## PIPERACEAE

Ours shrubs or small and weak trees; leaves alternate, palmately nerved or penninerved, inflorescence ament-like spikes either terminal or leaf opposed; flowers small, green to white or rarely darker, perfect or unisexual; perianth none; stamens 2-6; ovary superior, sessile, 1-celled; style 1 with 2-5 stigmas; fruit berry-like, indehiscent.

A large family in our region with some hundreds of species but only two genera. Peperomia is often epiphytic and almost always a herb; Piper is usually a shrub or sometimes a small tree and most are terrestrial, some are vines. Black pepper is the only well known commercial product in the family.

Piper auritum HBK. Nov. Gen. & Sp. 1: 54. 1816.
Santa María, cordoncillo, hoja de jute, matarro, bull hoof.

One of the commonest of Pipers from Mexico to Colombia, often planted and doubtless naturalized in disturbed places or weedy. The leaves are sometimes cooked and eaten but more often the fresh leaves are used in flavoring soups and meat dishes. The flavor and odor which is somewhat like sarsaparilla, is evanescent so leaves are not found in markets.

Piper nigrum L. Sp. Pl. 28. 1753.
Pimienta, black pepper, white pepper.

Native in the Old World tropics. Black pepper is the dried unripe fruits of this species, harvested when only a few berries in each spike are ripe, then dried in the sun or smoked, sometimes put into boiling water before drying. White pepper is made from the nearly ripe berries that are fermented or soaked in water. The outer coating of the fruit is "white pepper." The two kinds are often mixed commercially.

The United Fruit Company once looked into the feasibility of pepper as a plantation crop in Central America. It was thought at the time that the world market for the product was too small and labor costs too high in Central America to make the crop competitive with plantations in the paleotropics. Some pepper is grown in Jamaica and in Brazil.

## PODOCARPACEAE

Trees with persistent (evergreen) leaves either alternate or opposite; dioecious or monoecious; the staminate flowers in terminal or axillary strobili; female flowers solitary, axillary or terminal; fruits berry-like with a single ovule.

A family of about 5 genera and 60 species, mostly of the southern hemisphere with only one genus extending into North America.

PODOCARPUS: several species in addition to the one given below are reported from Central America, mostly as ornamentals. A native species, Podocarpus standleyi Buckholz & Gray of Costa Rica may have been used there as lumber but little is known about it. The common name is cobola.

Podocarpus oleifera Don in Lambert, Pinus 2: 20. 1824.
Ciprés, ciprés de montaña.

Found in montane forests from Mexico to western South America. Uncommon in our region and although useful in construction it is little known.

## POLYGALACEAE

Herbs, woody vines, shrubs or rarely trees, often with glands in the tissue of the leaves or flowers; leaves alternate, opposite or verticillate, entire; inflorescences mostly racemose or spicate; flowers perfect, zygomorphic; sepals 5, distinct or the two lower ones connate; petals 3 or rarely 5, the anterior one keeled, often with a terminal beak or crest; stamens 3 to usually 8; anther dehiscent by a subterminal pore; fruit a capsule, drupe or samara; seeds usually one in each cell of the ovary.

About ten genera in temperate and tropical regions. A few species are cultivated as ornamentals in our region.

Monnina xalapensis HBK. Nov. Gen. & Sp. 5: 414. 1823.
San Benito, tinta, tintamora, tintilla, zacate de venado.

The juice of the ripe, purple fruits is sometimes used as a dye or as ink. It grows from southern Mexico to Panama at middle elevations.

Securidaca sylvestris Schlecht. Linnaea 14: 381. 1840.
Corralmeca.

Native from Mexico to Costa Rica at middle elevations. Occasionally used as an ornamental. In El Salvador used in the treatment of cattle and perhaps used as a barbasco.

## POLYGONACEAE

Herbs, shrubs with some scandent, or trees; leaves alternate or rarely opposite, variable but mostly simple, the base of the petiole often membranaceous-marginate and with interpetiolar ochrea; inflorescence of axillary fascicles or in spikes or racemes; flowers occasionally large and attractive but usually not; perianth inferior, calyx-like or colored, segments 4-6 in 1-2 series, usually unchanged in fruit; stamens 6-9; ovary superior, compressed or usually trigonous; fruit an achene, usually trigonous.

The family has about 30 genera and 800 species, often weedy ones. There are about 12 genera in Central America.

