves alternate, petiolate pinnately veined or with three veins from the base. *Flowers* in axillary clusters, small, yellowish; calyx 5-lobed, with persistent hemispheric tube and deciduous lobes keeled inside; petals 5, alternate with and shorter than the calyx-lobes, hood-shaped and infolding the stamens and inserted with them under the margin of the 5- to 10-lobed annular disk; stamens 5, opposite the petals and with incurved filaments and ovate anthers, pistil with 3-celled subglobose ovary, with a single erect ovule in each cell, slender style and capitate 3-lobed stigma. *Fruit* a small subglobose capsule, 3-lobed at the summit, and splitting at maturity into 3 2-valved sections each containing a single smooth shining black seed.

The genus consists of 12 or 15 species of shrubs and trees of tropical regions mainly of the New World, one being arborescent and another shrubby in southern Florida, and two shrubby in Mexico. The name is from the Latin *coluber*, a *serpent*, probably from a fancied resemblance in the snake-like ridges of the trunk of some species to a serpent.

313. COLUBRINA RECLINATA BRONG.

NAKED-WOOD. NAKED-BARK. SOLDIER-WOOD.

Ger., *Nackt-holz*. Fr., *Bois costiere* (Fr. W. I.). Sp., *Mabi*, *Bijaguara*.

SPECIFIC CHARACTERS:—*Leaves* persistent, oblong to ovate, $2\frac{1}{2}$ to 4 in. long, with slender petioles $\frac{1}{2}$ to $\frac{3}{4}$ in. long, membranaceous, entire, tapering at apex to a usually blunt point, obtuse or rounded at the base near which there is a marginal gland on each side, dull dark green above and paler beneath. *Flowers* on the shoots of the year, in stalked axillary clusters about as long as the petioles, glabrate. *Fruit*, capsule ripening in late autumn, reddish brown, about $\frac{1}{4}$ in. in diameter and with pedicels $\frac{1}{4}$ to $\frac{1}{2}$ in. long; seed shining black, about $\frac{1}{16}$ in. long.

The Naked-wood under favorable conditions attains a height of 50 or 60 ft. and the trunk a diameter of 3 or 4 ft. (1m.), but is usually a considerably smaller tree. The trunk is quite commonly ridged, irregular and burly, and is vested in a thin smooth orange brown bark.

HABITAT.—Some of the southern Keys at the lower end of Florida, the Bahamas and the West Indies to St. Vincent and Jamaica. It attains its largest size and greatest abundance on Umbrella Key.

PHYSICAL PROPERTIES.—Wood heavy, very hard, strong, close-grained, with very fine medullary rays and quite uniformly distributed

very small open ducts. It is of a rich brown color with thin light yellow sap-wood. *Specific Gravity*, 0.8208; *Percentage of Ash*, 1.75; *Relative Approximate Fuel Value*, 0.8064; *Coefficient of Elasticity*, 97656; *Modulus of Rupture*, 1216; *Weight of a Cubic Foot in Pounds*, 51.15.

USES.—The wood of this species is used in Cuba for building purposes and is considered durable. The bark is used in making the drink known as “Mabi” or “Mabee.”

MEDICINAL PROPERTIES.—The bark of this species, known as “Mabee bark,” is a glucoside and is used in the West Indies as a stomachic.*

ORDER RHIZOPHORACEÆ: MANGROVE FAMILY.

Leaves persistent, usually opposite, thick and leathery, smooth, petiolate and with interpetiolar stipules. *Flowers* regular, perfect and in axillary clusters; calyx persistent and with usually 4 lobes valvate in the bud; petals as many as the lobes of the calyx, alternate with them and inserted on the calyx tube; stamens 2 to 4 times as many as the petals, inserted at the base of a disk and with 2-celled anthers opening lengthwise; pistil with usually 2-5-celled ovary, with short united styles and stigmas various; ovules usually 2 in each cell, anatropous and suspended. *Fruit* berry-like and leathery, usually indehiscent, 1-celled, 1-seeded and subtended by the persistent calyx.

The family consists of some 50 species of trees and shrubs with terete branchlets, and largely maritime habitat of the tropics of both the Old World and the New, but predominating in the former.

GENUS RHIZOPHORA LINNÆUS.

Leaves mostly oblong, glabrous and with large caducous acuminate stipules infolding the bud. *Flowers* yellow or cream-colored, each with two short bractlets united into an involucre cup, pedicellate, two or three together, each pedicel subtended by a 2- or 3-lobed involucre cup at the end of the peduncle, calyx with 4 acute lobes coriaceous, with a central rib inside and 2 or 3 times as long as the turbinate tube, reflexed; petals 4, yellowish white, nearly linear, hairy and reflexed between the calyx-lobes, caducous; stamens 8 to 12, with very short filaments and elongated introrse connivent anthers; pistil with ovary partly inferior, with 2 awl-shaped spreading styles stigmatic at the tips. *Fruit* conical, leathery; seed usually solitary and germinating very early it sends out a strong radicle which forces its way through the apex of the fruit before it falls from the tree.

A genus of three species of trees of astringent properties, with stout, terete, pithy branchlets, and of very general distribution along the sea coasts of the tropics of both hemispheres. The following species only is American.

The name is from Greek words meaning “root bearing,” in allusion to the aerial roots borne by these trees.

**U. S. Dispensatory*, 19th Ed., p. 1454.

314. RHIZOPHORA MANGLE L.

MANGROVE. RED MANGROVE.

Ger., *Mangelbaum*. Fr., *Paletuvier rouge*. Sp., *Mangle colorado*.

SPECIFIC CHARACTER:—See ordinal and generic descriptions. *Leaves* oblong to oval, $3\frac{1}{2}$ to 5 in. long, acute or bluntly pointed, cuncate at base, glabrous dark green above, paler beneath, with entire revolute margins, rather obscure straight veinlets and broad flat midrib and petiole, $\frac{1}{2}$ to 1 in. long; stipules conspicuous when the leaf unfolds and some attaining a length of nearly 2 in. *Flowers* appearing continuously throughout the year, nearly 1 in. across when expanded, on 2-3-branched peduncles from 1 to 2 in long. *Fruit* about 1 in long, with roughish chocolate-brown surface and firm thick-walled protruding radicle and finally a woody tube protecting the plumule.

The Mangrove is a low wide-spreading tree usually, but when crowded together and obliged to grow upright may attain the height of 75 to 80 ft. (25m.) and its trunk is sometimes 3 or 4 ft. (1m.) in diameter. The bark of trunk is of a reddish gray color, fissured into low close ridges and these again transversely, giving a very characteristic appearance. It is red inside.

The Mangrove is a wonderful tree in its adaptation to battling for life under conditions which few trees could survive. It forms the van of advancing vegetation upon almost every tropical sea-coast and gives a foothold to less hardy species. It grows along the tidal marshes and mud-flats, where the shifting tides do not permit ordinary seeds to find lodgment, but not so with those of this tree. They drop as darts into the mud already sprouted, and there they stick, right end up, safe ordinarily against dislodgment.

They rapidly then put out roots and leaves and established existence commences. As growth advances the tree, as though conscious of the necessity of the strongest possible foothold, puts out additional roots from along its trunk, and finally its wonderful aerial roots form the branches, until, with guys well out on all sides, it is so firmly established that the waves of tempests can not dislodge it. Falling leaves and trash of all sorts floating on the water are than caught and held by its maze of roots and literally the growth of land is effected. In this new land, in time, the less hardy species become established and thrive.

HABITAT.—Skirting the sea coasts of the American tropics, encroaching so far upon the sea that a species of oyster is found in abundance attached to its exposed roots between tide marks, and

ascending the rivers many miles. It ranges as far north on the coasts of Florida as somewhat above Cape Canaveral on the east and the vicinity of Cedar Keys on the west.

PHYSICAL PROPERTIES.—Wood very nearly the heaviest known in the United States, exceedingly hard, strong, close-grained, with thin but broad medullary rays and generally distributed open ducts. It is of a reddish brown color with lighter sap wood. *Specific Gravity*, 1.1617; *Percentage of Ash*, 1.82; *Relative Approximate Fuel Value*, 1.1406; *Coefficient of Elasticity*, 165567; *Modulus of Rupture*, 1207; *Resistance to Longitudinal Pressure*, 860; *Resistance to Indentation*, 462; *Weight of a Cubic Foot in Pounds*, 72.40.

USES.—The wood makes an excellent fuel and is also used for piles and wharf-timbers. It is also now being used to some extent for flooring.

The bark is rich in tannin and useful in tanning leather. It is said that in early days a useful cordage was made by the Indians from the fibrous portion of the bark of this tree.

ORDER MYRTACEÆ: MYRTLE FAMILY.

Leaves simple, opposite or alternate, without stipules, often pellucid-punctate, coriaceous and with marginal vein. *Flowers* usually perfect; calyx-lobes valvate or imbricate or consolidated into a lid; petals 4 or 5 (rarely 6 or wanting), epigynous; stamens numerous; ovary usually inferior (rarely free), 2- to many-celled (rarely 1-celled), styles undivided; ovules 1 or many, amphy-tropous. *Fruit* a capsule or berry; seeds without albumen.

A large and important order of about 2,700 species, grouped in about 75 genera, mostly of trees and shrubs of warm climates, generally pervaded with a fragrant and pungent volatile oil and producing valuable woods, various spices, edible fruits, etc.

GENUS PSIDIUM LINNÆUS.

Leaves persistent, opposite, of firm texture. *Flowers* white, rather large, on 1-3-flowered peduncles, in the axils of the leaves or lateral; calyx with 4-5 persistent lobes; petals of same number and somewhat longer, spreading; stamens numerous, white, with small anthers; pistil with 2-5-celled ovary, filiform style longer than the stamens and capitate stigma, ovules numerous in each cell. *Fruit* a subglobose or pear-shaped berry, often subtended by the calyx lobes, yellow or pinkish, often with aromatic acidulous flesh and many hard seeds imbedded in the pulp.

The genus consists of about 130 species of trees and shrubs of tropical America with 4-angled branchlets, the following one of which



Fig. 13—NAKED-WOOD

Observe the bases of large roots of the Mangrove leading off on all sides far above ground.



Fig. 14—MANGROVE. RED MANGROVE

has become naturalized in southern Florida and southern California. The name is from a Greek word referring to the edible nature of the fruit.

