ROSACEAE

Herbs, shrubs or trees with persistent or deciduous leaves; leaves alternate (rarely opposite), simple or compound, usually with stipules; inflorescence from simple to variously compound, axillary or terminal; perianth perigynous; flowers mostly perfect and actinomorphic, the basal parts usually adnate into a hypanthium which bears sepals, petals and stamens on its margin; sepals 4-5 or rarely none; petals 4-5, rarely none; stamens 5-many; carpels 1-many, distinct or united and often connate with the receptacle; ovary inferior or superior; fruit a follicle, achene, drupe, hip or pome.

A large worldwide and diverse family but most abundant in north temperate regions. Perhaps 120 genera and 3,000 species with about 24 genera in Central America. Many of the important fruit crops of the world belong in this family and many of them originated in temperate Europe and Asia. These fruit crops, most of them trees, that are important in Central America belong in the genera Cydonia, Eriobotrya, some Fragaria, Malus, Prunus and Pyrus. Both introduced and native species of Rubus are grown for the fruits or fruits collected from wild plants.

Amelanchier denticulata (HBK.) Koch, Dendrol. 1: 183. 1869.

Membrillo, membrillito, manzanita, cerezo rojo, huitón.

Native from Texas and Mexico to middle elevations in Guatemala and Honduras. The fruits are eaten but are rather bitter.

Chrysobalanus icaco L. Sp. Pl. 513. 1753.

Icaco, coco-plum, pigeon plum.

Native from Florida, Mexico and the West Indies through Central America to South America mainly along the sea. The shrub is quite abundant in many places in Central America. I have seen fruits offered in markets in all countries except Nicaragua. The fruits are oval or globose and 2-4 cm. long, white to dark purple and in my opinion rather insipid and of little value. Cultivated forms are said to produce better fruits. The large seeds contain abundant oil and are reported to be

strung on sticks and used as candles in the West Indies. A black dye is obtained from the fruits and leaves.

Couepia polyandra (HBK.) Rose, Contr. U. S. Nat. Herb. 5: 196. 1899.

Zapote bolo, zapotillo, zapotillo amarillo, munzap, sunzapotillo, suncillo, baboon cap, monkey cap, uluzapote.

A tree native from Mexico to Costa Rica, or at least planted in some of our area. The fruit is 5-8 cm. long with juicy, yellow pulp, sweet and quite good but fibrous. Not popular enough to get into markets.

Crataegus pubescens (HBK.) Steud. Nom. Bot. ed. 2. 433. 1841.

Manzanita, manzanillo.

Probably native in Mexico and carried in colonial times to Central America and as far as Ecuador where it is now naturalized. Common in many places in Guatemala as a naturalized tree, cultivated in El Salvador and Costa Rica. The orange-yellow fruits, 2-3 cm. in diameter and not very good when raw. Used as a much sweetened cooked fruit or to make jam or jelly, to flavor rum or carbonated drinks.

Cydonia oblonga Miller, Gard. Dict. ed. 8. 1768.
Membrillo, quince.

Native of western Asia and still grows wild there. Cultivated since ancient times, found in all Central American countries where it is cultivated for the apple-sized fruits which are used commonly to make jams and jellies. Curiously the rather hard acid fruits are eaten out of hand. Naturalized in Honduras and doubtless elsewhere.

Eriobotrya japonica (Thunb.) Lindl. Trans. Linn. Soc. 13: 102. 1822.

Níspero, níspero japonés, níspero del Japón.

Native of Japan and now widely cultivated for its dull yellow, pear-shaped fruits which are 3-4 cm. long. The flavor

is good and although seen in Central American markets it is not much appreciated. I saw fruits in Angola superior to anything seen in tropical America. It was used as a dessert fruit in the hotel there.

FRAGARIA. The strawberries in Central America are introduced but have become naturalized in several places. It is not at all certain what species we have but possibly, even probably, all three species found in temperate America as wild plants or cultigens are present as species or hybrids. Fragaria virginiana is a fine wild berry from temperate North America and is doubtless a part of hundreds of cultivars. Fragaria vesca, the European berry, is the source of the everbearing strawberries. Fragaria chiloensis, native in western America from at least as far north as Mexico, perhaps to California and Alaska, south to Chile. The majority of cultivars are derived from the last one mentioned, especially those with large but sometimes not very flavorful fruits. The name Fragaria chiloensis var. ananassa Bailey is used by some botanists and horticulturists to represent most of the cultivated strawberries. Strawberries, called fresas everywhere, are to be found in most highland markets in season. Their principal uses, as elsewhere in the world, are as fresh fruits, to make jams and jellies and flavoring for various foods and drinks. Uncooked fruits are suspect, especially if the fields were irrigated with contaminated water as is probably often the case. I do not eat them but most people do, sometimes to their sorrow!

(HIRTELLA. Five or six species are known in Central America, most perhaps with astringent bark that might be used in tanning and dying. The fruits of Hirtella racemosa Lam., widely distributed from Mexico and the West Indies to South America, are sweet and edible but the taste of the scant flesh is not attractive. Called aceituno colorado or wild cocoplum.)

Licania arborea Seem. Bot. Voy. Herald 118, t. 25. 1852-53.

Alcornoque, roble blanco, encino, roble caja de niño, jobo, canilla de mula, Mexican oiticica.

The seeds are said to contain up to 30o/o of oil similar to oiticica oil which is a drying oil used in paints, varnishes,

printers' ink and for other purposes. I do not know of exploitation of this oil in Central America.

Licania platypus (Hemsl.) Fritisch, Ann. Naturhist. Hofmus. Wein 4: 53. 1889.

Sunza, sonzapote, sunzapote, súngano, sapote, caca de niño, urraco, monkey-apple.