Antigonon leptopus Hook. & Arn. Bot. Beechey Voy. 308, t. 69. 1839-40.

Santiago, San Diego, flor de San Miguel, confite, flor de confite, bellísima.

Native in Mexico and perhaps Guatemala, cultivated occasionally as an ornamental throughout Central America. The roots are said to be edible but I have never seen them offered in a market.

Coccoloba caracasana Meisn. in DC. Prodr. 14: 157. 1856.
Papaturro, papaturro blanco, papalón, paparrón.

A rather attractive tree found on the Pacific slope from Guatemala to Panama and in Colombia. The white, juicy fruits have an acidulous flavor and are often eaten.

Coccoloba uvifera L. Syst. Nat. ed. 10. 1007. 1759.
Uva, uva de playa, papaturro, sea-grapes, grape.

Sea beaches from Florida and the West Indies to Mexico and Panama along the beaches of the Atlantic, northern South America. The fruits are eaten and preserves may be made of them. The bark yields an astringent red sap which was the source of West Indian kino, gum kino or American kino used in medicines or as a tanning agent.

Coccoloba venosa L. Syst. Nat. ed. 10. 1007. 1759. C. floribunda (Benth.) Lindau, Bot. Jahrb. 13: 217. 1890.

Papaturro, iril, irire, juril.

Native from Mexico to Costa Rica along the Pacific plains, south to Brazil.

The fruits are juicy and edible, the tree a handsome one and a good shade tree.

Rheum rhaponticum L. Sp. Pl. 371. 1753.

Ruibarbo, rhubarb, pie plant.

Native of Siberia and cultivated in temperate regions around the world for the leaf petioles from which a fruit-like stew or pies may be made. Not especially appreciated in Central America since it is quite sour but I have collected it from markets in Guatemala and Costa Rica.

RUMEX: Rumex crispus L., leaves are used as a pot herb in the United States and although quite common in our region as lengua de vaca, lengua de caballo or lechugón so far as I know it is not used. Rumex hymenosepalus Torr., caña agria, or canaigre, is a potential crop as a source of tannin in our region where the rainy season produces some 60 cm. of water.

## PONTEDERIACEAE

Perennial aquatics or plants of wet soil, often floating; the leaves with inflated petioles (ours); inflorescences spike-like; perianth tubular; the tepals 6, somewhat bilabiate with the outer segments narrowest; fruit a 3-celled capsule.

Eichhornia crassipes (Mart.) Solm in DC. Monog. Phan. 4: 527. 1883.

Lechugilla, lechuga de concha, lirio de agua, jacinto, water hyacinth.

Possibly native of the Amazon river basin but now distributed in fresh waters in the tropics of the world. A water weed of considerable importance because it chokes waterways and fills ponds and lakes and is all but impossible to eradicate. It is a serious pest in the southeastern United States and even in such rivers as the Congo in Africa where serious attempts at control were being made when I was there in 1958. The flowers are attractive and the plant has been spread as one of horticultural value. It should not be distributed in waters where it does not occur and should be destroyed when possible. Eichhornia azurea (Sw.) Kunth., reported as a pest in Costa Rica, may be the same as I. crassipes.

## PORTULACACEAE

Herbs (ours), usually succulent, glabrous or pilose at the nodes; leaves alternate, opposite or in basal rosettes, entire; inflorescence terminal or axillary, racemose, paniculate or cymose; flowers perfect, regular or nearly so; sepals 2; petals 4-5, often fugaceous; stamens as many as the petals and inserted on them; fruit a capsule, loculicidally dehiscent or circumscissle.

A small family of perhaps 15 genera with about 5 in Central America, mostly of temperate or colder regions of the world. Quite a few are grown as ornamentals.

Calandrinia micrantha Schlecht. Ind. Sem. Hort. Hal. 1838. Linnaea 13: Litt.- Ber. 97. 1839.
Berros, barba de San Nicolás.

Native in Mexico and Guatemala, perhaps often as a weed there and elsewhere. Seen in markets in Guatemala where it was said to be a good pot herb.

Portulaca oleracea L. Sp. Pl. 445. 1753.
Verdolaga, puslane, purslane, pusley.

Now distributed almost everywhere in temperate and tropical regions as a pesistent weed. The original home not known. Used in Central America as a pot herb or in salads. Although it is found almost everywhere it is offered for sale in many markets. The Maya are said to use the juice of the leaves as a snake bite remedy,- "squeeze the juice on the perforation

of the snake bite. It is not bad for it." I would recommend, however, that for the bites from pit vipers that a more efficacious antidote be used.