315. PSIDIUM GUAJAVA L.

GUAVA.

Ger., *Guajava*.

Fr., *Goyavier*.

Sp., *Guajaba*.

SPECIFIC CHARACTERS:—*Leaves* mostly oblong, 3-5 in. long, with petioles about $\frac{1}{4}$ in. long, obtuse to acute at apex, obtuse to rounded at base, entire or very slightly crenate glabrous dark green above, paler puberulent and with prominent midrib and arcuate veins beneath. *Flowers* appearing early in the spring and irregularly during the summer in the axils of the leaves, solitary or few together; calyx lobes about $\frac{1}{2}$ in. long; petals longer, white. *Fruit* subglobose or pyriform, $\frac{1}{2}$ inches in diameter, yellow or pinkish, somewhat astringent and of pleasant acidulous flavor.

A small tree occasionally attaining the height of 15 or 20 ft. (5m.), with trunk 8 or 9 in. (0.20m.) in diameter at base, but trees of these dimensions are rare and it is generally considerably smaller. The bark of trunk is thin and of a rich purple-brown color. It exfoliates in large thin papery scales which curl up and drop off, leaving a brownish white inner bark darkening on exposure to the color of the older bark.

HABITAT.—A tropical American tree which has become naturalized in southern Florida and southern California, where it may be found growing naturally in fields and thickets.

PHYSICAL PROPERTIES.—Wood heavy, hard, strong, elastic, of very close grain, with exceedingly fine medullary rays and uniformly distributed fine open ducts. It is of a light reddish brown color with lighter sap-wood.

USES.—The wood is said to be used in the tropics to a limited extent for tool-handles, agricultural implements, etc., but with us the almost sole value of the tree is in its fruit. That is highly esteemed and is growing in popularity. It is more highly prized generally for the manufacture of a choice jelly and preserves than to be eaten fresh from the hand, as it is considered to many tastes rather too tart when fresh, but that quality appeals to some tastes.

ORDER COMBRETACEÆ: WHITE MANGROVE FAMILY.

Leaves simple, persistent, alternate or opposite, leathery, entire, without stipules and petioles often bearing lateral glands. *Flowers* regular, perfect or polygamous, in racemes, spikes or heads; calyx with mostly 5 lobes valvate in the bud; petals of the same number and also valvate in the bud, inserted at the base of the calyx or sometimes wanting; stamens 5 to 10, inserted on the calyx limb, exerted with distinct filiform filaments and introrse 2-celled anthers longitudinally dehiscent; pistil with 1-celled ovary containing usually 2 suspended ovules, slender terminal subulate style and terminal stigma. *Fruit* drupaceous, indehiscent, often crowned with an enlarged persistent calyx; seed solitary, without albumen, with straight embryo and convolute cotyledons.

A family of about 250 species of trees, shrubs and vines of tropical distribution, with astringent juice and naked buds, and grouped in about 15 genera, four of which are represented in the trees of southern Florida.

GENUS CONOCARPUS LINNÆUS.

Leaves alternate, persistent, leathery, 2-4 in. long, with petioles $\frac{1}{2}$ in. or less and conspicuously biglandular, narrow obovate-oblong, acute at apex, narrow cuneate at base, entire, glabrous light green above, paler and with prominent yellow midribs and obscure reticulate veinlets beneath; branchlets conspicuously angled at first. *Flowers* appearing at all seasons, very small, green, in dense globular heads about $\frac{1}{3}$ in. in diameter, arranged in terminal leafy hoary-tomentose panicles; calyx bell-shaped, hairy outside, with acute deciduous lobes scarcely $\frac{1}{8}$ in. long and tube of about the same length; corolla none; stamens usually 5 (sometimes 7 or 8) with very small heart-shaped anthers; pistil with inferior ovary and slender style hairy at base. *Fruit* scale-like, laterally winged, incurved and densely imbricated in an oblong pinkish green cone nearly $\frac{1}{2}$ in. long.

The genus consists of the single following species and takes its name from Greek roots descriptive of the cone-like nature of the fruit.

316. CONOCARPUS ERECTA L.

FLORIDA BUTTONWOOD. BUTTON MANGROVE.

Ger., *Knopfbäum*.

Fr., *Conocarpe droit*, *Paletuwier*.

Sp., *Mangle boton* (Sp. W. I.), *Mangle prieto* (Mex.).

SPECIFIC CHARACTERS:—See generic description, this being the only species.

A tree attaining the height of 50 or 60 ft. (18m.) when massed together or growing among other trees, but as found close along the water's edge it does not attain as great a height and is of irregular wide habit of growth. The trunk sometimes attains a diameter of



Fig. 15—GUAVA

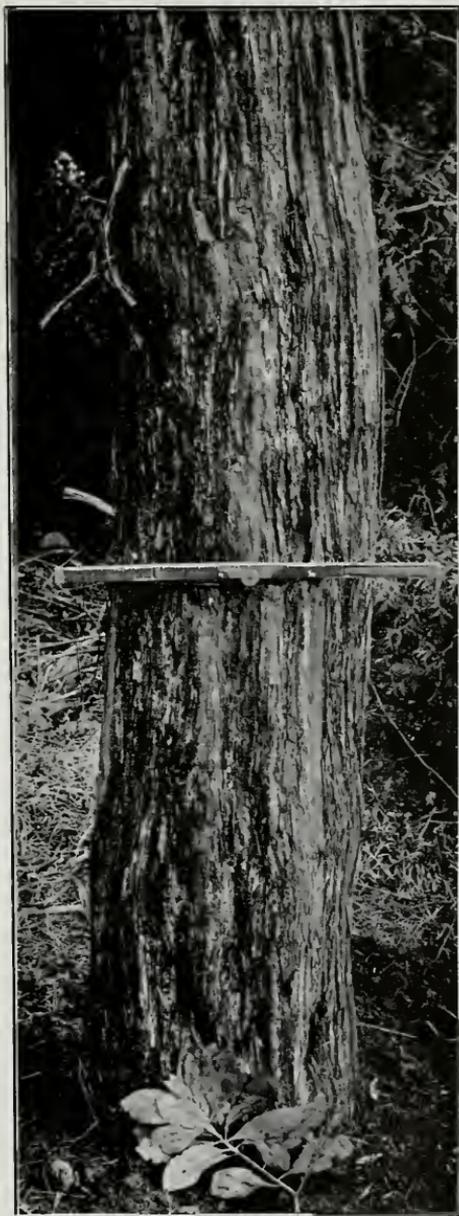


Fig. 16—BUTTON MANGROVE.
BUTTONWOOD.

2 or 2½ ft. (0.75m.) and is vested in a dark gray-brown bark, fissured into low flat ridges which exfoliate in thin scales and fibrous strips, peeling off lengthwise. It is often found fruiting as a shrub.

HABITAT.—A tree of wide distribution, being found along muddy tide-water shores of Florida south of Cedar Keys and Cape Canaveral, the Antilles generally, Central America and tropical South America and also on the west coast of Africa.

PHYSICAL PROPERTIES.—Wood very heavy, hard, strong, close-grained and of a dark yellowish brown color with thin lighter sapwood. *Specific Gravity*, 0.9900; *Percentage of Ash*, 0.32; *Relative Approximate Fuel Value*, 0.9868; *Coefficient of Elasticity*, 102411; *Modulus of Rupture*, 942; *Resistance to Longitudinal Pressure*, 599; *Resistance to Indentation*, 370; *Weight of a Cubic Foot in Pounds*, 61.70.

USES.—The principal use of this tree is for fuel, for which it is excellent, as it burns slowly, almost like coal, producing good heat and very little smoke.

The bark is rich in tannin and is used to some extent as an astringent and for tanning purposes.

GENUS LAGUNCULARIA GAERTNER.

Leaves opposite, thick, flat, leathery, oblong, 1½-3½ in. long, emarginate or rounded at apex, rounded at base, smooth dull green above, paler beneath, marked with small tubercles towards the margin, with straight brown midrib, obscure reticulate veinlets and thick biglandular petiole ½ in. or less in length. *Flowers* produced throughout the year, usually perfect, ¼ in. long, greenish white, sessile in few flowered axillary and terminal simple tomentose spikes 1½ to 2 in. long with minute bractlets; calyx turbinate, prominently ribbed and bracteolate near the middle and with 5 pointed, persistent lobes; petals 5, nearly orbicular, not longer than the calyx lobes, ciliate, caducous; stamens 10, with awl-shaped filaments and heart-shaped anthers; pistil with 1-celled ovary, short style and somewhat 2-lobed stigma. *Fruit* drupaceous, leathery, about ½ in. long, oblong or obovoid, unequally 10-ribbed, crowned with the calyx lobes and containing a single dark red stone.

A genus of the following single species and named from Latin roots alluding to a fancied resemblance in the fruits to little flasks.

317. *LAGUNCULARIA RACEMOSA* GAERTN. F.

WHITE MANGROVE. WHITE BUTTONWOOD.

Ger., *Weisze Knopfbaum*.Fr., *Manglier blanc*.Sp., *Mangle blanco*, *Pataban* (Cuba).

SPECIFIC CHARACTERS:—See the ordinal and generic descriptions, this being the only species.

The White Mangrove attains the height of 50 or 60 ft. (18m.) or more in crowded hammock growth, but when found close along the water's edge it develops a low, wide-spreading top of irregular branches. The trunks attain a thickness of from 12 to 20 inches and are vested in a dark brownish gray somewhat fibrous bark, fissured into low flat, more or less reticulated ridges.

HABITAT.—Low tidal lands along the coasts of Florida south of Cape Canaveral and Cedar Keys, of the southern Keys, Bermuda, the Bahamas, West Indies, southern Mexico, Central America and tropical South America, also western Africa. Generally a common species, but confined to the immediate proximity of the sea.

PROPERTIES.—Wood heavy, hard, strong, close grained, with numerous very fine medullary rays and quite uniformly distributed open ducts and susceptible of a good polish. It is of a light purple-brown color with lighter sap-wood. *Specific Gravity*, 0.7137; *Percentage of Ash*, 1.62; *Relative Approximate Fuel Value*, 0.7021; *Coefficient of Elasticity*, 72396; *Modulus of Rupture*, 518; *Resistance to Longitudinal Pressure*, 449; *Resistance to Indentation*, 149; *Weight of a Cubic Foot in Pounds*, 44.48.

