LORANTHACEAE

Parasitic shrubs usually on woody plants or rarely terrestrial trees, the branches usually terete or angular and articulated at the nodes; leaves opposite or reduced to scales; flowers usually small but sometimes large and attractive; fruits baccate, usually small and with viscid pulp.

A family abundant in species and individuals in our region, the seeds most often distributed by birds. There are 9 or 10 genera in Central America, all parasites except Gaiadendron.

PHORADENDRON. A large number of species in Central America, all parasitic on woody plants. Their importance derives from the damage which they cause in plantations of coffee, citrus and other cultivated trees and shrubs. Most kinds have the common name of mata palo. The taxonomy of most Phorodendrons is difficult.

Psittacanthus calyculatus (DC.) Don, Gen. Syst. 3: 415. 1834.

Mata palo, liga de jocote, anteojo, gallito, gallinago, suelda con suelda.

Economically important because of the damage caused to certain tree crops. Most often seen on Moraceae, Anacardiaceae, and Burseraceae. The plants are attractive when in flower. Mexico to Panama.

Psittacanthus schiedeanus (Schlecht. & Cham.) Blume ex Schult. Syst. Veg. 7: 1730. 1830.

Matapalo.

Occasionally common on Pinus oocarpa in Honduras and causing limited damage in the pine forest. Occasionally on broad leaf trees. Mexico to Panama.

LYTHRACEAE

Herbs, shrubs or trees; leaves mostly opposite, rarely verticillate or scattered, simple, entire; flowers mostly actinomorphic, usually perfect, 3-16-parted; calyx broad or tubular, the

lobes in bud valvate; petals inserted on the throat of the calyx, often crumpled in bud, sometimes fugaceous or none; stamens about as many as the calyx lobes and inserted on the calyx tube; fruit capsular, dehiscent or not, dry.

There are about 22 genera and 450 species, mostly in the tropics. There are ten genera known in Central America.

Cuphea utriculosa Koehne in Mart. Fl. Bras. 13, pt. 2: 452. 1877.

Nido de anguila, cufea.

Native from Mexico to Panama along swift-flowing streams. Occasionally planted as a border in gardens where it does quite well.

Lawsonia inermis L. Sp. Pl. 349. 1753.

Reseda, resedrón, henna.

An occasional ornamental in our region, native of the Old World. The famous henna dye comes from this plant. If a paste from the leaves is applied to the beard or to the hair a bright red color results. The use of henna is not unknown among Central American women.

MAGNOLIACEAE

Usually large trees, rarely shrubs. Leaves alternate, usually coriaceous, entire; flowers large and showy, solitary, terminal or axillary; sepals and petals often similar; stamens numerous, free, the filaments often dilated and thickened; fruit dry or fleshy, in age the whole spike often hard and woody; seeds large. — See also Winteraceae.

(Magnolia. Several species, including Magnolia grandiflora L. which is native of the southeastern United States, are in cultivation in our area. Very large trees of Magnolia grandiflora were seen in Cobán, Guatemala where it is a magnificant tree and does very well.)

Talauma mexicana (DC.) G. Don, Hist. Dichl. Pl. 1: 851. 1831.

Palo de peña.

The bark of this tree has been used in Mexico for its medicinal properties. It is said to control fevers and to have an effect similar to Digitalis on the heart. Native in moist forests from southern Mexico to Honduras.

MALPIGHIACEAE

Shrubs, trees or often vines, the pubescence often "malpighiaceous" hairs, i.e. stiff hairs attached at the middle but also of spreading or branched hairs; leaves mostly opposite, simple entire, dentate or lobate, often with glands on the margins or petioles, or on the lower surface; flowers mostly perfect, often attractive, single or in compound inflorescences; sepals usually always bearing sessile or stipitate glands; petals 5, somewhat unequal and usually unguiculate; stamens 5 or 10 with filaments usually united toward the base; fruits mostly characteristic variously winged samaras, also drupaceous, nut-like or capsular.

A pantropical family represented by 14 or 15 genera in Central America.

Banisteria argentea (HBK.) Spreng. Syst. 2: 388. 1825.

Ala de zope, bejuco de casa.

The tough and flexible stems of the vine are used to tie together the framework of some houses or sheds. It is likely that other vines of the family find the same use.

Byrsonima bucidifolia Standl. Field Mus. Bot. 8: 16. 1930.

Craboo.

The fruits are said to be offered in the markets of Belize.

Byrsonima crassifolia (L.) HBK. Nov. Gen. & Sp. 5: 149. 1822.

Nance, chi, tapal, nancito, nancite, nanche, crabo, craboo, krapo, wild craboo.

Native or perhaps distributed by man from Mexico throughout Central America to northern South America. The fruits, in season, are offered in most Central American markets and easy

to find by the pungent odor of the ripe, fermenting fruits. The fruits are eaten out of hand, made into jam (rarely), and used to make an alcoholic beverage called chicha, as also to flavor water and perhaps even to flavor carbonated beverages. The bark and wood may be used as a tan bark or to extract a red dye, also to prepare a remedy for diarrhea. Wild plants are most common in the pine-oak forest areas below 1,500 meters. Cultivated trees have been selected for fruit size.

Byrsonima densa (Poir.) DC. Prodr. 1:580. 1824.
Nance.

Known in Central America only from the rain forest area of Golfo Dulce, Costa Rica. The large yellow fruits mature in August.

Galphimia glauca Cav. Icon. 5: 61. 1799.
Botón de oro, lluvia de oro.

Native from Mexico to Nicaragua, perhaps elsewhere naturalized from cultivation. Once exceedingly common near Sébaco, Nicaragua in the chaparral or scrub. An excellent ornamental shrub for use in cool tropical or subtropical areas of low (about 1,000 mm.) rainfall.

Malpighia edulis Donn.-Sm. Bot. Gaz. 24: 391. 1897.

Acerola.

The slightly astringent fruits are edible and are used in Costa Rica in stomach disorders.

Malpighia glabra L. Sp. Pl. 425. 1753.

Acerola, azerola, panecito, nance, nance colorado, sibche, simche, wild crabo.

Native or man-distributed from Texas and Mexico through Central America and the West Indies to northern South America. The bright red cherry-like fruits are juicy and quite acid but very rich in ascorbic acid. The juice may be used to fortify fruit juices less rich in vitamin C. Not cultivated so far as I know. The bark has been used as a tan bark in Yucatan, and to prepare a remedy for diarrhea.

Malpighia punicifolia L. Sp. Pl. ed. 2. 609. 1762.

Pimentillo, acerola tocob.

Native from southern Mexico to Honduras and in the West Indies. The species has been cultivated in Puerto Rico and Florida for the juice which is exceedingly rich in ascorbic acid. The juice is used to fortify fruit juices less rich in vitamin C. The fruits are eaten wherever found. The stiff acicular hairs easily penetrate the skin causing intense and prolonged itching and irritation.

MALVACEAE

Herbs, shrubs or trees; leaves alternate, mostly palmately nerved, usually dentate or lobate; inflorescences axillary, the flowers solitary or in fascicles, racemes or panicles, bractlets often present at the base of the calyx; flowers regular, usually perfect, often showy; calyx normally of five or fewer united sepals; petals 5, hypogenous, mostly adnate to the base of the stamen column; stamens numerous, or only 5-10, with the filaments forming a column at the base; style single at the base but divided into as many branches as there are cells of the ovary; fruits usually dry, the mature carpels separating one from another or sometimes united to form a capsule; seeds sometimes lanate.

A large and difficult family, widely distributed except in the polar regions. Cotton, the most important fiber plant of the world, is grown in the dry lowlands of all our region. There are about 23 genera known in our area, many contain fibers that have been used occasionally.

Malvaceous plant with possible minor uses, not included in the regular listing below: Malvastrum spicatum (L.) Gray, a fiber in the stem; Malvaviscus arboreus Cav., the fruits sometimes eaten; Pavonia dasypetala Turcz. A fiber in the bark once used by the Indians in Costa Rica; Urena lobata L., a weed fortunately common in only a few places, the burs (carpels) stick to animals and man by barbed spines and are efficiently spread about, the stems yield a fiber; Wissadula excelsior (Cav.) Presl, and other species of the genus contain a tough fiber in the stems.

Abutilon giganteum (Jacq.) Sweet, Hort. Brit. 1: 53. 1826. Oropéndula de monte.

The stems contain a tough fiber may be used for cordage. The plant is found from southern Mexico and the West Indies to northern and western South America.

Abutilon permolle (Willd.) Sweet, Hort. Brit. 1:53. 1826.

The stems contain a strong fiber used to make twine. Native in Yucatán, southern Florida and the West Indies. Found in our region only in the Petén.

GOSSYPIUM. Cotton is the most important fiber crop of the world and is grown in all Central American countries. Nicaragua is the largest producer and feast or famine, almost literally, depends on the weather that will produce a good or a poor crop. Most Central American cotton is produced along the dry, hot, Pacific coastal plain.

Cotton has been cultivated and used around the world since ancient times. It originated apparently in both hemispheres and different but similar species were used to make textiles long before the time of discovery. India was the center of the cotton textile industry for nearly 3000 years, beginning about 1500 B.C.

The most distinctive cotton textiles of Central America are those produced on small looms by the Indians of Guatemala. The designs of these cotton textiles are often quite distinctive, in addition to being attractive. The women of highland Guatemala, being more conservative than the men, still wear the native textiles and their home villages may be determined by the designs used. The men are slowly changing their native dress to the unattractive clothes produced in mechanized factories. The women in urban centers, at least on work days, now mostly wear undistinctive clothing. I once saw a woman, whom I recognized as a waitres in a hotel, come into the hotel in a fur coat and high heeled shoes. Soon afterward she was in the dining room resplendent in beautiful Guatemalan dress. Distinctive clothing is not made in any of the Central American countries except Guatemala. The Mayan Indians of Chiapas (Mexico) make and wear distinctive clothing similar to that used by the highland Guatemalans.

Most cultivated cottons may have originated through selection by man. Like most plants long in cultivation the systematics are complicated and the origins obscure. E. D. Merrill, perhaps the outstanding systematist of this century, was constrained to write: "I am neither a geneticist nor a cotton specialist, but the four systems of classification for the species of this one genus within the present century. . . are so radically different from each other, that a mere tyro is lost in the maze, . ." (Chron. Bot. 14: 338. 1956.)

The kinds of cotton hybridize and this does not make their determination easier.

In addition to the cotton fiber the cotton seed from which oils are extracted is important in our area and around the world. The residue from oil extraction provides cotton seed cake, an important feed for domestic animals.

Most of the cottons in our area perhaps may be refered to the few specific names that follow:

Gossypium barbadense L. Sp. Pl. 693. 1753.

Algodón, algodonero, sea island or long staple cotton, cotton.

A premium cotton grown in a few places in our area. Native or perhaps a cultigen in South America. The fiber is long, fine and appears silkier than other cottons. Egyptian cotton is a form of this with somewhat shorter brownish staple.

Gossypium hirsutum L. Sp. Pl. ed. 2. 975. 1763.
Algodón, algodonero, short staple cotton.

This name perhaps encompasses most of the cottons grown in the western hemisphere. It is also commonly grown in other areas of the world. Presumed to be native (or a cultigen?) in America and to have been the cotton grown in pre-Columbian times. A perennial form with rust-brown lint has been described from Guatemalan and Mexican plants as var. ferrugineum Maurer.

Gossypium irenaeum Lewton, Smithson. Miscl. Coll. 60, No. 4: 1, tt. 1-2. 1912.
Algodón.

Described from Guatemalan seed grown out in Florida. Said to have been grown in Alta Verapaz, Guatemala.

Gossypium mexicanum Todaro, Rel. Cult. Cot. 193, t. 6. 1877-78.

Algodón, mix, nooc, teno, pütz, mit, coc, ixcaco, cuyusate (with brown staple).

Standley thought it likely that this was the cotton grown from pre-Columbian times by Guatemalans and Mexicans. The brown staple cotton is used without dying in some Guatemalan textiles. Brown staple is found in other species, -and it is possible that this may be a form of Gossypium hirsutum L.

Hibiscus abelmoschus L. Sp. Pl. 696. 1753.

Algalia, elvira, gaumauca, oil of ambrette seed.

The stem yields a strong fiber that has been used in some regions. Oil extracted from the seeds has a strong musk odor and has been used as a substitute for true musk. It is reported that the plant was grown in Central America as a source of oil of ambrette but was not successful due to a limited market. Guenther (Essential Oils 6: 173-175. 1952) says that the "seed is a valuable adjunct in high-grade perfume compositions. . ." Old world in origin.

Hibiscus bifurcatus Cav. Monad. Diss. 3: 146, t. 51, f. 1. 1787.

Reguilete, amapola grande.

The mucilaginous sap is said to have been used in clarifying sugar syrup in Guatemala.

Hibiscus cannabinus L. Syst. Nat. ed. 10. 1149. 1759.
Kenaf.

A substitute for hemp and jute in the manufacture of coarse cloth for sacks, cordage and other textiles. It was suggested in a Banco of Guatemala study (1959) as a peasant crop in that country. A coffee sack mill was in operation in El Salvador in 1958 utilizing kenaf fiber. Native of old world tropics.

Hibiscus esculentus L. Sp. Pl. 696. 1753.
Ocra, gombo, gumbo, chimbombo, okra.

The tender young capsules are the part of the plant eaten. Offered in markets in Central America, more common along the Atlantic where black West Indians are concentrated. Thought to have been brought to America by early slaves who brought the African names of okra and gombo. The stem yields a fiber which has been used in paper making and for textiles.

Hibiscus rosa-sinensis L. Sp. Pl. 694. 1753.

Clavel, clavel japonés, estrella de Panamá, mar Pacífico, amapola, campana, jazmín de chispa, Chinese hibiscus, rose of China.

One of the most abundant of horticultural plants in our region and an attractive one. A shrub, or tree-like and becoming 8-10 meters tall. Native of Asia, possibly China.

Hibiscus sabdariffa L. Sp. Pl. 695. 1753.

Agria, Jamaica, rosa de Jamaica, Jamaica sorrell, roselle.