Talinum triangulare (Jacq.) Willd. Sp. Pl. 2: 862. 1800.
Espinaca, Philippine spinach.

Native in America, possibly the West Indies and widely distributed from Florida and Mexico to South America. The fleshy leaves are used as a pot herb, like spinach for which they are a good substitute. It is reported that in western Africa the leaves are given to fowl to stimulate egg laying. The leaves of the related T. paniculatum might be used as a pot herb but I do not know that they have been.

## PROTEACEAE

Trees (ours) with alternate, opposite or verticillate leaves; leaves entire or serrate (Macademia) or pinnate (Grevillea); inflorescences racemose, spicate or solitary; flowers perfect, often large and showy; sepals 4, valvate in bud, tubular; petals none; stamens 4, opposite the sepals; fruit a nut, capsule or follicle.

A family of some 50 or more genera mostly in the drier regions of Africa and Australia, a few in South America. Many ornamental plants and one which produces very fine nuts.

Grevillea robusta A. Cunn. Suppl. Prod. Nov. Holl. 24. 1830.
Gravilea, silk oak.

Grevilleas are commonly planted in the Antigua valley of Guatemala as shade in the coffee plantations, almost to the exclusion of other shade trees. The tree is rarely used as shade elsewhere. The leaves are inclined to lodge in the coffee trees when they fall. Used as an ornamental there and elsewhere.

Macademia ternifolia M. Muell. in trans. phil. Inst. Vic. 2: 72. 1858.
Macademia, Queensland nut.

Native in Australia. Produces a very fine dessert nut. There are small plantings in Honduras and perhaps elsewhere in

Central America. Most nuts on the American markets are produced in Hawaii.

## PUNICACEAE

Shrubs or small trees; leaves opposite or often fasciculate; inflorescences subfasciculate or of solitary flowers; flowers perfect, regular, axillary, large and red; calyx 5-7-lobate, persistent; petals 5-7 on the throat of the calyx; stamens many, in several series on the calyx throat; ovary inferior, many celled; fruit baccate, crowned by the persistent calyx; seeds imbedded in the juicy pulp.

Native of the Mediterranean region but cultivated for its fruit or as an ornamental from warm temperate regions to the tropics. One genus and two species.

Punica granatum L. Sp. Pl. 472. 1753.
Granado, granada, granada de castilla, pomegranate.

Grown in most Central American countries and around the world for the fruit with sour-sweet rose-colored pulp. The fruit is rare in markets, probably because it is not much appreciated. Fine leathers are tanned with the bark of the tree or rind of the fruit.

## RANUNCULACEAE

Herbs or woody vines often with acrid sap; leaves alternate or opposite (Clematis only), simple or compound; inflorescence cymose or paniculate; flowers regular or irregular; sepals 3-15, often petaloid; petals as many or more than the sepals, or none, fruits of achenes or folicles.

A family of 20 or more genera and 300 species principally of temperate or arctic regions, six genera in Central America.

Clematis dioica L. Syst. ed. 10. 1084. 1759.

Barba de viejo, cabeza de viejo, hierba de mendigo, barba de chivo, rabo de chivo, barba de venado, barbilla, cabellos de ángel, corona de ángel, tietie.

A common vine of middle elevations from Mexico and the West Indies through Central America to South America, especially visible when the plumose styles of the ripe achenes are showing. The juice of the stems is a skin irritant to many persons and is said to have been used for this purpose in El Salvador by beggars to make themselves appear more pitiful. The gum from the stems is said to have been used as a glue for wood and as good as the best of glues. I have not seen it used as a glue. The stems are sometimes used as cordage.

Clematis grossa Benth. Pl. Hartw. 33. 1840.
Barba de viejo, cabello de ángel, bejuco crespillo, bejuco de algodón, cochillo.

A vine found from Mexico to Brazil. The leaves are reported to irriate the skin, as in the above species, and used in poultice to produce blisters or local irritation. The tough stems are sometimes used as cordage.

Delphinium ajacis L. Sp. Pl. 531. 1753.
Espuela, espuela de caballero, delphinium.

A decoction from the stems and leaves of this cultivated European Delphinium is used as a toothache remedy and to kill head lice. An ornamental commonly grown at middle elevations.