USES.—The wood, though of excellent qualities, is not of commercial importance, owing to limited size and crooked trunks. It is useful for fuel.

The bark is rich in tannin and is sometimes used in tanning leather.

MEDICINAL PROPERTIES.—The bark is astringent and tonic, but not recognized in the pharmacopœia.

ORDER SAPOTACEÆ: SAPODILLA FAMILY.

Leaves alternate or sometimes clustered, simple, entire, pinnately-veined, mostly coriaceous, petiolate, with stipules. *Flowers* small, regular, perfect, in axillary clusters; calyx of 5-8 persistent sepals, imbricated; corolla hypogenous,

5-8-cleft with an internal lobe-like appendage (staminodium) at each sinus and a short tube; disk none; stamens as many as the lobes of the corolla and opposite them inserted on the tube; anthers 2-celled, subextrorse, longitudinally dehiscent; pistil with ovary sessile, usually 5-celled, with simple style and terminal stigma, and containing a solitary anatropous ovule. *Fruit* a berry with persistent calyx at base and tipped with remnants of the style, usually 1-seeded, the seed containing a large straight embryo with or without albumen.

Trees, shrubs and vines with milky juice and of wide distribution throughout the warmer regions of the globe, some species producing valuable timbers or fruits and one producing the gutta percha of commerce. The family consists of about 400 species of 35 genera, of which 6 genera are represented in the trees of the United States, all southern.

GENUS SAPOTA MILLER.

Leaves evergreen alternate and clustered at the ends of the branchlets, thick, coriaceous, oblong, mostly obtuse or acute at apex, cuneate at base, with entire revolute margin, smooth dark green above, duller and with prominent straight mid-rib and obscure veins beneath; petioles $\frac{1}{2}$ to $\frac{3}{4}$ in. long. *Flowers* small on rusty pubescent stalks in the axils of the leaves of the season, perfect; calyx rusty, with 6 bluntly pointed lobes in 2 series, corolla 6-lobed, whitish, scarcely longer than the lobes of the calyx; stamens 6, with arrow-shaped anthers, pistil with obovoid brown hairy ovary, exerted style and small terminal stigma. *Fruit*, though technically a berry resembling a russet apple, subglobose, $1\frac{1}{2}$ to 3 in. in diameter, with usually rough brown surface and at first with greenish very firm flesh of austere flavor and with milky very glutinous juice, but soon becoming tender, of delicious pear-like flavor, pinkish yellow, with watery juice and agreeable odor. It contains 4 or 5 nearly black shining flattened seeds radiating edgewise from the central axis and with long white scar on inner edge.

A genus of the following single species taking its name from the native West Indian name of the tree.

318. SAPOTA ACHRAS MILLER.

SAPODILLA. CHICLE-TREE.

Ger., *Sappadill*.

Fr., *Sapotillier*.

Sp., *Nispero* (Cen. and So. Amer.), *Chico-zapote* (Mex.).

SPECIFIC CHARACTER:—See ordinal and generic descriptions, this being the only species.

A shapely tree attaining in Florida the height of 30 or 40 ft. (12m.) with compact rounded top of handsome evergreen foliage and a trunk sometimes 1 ft. (0.30m.) or more in diameter. This is covered with a

grayish brown bark fissured into narrow firm rounded ridges and exfoliating in small thick scales.

HABITAT.—The native land of the Sapodilla is supposed to be the West Indies, Central America and northern South America. It is extensively grown in southern Florida and on the southern keys and has become naturalized in places. Besides the names mentioned in our heading it is also known as *Nisberry*, *Naseberry*, *Chico*, *Bully-tree*, etc.

PHYSICAL PROPERTIES.—Wood very heavy, hard, strong, close grained, very durable, with very fine medullary rays and of a rich reddish brown color with lighter sap-wood. *Specific Gravity*, 1.02.

USES.—The usefulness of the Sapodilla is three-fold. The fruit, known in common parlance of the regions where grown as “dillies,” is very highly prized in warm countries, and is of growing popularity outside of the tropics as far as it can be shipped. Unfortunately it is not adapted to long shipments.

The glutinous milk juice, obtained from the bark and fruit, is known as *gum chicle* of commerce. It is an important ingredient of chewing gum and is also used in England as a substitute and adulterant of gutta-percha. The wood is used to some extent for construction purposes. It is said that lintels made of this wood in old ruins in Mexico, centuries if not thousands of years old, are found to be still sound.

MEDICINAL PROPERTIES are not officinally recognized of this species, though Nuttall mentions the astringent bark as being febrifugal and the seeds as being powerfully aperient and diuretic. He also mentions the gum as diffusing the odor of incense when burned.

GENUS SIDEROXYLON LINNAEUS.

Leaves persistent, simple, alternate, long-petiolate, rather thin and leathery, with prominent midrib impressed above and rather remote arcuate veins. *Flowers* small, in crowded many-flowered axillary fascicles; calyx bell-shaped, 5- or occasionally 6-parted, corolla 5- or 6-lobed and furnished with 5 or 6 lanceolate scale-like staminodia in the sinuses; stamens 5 or 6, with slender elongated filaments and oblong anthers; pistil with usually 5-celled ovary contracted into a subulate style and small terminal stigma. *Fruit*, usually but one developing from each flower-cluster, an oblong drupe, shining light brown, with elevated hilum and erect embryo in fleshy albumen.

A genus of 60 or more species of trees and shrubs, widely distributed through the warm climates of both hemispheres, and the following one species in southern Florida. The name is from Greek words meaning *iron* and *wood*, owing to its hardness and weight.



Fig. 17—WHITE MANGROVE

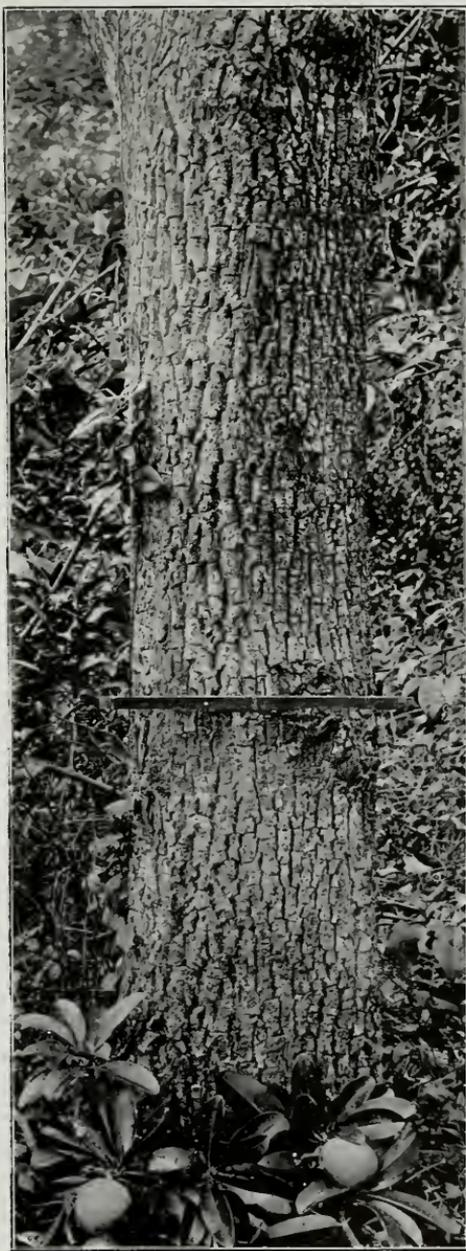


Fig. 18—SAPODILLA. CHICLE-TREE

319. SIDEROXYLON MASTICHODENDRON JACQ.

MASTIC.

Ger., *Mastixbaum*. Fr., *Acomat* (Mar.), *Acomat franc* (Guad.),

Sp., *Tocuma amarillo*, *Ausubo* (P. R.).

SPECIFIC CHARACTERS:—*Leaves* oblong, 3 to 5 in. long, mostly acute to obtuse at apex, cuneate at base, with cartilaginous entire more or less wavy margin, lustrous bright green with depressed midrib above, paler and very prominent midrib beneath, rather remote and obscure arcuate veins and long slender petioles 1 to 1½ in. long. *Flowers*, appearing at almost any season, from the axils of the leaves of the season, or from the nodes of the preceding season; calyx yellow-green, puberulous outside; corolla light yellow with lobes somewhat longer than those of the calyx, staminodia short, with subulate tips; pistil with glabrous ovary. *Fruit* about 1 in. long, with rather tough yellow skin and of a pleasant flavor, but leaving in the mouth a rather peppery after-taste; seed about ½ in. long, flattened obovoid.

One of the large trees of southern Florida, attaining a height of 75 or 80 ft. (23m.) or more, with stout spreading and ascending branches and straight trunk sometimes 3 or 4 ft. (1.25m.) in diameter. The bark of trunk is about ⅓ in. in thickness, of a brownish gray color and exfoliating in thinnish irregular scales.

HABITAT.—A common and important tree of the hammocks of peninsular Florida south of Cape Canaveral and Charlotte Harbor, the southern Keys, the Bahamas and many of the West Indian islands.

PHYSICAL PROPERTIES.—Wood very heavy, hard, strong, close-grained, with few small open ducts and many fine medullary rays, durable and of a brownish orange color, with lighter ample sap-wood. *Specific Gravity*, 1.0109; *Percentage of Ash*, 5.14; *Relative Approximate Fuel Value*, 0.9589; *Coefficient of Elasticity*, 109948; *Modulus of Rupture*, 970; *Resistance to Longitudinal Pressure*, 650; *Resistance to Indentation*, 355; *Weight of a Cubic Foot in Pounds*, 63.00.

USES.—The wood is largely used for boat-building, general construction purposes and for furniture. It is considered in Porto Rico as one of their most valuable timbers and sells at a high price for sills, rafters, etc., in house-building.

The fruit is juicy, edible and very pleasing in flavor, in the tastes of most people, but it leaves for a time a peppery after-flavor and a slowly soluble gummy coating of the tongue and roof of the mouth, qualities which prompt one, after the first experience, to partake of it not too freely.

GENUS DIPHOLIS A. DECANDOLE.