The large fruits, 15-20 cm. long and nearly as broad have deep yellow fibrous flesh which is juicy and sweet. Often in markets but not universally appreciated since it is thought to be unhealthy. In lowland forests from southern Mexico to Colombia.

MALUS. The apples, pears and quinces were all placed in the genus Pyrus by Linnaeus (Sp. Pl. 479-480. 1753). Bailey's very useful Manual of Cultivated Plants (revised edition, 1948) maintains them as three genera, as I have done in this work, more for convenience than any other reason since they are kept as three genera in Flora of Guatemala.

Malus pumila Miller, Gard. Dict. ed. 8. 1768. **Pyrus malus** L. Sp. Pl. 479. 1753. **Malus sylvestris** Miller, l.c.

Manzana, perote, apple.

Apples were native of Europe and western Asia and have been in cultivation for more than 3,000 years. There are now an endless number of horticultural varieties and some few are in Central America, mainly in the highlands of Guatemala and Honduras. The small "crab-apples" called perote in Honduras may be one of the many varieties of **Malus baccata** (L.) Borkh., perhaps brought from Spain in colonial times.

Apples are the most important of the fruit crops in temperate regions of the world but of little importance in our region. Apples occasionally are cultivated in Guatemala, Honduras and El Salvador at 1,200 to about 2,300 meters. The fruits are mostly small and poor. Apples sold everywhere by street peddlers and in markets are mostly from Washington or California.

PRUNUS. There are several species of stone fruits of the genus **Prunus** cultivated in Central America. The introduced

Old World kinds all have flowers solitary or in umbells. The native species all have flowers in racemes and of these only one kind is cultivated.

Prunus avium L. Fl. Suec. ed. 2. 165. 1755.
Cereza, guinda, sweet cherry.

Native of Eurasia and long in cultivation. I have seen cherries in western Guatemala probably of this species.

Prunus capuli Cav. Anal. Hist. Nat. (Madrid) 2: 110. 1800.
Capulín, cereza, wild cherry.

Native of Mexico and possibly also of Guatemala, or more likely distributed by early man. Carried in colonial times to Ecuador and Peru. An important fruit in western Guatemala and a quite good one. In most markets in season.

Prunus domestica L. Sp. Pl. 475. 1753.
Ciruela, plum.

Native of southwestern Asia. Probably occasionally grown in the highlands of Central America. I considered the fine plums now grown around Quezaltenango to be this species but now think that they belong to Prunus salicina, which see.

Prunus persica (L.) Stokes, Bot. Mat. Med. 3: 100. 1812.
Durazno, peach.

Native of China and cultivated since ancient times. Grown in temperate regions of the world where it is an important fruit crop. There are many cultivars. Found in the highlands of Central America, probably mostly as seedlings. Fruits and flowers are produced the year around but a ripe fruit is rarely seen probably because birds or animals (or small boys) get them first if left on the trees to ripen. — I bought fruits from a market lady in San Salvador for sampling and needed all that she had. "If you can afford to buy them all you can afford a higher price" I paid a premium price. Those peaches were all the produce she had to sell and with nothing to sell she would have to go home and miss all of the gossip of a day in the market.

Prunus salicina Lindl. in Trans. Hort. Soc. 7:239. 1830.

Ciruela clara, ciruela Santa Rosa, plum or Japanese plum.

Native of China. Commonly grown around Quezaltenango where the fruit is very fine and apparently tree-ripened fruits are common. The fruits often crack open, perhaps from too rapid growth. In our studies of Central American foods (Munsell & Williams, Food Technology 14: 446. 1950 and 15: 13. 1950) these are given as Prunus demestica.

Pyrus communis L. Sp. Pl. 470. 1753.
Pera, pear.

Native of Eurasia and long in cultivation. Perhaps to be found in Central America above 1,500 meters but probably most pears grown are of the following species.

Pyrus pyrifolia var. culta Nakai
Pera, Chinese sand pear, Japanese sand pear, sand pear.

Native of China. This is probably the pear usually grown in Central America, never abundant but I have collected it in Guatemalan and Honduran markets. The flesh is firm, keeps well and is gritty.

RUBUS. There are a large number of native species of Rubus in our region at middle and higher elevations. The taxonomy of them is difficult and whether there are more species than those described as L. H. Bailey thought, or fewer as I thought I have no way of knowing. Probably the fruits of all native species are eaten. The National Distillery in Costa Rica buys wild blackberries and makes them into quite acceptable wine.

Rubus adenotrichus Schlecht. Linnaea 13: 267. 1839.
Mora, zarzamora, tocán.

Native from central Mexico thorugh Central America to Ecuador.

The berries of this species, and probably of other species mixed in, are collected in Guatemala and often offered in markets as fresh fruit or to be used as flavorings or jams. Perhaps among the kinds used to make wine in Costa Rica.

Rubus costaricanus Liebm. Kjoeb. Vid. Medd. 159. 1852.
Zarzamora.

Used as fruit and doubtless to make wine in Costa Rica.

Rubus glaucus Benth. Pl. Hartw. 173. 1845.

Native of Ecuador, perhaps in Central America but I have seen it only cultivated or where it might have been an escape. The species is more closely related to the raspberries than to the blackberries. The fruits are the largest from any Rubus in our region and quite good. Standley considered them to be one of the best fruits of the whole earth, but I never found any that good! Often in markets in Guatemala and El Salvador and rather expensive. The plant is easily distinguished by the glaucous canes and under surfaces of the leaves.

Rubus occidentalis L. Sp. Pl. 493. 1753.
Blackcap raspberry.

Native in the eastern United States and now cultivated in many horticultural forms. Walter Huppke cultivated one of the varieties in Honduras from imported stock, with great success. Certainly the best Rubus fruits that I tasted in Central America.