The calyces and capsules become fleshy as the flowers mature and are juicy and with an acidulous flavor not unlike that of cranberries. Roselle is said by some "to make better cranberry jelly than cranberries do." Roselle is grown in many places in the tropics for the fiber which it produces. In our region, below 800 meters, it might be grown and harvested after about three months for fiber. It is questionable that roselle would be a profitable crop unless a local use for the fiber were found. There is a potential for the production of a jelly from the fleshy calyces but I do not know that this has been done. Dried calyces are sometimes sold in our markets and a "tea" is made from them. It is said that these are used to make an infusion which is taken as a preventive for measles.

Hibiscus tiliaceus L. Sp. Pl. 694. 1753.
Majagua, majao, mahoe, blue majoe.

A fiber in the bark is strong and used to make rope and twine. The rope or twine is said to become stronger when wet and that the Caribs along the Mosquito Coast use it for fish

lines. The wood is light, firm and straight-grained and is used in Costa Rica, and perhaps elsewhere, as floats or as a substitute for cork. Probably a plant of natural pantropical distribution attained by its floating seeds.

Malva parviflora L. Amoen. Acad. 3: 416. 1756.
Malva.

Introduced from Europe and found as a weed in waste ground or in cultivated fields in much of Latin America. The leaves and tops are eaten as a cooked green and as such are high in protein and very nutritious although rather fibrous. Extensively cultivated for food in southwestern China.

Sida acuta Burm. Fl. Ind. 147. 1768.

Escobilla, escobilla negra, escobillo, chichibe, wire weed, broom weed.

Bunches of the wiry stems are commonly used for brooms, hence many of the common names. The stems contain tough fibers which have been used in making twine. A pestiferous weed often exceedingly common in overgrazed pastures.

Sida rhombifolia L. Sp. Pl. 684. 1753.

Escoba, escobilla, escobillo blanco, mesbé, escobilla lisa, malva.

Like the preceeding species bunches of branches are used as crude brooms. The plant is a bad weed in overgrazed places in the lowlands and is now found in the tropical lowlands around the world.

MARANTHACEAE

Perennial herbs, often very large, acaulescent or with elongated stems; the leaves penninerved, often with a thin coating of wax; flowers perfect, very irregular, each flower or group of flowers subtended by a conspicuous bract and often also by bractlets; sepals free, equal or nearly so; petals united below into a tube, contorted, the outermost one largest; ovary inferior, 3-1-celled; fruit capsular, baccate or nut-like; seeds hard, arillate.

A pantropical family, about six genera in our region.

Calathea allouia (Aubl.) Lindl. Bot. Reg. 14: sub t. 1210. 1828.

Chufle, plantanillo, mox, max, macús, macuz.

The flowers are cooked and eaten. The leaves are used, like banana leaves, to wrap tamales and some foods containing rice, perhaps others. The plants are cultivated in some places in the lowlands for the leaves and these are found for sale in most highland markets. Leaves from wild plants also are harvested. Native from Mexico and the West Indies through Central America to northern South America.

Calathea insignis Peterson in Mart. Fl. Bras. 3, 3: 124. 1890.

Vijagua, bijagua, platanillo.

The leaves are used for wrapping many things. Pittier has reported that the Indians of the Talamanca used the leaves to wrap artistically the bodies of their dead. Native from Costa Rica to South America.

Calathea lutea (Aubl.) G.F.W. Meyer, Prim. Fl. Esseq. 10. 1818.

Hoja de sal, maxán, hoja de cuero, bijao, platanillo.

Perhaps the most important of the genus as a producer of leaves for wrapping, both as a wild and as a cultivated plant. Fields of it are cultivated on the Pacific slope of Guatemala and perhaps elsewhere. The leaves are made into bundles and stacks of them are seen in the Guatemalan markets, and perhaps still in most Central American markets. The leaves have a thin coating of wax which has been found to have a commercial value. The waxy coating on the tough leaves is perhaps a reason why the leaves are sought after as wrapping material and even as temporary thatching. Native, or possibly carried by early man, from Mexico and the West Indies south to Peru. It is found in swampy or very wet places, often in great abundance.

Maranta arundanacea L. Sp. Pl. 2. 1753.

Chuchute, tamalera, yuquilla, yuquilla de monte.

The fleshy rhizomes of cultivated plants contain abundant starch which is used to starch clothes and also as a food. Formerly, at least, it was found in most highland markets, usually as small balls, to be used by laundresses. The starch is more easily digested than most kinds and so is used for food for children and invalids. Wild plants mostly have slender rhizomes and are essentially useless as sources for starch. Arrowroot starch comes from several other plants. The Costa Rican common name sagú is doubtless a confusion with the starch of Metroxylon sagu Rottb. of the old world tropics, called sago in commerce. Mexico and the West Indies through Central America to South America. Introduced in the orient about 1850.

MELASTOMACEAE

Annual or perennial herbs, shrubs or medium sized trees, sometimes epiphytic or scandent; leaves simple, opposite, decussate, those of a pair sometimes unequal and the leaves then appearing to be alternate, entire or dentate, usually longitudinally several-nerved with the nerves arising near the base of the blade, or variously plinerved with the inner ones, at least, arising above the base of the blade; inflorescence cymose; flowers large to very small, mostly 4-6 parted; hypanthium bearing sepals, petals and stamens at its margin; stamens normally twice as many as the petals, often dimorphic; anthers usually opening by a terminal pore, marvellously variable; ovary usually partly or wholly inferior, 2-10-celled; fruit enclosed within the persistent hypanthium, capsular or baccate.

A fascinating family with about 200 genera and perhaps 4,500 species. Some two thirds of the melastomes are in the American tropics and especially abundant in southern Brazil. There are about 35 genera in Central America and but few of any importance as useful plants. The family name is often written as Melastomataceae.

Bellucia costaricensis Cogn. Bull. Soc. Bot. Belg. 30, pt. 1: 264. 1891.

Manzana de montaña, papaturo agrio, coronillo.

The large fruits of this, and of other species, are edible but rather bland. Native in the wet forests from Mexico to Colombia.

CLIDEMIA. The fruits of this genus are usually quite juicy and are eaten by country people. To my taste they are rather bland. Thirty or forty species are known in our area.

Clidema setosa (Triana) Gleason, Bull. Torr. Bot. Club 58: 82. 1931.

Hembra, hoja de hembra, hoja de danta, hierba paridora, hierba de giganta, hierba de mico, ixqui-quen.

This is one of the most celebrated plants of Guatemala, well known even where it does not grow and even beyond Guatemala. It is the "planta hembra par excellance", the name applied to it because of a pair of formicaria at the base of the leaf blade that are thought to resemble female genitals. The species is a fine example of the doctrine of signatures in the practice of domestic medicine since a decoction of the leaves, sometimes prepared ceremonially, is a favorite remedy for sterility in women. Dieseldorf remarks that its effects are doubtful! Perhaps as much faith is placed in it as a pilgrimage to Esquipulas, that mecca of all sterile Central Americans, and some not so sterile.

Conostegia xalapensis (Bonpl.) D. Don, Mem. Wern. Soc. 4: 317. 1823.

Capirote, zarcil, cirín, sirín, cinco negritos, tamborcillo, cachito, tolejillo, pasita, guabón, uva, lengua de vaca, lengua de gato.

A common, sometimes weedy, shrub often with abundant fruits which are eaten out of hand. The fruits are purple when mature, juicy and have a fair flavor. Although reported to be found in markets I have never seen the fruits offered for sale. Native from Mexico and the West Indies through Central America and Panama to Colombia.

LEANDRA. There are several species of this genus which have juicy fruits. They may be eaten occasionally. I have tried several kinds and most are bland. The species of Leandra are difficult to distinguish from Miconia and Clidemia.

MICONIA. A vast genus with some 900 species in tropical America. There are many species in Central America that have

fruits that may be eaten, although often small and not very good. Miconias are to be found at all elevations in Central America, except the highest, often in wet forests at middle and lower elevations.

MELIACEAE

Trees or shrubs with alternate or rarely opposite, pinnately or digitately compound leaves, the leaflets mostly entire; inflorescence usually paniculate; flowers regular, perfect (ours); calyx 4-5-lobate; petals normally 4-5, imbricate or valvate, free or sometimes adnate to the lower part of the stamen tube; stamens mostly 8-10, the filaments connate to form a tube, at least below, rarely free; anthers sessile or stipitate, inserted within the tube or on its border; ovary with 2-5 united carpels, 2-5-celled; fruits capsular, seeds solitary or few in each cell, sometimes winged.

The family is pantropical with about 45 genera, and of these seven are in Central America.

Spanish cedar and mahogany (Honduras mahogany) are two of the finest cabinet woods of the world. The name mahogany has been "appropriated" for several African and Asian woods of very good quality, usually with a qualifying adjective, as "Philippine" mahogany. In addition to mahogany and the (several) kinds of Spanish cedar other good woods come from the Meliaceae, as documented below.

Carapa guianensis Aubl. Pl. Guian. suppl. 32, t. 387. 1775.

Crabwood, bastard mahogany; in trade as andiroba, Brazilian, Guiana or Demerara mahogany.

The large 4-angulate seeds are rich in oil and the oil has been used in South America for illumination and soap making. The wood is of good quality but is not common in our area. Native along lowland streams or swamps, Guatemala, Belize and Honduras; West Indies, and in South America to the Amazon basin.

Carapa slateri Standl. in Tropical Woods 10:48. 1927.

Cedro de batea, cedro macho.

The timber is used in general constructions along the Pacific of Costa Rica where it is considered to be of second quality. Formerly exported, perhaps for use in making plywood. Native in Costa Rica and Panama.

CEDRELA. A genus of some 15 species, mostly Mexican but 7 or 8 are to be found in Central America. The kinds are difficult to distinguish and those cut for the timber trade probably mostly go under the names of cedro or Spanish cedar. Once exported in great quantities, perhaps as much as ten million board feet a year to the United States alone. The trees are now becoming rare and so far as I know almost nothing has been done to attempt plantation culture of the trees.

Cedrela fissilis Vell. Fl. Flum. 2: 75, t. 68.
Cedro, cedro grenadino, cedro real.

Used in Costa Rica for furniture, cabinetry, cigar boxes and pencils. Costa Rica to South America.

Cedrela longipes Blake, Contr. U. S. Nat. Herb. 24: 9. 1922.
Cedro.

Native in Honduras where it is used for furniture and cabinets. Rare and perhaps not distinguished locally from C. odorata.

Cedrela odorata L. Syst. ed. 10. 940. 1759. C. mexicana Roem. is the name most used in the literature of this century in our region.

Cedro, Spanish cedar, cedro real, cedro amargo, cedro blanco, cedro dulce, cedro colorado, cóbano, cedro cóbano, kulche, culche, cuche.

Native or man distributed from Mexico and the West Indies through Central America and Panama to northern South America. Perhaps the most widely used of the cabinet woods of our area, becoming scarce and expensive. Spanish cedar was once abundant in many places in Central America, especially the lower elevations of the Pacific slope. Large quantities were exported and still more used locally in constructions that required a durable and termite resistant wood. Some of the

finest cabinetry of the colonial period used cedar lumber. Cabinets, buffets, beds, chairs, benches, tables made by the superb cabinet makers of Honduras from the colonial period to the present are some of the finest that can be obtained anywhere. Mahogany is, and was, used in the same way and occasionally the two woods are used together, as is the case of some of the Honduran furniture in the home of the writer. Spanish cedar when made into furniture ages well. Newly sawed lumber is light in color and will turn naturally to a rich, dark, reddish brown in less than two hundred years.

Spanish cedar has a distinctive odor and because of this was the wood par excellence in the manufacture of cigar boxes and the only wood considered satisfactory for this purpose. Cedar sometimes is still used for cigar boxes when fancy cigars are packed. Pencils once were made from fragrant cedar wood but now none of the twenty or so pencils on my desk are of cedar.

A gum is obtained from cedar, known as goma de cedro. It is only about 25 percent soluable in water.

Cedrela tonduzii C. DC. in Bull. Herb. Boiss. Sér. II. 5: 427. 1905.

Cedro, cedro dulce.

Used in Costa Rica for furniture, interior trim and paneling. Said not to be resistant to insect attacks.

Melia azedarach L. Sp. Pl. 384. 1753.
Paraíso, paraíso, paradise tree.

A small tree or often brittle shrub from Asia, planted and spontaneous in much of Central America below 1,500 meters. The large seeds are used to make necklaces and other ornaments. The fruits are rather attractive but may be poisonous, especially to hogs. A lethal dose is said to be about 150 grams for a hog of 25 kilograms. The bark and foliage may be used as a barbasco in fishing.

SWIETENIA. There are perhaps only three species of Swietenia. Many additional ones have been described, mostly suspected to be more forms of S. macrophylla. Swietenia mahogoni

(L.) Jacq. is the original and type species of the genus. Swietenia humilis Zucc. is a lowland species along the Pacific of western and southern Mexico southward to Costa Rica. Swietenia macrophylla is the majestic tree once found in abundance along the Caribbean slopes of Mexico and through Belize on to Panama, and in South America in the Amazon basin of Peru and Brazil. The early importance of the Amazon basin of Peru and Brazil. The early importance of the colony of British Honduras and reason for its establishment was due to mahogany and logwood.

Swietenia humilis Zucc. Abh. Akad. Muenchen 2: 355. 1837.

Caoba.

Once abundant along the Pacific slope of southern and western Mexico through Central America to Costa Rica, mostly in the dry hills and plains below 400 meters. The tree is now scarce and it is doubtful if there is sufficient for even the local demand. Most trees that I have seen in recent years were small ones hardly large enough for the saw mill. There has been a plantation established near Esquintla, Guatemala. The owner estimated that trees would be ready for market in 40 years.

Swietenia macrophylla King in Hook. Icon. t. 1550. 1886. S. belizensis Lundell, Contr. Univ. Mich. Herb. 6: 36. 1941.

Caoba, chacalte, mahogany, Honduras mahogany.

Native from VeraCruz and Oaxaca in Mexico to Belize and along the Atlantic coast of Central America to Panama. In the Amazon basin of Brazil and Peru. It is found at elevations of 600 meters or less. Mahogany is considered to be the primier cabinet wood of the world and certainly the most famous wood of the neotropics. It has long been in demand for beautiful furniture. The original interior of the cathedral in Cobán, Guatemala, more than 400 years old, was of mahogany carried up from the low country to the north, probably carried on the backs of Indians. Some of the original mahogany is still in use in the cathedral.