Leaves persistent, alternate, thinnish, leathery, with midrib prominent beneath and slender arcuate veins uniting near the margin. *Flowers* small, in dense fascicles both from the axils of existing leaves and the leafless nodes of earlier growth; calyx bell-shaped with 5 lobes rounded at apex; corolla white with 5 spreading lobes, each lobe supplied at its base with a linear appendage; stamens 5, exserted with slender filaments and versatile oblong extrorse anthers; stamens 5, petaloid, alternating with the stamens and inserted with them on the calyx-tube; pistil with ovoid ovary gradually contracted into a slender short style stigmatic at the apex. *Fruit* a subglobose or oblong black drupe with thin dryish flesh; seed solitary, oblong, with shining dark brown thick coriaceous coat, and erect embryo in fleshy albumen.

A genus of few species of trees and shrubs of the warmer regions of the New World and named from two Greek words referring to the two appendages to each lobe of the corolla. The following one species is the only one found within the United States.

320. DIPHOLIS SALICIFOLIA, A. DE C.

BUSTIC. CASSADA.

Ger., *Weidenblättrige Diphole*. Fr., *Acomat rouge*, *Acomat bastard*.

Sp., *Tocuma*, *Almendro sylvestre*, *Tabloncillo*.

SPECIFIC CHARACTERS:—*Leaves* lanceolate-oblong to narrow obovate, acuminate to acute at apex, narrow cuneate at base, with entire, somewhat wavy cartilaginous margin, thinnish, firm, lustrous dark green above, paler beneath, 3-5 in. long, with slender petioles $\frac{1}{2}$ to 1 in. long. *Flowers*, opening in Florida in March and April, about $\frac{1}{8}$ in. long, numerous, in dense fascicles, with rufous pubescent pedicels about $\frac{1}{4}$ in. long; calyx rusty pubescent outside; corolla about twice as long as the calyx and with appendages of the lobes about the length of the irregularly toothed, ovate, stamens; ovary glabrous. *Fruit*, ripening in autumn, solitary or clustered, about $\frac{1}{4}$ in. long.

The Busic tree sometimes attains the height of 40 or 50 ft. (15m.), with rather small upright branches and a straight trunk 18 in. (0.50m.) or more in diameter. This is vested in a grayish brown bark which becomes fissured with age into narrow longitudinal and reticulated ridges and exfoliates in irregular and elongated scales.

HABITAT.—The rich hammocks of southern Florida in the vicinity of Bay Biscayne, the southern Keys, the Bahamas (where it is known as the "sour-wood") and many of the Antilles.

PHYSICAL PROPERTIES.—Wood very heavy, hard, strong, close-

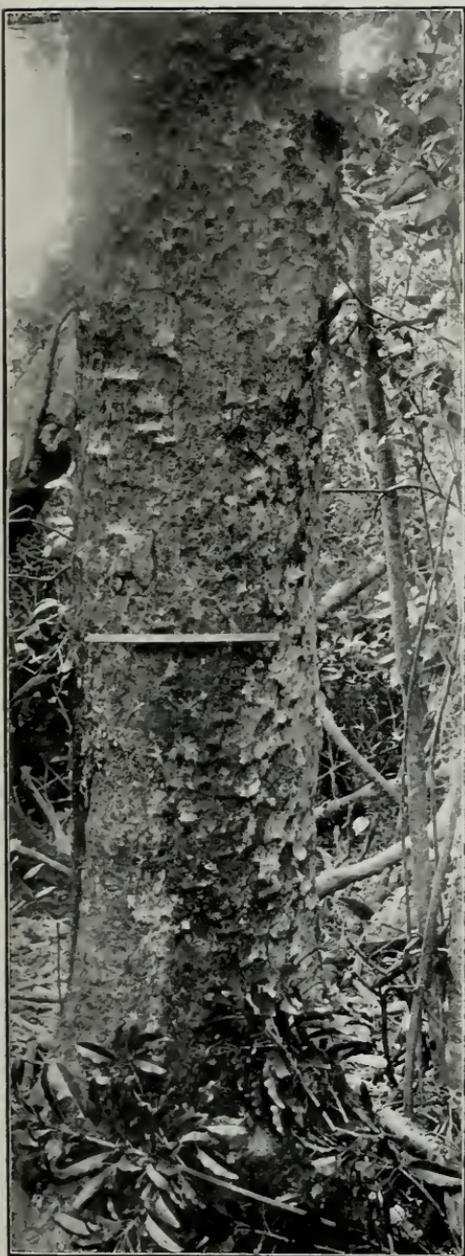


Fig. 19—MASTIC

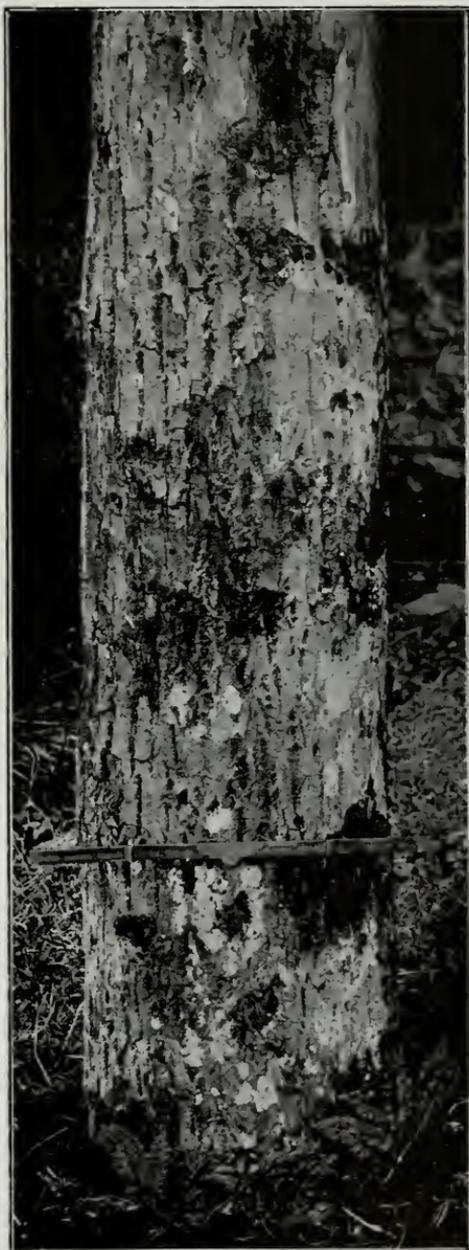


Fig. 20—BUSTIC. CASSADA



grained with fine medullary rays and of a rich brownish red color with lighter sap-wood. It is susceptible of a beautiful polish. The odor of the fresh wood is strongly suggestive of that of vinegar, and hence, perhaps, its Bahaman name, Sour-wood, but in flavor it is very bitter. *Specific Gravity*, 0.9316; *Percentage of Ash*, 0.32; *Relative Approximate Fuel Value*, 0.9286; *Coefficient of Elasticity*, 133593; *Modulus of Rupture*, 1148; *Resistance to Longitudinal Pressure*, 730; *Resistance to Indentation*, 274; *Weight of a Cubic Foot in Pounds*, 58.06.

USES.—The wood is occasionally used for knees and timbers in boat-building, though not abundant enough to have a recognized place in commerce. Its handsome color and other desirable qualities strongly commend it for use in furniture, interior finishing, etc.

ORDER BORRAGINACEÆ: BORAGE FAMILY.

Leaves simple, persistent, both alternate and opposite or sub-verticillate without stipules. *Flowers* regular, perfect, in terminal or axillary compound cymes; calyx usually 5-lobed, persistent; corolla with usually 5 spreading lobes, hypogenous; stamens, 5, alternate with the lobes of the corolla and inserted on its tube, with filiform filaments and introrse 2-celled anthers longitudinally dehiscent; pistil with usually 2- or 4- celled ovary and single style dividing into 2 branches with capitate stigmas; ovules solitary in each cell. *Fruit* drupaceous, tipped with the remnants of the style and subtended by the persistent calyx, and the pit containing 2-4 ascending seeds.

A family of about 85 genera of mostly herbaceous plants of temperate regions. It is represented in warm climates also by a few trees, three genera of which are native to extreme southern United States. The above description applies mainly to the arborescent species.

GENUS BOURRERIA P. BROWNE.

Leaves both alternate and opposite, persistent, obovate-oblong. *Flowers* white, with slender bracteolate pedicels in terminal compound cymes; calyx bell-shaped, persistent, with 5 valvate lobes; corolla with 5 broadly spreading rounded lobes; stamens with thread-like filaments and oblong slightly wrinkled anthers; pistil with sessile incompletely 4-celled ovary, tapering to a 2-parted style with capitate stigmas; ovules anatropous and solitary. *Fruit* a subglobose drupe with thin flesh and a stone separable into 4 thick-walled bony nutlets, each with a spongy many-ridged appendage on the back and with flattened inner faces.

A genus of about 18 species of trees and shrubs of the American tropics, two being found on the Keys of Southern Florida. It is named after J. A. Bourrer, an apothecary of Nuremberg.

321. **BOURRERIA HAVANENSIS** MIERS.

STRONGBACK. STRONGBARK.

Ger., *Havanische Bourreria*.Fr., *Bourrier de Havana*.Sp., *Ateje, Ircuma, Bureria*.

SPECIFIC CHARACTERS:—*Leaves* obovate-oblong, 2-3½ in. long, mostly rounded at apex, cuneate at base, with entire revolute margin, smooth and lustrous yellow green above, somewhat paler beneath; petioles slender ½ to 1 in. long. *Flowers* appearing at almost all seasons, in glabrous terminal cymes 3-4 in. across; calyx bell-shaped, about ¼ in. long; corolla creamy white, with tube about ½ in. long and nearly orbicular, spreading lobes, about ¾ in. across when expanded. *Fruit* subglobose, about ½ in. in diameter, orange red, with tough skin, tipped with the remnants of the style and subtended by the somewhat enlarged calyx lobes.

The Strong-back tree occasionally attains the height of 30 or 40 ft. (12m.), with trunk 8 or 10 in. (0.25m.) in diameter, but it is usually smaller. The bark of trunk is of a brownish gray color, quite smooth and exfoliating in small irregular scales.

HABITAT.—Hammocks of the Florida Keys, the Bahama Islands and many of the Antilles.

PHYSICAL PROPERTIES.—The wood of this species is quite soft, light, brittle and of a very different type of structure from that of ordinary woods. It consists of a system of close fibro-vascular tissue permeated with spaces, in concentric arrangement, occupied by a very delicate, pith-like parenchymatous tissue and minute transparent crystals. There are no distinct annual rings, but many fine medullary rays are readily seen with aid of a hand magnifier. In sectioning the wood we found its behavior to be similar to that of the *Yucca* and like that we have to protect the transverse sections with celluloid, owing to its fragile nature.