## RHAMNACEAE

Herbs, trees, shrubs or vines, often spinescent; leaves simple, alternate or opposite, often 3-5 nerved, entire or serrate; inflorescences mostly axillary cymes; flowers perigynous, small, perfect or polygamodioecious; calyx limb 4-5-lobate, valvate; petals 4-5 or none, inserted on the throat of the calyx, sessile or unguiculate; stamens 4-5, inserted on the usually concave petals; ovary superior or often connate with the calyx tube; fruits coriaceous, drupaceous or capsular, 1-3-celled; seeds 1 in each cell of the ovary.

A family of almost worldwide distribution with some 45 genera and 600 species,- about 12 genera and 30 species in Central America. There are many ornamentals cultivated in temperate climates. A purgative known as cascara sagrada is obtained from **Rhamnus purshiana.**

Gouania lupuloides (L.) Urban, Symb. Antill. 4: 378. 1910.

Limpia dientes, chew stick, xomak.

Native from Mexico and the West Indies through Central America. The stems are dried and used to clean teeth or exported for use in dentifrices. A decoction has been used to cure sores in the mouth.

Gouania polygama (Jacq.) Urban, Symb. Antill. 4: 378. 1910.

Limpia dientes, pie de pava, jaboncillo.

Native from Mexico and the West InIndies through Central America to northern South America. Used in washing clothes and once exported for use in dentifrices. The foliage once was used in Jamaica in place of hops in brewing beer, a questionable practice since the leaves may contain saponins.

Karwinskia calderonii Standl. Journ. Wash. Acad. Sci. 13: 352. 1923.

Fruto de cabra, huilihuiste, güiligüiste, anonillo, teresico.

Native from southern Mexico to Nicaragua. The fruits or seeds have a sinister reputation as killing pigs and chickens and that small children who have eaten them may experience paralysis and finally death. In Honduras the seeds are said to be very poisonous and used in foods for purposes of homocide. I supplied seeds to Merck Institute of Therapeutic Research in 1949 for testing. The seeds were fed to rats and mice and extracts were injected orally to groups of rats. Massive single doses of extracts or a diet of only seeds produced no deaths nor toxic symptoms in the laboratory animals. The wood from this tree is used where a tough wood is required, axils for ox carts and railroad ties.

Zizyphus mauritiana Lam. Encycl. 3: 319. 1789. Z. jujuba Lam. l. c. 318. 1789.

Jujube, yuyuga, nance japonés.

Native of Asia and Africa. Planted in Guatemala, Honduras and Belize, perhaps elsewhere for the sweet edible fruits.

## RHIZOPHORACEAE

Usually glabrous shrubs or trees with terete branches; leaves opposite and stipulate or rarely alternate and without stipiles, coriaceous, entire to serrate or sinuate crenate; inflorescences cymose, paniculate, spicate or racemose, rarely congested or of a solitary flower; calyx usually more or less adnate to the ovary or rarely free, the limb produced beyond the ovary and cleft into 3-14 lobes; petals as many as the calyx segments and usually shorter, inserted at the base of the calyx limb; stamens 2-4 times as many as the petals or rarely the same number; ovary usually inferior, 2-5-(6)-celled; fruit coriaceous, crowned with the persistent calyx limb, indehiscent or sometimes tardily dehiscent.

There are about 15 genera with few species distributed in tropical regions. One other genus, Cassipourea, in Central America.

Rhizophora mangle L. Sp. Pl. 443. 1753.

Mangle, mangle colorado, mangle caballero, manglar (mangrove forest), mangrove, red mangrove.

Abundant along the shores of Central America and along muddy tropical shores of much of the world. Often in extensive stands with other mangrove plants, Conocarpus, Avicennia and Laguncularia, called mangrove swamps. These are trees of salt or brackish water and seen from the sea are quite beautiful. A mangrove forest seen from inside is a vast tangle of slimy prop roots frequented by spider crabs, other marine animals and a few birds. The bark of the red mangrove tree contains some 22-33 percent of tannin which is extracted and used for tanning hides. It is the least expensive of the tan materials but used alone gives a darker color to the finished leather than is usually desired. Central American leathers tanned with the bark or shoots often are dark red, brittle and not very durable. Tan bark from mangrove was exported from Central America but relatively little is now. Higher labor costs than Asian and African mangrove areas have made it non-competitive. A good quality charcoal is made from mangrove and the wood is used where a hard and durable wood is required.