Stands of mahogany along the north coast of Honduras and in Belize are usually only scattered trees in the forest. The wood is so valuable that trees, where it was not convenient

to swamp a road to them, were cut, whip-sawed into lumber and the lumber carried out on men's backs. The lumber purchased thirty years ago to make the furniture in our house cost 10 cents (of dollar) per board foot in Honduras. A small amount purchased recently in a local lumber yard (Fayetteville, Ark. 1977) cost $ 2 a board foot.

A large plantation of Honduras mahogany was set out in 1940 by the United Fruit Company on lands near Lake Yojoa in Honduras. This plantation was not successful since it was not possible to control the twig borers that proliferated when large numbers of small trees were planted close together.

TRICHILIA. There are a large number of species of Trichilia, perhaps as many as 200 found in tropical America and tropical Africa. There are about 20 species in Central America. Most are trees and doubtless the wood of several is used locally.

Trichilia havanensis Jacq. Enum. Pl. Carib. 20. 1760.

Limoncillo, lagarto, caimito de montaña, cot, barrehorno, barredor, ojo de muñeca, bastard lime.

Widely distributed from Mexico and the West Indies through Central America to northern South America. Often a fence-row tree or shrub. The branches are used to make "brooms" used to clean adobe ovens. The bark has been used to prepare a remedy for malaria in Guatemala. The wood is soft and used to carve dolls, for box wood and other uses.

Trichilia hirta L. Syst. Nat. ed. 10. 1020. 1759.

Napahuite, mapahuite, trompillo, cedrillo, cedro colorado, cola de pavo, jocotillo, cedro espino.

The seeds are said to contain 48 percent of an oil. Standley reports that seeds were seen in a Guatemalan market and that the oil expressed from them was used to give luster and smoothness to women's hair. Native from Mexico and the West Indies through Central America to Panama and South America.

MENISPERMACEAE

Scandent vines, sometimes trees or shrubs, without tendrils; leaves alternate, without stipules, entire or palmate-lobed;

the plants dioecious with small flowers in cymes, racemes or panicles; sepals usually in whorls of 3; petals mostly six in two series, free, sometimes reduced to one or none; stamens many or the same number as the petals and opposite them, often 3 or 6; fruits drupaceous with free, sessile or stipitate carpels; seeds usually curved (Moon-seed family).

Some 65 genera of mostly tropical regions. Eight genera in Mexico and Central America.

Cissampelos pareira L. Sp. Pl. 1031. 1753.

Alcotán, tamagás, curarina, curarina de monte, bejuco azul, bejuco de la preñada, estrella de la preñada, venadera, ixcatú-can, cuxoguí, cuxbá, guaco.

The abundance of common names, mostly indicating medicinal usage, attached to this well known plant indicates its importance to rural peoples. It is said to be an antidote for snake bite (tamagás is the name of one or more kinds of pit vipers). An extract of the roots is used to treat fevers in Cobán. The roots have a bitter flavor. Many bitter barks and roots are considered to be useful to make remedies for fevers, since quinine is bitter and a well known febrifuge. Mexico and the West Indies, Belize through Central America to South America. Old world tropics.

Cissampelos tropaeolifolia DC. Reg. Veg. Syst. 1: 532. 1818.

Aspirina, alcotán.

Used as a home remedy for fevers, and in Guatemala to treat colds as the common name aspirina may indicate. Mexico through Central America and Panama to western South America.

Disciphania calocarpa Standl. Field Mus. Bot. 4: 305.1929.

A little known plant, a decoction of which Standley reports as being used in Guatemala for kidney ailments and as a blood "purifier."

MONIMIACEAE

Shrubs or small trees; leaves mostly opposite, entire or dentate, petiolate, exstipulate; plants monoecious of dioecious;

flowers small, usually in cymes; sepals 4 to several or none, small to minute; stamens 1 -many, the staminate receptacle yellow to red or orange; fruiting receptacle usually rose-colored; fruit drupaceous.

A small pantropical family with two genera in our area.

Siparuna nicaraguensis Hemsl. Biol. Cent. Am. Bot. 3: 69. 1882.

Limoncillo, hormiguillo, salvia, cerbatana, kex, wild coffee.

The leaves have a strong lemon odor and in Guatemala these are crushed to prepare a remedy for influenza and catarrh. The fruits are insipid and not commonly eaten although the plant is a common forest species.

MORACEAE

Trees or shrubs, rarely herbs, mostly with milky sap; leaves alternate, stipulate, entire, dentate or variously lobate; flowers small, unisexual, in ament-like spikes, capitate, or on a flat receptacle or on the inner surface of a closed receptacle (fig); staminate perianth 2-4-lobate or parted; stamens as many as the lobes of the perianth and opposite them; petals none; ovary superior or partially inferior, 1-2-celled; fruit a syncarp usually on a fleshy receptacle, or the fruits enclosed in a more or less fleshy receptacle.

A large and fascinating family of considerable economic importance for the fruits which are produced, breadfruits, jack fruits, figs and mulberries. Dyes, drugs, fibers as well as ornamentals are in the family. Some 50 genera or perhaps more, and as many as 1,000 species with more than half of the species in the genus Ficus.

ARTOCARPUS. A genus of some 40 species in the paleotropics. The breadfruit and the jackfruits are now cultivated in all tropical regions. The literature concerning the bread fruit is voluminous. The story of the expedition of the "Bounty" under

Captain Bligh to obtain plants for introduction to the West Indies is well known, the subject of books, movies and television plays. Neither breadfruits nor jackfruits are much appreciated as food in our region except where there are West Indian negro populations. I was offered breadfruit once and jackfruit never in my long residence in Central America.

Artocarpus altilis (Park.) Fosberg, Journ. Wash. Acad. Sci. 31: 95. 1941. A. communis J. R. & G. Forster, Char. Gen. 101, t. 51, 51a. 1776.

Palo de pan, árbol de pan, pan de fruta, breadfruit.

Native of Asia and now widely distributed in the tropics of the world. Introduced to the West Indies and from there to the American continents. While breadfruit is one of the important food plants of the tropical world it has never become popular in our area and I have never seen fruits offered in a market. It is used as food in a few areas populated by people who migrated from Jamaica, especially the coastal areas of Belize and Honduras and the Honduran Bay Islands.

Two varieties of breadfruit exist in our area. The variety without seeds is the one usually cultivated. The seeds in the fertile variety are sometimes roasted and eaten. Breadfruit trees are most attractive and are good shade trees along the hot, humid coastal region. An attractive bark cloth, called tapa cloth, is made in several of the Pacific islands from the bark.

Artocarpus heterophylla Lam. Encl. Méth. 3: 210. 1789. Jackfruit or Jack fruit.

A southeast Asian species now widely distributed in the humid tropics. The fruits are similar to those of the breadfruit, often enormous syncarps 60 cm. long and weighing 15-20 kilograms. Not much appreciated in our area and but rarely cultivated.

BROSIMUM. There are about ten species of Brosimum in the moist lowland forests of Central America. At least six of these have some economic use. The taxonomy of our species is difficult, due mostly to inadequate specimens. I am not sure that all of those mentioned here are distinct.

Brosimum alicastrum Sw. Prod. Veg. Ind. Occ. 12. 1788.

Ramón, ramón blanco, capono, ojoche, ujushte, ujushte blanco, masico, ox, breadnut; ramonal, a place where the trees are abundant.

Common in the wet (seasonal) forests of Guatemala and Belize. Distributed from Mexico and the West Indies to Honduras. The leaves are used for stock feed in the dry season. The pulp of the fruit is edible and the seeds, when boiled, are eaten but possibly as a "starvation" food. The latex is said to replace cow's milk. The wood is used in construction.

Brosimum costaricanum Liebm. Dansk. Vid. Selsk. Skrivt. 2: 334. 1851.

Ajushte, ajuste, ramón colorado, masicarán, masicarón.

Found in the mixed forests from Guatemala to Panama. The inflorescences were said to be cooked and eaten in Costa Rica. In Guatemala the seeds have been used as a "starvation" food. The foliage is used for feed for animals.

Brosimum sapiifolium Standl. & L. Wms. in Allen, Rain Forests of Golfo Dulce 142. 1956.

Morillo, ajoche macho.

Known only from Costa Rica. The fruits are edible, having a flavor somewhat like that of avocados according to Allen.

Brosimum terrabanum Pittier in Contrib. U.S. Nat. Herb. 18: 69. 1914.

Masica, masicarán, ujuschte, ojushte, jujuschte, ojoche, pisma, breadnut.

The fruits or seeds are edible and said to have been used in Honduras and Nicaragua to make tortillas. The foliage used for animal food as in other species.

Brosimum utile Pittier in Contrib. U.S. Nat. Herb. 20: 102. 1918.

Palo de vaca, mastate colorado, lechero, mastate, palo de leche.

Paul Allen in his Rain Forests of Golfo Dulce (pp. 143-144. 1956) says that "All parts of the plants produce an abundant, creamy latex, which is sweet and pleasant flavored when first taken from the tree. . . The fresh milk has been tried in coffee and can scarcely be distinguished from good cream, while chilled it can be whipped and flavored with sugar and vanilla and served to unsuspecting humans. Dogs and cats, however, will not touch it."

If anyone but Paul Allen, a superb field botanist, had written the above I would have been skeptical!

Allen says also that a bark cloth, known locally as "mastate," formerly was made from the tree by the Boruca Indians. Pittier has also reported the making of cloth items from the bark.

Cannabis sativa L. Sp. Pl. 1027. 1753.
Cáñamo, marijuana, mariguana, pot, hemp.

An important source of fiber in the old world. I have not seen the plant grown for fiber in Central America. A drying oil and a narcotic drug come from the plant.

In recent years one of the varieties has been much grown to produce a drug known commonly as "pot." "Pot" has a hypnotic, stupifying and often a hallucinatory effect on the users. Users when under the influence are estatic and may become fanatical and even dangerous. This illicit drug is now used by Central American "students" and others while twenty years ago I had not seen the plant in our region nor did I remark the use of it in my notes.

CASTILLA. The Mexican-Central American rubber tree was well known to the Maya and other Indian groups long before the time of discovery. The latex was used to waterproof clothing and especially to make the rubber balls used in games. Ball courts are found in most pre-Columbian Mayan ruins in Mexico and Central America. It is presumed that Castilla trees were the source of the rubber for the balls. This is the only native rubber tree of Mexico and Central America. The tree has been exploited since colonial times and sometimes the rubber exported. During the second world war perhaps nearly every tree in Cen-

tral America was tapped for rubber for the war effort. Trees with enormous tap scars made 30-35 years ago are still found in the forest.

Evidence of recent tapping is scarce for these poor grade wild rubbers have almost no market. Plantations of one or another species of Castilla were set out in Haiti, Costa Rica and Guatemala but probably all of them are now long abandoned. Not all of the Castillas produce rubber. There are perhaps five species in Central America.

Castilla costaricana Liebm. Dansk. Vid. Selsk. Skrivt. 2: 319. 1851.
Hule, ule.

Pittier states in his Plants Usuales de Costa Rica (p. 105. 1908) that extensive plantations of this species had been made on the San Carlos plains. Probably nothing came of these plantations although this species is presumed to have been the source of the rubber exported from Costa Rica at the turn of the century.

Castilla elastica Sessé ex Cervantes, Gaceta de Literatura de Mexico, suppl. July 2, 1794.

Hule, ule, yuxha, kiikche, rubber tree, Central American rubber tree, cheel k'i'c, kik, kiikche.

This was the first recognized of the Mexican-Central American rubber trees. The latex of this one was used by the pre-Columbian Indians of the region for waterproofing clothing and to make rubber balls. As noted above, under Castilla, it has been exploited from that time until the 1940s for rubber. It is little used now, not only because the rubber is inferior to Pará rubber and to synthetic rubber but also because the forests where it occured are being cut down. Distributed probably from Mexico to Panama.

It is to be noted that the Quecchí name of the tree is much like the tribal name of these Mayan people of Guatemala.

Castilla fallax Cook, Science n. ser. 18: 438. 1903.
Hule macho, hule blanco.

A Costa Rican tree that produced a resin, once common in the Diquis valley. A bark cloth made on the Atlantic coast of Nicaragua by the Sumo Indians is thought to have been from this species.

Castilla nicoyana Cook, Science n. ser. 18: 438. 1903. Hule.

A species of the Nicoya region of Costa Rica. It is possible that some rubber exported in the early years of the century came, in part, from this tree.

CECROPIA. Usually small and weak trees characteristic of cutover lands but sometimes in the forest, mostly in the wet or moist lowlands but sometimes to 1,000 meters. There are perhaps 6 or 8 species in Central America and these difficult to distinguish. The trunks are usually hollow and often inhabited by fierce ants, an interesting case of symbiosis. The leaves are large, to a meter across, peltate and palmately lobed, on long pedicels. The trees are conspicuous because of the large leaves. The trunks of most species are used by the country people to channel water to the house. The stems contain a fiber which has been used to make rope or sometimes coarse bark cloth.

Cecropia obtusifolia Bertol. Fl. Guate. 439. 1840.
Guarumo, guarumbo, pacl, choop.

A lowland species from Mexico to Panama. A fiber from the stem is used to make string or rope. The "wool" said to be smoked by the Indians of Alta Verapaz. The trunks are split and used to channel water.

Cecropia peltata L. Syst. ed. 10. 1286. 1759.
Guarumo, igarata, ix-coch, excochle, trumpet, trumpet tree.

A lowland species usually in cutover lands from Mexico to South America. Fiber in the stems is used to make string and the split trunks to channel water. A fast growing tree that might serve as a source for paper pulp.

Chlorophora tinctoria (L.) Gaud. in Freyc. Voy. Bot. 508. 1826.

Mora, morillo, mora amarilla, palo de mora, Brasil, macano, fustic, dyer's mulberry.

The wood, from which a yellowish dye or khaki dye is obtained was once an article of export or used locally in most of our region. I have not heard of fustic being collected in recent years although it may be used in Guatemala where there is an important native weaving industry.

Dorstenia contrajerva L. Sp. Pl. 121. 1753.
Contrahierba, contrayerba, contaúl.

The aromatic rootstocks when dried have been used to flavor cigarette tobacco in Guatemala and El Salvador. An infusion of the root is said to be useful as a febrifuge. The plant is now uncommon as the moist forests where it grows are being destroyed.