The U. S. government tests in connection with the Tenth Census investigation gives the following data concerning the physical properties of this wood. *Specific Gravity*, 0.8073; *Percentage of Ash*, 2.79; *Relative Approximate Fuel Value*, 0.7848; *Coefficient of Elasticity*, 99649; *Modulus of Rupture*, 944; *Resistance to Longitudinal Pressure*, 575; *Resistance to Indentation*, 294; *Weight of a Cubic Foot in Pounds*, 50.31.

USES.—Little if any use is made of the wood of this tree, but we are informed that a tea is made from its bark on the Bahama Islands.

ORDER VERBENACEÆ: VERVAIN FAMILY.

Leaves usually opposite, sometimes whorled, persistent, entire. *Flowers* perfect, sometimes irregular; calyx inferior, 4- or 5-lobed, persistent; corolla with 4 or 5 lobes imbricated in the bud; stamens 4 in pairs of different lengths, inserted on the corolla-tube alternately with its lobes and with 2-celled introrse anthers opening longitudinally; pistil sessile with 2- to 4-celled ovary, simple style and 2-lobed terminal stigma; ovules 1 or 2 in each cell. *Fruit* a dry or fleshy drupe or capsule.

The Vervain Family consists of some 1,200 species, grouped in about 70 genera of trees, shrubs, vines and herbs of wide distribution throughout temperate and tropical regions. The herbaceous species predominate in the temperate regions and the woody in tropical regions.

The species of greatest commercial importance is perhaps the Teak (*Tectoria grandis*, L. f.), of southeastern Asia.

Two of the genera, each of a single species, are represented in the trees of southern Florida.

GENUS AVICENNIA LINNAEUS.

Leaves thick and coriaceous. *Flowers* in terminal cymose pubescent clusters of pedunculate spikes, each subtended by a bract and pair of bractlets; calyx lobes 5, concave; corolla campanulate, white, with 4 spreading lobes, the posterior usually the largest; stamens exerted with short filiform filaments, pistil with ovate 1-celled ovary containing 4 orthotropous ovules suspended from a central placenta. *Fruit* a 2-valved capsule oblong, oblique, compressed, 1-seeded, apiculate, light green, pubescent; seed without albumen, the embryo germinating and enlarging somewhat before separating from the branch.

A genus of three species of trees and shrubs inhabiting the low muddy tidal shores of the tropics of both hemispheres, the following one only reaching Florida and the Gulf of Mexico coast to Texas. It is named after Avicenna, a distinguished physician who lived in Bokhara early in the eleventh century.

322. AVICENNIA NITIDA JACQ.

BLACK MANGROVE. NATIVE OAK (Jamaica).

Ger., *Schwarzer Mangelbaum*. Fr., *Paletuvier blanc* (Fr. W. I.).

Sp., *Mangle bobo* (Sp. W. I.); *Palo de sal*, *Culumata* (Cent. Amer.).

SPECIFIC CHARACTERS:—*Leaves* oblong to obovate-oblong, 2-3 in. long, rounded or obtuse at apex, cuneate at base, with entire revolute margin, smooth dark-green above, very finely hoary tomentose beneath, with rather broad midrib

and few oblique primary reticulating veins uniting near the margin; petioles about $\frac{1}{4}$ in. long, enlarged at base. *Flowers*, appearing at all seasons of the year, with bracts about as long as the lobes of the calyx. *Fruit* as described for the genus, 1-1 $\frac{1}{2}$ in. long.

The Black Mangrove occasionally attains the height of 70 or 80 ft. (25m.), with wide rounded top and a trunk rarely if ever more than 2 ft. (0.60m.) in diameter. This is vested in a dark brown bark fissured into very low flat ridges and these by narrow cross fissures, causing a characteristic chequered appearance. It is often no more than a wide-branched, bushy shrub or very low tree.

It sends up from its horizontal roots numerous small knees, or aerating roots as they are sometimes called, which bristle from the mud beneath the trees somewhat like asparagus shoots. Whatever may be the chief function of these curious growths they retain much trash which might otherwise float off with the tides and they really aid to make new land.

PHYSICAL PROPERTIES.—Wood very heavy, hard, strong and tough and of a rich dark brown color with ample creamy white sap-wood, the latter usually soon assuming a pronounced bluish brown tint.

The structure of this wood is very different from that of all the woods with which we are familiar, indeed even being at variance with the generally accepted ideas of wood structure and growth. It has no medullary rays, at least which extend through more than a season's growth; nor does it add its annual increment of new wood in unbroken layers—rings as seen in cross-sections. The new wood forms in strips, and these are braided together, as it were, in a sort of basket work of new growth each year around the older wood and beneath the bark. This basket-work growth gives to the wood the radial or lateral strength which is ordinarily given mainly the medullary rays. The result is a wood which is practically non-splitable radially.

We have found it impossible to make transverse sections of this wood, of the usual thickness adopted in our work, and keep them from separating between the annual layers, though we have succeeded fairly well with thinner sections. These are so fragile, however, that we are obliged to protect them with celluloid or mica. It has been impossible, too, to make as perfect radial and tangential sections as we would like and some roughness and checks have to be tolerated.

The government tests of physical properties are as follows: *Specific Gravity*, 0.9138; *Percentage of Ash*, 2.51; *Relative Approximate Fuel Value*, 0.8907; *Weight of a Cubic Foot in Pounds*, 56.95.



Fig. 21—STRONG-BACK

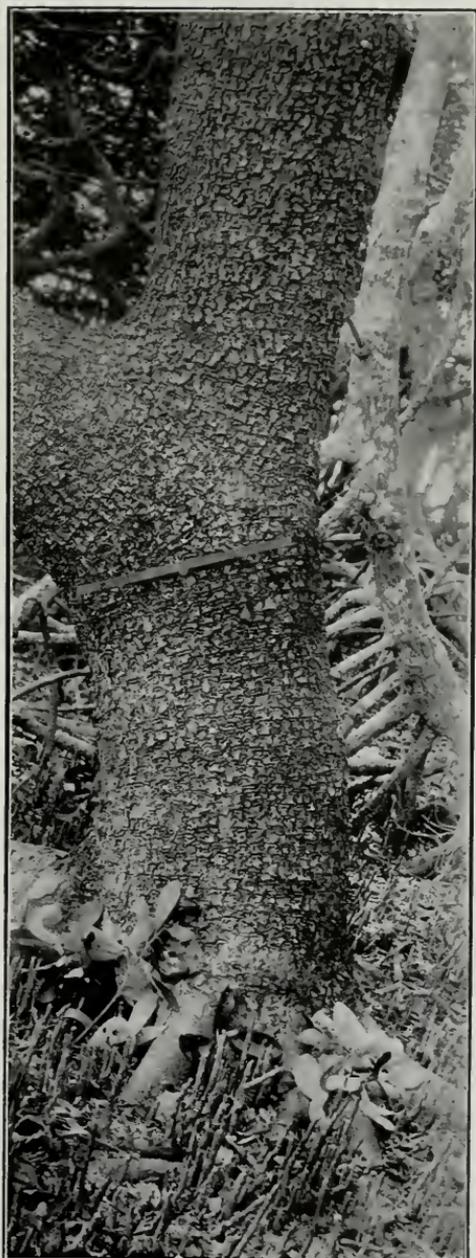


Fig. 22—BLACK MANGROVE

Observe the numerous little knees, or aerating roots as they are sometimes called, which cover the ground beneath the Black Mangrove tree.

USES.—Little use is made of the wood of this tree, though it is occasionally used for fancy-work, flooring, etc. It is very durable in contact with the soil and is valued in the West Indies for sills, posts, etc. The bark is used for tanning purposes.

The chief point of value in the tree is its usefulness in consolidating the muddy shores, for which, like the Red Mangrove with which it is associated, it is peculiarly adapted by the precocious germination of the seed, before leaving the parent tree. When this falls into the mud it quickly becomes established, undoubtedly assisted at first by the retroflexed hairs of its growing radicle. Later, when grown, the numerous little corky shoots from its roots hold or really make the land about it.

ORDER BIGNONIACEÆ: TRUMPET-CREEPER FAMILY.

Leaves simple in the arborescent representatives in the United States mostly opposite and without stipules. *Flowers* perfect, large, showy and more or less irregular; calyx hypogenous, bilabiate; corolla hypogenous, somewhat bilabiate, 5-lobed, imbricated in the bud; stamens 2 or 4 inserted on the base of the corolla with introrse 2-celled anthers longitudinally dehiscent; staminodia 1 or 3; ovary 1 or 2-celled, with simple slender 2-lobed style, stigmatic at the apex; ovules numerous, anatropous and horizontal. *Fruit* a podlike 2-valved capsule or berry and seeds without albumen.

Trees, shrubs, climbing vines and a few exotic herbs, mostly with large showy flowers, and widely distributed in tropics with a few representatives in temperate regions. About 1,500 species are known, grouped in nearly 100 genera. Of the 6 genera represented in the United States 3 are arborescent, one of the southwestern states, another of Florida and the third of the Atlantic states.

GENUS CRESCENTIA LINNÆUS.

Leaves alternate or clustered, persistent, short-petiolate and without stipules. *Flowers* perfect, solitary or few together in the axils of the leaves, or from the sides of the branchlets, with short bractiolate pedicels: calyx 2-parted or 5-lobed, leathery, deciduous; corolla hypogenous, narrow, bell-shaped and swollen and with transverse fold on the lower side, purplish or yellow streaked with purple, with limb slightly oblique and 2-lipped with five irregularly toothed short lobes; stamens 4 and usually a staminodium inserted on the corolla-tube, with filiform filaments and oblong spreading anther-cells; pistil with sessile 1-celled ovoid-conic ovary tapering into an elongated exserted style 2-lobed at the apex, the lobes stigmatic on the inner faces; ovules numerous on 2 lateral placentas. *Fruit* baccate, indehiscent, with thick firm rind and spongy placental mass containing, irregularly imbedded within its substance, numerous flattened suborbicular deeply grooved seeds.

A genus of 5 or 6 species of tropical American trees distributed from southern Florida and southern Mexico through the West Indies

to Brazil. It is named after a distinguished Italian writer on agriculture, Pietro de Crescenzi.