RUBIACEAE

Herbs, shrubs or trees; leaves simple, opposite or verticillate, entire, stipules present, intrapetiolar or interpetiolar, persistent or deciduous, frequently connate to form a sheath; inflorescences various; flowers usually perfect, regular and symetric, frequently dimorphous; hypanthium adnate to the inferior ovary; calyx cupular, tubular or nearly obsolete, the lobes similar or unequal; corolla sympetalous, the limb usually symetric, the lobes commonly 4, valvate, imbricate or contorted in the bud; stamens usually as many as the corolla lobes and alternate with them, inserted on the tube or throat of the corolla; ovary 1-10-celled, most often 2-celled, inferior; fruit capsular, baccate or drupaceous.

A large cosmopolitan family but most abundant in the tropics. There are 500-600 genera and perhaps more than 5,000

species,-about 80 genera occur in Central America. The account of the family in the Flora of Guatemala (Fieldiana, Botany 24, pt. XI: 1-205, tt. 1-68. 1975) is useful for Central America, although not complete for the whole region. The family is an interesting one,-the opposite leaves always with stipules, the usually 4-lobed calyx and corolla and the inferior ovary are distinctive. Most species in Central America are woody or suffrutescent.

Alibertia edulis (L. Rich.) A. Rich. ex DC. Prodr. 4: 443. 1830.

Trompillo, madroño, torilillo, albondiga, guayaba de monte, guayabillo, guabillo, wild guava.

Mexico to the Amazon basin, along both slopes of Central America. The large fruits are said to be edible and of poor flavor but I have never seen anyone eat them. Used by small boys and the young in spirit as spinning tops in Costa Rica, hence trompillo.

Calycophyllum candidissimum (Vahl) DC. Prodr. 4: 367. 1830.

Salamo, cáscara de salamo, solano, guayabillo, calán, canela, colorado, madroño, conejo, urraco, surrá, palo de piene, lancewood, lemonwood in U. S. trade.

Mexico and the West Indies, through Central America to Colombia. A conspicuous tree on the Pacific coastal plain of Central America when in flower, especially in Nicaragua where the tree has been left when forests were cleared for cotton and other plantations. Lemonwood is a favorite of the bow makers and is used locally in construction and for tool handles, formerly used to make fine-toothed combs and for other purposes.

Cephaelis ipecacuanha (Brot.) A. Rich. in Bull. Fac. Med. 4: 92. 1818.

Raicilla, ipecacuana.

Native from Nicaragua and Panama to northern South America. This plant, from the wet Atlantic lowlands furnished some of the ipecac of commerce. The drug is obtained from the

slender knotted roots which are about 6 mm. in diameter. Cultivation of this plant has been studied at the experimental station at El Recreo, Nicaragua. Importation of ipecac from Honduras has been reported (1960), perhaps from material in transit.

Chomelia spinosa Jacq. Enum. Pl. Carib. 12. 1760.
Chomelia.

Native from southern Mexico to northern Brazil. The fruits are said to be used in Costa Rica to prepare cool drink, that the fruits are edible, and much appreciated by squirrels and pisotes. The fruits also are said to be used as a remedy for fevers.

CINCHONA. The alkaloid quinine, from Cinchona, for more than three centuries was the only drug useful for the control of malaria and for this purpose was most important to people living in regions where malaria was endemic and often epidemic. The discovery of atabrine by Mietzsch and others in Germany was most opportune at the time of World War II since the source of quinine from the southeast Asian plantations had been cut off by the Japanese. Synthetic drugs for the control of malaria reduced the reliance on quinine. The few plantations in Central America have been abandoned as have most all of those in southeast Asia and Africa. See Wilson Popenoe, The Fever Tree, in Wilson, New Crops for the New World, Macmillan Co. pp. 109-125. 1945, for an interesting account of Cinchona.

Cinchona officinalis L. Sp. Pl. 172. 1753.
Quina, quinine.

Native from Colombia to Bolivia, formerly in plantations in many places in the tropics, including Guatemala, Nicaragua and Costa Rica. Very little Cinchona bark ever was exported from our region.

Cinchona pubescens Vahl, Skrivt. Naturh. Selsk. 1: 19. 1790. C. succirubra Pavón ex Klotzsch, Abh. Akad. Berl. 1857: 60. 1858.

Quina, quinine.

Native from Costa Rica south to Bolivia, once cultivated in Guatemala and Costa Rica for the bark. Becoming naturalized, at least near Cobán in Guatemala (1975).

COFFEA. Coffee is the prestige crop of Central America and is an important plantation crop in all countries in our region except Belize. A very large part of the national income of Guatemala, El Salvador, Nicaragua and Costa Rica is derived from the export of Coffee. The highland coffees of Central America are among the best in the world, if not the best. This writer, for many years consul of Guatemala in Chicago, has been quoted as saying that no coffee quite compares in flavor and aroma with that of Guatemala. Prosperity in Central American countries, Belize and Honduras excepted, depends in large measure upon the coffee crop and its market. When production is good and prices are high Central America is prosperous but when prices in the world market are low then hard times prevail. Most if not all Central American coffee comes from Coffea arabica and plantations are found in suitable places throughout the region between 600 and 1,500 meters, and in a few places even to 1,800 meters. Coffee futures on the world market, as this was being written in early July 1979 was about $2.07 a pound! There had just been a freeze in Brazil and futures had gone up about 30o/o in a month. This indicates the volatility of the coffee market. Quality Central American coffees often bring premium prices. — I visited the Belgian Congo, now Zaire, coffee area in 1958 and thought that the potentially fine highland coffee lands would produce a growing percentage of the fine coffees of the world if political stability could be achieved. It has not been.