FICUS. The genus Ficus is one of the large genera of plants with some 600 or more species in the tropics of the world. There are a large number of species in Central America and the fruits of several are eaten although not very attractive as food. Birds and animals feed on the fruits. The latex of a few species is used locally as anthelmintics and have local fame as such. Two or three old world species are found in cultivation, especially the common fig and some ornamentals. Most wild species of Ficus are called amate, higuero, or higuerón. Strangler figs universally are called mata palo.

(Ficus benjamina L. "amate rojo" A large spreading tree with drooping branches; the leaves small, elliptic-ovate to ovate, narrowed to a short abrupt apex. Perhaps this is one of the shade or street trees of our area. Asian and there is no certainty that our ornamental trees are of this species.)

Ficus carica L. Sp. Pl. 1059. 1753.
Higo, higuero, higuera, fig.

Figs are grown occasionally in Central America and the fruits sometimes offered in the markets. Most if not all dried figs offered in markets or stores are from the Mediterranean region or from California. I have not seen plantings of any extent in our region. Native possibly of Asia and in cultivation around the Mediterranean from very early times.

(Ficus elastica Roxb. "Palo de hule" The Indian rubber tree or Indian rubber plant is occasionally grown as an ornamental. It is attractive when cared for but weedy when neglected. Often grown as a house plant in cold climates.)

Ficus glabrata HBK. Nov. Gen. & Sp. 2: 47. 1817.

Amate, chilamate, higuerón, matapalo, higo de venado, deer fig.

One of the largest of the species of Ficus in our region and an attractive tree. The fruits are large, to 4 cm. diameter and quite good to eat. The latex often has been used as an anthelmintic. It is said that in Panama all hospital patients were given a dose of the latex probably on the theory that a vermifuge was needed. Native from southern Mexico and Belize through Central America and south to Brazil and Peru.

Ficus jimenezii Standl. Contr. U. S. Nat. Herb. 20: 14. 1917.

Amate.

Said to have been used as an anthelmintic in El Salvador. Native from Guatemala to Costa Rica.

Ficus padifolia HBK. Gen. & Sp. Pl. 2: 47. 1817.

Amate, amatillo, capulín, higuillo, chilamate, gus, moco, cushamate.

Common and often abundant. Used in Guatemala as living fence posts. Native from Mexico to Colombia.

(Ficus retusa L. "Laurel de la India." A large spreading tree producing aerial roots; leaves broadly ovate to rhombic-elliptic, apiculate. An old world species used as an ornamental. Perhaps confused with F. benjamina which see.)

(Morus alba var. multicaulis (Perrotet) Louden. The white mulberry is native of China and planted in many places in Central America. Perhaps first introduced as feed for silk-worms for it is reported that silk was produced in colonial Guatemala.)

Morus celtidifolius HBK. Nov. Gen. & Sp. 2: 33. 1817.

Mora.

A small tree with edible fruits. Distributed from Mexico to Bolivia. It is rare in our region.

Morus insignis Bureau in DC. Prodr. 17: 247. 1873.
Morero.

The fruiting spikes are very large, 5-10 cm. long, but the fruits are very poor. Found in Guatemala and Costa Rica then to Colombia and Ecuador. Trees in the Costa Rican mountains are reported to become 2 meters in diameter.

Poulsenia armata (Miq.) Standl. Trop. Woods 33: 4. 1933.
Mastate, tuno.

The large fruits, 1.5-2.5 cm. in diameter, are edible. The Indians of Panama have used the bark to produce a coarse fabric used in hammocks, mats and blankets. I have no record of fabric making in Central America but it is likely that the bark has been used for this purpose. Cloth is made from the bark of species of Moraceae in many parts of the world. The tapa cloth of the Pacific islands is one of the best known. Native in the lowlands from Mexico to Ecuador.

Pourouma aspera Trécul, Ann. Sci. Nat. III, 8: 102. 1847.
Guarumo, duarumo, guarumo macho, guaruma de montaña, mano de león, trumpet.

The fruits are juicy and black at maturity, sweet and edible. Known from Belize to northern South America.

Pseudolmedia oxyphyllaria Donn.-Sm. Bot. Gaz. 20: 294. 1895.
Ojoche, manax, cherry.

Pittier reports that the abundant fruits of this plant are eaten in Costa Rica, that the Indians cook the staminate flowers in a corn batter. Cattle eat the fruit, flowers and foliage. The English speaking Belizans call the fruit "cherry" from its size and color. Native from Belize to Costa Rica.

Pseudolmedia spuria (Sw.) Griseb. Fl. Brit. W. Indies 152. 1859.
Manax, ojoche, cherry.

The latex flows easily but is difficult to collect. Perhaps it has been used to adulterate chicle. Native of the Greater Antilles, Belize and Guatemala. I have not been able to verify reports of the plant in Costa Rica and Panama.

Trophis chorizantha Standl. Field Mus. Bot. 4: 302. 1929. Palo morillo, raspa lengua.

The fruits are edible. The foliage may be used as a dry season fodder for animals. Native in wet lowland forests from Mexico to Costa Rica.

Trophis racemosa (L.) Urban, Symb. Antill. 4: 195. 1903.

Ramón, ramón colorado, San Ramón, yaxox, catolux, raspa lengua, hoja tinta, ojushte.

The fruit is edible but not very good. The young branches and foliage are used in the Yucatán peninsula as fodder for stock, much as Brosimum is used. Mexico and the West Indies through Central America to northern South America in low wet forests.

MORINGACEAE

Ours large shrubs or small trees with a thickish and irregular trunk with white bark; leaves deciduous, alternate, 2-3-pinnate, the leaflets entire; inflorescence of axillary panicles; flowers perfect, irregular, white or reddish; calyx tube cup-like, 5 parted, the lobes unequal; petals 5, similar to the sepals, the upper ones smallest; stamens inserted on the margin of the disk, 5 perfect ones alternating with 5 imperfect ones; ovary stipitate, 1-celled; capsule silique-like, torulose, many seeded; seeds broadly winged.

Moringa, the only genus in the family, is native in northern and eastern Africa and in western Asia. The following species is cultivated in most tropical countries.

Moringa oleifera Lam. Encycl. 1: 398. 1783.

Paraíso, paraíso blanco, perlas, marango, maranga, marenga calalú, teberinto, terebinto, teberindo, horse radish tree. A product of the tree is ben oil or behn oil.

The fleshy roots have the flavor and odor of horse radish, for which they may have been used. The seeds contain the ben oil or behn oil of commerce which is odorless and does not become rancid. The oil is used to lubricate mechanical watches (which are more and more replaced by electronic ones) and other fine machinery. The leaves are reported to be cooked and eaten in Belize. Found cultivated or naturalized in many places in Central America.

MUSACEAE

Perennial herbs, often large and tree-like with short stems, the stems usually or always surpassed by the tightly enrolled leaf sheaths which form a false trunk; the leaves distichous or spirally arranged, petiolate, the petioles vaginate, the blades linear or oblong, pinnately nerved; inflorescence simple or rarely branched; the flowers sessile or pedicellate, usually bracteolate, zygomorphic, usually perfect; the tepals free or somewhat connate, colorful; fertile stamens 5 or rarely 6; ovary inferior, 3-celled; fruits baccate or capsular; seeds very hard, sometimes arillate (or none in triploid plants.).

The banana family is exceedingly important in Central America for the bananas and plantains which are valuable export crops. Bananas and plantains also are grown everywhere at low and even middle elevations as subsistence crops. Bananas are grown in the lowlands of Guatemala, Honduras and Costa Rica, sometimes in Nicaragua and Belize, for export.

Ensete ventricosum (Welw.) Cheeseman, Kew Bull. 1947: 101. 1947; Moore in Baileya 5: 192. 1957. Musa ensete Gmelin, Syst. Nat. ed. 3, 2: 567. 1791.

Abyssinian banana.

Rare as an ornamental in Central America. I have seen it in Quezaltenango at more than 2,000 meters where it is often frost damaged. An attractive plant, the fruits inedible.

HELICONIA. Perhaps more than fifty species in tropical America of which a dozen or more in Central America. The plants are often exceedingly abundant in bogs, roadside ditches and in wet lowland forests. The large, often wax covered

leaves are sometimes collected, made into bundles, and sold in markets to wrap cheese and other moist products. The leaves are carried to highland markets. I have seen them often but it is difficult to determine to which species any bundle of leaves may belong. Platanillo is the common name often used.

MUSA. Bananas have been in cultivation in India for at least 2,000 years, and perhaps longer. There are a great many varieties in cultivation, all seedless triploids propagated vegetatively. There are no members of the genus undoubtedly native of America although two species have been described as native. Bananas were brought to the West Indies in 1500 and were soon carried throughout the American tropics. The number of horticultural varieties is vitually endless. Certainly some or many of the common names much used in our area must refer to the same cultivars.

The importance of bananas and, to a lesser degree, of plantains in the economy of Guatemala, Honduras and Costa Rica is very great. Bananas are the primary export crop of Honduras, and second to coffee in Guatemala and Costa Rica. These two fruit crops are important in the subsistence economy of all five of the Central American countries and of Belize.

The taxonomy of the bananas and plantains, as in other plants long in cultivation, is difficult. I use the traditional names but have supplied other names when these may be useful. A method sometimes used to distinguish bananas from plantains, not a very scientific method, is that the fruits when commonly eaten out of hand uncooked are bananas. The kinds commonly cooked are usually considered to be plantains.

It has been proposed that the myriad forms of the two Linnaean species, Musa sapientum and M. paradisiaca, in fact are hybrids of Musa acuminata Colla and of M. balbisiana Colla.

Grocery stores in the United States, and many of those in free Europe will carry bananas from the American tropics. Very often bananas brought from Central or South America are cheaper per pound than apples produced only a few miles away. In 1978 bananas were cheaper in Rogers, Arkansas than were bananas in roadside stands adjacent to banana plantations in Mexico.

Musa acuminata Colla, Mem. della Real Academia de Scienze di Torino 25: 394. 1820.

Dwarf banana.

Grown occasionally for its fruit, which is somewhat bitter when mature, or as an ornamental. Musa cavendishii Lam. is considered to be a synonym by H. E. Moore.

Musa paradisiaca L. Sp. Pl. 1043. 1753.

Plátano, banano indio, maduro, plátano cuadrado, plátano cáre, majoncho, guineo, guineo criollo, guineo morado, guineo blanco, guineo cuadrado, guineo de caballo, plantain, horse plantain.

Plantains are abundantly grown in Central America, principally as a subsistence crop or for sale in local markets. Plantains normally are prepared by cooking and well prepared ones, with a sweet sauce, are a very fine dessert. The fruits are used in about as many ways as there are cooks, often in stews with other vegetables. There are an endless variety of plantains available and they are found from the lowlands well into the mountains, even in the dry valleys. Fruits are to be found in markets through the years.

Plantains were introduced from the old world tropics immediately after discovery and quickly spread as has always been the case with useful food plants. Fruits vary in size from the very large ones to a half meter long, which are called horse plantains, to small ones even smaller than the ordinary banana. Plantains with purple peel are found commonly in Costa Rica markets.

Nutritional analyses of many of the Central American plantains have been made. See Munsell, Williams and others, in Food Technology, volume 14, pages 3, 10, 20 for 1950, and vol. 15, pages 12, 13, 15 and 17, also for 1950.

Musa sapientum L. Sp. Pl. ed. 2. 1477. 1763. M. paradisiaca var. sapientum Kuntze, Rev. Gen. 2: 692. 1891.

Banano, mínimo, guineo, manzana, banano manzano, guineo manzano, guineo colorado, guineo morado, banano patriota, banano de seda, guineo morado blanco, guineo de

oro, guineo manzanito, tul, ts'ahlec, tulul, hazz, sachaaz, boxhasz, mines banana, finger bananas, red banana, apple banana.

In addition to the names above, some of which are also used for plantains, the following horticultural varieties were in the introduction garden of the United Fruit Company, near La Lima, Honduras. It is possible that some of these have gotten into gardens or plantations along the north coast of Honduras. Biochemical analyses can be found in Food Technology, volume 14, pages 13-15 for 1950.

Brazilian, Bungalan, Cavendish, Choui, Cau Trang, Congo, Dorado, Grand Nain, Gros Miche, Guyuran, Inarhibal, Indiana, Kanara, Kapas, Kau Chiao, Lidi, Masak Sahari, Morado Pula, Morado Puti, Morong Datu, Mundan, Pomme Java, Susu, Tadiao Tumoc, Vimana.

Bananas are not only a principal export crop in Guatemala, Honduras and Costa Rica but are also an important crop for local consumption in all of our area. Bananas for export are grown mostly along the coasts. Honduran and Guatemalan bananas are usually the best quality fruits that get into the United States market. Bananas, like many other field or plantation crops, grow best near their limit of tolerance to cold. Some varieties of bananas grown for local consumption may be grown up to an elevation of 1,000 meters, but usually the fruits are smaller and less flavorful than those grown in the lowlands. I saw a banana with black stems, petioles and midribs being grown at an elevation greater than 2,000 meters at the equator in Zaire (Africa) where it was called intuntu. This banana is not in America so far as I know yet it would be useful as a high elevation subsistence crop.

Propagation of all edible bananas (and of plantains) is vegetative since the plants are triploid and do not produce viable seeds. Cultivation is almost entirely for the fruits. However the petioles and foliage have been used to make paper, sacking (when used with hemp) and as wrapping material. Tamales wrapped in banana leaves always seem superior in flavor to those wrapped in other materials.

In Melanesia one banana variety is grown for the fleshy rhizomes which are eaten in the same way as other rhizomes or tubers.

Musa textilis Née, Ann. Ciencias Nat. 4: 123. 1801.

Abacá, Manila hemp.

Abacá or Manila hemp has been cultivated for its cordage fiber, perhaps the best one in the world. The plant was in cultivation in India and eastward to the Philippines long before the western explorers arrived. The Philippines were the main producer with the first record of fiber shipped to the United States in 1818.

Abacá is a relatively new crop in the American tropics. Six of the better varieties were brought from the Philippines to Panama in 1926. These varieties were later established in Honduras at Lancetilla. Between 1941 and 1942 some 28,000 acres were planted to abacá by the United Fruit Company in Guatemala, Honduras, Costa Rica and Panama. Four decorticating plants were set up and from these came the strategic requirements of hemp during the later years of World War II. Production reached 20,000 tons annually but the production fell off rapidly after the war, to some 5,000 tons from all Central America. Fiber produced in Central America was of superior quality.