323. CRESCENTIA CUCURBITINA L.

BLACK CALABASH.

Ger., *Schwarze Calabasse*.

Fr., *Colbasse* (Fr. W. I.),

Sp., *Higuero*, *Colabazo de playa*, *Guautecomate*.

SPECIFIC CHARACTERS:—*Leaves* clustered at the ends of the branchlets, thick and leathery, 5-8 in. long, with very short wrinkled petioles, obovate-oblong, rounding to an abrupt point at apex, narrow cuneate at base, with entire revolute margin, lustrous dark green with deeply impressed midrib above, paler beneath and with prominent veins which are arcuate and unite a little distance from the margin. *Flowers* appearing in early spring, on peduncles $1\frac{1}{2}$ to 2 in. long, furnished with two acute bractlets near the base and enlarged at apex; calyx with 2 large concave lobes nearly as long as the corolla tube; corolla thickish, dingy purple or creamy white streaked with purple bands on the lower side, about 2 in. long, stamens in 2 pairs and a staminodium on posterior side inserted about midway on the wall of the corolla tube; ovary obliquely conical. *Fruit* oblong, or subglobose, $2\frac{1}{2}$ to 4 in. long, unbonate, suspended on a thick stem $1\frac{1}{2}$ to 2 in. long, and enlarged at apex, obscurely 4-ridged, dark green, its shell about $\frac{1}{8}$ in. thick, finally hard and brittle; seed about $\frac{5}{8}$ in. long, somewhat broader than long, 2-lobed and $\frac{1}{4}$ in. thick.

The Black Calabash is a low spreading tree seldom more than 20 or 25 ft. (8m.) in height, with few long branches and usually leaning or recumbent trunk which may be 8 to 10 in. (0.25m.) in maximum diameter. The bark of trunk is of a brownish gray color and quite smooth, exfoliating with age in thin irregular scales.

HABITAT.—The borders of swamps and low rich hammocks in the vicinity of Bay Biscayne and the Florida Keys, many of the West Indies, southern Mexico, Central America and Venezuela, often growing in the shade of forests of taller growth.

PHYSICAL PROPERTIES.—Wood soft, light, not strong, with many small, quite regularly distributed open ducts and of a mottled dark and light brown color with lighter sap-wood. *Specific Gravity*, 0.6319; *Percentage of Ash*, 1.35; *Relative Approximate Fuel Value*, 0.6234; *Weight of a Cubic Foot in Pounds*, 39.38.

USES.—We are not aware of any particular use to which this tree is applied, though its large glossy leaves and interesting flowers and fruit suggest an appropriateness for ornamental planting in low moist localities.

ORDER RUBIACEÆ: Madder Family.

Leaves simple, opposite or verticillate, entire, mostly with stipules and turning black in drying. *Flowers* regular, perfect; calyx 4-5-toothed or lobed and with tube adnate to the ovary; corolla 4-5-lobed, stamens as many as the lobes of the corolla, alternate with them and inserted on the tube with filaments free or united at base and introrse 2-celled anthers opening longitudinally; disk epigynous; ovary 1-10-celled with slender style and ovules 1 to many in each cell. *Fruit* a capsule, drupe or achene; seeds with membranaceous coat and without albumen.

Trees, shrubs and a few herbs of about 5,550 species grouped in some 350 genera. They are chiefly natives of tropical regions and comprise several species which yield products of great economic importance, such as coffee, quinine, ipecac, madder, etc.

GENUS EXOSTEMA RICHARD.

Leaves persistent, sessile or petiolate, with pointed interpetiolar stipules. *Flowers* axillary, fragrant, erect, with peduncles bibracteolate above the middle; calyx with 5 very short triangular persistent lobes; corolla white, with long narrow tube and 5 elongated linear spreading lobes; stamens with filiform filaments united into a tube at base adnate to the base of the corolla and linear-oblong anthers; pistil with 2-celled ovary, a long slender exerted style and capitate stigma; ovules numerous. *Fruit* a many seeded firm 2-celled capsule, septicidally dehiscent, each cell 2-parted: seeds oblong compressed lustrous dark brown with lighter winged margin and minute embryo in fleshy albumen.

A genus of about 20 species of tropical American trees and shrubs. the following one species being found on the Keys of southern Florida.

324. EXOSTEMA CARIBÆUM R. & S.

PRINCE-WOOD.

Ger., *Prinz-holz*.Fr., *Quinquina Caraibe*.Sp., *Cuero de sapo, Macagua de costa, Falsa quina* (Mex.).

SPECIFIC CHARACTERS:—*Leaves* persistent, oblong-lanceolate, 1½ to 3 in. long, with slender petioles ½ in. or less in length, entire, acuminate or acute and apiculate at apex, cuneate at base, coriaceous, smooth dark green above and yellow green with orange-colored midrib and few arcuate veins beneath; interpetiolar stipules triangular, apiculate. *Flowers*, appearing in middle or late spring, about 3 in. long, solitary in the axils of the leaves, with peduncles somewhat shorter than the leaf-stalks; calyx narrow bell-shaped, corolla with tube nearly 1½ in. long. *Fruit* capsules about ⅝ in. long, blackish when dry with seeds about ⅓ in. long.

A small tree occasionally attaining the height of about 25 ft. (8m.),

with narrow top of upright branches and slender gray branchlets enlarged at the nodes and a trunk rarely over 10 or 12 in. (0.30m.) in diameter. The bark of trunk is quite smooth and of light gray color mottled with orange brown. It becomes fissured with age into narrow ridges and these checking crosswise finally exfoliate in thick rectangular scales.

HABITAT.—The Princewood inhabits the hammocks of the Keys of southern Florida, many of the Antilles, southern Mexico and Central America.

PHYSICAL PROPERTIES.—Wood very heavy, hard, strong, close-grained, with exceedingly fine uniformly distributed open ducts and medullary rays. It is of a rich yellow color streaked with purple-brown and yellowish-white sap-wood, the latter, however, sometimes assuming a bluish brown color after being cut. *Specific Gravity*, 0.9310; *Percentage of Ash*, 0.23; *Relative Approximate Fuel Value*, 0.9289; *Coefficient of Elasticity*, 119357; *Modulus of Rupture*, 1005; *Resistance to Longitudinal Pressure*, 751; *Resistance to Indentation*, 481; *Weight of a Cubic Foot in Pounds*, 58.02.

USES.—The wood of this species is not of sufficient size or abundance to be applied to any particular use. As it is possessed of excellent properties, however, and rare color, it might well be valued for turned articles of wooden ware, fancy wood-work, etc.

MEDICINAL PROPERTIES.—The bark is used in domestic practice as a tonic and febrifuge, in regions in which the tree grows, and was more extensively used, under the name of *Caribaeen bark*, before the general introduction of the more valuable Cinchona barks.



Fig. 23—BLACK CALABASH



Fig. 24—PRINCE-WOOD

Observe on the Calabash trunk a fine specimen of the land snail, *Liguus crenatus*, which abounds in the hammock where this tree was found.

CLASS GYMNOSPERMÆ

This division of the vegetable kingdom includes the seed-bearing plants which bear their ovules (ripening into seeds) not in a closed ovary, like the *Angiospermæ*, but on open scales; hence they are called naked-seeded. Their leaves are chiefly parallel-veined and cotyledons are frequently more than two. The flowers are unisexual and incomplete and the ovule is fertilized by direct contact with the pollen. The fruit is usually a cone, but sometimes considerably modified so as to more resemble a drupe or berry. The representatives are all woody plants, being mostly trees. A few are shrubs.

ORDER CONIFERÆ: PINE FAMILY.

Leaves narrow or scale-like, clustered or alternate, parallel-veined and generally persistent; buds scaly. *Flowers* in catkins or solitary with an involucre of enlarged bud-scales, unisexual and monœcious (diœcious in *Juniperus*), destitute of calyx and corolla; anthers 2-celled; pistillate flowers bearing on the inner face of each scale 2 or more ovules and becoming in *Fruit* a woody cone or rarely a berry or drupe; seeds often winged, with coat of two layers; embryo axial in copious albumen; cotyledons 2 or several.

A family of trees and few shrubs with resinous juice and cell-walls of wood marked with circular disks. It is of greatest economic value and world-wide distribution, but chiefly in north temperate regions. Among its representatives are trees, notably the Sequoias, which are considered to be of the greatest longevity of all living organisms. It consists of 31 genera, of which 13 are represented in the United States.

GENUS JUNIPERUS LINNÆUS.

Leaves of two sorts, viz., opposite, scale-like, with gland-like disk and appressed in four ranks, or subulate and free in whorls of three, sessile, sharp-pointed, without gland, convex below, concave and stomatiferous above—both forms sometimes on the same plant. *Flowers* small, diœcious or sometimes monœcious, oblong, terminal or axillary, the staminate yellow, with peltate scales each bearing 2-6 globose anther-cells attached to its base; the pistillate consisting of 2-6 opposite or ternate fleshy pointed scales each bearing one or two erect ovules. *Fruit* berry-like by a coalescence of the fleshy scales of the flower, blue-black or red with white bloom, smooth or marked with points of the flower-scales, closed or open, containing usually one to six bony wingless seeds and requiring one to three years to attain maturity; cotyledons 2-6.

Evergreen trees and shrubs of the northern hemisphere having pungent aromatic juice, generally fibrous bark and very durable light odorous wood. About 35 species are known. In the New World they are distributed from the Arctic Circle to the highlands of Mexico, Lower California and the West Indies in twelve arborescent species and

one or two shrubby. Two only of the arborescent and one of the shrubby species are found in northeastern United States. The name is the ancient Latin name of the Juniper.

325. JUNIPERUS BARBADENSIS L.

SOUTHERN RED CEDAR. PENCIL-WOOD.

Ger., *Südlicher Wachholder*.

Fr., *Genevrier meridional*.

Sp., *Sabina meridional*.

SPECIFIC CHARACTERS:—*Leaves* in pairs, opposite, closely appressed, entire, sharply pointed, light green with conspicuous oblong gland on back. *Flowers*, opening in very early spring, dioecious, the staminate oblong, $\frac{1}{8}$ to $\frac{1}{4}$ in. long, with 10-12 stamens having rounded entire connectives and each bearing 3 pollen-sacs; pistillate flowers about $\frac{1}{8}$ in. long with narrow pointed scales. *Fruit* subglobose, about $\frac{1}{8}$ in. in diameter, dark blue with glaucous bloom when ripe, with sweet resinous flesh and usually 2 ovoid pointed ridged seeds.