Coffea arabica L. Sp. Pl. 172. 1753.

Café, café arábigo, Arabian coffee, cafeto (The tree), cafetal or coffee finca (the plantation), café en grano or coffee beans, cafe malacara (El Salvador), caracol (Nicaragua and elsewhere when the fruit produces a single seed), grano de oro (in Costa Rica and perhaps elsewhere).

Native of tropical Africa and widely cultivated in the tropical highlands of the world. See above for commentary on coffee.

Coffea liberica Bull Retail list new, beautiful & Rare Pl. No. 97: 4. 1874.

Café robusta, Liberian coffee.

Native of Liberia and other regions of west Africa. Rarely grown in Central America. Used in blends because the flavor and aroma are inferior to Arabian coffee, commonly grown in Indonesia.

Gardenia angusta (L.) Merrill, Interpr. Herb. Amboin. 485. 1917.

Jazmín, jazmín del cebo, gardenia.

Native of southern China, now commonly cultivated in the tropics and in greenhouses. Esteemed in Central America as a garden plant and for the fragrance of its flowers.

Genipa americana L. Syst. ed. 10: 931. 1759.

Guaitil, jagua.

Native of Costa Rica and Panama and on south into South America. The pulp of the fruit is eaten but is unattractive and not very good. The fruits contain a dye which was used as a body stain by early Americans, and may still be. It has been used as a dye for textiles. See also the next species.

Genipa caruto HBK. Nov. Gen. & Sp. 3: 407. 1820.

Irayol, jagua, guaitil, tambor, tiñe-dientes, genipap, gualí.

Native from southern Mexico through Central America to northern South America and often considered to be a variety of G. americana. There are six species of Genipa in Central America. The fruits are eaten but certainly not attractive as they stain the teeth and the mouth. The fruits have been used to produce a blue or almost black color on textiles. In Honduras a concoction made from the ripe fruits is said to stimulate the appetite and to aid digestion. The fruits were a source of body stain for the Central American Indians. W. A. Archer speculated to this writer that the "decoration" which certain Indians used was rather a method of protection from sunburn since the Indians usually placed the stain on rounded parts of the body and on the face where sunburn is likely to be greatest. Dr. Archer questioned whether or not some of the proprietary tanning lotions, which give a synthetic suntan, may not act in the same way.

Hamelia patens Jacq. Enum. Pl. Carib. 16. 1760.

Coloradillo, zorrillo, azulillo, zorillo real, palo camerón, añileto, clavito, flor cangrejo, canuto, hierba de cáncer, chichipince, sisipince, and many more in Mayan dialects.

Native from southern Florida, Mexico and the West Indies through Central America to Bolivia and Paraguay. It is often a weedy shrub and one of the first to appear in disturbed forest soils, perhaps the wide distribution has been assisted by birds and small mammals. The fruits are edible but not very good. Sometimes planted as an ornamental. The abundance of common names indicates a well-known plant. "Coloradillo" is sometimes used for chiggers or small ticks but I do not know if there is a connection.

Morinda yucatanensis Greenm. Field Mus. Bot. 2: 262. 1907.

Pinuela, several Mayan names based on xhoyoc.

Said to have been used by the Mayas as a dye plant and that the fruits rubbed on warts removed those growths.

PSYCHOTRIA. One of the large pantropical genera of plants, possibly with more than a thousand species. Common in the forest understory in Central America with perhaps 80-100 species. Many doubtless contain alkaloids but little is known about them. Ipecac may be derived from the roots of some kinds but I have no firm records that this is so.

Randia armata (Sw.) DC. Prodr. 4: 387. 1830.

Flor de cruz, palo de cruz, crucito, crucetilla, jicarillo, jasmín cimarrón, cagalera, rosetillo, torolillo, caja de mico.

Mexico and the West Indies south to Argentina. The fruits of this spiny shrub or tree are eaten by people but as fruits they are rather unattractive. The fruits are said to be used in the West Indies to stupify fish.

Sickingia salvadorensis Standl. Field Mus. Bot. 12: 390. 1936.

Campeche, brasil, palo colorado, drago, sangre de chucho, palo puntero, John Crow redwood.

Native in Yucatán, Guatemala, Belize and El Salvador. The wood turns red when first cut but fades with time. In Belize the wood has been used to dye textiles.

RUTACEAE

Trees (ours), shrubs or rarely herbs, often spiny and with secreting glands in the foliage, bark and fruit; leaves alternate or opposite, almost always compound, estipulate, translucent oil glands usually present as is usually a pleasant fragrance; inflorescence of fascicles, cymes, panicles, spikes or racemes; flowers perfect or unisexual; calyx with 3-5 sepals, rarely none; petals 3-5 or more, free or rarely united; stamens as many as the petals or twice as many or more; carpels of the ovary 1-5 or more, free or united, each cell with 2 or more ovules; fruit of follicles, samaras, drupes or berries.

A large family of about 120 genera, mostly tropical, with about 15 in Central America, Distinguishing marks are compound leaves nearly always, pellucid dots in the foliage and often in the bark, flowers and fruit and a characteristic fragrance, the outer stamens opposite the petals. There are many economic plants in the family, notable are the citrus fruits.

Casimiroa edulis Llave & Lex. Nov. Veg. Descr. 2: 9. 1825.

Matasano, matasán, ajachel, ahache, white sapote.

Found from Mexico to Costa Rica, probably spread by man from early times down to today, as a useful food plant. The fruits somewhat resemble early apples in color, shape and size as well as in flavor. The fruits are eaten everywhere, sometimes with reserve since the common name, matasano, derives from the popular belief that the fruit is unhealthy. A glucocide, casimirosine, extracted in Mexico is said to have hypnotic and sedative effects. Popular belief is that if considerable amounts are eaten the fruit will induce sleep. The name of the well-known Guatemalan resort town, Panajachel, signifies the "place of the matasano."