La Perla pulp and paper mill was set up in 1953 to process abacá waste, estimated a 3,000 tons a year. This was enough to produce some 12 tons of craft paper a day, plus some paper of better grade.

The world requirements for abacá are now provided from the East Indies, principally the Philippines.

(RAVENALA. The Traveller's Tree or Traveller's palm, Ravenala madagascariensis Sonn. is native of Madagascar and now is widely planted as an ornamental in the American tropics for its impressive appearance.)

STRELITZIA. The Bird-of-Paradise plants are cultivated as ornamentals and the flowers offered in markets in our region. Strelitzia reginae Banks and S. nicolai Regel & Koern., both native of southern Africa, are those commonly seen.)

MYRICACEAE

Aromatic shrubs or small trees; leaves alternate, simple, entire or dentate to rarely lobate, resin dotted; flowers small, perfect or unisexual, borne in aments; pistillate flowers usually with 4-8 stamens inserted on the receptacle; pistillate flowers with a 1-celled ovary; fruit a small berry or drupe, the exocarp usually wax covered.

A single genus.

Myrica cerifera L. Sp. Pl. 1024. 1753.

Arrayán, cera vegetal, árbol de cera, gua-ut, tea bark, tea box, bayberry, wax myrtle.

A shrub of about 2-4 meters distributed through much of the southern United States, Mexico and the West Indies to Costa Rica. The sometimes abundant wax on the berries is extracted in hot water and made into candles. Bayberry candles were not uncommon in the 1950s although rather expensive. The aromatic candles are pale green and the wax is firm and melts at a higher temperature than ordinary candles from petroleum wax. The candles were used in religious observances in Guatemala, Honduras and Costa Rica, perhaps elsewhere. I have not seen bayberry candles offered in markets in recent years.

MYRISTICACEAE

Trees or shrubs with simple, alternate, entire leaves; flowers small, unisexual, in axillary or terminal reaces, panicles or umbels; perianth simple, trilobate with valvate segments; petals none; anthers 3 or more, extrorse, adnate to the staminal column; ovary superior, 1-celled; fruit normally bivalvate, often fleshy; seeds enclosed in an entire or laciniate aril.

An important family of some 5 pantropical genera, of these four in Central America.

Dialyanthera otoba (Humb. & Bonpl.) Warb. Nova Acta Leo. Carol. 68: 149. 1897.

This plant is the source of otoba butter or otoba wax, a vegetable tallow which comes from the seeds. I do not know that the seeds have been collected in Costa Rica although the wax is said to be exploited in Colombia. Native from Costa Rica to Colombia.

Myristica fragrans Houtt. Handleid. Hist. Nat. Linn. 2: 333. 1774.

Nuez moscada, nutmeg, mace.

Native of the Moluccas and planted in small scale at least in Guatemala and Honduras. The trees are dioecious and the sex is not known until first flowering. About one staminate tree to ten pistillate ones is needed in the plantation. It is advisable to propagate the trees vegetatively. Whether nutmeg and mace could be produced commercially in Central America is questionable. The nutmeg of commerce is the seed while the spice known as mace is the bright red aril surrounding the seed. The aril is removed and dried. An oil may be distilled from the seeds.

Virola guatemalensis (Hemsl.) Warb. Nova Acta Acad. Leop.-Carol. 68: 220. 1897.

Sangre, palo de seba, cacao volador, cacao cimarrón, chucul.

The dried seeds were used in Guatemala as a flavoring for chocolate and offered in markets for this purpose. The seed contains a considerable quantity of oil, sufficient so that dry seeds have been used as candles. The oil may be extracted and used to make candles or soap. A tree sometimes to 30 m. tall of the moist forests from Guatemala to Panama.

Virola koschnyi Warb. in Fedde, Rep. Sp. Nov. 1: 71. 1905.

Sangre, drago, cedrillo.

The seed oil or fat is used to make candles and soap. A secondary timber tree in Belize the wood of which is used for interiors and exported for making plywood. Belize and Guatemala to Panama.

Virola sebifera Aubl. Pl. Guian. 2: 904. 1775.
Sangre de drago, drago, fruta dorada, banak.

The seeds, as in other species, are rich in fat and used in the same way. It is not unlikely that the three Virolas mentioned here may be confused by native peoples. Native from Nicaragua probably to Peru and southern Brazil.

MYRTACEAE

Trees or shrubs; leaves simple, opposite, entire or rarely crenate, punctate with resinous or pellucid glands, estipulate; inflorescence cymose, racemose or paniculate; flowers perfect, actinomorphic, epigynous; sepals 4-5, distinct or connate at the base; petals 4-5, distinct, imbricated; stamens usually many, sometimes in fascicles on the calyx opposite the petals; pistil one, the ovary 2-many locular; fruit a berry or a capsule; seeds few.

A large pantropical family with some 150 genera and 4,000 species, perhaps more than 40 genera in America.

Callistemon salignus Sweet, Fl. Austral. sub. t. 29; DC. Prodr. 3: 223. 1828.
Bottle brush.

A small tree or usually a shrub planted as an ornamental. The attractive red flowers are long lasting and much appreciated by humming birds. Native of Australia.

Calyptranthes costaricensis Berg, Linnaea 27: 20. 1854.
Mirta.

A Costa Rican tree. The berries, about 1 cm. in diameter and yellow or red, are edible. The wood is very hard.

EUCALYPTUS: A large genus mostly of Australia and the Malayan region, perhaps 500 species. How many are grown for one purpose or another in our region is unsure since their systematics is difficult. Only one has been cultivated here for an economic product.

Eucalyptus globosus Labill, Voy. Perouse 1: 153, t. 13. 1799.

Eucalipto, ocalipto.

A Eucalyptus, presumed to be this species was grown near Guatemala City by the Piñol family. An oil, used as citronella, is extracted from the leaves of stump shoots.

EUGENIA: A large pantropical genus with perhaps as many as 2,500 species. The native species of Central America are many but only one of these is considered here. The others mentioned are all introduced, one probably from South America while the other six species are from the paleotropics and have often been put into the genus Syzygium.

Eugenia caryophyllata Thunb. Diss. 1:
Clavos, cloves.

Cloves are cultivated and harvested in Cobán, Guatemala. I do not know of them being harvested commercially elsewhere in Central America. The name Syzygium aromaticum (L.) Merrill & Perry is also used for this plant. McVaugh, in the Flora of Guatemala does not accept the generic name Syzygium. Cloves are used in our region as a spice and most of them doubtless are imported. The main use of cloves is in Indonesia where they are used to flavor the popular "Kretek" cigarettes.

Eugenia cumini (L.) Druce, Rep. Bot. Exch. Club Brit. Isles 3: 418. 1914. Calyptranthes o'neilii Lundell, Bull. Torr. Bot. Club 64: 554. 1937.

An Asian species cultivated as an ornamental and now also spontaneous.

Eugenia dombeyana DC. Prodr. 3: 276. 1828.
Grumichama.

An Asian species seen in cultivation in Honduras. The fruits are eaten.

Eugenia jambolana Lam. Encyc. 3: 198. 1789.
Jambolana, jambolan plum.

Occasionally cultivated for the rather poor fruit. Native of Asia.

Eugenia jambos L. Sp. Pl. 470. 1753.
Manzana rosa, pamarosa, manzana, ros, rose apple.

Native of southeastern Asia and now widely cultivated and spontaneous in all American tropics, and elsewhere. The fruits are occasionally eaten but are rather insipid in flavor. A handsome shade tree now even naturalized in the pine forest areas of Guatemala and Honduras.

Eugenia malaccensis L. Sp. Pl. 470. 1753.
Marañón japonés.

The fruit is an attractive red, acid and with an agreeable flavor. Cultivated as an ornamental or spontaneous. Native of tropical Asia.

Eugenia oerstediana Berg, Linnaea 27: 285. 1856.
Tutú in Costa Rica, joltiello in Petén.

The fruits, about 2 cm. in diameter, are eaten and considered quite good by some people. Native from southern Mexico to Costa Rica and in the West Indies. Quite variable and several synomymous names exist for Mexican and Guatemalan plants.

Eugenia uniflora L. Sp. Pl. 470. 1753.
Cereza de Surinam, guinda, pitanga, Surinam cherry.

Probably native of South America but now cultivated everywhere in the tropics. The bright red fruits are flavorful and aromatic. Used to flavor ices and beverages. The plant makes an excellent hedge plant in the warmer tropics, common in our region.

(Melaleuca leucadendron L. Mant. 1: 105. 1767. Cajeput tree, punk tree. Native of the paleotropics. It is the source of cajeput oil. The tree is easily grown in the American tropics where it is not yet common but it could become a weed in low swampy areas. The bark, which is said to be resistant to decay, might be used in making insulation.)

Pimenta dioica (L.) Merrill, Contr. Gray Herb. 165: 37, f. 1. 1947. P. officinalis Lindl. Coll. Bot. sub t. 19. 1821.

Pimienta gorda, pimienta, peensa, pens, jamaica, pimeinta de Jamaica, allspice.

Native from southern Mexico through Central America and the West Indies, perhaps to northern South America.

One of the best of the spice plants of America. The tree is occasionally planted in Central America for the unripe berries which are dried and become the allspice of commerce. All parts of the tree are fragrant and the fragrance may persist in the dried berries for years. The spice has a flavor similar to a combination of cinnamon, cloves and nutmeg, hence allspice. Jamaica produces the greater part of commercial allspice. A small amount is produced in Guatemala and perhaps in El Salvador where the dry berries have been seen in markets. Used locally in "atol" and to flavor other foods.

PSIDIUM is a large and difficult genus in Central America but only a few have usable fruits. Some kinds become weedy in cleared pastures.

Psidium cattleyanum Sabine, Trans. Roy. Hort. Soc. 4: 315, t. 11. 1821.

Guayaba, guayaba japonés, cas dulce, strawberry guava.

The fruits are 2.5-3.5 cm. in diameter and are used as a fruit out-of-hand and to make jelly or paste. Probably only cultivated in Honduras and Costa Rica. Native of Brazil.

Psidium friedrichsthalianum (Berg) Niedenzu in Engler & Prantl, Nat. Pflanzenf. 3, Abt. 7: 69. 1893.

Cas, cas ácida, guayaba agria, arrayán.

The fruits are edible, more acid and with a better flavor than the common guava. Cultivated and perhaps native from Mexico to Panama.

Psidium guajava L. Sp. Pl. 470. 1753.

Guayaba, guayabo (the plant), guayaba perulera, guayaba de gusano, guava.

The fruits are eaten out-of-hand or cooked, and collected to make the ubiquitous guava jelly or paste. The fruits, and the plants, are variable in size and flavor. Native or naturalized and often forming thickets from Florida and Mexico and the West Indies south to Brazil, naturalized in the Old World tropics. Sometimes planted in orchards. The fruits are eatern by birds and animals, as well as man, and perhaps its wide distribution is due in some part to this.

Psidum guineense Sw. Prodr. 77. 1788.
Guayaba, guayaba ácida, cas, cas extranjero, güisaro, guava.

Native from Mexico to Argentina. Often weedy and forming thickets. Probably never cultivated but the wild fruits are commonly used to make jelly or guava paste. Doubtless hybridizes with P. guayaba.

Psidium oerstedianum Berg, Linnaea 27: 360. 1854.
Native of Costa Rica. The small and sweet fruits are eaten.

Psidium sartorianum (Berg) Niedenzu in Engler & Prantl, Nat. Pflanzenf. 3, Abt. 7: 69. 1893.

Half crown, pichiche.

Native from Mexico and the West Indies to northern South America, occasionally cultivated in the West Indies. The fruit is said to have a rich, spicy flavor. I have never seen it.

MYRSINACEAE

Mostly small trees or shrubs with alternate, simple, exstipulate leaves, the leaves mostly entire or crenate to serrate, glandular punctate; inflorescences terminal or lateral, paniculate or corymbose or cymose; flowers perfect or rarely unisexual, mostly 5-parted, regular; corolla usually gamopetalous, rotate or tubular; stamens as many as and opposite the petals; ovary globose or ovoid, 1-celled, fruit drupaceous.

A large family of some 40 genera and perhaps 1,000 species, pantropical. The commonest plants in our region are Ardisias. C. L. Lundell for many years was the specialist for this family in North America.

ARDISIA. Many species of the genus produce berries which might be eaten in emergencies. Most are rather woody and insipid.

Ardisia compressa HBK. Nov. Gen. & Sp. 3: 245. 1818.

Zarcil de montaña, ixbambul, hueso blanco, huisito blanco, cereza morada, capulín, bird berry, tucuico.

Common in moist woods and second growth from Mexico to Panama and Venezuela.

The rather insipid ripe fruits are eaten by birds and children.

Ardisia escallonioides Schlecht. & Cham. Linnaea 6: 393. 1831.

Zarcil, uva, hullaba.

Native from southern Florida, Mexico, the West Indies, Guatemala to Honduras. The berries are eaten. This or a similar species is used as a hedge plant in Honduras.

Ardisia palmana Donn.-Sm. Bot. Gaz. 27: 434. 1899.

Tucuico.

Native of Costa Rica where the purple or black fruits are eaten.

Ardisia pachalis Donn.-Sm. Bot. Gaz. 19: 5, t. 1. 1894.

Cerezo, cerezo silvestre, sirsil de pava, morrito, capulín.

The small black fruits are said to be acid but of good flavor. Native from Mexico to El Salvador and Honduras.

Ardisia revoluta HBK. Nov. Gen. & Sp. 3: 246. 1818.

Uva, fruta de pava, cerezo, silasil, sirasil, mora, morita, tucuico.

The black, juicy fruits are edible. Native from Mexico through Central America to northern South America.

PARATHESIS is a large genus of perhaps 60-70 species in Mexico and Central America. Guatemala is the center of dis-

tribution. Fruits of most species may be edible although those that I have tried are not especially good. The genus is distinguished (usually) from the equally or more abundant Ardisia by pubescent petals, not glabrous ones.

Stylogyne guatemalensis Blake, Contr. U. S. Nat. Herb. 24: 16. 1922.
Pigeon berry.