The Southern Red Cedar is a tree occasionally attaining the height of 50 ft. (15m.), with wide-spreading rounded top of long lateral branches and slender more or less pendulous branchlets. The maximum thickness of trunk is about 2 ft. (0.60m.) and this is vested in a thin brown bark which exfoliates in thin narrow fibrous strips peeling off lengthwise and giving a more or less ragged appearance to old trunks.

HABITAT.—The native range of the Southern Red Cedar is from the coast region of southern Georgia to the banks of the Indian River on the eastern coast of Florida, and from the Appalachian River to Charlotte Harbor on the western coast, growing in inundated river swamps and moist low-lands. It has become naturalized along the Gulf coast to western Louisiana. It is also found on the Bahama Islands, Antigua, Santo Domingo, and Jamaica, in the last mentioned locality inhabiting the slopes of mountains.

PHYSICAL PROPERTIES.—Wood light, soft, brittle, close-grained, easily worked, fragrant and very durable in contact with the soil. It is of a rich red color mottled with light yellowish brown and has a creamy white sap-wood. *Specific Gravity*, 0.4814; *Percentage of Ash*, 0.11; *Coefficient of Elasticity*, 8.40; *Modulus of Rupture*, 780.



Fig. 25—SOUTHERN RED CEDAR

USES.—This wood is used almost exclusively in the manufacture of lead pencils, for which it is peculiarly adapted, but the natural supply is now so reduced that it has become expensive, and other woods are being substituted. It is also valued for chests for clothes, the odor of the wood being considered obnoxious to moths.

The tree is extensively planted as an ornamental shade tree in the cities and towns of the Gulf States, and hence its naturalization in localities outside of its natural range.

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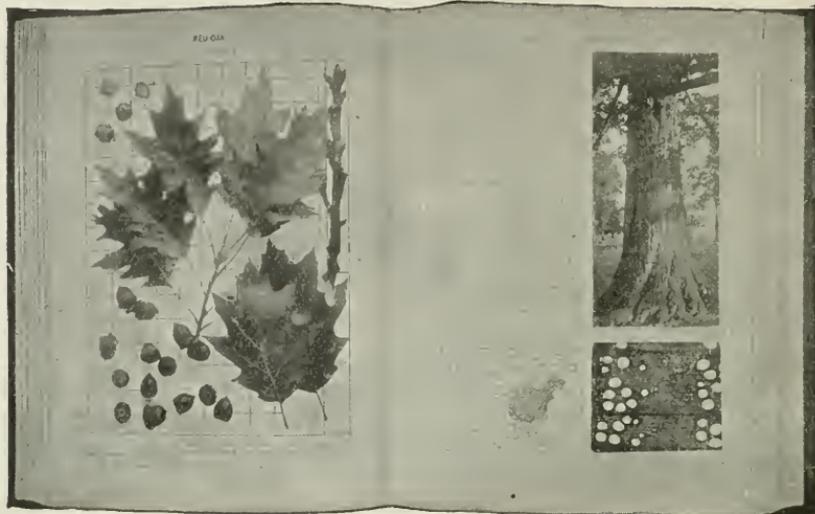
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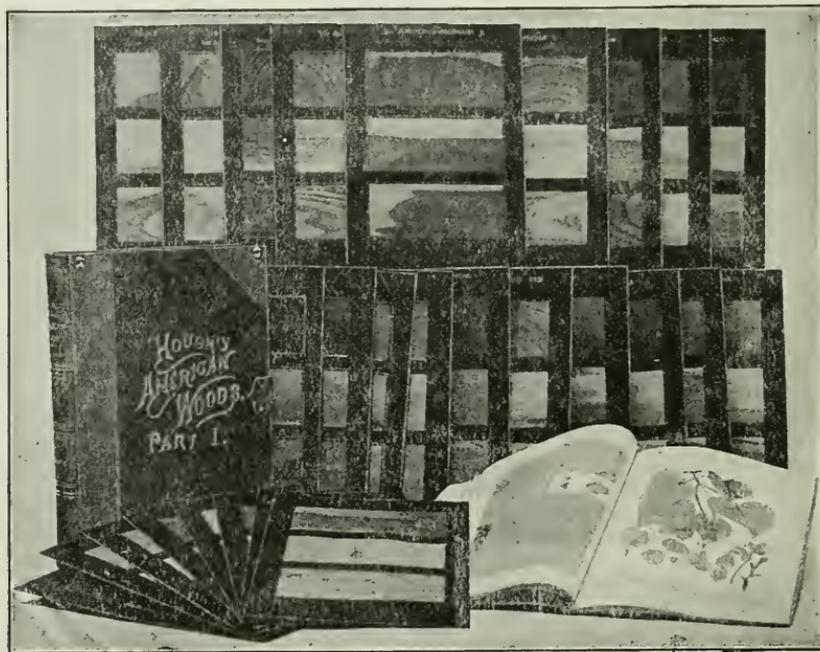
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(b) *Characteristic barks of trees*, a one-foot rule being displayed to show size of trunk.

(c) *Flowers of trees*, and such conditions of leaves as exist at the corresponding season of the year.

(d) *Fruits and nature leaves*.

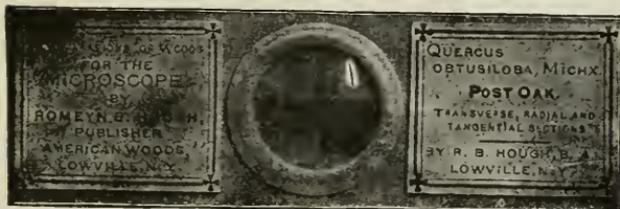
(e) *Leafless branchlets*, showing the interesting characters by which the trees may be known in winter.

The subjects of classes *c*, *d* and *e* are photographed while fresh, even before their wilting, against a background ruled into square inches, by means of which natural sizes are at once apparent. The pictures of classes *b*, *d* and *e*, as pertains to the trees of the Northern States and Canada appear in our **HANDBOOK OF THE TREES**.

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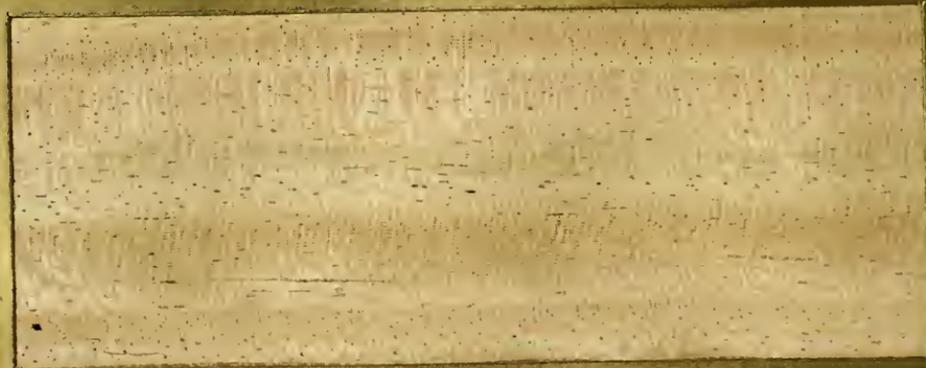
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Ger. COCOS-PFLAUME. Fr. ICAQUIER.

Sp. ICACO.

306. *LYSILOMA BAHAMENSIS* Benth.

WILD TAMARIND.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Wilde Tamarinde.

Fr. Tamarin sauvage.

Sp. Juama hediondo (Cuba).

306. *LYSILOMA BAHAMENSIS* Benth.

WILD TAMARIND.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Wilde Tamarinde.

Fr. Tamarin sauvage.

Sp. Juama hediondo. (Cuba).

307. *ICHTHYOMETHIA PISCIPULA* Hitch.
JAMAICA DOGWOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Jamaikischer Hundshuol. Fr. Boisivrant de la Jamaïque.

Sp. Borracho (Venezuela). Guama hediondo (Cuba).

307. *ICHTHYOMETHIA PISCIPULA* Hitch.

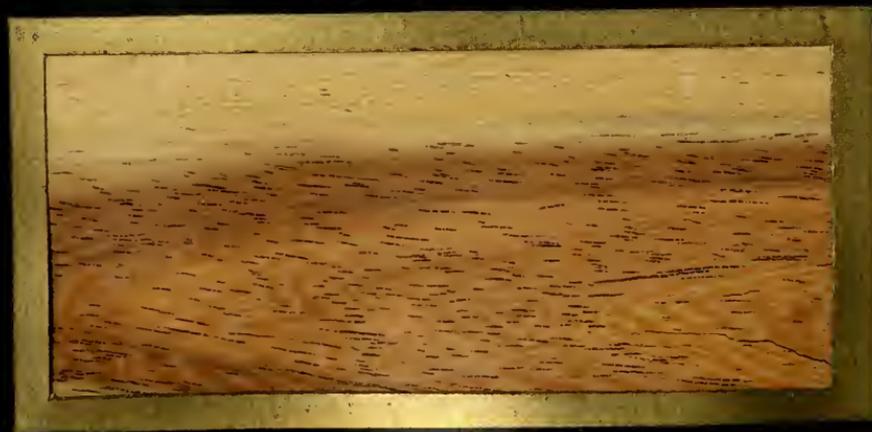
JAMAICA DOGWOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Jamalkischer Hundsholz.

Fr. Boisivrant de la Jamaïque.

Sp. Borracho (Venezuela). Guama hediondo (Cuba)

308. SIMARUBA GLAUCA deC.

PARADISE-TREE.

BITTER-WOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Simaruba.

Fr. Simarouba.

Sp. Simaruba (Sp. W. I.), Olivo (Panama), Palo blanco (Cuba).

308. SIMARUBA GLAUGA deC.

PARADISE-TREE.