Casimiroa sapota Oerst. Kjoebn. Vidd. Medd. 187. 1857.

Matasano.

Costa Rican, with the same name and presumed uses as the above,-and perhaps not really distinct from it.

Casimiroa tetrameria Millsp. Field Mus. Bot. 1: 401. 1898.

Matasano, sapote blanco.

Southern Mexico to Costa Rica. Closely allied to Casimiroa edulis but distinguished by pubescence of the leaves. The uses are the same.

CITRUS. The species of Citrus are all from eastern and southern Asia, or derived from species of that region. Some of the species given below have been in cultivation for 3,000 years or more. Citrus fruits were introduced into Iberia in early times and many brought to the colonies in America soon after the time of discovery. The cultivation of citrus fruits in Central America is mostly to supply local demand. Citrus fruits are processed for export in Belize. The botanical names in Citrus are difficult and those that I have used below are the ones that I believe useful in our region. There are species not mentioned in this account that may be found in our region.

Citrus aurantifolia (Christm.) Swingle, Journ. Wash. Acad. Sci. 3: 465. 1913.

Limón, lime.

Native of southeast Asia. Limes are cultivated and used cver most of Central America, being found in most markets in season. Many Central Americans have a child-like faith in the sterilizing effect of lime juice on suspect water. The juice is used in cool drinks, in soups, over meat and fish dishes. In the days of sailing ships lime juice was used on British ships as an antiscorbutic and hence British sailors, and others, became known as "limeys."

Citrus aurantium L. Sp. Pl. 782. 1753.

Naranja ácida, naranja agria, sour orange, bitter orange.

Native of Asia. Said to have been brought into Spain by the Arabs before the sweet orange. Used to flavor soups or meats, to make orange preserves. The seedlings are used as stock for sweet oranges in grafting. The peel of this, and of other oranges, when dried is used as kindling to start fires. The oil in the peel is the tinder. Bitter orange peel has been used in formulation of medicines, as a simple bitters or as a flavoring agent.

Citrus grandis (L.) Osbeck. I have seen the pummelo once in Central America, apparently as a curiosity. The juice is quite bitter. This species is supposed to have given rise to the grapefruit.)

Citrus limetta Risso, Ann. Mus. Hist. Nat. Paris 20: 195, t. 2. 1813.

Lima, lima dulce, naranja lima, lima limón (at least in Brazil).

Native of Asia. Common in Central America where it is much appreciated. It is the most insipid of the citrus fruits, to my taste. The globose, pale green fruits were held in high esteem in central Brazil by caravan or horseback travellers as an alternative source of water.

Citrus limonia Osbeck, Reise Ostind. China 250. 1765.
Stet, limón, limón real, limón ponderosa, lemon.

Probably native of southeast Asia and cultivated since ancient times.

Found in all Central American countries but mostly little appreciated. Sometimes the bitter orange is called limón, incorrectly. The fruits are useful in cleaning furniture of mahogany and Spanish cedar and in tenderizing meats.

Citrus maxima (Burm.) Merrill, Interpret. Herb. Amboin. 296. 1917.
Toronja, grapefruit.

Thought possibly to have originated in Jamaica from C. grandis. Cultivated in all Central American countries and in

appropriate tropical and subtropical regions of the world. Considerable grapefruit juice is canned or frozen in Belize for the European market. I found Belizan grapefruit juice in a small store in Scotland. Grapefruit, as a plantation crop, has become important in Texas, Arizona, California and Florida. The fruit is often "too sour" for the taste of Central Americans.

Citrus medica L. Sp. Pl. 782. 1753.

Cidra, citron, limón de Florida.

Mostly grown for the peel which may be candied and used as a flavoring in baked goods or as a candy. Uncommon in Central America. Named for Media, an ancient country in what is now Iran.

Citrus reticulata Blanco, Fl. Filip. p. 610. 1837.

Mandarina, tangerine, mandarin orange.

Native of southeast Asia, possibly from cultivation. Grown in all Central American countries, the best perhaps from Nicaragua. Tangerines will do well in drier localities than most kinds of citrus will tolerate and should be more widely grown to increase the fruit supply. The citrus fruits with loose, easily removed peel are placed here. Citrus deliciosa and C. nobilis var. deliciosa are names which have been used in our literature for this plant.

Citrus sinensis (L.) Osbeck, Reise Ostind. China 250. 1765.

Naranja, naranja dulce, naranja de Bahía, naranja sin pepitas, sweet orange, navel orange, Washington navel.

Oranges are one of the commonest of the cultivated fruits in our region although there are not as many of them as there ought to be nor are all of the good varieties to be found. Oranges are to be found in all markets in season and, of course, the season is extended by elevation. Oranges are ancient in cultivation, perhaps originating in China. The "Valencia" oranges are among the best to be found in Central America. Navel or Bahía oranges, which originated in Bahía, Brazil, are becoming quite common.

Murraya paniculata (L.) Jack, Malay Misc. 1: 31. 1820.
Mirto, jazmín de Arabia, limonaria.

Native of India, planted as an ornamental and sometimes naturalized in Central America. Flowers fragrant, the fruits bright red.

Ruta chalepensis L. Mant. 1: 69. 1767.
Ruda, rue.

Native of southern Europe. Rue contains an aromatic oil which was used formerly in medicine as a flavoring. Used in Central America in family medicine, among others to induce menstruation but it may have disastrous results.