Native from Mexico and Belize to Honduras. The small fruits are edible. The flowers in this genus are unisexual.

Stylogyne laevis (Oerst.) Mez, Pflanzenr. IV. 236: 268. 1902.
Guastomate in Costa Rica.

The small berries are edible. Native from Mexico to Costa Rica and Panama.

NYCTAGINACEAE

Annual or perennial herbs, shrubs or trees, sometimes vines; leaves simple, alternate, opposite or verticillate, entire or nearly so, without stipules; inflorescence cymose, often with highly colored bracts subtending the flowers and these calyx-like; flowers perfect, rarely unisexual, the perianth inferior, simple or corolla-like, tubular to campanulate or funnelform, limb truncate or 3-5-lobate or dentate; stamens 1-many.

A small family mostly of the tropics, those mentioned below either weedy or ornamentals. Bougainvillea is an attractive vine cultivated everywhere in our area except at highest elevations.

Boerhaavia diffusa L. Sp. Pl. 3. 1753.
Hierba de cabro, moradilla, erisipela.

Said to be used in the Petén as a remedy for erysipelas, a febrile infectious disease caused by a Streptococcus.

Bougainvillea buttiana Holttum & Standley, Field Mus. Bot. 23: 44. 1944.
Bugambilla, pompilla, bombilla, bougainvillea.

Perhaps native of Brazil but now almost everywhere in the tropics as an ornamental. The bracts are crimson and more attractive than the magenta form. Plants with salmon-colored bracts are occasional.

Bougainvillea glabra Choisy in DC. Prodr. 13, pt. 2: 437. 1849.

Bugambilia, napoleón, bougainvillea, trinitaria veranera.

Grown as an ornamental at all but the highest localities. The bracts are purplish or magenta. Native of Brazil.

Mirabilis jalapa L. Sp. Pl. 177. 1753.

Maravilla, four-o'clock, marvel of Peru.

Commonly cultivated and escaped in much of Central America. The common name maravilla refers to the flowers which are of several colors, as white and red on the same plant. The Latin name Mirabilis means wonderful. The English name "four-o'clock" refers to the flowers which open in the afternoon and close the following morning. The roots are said to be used as a purgative by the country people, dried and pulverized, then administered in sweetened water. The roots are reported to be good hog feed.

NYMPHAEACEAE

Aquatic herbs from submerged rhizomes, the large flowers produced on naked scapes, rarely leafy ones; the leaves usually floating on the surface of water, often peltate; the flowers with 3-6 sepals and petals or usually many; seeds arillate or surrounded by pulp, or naked.

Nelumbo lutea Pers.
Ninfea, water chinkapin.

A strictly American plant and widely distributed by early man,- Minnesota and Ontario south to Cuba, Mexico, Honduras and Colombia. Only known to me in our area from Lake Yojoa where it was formerly abundant. A very attractive plant. The rhizomes and seeds of an Old World species are eaten.

NYMPHAEA. Several horticultural varieties of Nymphaea are cultivated as ornamentals in our region. Ponds are filled with them at Escuela Agrícola Panamericana and from here distributed to whoever cares for a few plants. One native species, N. ampla (Salisb.) DC. is distributed from Texas and the West Indies to South America. I have not seen it grown as an ornamental.)

OLACACEAE

Trees or shrubs, often armed with spines; leaves mostly alternate and entire; inflorescence usually axillary, with few flowers; calyx small with 4-6 teeth or lobes, often much enlarged in fruit; petals 4-6, free or united, valvate or subimbricated; stamens 4-12, inserted on the petals; fruit drupaceous, usually 1-celled and 1-seeded.

A small tropical family with about 25 genera, five in Central America but only one of minor economic importance

Ximenia americana L. Sp. Pl. 1193. 1753.

Cagalera, limoncillo, manzanilla, manzanillo, membrillo de monte, pepenance.

The fruits are acid and of inferior quality although sometimes eaten. The bark is said to be astringent and useful in tanning. The seeds are rich in oil. The wood has been substituted for sandalwood. Forms thickets along the coast. Native from Mexico and the West Indies and south through Central America to South America. Old World tropics.

OLEACEAE

Trees or shrubs; leaves usually opposite, simple or pinnately compounded; flowers actinomorphic bisexual; calyx 4-lobed; corolla sympetalous, with usually 4 lobes; stamens 2, rarely 4, epipetalous; ovary, superior, bilocular; styles simple or with bifid stigma; fruits capsular, of samaras or baccate or drupaceous.

Olea europaea L. Sp. Pl. 8. 1753.
Aceituno, oliva, olive.

Olives were said to have been planted in Colonial times. I do not know of any plantings in production in Central America at the present time. The Ministry of Agriculture of Guatemala in 1959 offered 35,000 olive plants to farmers who had lands suitable for olive plantations in western Guatemala.

ONAGRACEAE

Herbs, shrubs or rarely trees; leaves opposite, alternate or verticillate, entire to pinnatifid; inflorescences of a single flower to variously compounded; flowers mostly perfect and regular; hypanthium (calyx tube) often prolonged into a slender tube; sepals 2-6, usually 4; petals 2-5, usually 4, often fugaceous; stamens 1-8, usually 4 in one or two series; ovary inferior, commonly 4-celled; fruit capsular or baccate.

A family of about 20 genera, ten known in Central America.

FUCHSIA. The berries of most species may be eaten or used as a substitute for water. Many are ornamentals.

Fuchsia arborescens Sims, Bot. Mag. 53: t. 2620. 1825.

Flor de verano, amor de verano, amor fino, achiotillo (in Costa Rica, perhaps erroneous name.)

The berries are sweet and edible. Common along the edges of forests and in fence rows where the forest has been cleared at 1,200-2,900 meters from Mexico to Panama. An attractive shrub when in flower.

Fuchsia cordifolia Benth. Pl. Hartw. 74. 1841.
Melocotón, platanillo.

Endemic in Guatemala above 2,400 meters. An attractive plant that might be useful in horticulture. It is used as a "water plant" on some of the high, dry volcanoes since the large fruits provide liquid to sheep herders and hunters. The common names are misleading since both normally apply to very different plants.

Fuchsia splendens Zucc. Flora 1882, pt. 2: Beibl. 102. 1832.
Platanillo, mecolotoncito.

An attractive and beautiful plant of the high forests from Mexico and Guatemala to Costa Rica. A potential cultigen. The fruits are edible.

ORCHIDACEAE

Herbs, vines or suffrutescent plants, usually epiphytic, lithophytic or relatively few terrestrial, a few are saprophytic and a small number are subterranean; stemless or mostly with vine-like of bulb-like stems; leaves simple, usually coriaceous or fleshy and thick, the veins parallel; inflorescence lateral or terminal, of one to many flowers; flowers zygomorphic, minute to very large; perianth of tepals, the inner series petals and the outer ones sepals, normally 3 in each series with one of the inner series (labellum, lip) larger than or different from the others; pollen reduced to 2-8 masses called pollinia, borne on the column; the stigma usually only 1, borne on the column; ovary inferior; seeds minute and very numerous, except in Vanilla.

One of the largest of the families of flowering plants, found mainly in the tropics of the world but a few in temperate regions. There are about 140 genera in Central America with some 1,500 species. Many species are grown as ornamentals, mostly in greenhouses but in lath houses or on trees in the tropics. Only one genus, Vanilla, is of importance as a cultivated crop, the essence used as a condiment.

VANILLA is and was one of the most sought after flavoring materials, now often made synthetically but that inferior to the natural vanilla. A native of Mexico and Central America where it has been used since pre-Columbian times. Vanilla plants were soon carried to the Old World tropics and were widely cultivated. Pollination in plantations is usually done by hand. Vanilla extract is prepared from the unripe but fully grown capsules (beans) after curing. A product labelled "Extract of Vanilla" must contain the soluable matter of the cured beans extracted in alcohol. Old issues of the Dispensatory of the United States contain a method of preparing vanilla extract from the concentrate.

Vanilla planifolia Andrews, Bot. Repos. 8: t. 538. 1809. V. fragrans (Salisb.) Ames, Sched. Orch. 7: 36. 1924.

Vainilla, vanilla.

Native from Florida, Mexico and the West Indies through Central America and Panama to northern South America. Widely grown in the tropics of the Old World.

This is the plant from which the vanilla of commerce comes. See above.

Vanilla pittieri Schltr. Rep. Sp. Nov. 3: 106. 1906.
Vainillón.

Native of Costa Rica. The "beans" are larger and thicker than in V. planifolia but have been used to make a vanilla extract of inferior quality.

Vanilla pompona Schiede, Linnaea 4: 573. 1829.
Vainillón.

Once cultivated for its aromatic properties and used to make vanilla extract. Native or spread by man from Mexico and Central America to northern South America.

OXALIDACEAE

Herbs or trees; leaves alternate, compound, basal on herbs, leaflets entire, stipulate or not; inflorescences simple or compound cymes or umbels; flowers perfect, regular but often asymetric; sepals and petals 5; stamens 10 in two rows; gynoecium 5-carpellate; fruit a capsule or baccate.

Seven pantropical or temperate region genera, only three in Central America.

AVERRHOA. The genus has only two species and these almost always credited to the Old World. Merrill, the outstanding student of Asian tropical flora, believed both species to have been introduced into India from Brazil by the Portuguese after 1500 (Chron. Bot. 14: 301. 1954.)

Averrhoa bilimbi L. Sp. Pl. 428. 1753.
Tiriguro, mimbro.

A tree to 15 meters. The small green fruits are sour but used to make relish or used in cool drinks. The juice is used to remove stains from white cloth. In wet tropical regions of all Central America.

Averrhoa carambola L. Sp. Pl. 428. 1753.
Carambola, star apple.

Native of Brazil and now everywhere in the warm tropics. The fruits are acid but used to make preserves, rarely eaten out of hand. Not Commonly cultivated and then often as a curiosity.

Oxalis hayi Knuth, Notizbl. Bot. Gart. Berlin 7: 316. 1919.
Loch.

The bulbs are said to be eaten raw in Guatemala, and the leaves after being cooked. Both the bulbs and the leaves may be used in many other species. Southern Mexico and Guatemala.

Oxalis neaei DC. Prodr. 1: 690. 1824.

Vinagrillo, agrillo, comino, platanito, hierba de conejo, jocotillo, nancillo, tamarandillo.

Mexico to South America. A common species of which the leaves are sometimes eaten. The common names are mostly diminutives of those of other plants having an acid flavor and names to indicate this.

PALMAE

Mostly unbranched trees, shrubs or sometimes vines of characteristic appearance, terrestrial; the fronds or leaves usually born in a terminal cluster (coma) or scattered along the stem in vines and some shrubby species, the blade simple and flabellate (fan palms) or pinnately compounded (feather palms); the inflorescences usually paniculate and borne below, among or above the leaves, simple in a few genera; flowers small, actinomorphic, perfect or commonly unisexual; perianth of six segments in two series, free or connate; sepals usually imbricate or open in the bud; the petals valvate or imbricate; stamens mostly six; ovary superior, 1-3-celled; fruit a berry or drupe with fleshy, fibrous or leathery exocarp; seeds with the endosperm sometimes ruminate.

A large family with many attractive species, mostly in the tropics and when abundant give a characteristic aspect to the landscape. Most palms occur at low or medium elevations with few in colder and high elevations. There are some 200 genera in the pantropics. Most palms in Central America are not as well known as they might be, due to their large size and the difficulty of preparing adequate specimens for their study.

The palms are a prominent part of the flora of Central America and many of them have economic uses. However their value is sometimes limited to the use of their leaves, often as thatch, or as ornamentals. Coconut palms and African oil palms produce important commercial products. Neither of these palms is native to America although the coconut palm is suspected of having been introduced by ocean current at about the time of discovery.

ACROCOMIA. I assume that there are not more than three species of Acrocomia in Central America,- and perhaps these are really only one. L. H. Bailey (Gentes Her. 4: 420-476. 1941) recognized 25 species, mostly from South America. I have seen Acrocomias in all of our region, in fact lived in a grove of them for years, and could not distinguish them one from another in the field. Fats and oils have been reported from the fruits of these palms but I have never seen or heard of these products in Central America.

Acrocomia belizensis Bailey, Gentes Herb. 4: 445, tt. 273-274. 1941.
Suba.

Whether or not and how this Belizan species differs from the following one I do not know. The uses are the same.

Acrocomia mexicana Karw. ex Martius, Hist. Nat. Palm. 3: 285, t. 138. 1845.

Coyol, grugru, suppa palm, supa, tuc, map, cocoyol, coyoo, wine palm, palmito de coyol (the palm cabbage); coyolar, the place where the palm is abundant.

Native of southern Mexico, Guatemala, Belize (?), El Salvador, Honduras, perhaps further south.

The fruits are eaten by cattle and sometimes by men. The hard nuts are broken open and the kernels eaten. The trees are felled and one or more troughs are cut into the trunk and these fill with sap which soon ferments. The fermented sap is called vino de coyol. The government of Honduras once collected, or tried to collect, a tax on the cutting of coyol palms for "wine" making. The palm has been, or still is used for this purpose in Honduras, Nicaragua and Costa Rica (see the following species.) Palm cabbages once were common in the markets of El Salvador but the species is probably exterminated there now. I never saw palm cabbages from this species offered elsewhere in Central America. Standley has reported the palm to have been cultivated at Tela, Honduras. The spiny fronds are rarely used as thatch.

Acrocomia vinifera Oerst. Vid. Medd. Kjoebenhavn 1858: 47. 1859.

Coyol.

This coyol I can not distinguish from Acrocomia mexicana. It was once abundant on the savannas of the Pacific slopes of Costa Rica. The specific name doubtless comes from the coyol wine made from the trunks of the palm. Other uses are doubtless the same as for other coyols.

ASTROCARYUM. Three species are found in Central America, A. alatum Loomis, A mexicanum Liebm., and A. standleyanum. The wood of all is exceedingly hard and black. The kernels of the seeds may be edible. This is a group of excessively spiny palms called Lancetilla, güiscoyol, waree cohune, cohune or pejibaye.)