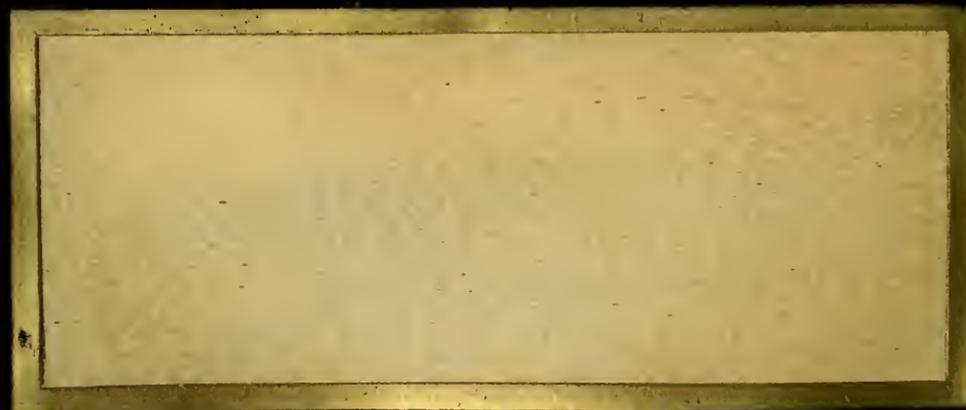
BITTER-WOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Simaruba.

Fr. Simarouba.

Sp. Simaruba (Sp.W.I.). Olivo (Panama). Palo blanco (Cuba).

309. BURSERA SIMARUBA Sarg.
GUMBO LIMBO. WEST INDIAN BIRCH.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Gummitragender Bursere. Fr. Gomart d'Amerique. Gommier (Fr.W.I.).

Sp. Almácigo. Carano (Sp.W.I., Mex., etc.), Jinocuave (Costa Rica).

309. BURSERA SIMARUBA Sarg.
GUMBO LIMBO. WEST INDIAN BIRCH.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Gummitragender Bursere. Fr. Gomart d'Amerique. Gommier (Tr.W.I.).
Sp. Almácigo, Carano (Sp.W.I., Mex., etc.). Jinocuave (Costa Rica).

310. SWIETENIA MAHAGONI Jacq.

MAHOGANY.

MADEIRA-WOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Mahoganiholz.

Fr. Acajou, Mahogon (Fr.W.I.)

Sp. Caoba, Caobo.

310. SWIETENIA MAHAGONI Jacq.
MAHOGANY. MADEIRA-WOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Mahoganiholz, Fr. Acajou. Mahogon (Fr. W.)
Sp. Caoba, Caobo.

311. DRYPETES KEYENSIS Urb.
FLORIDA WHITEWOOD. FLORIDA PLUM.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. PFLAUME VON FLORIDA. Fr. PRUNE DE FLORIDA.

Sp. HUESO (Sp. W. I.) VARITAL (Puerto Rico)

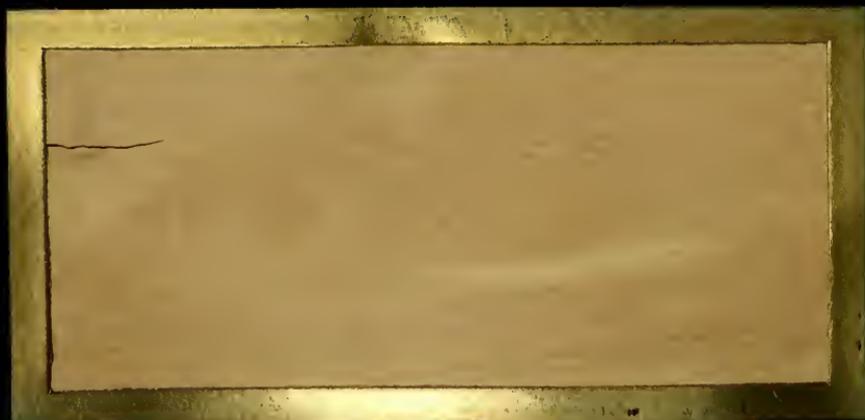
311. DRYPETES KEYENSIS Urb.
FLORIDA WHITEWOOD, FLORIDA PLUM.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. PFLAUME VON FLORIDA. Fr. PRUNE DE FLORIDA.

Sp. HUESO (Sp. W. I.) VARITAL (Porto Rico)

312. EXOTHEA PANICULATA Radlk.

INK-WOOD.

BUTTER-BOUGH.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Tinten-holz.

Fr. Bois d'encre.

Sp. Guacarán. Gaita.

312. EXOTHEA PANICULATA Radlk.

INK-WOOD

BUTTER-BOUGH.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Tinten-holz.

Fr. Bois d'encre.

Sp. Guacarán. Gaita.

313. COLUBRINA REGLINATA Brong.

Naked-wood,

Naked-bark,

Soldier-wood.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Nackt-holz, Fr. Bois costiere (Fr.W.I.).

Sp. Man. Bijaguara.

313. COLUBRINA RECLINATA Brong.

Naked-wood.

Naked-bark.

Soldier-wood.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Nackt-holz.

Fr. Bois costiere (Fr. W.).

Sp. Mabi. Bijaguara.

314. RHIZOPHORA MANGLE L.
MANGROVE. RED MANGROVE.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Mangelbaum.

Fr. Palétuvier rouge.

Sp. Mangle colorado.

314. RHIZOPHORA MANGLE L.

MANGROVE.

RED MANGROVE.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Mangelbaum.

Fr. Palétuvier rouge.

Sp. Mangle Colorado.

315. PSIDIUM GUAJAVA L.

GUAVA.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. GUAJAVA.

Fr. GOYAVIER

Sp. GUAJABA.

315. PSIDIUM GUAJAVA L.

GUAVA.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. GUAJAVA.

Fr. GOYAVIER.

Sp. GUAJABA.

316. CONOCARPUS ERECTA L.

FLORIDA BUTTONWOOD. BUTTON MANGROVE.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Knopfbaum. Fr. Conocarpe droit. Palétuvier

Sp. Mangle boton (Sp.W.I.), Mangle prieto (Mex.)

316. CONOCARPUS ERECTA L.

FLORIDA BUTTONWOOD, BUTTON MANGROVE.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Knopfbaum, Fr. Conocarpe droit, Palétuvier.

Sp. Mangle boton (Sp.W.I.). Mangle prieto (Mex.)

317. LAGUNCULARIA RACEMOSA Gaertn. f.

White Mangrove.

White Buttonwood.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Weisse Knopfbaum.

Fr. Manglier blanc.

Sp. Mangle blanco. Pataban (Cuba).

317. LAGUNCULARIA RACEMOSA Gaertn. f.

White Mangrove.

White Buttonwood.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Weisse Knopfbaum.

Fr. Manglier blanc.

Sp. Mangle blanco. Pataban (Cuba).

318. SAPOTA ACHRAS Miller.

SAPODILLA.

CHICLE-TREE.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Sappadill.

Fr. Sapotillier.

Sp. Nispero (Cent. & So. Amer.), Chico-zapote (Mex.).

318. SAPOTA ACHRAS Miller,
SAPODILLA. CHICLE-TREE.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Sappadill.

Fr. Sappotillier.

Sp. Nispero (Cent. & So. Amer.). Chico-zapote. (Mex.)

MASTIC.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Mastixbaum. Fr. Acomat (Martinique). Acomat franc (Guadeloupe).

Sp. Tocuma amarillo. Caya.

319. SIDEROXYLON MASTICHODENDRON.

MASTIC.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ser. Mastikbaum. Fr. Acomat (Martinique). Acomat franc (Guadeloupe).

Sp. Tocuma amarillo, Caya.

BUSTIC.

CASSADA.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Weidenblättrige Diphole. Fr. Acomat rouge (Haiti). Acomat
bastard (Fr.W.l.). Sp. Tocuma. Almendro sylvestre. Tabloncillo.

320. DIPHOLIS SALICIFOLIA A.deC.

BUSTIC.

CASSADA.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Weidenblättrige Diphole, Fr. Acomat rouge (Haiti), Acomat
bastard (Fr.W.I.), Sp. Tocuma, Almendro sylvestre, Tablarillo.

32) BOURRERIA HAVANENSIS Miers.
STRONGBACK. STRONGBARK.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Havansche Bourreria. Fr. Bourrierier de Havana.

Sp. Ateje. Ircuma. Bureria.

321. BOURRERIA HAVANENSIS Miers.
STRONGBACK. STRONGBARK.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Havanische Bourreria. Fr. Bourrier de Havane.

Sp. Ateje. Ircuma. Bureria.

322. AVICENNIA NATIDA Jacq.
BLACK MANGROVE. NATIVE OAK (JAMAICA).



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Schwarzer Mangelbaum. Fr. Palétuvier blanc (Fr.W.I.).
Sp. Mangle bobo (Sp.W.I.). Palo de sal. Culumata (Cent.Amer.).

322. AVICENNIA NATIDA Jacq.
BLACK MANGROVE. NATIVE OAK (JAMAICA).



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Schwarzer Mangelbaum. Fr. Palétuvier blanc (D.W.).

Sp. Mangle bobo (Sp.W.I.). Palo de sal. Culumata (Cent. Amer.).

323. CRESENTIA CUCURBITINA L.
BLACK CALABASH.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Schwarze Calabasse.

Fr. Colebasse (Fr.W.I.)

Sp. Higuero (Sp.W.I.), Colabazo de playa (Panama), Guautecomate (Mex.).

323. CRESENTIA CUCURBITINA L.
BLACK CALABASH.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Schwarze Calabasse. Fr. Colebasse (Fr.W.I.)

Sp. Higuero (Sp.W.I.). Colabazo de playa (Panama). Guatecomate (Mex.).

324. EXOSTEMA CARIBAEUM R.&S.
PRINCE-WOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Prinz-holz.

Fr. Quinquina Caraïbe.

Sp. Cuero de sapo. Macagua de costa. Falsa quina (Mex.).

324. EXOSTEMA CARIBAEUM R.&S.
PRINCE-WOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Prinz-holz.

Fr. Quinquina Caribée

Sp. Cuero de sapo, Macagua de costa, Falso quina (Mec.)

325. JUNIPERUS BARBADENSIS L.

SOUTHERN RED CEDAR.

PENCIL-WOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Sudlicher Wachholder.

Fr. Genévrier meridional.

Sp. Sabina meridional.

325. JUNIPERUS BARBADENSIS L.
SOUTHERN RED CEDAR. PENCIL-WOOD.



TRANSVERSE SECTION.



RADIAL SECTION.



TANGENTIAL SECTION.

Ger. Südlicher Wachholder, Fr. Genévrier meridional.

Sp. Sabina meridional.