ZANTHOXYLUM. Several of the Central American species have a rather strong and often pleasant fragrance, apparently due to an essential oil in the leaves and bark. There is a bit of a quick drying, fragrant oleoresin in the leaves and bark of Z. williamsii Standl. (Honduras) that leaves a varnish-like covering.

SALICACEAE

Trees or shrubs; leaves alternate, entire or serrate, stipulate; inflorescence usually an ament; flowers unisexual, solitary in the axils of bracts in the ament, either all of one sex or mixed in the aments; seeds small, bearing a coma of usually silky white hairs.

Two genera with some 250 species, mostly in north temperate and arctic regions, both in Central America.

Populus alba L. Sp. Pl. 1034. 1753.
Alamo, alamo blanco, poplar, cottonwood.

Native of Europe and Asia. Planted as a street tree or ornamental in the Guatemalan highlands and perhaps elsewhere.

Salix chilensis Molina, Sagg. Storia Nat. Chil. 169. 1782.
Sauce, willow.

Thought to be native from Mexico and Belize and south to Argentina. It is abundant along some streams and rivers in Cen-

tral America from the lowlands to the cool highlands. Planted occasionally as an ornamental or as a shade tree. The wood is not very good but it is used locally as fuel. The slender and flexible branches are used to weave baskets. Columnar willows are occasionally seen, some of the best on Leo Salazar's land above Matagalpa, Nicaragua.

SAPINDACEAE

Trees, shrubs, woody or herbaceous vines; leaves alternate, usually without stipules, mostly pinnately or palmately compounded but sometimes simple, the leaflets entire, dentate to lobate, the leaves of the vining kinds often with tendrils; inflorescences racemes, panicles or corymbs; flowers mostly polygamodioecious, regular or not, usually small and white; sepals 4-5 or more, rarely one; petals 3-5 or none, equal or unequal, often squamate or barbate within; disk various, complete, incomplete or unilateral; stamens 5-10, mostly 8, usually inserted on the disk; ovary central or eccentric, most often 3-celled, entire, lobate or divided to the base, ovules 1-2 in each cell; fruits capsular or indehiscent, drupaceous, baccate, coriaceous, or of samaras; seeds often arillate.

A large family in the tropics with some 150 genera and well more than 1,000 species, about 18 genera in Central America.

Blighia sapida Koenig in Koenig & Sims, Ann. Bot. 2: 571, tt. 16-17. 1806.

Huevo vegetal, seso vegetal, palo de huevo, aki, akee.

Native of Africa and perhaps brought to our region from the West Indies by negro immigrants. The yellow or white aril is the edible portion and is said to be quite good when fried. Uncooked or improperly cooked it is poisonous. The tree flowers and fruits abundantly along the Atlantic of Central America. It produced fruits in my yard in the relatively dry Zamorano valley in Honduras at 800 meters. The genus is named for William Bligh, comander of the "Bounty."

(Dodonaea viscosa (L.) Jacq. Enum. Pl. Carib. 19. 1760.— I have no record of the uses of this plant in Central America. The leaves and stems are covered with a resin-like substance. An

aqueous solution prepared from the leaves and stems is said to be toxic to some cockroaches. The plants increase in over grazed situations so probably are unpalatable to stock. The plant has a natural pantropical distribution.)

(Litchi chinensis Sonn. — The litchi, lychee or leechee, native of southeast Asia, has been in cultivation for 2,000 years or more. The trees are attractive ones and the fruit is very fine, either fresh or dried. The dried fruit, with a raisin-like consistency are the "litchi nuts" of the Chinese. I have seen the trees in cultivation in Guatemala and Honduras.)

Melicocca bijuga L. Sp. Pl. 495. 1753.
Mamón, mamón de Cartagena, Spanish lime, genip.

Native or introduced, perhaps in pre-Columbian times, from the West Indies and El Salvador to northern South America. The salmon colored pulp of the fruits is edible and quite good. Used also in cool drinks, the seeds when roasted are eaten. I found the fruits in markets in El Salvador and Nicaragua.

PAULLINIA. A genus of woody vines with about 150 species, all in America. The crushed plants of several kinds are used as a barbasco. When thrown into a quiet stream or pool the fish are stupified and can easily be caught. It is said that if not collected the fish revive and swim away. The seeds of P. cupana HBK., and perhaps of other species, are roasted and used to prepare a stimulating carbonated soft drink called guaraná in Brazil.

Paullinia fuscescens HBK. Nov. Gen. & Sp. 5: 93. 1821.

Bejuco colorado, barbasco, bejuco de barbasco, sebo de pollo, nistamal, bejuco cuadrado, palo de mimbre, chilmecate, bejuquillo de gusano.

Native or perhaps spread by early man as a barbasco, from Mexico and the west Indies through Central America to northern South America. The fleshy aril is eaten but the seeds are thought to be poisonous.

Paullinia pinnata L. Sp. Pl. 366. 1753.
Barbasco, pate, pietie, fish poison.

Native from southern Mexico and the West Indies south through Central America to South America. Africa.

Used as a barbasco, as discussed above. The flexible stems sometimes used as cordage. The seeds are reported to have been used in the West Indies in criminal poisonings.

Paullinia scarlatina Radlk. in Donn.-Sm., Bot. Gaz. 16: 193. 1891.
Barbasco, pate.

Native in Guatemala, Belize and Honduras where it is reported to be used as a barbasco.

Sapindus saponaria L. Sp. Pl. 367. 1753.
Jaboncillo, pacón, pacún, cuyas, jabon-che, soap-berry.

Native from Mexico and the West Indies to South America. Native or more likely introduced into the Old World. When the ripe fruits are macerated and agitated in water a suds is produced so the pericarp is widely used as a soap substitute in washing clothes. The crushed fruits are used as a barbasco.