(BACTRIS. A rather large genus (probably) of excessively spiny and unlovely palms. Several are reported to have fruits that are eaten but the scant acidulous pulp in not very enjoyable. The following have been reported: B. balanoidea (Oerst.) Wendl., huiscoyol of Costa Rica, frequently eaten locally; B. major Jacq., biscoyol, the pulp and the kernels of the seeds are eaten in Honduras, Nicaragua and Costa Rica; B. subglobosa Wendl., huiscoyol, of which the "seeds" are said to have been eaten in El Salvador. See also Guilielma.)

Calyptorgyne sarapiquensis Wendl. ex Burret, Bot. Jahrb. 63: 134. 1930.

Cola de gallo, coligallo, siuta.

The fronds are used along the coast and swampy lowlands of Costa Rica as thatch for houses. Common and often in dense stands.

Caryota urens L. Sp. Pl. 1189. 1753.

Wine palm, toddy palm, palma comida por las ratas.

An attractive ornamental palm. The curious Guatemalan name comes from the "ratty" look of the leaf segments.

CHAMAEDOREA. A group of mostly small and attractive palms, perhaps more than a hundred species from Mexico to Bolivia and of difficult taxonomy. While these plants have some economic importance as prestige foods their greater importance is as horticultural plants. Markets in Guatemala, El Salvador and Costa Rica often have the unopened staminate spadices offered for sale. I have not seen them in markets in Honduras or Nicaragua although they must be collected in these countries. The spadices with pistillate flowers are usually not used for food since the flowers are bitter and on some kinds all flowers are bitter. The immature inflorescences are taken from the spadices and either eaten uncooked in salads or boiled, fried in an egg batter or used in soups. Chamaedoreas were once quite extensively cultivated for market in Alta Verapaz and perhaps to a lesser extent in Costa Rica. It is believed that several of the Mayan tribes of Guatemala may have cultivated these palms for centuries. It is probable that species other than those given below may have been used for food. Many are in horticulture, locally and for the export trade.

Chamaedorea bifurcata Oerst. Kjoeb. Vid. Medd. 1858: 13. 1859.

Pacaya.

Several Costa Rican species of which the tender inflorescences, growing points and undeveloped leaves are used for food are called pacaya, as most of them are through Central America where they are used for food.

Chamaedorea costaricensis Oerst. Kjoeb. Vid. Medd. 1858: 19. 1859.
Pacaya.

See notes on species above. Costa Rican.

Costa Rica, and I have seen in markets in San Salvador spadices that seemed to belong to this species. The species now possibly exterminated in El Salvador.

Chamaedorea macrospadix Oerst. Kjoeb. Vid. Medd. 1858: 20. 1859.
Pacaya.

Chamaedorea graminifolia Wendl. Index Palm. 62. 1854.
Pacaya, cuilote amargo, cuilote.

Costa Rican and possibly once, or still, cultivated for the spadices.

Chamaedorea pacaya Oerst. Kjoeb. Vid. Medd. 1858: 12. 1859.
Pacaya.

Costa Rican. The common name taken as the specific name although pacaya is applied to several Central American species. Like others the inflorescences and tender growing points are used. Once common in the markets in San José but the wild plants are becoming scarce due to the destruction of the forests.

Chamaedorea parvifolia Burret. Notizbl. Bot. Gart. Berlin 11: 746. 1933.
Pacaya.

One of the species in which the inflorescence is used for food. I have not seen it in the Costa Rican markets.

Chamaedorea tepejilote Liebm. in Martius, Hist. Nat. Palm. 3: 308. 1849.
Pacaya.

Cultivated in Alta Verapaz for market and perhaps the best of the Chamaedoreas. Native from Mexico to Colombia. Stand-

ley thought that the word pacaya was possibly of Quechua origin since it was widely used in South America as well as in Central America. Standley says, further, that "tepejilote" used as the specific name is of Nahuatl origin and signifies "Mountain maize." Jilote is commonly used in Central America for very tender ears of maize.

Cocos nucifera L. Sp. Pl. 1188. 1753.

Cocos, cocotero, coconut palm, often written erroneously as cocoanut palm.

The coconut palm is certainly an Old World species where it is almost entirely man-distributed. Coconuts were in America and established sometime before the conquest but seem to have been only along the west coast from Panama possibly as far south as present day Ecuador. They are now man-distributed along both coasts of Central America and often planted far inland. Literally thousand of things have been made from the coconut palm. It may well be mankind's greatest provider in the tropics. (See Oscar K. Moore, Econ. Botany 2: 119-144. 1948). While the palm is important in Central America its great importance is in the paleotropics. Commercial plantings have been made at many places, especially by the United Fruit Company which had more than 14,000 acres in plantations mostly in Jamaica but also in Honduras, Costa Rica and Panama. The Central American plantations were not profitable nor successful due to bud rot and nematode red ring and were abandoned.

Commercial products from coconuts are many. The husks provide coir, a short rough fiber which when made into ropes or cables is light in weight and water resistant. Coir is made into brushes, door mats, sacks and coarse textiles. Copra is the dried coconut meat which provides oil and oil cake. World production of copra in 1958 was 2,881,000 metric tons of which more than half came from the Philippines. Sugar is obtained by tapping the unopened inflorescences. Coconut thatch used everywhere. The export of coconuts to markets in the north is of some importance to several tropical American countries.

Coconuts produce through the year hence are a year around source of food. Coconut milk is a useful drink always seeming to be cool and a safe drink where water is questioned

as it is in most places in our tropics. A palm wine, like coyol wine, is made in the Bay Islands (Honduras) by felling the palms and cutting troughs in the trunk where the sap collects and ferments.

Biochemical analyses for Central American coconut meat and milk are to be found in Munsell & Williams, Food Tecnology 14: 10, 20, 447. 1950 and 15: 15, 49. 1949.

Corozo oleifera (HBK.) Bailey, Gentes Herb. 3: 59. 1933.
Corozo, coquito, palmiche.

The fleshy pericarp is used to extract an edible oil. Costa Rica and Panama.

CRYPSOPHILA. A genus of perhaps 4 or 5 species in Central America. C. argentea Bartlett is used for thatch and to make brooms in Belize and Guatemala.

(DESMONCUS. A genus of some 50 species with perhaps a dozen in Central America which are not very distinctive. They are scandent palms with hooked or straight spines, common in many places in the wet lowlands and often reach a length of 100 meters or more. The tough and flexible stems are used as ropes and either the stems or strips of bark are used to weave durable baskets. The common name bayal is often used.)

Elaeis guineensis Jacq. Select. Stirp. Hist. 280. 1763.
Oil palm, African oil palm, palma de aceite, palma africana.

Native of western Africa and now cultivated widely in the wet tropics. The plantation stock in the neotropics all came from improved or selected strains from Dutch plantations in Sumatra, Java and Malaysia. These were grown out by the United Fruit Company at the Lancetilla gardens in Honduras and in Costa Rica. Some 25,000 acres of oil palm were planted in these two countries and factories were established to extract both the pericarp and the kernel oils.

Palm oil is a white fat usually solid at ordinary temperatures and is a good edible oil. Well cared for and good plantations will produce more oil per hectare in the tropics than any other plant, to 3,000 kg. or more. Locally produced edible oils are normally in short supply in our region.

Erythaea salvadorensis (Wendl. ex Beccari) H. E. Moore, Gentes Herb. 8: 217. 1951.

Palma. (!)

An attractive palm found at 800-1,000 meters from Guatemala and El Salvador to Honduras. Hats are made from the leaves of this palm in El Salvador.

Euterpe longipetiolata Oerst. Kjoeb. Vid. Medd. 1858: 32. 1859.

Palmito, pacaya de ratón, palm cabbage.

Costa Rican. Tall graceful palms of the wet forests. Stacks, like ricks of wood, were once seen along Costa Rican roads waiting to be transported to San José where they were roasted in bakeries, especially during Easter time. The tender white growing points weighing 2-3 kg. are bitter but much appreciated. Probably now rare and will be exterminated.

GEONOMA. One of the large genera of American palms usually found in wet forests. Mostly small, graceful and attractive plants. Some are in horticulture out of the 200 or so found in the neotropics. The leaves from some species are used for thatch.

Geonoma binervis Oerst. Kjoeb, Vid. Medd. 1858: 33. 1859.

Súrtuba; manaca, pacuca.

Mexico to Panama. The tender inflorescences are cooked and eaten. Once common in Costa Rican markets. The leaves are used for thatch.

Geonoma edulis Wendl. ex Spruce, Jour. Linn. Soc. 11: 106. 1871.

Súrtuba.

The terminal buds and cabbages are eaten, once common in highland Costa Rican markets.

Geonoma mexicana Liebm. ex Martius, Hist. Nat. Palm. 3: 316. 1850.

Pamac, canpamac.

Mexico to Costa Rica along the Atlantic coast. The inflorescences are eaten in Honduras and doubtless elsewhere. The leaves are used as thatch.

Geonoma microstachys Wendl. ex Burret, Bot. Jahrb. 63: 228. 1930.

Coyolito.

The fruits are said to be eaten in Nicaragua.

Guilielma gasipaes (HBK.) Bailey, Gentes Herb. 2: 187. 1930. G. utilis Oerst. Kjoeb. Vid. Medd. 1858: 46. 1859. Bactris gasipaes HBK. Nov. Gen. Sp. 1: 302, t. 700. 1816.

Pejibaye, pijibaye, pejiballe, pijibay, pixbae, pixbay, peach palm.

Native probably in Colombia and introduced in pre-Columbian times to Costa Rica, now planted in Honduras and doubtless elsewhere in Central America. Pittier says (Pl. Usuales de C. R. 125. 1908) that it was cultivated since remote times and that it was known there as a wild plant. The fruits borne in racemes are the size of small peaches and yellowish to reddish. The fruits are cooked and the farinaceous pulp, which has the flavor of chestnuts, is eaten by everybody. The fruits are offered hot in markets and by street vendors. They take a bit of "getting used to" by outsiders.

Manicaria saccifera Gaertn. Fruct. & Sem. 2: 469, t. 176. 1791.

Yolillo, confra, manaca, temiche palm.

Belize to Brazil in brackish coastal swamps.

The large leaves are used for thatch and are said to be more durable than most palm thatch. The seeds contain an oil, probably not used in Central America.

Orbignya cohune (Mart.) Dahlgren ex Standl. Trop. Woods 30: 3. 1932.

Corozo, manaca, cohune, tutz, corós.

Native and abundant along the Atlantic lowlands from southern Mexico to Honduras (and perhaps to Costa Rica.)

The largest of the native palms and up to 15 m. tall and very attractive. The fruits are large, to 6 cm. long and resemble small coconuts. There are as many as a thousand nuts in the heavy, pendant inflorescences. The leaves are very large, to 18 m., but mostly 10-12 m. long and plume-like. The trunks and rhaches of the leaves are used in construction. The leaves are usually called "manaca" and from this comes the term "manaca shack," often used by English speaking people, for the houses built from this palm. The nuts have been used to produce a cooking oil and a machine to crack the very durable nuts was once "invented" in Belize where there were said to be more than 800,000 hectares of this palm. So far as I know no industry based on the nut has persisted. The kernel of the nut has been reported to contain 61-75o/o of oil. The palm has been reported also to be a potential source of furfural with 17.8o/o in the shell and 6.4 in the husks.

(Phoenix Dactylifera L. Sp. Pl. 1188. 1753.
Datil, datilero, date.

Native of northern Africa. Planted for its fruits in the subtropical area of California, Arizona and adjacent Mexico. Occasional in Central America as a curiosity but not known to produce fruits.)

Raphia taedigera Mart. Hist. Nat. Palm. 3: 217. 1838.
Yolillo, holillo, jolillo, raffia.

Nicaragua and Costa Rica. Allen in his "rain forests of Golfo Dulce 310-311. 1956," comments that the tremendous stands would be tapped for sugar in the Asiatic tropics but that nothing of the sort is attempted in our hemisphere. The pliable fibers of the leaves are used in weaving or as ties for horticultural purposes. A bitter red oil is extracted in Brazil and used to color soap.

Roystonea regia (HBK.) O.F. Cook, Science II 12: 479. 1900.
Palma real, royal palm.

A palm prized as an ornamental and often planted along driveways. The driveway at the entrance of the botanical garden in Río de Janeiro has a very fine and spectacular group of

these palms said to have been planted in 1808. Native of Cuba. Other species of Roystonea may be expected as ornamentals in our area.

Sabal mexicana Mart. Hist. Nat. Palm. 3: 246. 1838. Botán, sabal.

Native of Guatemala and Mexico. The leaves are used in weaving and for thatch for roofs and sidings of shacks in the hot, dry valleys of Guatemala.

SCHEELEA. Very similar in appearance to the common corozo palm, Orbignya cohune and often growing intermixed with them. There are thought to be six species in Mexico and Central America and oil may be extracted from them.

Scheelea lundellii Bartlett, Carnegie Inst. Wash. Publ. 461: 46, t. 1-5. 1935.

Corozo.

Possibly only in Guatemala with the uses the same as those of the following species.

Scheelea preussii Burret, Notizbl. Bot. Gart. Berlin 10: 678. 1929.

Corozo, manaca, coquito.

Native of southern Mexico and the Pacific plains of Guatemala. Commonly used for thatch in western Guatemala and to make rain capes, fans to start fires, and brooms. The cabbage is eaten either raw or cooked. Oil is extracted from the kernels and used to make soap.

Socratea durissima (Oerst.) Wendl. Bonplandia 8: 103. 1860.

Palmito, maquenque, matuenque, chonta, palmilera, stilt palm.

Costa Rican. The wood is hard and durable and used in construction by the inhabitants of the Talamanca and Atlantic slope. The cabbages and young leaves are said to be eaten but that they are somewhat bitter.

Washingtonia filifera (Lind.) Wendl. Bot. Zeit. 37: 68. 1879.

Palma pendula.

Native in California, Arizona and adjacent Mexico. Occasionally planted in Guatemala and doubtless elsewhere as an ornamental.

Welffia georgii Wendl. ex Burret, Engl. Bot. Jahrb. 63: 125. 1930.

Palmito, palma conga, palma real.

Costa Rica and Panama.

Allen says that the crown yields a sweet, edible palm cabbage.

(PANDANACEAE

Trees or shrubs, often or usually with branched stems; leaves linear or lanceolate, sessile and sheathing at the base, margins usually spiny; fruits drupaceous or baccate.

Old World, a few kinds introduced as ornamentals into Central America where Pandanus dubius Spreng. and P. tectorius Solander are occasionally seen. Coarse textiles are woven from the fibrous leaves in southeastern Asia and Oceania.

PAPAVERACEAE

Herbs or rarely shrubs or trees, usually with colored sap; leaves alternate, entire or deeply dissected; flowers perfect, regular, some of ours large and showy; sepals 2-3, soon falling away; petals 4-6, free, deciduous; stamens usually many, free; ovary 1-many-celled; fruit capsular, dehiscing by pores or valves; seeds many, often very small.

A family mostly of the temperate regions, only two genera with native species in Central America but about 25 genera and perhaps 250 species worldwide.

Argemone mexicana L. Sp. Pl. 508. 1753.

Chicalote, cardosanto, prickly poppy.

Native supposedly of Mexico and possibly Central America, weedy and naturalized in the tropics of much of the world. The seeds have been a source of oil in India, used as an illuminant, as a medicinal, and in soap manufacture. In Nyasaland the seeds are said to be narcotic and to make a native beer more intoxicating. In Central America the plant has been little used, except perhaps the latex used as a purgative in Costa Rica and in Guatemala as a cure for drunkenness.

Bocconia arborea S. Wats. Proc. Am. Acad. 25: 141. 1890.

Quiebra muelas, palo de matates, tiñecanastas, llore sangre, sangre de chucho, saupé de chucho.

Native or spontaneous from Mexico to South America. The bark gives a yellow dye to color baskets or mats, said to have been used to color feathers in pre-Columbian Mexico. The latex is said to contain alkaloids similar to those of the poppy and that these have been used as a local anesthetic in surgery. In Guatemala the seeds have been used as a toothache remedy.

Bocconia frutescens L. Sp. Pl. 505. 1753.
Native from Mexico and the West Indies to Panama.

Used as a source of a yellow dye in Belize. The alkaloids from the latex are said to have been used as anesthetics.

Bocconia vulcanica Donn.-Sm. Bot. Gaz. 16: 1. 1891.
Cerbatana, quiebra-muelas.

Native of Guatemala and adjacent Mexico, used as a remedy for toothache.

Papaver rhoeas L. Sp. Pl. 507. 1753.
Adormidera, poppy, corn poppy.

Native of Europe and planted as an ornamental in Central America.

Papaver somnifera L. Sp. Pl. 508. 1753.
Adormidera, amapola, azumbador, tulipán, opium poppy.

Native of the Old World and planted occasionally in Central America as an ornamental. Cultivated extensively in Asia Minor, the Balkans, southeastern Asia, China and elsewhere for

the alkaloids derived from the crude opium which comes from the incised immature capsules. The drugs obtained are some of the most useful known to the medical profession and, especially in recent years, these same drugs have become some of the most abused and vicious ones because of misuse. I do not know of this poppy being grown in Central America except as an ornamental.

PASSIFLORACEAE

Herbaceous or woody vines, rarely trees; leaves alternate, simple or compound, often lobate; flowers perfect; sepals 5-4, distinct or connate at the base; petals 5 or 4 or wanting, distinct or connate at the base; corona usually fleshy, situated between the perianth and the androecium; stamens 5 with the filaments formed into a tube; ovary borne on a conspiuous elongate gynophore, ovoid or globose; fruit indehiscent, containing a mucilaginous pulp which holds the seeds.

More than 350 species known in tropical America. The flower of Passifloras is distinctive and of complicated structure. The corona was associated by the early Spanish explorers with the emblem of the crucifixion of Christ and the name pasionaria applied to these plants is the Passiflora of the botanical name.

It is probable that the fruits of Passifloras, in addition to those given below, may be eaten. Some are especially fine with interesting flavors.

Passiflora ambigua Hemsl. Bot. Mag. 128: t. 7822. 1902.

Granadilla, granadilla de monte.

The fruits have been described as large and edible. Found from southern Mexico to Panama.

Passiflora edulis Sims, Bot. Mag. 45: t. 1989. 1818.

Granadilla, granadilla silvestre, granadina.

Native of southern Brazil and Argentina, perhaps sometimes spontaneous in Central America from cultivation. The fruit is 4-5 cm. long and to my taste not very good.

Passiflora foetida L. Sp. Pl. 959. 1753.

Granadilla, granadilla de culebra, sandía de ratón, granadilla colorada.

In the tropics of America and introduced into the paleotropics. Several varieties are described. The small greenish fruits are sometimes eaten.

Passiflora ligularis Juss. Ann. Mus. Hist. Nat. 6: 113, t. 40. 1805.

Granadilla, cranix.

The only passion flower commonly grown in Central America and the fruit by far the best of them. Found in season in markets everywhere. The fruits, with a tough rind, are broken open and the slightly acidulous sweet pulp is eaten along with the crunchy, crisp seeds. I have never seen the plant where it could have been undoubtedly native. The species was probably widely distributed in pre-Columbian times for its fine fruit. It is found now from central Mexico through tropical South America. The name granadilla which the Spaniards gave to the fruit indicates its resemblance to the Old World granada, pomegranate, is used everywhere in Central America almost to the exclusion of any indigenous names that may have existed.

Passiflora membranacea Benth. Pl. Hartw. 83. 1841.

Granadilla.

Native from southern Mexico to Costa Rica. Reported to be eaten in Costa Rica. I have never seen fruits offered in markets and wild plants seen did not have fruits of much value.

Passiflora platyloba Killip, Journ. Wash. Acad. Sci. 12: 260. 1922.

Granadilla, granadilla ácida, granadilla montés.

Native from Guatemala to Costa Rica and said to be used in El Salvador in making ices.

Passiflora quadrangularis L. Syst. ed. 10. 1248. 1759.

Granadilla real, granadilla de fresco, melocotón.

Widely dispersed by man and the place of origin not known. The fruits are large but light in weight and used to flavor beverages. Occasionally cultivated and seen in markets.

Passiflora serratifolia L. Sp. Pl. 955. 1753.
Granadilla.

Native or perhaps man-distributed from Mexico to Costa Rica. The fruits are 5-9 cm. long, yellow, and when mature are edible.

PEDALIACEAE

Erect herbs with the lower leaves opposite; flowers axillary usually solitary, perfect, zygomorphic; calyx 5-lobed; corolla oblique, sometimes gibbous at the base, the limb usually bilabiate and 5-lobed; stamens 4 in 2 pairs, or rarely only 2; fruit usually a rostrate 4 loculed bicarpellate capsule.

An Old World family with about 14 genera and some 50 species, one commonly cultivated in our region.

Sesamum indicum L. Sp. Pl. 634. 1753. S. orientalis l.c.
Ajonjolí, sesame.

An annual crop grown for the seed. The seeds are used as a condiment or oil is expressed from them. Native in the Old World and now commonly grown in the drier tropics and subtropics everywhere. In Central America grown in Guatemala, El Salvador and Nicaragua. Mexico is the largest producer in North America. India and China are the large producers in the world with more than a half million tons each. First quality sesame oil is almost tasteless and colorless. It is used to make salad oils, shortenings, margarine and for special purposes in pharmaceuticals and cosmetics. Poorer grade oils go into soaps and synthetics. The cake is a good stock food. The seeds are commonly used to add flavor to bread, to flavor candy or as the principal ingredient in some kinds of candy.

PHYTOLACCACEAE

Herbs or shrubs; leaves opposite, usually entire; inflorescences terminal or axillary, racemose or sometimes paniculate;

flowers perfect or unisexual; sepals 4-5, often persistent; petals usually none, sometimes 5; stamens 3-many; carpels 1 or more with equal number of styles; ovary superior or partly inferior; fruit drupe-like, berry-like or capsular.

A small family of about 15 genera and 100 species or more, mostly in the American tropics. The family is of little importance in Central America.

Petiveria alliacea L. Sp. Pl. 342. 1753.

Apacina, hierba de zorrillo, zorrillo, apazote de zorro, epacina, ipacina, apacín, hierba de zorro, skunk weed.

Used in domestic medicine and in Guatemala said to be used to induce menstruation. An unpleasant plant both because of the odor and the fruits with hooked spines that adhere to clothing or will even penetrate the skin. Found in most tropical regions in this hemisphere.

Phytolacca dioica L. Sp. Pl. ed. 2. 632. 1762.
Ombú, umbú.

The famous ombú of Argentina. I have seen it as an ornamental in Guatemala and Comayagua. It is picturesque,- that and its shade are about all the virtues it has.

Phytolacca icosandra L. Syst. Nat. ed. 10. 1040. 1759.

Jaboncillo, almorsaca, mazorquilla, ixmaxím, calaloo, calalú, tinta, scorpion tail.

Often a weed at middle elevations. Mexico through Central America to South America and naturalized in the Old World tropics. Said to be used like spinach by the Jamaicans in Costa Rica. The green fruits are collected in the Guatemalan highlands and doubtless elsewhere, as a soap substitute. The ripe, red, fruits are not used as they stain cloth. The fruits are thought to be poisonous but they are sometimes eaten in small quantities. The roots are poisonous.

Phytolacca rivinoides Kunth & Bouché, Ind. Sem. Hort. Berol. 1848: 15. 1849.
Quilete, cola de ardilla, calalú, pinta-machete, jaboncillo.

Mexico through Central America and the West Indies to South America. The tender shoots are eaten as pot herbs. The roots are used in Honduras as a soap substitute.

Phytolacca rugosa Braun and Bouché, Ind. Sem. Hort. Berol. 1851: 13. 1852.
Jabón, jaboncillo, mazorquilla.

Native or spontaneous from Mexico through Central America and Panama to South America.

The unripe fruits are used as a substitute for soap. Perhaps not distinguishable from P. icosandra above.

Rivina humilis L. Sp. Pl. 121. 1753.
Achotillo, chile, chile de ratón, tomatillo, coralillo.

Native of the American tropics or spread as a weed, naturalized in the Old World tropics. The red juice of the ripe berries is sometimes used as a dye or as ink.

PINACEAE

Usually large trees; the leaves persistent, "evergreen", resinous, spirally arranged, solitary (Abies) or in fascicles (Pinus); flowers naked, unisexual, subtended by scales; fruit a cone, usually woody and made up of indurated scales; seeds usually winged on one margin. — See also Araucariaceae, Cupressaceae and Taxodiaceae, the other families of gymnosperms found in Central America.

An important family of timber trees with about 9 genera and some 200 species, most all of the northern hemisphere. There are only two genera native in Central America, Abies with one species in Guatemala, Honduras and perhaps once in El Salvador and Pinus with five species of which all are in Guatemala and two extend as far as Nicaragua. The pines are the most important trees of the world for timber and resin production. Carlos Balser, well known Costa Rican archaeologist recovered some material from a pre-Columbian grave at Guapiles which when analyzed seemed to be pine rosin. If the determination is correct then perhaps Pinus caribaea extended farther south along the Caribbean coast than known in historical times,- or the resin was brought south in trade.

Abies guatemalensis Rehder, Journ. Arn Arb. 20: 285, f. 1. 1939.
Pinabete.

Native in Mexico and Guatemala, limited to Santa Bárbara mountain in Honduras, reported by Molina from El Salvador but perhaps now exterminated there. Beautiful but limited stand in the western highlands of Guatemala where it was once cut for lumber. The remaining stands are now protected and cutting for any purpose is prohibited. It is hoped that this tree may persist but regeneration is poor since these forest lands are much overgrazed by sheep. This species was formerly confused with Abies religiosa, a Mexican fir to which it is closely related.

Pinus ayacahuite Ehrenb. Linnaea 12: 492. 1838.
Pino, pino dulce, pachá.

A majestic pine of the highest mountains of Mexico, Guatemala, and at one location on Santa Bárbara mountain in Honduras. Used for lumber in Guatemala, and formerly for resin extraction. Becoming rare.

Pinus caribaea Mor. Rev. Hort. Cote d'or 1: 105. 1851.
Pino, pino colorado, pino de ocote, ocote, slash pine.

Once abundant along the gulf and Caribbean coasts of Mexico south to Nicaragua and in the West Indies, still fairly common in parts of that region where it occurs up to about 600 meters. Known from one locality on the Pacific slope of Honduras (Río Choluteca valley) at 600-700 meters. An important tree for lumber and for the extraction of resin. The tree has been used in trials for making hard board and kraft paper pulp for which it was deemed satisfactory. I saw large plantations of what I presumed to be this species in South Africa under the name Pinus hondurensis Loock. It seemed to be a successful plantation crop there. Locally used for lumber in our range.

Pinus oocarpa Schiede, Linnaea 12: 491. 1838.
Ocote, pino de ocote.

Native from Mexico through Guatemala and Honduras to Nicaragua. This is the most abundant and most importance pine in Central America. It is the most important tree in Honduras

where there are still large expanses of pine forest between 800 and 1,600 meters. The lumber industry of Honduras now is based principally on this tree since the fine hardwoods of the tropical forests on the coast, mahogany and others, have been nearly exterminated. There was important production of "naval stores," the oleoresin, in Honduras and Nicaragua years ago. Some is still produced but it is now uncommon to find trees that have been tapped. Ocote pine was abundant in El Salvador during the colonial period but there are probaly no native stands left in the country. The pine forests extend to a bit north of the lake region, in Nicaragua.

Large lumber operations still are the main source of income in the Ocotal region of northern Nicaragua. It is probable that the forests will be reduced nearly to extinction before the end of the century. Large quantities of the seeds form the highlands of Honduras were sent to South Africa years ago so it is possible that there may be plantations there now.

Pinus pseudostrobus Lindl. Bot. Reg. 25: misc. 63. 1839.

Pinabete, pino, pino de ocote (erroneously), pino blanco.

A superb pine of the moist highland mountains at 1,000-3,000 meters from Mexico to Guatemala and Honduras. Limited stands may still exist in the mountains of Belize but the species is probably exterminated in El Salvador and Nicaragua. Pinabete is the finest of the lumber producing pines of Central America, probably never abundant and now existing only in areas difficult of access. It will probably be exterminated in Central America before the turn of the century.

Pinus sp.
Ocote.

There were large stands of a fine lumber pine in central Honduras around Lake Yojoa forty years ago. It produced better lumber than P. oocarpa or P. caribaea and was a larger tree than either of those species. I was never able to find a name for this pine and hesitated to describe it because of the difficulty of distinguishing these yellow pines. Small stands still existed in 1975.