SERJANIA. A large genus of some 200 species of woody vines, all American. Several species have been reported to have been used as barbascos or fish poisons. Perhaps all or most of them do have this potential. Dynamite perhaps is more efficient than barbascos although destructive of all fish in a pond or pool and its use is prohibited in most countries. Serjania goniocarpus Radlk. and S. inebrians Radlk. have been reported as barbascos. The stems of Serjania rufisepala Radlk. and S. sordida Radlk., both called bejuco juriso, are used to weave coffee baskets in Costa Rica.

Talisia floresii Standl. Trop. Woods 26: 14. 1931.
Poloc, ixezul (Maya).

Native of northern Petén and adjacent Mexico. The large tobacco colored fruits suggest the chicozapote (Acras zapota). The aril surrounding the seed is aromatic, edible and with a sweet and agreeable flavor.

Talisia olivaeformis (HBK.) Radlk. Sitzunbsber. Bayer. Akad. 8: 342. 1878.

Tinalujo, tinaljuco, jurgay, urugalle, tapajocote, kenap, guayo, mayum (Maya).

A lowland native or planted from Yucatan and Belize, occasional in Central America to northern South America. Perhaps distributed by early man. The greenish or yellow fruits have been seen in Guatemalan markets. The orange-red pulp is somewhat acid but of agreeable flavor.

SAPOTACEAE

Usually trees, often very large, sometimes armed with spines, sap usually milky; leaves alternate, entire, usually coriaceous; inflorescence fasciculate, cymose, or the flowers solitary in the leaf axils or on old stems; flowers perfect, actinomorphic; sepals imbricated, 4-12, often sericeous, usually unequal; corolla sympetalous, lobate, the tube usually short and broad, often bearing appendages between the lobes; stamens as many as the corolla lobes and often alternating with staminodes; ovary superior, 4-12-celled; fruits baccate, often very large, smooth and lustrous or not.

Economically the family is and has been important in our region for chicle, for several good fruits and wood of fair to good quality, some wood exceedingly durable. Seven genera in Central America. More than 200 genera have been described world wide but of these perhaps not more than 30 or 40 are good.

Chrysophyllum cainito L. Sp. Pl. 192. 1753.
Camito, star apple.

One of the better fruits of this family and one which has been in cultivation since long before the conquest. Probably not native in Central America but occasionally naturalized. The fruits are globose, to 8 cm. in diameter and green to purple. The usually milky flesh of the edible fruits is white to purple. and when cut cross-wise shows the seeds radiating like the points of a star, hence star-apple. A fine shade tree and a handsome one since the golden pubsecence on the lower leaf surfaces "flashes" like gold when the leaves are moved by the wind.

Chrysophyllum mexicanum Brandegee ex Standl. Contr. U.S. Nat. Herb. 23: 1114. 1924.

Camito, camito silvestre, caimito morado, guayaba de danta, zapotillo, guayabillo, siciya, wild star apple, damsel.

Native in southern Mexico and Belize to El Salvador and Honduras. The fruits are edible when ripe, they are dark purple and 2-4 cm. in diameter, usually 1-seeded and the flesh with abundant white latex as are other parts of the plant.

Dipholis salicifolia (L.) DC. Prodr. 8: 188. 1844.
Cháchiga, mijico, sac-chum.

Native from southern Florida, the West Indies, Mexico and Belize. Tapped for the latex which is used like chicle to adulterate chicle. The wood is used locally in construction.

Dipholis stevensonii Standl. Trop. Woods 11: 21. 1927.
Zapote faisán, white faisán, red faisán.

Native in Belize and the Petén of Guatemala. The tree has been tapped for chicle which is said to be of good quality.

MANILKARA. The genus was important in Belize and the Petén as a source of the gums called chicle. Several species were involved in the production of chicle, the principal one is called Manilkara achras. Some 5,500 to 6,400 metric tons of chicle were exported from Belize annually from 1927 to 1930 but now very little is collected and exported, -and chewing gum is not as good as it once was.

Manilkara achras (Miller) Fosberg, Taxon 13: 254. 1964. Sapota achras Miller, Gard. Dict. ed. 8. 1768. Achras sapota L. Sp. Pl. ed. 2. 469. 1762. Achras zapotilla Nutt. No. Am. Sylva 3: 28. 1849.

Níspero, chicosapote (tzicozapotl, the Nahuatl name), chicozapote, chico, sapodilla.

Native of southern Mexico and Belize. Perhaps planted and naturalized around pre-conquest sites and villages. Presumed to be introduced and perhaps naturalized elsewhere in tropical America. The fruits are much appreciated everywhere and

are in markets in season. The fruits have a rough, brown or russet colored skin. The flesh is brownish, rather mucilaginous and very sweet when ripe. Known as níspero or chicosapote the fruits are usually globose and up to 9 cm. in diameter. The gum chicle is obtained by tapping the trunks or branches during the wet season. The white latex obtained is coagulated by heating and formed into blocks for export. The wood is resistant to decay and some lintels in Mayan structures in Honduras are said to have been solid after about a thousand years in place.

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

Níspero de montaña, chico, zapotè macho, chicozapote, zapotillo.

Native from southern Mexico and El Salvador. The fruits are said to be similar to those of M. achras, and edible. Trees are tapped for the latex which is of inferior quality but sometimes it was used to adulterate that of M. achras. The gum is softer and more difficult to mold.

Mastichodendron capiri var. tempisque (Pittier) Cronquist, Lloydia 9: 250. 1946.

Tempisque.

Native from Mexico to Panama, mostly near the Pacific. The fruits are edible but those that I have tried are poor in flavor and with scant flesh.

Mastichodendron foetidissimum var. gaumeri (Pittier) L. Wms. Fieldiana, Bot. 31: 263. 1967.

Zoy, dzoy, cream tree.

Native of the lowland forests of Mexico and Belize. The fruits are reported to be eaten.

POUTERIA. Perhaps some 15 species in Central America. The fruits of most species are edible but not very good. The generic name Lucuma often has been used for these plants.

Pouteria campechiana (HBK). Baehni, Candollea 9: 398. 1942.

Zapote, zapote amarillo, zapotillo de montaña, zapotillo, mamey cera, mamey cerilla, guaicume, güicume, caca de niño, canistel.

Pouteria mammosa (L.) Cronquist, Lloydia 9: 287. 1946.

Mamey, zapote, zapote mamey, sapote, sapotillo, satul, saltulul, tulul, mamee apple. mamee zapote.

Possibly native in southern Mexico and Guatemala. Widely cultivated and doubtless spread by early man through tropical America, naturalized in many places. The fruit is globose or ellipsoid, about 10-20 cm. long, with rough brown peel, the pulp soft and sweet, yellow to deep red, eaten raw or made into preserves. The single large seed is a lustrous brown and it is known as sapuyul. The seeds when dried are used for flavoring chocolate, atols and other beverages. The seed oil is used as a hair dressing or to make soap. The oil is believed to prevent the falling of hair and even to promote its growth.

Pouteria viridis (Pittier) Cronquist, Lloydia 9: 290. 1946.

Injerto, ingerto, sapote injerto, zapotillo, zapotillo calenturiento, green zapote.

Distributed from Mexico to Costa Rica, perhaps part of the range as a cultigen, the native habitat is not known. Perhaps widely distributed by early man as were many other large fruited trees, ones easily dispersed by seeds. The fruits are much appreciated as fresh fruit and are often seen in markets. The peel is soft and thin, olive green to yellow or reddish, the flesh green. Not one of my favorite tropical fruits!

SAXIFRAGACEAE

Herbs, shrubs or small trees, sometimes armed with prickles; leaves alternate, usually simple, entire or lobate; flowers perfect; sepals mostly 5; petals as many as the sepals or none; stamens as many as the sepals to many; ovary partly or wholly inferior; fruit a capsule, follicle or berry.

Te family is notable for the many ornamentals or cultivated plants which belong here. The gooseberries, species of Ribes, may be cultivated here but I have not seen them and expect that the tart fruits would not be appreciated. I have seen Escallonia floribunda HBK. in fence rows in Costa Rica where it is native but probably not planted in that place.

Hydrangea macrophylla (Thunb.) DC. Prodr. 4: 15. 1830. Hortensia.

Native of Japan. Cultivated at middle and higher elevations for the attractive globose heads of flowers. A favored ornamental where ever it will grow.

Philadelphus mexicanus Schlecht. Linnaea 13: 418. 1839. Mosqueta, filadelfus.

Assumed to be native in Mexico and commonly cultivated in the mountains of Central America. An attractive ornamental perhaps naturalized in some places.

SCROPHULARIACEAE

Herbs, shrubs (rarely trees), saprophytes or root parasites occur; leaves mostly opposite, also verticillate or alternate, simple, dentate or incised; inflorescences of spikes, racemes, or the flowers solitary or fasciculate in the leaf axils; flowers perfect, zygomorphic or sometimes nearly actinomorphic; calyx with or rarely with fewer calyx lobes; corolla gamopetalous, the tube long or none, the limb 4-5-(rarely 6-8)-lobed, usually bilabiate; stamens 4 or 2, inserted on the corolla tube, the fifth stamen represented by a staminode; ovary superior, locules and carpels 2; fruit a capsule, rarely baccate; seeds usually many and small.

A family with many horticultural plants, one important drug plant, many attractive wild plants, and a few weeds. About 200 genera and perhaps 2,000 species, mostly in the mountains of temperate and tropical regions, about 30 genera in Central America. The most recent account of this sometimes difficult family is in the Flora of Guatemala (Fieldiana, Bot. 24, pt. 9: 319-416. 1973) where most Central American kinds are accounted for.

Antirrhinum majus L. Sp. Pl. 617. 1753.
Dragón, boca de dragón, boca de león, snapdragon.

Native of Europe. Widely planted in several horticultural forms as an ornamental and for the market, at middle elevations.

Digitalis purpurea L. Sp. Pl. 621. 1753.
Dedalera, digital, dedal de la reina, goxglove.

An European plant well known for its medicinal uses in heart disorders. Full grown leaves are dried quickly and the drug, a glucoside called digitoxin, is extracted from them. Standley reports the plant as having been established on Irazú volcano fifty years ago. I have not seen it there in more recent years. Planted as an ornamental in many places.

Maurandya barclaiana Lindl. Bot. Reg. 13: t. 1108. 1827.

Native of Mexico and perhaps of western Guatemala, an attractive vine occasional in Central American gardens as an ornamental. Other species of the genus may occur as ornamentals, or as escapes.

Penstemon gentianoides (HBK.) Poiret, Dict. Sci. Nat. 38: 385. 1825.
Campanola, penstemon.

Native from Mexico south to the Guatemalan highlands. Occasionally planted as an ornamental.

Penstemon perfoliatus Brongn. Hortic. Univ. 5: 265. 1844.
Penstemon.

Native of Mexico, planted in Guatemala and perhaps elsewhere in Central America as an ornamental.

Scoparia dulcis L. Sp. Pl. 116. 1753.

Escobilla, culantro, culantro montés, escobeta, mastuerzo, anise seed bush.

Distributed from the southern United States, Mexico and the West Indies and South America, and into the Old World Tropics. Made into brooms and said to be useful in destroying fleas and other parasites in the nests of chickens.